INTERNATIONAL CODE COUNCIL
2009/2010 CODE DEVELOPMENT CYCLE

PROPOSED CHANGES TO THE 2009 EDITIONS OF THE

INTERNATIONAL BUILDING CODE®

INTERNATIONAL ENERGY CONSERVATION CODE®

INTERNATIONAL EXISTING BUILDING CODE®

INTERNATIONAL FIRE CODE®

INTERNATIONAL FUEL GAS CODE®

INTERNATIONAL MECHANICAL CODE®

INTERNATIONAL PLUMBING CODE®

INTERNATIONAL PRIVATE SEWAGE DISPOSAL CODE®

INTERNATIONAL PROPERTY MAINTENANCE CODE®

INTERNATIONAL RESIDENTIAL CODE®

INTERNATIONAL WILDLAND-URBAN INTERFACE CODE®

INTERNATIONAL ZONING CODE®

October 24 2009 – November 11, 2009

Hilton Baltimore
Baltimore, MD

First Printing

Publication Date: August 2009

PRINTED IN THE U.S.A.

TABLE OF CONTENTS

INTRODUCTION

The proposed changes published herein have been submitted in accordance with established procedures and are distributed for review. The publication of these changes constitutes neither endorsement nor question of them but is in accordance with established procedures so that any interested individuals may make their views known to the relevant code committee and others similarly interested. In furtherance of this purpose, the committee will hold an open public hearing at the date and place shown below for the purpose of receiving comments and arguments for or against such proposed changes. Those who are interested in testifying on any of the published changes are expected to be represented at these hearings.

This compilation of code change proposals is available in electronic form only. As part of ICC's green initiative, ICC will no longer print and distribute this document. The compilation of code change proposals will be posted on the ICC website, and CD copies will be distributed to all interested parties on our list.

2009 ICC CODE DEVELOPMENT HEARINGS

These proposed changes will be discussed in public hearings to be held on October 24, 2009 through October 31, 2009 and November 4-11, 2009 at the Hilton Baltimore, Baltimore, Maryland. The code committees will conduct their public hearings in accordance with the schedule shown on page xxxii.

REGISTRATION AND VOTING

All members of ICC may vote on any assembly motion on proposed code changes to all International Codes. **For identification purposes, eligible voting members must register, at no cost, in order to vote.** The registration desk will be open in the lobby of the convention center according to the following schedule:

Friday, October 23rd	3:00 pm to 6:00 pm
Saturday, October 24th through Wednesday November 11th	7:30 am to 5:00 pm

Council Policy #28-Code Development (page xii) requires that ICC's membership records regarding ICC members reflect the eligible voters 10 days prior to the start of the Code Development Hearings. This process includes new as well as changes to voting status. Section 5.7.4 of CP #28 (page xix) reads as follows:

> **5.7.4 Eligible Voters:** All members of ICC in attendance at the public hearing shall be eligible to vote on floor motions. Only one vote authorized for each eligible attendee. Code Development Committee member shall be eligible to vote on floor motions. Application, whether new or updated, for ICC membership must be received by the Code Council ten days prior to the commencement of the first day of the public hearing.

As such, new membership application as well as renewal applications must be received by ICC's Member Services Department by October 14, 2009. These records will be used to verify eligible voter status for the Code Development Hearings. Members are strongly encouraged to review their membership records for accuracy well in advance of the hearings so that any necessary changes are made prior to the October 14, 2009 deadline. For information on application for new membership and membership renewal, please go to www.iccsafe.org/membership/join.html or call ICC Member Services at 1-888-ICC SAFE (422-7233)

It should be noted that a corporate member has a single vote. Only one representative of a corporate member will be issued a voting badge. ICC Staff will be contacting corporate members regarding who the designated voting representative will be.

ADVANCED REGISTRATION

You are encouraged to advance register by filling out the registration form available at www.iccsafe.org/codesforum.

CODE DEVELOPMENT PROCESS CHANGES

As noted in the posted Advisory Statement of February 4, 2009, the revised Code Development Process includes maintaining the current 3-year publication cycle with a single cycle of code development between code editions. The schedule for the 2009/2010 Code Development Cycle is the transitional schedule for the revised code development process. As noted, there will be two Final Action Hearings in 2010—one for the modified Group A, and one for the modified Group B. The codes that will comprise the Group A and Group B hearings will be announced prior to the Code Development Hearings in Baltimore. See the Code Development Process Notes included with the Schedule on page viii.

PROCEDURES

The procedures for the conduct of the public hearing are published in *Council Policy #28-Code Development (CP#28)* ("Procedures") on page xii. The attention of interested parties is specifically directed to Section 5.0 of the Procedures. These procedures indicate the conduct of, and opportunity to participate in the ICC Code Development Process. Please review these procedures carefully to familiarize yourself with the process.

There have been a number of revisions to the procedures. Included among these revisions are the following:

Section 2.3: **Supplements:** ICC will no longer produce a Supplement to each edition of the I-Codes. A new edition of the I-Codes will be based upon activity of a single code change cycle.

Section 3.3.3: **Multiple code change proposals:** A proponent is not permitted to submit multiple code changes to one section of a code unless the subject matter of each proposal is different.

Section 4.5.1: **Administrative update of standards:** Updating of standards without a change to code text (administrative update) shall be a code change proposal dealt with by the Administrative Code Development Committee. The updating of standards procedures have also changed. See discussion on updating of standards on page vi.

Section 4.7: **Code change posting:** All code change proposals are required to be posted on the ICC website 30 days before the code development hearings. Published copies will not be provided.

Section 5.2.2: **Conflict of interest:** Clarification is added that a committee member who steps down from the dais because of a conflict of interest is allowed to provide testimony from the floor on that code change proposal.

Section 5.4.6.2: **Proponent rebuttal testimony:** Where the code change proposal is submitted by multiple proponents, only one proponent of the joint submittal to be allotted additional time for rebuttal.

Section 5.5.2: **Modifications:** The chair rules a modification in or out of order. The chair's decision is final. No challenge in a point of order is allowed for this ruling.

Section 5.7.3: **Assembly Actions:** Several changes have been made to assembly actions. See explanation page v

Section 7.3.8.2: **Initial motion at final action hearings:** A successful assembly action becomes the initial motion at the final action hearings. See explanation page v.

ASSEMBLY ACTION

The procedures regarding assembly action at the Code Development Hearings have been revised to place more weight on the results of that action (see Section 5.7 of CP #28 on page viii). Some important items to note regarding assembly action are:

- A successful assembly action now requires a 2/3 majority rather than a simple majority.
- After the committee decision on a code change proposal is announced by the moderator, any one in the assembly may make a motion for assembly action.
- After a motion for assembly action is made and seconded, the moderator calls for a floor vote in accordance with Section 5.7.2. *No additional testimony will be permitted.*
- A successful assembly action becomes the initial motion considered at the Final Action Hearings. This also means that the required vote at the Final Action Hearings to uphold the assembly action is a simple majority.

MULTIPLE PART CODE CHANGE PROPOSALS

It is common for ICC to receive code change proposals for more than one code or more than 1 part of a code that is the responsibility of more than one committee. For instance, a code change proposal could be proposing related changes to the text of IBC Chapter 4 (IBC-General), IBC Chapter 7 (IBC-Fire Safety), and the IFC Chapter 27 (IFC). When this occurs, a single committee will now hear all of the parts, unless one of the parts is a change to the IRC, in which case the respective IRC committee will hear that part separately.

ADMINISTRATIVE CODE DEVELOPMENT COMMITTEE

A new committee for the 2009/2010 Code Change Cycle and going forward is the Administrative Code Development Committee. This committee will hear code change proposals to the administrative provisions of the I-Codes (Chapter 1 of each code.) The purpose of this committee is to achieve, inasmuch as possible, uniformity in the administrative provisions of all I-Codes when such uniformity is warranted.

ANALYSIS STATEMENTS

Various proposed changes published herein contain an “analysis” that appears after the proponent’s reason. These comments do not advocate action by the code committees or the voting membership for or against a proposal. The purpose of such comments is to identify pertinent information that is relevant to the consideration of the proposed change by all interested parties, including those testifying, the code committees and the voting membership. Staff analyses customarily identify such things as: conflicts and duplication within a proposed change and with other proposed changes and/or current code text; deficiencies in proposed text and/or substantiation; text problems such as wording defects and vagueness; background information on the development of current text; and staff’s review of proposed reference standards for compliance with the Procedures. Lack of an analysis indicates neither support for, nor opposition to a proposal.

REFERENCE STANDARDS

Proposed changes that include the addition of a reference to a new standard (i.e. a standard that is not currently referenced in the I-Codes.) will include in the proposal the number, title and edition of the proposed standard. This identifies to all interested parties the precise document that is being proposed and which would be included in the referenced standards chapter of the code if the proposed change is approved. Proponents of code changes which propose a new standard have been directed to forward copies of the standard to the Code Committee and an analysis statement will be posted on the ICC website indication the status of compliance of the standard with the ICC referenced standards criteria in Section 3.6 of CP #28 (see page xiv). (See the ICC Website page xi) The analysis statements for referenced standards will be posted on or before September 24, 2009. This information will also be published and made available at the hearings.

REFERENCED STANDARDS UPDATES

At the end of the agenda of the Administrative Code Development Committee is a code change proposal that is an administrative update of the referenced standards contained in the I-Codes. This code change proposal, ADM39-09/10 contains a list of standards for which the respective promulgators have indicated that the standard has been updated. The codes that these standards appear in are indicated beside each listed referenced standard. This update will then apply to every code in which the standard appears.

It should be noted that in accordance with Section 4.5.1 of CP #28 (see page xvi), standards promulgators have until December 1, 2011 to finalize and publish any updates to standards in the administrative update. If the standard is not finalized by December 1, 2011, the code will be revised to reference the previously listed year edition of that standard.

MODIFICATIONS

Those who are submitting modification for consideration by the respective Code Development Committee are required to submit a Copyright Release in order to have their modifications considered (Section 3.3.4.5 of CP #28). It is preferred that such release be executed in advance – the form is at http://www.iccsafe.org/cs/codes/publicforms.htm. Copyright release forms will also be available at the hearings. Please note that an individual need only sign one copyright release for submittals of all code change proposals, modification, and public comments in this code change cycle for which the individual might be responsible. **Please be sure to review Section 5.5.2 of CP #28 for the modification process.** The Chair of the respective code development committee rules a modification in or out of order. That ruling is final, with no challenge allowed. The proponent submitting a modification is required to supply 20 printed copies. The minimum font size must be 12 point.

CODE CORRELATION COMMITTEE

In every code change cycle, there are code change proposals that are strictly editorial. The Code Correlation Committee approves all proposals deemed editorial. A list of code correlation committee actions will be posted on the ICC website by September 24, 2009.

2009/2010 ICC CODE DEVELOPMENT SCHEDULE

STEP IN CODE DEVELOPMENT CYCLE	DATE
DEADLINE FOR RECEIPT OF APPLICATIONS FOR CODE COMMITTEES	January 2, 2009
DEADLINE FOR RECEIPT OF CODE CHANGE PROPOSALS	June 1, 2009
WEB POSTING OF "PROPOSED CHANGES TO THE I-CODES"	August 24, 2009
DISTRIBUTION DATE OF "PROPOSED CHANGES TO THE I-CODES" (Limited distribution – see notes)	October 3, 2009
CODE DEVELOPMENT HEARING (CDH) ALL CODES – see notes	**October 24 2009 – November 11, 2009** Hilton Baltimore Baltimore, MD
WEB POSTING OF "REPORT OF THE PUBLIC HEARING"	December 16, 2009
DISTRIBUTION DATE OF "REPORT OF THE PUBLIC HEARING" (Limited distribution – see notes)	January 11, 2010

IN ACCORDANCE WITH THE NEW CODE DEVELOPMENT PROCESS (see notes), THE CODES WILL BE SPLIT INTO TWO GROUPS WITH SEPARATE PUBLIC COMMENT DEADLINES AND FINAL ACTION HEARINGS

	GROUP A (see notes)	GROUP B (see notes)
DEADLINE FOR RECEIPT OF PUBLIC COMMENTS	February 8, 2010	July 1, 2010
WEB POSTING OF PUBLIC COMMENTS "FINAL ACTION AGENDA"	March 15, 2010	August 26, 2010
DISTRIBUTION DATE OF PUBLIC COMMENTS "FINAL ACTION AGENDA" (Limited distribution see notes)	April 16, 2010	September 27, 2010
FINAL ACTION HEARINGS (FAH)	**May 14 – 23, 2010** Dallas, TX	**Oct 28 – Nov 1, 1020** Charlotte, NC
ANNUAL CONFERENCES	**<u>October 24 – November 11, 2009</u>** 2009 ICC Annual Conference and Code Development Hearing Balitmore, MD **<u>October 25 – November 1, 2010</u>** 2010 ICC Annual Conference and Final Action Hearing Charlotte, NC	
RESULTING PUBLICATION	2012 – I-Codes (available April, 2011)	

Code Development Process Notes:

As noted in the posted Advisory Statement of February 4, 2009, the revised Code Development Process includes maintaining the current 3-year publication cycle with a single cycle of code development between code editions. Implemented as follows:

- Transitional Process – 2009/2010 only
    - Single Code Development Hearing (CDH) for all codes in 2009
    - Two Final Action Hearings (FAH) in 2010 – modified Groups A and B (see below)
    - Public 2012 edition in April, 2011
- New Process – 2012/2013 and going forward
    - Code Committee application deadline (all codes); June 1, 2011
    - Codes split into two groups: Group A and Group B
    - Group A: IBC; IFGC; IMC; IPC; IPSDC
        - Code change deadline: January 3, 2012
        - Code Development Hearing: April/May 2012
        - Final Action Hearing: October/November 2012 (in conjunction with Annual Conference)
    - Group B: Admin (Ch. 1 of I-Codes); IEBC; IECC; IFC; IPerfC; IPMC; IRC; IWUIC; IZC
        - Code change deadline: January 3, 2013
        - Code Development Hearing: April/May 2013
        - Final Action Hearing: October/November 2013 (in conjunction with Annual Conference)
    - Publish 2015 edition in April, 2014
    - Repeat for subsequent editions

2009/2010 Cycle Notes:

- Revised code change deadline of June 1st posted on March 19th

- Distribution date: Complimentary code development cycle document distribution will be limited to CD's mailed to those who are on ICC's code change document mailing list.

- Code Development Hearings: The Baltimore Code Development Hearings will include 12 I-Codes (no changes to the ICC Performance Code. The hearings will be held in the conventional two track format with the hearings split before and after the Annual Conference during the periods of October 24 – 31 and November 4 – 11. The specific codes and hearing order to be determined based on code change volume.

- Final Action Hearing Groupings: Final Action Hearing logistics dictate that the hearings will not be split along established Group A and B codes (see above) due to hotel commitments which limit the amount of hearing time at the October/2010 FAH versus the May/2010 FAH. Tentatively, the May/2010 FAH will include Group A codes plus certain Group B codes to be determined based on code change volume.

2009/2010 STAFF SECRETARIES

IBC-General Chapters 1-6. 12, 13, 27-34	IBC-Fire Safety Chapters 7, 8, 9, 14, 26	IBC-Means of Egress Chapters 10, 11	IBC-Structural Chapters 15-25
Kermit Robinson ICC Whittier District Office 1-888-ICC-SAFE, ext. 3317 FAX: 562/699-4522 krobinson@iccsafe.org	Ed Wirtschoreck ICC Chicago District Office 1-888-ICC-SAFE, ext 4317 FAX: 708/799-0320 ewirtschoreck@iccsafe.org	Kim Paarlberg ICC Indianapolis Field Office 1-888-ICC-SAFE, ext 4306 FAX: 708/799-0320 kpearlberg@iccsafe.org	Alan Carr ICC NW Resource Center 1-888-ICC-SAFE, ext 7601 FAX: 425/637-8939 acarr@iccsafe.org

IEBC	IECC	IFC	IFGC
BethTubbs ICC Northbridge Field Office 1-888-ICC-SAFE, ext 7708 FAX: 419/ 730-6531 btubbs@iccsafe.org	Dave Bowman ICC Chicago District Office 1-888-ICC-SAFE, ext 4323 FAX: 708/799-0320 dmeyers@iccsafe.org	Bill Rehr/ Beth Tubbs ICC Chicago District Office 1-888-ICC-SAFE, ext 4342 FAX: 708/799-0320 brehr@iccsafe.org btubbs@iccsafe.org	Gregg Gress ICC Chicago District Office 1-888-ICC-SAFE, ext 4343 FAX: 708/799-0320 ggress@iccsafe.org

IMC	ICC PC	IPMC	IPC/IPSDC
Gregg Gress ICC Chicago District Office 1-888-ICC-SAFE, ext 4343 FAX: 708/799-0320 ggress@iccsafe.org	BethTubbs ICC Northbridge Field Office 1-888-ICC-SAFE, ext 7708 FAX: 419/ 730-6531 btubbs@iccsafe.org	Ed Wirtschoreck ICC Chicago District Office 1-888-ICC-SAFE, ext 4317 FAX: 708/799-0320 ewirtschoreck@iccsafe.org	Fred Grable ICC Chicago District Office 1-888-ICC-SAFE, ext 4359 FAX: 708/799-0320 fgrable@iccsafe.org

IRC-Building/Energy	IRC Mechanical	IRC Plumbing	IWUIC
Larry Franks/ Dave Bowman ICC Northbridge Field Office 1-888-ICC-SAFE, ext 5279 FAX: 205/592-7001 lfranks@iccsafe.org dbowman@iccsafe.org	Gregg Gress ICC Chicago District Office 1-888-ICC-SAFE, ext 4343 FAX: 708/799-0320 ggress@iccsafe.org	Fred Grable ICC Chicago District Office 1-888-ICC-SAFE, ext 4359 FAX: 708/799-0320 fgrable@iccsafe.org	Bill Rehr ICC Chicago District Office 1-888-ICC-SAFE, ext 4342 FAX: 708/799-0320 brehr@iccsafe.org

IZC	ADMINISTRATIVE Chapter 1 All Codes Except IRC
Ed Wirtschoreck ICC Chicago District Office 1-888-ICC-SAFE, ext 4317 FAX: 708/799-0320 ewirtschoreck@iccsafe.org	Dave Bowman ICC Chicago District Office 1-888-ICC-SAFE, ext 4323 FAX: 708/799-0320 dbowman@iccsafe.org

SCOPING REVISIONS – WITHIN THE IBC

The 2009/2010 Staff Secretaries assignments on page ix indicate which chapters of the International Building Code are generally within the responsibility of each IBC Code Committee. However, within each of these IBC Chapters are subjects that are most appropriately maintained by another IBC Code Committee. For example, the provisions of Section 3008.1 deal with occupant evacuation elevators. Therefore, even though Chapter 30 is within the responsibility of the IBC General Committee, this section would most appropriately be maintained by the IBC Means of Egress Committee. The following table indicates responsibilities by IBC Code Committees other than the main committee for those chapters, for code changes submitted for the 2009/2010 Cycle.

SECTION	CHAPTER MAINTAINED BY	SECTION MAINTAINED BY	CODE CHANGES
403.2.3	IBC-General	IBC-Structural	E5 Part I (Heard by IBC-MOE)
403.5.1	IBC-General	IBC-Structural	E5 Part I (Heard by IBC-MOE)
403.5.2	IBC-General	IBC-Means of Egress	G46
403.5.4	IBC-General	IBC-Structural	E5 Part I (Heard by IBC-MOE)
403.5.4	IBC-General	IBC-Means of Egress	G47
403.6.1	IBC-General	IBC-Means of Egress	G48, G49
408.3.8	IBC-General	IBC-Structural	E5 Part I (Heard by IBC-MOE)
410.5.3.1	IBC-General	IBC-Structural	E5 Part I (Heard by IBC-MOE)
419.3.0	IBC-General	IBC-Means of Egress	G79
1505.1.0	IBC-Structural	IBC-Fire Safety	S10, S11
1505.8.0	IBC-Structural	IBC-Fire Safety	S12, S13
1507.16.0	IBC-Structural	IBC-Fire Safety	S10, S11
1508.1.0	IBC-Structural	IBC-Fire Safety	S24
1508.2.0	IBC-Structural	IBC-Fire Safety	S25
1509.0.0	IBC-Structural	IBC-General	S26, S27
1509.6.(new)	IBC-Structural	IBC-General	S28
1704.15.0	IBC-Structural	IBC-Fire Safety	S126, S127,S128
3007.1.0	IBC-General	IBC-Means of Egress	G48,G157
3007.2.(new)	IBC-General	IBC-Means of Egress	G158, G159
3007.2.0	IBC-General	IBC-Means of Egress	G160
3007.3.(new)	IBC-General	IBC-Means of Egress	G158, G161
3007.4.(new)	IBC-General	IBC-Means of Egress	G162
3007.4.2	IBC-General	IBC-Means of Egress	G163
3007.4.3	IBC-General	IBC-Means of Egress	G176
3007.5.1.(NEW)	IBC-General	IBC-Means of Egress	G164
3007.7.1	IBC-General	IBC-Means of Egress	G165, G166
3007.8.0	IBC-General	IBC-Means of Egress	G167
3008.1.0	IBC-General	IBC-Means of Egress	G168, G170
3008.1.1	IBC-General	IBC-Means of Egress	G169
3008.10.0	IBC-General	IBC-Means of Egress	G174
3008.10.1	IBC-General	IBC-Means of Egress	G175
3008.11.3	IBC-General	IBC-Means of Egress	G176
3008.11.5	IBC-General	IBC-Means of Egress	G177
3008.3.(NEW)	IBC-General	IBC-Means of Egress	G165, G166
3008.4.(NEW)	IBC-General	IBC-Means of Egress	G171
3008.4.0	IBC-General	IBC-Means of Egress	G46
3008.7.0	IBC-General	IBC-Means of Egress	G172
3008.9.0	IBC-General	IBC-Means of Egress	G173
3401.4.0	IBC-General	IBC-Structural	G190
3401.4.1	IBC-General	IBC-Structural	G191
3401.4.3	IBC-General	IBC-Structural	G190
3401.5.(NEW)	IBC-General	IBC-Structural	G192

SECTION	CHAPTER MAINTAINED BY	SECTION MAINTAINED BY	CODE CHANGES
3402.1.0	IBC-General	IBC-Structural	G193
3403.4.1	IBC-General	IBC-Structural	G190
3404.4.1	IBC-General	IBC-Structural	G190
3405.1.1	IBC-General	IBC-Structural	G192
3405.2.0	IBC-General	IBC-Structural	G193, G194
3405.2.1	IBC-General	IBC-Structural	G193, G190
3405.2.2	IBC-General	IBC-Structural	G193
3405.2.3	IBC-General	IBC-Structural	G193, G195
3405.3.0	IBC-General	IBC-Structural	G193
3405.4.0	IBC-General	IBC-Structural	G193, G194
3405.5.0	IBC-General	IBC-Structural	G196
3408.4.0	IBC-General	IBC-Structural	G190, G197
3408.4.0	IBC-General	IBC-Structural	G190
403.2.3	IBC-General	IBC-Structural	E5 Part I (Heard by IBC-MOE)
403.5.1	IBC-General	IBC-Structural	E5 Part I (Heard by IBC-MOE)
403.5.2	IBC-General	IBC-Means of Egress	G46
403.5.4	IBC-General	IBC-Structural	E5 Part I (Heard by IBC-MOE)
403.5.4	IBC-General	IBC-Means of Egress	G47
403.6.1	IBC-General	IBC-Means of Egress	G48, G49
408.3.8	IBC-General	IBC-Structural	E5 Part I (Heard by IBC-MOE)
410.5.3.1	IBC-General	IBC-Structural	E5 Part I (Heard by IBC-MOE)
419.3.0	IBC-General	IBC-Means of Egress	G79

ICC WEBSITE – WWW.ICCSAFE.ORG

While great care has been exercised in the publication of this document, errata to proposed changes may occur. Errata, if any, identified prior to the Code Development Hearings will be posted on the ICC website at http://www.iccsafe.org. Users are encouraged to periodically review the ICC Website for updates to errata to the 2009/2010 Code Development Cycle Proposed Changes. Additionally, analysis statements for code changes which propose a new referenced standard will be updated to reflect the staff review of the standard for compliance with Section 3.6 of the Procedures.

CP# 28-05 CODE DEVELOPMENT

Approved: 9/24/05
Revised: 2/27/09

CP # 28-05 is an update to *ICC's Code Development Process for the International Codes* dated May 15, 2004.

1.0 Introduction

1.1 Purpose: The purpose of this Council Policy is to prescribe the Rules of Procedure utilized in the continued development and maintenance of the International Codes (Codes).

1.2 Objectives: The ICC Code Development Process has the following objectives:

1.2.1 The timely evaluation and recognition of technological developments pertaining to construction regulations.
1.2.2 The open discussion of proposals by all parties desiring to participate.
1.2.3 The final determination of Code text by officials representing code enforcement and regulatory agencies and by honorary members.

1.3 Code Publication: The ICC Board of Directors (ICC Board) shall determine the title and the general purpose and scope of each Code published by the ICC.

1.3.1 Code Correlation: The provisions of all Codes shall be consistent with one another so that conflicts between the Codes do not occur. Where a given subject matter or code text could appear in more than one Code, the ICC Board shall determine which Code shall be the primary document, and therefore which code development committee shall be responsible for review and maintenance of the code text. Duplication of content or text between Codes shall be limited to the minimum extent necessary for practical usability of the Codes, as determined in accordance with Section 4.4.

1.4 Process Maintenance: The review and maintenance of the Code Development Process and these Rules of Procedure shall be by the ICC Board. The manner in which ICC codes are developed embodies core principles of the organization. One of those principles is that the final content of ICC codes is determined by a majority vote of the governmental and honorary members. It is the policy of the Board that there shall be no change to this principle without the affirmation of two-thirds of the governmental and honorary members responding.

1.5 Secretariat: The Chief Executive Officer shall assign a Secretariat for each of the Codes. All correspondence relating to code change proposals and public comments shall be addressed to the Secretariat.

1.6 Video Taping: Individuals requesting permission to video tape any meeting, or portion thereof, shall be required to provide the ICC with a release of responsibility disclaimer and shall acknowledge that they have insurance coverage for liability and misuse of video tape materials. Equipment and the process used to video tape shall, in the judgment of the ICC Secretariat, be conducted in a manner that is not disruptive to the meeting. The ICC shall not be responsible for equipment, personnel or any other provision necessary to accomplish the videotaping. An unedited copy of the video tape shall be forwarded to ICC within 30 days of the meeting.

2.0 Code Development Cycle

2.1 Intent: The code development cycle shall consist of the complete consideration of code change proposals in accordance with the procedures herein specified, commencing with the deadline for submission of code change proposals (see Section 3.5) and ending with publication of final action on the code change proposals (see Section 7.6).

2.2 New Editions: The ICC Board shall determine the schedule for publishing new editions of the Codes. Each new edition shall incorporate the results of the code development activity since the last edition.

2.3 Supplements: The results of code development activity between editions may be published.

2.4 Emergency Procedures: In the event that the ICC Board determines that an emergency amendment to any Code is warranted, the same may be adopted by the ICC Board. Such action shall require an affirmative vote of at least two-thirds of the ICC Board.

The ICC membership shall be notified within ten days after the ICC Boards' official action of any emergency amendment. At the next Annual Business Meeting, any emergency amendment shall be presented to the members for ratification by a majority of the ICC Governmental Member Representatives and Honorary Members present and voting.

All code revisions pursuant to these emergency procedures and the reasons for such corrective action shall be published as soon as practicable after ICC Board action. Such revisions shall be identified as an emergency amendment.

Emergency amendments to any Code shall not be considered as a retro-active requirement to the Code. Incorporation of the emergency amendment into the adopted Code shall be subjected to the process established by the adopting authority.

3.0 Submittal of Code Change Proposals

3.1 Intent: Any interested person, persons or group may submit a code change proposal which will be duly considered when in conformance to these Rules of Procedure.

3.2 Withdrawal of Proposal: A code change proposal may be withdrawn by the proponent (WP) at any time prior to Final Action Consideration of that proposal. A withdrawn code change proposal shall not be subject to a public hearing, motions, or Final Action Consideration.

3.3 Form and Content of Code Change Submittals: Each code change proposal shall be submitted separately and shall be complete in itself. Each submittal shall contain the following information:

3.3.1 Proponent: Each code change proposal shall include the name, title, mailing address, telephone number, and email address of the proponent.

3.3.1.1 If a group, organization or committee submits a code change proposal, an individual with prime responsibility shall be indicated.

3.3.1.2 If a proponent submits a code change on behalf of a client, group, organization or committee, the name and mailing address of the client, group, organization or committee shall be indicated.

3.3.2 Code Reference: Each code change proposal shall relate to the applicable code sections(s) in the latest edition of the Code.

3.3.2.1 If more than one section in the Code is affected by a code change proposal, appropriate proposals shall be included for all such affected sections.

3.3.2.2 If more than one Code is affected by a code change proposal, appropriate proposals shall be included for all such affected Codes and appropriate cross referencing shall be included in the supporting information.

3.3.3 Multiple code change proposals to a code section. A proponent shall not submit multiple code change proposals to the same code section. When a proponent submits multiple code change proposals to the same section, the proposals shall be considered as incomplete proposals and processed in accordance with Section 4.3. This restriction shall not apply to code change proposals that attempt to address differing subject matter within a code section.

3.3.4 Text Presentation: The text proposal shall be presented in the specific wording desired with deletions shown struck out with a single line and additions shown underlined with a single line.

3.3.4.1 A charging statement shall indicate the referenced code section(s) and whether the proposal is intended to be an addition, a deletion or a revision to existing Code text.

3.3.4.2 Whenever practical, the existing wording of the text shall be preserved with only such deletions and additions as necessary to accomplish the desired change.

3.3.4.3 Each proposal shall be in proper code format and terminology.

3.3.4.4 Each proposal shall be complete and specific in the text to eliminate unnecessary confusion or misinterpretation.

3.3.4.5 The proposed text shall be in mandatory terms.

3.3.5 Supporting Information: Each code change proposal shall include sufficient supporting information to indicate how the proposal is intended to affect the intent and application of the Code.

3.3.5.1 Purpose: The proponent shall clearly state the purpose of the proposed code change (e.g. clarify the Code; revise outdated material; substitute new or revised material for current provisions of the Code; add new requirements to the Code; delete current requirements, etc.)

3.3.5.2 Reasons: The proponent shall justify changing the current Code provisions, stating why the proposal is superior to the current provisions of the Code. Proposals which add or delete requirements shall be supported by a logical explanation which clearly shows why the current Code provisions are inadequate or overly restrictive, specifies the shortcomings of the current Code provisions and explains how such proposals will improve the Code.

3.3.5.3 Substantiation: The proponent shall substantiate the proposed code change based on technical information and substantiation. Substantiation provided which is reviewed in accordance with Section 4.2 and determined as not germane to the technical issues addressed in the proposed code change shall be identified as such. The proponent shall be notified that the proposal is considered an incomplete proposal in accordance with Section 4.3 and the proposal shall be held until the deficiencies are corrected. The proponent shall have the right to appeal this action in accordance with the policy of the ICC Board. The burden of providing substantiating material lies with the proponent of the code change proposal.

3.3.5.4 Bibliography: The proponent shall submit a bibliography of any substantiating material submitted with the code change proposal. The bibliography shall be published with the code change and the proponent shall make the substantiating materials available for review at the appropriate ICC office and during the public hearing.

3.3.5.5 Copyright Release: The proponent of code change proposals, floor modifications and public comments shall sign a copyright release reading: “I hereby grant and assign to ICC all rights in copyright I may have in any authorship contributions I make to ICC in connection with any proposal and public comment, in its original form submitted or revised form, including written and verbal modifications submitted in accordance Section 5.5.2. I understand that I will have no rights in any ICC publications that use such contributions in the form submitted by me or another similar form and certify that such contributions are not protected by the copyright of any other person or entity.”

3.3.5.6 Cost Impact: The proponent shall indicate one of the following regarding the cost impact of the code change proposal: 1) the code change proposal will increase the cost of construction; or 2) the code change proposal will not increase the cost of construction. This information will be included in the published code change proposal.

3.4 Number: One copy of each code change proposal, two copies of each proposed new referenced standard and one copy of all substantiating information shall be submitted. Additional copies may be requested when determined necessary by the Secretariat to allow such information to be distributed to the code development committee. Where such additional copies are requested, it shall be the responsibility of the proponent to send such copies to the respective code development committee. A copy of the code change proposal in electronic form is preferred.

3.5 Submittal Deadline: Each code change proposal shall be received at the office of the Secretariat by the posted deadline. Such posting shall occur no later than 120 days prior to the code change deadline. The submitter of a proposed code change is responsible for the proper and timely receipt of all pertinent materials by the Secretariat.

3.6 Referenced Standards: In order for a standard to be considered for reference or to continue to be referenced by the Codes, a standard shall meet the following criteria:

3.6.1 Code References:

3.6.1.1 The standard, including title and date, and the manner in which it is to be utilized shall be specifically referenced in the Code text.
3.6.1.2 The need for the standard to be referenced shall be established.

3.6.2 Standard Content:

3.6.2.1 A standard or portions of a standard intended to be enforced shall be written in mandatory language.
3.6.2.2 The standard shall be appropriate for the subject covered.
3.6.2.3 All terms shall be defined when they deviate from an ordinarily accepted meaning or a dictionary definition.
3.6.2.4 The scope or application of a standard shall be clearly described.
3.6.2.5 The standard shall not have the effect of requiring proprietary materials.
3.6.2.6 The standard shall not prescribe a proprietary agency for quality control or testing.
3.6.2.7 The test standard shall describe, in detail, preparation of the test sample, sample selection or both.
3.6.2.8 The test standard shall prescribe the reporting format for the test results. The format shall identify the key performance criteria for the element(s) tested.
3.6.2.9 The measure of performance for which the test is conducted shall be clearly defined in either the test standard or in Code text.
3.6.2.10 The standard shall not state that its provisions shall govern whenever the referenced standard is in conflict with the requirements of the referencing Code.
3.6.2.11 The preface to the standard shall announce that the standard is promulgated according to a consensus procedure.

3.6.3 Standard Promulgation:

3.6.3.1 Code change proposals with corresponding changes to the code text which include a reference to a proposed new standard or a proposed update of an existing referenced shall comply with this section. The standard shall be completed and readily available prior to Final Action Consideration based on the cycle of code development which includes the proposed code change proposal. In order for a new standard to be considered for reference by the Code, such standard shall be submitted in at least a consensus draft form in accordance with Section 3.4. Updating of standards without corresponding code text changes shall be accomplished administratively in accordance with Section 4.5.
3.6.3.2 The standard shall be developed and maintained through a consensus process such as ASTM or ANSI.

4.0 Processing of Proposals

4.1 Intent: The processing of code change proposals is intended to ensure that each proposal complies with these Rules of Procedure and that the resulting published proposal accurately reflects that proponent's intent.

4.2 Review: Upon receipt in the Secretariat's office, the code change proposals will be checked for compliance with these Rules of Procedure as to division, separation, number of copies, form, language, terminology, supporting statements and substantiating data. Where a code change proposal consists of multiple parts which fall under the maintenance responsibilities of different code committees, the Secretariat shall determine the code committee responsible for determining the committee action in accordance with Section 5.6.

4.3 Incomplete Proposals: When a code change proposal is submitted with incorrect format, without the required information or judged as not in compliance with these Rules of Procedure, the Secretariat shall notify the proponent of the specific deficiencies and the proposal shall be held until the deficiencies are corrected, with a final date set for receipt of a corrected submittal. If the Secretariat receives the corrected proposal after the final date, the proposal shall be held over until the next code development cycle. Where there are otherwise no deficiencies addressed by this section, a proposal that incorporates a new referenced standard shall be processed with an analysis of referenced standard's compliance with the criteria set forth in Section 3.6.

4.4 Editorial: The Chief Executive Officer shall have the authority at all times to make editorial and format changes to the Code text, or any approved changes, consistent with the intent, provisions and style of the Code. An editorial or format change is a text change that does not affect the scope or application of the code requirements.

4.5 Updating Standards:

4.5.1 Standards referenced in the 2012 Edition of the I-Codes: The updating of standards referenced by the Codes shall be accomplished administratively by the Administrative code development committee in accordance with these full procedures except that the deadline for availability of the updated standard and receipt by the Secretariat shall be December 1, 2011. The published version of the 2012 Code which references the standard will refer to the updated edition of the standard. If the standard is not available by the deadline, the edition of the standard as referenced by the newly published Code shall revert back to the reference contained in the previous edition and an errata to the Code issued Multiple standards to be updated may be included in a single proposal.

4.5.2 Standards referenced in the 2015 Edition and following Editions of the I-Codes: The updating of standards referenced by the Codes shall be accomplished administratively by the Administrative code development committee in accordance with these full procedures except that multiple standards to be updated may be included in a single proposal. The standard shall be completed and readily available prior to Final Action Consideration of the Administrative code change proposal which includes the proposed update.

4.6 Preparation: All code change proposals in compliance with these procedures shall be prepared in a standard manner by the Secretariat and be assigned separate, distinct and consecutive numbers. The Secretariat shall coordinate related proposals submitted in accordance with Section 3.3.2 to facilitate the hearing process.

4.7 Publication: All code change proposals shall be posted on the ICC website at least 30 days prior to the public hearing on those proposals and shall constitute the agenda for the public hearing. Code change proposals which have not been published shall not be considered.

5.0 Public Hearing

5.1 Intent: The intent of the public hearing is to permit interested parties to present their views including the cost and benefits on the code change proposals on the published agenda. The code development committee will consider such comments as may be presented in the development of their action on the disposition of such proposals. At the conclusion of the code development committee deliberations, the committee action on each code change proposal shall be placed before the hearing assembly for consideration in accordance with Section 5.7.

5.2 Committee: The Code Development Committees shall be appointed by the applicable ICC Council.

5.2.1 Chairman/Moderator: The Chairman and Vice-Chairman shall be appointed by the Steering Committee on Councils from the appointed members of the committee. The ICC President shall appoint one or more Moderators who shall act as presiding officer for the public hearing.

5.2.2 Conflict of Interest: A committee member shall withdraw from and take no part in those matters with which the committee member has an undisclosed financial, business or property interest. The committee member shall not participate in any committee discussion on the matter or any committee vote. Violation thereof shall result in the immediate removal of the committee member from the committee. A committee member who is a proponent of a proposal shall not participate in any committee discussion on the matter or any committee vote. Such committee member shall be permitted to participate in the floor discussion in accordance with Section 5.5 by stepping down from the dais.

5.2.3 Representation of Interest: Committee members shall not represent themselves as official or unofficial representatives of the ICC except at regularly convened meetings of the committee.

5.2.4 Committee Composition: The committee may consist of representation from multiple interests. A minimum of thirty-three and one-third percent (33.3%) of the committee members shall be regulators.

5.3 Date and Location: The date and location of each public hearing shall be announced not less than 60 days prior to the date of the public hearing.

5.4 General Procedures: *The Robert's Rules of Order* shall be the formal procedure for the conduct of the public hearing except as a specific provision of these Rules of Procedure may otherwise dictate. A quorum shall consist of a majority of the voting members of the committee.

5.4.1 Chair Voting: The Chairman of the committee shall vote only when the vote cast will break a tie vote of the committee.

5.4.2 Open Meetings: Public hearings of the Code Development Committees are open meetings. ` Any interested person may attend and participate in the Floor Discussion and Assembly Consideration portions of the hearing. Only eligible voters (see Section 5.7.4) are permitted to vote on Assembly Considerations. Only Code Development Committee members may participate in the Committee Action portion of the hearings (see Section 5.6).

5.4.3 Presentation of Material at the Public Hearing: Information to be provided at the hearing shall be limited to verbal presentations and modifications submitted in accordance with Section 5.5.2. Audio-visual presentations are not permitted. Substantiating material submitted in accordance with Section 3.3.4.4 and other material submitted in response to a code change proposal shall be located in a designated area in the hearing room and shall not be distributed to the code development committee at the public hearing.

5.4.4 Agenda Order: The Secretariat shall publish an agenda for each public hearing, placing individual code change proposals in a logical order to facilitate the hearing. Any public hearing attendee may move to revise the agenda order as the first order of business at the public hearing, or at any time during the hearing except while another proposal is being discussed. Preference shall be given to grouping like subjects together, and for moving items back to a later position on the agenda as opposed to moving items forward to an earlier position. A motion to revise the agenda order is subject to a 2/3 vote of those present and voting.

5.4.5 Reconsideration: There shall be no reconsideration of a proposed code change after it has been voted on by the committee in accordance with Section 5.6; or, in the case of assembly consideration, there shall be no reconsideration of a proposed code change after it has been voted on by the assembly in accordance with Section 5.7.

5.4.6 Time Limits: Time limits shall be established as part of the agenda for testimony on all proposed changes at the beginning of each hearing session. Each person requesting to testify on a change shall be given equal time. In the interest of time and fairness to all hearing participants, the Moderator shall have limited authority to modify time limitations on debate. The Moderator shall have the authority to adjust time limits as necessary in order to complete the hearing agenda.

5.4.6.1 Time Keeping: Keeping of time for testimony by an individual shall be by an automatic timing device. Remaining time shall be evident to the person testifying. Interruptions during testimony shall not be tolerated. The Moderator shall maintain appropriate decorum during all testimony.

5.4.6.2 Proponent Testimony: The Proponent is permitted to waive an initial statement. The Proponent shall be permitted to have the amount of time that would have been allocated during the initial testimony period plus the amount of time that would be allocated for rebuttal. Where the code change proposal is submitted by multiple proponents, this provision shall permit only one proponent of the joint submittal to be allotted additional time for rebuttal.

5.4.7 Points of Order: Any person participating in the public hearing may challenge a procedural ruling of the Moderator or the Chairman. A majority vote of the eligible voters as determined in Section 5.7.4 shall determine the decision.

5.5 Floor Discussion: The Moderator shall place each code change proposal before the hearing for discussion by identifying the proposal and by regulating discussion as follows:

5.5.1 Discussion Order:

1. *Proponents.* The Moderator shall begin by asking the proponent and then others in support of the proposal for their comments.
2. *Opponents.* After discussion by those in support of a proposal, those opposed hereto, if any, shall have the opportunity to present their views.
3. *Rebuttal in support.* Proponents shall then have the opportunity to rebut points raised by the opponents.
4. *Rerebuttal in opposition.* Opponents shall then have the opportunity to respond to the proponent's rebuttal.

5.5.2 Modifications: Modifications to proposals may be suggested from the floor by any person participating in the public hearing. The person proposing the modification is deemed to be the proponent of the modification.

5.5.2.1 Submission and Written Copies. All modifications must be written, unless determined by the Chairman to be either editorial or minor in nature. The modification proponent shall provide 20 copies to the Secretariat for distribution to the committee.

5.5.2.2 Criteria. The Chairman shall rule proposed modifications in or out of order before they are discussed on the floor. A proposed modification shall be ruled out of order if it:

1. is not legible, unless not required to be written in accordance with Section 5.5.2.1; or
2. changes the scope of the original proposal; or
3. is not readily understood to allow a proper assessment of its impact on the original proposal or the code.

The ruling of the Chairman on whether or not the modification is in or out of order shall be final and is not subject to a point of order in accordance with Section 5.4.7.

5.5.2.3 Testimony. When a modification is offered from the floor and ruled in order by the Chairman, a specific floor discussion on that modification is to commence in accordance with the procedures listed in Section 5.5.1.

5.6 Committee Action: Following the floor discussion of each code change proposal, one of the following motions shall be made and seconded by members of the committee.

1. Approve the code change proposal as submitted (AS) or
2. Approve the code change proposal as modified with specific modifications (AM), or
3. Disapprove the code change proposal (D)

Discussion on this motion shall be limited to Code Development Committee members. If a committee member proposes a modification which had not been proposed during floor discussion, the Chairman shall rule on the modification in accordance with Section 5.5.2.2 If a committee member raises a matter of issue, including a proposed modification, which has not been proposed or discussed during the floor discussion, the Moderator shall suspend the committee discussion and shall reopen the floor discussion for comments on the specific matter or issue. Upon receipt of all comments from the floor, the Moderator shall resume committee discussion.

The Code Development Committee shall vote on each motion with the majority dictating the committee's action. Committee action on each code change proposal shall be completed when one of the motions noted above has been approved. Each committee vote shall be supported by a reason.

The Code Development Committee shall maintain a record of its proceedings including the action on each code change proposal.

5.7 Assembly Consideration: At the conclusion of the committee's action on a code change proposal and before the next code change proposal is called to the floor, the Moderator shall ask for a motion from the public hearing attendees who may object to the committee's action. If a motion in accordance with Section 5.7.1 is not brought forward on the committee's action, the results of the public hearing shall be established by the committee's action. If a motion in accordance with Section 5.7.1 is brought forward and

is sustained in accordance with Section 5.7.3, both the committee's action and the assemblies' action shall be reported as the results of the public hearing. Where a motion is sustained in accordance with Section 5.7.3, such action shall be the initial motion considered at Final Action Consideration in accordance with Section 7.3.8.2.

5.7.1 Floor Motion: Any attendee may raise an objection to the committee's action in which case the attendee will be able to make a motion to:

1. Approve the code change proposal as submitted from the floor (ASF), or
2. Approve the code change proposal as modified from the floor (AMF) with a specific modification that has been previously offered from the floor and ruled in order by the Chairman during floor discussion (see Section 5.5.2) or has been offered by a member of the Committee and ruled in order by the Chairman during committee discussion (see Section 5.6), or
3. Disapprove the code change proposal from the floor (DF).

5.7.2 Discussion: On receipt of a second to the floor motion, the Moderator shall place the motion before the assembly for a vote. No additional testimony shall be permitted.

5.7.3 Assembly Action: The assembly action shall be in accordance with the following majorities based on the number of votes cast by eligible voters (See 5.7.4).

Committee Action	Desired Assembly Action		
	ASF	AMF	DF
AS	--	2/3 Majority	2/3 Majority
AM	2/3 Majority	2/3 Majority	2/3 Majority
D	2/3 Majority	2/3 Majority	--

5.7.4 Eligible Voters: All members of ICC in attendance at the public hearing shall be eligible to vote on floor motions. Only one vote authorized for each eligible attendee. Code Development Committee members shall be eligible to vote on floor motions. Application, whether new or updated, for ICC membership must be received by the Code Council ten days prior to the commencement of the first day of the public hearing.

5.8 Report of the Public Hearing: The results of the public hearing, including committee action and successful assembly action, shall be posted on the ICC website not less than 60 days prior to Final Action Consideration except as approved by the ICC Board.

6.0 Public Comments

6.1 Intent: The public comment process gives attendees at the Final Action Hearing an opportunity to consider specific objections to the results of the public hearing and more thoughtfully prepare for the discussion for Final Action Consideration. The public comment process expedites the Final Action Consideration at the Final Action Hearing by limiting the items discussed to the following:

6.1.1 Consideration of items for which a public comment has been submitted; and
6.1.2 Consideration of items which received a successful assembly action at the public hearing.

6.2 Deadline: The deadline for receipt of a public comment to the results of the public hearing shall be announced at the public hearing but shall not be less than 30 days from the availability of the report of the results of the public hearing (see Section 5.8).

6.3 Withdrawal of Public Comment: A public comment may be withdrawn by the public commenter at any time prior to Final Action Consideration of that comment. A withdrawn public comment shall not be subject to Final Action Consideration. If the only public comment to a code change proposal is withdrawn by the public commenter prior to the vote on the consent agenda in accordance with Section 7.3.4, the proposal shall be considered as part of the consent agenda. If the only public comment to a code change proposal is withdrawn by the public commenter after the vote on the consent agenda in accordance with Section 7.3.4, the proposal shall continue as part of the individual consent agenda in accordance with Section 7.3.5, however the public comment shall not be subject to Final Action Consideration.

6.4 Form and Content of Public Comments: Any interested person, persons, or group may submit a public comment to the results of the public hearing which will be considered when in conformance to these requirements. Each public comment to a code change proposal shall be submitted separately and shall be complete in itself. Each public comment shall contain the following information:

6.4.1 Public comment: Each public comment shall include the name, title, mailing address, telephone number and email address of the public commenter. If group, organization, or committee submits a public comment, an individual with prime responsibility shall be indicated. If a public comment is submitted on behalf a client, group, organization or committee, the name and mailing address of the client, group, organization or committee shall be indicated. The scope of the public comment shall be consistent with the scope of the original code change proposal, committee action or successful assembly action. Public comments which are determined as not within the scope of the code change proposal, committee action or successful assembly action shall be identified as such. The public commenter shall be notified that the public comment is considered an incomplete public comment in accordance with Section 6.5.1 and the public comment shall be held until the deficiencies are corrected. A copyright release in accordance with Section 3.3.4.5 shall be provided with the public comment.

6.4.2 Code Reference: Each public comment shall include the code change proposal number and the results of the public hearing, including successful assembly actions, on the code change proposal to which the public comment is directed.

6.4.3 Multiple public comments to a code change proposal. A proponent shall not submit multiple public comments to the same code change proposal. When a proponent submits multiple public comments to the same code change proposal, the public comments shall be considered as incomplete public comments and processed in accordance with Section 6.5.1. This restriction shall not apply to public comments that attempt to address differing subject matter within a code section.

6.4.4 Desired Final Action: The public comment shall indicate the desired final action as one of the following:

1. Approve the code change proposal as submitted (AS), or
2. Approve the code change proposal as modified (AM) by one or more specific modifications published in the Results of the Public Hearing or published in a public comment, or
3. Disapprove the code change proposal (D)

6.4.5 Supporting Information: The public comment shall include in a statement containing a reason and justification for the desired final action on the code change proposal. Reasons and justification which are reviewed in accordance with Section 6.4 and determined as not germane to the technical issues addressed in the code change proposal or committee action shall be identified as such. The public commenter shall be notified that the public comment is considered an incomplete public comment in accordance with Section 6.5.1 and the public comment shall be held until the deficiencies are corrected. The public commenter shall have the right to appeal this action in accordance with the policy of the ICC Board. A bibliography of any substantiating material submitted with a public comment shall be published with the public comment and the substantiating material shall be made available at the Final Action Hearing.

6.4.6 Number: One copy of each public comment and one copy of all substantiating information shall be submitted. Additional copies may be requested when determined necessary by the Secretariat. A copy of the public comment in electronic form is preferred.

6.5 Review: The Secretariat shall be responsible for reviewing all submitted public comments from an editorial and technical viewpoint similar to the review of code change proposals (See Section 4.2).

6.5.1 Incomplete Public Comment: When a public comment is submitted with incorrect format, without the required information or judged as not in compliance with these Rules of Procedure, the public comment shall not be processed. The Secretariat shall notify the public commenter of the specific deficiencies and the public comment shall be held until the deficiencies are corrected, or the public comment shall be returned to the public commenter with instructions to correct the deficiencies with a final date set for receipt of the corrected public comment.

6.5.2 Duplications: On receipt of duplicate or parallel public comments, the Secretariat may consolidate such public comments for Final Action Consideration. Each public commenter shall be notified of this action when it occurs.

6.5.3 Deadline: Public comments received by the Secretariat after the deadline set for receipt shall not be published and shall not be considered as part of the Final Action Consideration.

6.6 Publication: The public hearing results on code change proposals that have not been public commented and the code change proposals with public commented public hearing results and successful assembly actions shall constitute the Final Action Agenda. The Final Action Agenda shall be posted on the ICC website at least 30 days prior to Final Action consideration.

7.0 Final Action Consideration

7.1 Intent: The purpose of Final Action Consideration is to make a final determination of all code change proposals which have been considered in a code development cycle by a vote cast by eligible voters (see Section 7.4).

7.2 Agenda: The final action consent agenda shall be comprised of proposals which have neither an assembly action nor public comment. The agenda for public testimony and individual consideration shall be comprised of proposals which have a successful assembly action or public comment (see Sections 5.7 and 6.0).

7.3 Procedure: *The Robert's Rules of Order* shall be the formal procedure for the conduct of the Final Action Consideration except as these Rules of Procedure may otherwise dictate.

7.3.1 Open Meetings: Public hearings for Final Action Consideration are open meetings. Any interested person may attend and participate in the Floor Discussion.

7.3.2 Agenda Order: The Secretariat shall publish an agenda for Final Action Consideration, placing individual code change proposals and public comments in a logical order to facilitate the hearing. The proponents or opponents of any proposal or public comment may move to revise the agenda order as the first order of business at the public hearing, or at any time during the hearing except while another proposal is being discussed. Preference shall be given to grouping like subjects together and for moving items back to a later position on the agenda as opposed to moving items forward to an earlier position. A motion to revise the agenda order is subject to a 2/3 vote of those present and voting.

7.3.3 Presentation of Material at the Public Hearing: Information to be provided at the hearing shall be limited to verbal presentations. Audio-visual presentations are not permitted. Substantiating material submitted in accordance with Section 6.4.4 and other material submitted in response to a code change proposal or public comment shall be located in a designated area in the hearing room.

7.3.4 Final Action Consent Agenda: The final action consent agenda (see Section 7.2) shall be placed before the assembly with a single motion for final action in accordance with the results of the public hearing. When the motion has been seconded, the vote shall be taken with no testimony being allowed. A simple majority (50% plus one) based on the number of votes cast by eligible voters shall decide the motion.

7.3.5 Individual Consideration Agenda: Upon completion of the final action consent vote, all proposed changes not on the final action consent agenda shall be placed before the assembly for individual consideration of each item (see Section 7.2).

7.3.6 Reconsideration: There shall be no reconsideration of a proposed code change after it has been voted on in accordance with Section 7.3.8.

7.3.7 Time Limits: Time limits shall be established as part of the agenda for testimony on all proposed changes at the beginning of each hearing session. Each person requesting to testify on a change shall be given equal time. In the interest of time and fairness to all hearing participants, the Moderator shall have limited authority to modify time limitations on debate. The Moderator shall have the authority to adjust time limits as necessary in order to complete the hearing agenda.

7.3.7.1 Time Keeping: Keeping of time for testimony by an individual shall be by an automatic timing device. Remaining time shall be evident to the person testifying. Interruptions during testimony shall not be tolerated. The Moderator shall maintain appropriate decorum during all testimony.

7.3.8 Discussion and Voting: Discussion and voting on proposals being individually considered shall be in accordance with the following procedures:

7.3.8.1 Allowable Final Action Motions: The only allowable motions for final action are Approval as Submitted, Approval as Modified by one or more modifications published in the Final Action Agenda, and Disapproval.

7.3.8.2 Initial Motion: The Code Development Committee action shall be the initial motion considered, unless there was a successful assembly action in accordance with Section 5.7.3. If there was a successful assembly action, it shall be the initial motion considered. If the assembly action motion fails, the code development committee action shall become the next motion considered.

7.3.8.3 Motions for Modifications: Whenever a motion under consideration is for Approval as Submitted or Approval as Modified, a subsequent motion and second for a modification published in the Final Action Agenda may be made (see Section 6.4.3). Each subsequent motion for modification, if any, shall be individually discussed and voted before returning to the main motion. A two-thirds majority based on the number of votes cast by eligible voters shall be required for a successful motion on all modifications.

7.3.8.4 Voting: After dispensing with all motions for modifications, if any, and upon completion of discussion on the main motion, the Moderator shall then ask for the vote on the main motion. If the motion fails to receive the majority required in Section 7.5, the Moderator shall ask for a new motion.

7.3.8.5 Subsequent Motion: If the initial motion is unsuccessful, a motion for one of the other allowable final actions shall be made (see Section 7.3.8.1) and dispensed with until a successful final action is achieved. If a successful final action is not achieved, Section 7.5.1 shall apply.

7.3.9 **Proponent testimony:** The Proponent of a public comment is permitted to waive an initial statement. The Proponent of the public comment shall be permitted to have the amount of time that would have been allocated during the initial testimony period plus the amount of time that would be allocated for rebuttal. Where a public comment is submitted by multiple proponents, this provision shall permit only one proponent of the joint submittal to waive an initial statement.

7.3.10 **Points of Order:** Any person participating in the public hearing may challenge a procedural ruling of the Moderator. A majority vote of the eligible voters as determined in Section 5.7.4 shall determine the decision.

7.4 **Eligible voters:** ICC Governmental Member Representatives and Honorary Members in attendance at the Final Action Hearing shall have one vote per eligible attendee on all International Codes. Applications, whether new or updated, for governmental member voting representative status must be received by the Code Council ten days prior to the commencement of the first day of the Final Action Hearing in order for any designated representative to be eligible to vote.

7.5 **Majorities for Final Action:** The required voting majority based on the number of votes cast of eligible voters shall be in accordance with the following table:

Public Hearing Action (see note)	**Desired Final Action**		
	AS	**AM**	**D**
AS	Simple Majority	2/3 Majority	Simple Majority
AM	2/3 Majority	Simple Majority to sustain the Public Hearing Action or; 2/3 Majority on additional modifications and 2/3 on overall AM	Simple Majority
D	2/3 Majority	2/3 Majority	Simple Majority

Note: The Public Hearing Action includes the committee action and successful assembly action.

7.5.1 **Failure to Achieve Majority Vote:** In the event that a code change proposal does not receive any of the required majorities for final action in Section 7.5, final action on the code change proposal in question shall be disapproval.

7.6 **Publication:** The Final action on all proposed code changes shall be published as soon as practicable after the determination of final action. The exact wording of any resulting text modifications shall be made available to any interested party.

8.0 Appeals

8.1 **Right to Appeal:** Any person may appeal an action or inaction in accordance with CP-1.

2009/2010 ICC CODE DEVELOPMENT CYCLE
CROSS INDEX OF PROPOSED CODE CHANGES

Some of the proposed code changes include sections that are outside of the scope of the chapters or the code listed in the table of 2009/2010 Staff Secretaries on page ix. This is done in order to facilitate coordination among the International Codes which is one of the fundamental principles of the International Codes.

Listed in this cross index are proposed code changes that include sections of codes or codes other than those listed on page ix. For example, IBC Section 402.16.5 is proposed for revision in Part II of code change F58-09/10, which is to be heard by the IFC Committee. This section of the IBC is typically the responsibility of the IBC General Committee as listed in the table of 2009/2010 Staff Secretaries. It is therefore identified in this cross index. Another example is Section 905.4 of the International Fire Code. The International Fire Code is normally maintained by the IFC Committee, but Section 905.4 will be considered for revision in proposed code change G31-09/10 and will be placed on the IBC General Committee agenda. In some instances, there are other subsections that are revised by an identified code change that is not included in the cross index. For example, numerous sections in Chapter 10 of the International Fire Code would be revised by the proposed changes to Chapter 10 of the IBC. This was done to keep the cross index brief enough for easy reference.

This information is provided to assist users in locating all of the proposed code changes that would affect a certain section or chapter. For example, to find all of the proposed code changes that would affect Chapter 7 of the IBC, review the proposed code changes in the Volume 1 monograph for the IBC Fire Safety Committee (listed with a FS prefix) then review this cross reference for Chapter 7 of the IBC for proposed code changes published in other code change groups. While care has been taken to be accurate, there may be some omissions in this list.

Letter prefix: Each proposed change number has a letter prefix that will identify where the proposal is published. The letter designations for proposed changes and the corresponding publications are as follows:

PREFIX	**PROPOSED CHANGE GROUP (see monograph table of contents for location)**
ADM	Administrative
E	International Building Code - Means of Egress
EB	International Existing Building Code
EC	International Energy Conservation Code
F	International Fire Code
FG	International Fuel Gas Code
FS	International Building Code - Fire Safety
G	International Building Code - General
M	International Mechanical Code
PC	ICC Performance Code
P	International Plumbing Code
PSD	International Private Sewage Disposal Code
PM	International Property Maintenance Code
RB	International Residential Code - Building
RE	International Residential Code - Energy
RM	International Residential Code - Mechanical
RP	International Residential Code - Plumbing
S	International Building Code - Structural
WUIC	International Wildland-Urban Interface Code
Z	International Zoning Code

INTERNATIONAL BUILDING CODE	
Chapter 1	ADM1 Part I
101.2	ADM2
101.3	ADM3
102.4	ADM4 Part I
104.10.1(New)	ADM5
105.2	ADM6 Part I
105.2.4	ADM7 Part I
106.1	S55-09/10
107.2	ADM9 Part I
107.2.2	ADM10
107.2.3	ADM11
107.2.6	ADM12
108.1	ADM13
109.3.10.1	ADM14 Part I
110.3	ADM8 Part II
110.3.6	ADM23 Part I (Heard by IBC-FS Committee)
110.6	ADM15 Part II
113.2.1	ADM5
117 (New)	ADM16 Part I
R202	EB3 , EB4
202	G2 Part I– Heard by Structural
303.1	E140, E141
Table 307.1(1)	F186, F187
307.2	F186, F190, F196
307.4	F187
402.11	F58, Part II
402.12.1	F58, Part II
402.16.5	F58, Part II
403.2.3	E5 – Part I
403.2.3.1	E5 – Part I
403.2.3.2	E5 – Part I
403.3.1.1 (IFC 914.3.1.1.1)	E5 – Part II
403.5.1	E5 – Part I
403.5.4	E5 – Part I
406.2.2	E151 Part I
406.6.6.1	F178
406.6.6.1.1 (New)	F178
408.3.8	E5 – Part I
410.5.3.1 (New)	E5 – Part I
414.2.1	F189
414.2.2	F190
Table 414.2.2	F189
414.2.4	F189
414.7.2 (IFC 2705.4.4)	E5 – Part II
Table 415.8.2.1.1	F165
415.8.2.6	F162, Part I
415.8.3	F167
415.8.4.6.2 (IFC 1803.12.1.2)	E5 – Part II
415.8.11.2	F161
416	F155
501.2	F18
505.3	E6
505.4	E6
705.2	E5 – Part I, E137
705.11	G81
707.3.2	E5 – Part I
707.3.3 (New)	E5 – Part I
707.3.10 new	G81
707.3.10 (New)	E132
707.4	E5 – Part I
707.5.1	G178
707.5.1	E5 – Part I
707.6	E5 – Part I
707.7.1	E5 – Part I
708.1	E5 – Part I
708.2	E5 – Part I
708.3 (New)	E5 – Part I
708.6	E5 – Part I
708.14.1	G44 Part I
709.1	G82
709.3	G81
709.4	G81
709.5	E5 – Part I
710.5	G15, G21
712.4	G178
717.3.2	G81
717.4.2	G81, G82
712.4	E5 – Part I
Table 715.4	E5 – Part I
715.4.4	E5 – Part I
715.4.6.1	E5 – Part I
715.4.7.2	E5 – Part I
716.5.1	F162, Part II
716.5.2	E5 – Part I
Table 803.9	E5 – Part I
804.4	E5 – Part I
804.4.1	E5 – Part I
806.1	F57
901.2.1	F62
901.6.3	F193, Part II
907.5.2.3.4	E151 Part II
909.5 (IFC 909.5, IMC 513.5)	E5 – Part II
911.1.2	F22
911.1.5	F23, F24, F25
911.1.5	G44 Part II
1006.1	G21
1007.1	EB10
1008.1.9.6	G65
1009.7	G67 – Heard by MOE
1013.1 (New)	FS154
1013.8 (New)	FS154
1015.1 and Table 1015.1	G16
1015.6	G67 – Heard by MOE
1015.6.1	G67 – Heard by MOE
1015.7 new	G16
1021.2	G16, G20
Table 1021.2	G20
1022.1	G52
1022.1	G67 – Heard by MOE

IBC (continued)	
1103.2.12	G16
1106.3	G65
1106.4	G65
1107.5.2	G22, G23
1107.5.3	G20
1107.6.4.1	G21
1110.3	G177 – Heard by MOE
Table 1604.5	G65
1703.5.4 (New)	FS101
1704.16	F135
1704.16.1	F135
1704.16.2	F135
2303.3 (New)	FS133
2606.7	E5 – Part I
2702 (New)	F31
2702.2.21 (New)	F33
2902.4	E151 Part III
2902.1	P20
Table 2902.1	P21, P22, P23, P24
2902.2	P25
2902.2.1 (New)	P26
2902.3	P27
2902.4.1	P28
2902.3.5 (New)	P30
2902.5 (New)	P31
2902.3.2	P35
2902.1.3	P46
2902.3	P162
3001.3	E151 Part I
3003.3 (New)	F20, Part II
3007.4.1	E5 – Part I
3007.5	E5 – Part I
3008.11.1	E5 – Part I
3108.1	S85-09/10
3403.5 (New)	F114, Part II
3404.6	E20 Part I, E21 Part I
3404.7 (New)	F114, Part II
3405.2	EB6
3405.2.1	EB6
3405.3.1	EB8 , EB9
3408.4	S41-09/10
3411.1	EB11 , EB14
3411.1	E156 Part I
3411.4	EB10 , EB11 , EB14 , EB32
3411.4.1	EB10 , EB32
3411.4.2	EB10 , EB14 , EB32 , EB33
3411.5	EB10 , EB11
3411.6	EB10 , EB11 , EB14
3411.6	E151 Part I
3411.7	EB14
3411.7 (New)	EB11
3411.8	EB11
3411.8	E 152 Part I
3411.8 (New)	EB10
3411.8.1(New)	EB10
3411.8.5	EB11
3411.8.8	EB14
3411.8.9	EB11 , EB14
3411.8.15 (New)	E 152 Part I
3411.8.15.1 (New)	E 152 Part I
3411.8.15.2 (New)	E 152 Part I
3411.8.16 (New)	E 152 Part I
3411.9	EB10 , EB14
3412.2.5	EB14
3412.6.11	E20 Part I, E21 Part I
Table 3412.6.11(1)	E20 Part I, E21 Part I
Chapter 35	F58, Part II
Chapter 35	ADM39
K101.3	ADM3
Appendix I	G2 – Heard by IBC -S
Appendix L (New)	F236, Part II
Appendix L (New)	S108-09/10

INTERNATIONALENERGY CONSERVATION CODE	
Chapter 1	ADM1 Part III
101.3	ADM3, ADM24 (Heard by IECC Committee)
101.4.4	ADM27 (Heard by IECC Committee)
101.4.6	ADM25 (Heard by IECC Committee)
101.5.1	ADM17
101.5.2	ADM26 (Heard by IECC Committee)
102.1.1	ADM28 (Heard by IECC Committee) ADM31 (Heard by IECC Committee)
102.1.2	ADM29 (Heard by IECC Committee)
103.1	ADM17
103.2	ADM9 Part I
104.2	ADM15 Part I
106.1	ADM4
110	ADM16 Part I
Ch. 6	ADM39

INTERNATIONAL EXISTING BUILDING CODE	
Chapter 1	ADM1 Part II
101.2	ADM2
101.3	ADM3
Table 101.5.4.1	S41-09/10
101.5.4.2	S41-09/10
Table 101.5.4.2	S41-09/10
101.5.4.2	ADM32 (Heard by IBC-S Committee) ADM33 (Heard by IBC-S Committee)
102.4	ADM4
106.2.1	ADM9 Part I
107.1	ADM13
109.3.6(New)	ADM23
109.6	ADM15 Part I
118	ADM16 Part I

IEBC (continued)	
202	S91-09/10
301.1	G187
301.1.1	G188
301.2	G190 – Heard by IBC –S
301.2.1	G191 – Heard by IBC-S
301.2.3	G190 – Heard by IBC – S
301.3	G192 – Heard by IBC-S
302.4.1	G190 – Heard by IBC – S
302.5 (New)	F114, Part III
303.4.1	G190 – Heard by IBC-S
303.6	E20 Part I, E21 Part I
303.7 (New)	F114, Part III
304.1.1	G192 – Heard by IBC-S
304.2	G193, G194 – Both heard by IBC-S
304.2.1	G190, G193, G194 – All heard by IBC - S
304.2.2	G193, G194 – Both heard by IBC-S
304.2.3	G193, G194, G195 – All heard by IBC-S
304.3	G193 – Heard by IBC-S
304.3.1	G193 – Heard by IBC-S
304.3.2	G193 – Heard by IBC-S
304.4	G193, G194 – Both heard by IBC-S
304.5	G193, G196 – Both heard by IBC-S
307.4	G190, G197 – Both heard by IBC-S
307.4	S41-09/10
309.1	G198, G199
310.1	E156 Part I
310.6	E151 Part I
310.8	E152
310.8.8	G200 – Heard by MOE
310.8.15 (New)	E152
310.8.15.1 (New)	E152
310.8.15.2 (New)	E152
310.8.16 (New)	E152
605.1	E 151 Part IV, E152 Part II, E156 Part II
605.1.15 (New)	E152 Part II
605.1.15.1 (New)	E152 Part II
605.1.15.2 (New)	E152 Part II
605.1.16 (New)	E152 Part II
704.4.3	F114, Part III
907.3.1	S41-09/10
907.3.2	S41-09/10
1004.1	F114, Part III
1202.2	S146-09/10
1202.2.1	S146-09/10
1301.6.2.1	G201
1301.6.14	G202
1301.6.14.1	G202
1301.6.19	G203
1301.6.11	E20 Part I, E21 Part I
Table 1301.6.11(1)	E20 Part I, E21 Part I
1401.3.1 new	G184
1401.5 new	G185
Chapter 15	ADM39
A102.2	S41-09/10
INTERNATIONAL FIRE CODE	
Chapter 1	ADM1 Part IV
101.2	ADM19
101.3	ADM3
102.5	ADM20
102.7	ADM4
105.1.1	ADM21
105.4.2	ADM9 Part I
105.4.2.1	ADM10
105.4.3	ADM9 Part I
105.6.2	ADM34 (Heard by IFC Committee)
107.2.1	ADM35 (Heard by IFC Committee)
114 (New)	ADM16 Part I
202	
Def of Group A	G10, G11, G12, G13, G14
Def of Group B	G6, G15
Def of Group E	G16
Def of Group F	G18, G19
Def of Group I	G16, G20, G21, G22, G23. G24
Def of Group M	G25
Def of Group R	G20, G21, G22, G23, G26, G27, G28, G29
Def of Group S	G19
508.1.5 (IBC 911.1.5)	G44, Part II
603.4	M8 PII
607.4	G153, Part II
803.8	FS136 Part II
901.4.3 (New)	FS29
903.2.2	G15
903.2.3	G15
903.2.4.2 (new)	G19
903.2.6	G16, G20, G21
903.2.6.1	G21
903.2.8	G20
903.2.9.1	G19
903.3.1.3	G20
903.3.2	G20
904.5.2.3.3	G21
905.3.3.	G31
905.4	G31
907.2.2	G15
907.2.2.1	G15
907.2.6	G20
907.2.6.2	G20
907.5.2.3.4	E151 Part II
909.5 (IBC 909.5, IMC 513.5)	E5 – Part II
914.3.1.1.1 (IBC 403.3.1.1)	E5 – Part II

IFC (continued)	
914.6.1	G70 – Heard by IFC
914.8.2.2	G71 – Heard by IFC
Chapter 10 See IBC MOE changes	
1007.1	EB10
1030.4.1	E93 Part II
1404.5	G185 Part II
IFC 1803.12.1.2 (IBC 415.8.4.6.2)	E5 – Part II
2303.2	G64
IFC 2705.4.4 (IBC 414.7.2)	E5 – Part II
3904.1.2	G73 Part II – Heard by IFC
4604.7	E20 Part II, E21 Part II
Table 4604.7	E20 Part II, E21 Part II
Chapter 47	ADM39
INTERNATIONAL FUEL GAS CODE	
Chapter 1	ADM1 Part V
101.4	ADM3
102.8	ADM4
107.2	ADM8 Part I
111 (New)	ADM16 Part I
301.11	S92-09/10, Part III
306.5	M11, M12
306.5.1	M13
410.4 (New)	F148, Part II
Chapter 8	ADM39
INTERNATIONAL MECHANICAL CODE	
Chapter 1	ADM1 Part VI
102.8	ADM4
102.3	ADM36 (Heard by IMC Committee)
102.4	ADM37 (Heard by IMC Committee)
107.2	ADM8 Part I
202	FG14 PII
301.3 thru 301.5	FG14 PII
301.6	FG10 PI
301.13	S92-09/10, Part IV
307.3	FG11 PI
401.4	S92-09/10, Part IV
501.2.1	S92-09/10, Part IV
502.4	F43
502.5	F43
502.5.2	F43
502.8.4	F194
502.10.2	F162, Part I
510.7	F161, Part II
513.3	F135
513.10.2	F137
513.12	F138
513.12.1	F139
513.13.1	F140
602.4	S92-09/10, Part IV
603.13	S92-09/10, Part IV
606.2	F120
606.2.1 (New)	F120
606.2.2	F120
607.1	FS108, FS117
607.1.1	FS108, FS117
607.2	FS108, FS117
607.2.1	FS117
607.2.2	FS108, FS117
607.3.1	FS70, FS109
607.3.2.2	FS110
607.3.2.3	FS110
607.5	FS117
607.5.1	FS117
607.5.1	F162, Part II
607.5.1.1	FS117
607.5.2	FS117
607.5.2.1	FS117
607.5.3	FS114, FS117
607.5.4	FS117
607.5.5	FS111, FS112, FS113, FS117
607.5.6	FS117
607.5.7	FS117
607.6	FS117
607.6.1	FS115, FS117
607.6.2	FS117
607.6.2.1	FS117
607.6.3	FS116, FS117
607.7	FS117
918.6	FG32 PII
513.5 (IBC 909.5, IFC 909.5)	E5 – Part II
IMC 601.2 (IBC 1018.5, IFC 1018.5)	E116
1106.5	F39
1106.5.1	F39
1305.2.1	S92-09/10, Part IV
INTERNATIONAL PLUMBING CODE	
Chapter 1	ADM1 Part VII
101.3	ADM3
102.8	ADM4
107.2	ADM8 Part I
111 (New)	ADM16 Part I
202	FS124 Part II
309.2	S92-09/10, Part II
Table 403.1	G16, G20, G65
403.1	G16
403.2	G16
403.4	E151 Part III
1107.1	S2-09/10, Part I (Heard by IPC)
Chapter 13	ADM39
INT. PRIVATE SEWAGE DISPOSAL CODE	
Chapter 1	ADM1 Part IX
101.3	ADM3
102.10	ADM4
105.4	P1 Part II

IPSDC (continued)	
105.4.1	P1 Part II
105.4.2	P1 Part II
105.4.3	P1 Part II
105.4.4	P1 Part II
105.4.5	P1 Part II
105.4.6	P1 Part II
111 (New)	ADM 16 Part I
Section 304 (New)	P1 Part II
INTERNATIONAL PROPERTY MAINTENANCE CODE	
Chapter 1	ADM1 Part VIII
101.3	ADM3
102.3	ADM22
102.7	ADM4
108.1.3	ADM38 (Heard by IPMC Committee)
110.1	ADM38 (Heard by IPMC Committee)
113 (New)	ADM16 Part I
304.18.1	E60 Part II
606.1	G153 Part III
704.2	F114, Part I
704.3	F114, Part I
704.4	F114, Part II ; F115
Chapter 8	ADM39
INTERNATIONAL RESIDENTIAL CODE	***Note:*** All Code Change Parts for IRC are heard by the applicable IRC Committee except ADM39
Chapter 1	ADM 1 Part XII
R101.2	G28 Part II
R101.4	ADM3 Part II
R102.4	ADM4 Part II
R105.2	ADM6 Part II
R105.2.4 (New)	ADM7 Part II
R106.1.1	ADM9 Part II
R109.1.6.1	ADM14 Part II
R109.4	ADM15 Part II
110.3	ADM8 Part I
R115 (New)	ADM16 Part II
R202	FS124 Part III
R202	FG14 PIII
R202	M1 PII
R202	E8 Part II, E100 Part II, E156 Part III, E194 Part II
R202	F108, Part II; F132, Part II
R202	P2 Part II, P92 Part II, P128 Part II, P152 Part II
R202	G2 Part II, G5 Part II, G28 Part II
301.13	S92-09/10, Part IV
Figure R301.2(2)	S97-09/10, Part II
R301.2.1.1	S87-09/10, Part II
Table R301.5	S57-09/10, Part II, S61-09/10, Part II, S62-09/10, Part II, S66-09/10, Part II

R302.1	FS155 Part II
R302.1.2	FS155 Part II
R302.6	G56 Part II
R302.11.1	FS118 Part II
R308.3.1	S219-09/10, Part II
R308.4	S218-09/10, Part II
R308.4.1 (New)	S218-09/10, Part II
R308.4.2 (New)	S218-09/10, Part II
R308.4.3 (New)	S218-09/10, Part II
R308.4.4 (New)	S218-09/10, Part II
R308.4.5 (New)	S218-09/10, Part II
R308.4.6 (New)	S218-09/10, Part II
R308.4.7 (New)	S218-09/10, Part II
R308.6.1	S144-09/10, Part II
R310.1	E150 Part II
R311.2	E60 Part III
R311.2.1 (New)	E60 Part III
R311.3.1	E58 Part II
R311.4	E122 Part II
R311.7.4	E70 Part II, E71 Part II, E72 Part II
R311.7.4.1	E74 Part II
R311.7.4.2	E74 Part II
R311.7.4.3	E75 Part II
R311.7.4.3.1 (New)	E75 Part II
R311.7.4.3.2 (New)	E75 Part II
R311.7.4.3.3 (New)	E75 Part II
R311.7.7.3	E97 Part II
R312.2	E100 Part II
R314.1	F108, Part II; F112, Part II
R314.2	F108, Part II
R314.3	F108, Part II; F115, Part II
R314.4	F108, Part II; F115, Part II
R314.5	F115, Part II
R314.5 (New)	F116, Part II
R314.5.1 (New)	F116, Part II
R314.5.2 (New)	F116, Part II
R314.5.3 (New)	F116, Part II
R315	F132, Part II
R316.4	FS160 Part II
R316.5.3	FS168 Part II, FS169 Part II
R316.5.4	FS168 Part II, FS169 Part II
R316.5.13 (New)	FS171 Part II
R316.7	FS176 Part II
R316.8	FS176 Part II
R317.3	S203-09/10, Part II
R317.3.1	S203-09/10, Part II
R317.3.2	S203-09/10, Part II
R317.3.3	S203-09/10, Part II
R317.3.4	S203-09/10, Part II
R317.4.1 (New)	S207-09/10, Part II
R317.4.2	S207-09/10, Part II
R320.2 (New)	E156 Part III
R402.2	S162-09/10, Part II
R403.3.4	FS176 Part II
R404.1.2.3.6.1	FS176 Part II
R503.2.1	S200-09/10, Part II
R503.2.1.1	S200-09/10, Part II

IRC (continued)	
Table R601.3.1	FS147 Part II
R602.3	S200-09/10, Part II
R602.9	S214-09/10, Part II
R604.1	S199-09/10, Part II
R606.1	S171-09/10, Part II
R606.1.1	S171-09/10, Part II
R606.12.1	S171-09/10, Part II
R606.12.3.1	S171-09/10, Part II
R702.2.1	S222-09/10, Part II
R702.2.2	S222-09/10, Part II
R702.3.1	S222-09/10, Part II
R702.4.2	S224-09/10, Part II
R703.1.1	FS140 Part II
R703.3	FS156 Part II
R703.4	FS156 Part II
R703.4	S199-09/10, Part II
Table R703.4	FS156 Part II
R703.5.1	FS156 Part II
R703.6.1	FS156 Part II
R703.6.3	S225-09/10, Part II
R703.7.4.1	FS156 Part II
R703.11.2	FS156 Part II
R703.11.2.1	FS156 Part II
R703.11.2.2	FS156 Part II
R703.11.2.3	FS156 Part II
R703.12	FS150 Part II, FS151 Part II
703.12.1	FS150 Part II, FS151 Part II
R802.1.3	S201-09/10, Part II
R802.1.3.1	S201-09/10, Part II
R802.1.3.2	S201-09/10, Part II
R802.1.3.3	S201-09/10, Part II
R803.2.1	S200-09/10, Part II
R806.1	G146 Part II
R806.2	G145 Part II
R903.2.2	S3-09/10, Part II
R903.4	S2-09/10, Part III (heard by IRC Plumbing)
R903.4.1	S2-09/10, Part III (heard by IRC Plumbing)
Table R905.2.4.1(2)	S14-09/10, Part II
R905.2.7.2	S15-09/10, Part II
R905.2.8.5 (New)	S16-09/10, Part II
R905.3.3.3	S15-09/10, Part II
R905.4.3.2 (New)	S15-09/10, Part II
R905.4.5.1 (New)	S17-09/10, Part II
R905.5.3.2 (New)	S15-09/10, Part II
R905.6.3.2 (New)	S15-09/10, Part II
R905.7.3.2 (New)	S15-09/10, Part II
R905.8.3.2 (New)	S15-09/10, Part II
R905.9.2	S18-09/10, Part II
R905.10.5.1 (New)	S15-09/10, Part II
R905.14.3	S20-09/10, Part II
Table R905.14.3 (New)	S20-09/10, Part II
R905.15	S21-09/10, Part II
R905.15.1	S21-09/10, Part II
R905.15.2	S21-09/10, Part II
R905.15.3	S21-09/10, Part II
R905.16 (New)	S22-09/10, Part III, S23-09/10. Part, II
R905.16.1 (New)	S22-09/10, Part III, S23-09/10. Part II
R905.16.1.1 (New)	S23-09/10, Part II
R905.16.2 (New)	S22-09/10, Part III
R905.16.3 (New)	S22-09/10, Part III
R907.3	S30-09/10, Part II
R1003.9.1 (New)	S182-09/10, Part II
R1003.9.3 (New)	S182-09/10, Part II
R1003.11.1	M114 PII
R1005.7	M117 PII
R1004.2	M119 PII
T N1101.2	EC1 Part II
N1101.4.2.1(New)	EC2 Part II
N1101.6	EC4
Chapter 11	EC11 Part II, EC 13 Part II, EC16, Part II, EC19 Part II, EC25 Part II
N1101.2.2	EC21
N1101.7	EC28
N1101.9	EC22 Part II, EC23 Part II
N1102	EC26
N1102.1	EC31
N1103.2.1	EC26
Table N1102.1, Table N1102.1.2, Table1102.2.5	EC27, EC29, EC30, EC31, EC32, EC34, EC35, EC36, EC38, EC39, EC40, EC41, EC42, EC43, EC45, EC46, EC47, EC48, EC50, EC54, EC55, EC60, EC102 (All Part II)
Table N1102.1.4 (New) N1102.1.4(New)	EC56 Part II
N1102.2.2	EC59 Part II
N1102.2.2.1(New)	EC64 Part II
N1102.2.3 (New)	EC63 Part II
Table N1102.2.5	EC66 Part II
N1102.2.11	EC68 Part II
N1102.2.12(New)	EC69 Part II
Table N1102.4.2	EC26 Part II, EC59 Part II
Table N1102.1.4 (New) N1102.1.4(New)	EC57 Part II
N1102.3 (New)	EC71 Part II
N1102.3.3 (New)	EC72 Part II
N1102.3.3 (New)	EC73 Part II
N1102.3.3 (New)	EC74 Part II
N1102.3.4	EC76 Part II
N1102.3.5	EC68 Part II
N1102.3.6 (New)	EC96 Part II
N1102.3.7(New)	EC78 Part II
N1102.4.1	EC79, EC82, EC83
N1102.4.1.1(New)	EC79 Part II
N1102.4.1.2 (New)	EC79 Part II
N1102.4.2	EC81, EC82, EC83, EC86, EC90

IRC (continued)	
N1102.4.2.1.1 (New)	EC80 Part II
N1102.4.2.1.1 (New)	EC87 Part II
N1102.4.3	EC79 Part II, EC89 Part II
N1102.4.4	EC91 Part II
N1102.4.5	EC92 Part II
N1102.4.6	EC84
N1103.1	EC100 Part II
N1103.1.1	EC101 Part II
N1103.1.3 (New)	EC100 Part II
N1103.2.1	EC103 Part II
N1103.2.2	EC103, EC104, EC107 (All Part II)
N1103	
N1103.2.3	EC103 Part II, EC109 Part II,
N1103.3	EC117 Part II
N1103.3	EC123 Part II
N1103.4	EC115 Part II, EC116
N1103.4 (New)	EC114 Part II
N1103.4 (New)	EC118 Part II
N1103.4.1	EC112 Part II
N1103.4.2	EC112 Part II
N1103.5	EC79 Part II, EC131 Part II
N1103.5 (New)	EC119 Part II
N1103.5.1	EC99 Part II
N1103.6	EC120 Part II
T N1103.6 (New)	EC121 Part II
N1103.8	EC124 Part II
N1103.9	EC125 Part II
N1103.10 (New)	EC126 Part II
N1104 (New)	EC131 Part II
N1104.1	EC127, EC129, EC130 (All Part II)
N1104.1.1	EC18
M1301.2 thru M1301.5	FG14 PIII
M1303.1	M6 PII
M1303.1	FG10 PIII
M1307.3, P2801.6	M10 PII
M1401.1	M9 PII
M1407.1	M121 PII
M1411.5	FG11 PIII
M1411.6	M130 PII, M131 PII
M1411.6.1	M133 PII
M1413.1	M126 PII
M1413.2	M126 PII
M1502.4.1	M35 PII, M36 PII
M1502.4.2	M35 PII
M1502.4.4.1	M35 PII
M1502.4.4	M38 PII, M39 PII, M40 PII
M1502.4.4.2	M38 PII
M1502.4.4.3	M39 PII, M40 PII
M1503.1	M45 PII
M1503.2	M46 PII
M1506.1	M31 PII
M1601.1.1	M97 PII
Table M1601.1.1(2)	M98 PII
M1601.1.2	M102 PII, M103 PII
M1601.4.1	M105 PII
M1601.4	M110 PII
M1601.3	M111 PII, M112 PII
M1602.2	FG32 PIII
M2005.1	M127 PII
M2001.1.1	M128 PII
Table M2101.1	M140 PII, M141 PII, M142 PII
M2104.5	M148 PII
M2201.5	M151 PII
M2201.5	M151 PII
M2204.2	M152 PII
P2503.6	P18 Part II
P2503.8.2	P19 Part II, P106 Part II
P2601.2	P152 Part II
P2603.3	P8 Part II
P2603.4	P16 Part II
P2603.5	P10 Part II
Table P2605.1	P70 Part II
P2608.1	P7 Part II
P2608.4	P7 Part II
Table P2608.4	P7 Part II
Table P2701.1	P37 Part II
P2706.1	P121 Part II
P2708.1.1	P52 Part II
P2708.4 (New)	P53 Part II
P2709.2.1	P54 PartII
P2709.2.2	P54 PartII
P2709.2.4 (New)	P55 PartII
P2713.1	P40 Part II, P41 Part II
P2721.2	P42 Part II
P2722.5 (New)	P60 Part II
P2724.1 (New)	P61 Part II
P2803.6	P62 Part II
P2803.6 (New)	P63 Part II
P2803.6.1	P64 Part II
P2801.1.2	EC122 Part II
P2801.5	P65 Part II. P66 Part II P67 Part II
P2801.5.1	P67 Part II
P2801.5.3 (New)	P158 Part II
P2901.1	P87 Part II
P2902.1	P102 Part II
Table P2902.3	P83 Part II, P93 Part II
P2902.3.2	P93 Part II
P2902.3.3	P103 Part II
P2902.3.4	P96 Part II, P104 Part II
P2902.3.5	P95 Part II
P2902.3.6	P94 Part II
P2902.4	P94 Part II
P2902.4.2	P94 Part II
P2902.4.3	P86 Part II
P2902.5.1	P103 Part II
P2902.5.2	P154 Part II, P160 Part II
P2902.5.3	P100 Part II

IRC (continued)	
P2902.5.4	P99 Part II
P2902.5.4.1	P99 Part II
P2902.5.5	P94 Part II
P2902.6	P90 Part II
P2903.3.1	P157 Part II
P2903.5	P72 Part II
P2503.5.1	P156 Part II
Table P2903.6(1)	P153 Part II
P2903.9.5	P86 Part II
P2903.11 (New)	P75 Part II
P2904.3.1	P70 Part II
P2904.4.3	P94 Part II
Table P2904.6.2(8)	P70 Part II
Table P2904.6.2(9)	P70 Part II
P2905.4	P69 Part II
Table P2905.4	P68 Part II, P70 Part II
Table P2905.5	P70 Part II, P71 Part II
Table P2905.6	P70 Part II
P2905.9.1.2	P84 Part II
P2905.19 (New)	P70 Part II, P73 Part II
P2905.19.1(New)	P70 Part II
P2905.19.2 (New)	P70 Part II
P2908.1	P108 Part II
P2908.2	P108 Part II
P3001.4 (New)	P109 Part II
P3002.3.1	P111 Part II
P3003.9.2	P110 Part II
P3003.14.2	P110 Part II
P3003.19	P36 Part II
P3007.3.2.1 (New)	P114 Part II
P3007.3.3 (New)	P115 Part II
P3007.3.3.1 (New)	P115 Part II
P3007.3.3.2 (New)	P115 Part II
P3007.3.5	P116 Part II
P3009 (New)	P152 Part II
P3103.4	P124 Part II
P3103.5	P159 Part II
P3111.2	P128 Part II
P3111.3	P127 Part II
P3113.4.1	P131 Part II
P3201.5	P135 Part II
P3201.2	P136 Part II
Chapter 44	P60 Part II, P68 Part II, P69 Part II, P70 Part II, P71 Part II, P73 Part II, P83 Part II, P106 Part II, P108 Part II, P135 Part II, P136 Part II, P157 Part II
Chapter 44	F108, Part II; F132, Part II
Chapter 44	ADM39
Appendix H	G2 Part II
Appendix K	G147 Part II
Appendix L	G204 Part II

INT. WILDLAND-URBAN INTERFACE CODE	
Chapter 1	ADM1 Part X
101.3	ADM3
102.4	ADM4
115 (New)	ADM16 Part I
Chapter 15	ADM39
INTERNATIONAL ZONING CODE	
Chapter 1	ADM1 Part XI
101.2	ADM3
112 (New)	ADM16 Part I
Chapter 14	ADM39

2009/2010 ICC CODE DEVELOPMENT HEARING SCHEDULE

October 24 – November 11, 2009
Hilton Baltimore

Unless noted by "Start no earlier than X am/pm," each Code Committee will begin immediately upon completion of the hearings for the prior Committee. Thus the actual start times for the various Code Committees are tentative. The hearing volume is higher than previous cycles. The schedule anticipates that the hearings will finish by the times noted as "Finish" for each track and each week.

CODE DEVELOPMENT HEARINGS: OCTOBER 24 - 31

	Saturday October 24	Sunday October 25	Monday October 26	Tuesday October 27	Wednesday October 28	Thursday October 29	Friday October 30	Saturday October 31
TRACK 1	Start 8 am IWUIC IFC End 8 pm	Start 10 am IFC End 8 pm	Start 8 am IFC IRC-Energy (Start no earlier than 1 pm) End 8 pm	Start 8 am IRC – Energy End 8 pm	Start 8 am IRC-Building (Start no earlier than 8 am) End 8 pm	Start 8 am IRC- Building End 8 pm	Start 8 am IRC – Building Admin (Start no earlier than 3 pm) End 8 pm	Start 8 am Admin Finish 3 pm
TRACK 2	Start 8 am IBC-Structural End 8 pm	Start 10 am IBC-Structural End 8 pm	Start 8 am IBC-Structural End 8 pm	Start 8 am IBC-Structural End 8 pm	Start 8 am IECC (Start no earlier than 8 am) End 8 pm	Start 8 am IECC End 8 pm	Start 8 am IECC End 8 pm	Start 8 am IECC Finish 8 pm

ANNUAL CONFERENCE: NOVEMBER 1 - 4

CODE DEVELOPMENT HEARINGS: NOVEMBER 4 - 11

	Wednesday November 4	Thursday November 5	Friday November 6	Saturday November 7	Sunday November 8	Monday November 9	Tuesday November 10	Wednesday November 11
TRACK 1	Start 8 am IPM/ZC IEBC IBC-Fire Safety End 5 pm	Start 8 am IBC-Fire Safety End 8 pm	Start 8 am IBC – Fire Safety IBC – General (Start no earlier than 3 pm) End 8 pm	Start 8 am IBC - General End 8 pm	Start 10 am IBC – General IBC – Egress (Start no earlier than 3 pm) End 8 pm	Start 8 am IBC - Egress End 8 pm	Start 8 am IBC - Egress End 8 pm	Start 8 am IBC - Egress Finish 12 pm
TRACK 2	Start 8 am IPC/IPSDC End 5 pm	Start 8 am IPC/IPSDC End 9 pm	Start 8 am IMC (Start no earlier than 8 am) End 9 pm	Start 8 am IMC IRC-Plumbing/ Mechanical (Start no earlier than 1 pm) End 9 pm	Start 10 am IRC – Plumbing/ Mechanical End 9 pm	Start 8 am IRC – Plumbing/ Mechanical IFGC (Start no earlier than 8 am) Finish 9 pm	NO HEARINGS TRACK 2 COMPLETED	

Notes:

1. Hearing times may be modified at the discretion of the Chairman. Breaks will be announced.
2. Proposed code changes submitted to the International Wildland-Urban Interface Code (IWUIC) to be heard by the IFC Committee.
3. Proposed code changes submitted to the International Zoning (Z) and Property Maintenance (PM) Codes to be heard by the IPM/Z Committee.
4. "Admin" is a new code committee who will hear changes that affect coordination of Chapter 1 of all the I-Codes, except the IRC, and referenced standards updates.

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL CODES

Registration
Delegate

2009 Annual Conference and
Code Development Hearings

Hearings: October 24–31 and November 4–11
Hilton Baltimore

Conference: November 1–4
Baltimore Convention Center

FIRST NAME AND M.I. _____ LAST NAME/SURNAME _____

JOB TITLE _____

JURISDICTION/ORGANIZATION _____

MAILING ADDRESS _____

CITY _____ STATE/PROVINCE _____ ZIP/POSTAL CODE _____

COUNTRY _____ E-MAIL (MUST PROVIDE TO RECEIVE CONFIRMATION) _____

PHONE (SPECIFY COUNTRY AND CITY CODE IF OUTSIDE THE U.S.) _____ FAX (SPECIFY COUNTRY AND CITY CODE IF OUTSIDE THE U.S.) _____

Are you an ICC Member? ☐ NO ☐ YES, my ICC Membership Number is: _____ ☐ Check here if this is your first ICC Conference.

Type of Registration	ICC Member BEFORE SEPTEMBER 1	Nonmember BEFORE SEPTEMBER 1	ICC Member AFTER SEPTEMBER 1	Nonmember AFTER SEPTEMBER 1
☐ Full Conference Registration (includes all business, education and social functions)	$495*	$625*	$560*	$685*
☐ Code Development Hearings only (Registration is required to verify voting status)	FREE Registration		FREE Registration	
☐ One-Day Education ☐ Monday, November 2 ☐ Tuesday, November 3	$125	$160	$160	$190
☐ Golf Tournament (per person)** Handicap _____	$75	$75	$125	$125
☐ Golf Club Rental** ☐ Men's ☐ Women's ☐ Left ☐ Right	$25	$25	$25	$25

REGISTER BY SEPTEMBER 1 AND SAVE!

All fees are in U.S. dollars.

TOTAL $ _____

Payment Options:

☐ **BILL ME (ICC MEMBERS ONLY)**
☐ **CHECK (PAYABLE TO ICC)**
☐ **VISA** ☐ **MASTERCARD**
☐ **AMERICAN EXPRESS**

SIGNATURE _____

CREDIT CARD NUMBER _____ EXP. DATE _____

The Code Council reserves the right to photograph or videotape events for promotional purposes. Your registration serves as permission for ICC to copyright, publish and use your likeness in print, online or in other media. If you do not wish to be photographed or videotaped, please tell the camera operator.

Cancellation Policy: *All cancellation requests must be received in writing. Cancellations received prior to September 1 will receive a full refund. Requests received between September 2–October 5 will be refunded, less a $50 administrative charge. Cancellations received after October 5 will not be eligible for a refund.*

**Take $10 off when you register online.*

***Payment is required with registration.*

TO ATTEND EDUCATION SESSIONS, PLEASE COMPLETE THE EDUCATION PROGRAM FORM ON REVERSE.

Save $10 When You Register Online

Register online: www.iccsafe.org/conference

Fax to: (708) 799-2307

Mail to: 2009 ICC Annual Conference
International Code Council
4051 W. Flossmoor Road
Country Club Hills, IL 60478

Phone registrations are not accepted.
Please do not fax AND mail your registration.

Lodging information available online.

If you have any questions, please call 1-888-ICC-SAFE, x4226 or x4229.

REQUIRED INFORMATION FOR EDUCATION PROGRAM

Last Name _____ First Name _____

SESSION SELECTION

If you are registering for the full conference, please enter a session number for each time slot.
If you are registering for one day of education only, please check the day you will be attending and enter your session selection number.

☐ **Monday, November 2**
1:15 pm–4:15 pm
Session selection: # _____

☐ **Tuesday, November 3**
1:15 pm–4:15 pm
Session selection: # _____

EARN CEUs

Earn continuing education recognition for attending sessions at the Conference. Indicate your choice(s) and provide your license or credential number (ID number) for each:

ALABAMA
☐ Board of Heating & Air Conditioning Contractors
ID Number _____

CALIFORNIA
☐ Council for Interior Design Certification/ CCIDC
ID Number _____

CONNECTICUT
☐ Department of Public Safety, Office of Education & Data Management
ID Number _____

FLORIDA
☐ Building Code Administrators & Inspectors Board
ID Number _____

☐ Florida Professional Engineers Board
ID Number _____

GEORGIA
☐ Fire Fighter Standards and Training Council
ID Number _____

KANSAS
☐ Johnson County Contractor Licensing
ID Number _____

KENTUCKY
☐ Division of Building Code Enforcement, Department of Housing, Buildings, & Construction
ID Number _____

MAINE
☐ State Planning Office
ID Number _____

MASSACHUSETTS
☐ Board of Building Regulations and Standards
ID Number _____

MARYLAND
☐ Hartford County Department of Inspections, License & Permits, Building Services
ID Number _____

MICHIGAN
☐ Office of Fire Safety
ID Number _____

☐ Bureau of Construction Codes
ID Number _____

MISSOURI
☐ Board of Professional Registration – APELSLA
ID Number _____

NEW JERSEY
☐ Department of Community Affairs, Division of Codes and Standards
ID Number _____

☐ Department of Community Affairs, Division of Fire Safety
ID Number _____

NEW YORK
☐ Department of State, Codes Division
Requires Social Security # _____
ID Number _____

☐ Department of State, Office of Fire Prevention
Requires Social Security # _____
FDID #/City Code _____
County Code _____
ID Number _____

NORTH CAROLINA
☐ Code Officials Qualification Board
Requires Driver's License # _____
ID Number _____

OHIO
☐ Ohio Department of Commerce, Board of Building Standards
ID Number _____

☐ Ohio Department of Commerce, Division of Industrial Compliance, Plumbing Section
ID Number _____

OKLAHOMA
☐ Construction Industries Board, Inspector Examining Committee
ID Number _____

PENNSYLVANIA
☐ Department of Labor and Industry
ID Number _____

RHODE ISLAND
☐ State Building Code Commission
ID Number _____

SOUTH CAROLINA
☐ Department of Labor, Licensing and Regulation Board of Building Codes Council
ID Number _____

TENNESSEE
☐ Commerce and Insurance, Fire Prevention Division (aka State Fire Marshal's Office)
ID Number _____

TEXAS
☐ Department of Licensing and Regulation, Electrical Safety and Licensing Advisory Board
ID Number _____

UTAH
☐ Division of Occupational and Professional Licensing, Contractor Licensing
ID Number _____

WISCONSIN
☐ Safety and Buildings Division
ID Number _____

☐ AMERICAN INSTITUTE OF ARCHITECTS
ID Number _____

☐ AMERICAN SOCIETY OF HOME INSPECTORS
ID Number _____

☐ INTERNATIONAL CODE COUNCIL
ID Number _____

☐ OTHER
ID Number _____

Many professional organizations, boards, and state agencies recognize ICC educational offerings. If you do not find your professional organization or agency listed above, you may still be able to earn continuing education credit by attending these educational sessions. To find out if a specific ICC offering has been recognized by a specific board/agency for continuing education credit, contact the applicable agency/board. ICC cannot guarantee that a specific professional board, organization or agency will recognize an ICC educational offering.

ICC ADMINISTRATIVE CODE COMMITTEE (IADMIN)

Rebecca Baker, CBO – *Chair*
Director of Building Safety
Jefferson County
Golden, CO

Richard Thomson – *Vice Chair*
Code Compliance Specialist
New York State Department of State
Rose, NY

David Adams
Fire Protection Engineer
Sandy Springs Fire Rescue
Sandy Springs, GA

Mark Berg, CBO
Building Official
City of Norco
Norco, CA

Charles Bloomberg
Plans Examiner
City of Southlake, TX
Southlake, TX

Lawrence Brown, CBO
Director, Codes and Standards
National Association of Home Builders
Washington, DC

James Burton
Manager - Compliance Services
FRA Engineering - A TY LIN
International Company
Henrietta, NY

Dale Engebretson, CBO
Building Commissioner
Village of Round Lake
Carol Stream, IL

John Hitch, AIA
Partner
Smith Sinnett Architecture, PA
Raleigh, NC

Craig Johnson
Building Official
Culver City Building Safety Division
Culver City, CA

Dennis Martinelli
Supervising Combination Inspector
Fairfax County Government
Fairfax, VA

Roxanne Michael, CBO, AICP
Instructor & Sr. Plans Examiner
Whatcom County
Bellingham, WA

Michael O'Brian
Fire Marshal
Brighton Area Fire Authority
Brighton, MI

Andrea Lanier Papageorge, JD
Specialist, Codes and Standards
AGL Resources
Atlanta, GA

Wilma Jean Stanley
Inspections Supervisor
Chesterfield County
Chesterfield, VA

Committee Secretary
David Bowman, PE
Manager of Codes
International Code Council

TENTATIVE ORDER OF DISCUSSION

2009-2010 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE

ADMINISTRATIVE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation **does not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some AADM@ code change proposals are not included on this list, as they are being heard by other committees. Please consult the Cross Index of Proposed Changes.

ADM1-09/10, Part I
ADM1-09/10, Part II
ADM1-09/10, Part III
ADM1-09/10, Part IV
ADM1-09/10, Part V
ADM1-09/10, Part VI
ADM1-09/10, Part VII
ADM1-09/10, Part VIII
ADM1-09/10, Part IX
ADM1-09/10, Part X
ADM1-09/10, Part XI
ADM2-09/10
ADM3-09/10, Part I
ADM4-09/10, Part I
ADM5-09/10
ADM6-09/10, Part I
ADM7-09/10, Part I
ADM8-09/10, Part I
ADM8-09/10, Part II
ADM9-09/10, Part I
ADM10-09/10
ADM11-09/10
ADM12-09/10
ADM13-09/10
ADM14-09/10, Part I
ADM15-09/10, Part I
ADM16-09/10, Part I
ADM17-09/10
ADM18-09/10
AM19-09/10
ADM20-09/10
ADM21-09/10
ADM22-09/10
ADM39-09/10

ADM1–09/10
Chapter 1 IBC; IEBC; IECC; IFC; IFGC; IMC; IPC; IPMC; IPSDC; IWUIC; IZC; IRC

Proponent: Lawrence Brown, CBO, National Association of Home Builders

THIS IS A 12 PART CODE CHANGE. PARTS I THROUGH XI WILL BE HEARD BY THE ADMINISTRATIVE COMMITTEE. PART XII WILL BE HEARD BY THE IRC BUILDING AND ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC

NOTE: The template, submitted by the proponent, that all parts of the Chapter 1 revisions are formatted to, can be found at the beginning of the reason statement.

1. Revise IBC (Item 1-A) as follows:

CHAPTER 1
SCOPE AND ADMINISTRATION

PART 1—SCOPE AND APPLICATION

SECTION 101
GENERAL

101.1 Title. These regulations shall be known as the *Building Code* of [NAME OF JURISDICTION], hereinafter referred to as "this code."

101.2 Scope. The provisions of this code shall apply to the construction, *alteration*, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures.

> **Exception:** Detached one- and two-family *dwellings* and multiple single-family *dwellings* (*townhouses*) not more than three *stories* in height above *grade plane* ~~in height~~ with a separate *means of egress* and their accessory structures shall comply with the *International Residential Code*.

101.3 Purpose ~~Intent~~. The purpose of this code is to establish the minimum requirements to safeguard the public health, safety, and general welfare through structural strength, *means of egress* facilities, stability, sanitation, ~~adequate~~ light and ventilation, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment, and to provide safety to fire fighters and emergency responders during emergency operations.

101.4 Severability. If a section, subsection, sentence, clause, or phrase of this code is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code.

101.5 ~~102.5~~ Validity ~~Partial invalidity~~. In the event any part or provision of this code is held to be illegal or void, this shall not have the effect of making illegal or void ~~or illegal~~ any of the other parts or provisions hereof, which are determined to be legal; and it shall be presumed that this code would have been adopted without such illegal or invalid parts or provisions.

101.6 ~~102.2~~ Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state, or federal law.

SECTION 102
APPLICABILITY

102.1 General. Where there is a conflict between a general requirement and a specific requirement of this code, the specific requirement shall be applicable. Where, in a ~~any~~ specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

102.2 ~~102.3~~ Application of references. References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section, or provision of this code.

102.3 ~~102.4~~ Referenced codes and standards. The codes and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between the provisions of this code and the referenced codes and standards, the provisions of this code shall apply.

Exception: Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing shall govern.

102.4 ~~101.2.1~~ Appendices. Provisions in the appendices shall not apply unless specifically adopted.

102.5 ~~102.6~~ Existing structures and systems. The legal occupancy or use of any structure or installed system existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the *International Fire Code*, or the *International Property Maintenance Code* ~~or the *International Fire Code*~~, or as is deemed necessary by the *building official* for the general safety and welfare of the occupants and the public.

102.5.1 Historic buildings. The application of this code to *historic buildings* shall be in accordance with Section 3409.

102.6 ~~104.11~~ Alternative materials, design, ~~and~~ methods ~~of construction~~, and equipment. The provisions of this code are not intended to prevent the installation of any material, or the use or operation of appliances, equipment, systems, or method, or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative ~~material, design or method of construction~~ shall be *approved* where the *building official* finds that the proposed ~~design~~ alternative is satisfactory and complies with the intent of the provisions of this code, and that the alternative ~~material, method or work offered~~ is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, *fire resistance*, durability and safety.

102.7 Requirements not covered by code. Requirements necessary for the strength, stability or proper operation of an existing or proposed fixture, structure, or equipment, or for the public safety, health and general welfare, not specifically covered by this code, shall be determined by the *building official*.

102.8 Subjects not regulated by this code. Where no applicable standards or requirements are set forth in this code, or are contained within other laws, codes, regulations, ordinances or bylaws adopted by the jurisdiction, compliance with applicable nationally recognized standards, as *approved*, shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the *building official* to determine compliance with codes or standards for those activities or installations within the *building official's* jurisdiction or responsibility.

102.9 ~~107.3.2~~ Previous approvals. This code shall not require changes in the *construction documents*, construction or designated occupancy of a structure for which a lawful *permit* has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

102.10 Contractor's responsibilities. Every contractor who enters into contracts for which a permit is required shall comply with the state and local rules and regulations concerning licensing.

102.11 Specific application of this code. The following are application specific to this code.

102.11.1 ~~101.4~~ ~~Referenced~~ Other codes. The other codes listed in Sections ~~101.4.1~~ 102.11.1.1 through 102.11.1.6 ~~101.4.6~~ and referenced elsewhere in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference.

102.11.1.1 ~~101.4.1~~ Gas. The provisions of the *International Fuel Gas Code* shall apply to the installation of gas piping from the point of delivery, gas appliances and related accessories as covered in this code. These requirements apply to gas piping systems extending from the point of delivery to the inlet connections of appliances and the installation and operation of residential and commercial gas appliances and related accessories.

102.11.1.2 ~~101.4.2~~ Mechanical. The provisions of the *International Mechanical Code* shall apply to the installation, alterations, repairs and replacement of mechanical systems, including equipment, appliances, fixtures, fittings and/or appurtenances, including ventilating, heating, cooling, air-conditioning and refrigeration systems, incinerators and other energy-related systems.

102.11.1.3 ~~101.4.3~~ Plumbing. The provisions of the *International Plumbing Code* shall apply to the installation, *alteration*, repair and replacement of plumbing systems, including equipment, appliances, fixtures, fittings and appurtenances, and where connected to a water or sewage system and all aspects of a medical gas system. The provisions of the *International Private Sewage Disposal Code* shall apply to private sewage disposal systems.

102.11.1.4 ~~101.4.4~~ Property maintenance. The provisions of the *International Property Maintenance Code* shall apply to existing structures and premises; equipment and facilities; light, ventilation, space heating, sanitation, life and fire safety hazards; responsibilities of owners, operators and occupants; and occupancy of existing premises and structures.

102.11.1.5 ~~101.4.5~~ Fire prevention. The provisions of the *International Fire Code* shall apply to matters affecting or relating to structures, processes and premises from the hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices; from conditions hazardous to life, property or public welfare in the occupancy of structures or premises; and from the construction, extension, repair, *alteration* or removal of fire suppression and alarm systems or fire hazards in the structure or on the premises from occupancy or operation.

102.11.1.6 ~~101.4.6~~ Energy. The provisions of the *International Energy Conservation Code* shall apply to all matters governing the design and construction of buildings for energy efficiency.

102.11.2 ~~106.3~~ Restrictions on loading. It shall be unlawful to place, or cause or permit to be placed, on any floor or roof of a building, structure or portion thereof, a load greater than is permitted by this code.

PART 2—ADMINISTRATION AND ENFORCEMENT

SECTION 103
DEPARTMENT OF BUILDING SAFETY

103.1 General ~~Creation of enforcement agency~~. The Department of Building Safety, herein referred to as "the department," is hereby established within the jurisdiction under the direction of ~~created and the official in charge thereof shall be known as~~ the *building official*. The function of the department shall be the implementation, administration and enforcement of the provisions of this code.

103.2 Appointment. The *building official* shall be appointed by the chief appointing authority of the jurisdiction.

103.3 Deputies. In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the *building official* shall have the authority to appoint a deputy building official, ~~the~~ related technical officers, inspectors, ~~plan examiners~~ and other employees. Such employees shall have powers as delegated by the *building official*. ~~For the maintenance of existing properties, see the *International Property Maintenance Code*.~~

103.4 ~~104.8~~ Liability. The *building official*, member of the Board of Appeals or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally and is hereby relieved from all personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties.

103.5 Legal defense. Any suit instituted against an officer or employee of the department because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by legal representative of the jurisdiction until the final termination of the proceedings. The *building official* or any subordinate shall not be liable for cost in an action, suit or proceeding that is instituted in pursuance of the provisions of this code. Any officer or employee, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith.

SECTION 104
DUTIES AND POWERS OF BUILDING OFFICIAL

104.1 General. The *building official* is hereby authorized and directed to enforce the provisions of this code. The *building official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies, and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

104.2 Applications and permits. The *building official* shall receive applications, review *construction documents* and issue *permits* required by this code ~~for the erection, and *alteration*, demolition, and moving of buildings and structures~~, inspect the premises for which such *permits* have been issued, and enforce compliance with the provisions of this code.

104.3 Notices and orders. The *building official* shall issue all necessary notices or orders to ensure compliance with this code.

104.4 Inspections. The *building official* shall make all of the required inspections, or the *building official* shall have the authority to accept reports of inspection by *approved agencies* or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such *approved agency* or by the responsible individual. The *building official* is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

104.5 Identification. The *building official* shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

104.6 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the *building official* has reasonable cause to believe that there exists in a structure or upon a premises a condition which is contrary to or in violation of this code which makes the structure or premises unsafe, dangerous, or hazardous, the *building official* is authorized to enter the structure or premises at reasonable times to inspect or to perform the duties imposed by this code, provided that if such structure or premises be occupied, that credentials be presented to the occupant and entry requested. If such structure or premises is unoccupied, the *building official* shall first make a reasonable effort to locate the owner or other person having charge or control of the structure or premises and request entry. If entry is refused, the *building official* shall have recourse to the remedies provided by law to secure entry.

104.6.1 Warrant. When the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner or occupant or person having charge, care or control of the structure or premises shall not fail or neglect, after proper request is made as herein provided, to promptly permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

104.7 Department records. The *building official* shall keep official records of applications received, *permits* and certificates issued, fees collected, reports of inspections, and notices and orders issued. Such records shall be retained in the official records for the period required for retention of public records.

104.8 Assistance of other agencies. The code official is authorized to request, and shall receive so far as is required in the discharge of the duties described in this code, the assistance and cooperation of other officials of the jurisdiction.

104.9 Specific duties. The following are specific duties of the code official. [JURISDICTION TO INSERT CODE OFFICIAL DUTIES SPECIFIC TO THIS CODE]

SECTION 105
PERMITS

105.1 Permit required. Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to construct, erect, install, enlarge, alter, repair, remove, convert or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the *building official* and obtain the required *permit* for the project. Where laws or regulations are enforceable by other agencies or departments, approval shall be obtained from all agencies or departments concerned.

105.1.1 Annual permit. In lieu of an individual *permit* for each *alteration* to an already *approved* electrical, gas, mechanical or plumbing installation, the *building official* is authorized to issue an annual *permit* upon application therefor to any person, firm or corporation regularly employing one or more qualified tradespersons in the building, structure or on the premises owned or operated by the applicant for the *permit*.

~~**105.1.2**~~ **105.1.1.1 Annual permit records.** The person to whom an annual *permit* is issued shall keep a detailed record of *alterations* made under such annual *permit*. The *building official* shall have access to such records at all times or such records shall be filed with the *building official* as designated.

105.1.2 ~~105.2.1~~ Emergency repairs. Where equipment replacements and repairs must be performed in an emergency situation, the *permit* application shall be submitted within the next working business day to the *building official*.

105.1.3 Permits specifically required. The following specifically require a permit. [JURISDICTION TO INSERT SPECIFIC ITEMS REQUIRING A PERMIT FOR THIS CODE]

105.2 Permit not required ~~Work exempt from permit.~~ Exemptions from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. *Permits* shall not be required in accordance with Sections 105.2.1 through 105.2.3. ~~for the following:~~

105.2.1 Repairs. Application or notice to the *building official* is not required for ordinary repairs to structures, replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required *means of egress*, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include *addition* to, *alteration* of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

105.2.2 Public service agencies. A *permit* shall not be required for the installation, *alteration* or repair of generation, transmission, distribution or metering or other related equipment that is under the ownership and control of public service agencies by established right.

105.2.3 Specific exemption. The following are specifically exempt from requiring a permit.

105.2.3.1 Building:

1. One-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m2).
2. Fences not over 6 feet (1829 mm) high.
3. Oil derricks.
4. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or impounding Class I, II or IIIA liquids.
5. Water tanks supported directly on grade if the capacity does not exceed 5,000 gallons (18 925 L) and the ratio of height to diameter or width does not exceed 2:1.
6. Sidewalks and driveways not more than 30 inches (762 mm) above adjacent grade, and not over any basement or *story* below and are not part of an *accessible route*.
7. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
8. Temporary motion picture, television and theater stage sets and scenery.
9. Prefabricated swimming pools accessory to a Group R-3 occupancy that are less than 24 inches (610 mm) deep, do not exceed 5,000 gallons (18 925 L) and are installed entirely above ground.
10. Shade cloth structures constructed for nursery or agricultural purposes, not including service systems.
11. Swings and other playground equipment accessory to detached one- and two-family *dwellings*.
12. Window *awnings* supported by an *exterior wall* that do not project more than 54 inches (1372 mm) from the *exterior wall* and do not require additional support of Groups R-3 and U occupancies.
13. Nonfixed and movable fixtures, cases, racks, counters and partitions not over 5 feet 9 inches (1753 mm) in height.

105.2.5 Electrical:

105.2.5.1 Repairs and maintenance: Minor repair work, including the replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles.

105.2.5.2 Radio and television transmitting stations: The provisions of this code shall not apply to electrical equipment used for radio and television transmissions, but do apply to equipment and wiring for a power supply and the installations of towers and antennas.

105.2.5.3 Temporary testing systems: A *permit* shall not be required for the installation of any temporary system required for the testing or servicing of electrical equipment or apparatus.

105.2.6 Gas:

1. Portable heating appliance.
2. Replacement of any minor part that does not alter approval of equipment or make such equipment unsafe.

105.2.7 Mechanical:

1. Portable heating appliance.
2. Portable ventilation equipment.
3. Portable cooling unit.
4. Steam, hot or chilled water piping within any heating or cooling equipment regulated by this code.
5. Replacement of any part that does not alter its approval or make it unsafe.
6. Portable evaporative cooler.
7. Self-contained refrigeration system containing 10 pounds (5 kg) or less of refrigerant and actuated by motors of 1 horsepower (746 W) or less.

105.2.8 Plumbing:

1. The stopping of leaks in drains, water, soil, waste or vent pipe, provided, however, that if any concealed trap, drain pipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with new material, such work shall be considered as new work and a *permit* shall be obtained and inspection made as provided in this code.
2. The clearing of stoppages or the repairing of leaks in pipes, valves or fixtures and the removal and reinstallation of water closets, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

105.3 Application for permit. To obtain a *permit*, the applicant shall first file an application therefor in writing on a form furnished by the department ~~of building safety~~ for that purpose. Such application shall:

1. Identify and describe the project ~~work~~ to be covered by the *permit* for which application is made.
2. Describe the land on which the proposed project ~~work~~ is to be done by legal description, street address or similar description that will readily identify and definitely locate the proposed building or project ~~work~~.
3. Indicate the use and occupancy for which the proposed project ~~work~~ is intended.
4. Be accompanied by *construction documents* and other information as required in Section 106 ~~107~~.
5. State the valuation of the proposed project ~~work~~.
6. Be signed by the applicant, or the applicant's authorized agent.
7. Give such other data and information as required by the *building official*.

105.3.1 ~~109.3 Building~~ Permit valuations. ~~The applicant for a *permit* shall provide an estimated *permit* value at time of application.~~ *Permit* valuations required under Section 105.3(5) shall include total value of the project ~~work~~, including materials and labor, ~~for which the *permit* is being issued~~, ~~such as~~ and electrical, gas, mechanical, plumbing equipment and other permanent systems for which the *permit* is being issued. If, in the opinion of the *building official*, the valuation is underestimated on the application, the *permit* shall be denied, unless the applicant can show detailed estimates to meet the approval of the *building official*. Final building *permit* valuation shall be set by the *building official*.

~~105.3.1~~ 105.4 Action on application. The *building official* shall examine or cause to be examined applications for *permits* and amendments thereto within a reasonable time after filing. If the application or the *construction documents* do not conform to the requirements of pertinent laws, the *building official* shall reject such application in writing, stating the reasons therefor. If the *building official* is satisfied that the proposed project ~~work~~ conforms to the requirements of this code and laws and ordinances applicable thereto, the *building official* shall issue a *permit* therefor as soon as practicable.

105.4.1 Preliminary inspection. Before a permit is issued, the code official is authorized to inspect and evaluate the systems, *equipment*, buildings, devices, premises and spaces or areas to be used.

105.4.2 ~~107.3.3 Phased approval~~ Conditional permits. The *building official* is authorized to issue a *permit* for the construction or operation of part of the project such as the construction of foundations or any other part of a building or structure, or installation of systems or materials, or operation before the *construction documents* for the entire project ~~whole building, or structure~~ have been submitted or *approved*, provided that adequate information and detailed statements have been filed complying with pertinent requirements of this code. The holder of such *permit* ~~for the foundation or other parts of a building or structure~~ shall proceed only to the point for which approval has been given, at the holder's own risk, ~~with the building operation~~ and without assurance that a *permit* for the entire project ~~structure~~ will be granted.

~~105.3.2~~ **105.5 Time limitation of application.** An application for a *permit* for any proposed project ~~work~~ shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a *permit* has been issued.~~; except that~~ The *building official* is authorized to grant one or more extensions of time for additional periods not exceeding ~~90~~ 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

~~105.4~~ **105.6 Validity of permit.** The issuance or granting of a *permit* shall not be construed to be a *permit* for, or an approval of, any violation of any of the provisions of this code or of any other ordinance of the jurisdiction. *Permits* presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a *permit* based on *construction documents* and other data shall not prevent the *building official* from requiring the correction of errors in the *construction documents* and other data. ~~The *building official* is also authorized to prevent occupancy or use of a structure where in violation of this code or of any other ordinances of this jurisdiction.~~

105.7 Extension of permit. For an unexpired permit the *building official* is authorized to grant, in writing, one or more extensions of the time, for periods of not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

~~105.5~~ **105.8 Expiration of permit.** Every *permit* issued shall become invalid unless the work on the site authorized by such *permit* is commenced within 180 days after its issuance, or if the work authorized on the site by such *permit* is suspended or abandoned for a period of 180 days after the time the work is commenced. ~~The *building official* is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.~~

105.8.1 Recommencement of work. Before such work covered under an expired permit recommences, a new permit shall be first obtained. The new permit shall be issued provided no changes have been made or will be made in the original construction documents for such work, and provided further that such suspension or abandonment has not exceeded one year.

~~105.6~~ **105.9 Suspension or revocation of permit.** The *building official* is authorized to suspend or revoke a *permit* issued under the provisions of this code ~~wherever~~ whenever the *permit* is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or regulation or any of the provisions of this code.

~~105.7~~ **105.10 Posting ~~Placement~~ of permit.** ~~The building *permit*~~ Issued permits or copy thereof shall be kept on the site of the project ~~work~~ until the completion of the project.

SECTION 106 ~~107~~
SUBMITTAL DOCUMENTS

~~107.1~~ **106.1 General.** Submittal documents consisting of *construction documents*~~, statement of *special inspections*, geotechnical report~~ and other supporting data shall be submitted in two or more sets with each application for *permit* , and in such form and detail as required by the *building official* ~~application~~. The *building official* shall require *construction documents* ~~shall~~ and other data to be prepared by a *registered design professional* where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *building official* is authorized to require necessary ~~additional~~ *construction documents* to be prepared by a *registered design professional*.

> **Exception:** The *building official* is authorized to waive the submission of *construction documents* and other data not required to be prepared by a *registered design professional* if ~~it is found that~~ the nature of the work applied for is such that review of *construction documents* is not necessary to obtain compliance with this code.

106.2 ~~107.2~~ Construction documents. *Construction documents* shall be in accordance with Sections ~~107.2.1~~ 106.2.1 through 106.2.4 ~~107.2.5~~.

106.2.1 ~~107.2.1~~ Information on construction documents. *Construction documents* shall be ~~dimensioned and drawn upon suitable material. Electronic media documents are permitted to be submitted when *approved* by the *building official*. *Construction documents* shall be~~ of sufficient clarity to indicate the location, nature and extent of the ~~work~~ proposed project, and show in detail that the proposed project ~~it~~ will conform to the provisions of this code and relevant laws, ordinances, rules, and regulations, as determined by the *building official*. Plans shall be to scale and be on suitable material. Electronic media documents are permitted to be submitted when *approved* by the *code official*.

106.2.1.1 Specific information required. Where the quality of the materials is essential for conformity to this code, specific information shall be given to establish such quality. The terms "this code" or "legal" or "its equivalent" shall not be cited or used as a substitute for specific information.

106.2.2 ~~107.5~~ Site plan. The *construction documents* submitted with the application for *permit* shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from *lot lines*, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and *design flood* elevations~~.~~; and it The site plan shall be drawn in accordance with an accurate boundary line survey.

106.2.2.1 Site plan for demolition. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot.

106.2.2.2. Waiver of site plan. The *building official* is authorized to waive or modify the requirement for a site plan when the application for *permit* is for *alteration* or repair or when otherwise warranted.

106.2.3 Specific Information. The following are specific requirements for submittal documents required by this code.

106.2.3.1 ~~107.2.2~~ Fire protection system shop drawings. Shop drawings for the *fire protection system(s)* shall be submitted to indicate conformance with this code and the *construction documents* and shall be *approved* prior to the start of system installation. Shop drawings shall contain all information as required by the referenced installation standards in Chapter 9.

106.2.3.2 ~~107.2.3~~ Means of egress. The *construction documents* shall show in sufficient detail the location, construction, size and character of all portions of the *means of egress* in compliance with the provisions of this code. In other than occupancies in Groups R-2, R-3, and I-1, the *construction documents* shall designate the number of occupants to be accommodated on every floor, and in all rooms and spaces.

106.2.3.3 ~~107.2.4~~ Exterior wall envelope. *Construction documents* for all buildings shall describe the *exterior wall envelope* in sufficient detail to determine compliance with this code. The *construction documents* shall provide details of the *exterior wall envelope* as required, including flashing, intersections with dissimilar materials, corners, end details, control joints, intersections at roof, eaves or parapets, means of drainage, water-resistive membrane and details around openings.

106.2.3.3.1. The *construction documents* shall include manufacturer's installation instructions that provide supporting documentation that the proposed penetration and opening details described in the *construction documents* maintain the weather resistance of the *exterior wall envelope*. The supporting documentation shall fully describe the *exterior wall* system which was tested, where applicable, as well as the test procedure used.

106.2.3.4 ~~107.2.5.1~~ Design flood elevations. Where *design flood* elevations are not specified, they shall be established in accordance with Section 1612.3.1.

106.2.4 ~~107.3.4~~ Design professional in responsible charge. ~~107.3.4.1 General.~~ When it is required that documents be prepared by a *registered design professional*, the *building official* shall be authorized to require the owner to engage and designate on the building *permit* application a *registered design professional* who shall act as the *registered design professional in responsible charge*. If the circumstances require, the owner shall designate a substitute *registered design professional in responsible charge* who shall perform the duties required of the original *registered design professional in responsible charge*. The *building official* shall be notified in writing by the owner if the *registered design professional in responsible charge* is changed or is unable to continue to perform the duties.

106.2.4.1 Responsibility. The *registered design professional in responsible charge* shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

106.2.4.2 Observation. Where structural observation is required, the inspection program shall name the individual or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur.

106.3 ~~107.3.4.2~~ Deferred submittals. For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the *building official* within a specified period.

106.3.1 Prior approval. Deferral of any submittal items shall have the prior approval of the *building official*. The *registered design professional in responsible charge* shall list the deferred submittals on the *construction documents* for review by the *building official*.

106.3.2 Review. Documents for deferred submittal items shall be submitted to the *registered design professional in responsible charge* who shall review them and forward them to the *building official* with a notation indicating that the deferred submittal documents have been reviewed and been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the deferred submittal documents have been *approved* by the *building official*.

106.4 ~~107.3~~ Examination of documents. The *building official* shall examine or cause to be examined the ~~accompanying~~ submittal documents and shall ascertain by such examinations whether the ~~construction~~ project indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

106.5 ~~107.3.1~~ Approval of construction documents. When the *building official* issues a *permit*, the *construction documents* and other data shall be endorsed ~~*approved*~~, in writing or by stamp, as "APPROVED ~~Reviewed for Code Compliance~~." One set of *construction documents* and other data so reviewed shall be retained by the *building official*. The other set(s) shall be returned to the applicant~~.~~, One set shall be kept at the site of the project ~~work~~ and shall be open to inspection by the *building official* or a duly authorized representative. Such *approved construction documents* shall not be changed, modified, or altered without authorization from the *code official*. All work shall be done in accordance with the *approved construction documents*.

106.6 ~~107.4~~ Amended construction documents. ~~Work shall be installed in accordance with the *approved construction documents* and~~ Any changes made during construction that are not in compliance with the *approved construction documents* shall be resubmitted for approval as an amended set of *construction documents*.

106.7 ~~107.5~~ Retention of construction documents. One set of *approved construction documents* shall be retained by the *building official* for a period of not less than 180 days from date of completion of the permitted project ~~work~~, or for the period required for retention of public records ~~as required by state or local laws~~.

SECTION 107
MODIFICATIONS, TESTING, AND APPROVAL

107.1 ~~104.10~~ Modifications. Wherever there are practical difficulties involved in carrying out the provisions of this code, and upon application of the owner or owner's representative, the *building official* shall have the authority to grant modifications for individual cases, ~~upon application of the owner or owner's representative,~~ provided the *building official* shall first find that special individual reason makes the strict letter of this code impractical and the modification is in conformance ~~compliance~~ with the intent and purpose of this code, and that such modification does not lessen health, life and fire safety, accessibility, ~~life and fire safety,~~ or structural integrity ~~requirements~~. The details of action granting modifications shall be recorded and entered in the files of the department ~~of building safety~~.

107.2 ~~104.9~~ Approved materials and equipment. Materials, equipment and devices *approved* by the *building official* shall be constructed and installed in accordance with such approval.

107.3 ~~104.9.1~~ Used materials, appliances and equipment. The use of used materials ~~which~~ that meet the requirements of this code for new materials is permitted. Used appliances, equipment and devices shall not be reused unless such elements are in good repair or have been reconditioned and tested when necessary, placed in good and proper working condition, and *approved* by the *building official*.

107.4 Listed and labeled material and appliances. Listed and labeled materials, equipment, and appliances shall be used and installed in accordance with the conditions the listing and the manufacturer's instructions.

107.5 ~~104.11.1~~ Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

107.6 ~~104.11.2~~ Technical assistance ~~Tests~~. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, or to determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building or premises, the *building official* shall have the authority to require tests be conducted, or a technical opinion, recommendation or report be submitted as evidence of compliance. The tests, opinions, recommendations and reports shall to be made at no expense to the jurisdiction.

107.6.1 Preparation. The technical reports and opinions shall be prepared by a qualified engineer, approved specialist or specialty organization, or an *approved agency*.

107.6.2 Test methods. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the *building* official shall approve the testing procedures.

107.6.3 Testing agency. All tests shall be performed by an *approved agency*.

107.6.4 Retention of reports. ~~Reports of~~ The technical opinions, recommendation, reports and tests results shall be retained by the *building* official for the period required for retention of public records.

SECTION 108 ~~110~~
INSPECTIONS

108.1 ~~110.1~~ General. Construction or work on a project for which a *permit* is required shall be subject to inspection by the *building official* and such construction or work shall remain accessible and exposed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the *permit* applicant to cause the construction or work to remain accessible and exposed for inspection purposes. Neither the *building official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

108.1.1 Replacement of existing appliance. The requirements of this section shall not be considered to prohibit the operation of any heating or cooling *equipment* or appliances installed to replace such existing *equipment* or appliances serving an occupied portion of a structure provided that a request for inspection of such *equipment* or appliances has been filed with the department not more than 48 hours after such replacement work is completed, and before any portion of such *equipment* or appliances is concealed by any permanent portion of the structure.

~~**110.2 Preliminary inspection.** Before issuing a *permit*, the *building official* is authorized to examine or cause to be examined buildings, structures and sites for which an application has been filed.~~

108.2 ~~110.3~~ Required inspections and testing. The *building official*, upon notification, shall make the inspections and require the tests set forth in Sections ~~110.3.1~~ 108.2.1 through 108.2.4 ~~110.3.10~~.

108.2.1 Specific Inspections. The following are specific inspections and tests required by this code.

108.2.1.1 ~~110.3.1~~ Footing and foundation inspection. Footing and foundation inspections shall be made after excavations for footings are complete and any required reinforcing steel is in place. For concrete foundations, any required forms shall be in place prior to inspection. Materials for the foundation shall be on the job, except where concrete is ready mixed in accordance with ASTM C 94, the concrete need not be on the job.

108.2.1.2 ~~110.3.2~~ Concrete slab and under-floor inspection. Concrete slab and under-floor inspections shall be made after in-slab or under-floor reinforcing steel and building service equipment, conduit, piping accessories and other ancillary equipment items are in place, but before any concrete is placed or floor sheathing installed, including the subfloor.

108.2.1.3 ~~110.3.3~~ Lowest floor elevation. In flood hazard areas, upon placement of the lowest floor, including the basement, and prior to further vertical construction, the elevation certification required in Section 1612.5 shall be submitted to the *building official*.

108.2.1.4 ~~110.3.4~~ Frame inspection. Framing inspections shall be made after the roof deck or sheathing, all framing, *fireblocking* and bracing are in place and pipes, chimneys and vents to be concealed are complete and the rough electrical, plumbing, heating wires, pipes and ducts are *approved*.

108.2.1.5 ~~110.3.5~~ Lath and gypsum board inspection. Lath and gypsum board inspections shall be made after lathing and gypsum board, interior and exterior, is in place, but before any plastering is applied or gypsum board joints and fasteners are taped and finished.

Exception: Gypsum board that is not part of a fire-resistance-rated assembly or a shear assembly.

108.2.1.6 ~~110.3.6~~ Fire- and smoke-resistant penetrations. Protection of joints and penetrations in fire-resistance-rated assemblies, *smoke barriers* and smoke partitions shall not be concealed from view until inspected and *approved*.

108.2.1.7 ~~110.3.7~~ Energy efficiency inspections. Inspections shall be made to determine compliance with Chapter 13 and shall include, but not be limited to, inspections for: envelope insulation *R*- and *U*-values, fenestration *U*-value, duct system *R*-value, and HVAC and water-heating equipment efficiency.

108.2.2 ~~110.3.8~~ Other inspections. In addition to the inspections specified above, the *building official* is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department ~~of building safety~~.

108.2.3 ~~110.3.9~~ Special inspections. For *special inspections*, see Section 1704.

108.2.4 ~~110.3.10~~ Final inspection. ~~The~~ A final inspection shall be made after all work on the project required by the ~~building~~ *permit* is completed.

108.3 ~~110.4~~ Inspection agencies. The *building official* is authorized to accept reports of *approved* inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.

108.4 ~~110.5~~ Inspection requests. It shall be the duty of the holder of the ~~building~~ *permit* or their duly authorized agent to notify the *building official* when a project ~~work~~ is ready for inspection. It shall be the duty of the *permit* holder to provide access to and means for inspections of such work that are required by this code.

108.4.1 Manufacturer's instructions. Manufacturer's instructions for equipment, appliances, and materials installed under the permit shall be available on the work site at the time of inspection.

108.5 ~~110.6~~ Approval required. Work on a project shall not proceed ~~be done~~ beyond the point indicated in each successive inspection without first obtaining the approval of the *building official*. The *building official*, upon notification, shall make the requested inspections and shall either ~~indicate~~ determine the portion of the project ~~construction~~ that is satisfactory as completed, or notify the *permit* holder or ~~his or her~~ authorized agent wherein the same fails to comply with this code. Any portions of the project that do not comply shall be corrected and such portion shall not be covered, ~~or~~ concealed, or used until authorized by the *building official*.

108.6 Notice of approval. After all prescribed inspections or tests indicate the project complies with this code, a certificate of completion complying with Section 109 shall be issued by the code official.

SECTION 109 ~~111~~
CERTIFICATE OF COMPLETION AND OCCUPANCY

109.1 ~~111.1~~ Use and occupancy. No building, ~~or~~ structure, or premises or portion thereof shall be used or occupied until the code official has issued a certificate of occupancy as provided herein. No equipment, appliance or system used, and no change in the existing occupancy classification of a building, ~~or~~ structure, premise or portion thereof shall be made, until the *building official* has issued a certificate of completion ~~occupancy therefor~~ as provided herein.

Exceptions:

1. Occupancy shall be permitted during **e**mergency situations as described under Section 105.1.
2. Certificates of completion or occupancy are not required for work exempt from permits under Section 105.2.
3. Occupancy shall be permitted during the replacement of existing appliances as described under Section 108.1.1.
4. Certificates of occupancy are not required for one-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m^2).

109.1.1 Validity. Issuance of a certificate of completion or occupancy shall not be construed as an approval of a violation of the provisions of this code or of other pertinent laws and ordinances of the jurisdiction. Certificates presuming to give authority to violate or cancel the provisions of this code or other laws or ordinances of the jurisdiction shall not be valid.

109.2 ~~111.2~~ Certificate issued. After the *building official* inspects ~~the building or structure~~ a project requiring a permit and finds no violations of the provisions of this code or other laws that are enforced by the department ~~of building safety~~, the *building official* shall issue a certificate of completion. After all certificates of completion have been issued by other departments or agencies concerned, the code official shall issue a certificate of occupancy where applicable. ~~that contains~~ A certificate of completion or occupancy shall contain the following:

1. The ~~building~~ *permit* number.
2. The address of the premises or structure.
3. The name and address of the owner.
4. A description of the project ~~that portion of the structure~~ for which the certificate is issued.
5. A statement that the described project ~~portion of the structure~~ has been inspected for compliance with the requirements of this code f~~or the occupancy and division of occupancy and the use for which the proposed occupancy is classified~~.
6. The name of the *building official*.
7. The edition of the code under which the *permit* was issued.
8. The use and occupancy~~,~~ in accordance with ~~the provisions of~~ Chapter 3 of the *International Building Code*.
9. The type of construction as defined in Chapter 6 of the *International Building Code*.
10. The design *occupant load*.
11. If ~~an *automatic sprinkler system* is~~ fire protection systems are provided, whether the ~~sprinkler system is~~ protection systems are required.
12. Any special stipulations and conditions of the ~~building~~ *permit*.

Exceptions:

1. A certificate of completion or occupancy shall not be required to indicate the items under Section 109.2, Items 8, 9, and 10 for detached one- and two family dwellings and multiple single-family *dwellings (townhouses)* constructed using the *International Residential Code*.
2. The *code official* is shall not be required to indicate on a certificate items under Section 109.2), Items 8, 9 and 10 for the installation of equipment, appliances or systems.

109.2.1 ~~106.2 Issuance of certificate of occupancy~~ Posting of live loads. A certificate of occupancy ~~required by Section 111~~ shall not be issued until the floor load signs, required by Section 1607.1.1 ~~106.1,~~ have been installed.

109.3 ~~111.3~~ Temporary occupancy. The *building official* is authorized to issue a temporary certificate of occupancy before the completion of the entire work covered by the *permit*, provided that such portion or portions shall be occupied safely and without endangerment to life or public welfare. The temporary certificate shall indicate any limitations or restrictions necessary to keep the permit area safe, and items required to obtain the final certificate of occupancy. The *building official* shall set a time period during which the temporary certificate of occupancy is valid.

109.4 ~~111.4~~ Revocation. The *building official* is authorized to, in writing, suspend or revoke a certificate of completion or occupancy ~~or completion~~ issued under the provisions of this code wherever the certificate is issued in error~~, or~~ on the basis of incorrect information supplied, or where it is determined that the building or structure, premise, or portion thereof, or installation of appliance, equipment or system is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION 110 ~~115~~
STOP WORK ORDER

110.1 ~~115.1~~ Authority. Whenever the *building official* finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or dangerous or unsafe, the *building official* is authorized to issue a stop work order.

110.2 ~~115.2~~ Issuance. The stop work order shall be in writing and shall be given to the owner of the property involved, or to the owner's agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order, and the conditions under which the cited work will be permitted to resume.

110.2.1 Emergencies. Where an emergency exists, the *building official* shall not be required to give a written notice prior to stopping the work.

110.3 ~~115.3~~ Unlawful continuance. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fees, fines, or penalties as prescribed by this code or other laws or ordinances of the jurisdiction ~~law~~.

SECTION 111 ~~114~~

VIOLATIONS

111.1 Code violations. No person, association, organization, or business entity of any form shall:

1. Erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or premises in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
2. Install or operate any equipment, appliances, or systems regulated by this code that is in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
3. Be non-compliant with the conditions of any permit or certificate issued under the auspices of this code; or
4. Tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *building official* without the express authorization of the *building official*.

111.2 Notice of violation. A *code official* who observes or becomes aware of any code violation shall serve upon the responsible person, association, organization, or business entity a written notice in accordance with Section 111.2.1. In the absence of direct knowledge as to the identity or location of the responsible party, the *code official* shall serve the notice upon the property owner. Service may be effected by personal delivery, first class mail, substituted service, or such other means that may be authorized by state and/or local law.

111.2.1 Form of notice. Such notice of violation shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the violation into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties in accordance with Section 111.3.

111.3 Penalties. Violators who fail to comply with a notice to discontinue or abate a condition in violation of this code, and violators who tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *building official* without the express authorization of the *building official*, shall be subject to the penalties set forth in this code as may be adopted and authorized by state and/or local law.

~~**114.1 Unlawful acts.** It shall be unlawful for any person, firm or corporation to erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or equipment regulated by this code, or cause same to be done, in conflict with or in violation of any of the provisions of this code.~~

~~**114.2 Notice of violation.** The *building official* is authorized to serve a notice of violation or order on the person responsible for the erection, construction, *alteration*, extension, repair, moving, removal, demolition or occupancy of a building or structure in violation of the provisions of this code, or in violation of a *permit* or certificate issued under the provisions of this code. Such order shall direct the discontinuance of the illegal action or condition and the abatement of the violation.~~

~~**114.3 Prosecution of violation.** If the notice of violation is not complied with promptly, the *building official* is authorized to request the legal counsel of the jurisdiction to institute the appropriate proceeding at law or in equity to restrain, correct or abate such violation, or to require the removal or termination of the unlawful occupancy of the building or structure in violation of the provisions of this code or of the order or direction made pursuant thereto.~~

~~**114.4 Violation penalties.** Any person who violates a provision of this code or fails to comply with any of the requirements thereof or who erects, constructs, alters or repairs a building or structure in violation of the *approved construction documents* or directive of the *building official*, or of a *permit* or certificate issued under the provisions of this code, shall be subject to penalties as prescribed by law.~~

SECTION 112 ~~113~~
~~BOARD~~ MEANS OF APPEALS

112.1 Application for appeal. Any person directly affected by a decision of the *building official* or a notice or order issued under this code shall have the right to appeal to the board of appeals, provided that a written application for appeal is filed within 20 days after the day the decision, notice or order was served. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or the requirements of this code are adequately satisfied by other means.

112.1.1 Stays of enforcement. The filing of an appeal of notice or orders, except for notice or order concerning *Imminent Danger*, shall stay the enforcement of the notice or order until the appeal is heard by the board of appeals.

112.2 Membership of board. The board of appeals shall consist of five members who are qualified by experience and training to pass on matters pertaining to the provisions of this code. The board shall be appointed by the chief appointing authority, and shall serve staggered and overlapping terms.

112.2.1 Alternate members. The chief appointing authority shall appoint two or more alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership and shall be appointed for five years, or until a successor has been appointed.

112.2.2. An employee of the jurisdiction shall not be a member of the board of appeals. The *building official* shall be an ex officio member of the board but shall have no vote on any matter before the board.

112.2.3 Chairman. The board shall annually select one of its members to serve as chairman.

112.2.4 Secretary. The chief administrative officer shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

112.2.5 Qualifications. The board of appeals shall consist of five individuals, one from each of the following professions or disciplines.

1. Registered design professional who is a registered architect; or a builder or superintendent of building construction with at least 10 years' experience, five of which shall have been in responsible charge of work.
2. Registered design professional with structural engineering or architectural experience.
3. Registered design professional with fuel gas and plumbing engineering experience; or a fuel gas contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
4. Registered design professional with electrical engineering experience; or an electrical contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
5. Registered design professional with fire protection engineering experience; or a fire protection contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.

112.2.6 Disqualification of member. A member shall not hear an appeal in which that member has a personal, professional or financial interest.

112.2.7 Terms. The initial members of the board of appeals shall serve as follows: one for five years; one for four years; one for three years; one for two years and one for one year. Thereafter, each new member shall serve for five years or until a successor has been appointed.

112.2.8 Compensation of members. Compensation of members shall be determined by law.

112.3 Hearings and meetings. Hearings on appeals and other meetings of the board of appeals shall be held in conformance with Sections 109.3.1 through 109.3.3.

112.3.1 Procedures. The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

112.3.2 Notice. The board shall hold a hearing upon notice from the chairman, within 10 days of the filing of an appeal, or at stated periodic meetings.

112.3.3 Open hearing. All hearings before the board shall be open to the public. A quorum shall consist of not less than two-thirds of the board membership. The appellant, the appellant's representative, the *building official* and any person whose interests are affected shall be given an opportunity to be heard.

112.3.4 Postponed hearing. When the full board is not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

112.4 Board decision. The board shall modify or reverse the decision of the *building official* by a concurring vote of a majority of the total number of appointed board members.

112.4.1 Resolution. The decision of the board shall be by resolution. Certified copies shall be furnished to the appellant and to the *building official*.

112.4.2 Action by *building official*. The *building official* shall take immediate action in accordance with the decision of the board.

112.5 Court review. Any person, whether or not a previous party to the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

~~**113.1 General.** In order to hear and decide appeals of orders, decisions or determinations made by the *building official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business.~~

~~**113.2 Limitations on authority.** An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The board shall have no authority to waive requirements of this code.~~

~~**113.3 Qualifications.** The board of appeals shall consist of members who are qualified by experience and training to pass on matters pertaining to building construction and are not employees of the jurisdiction.~~

SECTION 113 ~~109~~
FEES

113.1 ~~109.1~~ Payment of fees. A permit or an amendment to a permit shall not be issued until the fees prescribed in Section 113.2 have been paid. ~~A *permit* shall not be valid until the fees prescribed by law have been paid, nor shall an amendment to a *permit* be released until the additional fee, if any, has been paid.~~

113.2 ~~109.2~~ Fee schedule ~~of permit fees~~. The fees for permits and other considerations shall be in accordance with ~~as indicated in~~ the following schedule: [JURISDICTION TO INSERT APPROPRIATE FEE SCHEDULE]

~~On buildings, structures, electrical, gas, mechanical, and plumbing systems or *alterations* requiring a *permit*, a fee for each *permit* shall be paid as required, in accordance with the schedule as established by the applicable governing authority.~~

113.3 ~~109.5~~ Related fees. The payment of the fee the ~~construction, *alteration*, removal or demolition for~~ work done in connection to or concurrently with the work authorized by a ~~building~~ *permit* shall not relieve the applicant or holder of the *permit* from the payment of other fees that are prescribed by law.

113.4 ~~109.4~~ Work commencing before permit issuance. Any person who commences any work on a project requiring a *permit* ~~on a building, structure, electrical, gas, mechanical or plumbing system~~ before obtaining the necessary *permits* shall be subject to a fee established by the *building official* that shall be in addition to the required *permit* fees.

113.5 Permit extension. The fee for an extension of a permit in conformance with Section 105.7 shall be one-half the amount required for a new permit for such work.

113.6 Expiration of permit. For permits that have expired, and before such work recommences in conformance with Section 105.8.1, the fee to recommence work shall be one-half the amount required for a new permit for such work.

113.7 Stop work order. Any person who shall continue any work on a project requiring a permit after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.

113.8 Reinspection fee. A reinspection of work not in compliance with this code shall be subject to a fee established by the *code official* that shall be in addition to the required *permit* fees. The fee may be assessed when the *approved* plans are not readily available to the inspector, for failure to provide access on the date for which inspection is requested, for work deviating from the approved, or the work or test is not in compliance with this code.

113.9 ~~109.6~~ Fee refunds. The code official shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment. The *building official* is authorized to establish a refund policy.

The code official shall authorize the refunding of fees as follows:

1. The full amount of any fee paid hereunder which was erroneously paid or collected.
2. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.
3. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid when no work on a project has been performed under a permit issued in accordance with this code.

(SECTIONS 114 THROUGH 119 RESERVED)

PART 3 – GENERAL REQUIREMENTS

SECTION 120 ~~116~~
UNSAFE STRUCTURES, ~~AND~~ EQUIPMENT, AND CONDITIONS

120.1 General. If any building, structure, premises or part thereof, or appliance, equipment, or system is found to be unsafe by the *code official*, or found in the case of a building or structure to be unfit for human occupancy, the condition shall be abated whenever possible, but if abatement is not achieved or is non-achievable, then condemnation shall be undertaken in accordance with the provisions of this code.

~~**116.1 Conditions.** Structures or existing equipment that are or hereafter become unsafe, insanitary or deficient because of inadequate *means of egress* facilities, inadequate light and ventilation, or which constitute a fire hazard, or are otherwise dangerous to human life or the public welfare, or that involve illegal or improper occupancy or inadequate maintenance, shall be deemed an unsafe condition. Unsafe structures shall be taken down and removed or made safe, as the *building official* deems necessary and as provided for in this section. A vacant structure that is not secured against entry shall be deemed unsafe.~~

120.1.1 Notice to building official. Abatement requiring repairs, *alterations*, remodeling, removing or demolition shall be referred to the *building official*.

120.1.2 Unsafe structures. An unsafe structure is a structure that is dangerous to the life, health, or safety of the public or to the *occupants* when:

1. There are no minimum safeguards provided to protect or warn *occupants* in the event of fire; or
2. Such structure contains unsafe equipment or is so damaged, decayed, dilapidated, is structurally unsound, is of such faulty construction, or has such an unstable foundation, that partial or complete collapse is possible.

120.1.3 Unsafe equipment. Unsafe equipment includes any boiler, heating equipment, elevator, moving stairway, electrical wiring or device, flammable liquid containers or other equipment on the *premises* or within the structure which is in such disrepair or condition that such equipment constitutes a hazard to life, health, property or safety of the public or the *occupants* of the *premises* or structure.

120.1.4 Structure unfit for human occupancy. A structure is unfit for human *occupancy* whenever the *code official* finds that such structure is unsafe, is unlawful or, because its degree of disrepair, or its want of maintenance, is unsanitary, vermin or rat infested, filthy and contaminated, lacking *ventilation*, illumination, sanitary, heating facilities or other essential equipment required by this code, or because the structure is in proximity to an unsafe or dangerous condition that constitutes a hazard to the *occupants* of the structure or to the public.

120.1.5 Unlawful structure. An unlawful structure is one found in whole or in part to be occupied by more persons than permitted under this code, or was erected, altered or occupied contrary to this code.

120.1.6 Structure and premise that are dangerous to the life, health or safety of the public or occupants. For the purpose of this code, any structure or *premises* that have any or all of the following conditions or defects shall be considered dangerous, and shall constitute an unsafe structure:

1. Any door, aisle, passageway, stairway, exit or other means of egress that does not conform to the *approved* building or fire code of the jurisdiction as related to the requirements for existing buildings.
2. The walking surface of any aisle, passageway, stairway, exit or other means of egress is so warped, worn loose, torn or otherwise unsafe as to not provide safe and adequate means of egress.
3. Any portion of a building, structure or appurtenance that has been damaged by fire, earthquake, wind, flood, *deterioration*, *neglect*, abandonment, vandalism or by any other cause to such an extent that it is likely to partially or completely collapse, or to become *detached* or dislodged.
4. Any portion of a building, or any member, appurtenance or ornamentation on the exterior thereof that is not of sufficient strength or stability, or is not so *anchored*, attached or fastened in place so as to be capable of resisting natural or artificial loads of one and one-half the original designed value.
5. The building or structure, or part of the building or structure, because of dilapidation, *deterioration*, decay, faulty construction, the removal or movement of some portion of the ground necessary for the support, or for any other reason, is likely to partially or completely collapse, or some portion of the foundation or underpinning of the building or structure is likely to fail or give way.
6. The building or structure, or any portion thereof, is clearly unsafe for its use and *occupancy*.
7. The building or structure is *neglected*, damaged, dilapidated, unsecured or abandoned so as to become an attractive nuisance to children who might play in the building or structure to their danger, becomes a harbor for vagrants, criminals or immoral persons, or enables persons to resort to the building or structure for committing a nuisance or an unlawful act.
8. Any building or structure has been constructed, exists or is maintained in violation of any specific requirement or prohibition applicable to such building or structure provided by the *approved* building or fire code of the jurisdiction, or of any law or ordinance to such an extent as to present either a substantial risk of fire, building collapse or any other threat to life and safety.
9. A building or structure, used or intended to be used for dwelling purposes, because of inadequate maintenance, dilapidation, decay, damage, faulty construction or arrangement, inadequate light, *ventilation*, mechanical or plumbing system, or otherwise, is determined by the *code official* to be unsanitary, unfit for human habitation or in such a condition that is likely to cause sickness or disease.
10. Any building or structure, because of a lack of sufficient or proper fire-resistance-rated construction, fire protection systems, electrical system, fuel connections, mechanical system, plumbing system or other cause, is determined by the *code official* to be a threat to life or health.
11. Any portion of a building remains on a site after the demolition or destruction of the building or structure or whenever any building or structure is abandoned so as to constitute such building or portion thereof as an attractive nuisance or hazard to the public.

120.2 Closing of vacant structures. If the structure is vacant and unfit for human habitation and *occupancy*, and is not in danger of structural collapse, the *code official* is authorized to post a placard of condemnation on the *premises* and order the structure closed up so as not to be an attractive nuisance. Upon failure of the *owner* to close up the *premises* within the time specified in the order, the *code official* shall cause the *premises* to be closed and secured through any available public agency or by contract or arrangement by private persons, and the cost thereof shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate that may be collected by any legal means.

120.3 Evacuation. The *code official* or the fire department official in charge of an emergency incident shall be authorized to order the immediate evacuation of any occupied building, structure or premises deemed unsafe due to hazardous conditions that present an imminent danger to occupants. *Persons* so notified shall immediately leave the structure or premises and shall not enter or re-enter until authorized to do so by the *code official* or the fire department official in charge of the incident.

120.4 Notice. Whenever the *code official* has *condemned* a structure or equipment under the provisions of this section, notice shall be posted in a conspicuous place in or about the structure affected by such notice and served on the *owner* or the person or persons responsible for the structure or equipment in accordance with Section 120.4.2. If the notice pertains to equipment, it shall also be placed on the *condemned* equipment. The notice shall be in the form prescribed in Section 120.4.1.

~~**116.3 Notice.** If an unsafe condition is found, the *building official* shall serve on the owner, agent or person in control of the structure, a written notice that describes the condition deemed unsafe and specifies the required repairs or improvements to be made to abate the unsafe condition, or that requires the unsafe structure to be demolished within a stipulated time. Such notice shall require the person thus notified to declare immediately to the *building official* acceptance or rejection of the terms of the order.~~

120.4.1 Form of notice. Such notice of shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the unsafe condition into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties set forth in this code or as may be adopted and authorized by state and/or local law.

120.4.2 ~~116.4 Method of~~ service of notice. Such notice shall be deemed properly served if a copy thereof is (a) delivered to the owner personally; (b) sent by certified or registered mail addressed to the owner at the last known address with the return receipt requested; or (c) delivered in any other manner as prescribed by local law. If the certified or registered letter is returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice. Service of such notice in the foregoing manner upon the owner's agent or upon the person responsible for the structure shall constitute service of notice upon the owner.

120.5 Placarding. Upon failure of the owner or person responsible to comply with the notice provisions within the time given, the *code official* shall post on the premises or on defective equipment a placard bearing the word "UNSAFE" or "CONDEMNED" as applicable, and a statement of the penalties provided for occupying the premises, operating the equipment or removing the placard.

120.5.1 Placard removal. The *code official* shall remove the placard whenever the unsafe conditions have been eliminated. Any person who defaces or removes an unsafe condition placard without the approval of the *code official* shall be subject to the penalties provided for by the jurisdiction.

120.6 Prohibited occupancy. Any structure *condemned* and placarded by the *code official* shall be vacated as ordered by the *code official*. It shall be unlawful for any person to occupy or to allow others to occupy a placarded *premises,* or to operate or allow others to operate any placarded equipment.

120.7 Abatement. The owner, operator, or occupant of a building, structure, premises, or equipment deemed unsafe by the *code official* shall abate or correct such unsafe conditions either by repair, rehabilitation, demolition or other *approved* corrective action.

~~**116.5 Restoration.** The structure or equipment determined to be unsafe by the *building official* is permitted to be restored to a safe condition. To the extent that repairs, *alterations* or *additions* are made or a change of occupancy occurs during the restoration of the structure, such repairs, *alterations*, *additions* or change of occupancy shall comply with the requirements of Section 105.2.2 and Chapter 34.~~

120.7.1 Summary abatement. Where conditions exist that are deemed an *imminent danger* as described in Section 121.1 that will necessarily result in injury to occupants or the public, the *code official* or fire department official in charge of the incident is authorized to summarily abate such unsafe or hazardous conditions.

120.8 ~~116.2~~ Record. The *building official* shall cause a report to be filed on an unsafe condition. The report shall state the occupancy of the structure and the nature of the unsafe condition. The record of an unsafe condition as outlined herein shall be retained by the *code official* for the period required for retention of public records.

SECTION 121
EMERGENCY MEASURES

121.1 Imminent danger. When, in the opinion of the *code official*, there is imminent danger of failure or collapse of a building or structure that endangers life, or when any building or part of a building has fallen and life is endangered by the occupation of the building, or when there is actual or potential danger to the building occupants or those in the proximity of any structure because of explosives, explosive fumes or vapors, or the presence of toxic fumes, gases, or materials, or operation of defective or *dangerous* equipment, the *code official* is hereby authorized and empowered to order and require the occupants to vacate the premises forthwith. The *code official* shall cause to be posted at each entrance to such structure a notice reading as follows: "This Structure Is Unsafe and Its Occupancy Has Been Prohibited by the *Code Official*." It shall be unlawful for any person to enter such structure except for the purpose of securing the structure, making the required *repairs*, removing the hazardous condition, or of demolishing the same.

121.2 Temporary safeguards. Notwithstanding other provisions of this code, whenever, in the opinion of the *code official*, there is imminent danger due to an unsafe condition, the *code official* shall order the necessary work to be done, including the boarding up of openings, to render such structure temporarily safe whether or not the legal procedure herein described has been instituted; and shall cause such other action to be taken as the *code official* deems necessary to meet such emergency.

121.3 Closing streets. When necessary for public safety, the *code official* shall temporarily close structures and close or order the authority having jurisdiction to close sidewalks, streets, public ways, and places adjacent to unsafe structures, and prohibit the same from being utilized.

121.4 Emergency repairs. For the purposes of this section, the *code official* shall employ the necessary labor and materials to perform the required work as expeditiously as possible.

121.5 Costs of emergency repairs. Costs incurred in the performance of emergency work shall be paid by the jurisdiction. The legal counsel of the jurisdiction shall institute appropriate action against the owner of the premises where the unsafe structure is or was located for the recovery of such costs.

121.6 Hearing. Any person ordered to take emergency measures shall comply with such order forthwith. Any affected person shall thereafter, upon petition directed to the appeals board, be afforded a hearing as described in this code.

SECTION 122 ~~112~~
SERVICE UTILITIES

122.1 ~~112.1~~ Connection of service utilities. No person shall make connections from a utility, source of energy, fuel, ~~or~~ power, water system or *sewer* system to any building, structure or system that is regulated by this code for which a *permit* is required, until ~~released~~ approved by the *building official*.

122.2 ~~112.2~~ Temporary connection. The *building official* shall have the authority to authorize the temporary connection of the building, structure or system to the utility source of energy, fuel, ~~or~~ power, water system or *sewer* system.

122.3 ~~112.3~~ Authority to disconnect service utilities. The *building official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards ~~set forth in Section 101.4~~ in case of emergency where necessary to eliminate an immediate hazard to life or property or when such utility connection has been made without the approval required by Section 122.1 or 122.2 ~~112.1 or 112.2~~. The *building official* shall notify the serving utility, and wherever possible the owner and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

SECTION 123 ~~108~~
TEMPORARY STRUCTURES, EQUIPMENT, SYSTEMS AND USES

122.1 ~~108.1~~ General. The *building official* is authorized to issue a *permit* for temporary structures and temporary structures, equipment, systems and uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The *building official* is authorized to grant extensions for demonstrated cause.

122.2 ~~108.2~~ Conformance. Temporary structures, equipment, systems and uses shall conform to the structural strength, fire safety, *means of egress*, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.

122.4 ~~108.4~~ Termination of approval. The *building official* is authorized to terminate such *permit* ~~for a temporary structure or use~~ and to order the temporary structure, equipment, system or use to be discontinued.

~~**108.3 Temporary power.** The *building official* is authorized to give permission to temporarily supply and use power in part of an electric installation before such installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in NFPA 70.~~

SECTION 124
MAINTENANCE

124.1 Maintenance of safeguards. Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or any other feature is required for compliance with the provisions of this code, or otherwise installed, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be continuously maintained in accordance with this code and applicable referenced standards.

124.2 Testing and operation. Equipment requiring periodic testing or operation to ensure maintenance shall be tested or operated as specified in this code.

124.2.1 Test and inspection records. Required test and inspection records shall be available to the *code official* at all times, or such records as designates shall be filed with the *code official*.

124.2.2 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

124.3 Supervision. Maintenance and testing shall be under the supervision of a responsible *person* who shall ensure that such maintenance and testing are conducted at specified intervals in accordance with this code.

124.4 Rendering equipment inoperable. Portable or fixed fire-extinguishing systems or devices and fire-warning systems shall not be rendered inoperative or inaccessible except as necessary during emergencies, maintenance, repairs, *alterations*, drills or prescribed testing.

SECTION 125
DEMOLITION

125.1 General. The *building official* shall order the owner of any premises upon which is located any structure that in the *building official's* judgment is deteriorated or dilapidated, or has become so out of *repair* as to be *dangerous*, unsafe, insanitary, or otherwise unfit for human habitation or occupancy, and such that it is unreasonable to *repair* the structure, to demolish and remove such structure; or if such structure is capable of being made safe by *repairs*, to *repair* and make safe and sanitary, or to board up and hold for future repair, or to demolish and remove at the owner's option; or where there has been a cessation of normal construction of any structure for a period of more than two years, to board up and hold for recommencement of work, or to demolish and remove such structure. Boarding up the building for future repair or recommencement of work shall not extend beyond one year, unless *approved* by the *building official*.

125.2 Notices and orders. All notices and orders shall comply with Section 111.2.

125.3 Failure to comply. If the owner of a premises fails to comply with a demolition order within the time prescribed, the *building official* shall cause the structure to be demolished and removed, either through an available public agency or by contract or arrangement with private persons, and the cost of such demolition and removal shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate.

125.4 Salvage materials. When any structure has been ordered demolished and removed in accordance with Section 125.3, the governing body or other designated officer under said contract or arrangement aforesaid shall have the right to sell the salvage and valuable materials at the highest price obtainable. The net proceeds of such sale, after deducting the expenses of such demolition and removal, shall be promptly remitted with a report of such sale or transaction, including the items of expense and the amounts deducted, for the person who is entitled thereto, subject to any order of a court. If such a surplus does not remain to be turned over, the report shall so state.

125.5 Existing remedies. The provisions in this code shall not be construed to abolish or impair existing remedies of the jurisdiction or its officers or agencies relating to the removal or demolition of any structure which is dangerous, unsafe or insanitary.

2. Revise and add the following definitions in the IBC:

ADDITION. An extension or increase in floor area, number of stories, or height of a building or structure.

ALTERATION. Any construction or renovation to an existing structure other than repair or addition that requires a *permit*, or a change in a mechanical, plumbing, fuel gas or other system that involves an extension, addition or change to the arrangement, type or purpose of the original installation that requires a *permit.* Alterations are classified as Level

1, Level 2, and Level 3.

APPLIANCE. A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.

APPROVED. ~~Acceptable to~~ Approval by the code official ~~or authority having jurisdiction~~ as the result of review, investigation or tests conducted by the code official or by reason of accepted principles or tests by national authorities, or technical or scientific organizations.

APPROVED AGENCY. An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been *approved* by the *code official*.

CERTIFICATE OF ~~COMPLIANCE~~ COMPLETION. A certificate stating that ~~materials and products meet specified standards or that work was done~~ the project or work for which a permit was issued has been completed in compliance with *approved construction documents* and the requirements of this code.

CONSTRUCTION DOCUMENTS. The written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of ~~the~~ a project necessary for obtaining a ~~building~~ permit.

EQUIPMENT OR FIXTURE. Any plumbing, heating, electrical, ventilating, air conditioning, refrigerating, and fire protection equipment, apparatus and devices, all piping, ducts, vents, control devices and other systems or components thereof, and elevators, dumb waiters, escalators, boilers, pressure vessels and other mechanical facilities or installations that are related to building services, any of which are specifically regulated in this code. Appliances as defined by this code shall not be considered equipment. Equipment or fixtures shall not include manufacturing, production, or process equipment, but shall include connections from building service to process equipment.

FIRE CODE OFFICIAL. The fire chief or other designated authority charged with the administration and enforcement of the code, or a duly authorized representative.

IMMINENT DANGER. A condition which could cause serious or life-threatening injury or death at any time.

REGISTERED DESIGN PROFESSIONAL. An ~~individual~~ architect or engineer who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

STRUCTURE. That which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

PART II – IEBC

1. Revise IEBC (Item 1-C) as follows:

CHAPTER 1
SCOPE AND ADMINISTRATION

PART 1—SCOPE AND APPLICATION

SECTION 101
GENERAL

101.1 Title. These regulations shall be known as the *Existing Building Code* of [NAME OF JURISDICTION], hereinafter referred to as "this code."

101.2 Scope. The provisions of this code ~~the *International Existing Building Code*~~ shall apply to the *repair*, *alteration*, *change of occupancy*, *addition* and relocation of *existing buildings*, regardless of occupancy, subject to the criteria of this code.

~~**101.4 Applicability.** This code shall apply to the *repair*, *alteration*, *change of occupancy*, *addition* and relocation of all *existing buildings*, regardless of occupancy, subject to the criteria of Sections 101.4.1 and 101.4.2~~

101.3 Purpose ~~Intent.~~ The purpose ~~intent~~ of this code is to provide flexibility to permit the use of alternative approaches to achieve compliance with the minimum requirements to safeguard the public health, safety, and welfare insofar as they are affected by the *repair*, *alteration*, *change of occupancy*, *addition*, and relocation of *existing buildings.*

101.4 Severability. If a section, subsection, sentence, clause, or phrase of this code is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code.

101.5 Validity ~~102.5 Partial invalidity~~. In the event that any part or provision of this code is held to be illegal or void, this shall not have the effect of making illegal or void ~~or illegal~~ any of the other parts or provisions hereof, which are determined to be legal; and it shall be presumed that this code would have been adopted without such illegal or invalid parts or provisions.

101.6 ~~102.2~~ Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state, or federal law.

SECTION 102
APPLICABILITY

102.1 General. Where there is a conflict between a general requirement and a specific requirement of this code, the specific requirement shall be applicable. Where in a ~~any~~ specific case different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

102.2 ~~102.3~~ Application of references. References to chapter or section numbers or to provisions not specifically identified by number shall be construed to refer to such chapter, section, or provision of this code.

102.3 ~~102.4~~ Referenced codes and standards. The codes and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between the provisions of this code and the referenced codes and standards, the provisions of this code shall apply ~~govern~~.

> **Exception:** Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing shall govern.

102.4 Appendices. Provisions in the appendices shall not apply unless specifically adopted. ~~**101.7 Appendices.** The *code official* is authorized to require rehabilitation and retrofit of buildings, structures or individual structural members in accordance with the appendices of this code if such appendices have been individually adopted.~~

102.5 ~~101.4.2~~ Existing structures and systems ~~Buildings previously occupied.~~. The legal occupancy or use of any ~~building~~ structure or installed system existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the *International Building Code,* the *International Fire Code*, or the *International Property Maintenance Code*, or as is deemed necessary by the *code official* for the general safety and welfare of the occupants and the public.

102.5.1 Historic buildings. The application of this code to *historic buildings* shall be in accordance with Section 308.

102.5.1 ~~101.4.1~~ Buildings not previously occupied. A building or portion of a building that has not been previously occupied or used for its intended purpose in accordance with the laws in existence at the time of its completion shall comply with the provisions of the *International Building Code* or *International Residential Code*, as applicable, for new construction or with any current permit for such occupancy.

102.6 ~~104.11~~ Alternative materials, design, ~~and~~ methods ~~of construction~~, and equipment. The provisions of this code are not intended to prevent the installation of any material, or the use or operation of appliances, equipment, systems, or method, or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative ~~material, design, or method of construction~~ shall be approved where the code official finds that the proposed ~~design~~ alternative is satisfactory and complies with the intent of the provisions of this code, and that the ~~material, method, or work offered~~ alternative is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability, and safety.

102.6.1 Matters regulated by the *International Building Code.* Approvals under the authority herein contained shall be subject to the approval of the *building official* whenever the alternative involves matters regulated by the *International Building Code*.

102.7 Requirements not covered by code. Requirements necessary for the strength, stability or proper operation of an existing or proposed fixture, structure, or equipment, or for the public safety, health, and general welfare, not specifically covered by this code, shall be determined by the *code official*.

102.8 Subjects not regulated by this code. Where no applicable standards or requirements are set forth in this code, or are contained within other laws, codes, regulations, ordinances, or bylaws adopted by the jurisdiction, compliance with applicable nationally recognized standards, as *approved*, shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the *code official* to determine compliance with codes or standards for those activities or installations within the *code official's* jurisdiction or responsibility.

102.9 ~~106.3.2~~ Previous approval. This code shall not require changes in the construction documents, construction or designated occupancy of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

102.10 Contractor's responsibilities. Every contractor who enters into contracts for which a permit is required shall comply with the state and local rules and regulations concerning licensing.

102.11 Specific application of this code. The following are application specific to this code.

102.11.1 ~~101.8~~ Correction of violations of other codes. *Repairs* or *alterations* mandated by any property, housing, or fire safety maintenance code or mandated by any licensing rule or ordinance adopted pursuant to law shall conform only to the requirements of that code, rule, or ordinance and shall not be required to conform to this code unless the code requiring such *repair* or *alteration* so provides.

102.11.2 ~~101.6~~ Safeguards during construction. All construction work covered in this code, including any related demolition, shall comply with the requirements of Chapter 14.

PART 2—ADMINISTRATION AND ENFORCEMENT

SECTION 103
DEPARTMENT OF BUILDING SAFETY

103.1 General ~~Creation of enforcement agency~~. The Department of Building Safety, herein referred to as "the department," is hereby ~~created, and the official in charge thereof shall be known as~~ established within the jurisdiction under the direction of the *code official*. The function of the department shall be the implementation, administration and enforcement of the provisions of this code.

103.2 Appointment. The *code official* shall be appointed by the chief appointing authority of the jurisdiction.

103.3 Deputies. In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the *code official* shall have the authority to appoint a deputy *code official*, the related technical officers, inspectors, ~~plan examiners,~~ and other employees. Such employees shall have powers as delegated by the *code official*.

103.4 ~~104.8~~ Liability. The *code official*, member of the Board of Appeals, officer, or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally and is hereby relieved from all personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties.

103.5 Legal defense. Any suit instituted against an officer or employee of the department because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings. The *code official* or any subordinate shall not be liable for cost in ~~any~~ an action, suit, or proceeding that is instituted in pursuance of the provisions of this code. Any officer or employee, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith.

SECTION 104
DUTIES AND POWERS OF CODE OFFICIAL

104.1 General. The *code official* is hereby authorized and directed to enforce the provisions of this code. The *code official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies, and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

104.2 Applications and permits. The *code official* shall receive applications, review construction documents, and issue permits required by this code, ~~for the erection, *repair*, demolition, *change of occupancy*, and relocation of buildings;~~ inspect the premises for which such permits have been issued,~~;~~ and enforce compliance with the provisions of this code.

104.2.1 Preliminary meeting. When requested by the permit applicant or the *code official*, the *code official* shall meet with the permit applicant prior to the application for a construction permit to discuss plans for the proposed work or *change of occupancy* in order to establish the specific applicability of the provisions of this code.

Exception: *Repairs* and Level 1 *alterations*.

104.2.1.1 Building evaluation. The *code official* is authorized to require an *existing building* to be investigated and evaluated by a registered design professional based on the circumstances agreed upon at the preliminary meeting. The design professional shall notify the *code official* if any potential nonconformance with the provisions of this code is identified.

104.3 Notices and orders. The *code official* shall issue all necessary notices or orders to ensure compliance with this code.

104.4 Inspections. The *code official* shall make all of the required inspections, or the *code official* shall have the authority to accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The *code official* is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

104.5 Identification. The *code official* shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

104.6 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the *code official* has reasonable cause to believe that there exists in a structure or upon a premises a condition which is contrary to or in violation of this code which makes the structure or premises unsafe, *dangerous*, or hazardous, the *code official* is authorized to enter the structure or premises at reasonable times to inspect or to perform the duties imposed by this code, provided that if such structure or premises be occupied, that credentials be presented to the occupant and entry requested. If such structure or premises ~~be~~ is unoccupied, the *code official* shall first make a reasonable effort to locate the owner or other person having charge or control of the structure or premises and request entry. If entry is refused, the *code official* shall have recourse to the remedies provided by law to secure entry.

104.6.1 Warrant. When the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner or occupant or person having charge, care or control of the structure or premises shall not fail or neglect, after proper request is made as herein provided, to promptly permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

104.7 Department records. The *code official* shall keep official records of applications received, permits and certificates issued, fees collected, reports of inspections, and notices and orders issued. Such records shall be retained in the official records for the period required for retention of public records.

104.8 Assistance of other agencies. The code official is authorized to request, and shall receive so far as is required in the discharge of the duties described in this code, the assistance and cooperation of other officials of the jurisdiction.

104.9 Specific duties. The following are specific duties of the code official. [JURISDICTION TO INSERT CODE OFFICIAL DUTIES SPECIFIC TO THIS CODE]

SECTION 105
PERMITS

105.1 Permit required. Any owner or authorized agent who intends to construct, enlarge, alter, *repair*, ~~add to, alter, relocate~~ move, demolish, or change the occupancy of a building or structure, or to construct, erect, install, enlarge, alter, *repair*, ~~install, add, alter,~~ remove, convert, or replace any electrical, gas, mechanical, or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the *code official* and obtain the required permit for the project. Where laws or regulations are enforceable by other agencies or departments, approval shall be obtained from all agencies or departments concerned.

105.1.1 Annual permit. In lieu of an individual permit for each *alteration* to an already approved electrical, gas, mechanical, or plumbing installation, the *code official* is authorized to issue an annual permit upon application therefore to any person, firm, or corporation regularly employing one or more qualified tradespersons in the building, structure, or on the premises owned or operated by the applicant for the permit.

~~105.1.2~~ 105.1.1 Annual permit records. The person to whom an annual permit is issued shall keep a detailed record of *alterations* made under such annual permit. The *code official* shall have access to such records at all times, or such records shall be filed with the *code official* as designated.

105.1.2 ~~105.2.1~~ Emergency repairs. Where equipment replacements and *repairs* must be performed in an emergency situation, the permit application shall be submitted within the next working business day to the *code official*.

105.1.3 Permits specifically required. The following specifically require a permit. [JURISDICTION TO INSERT SPECIFIC ITEMS REQUIRING A PERMIT FOR THIS CODE]

105.2 Permit not required ~~Work exempt from permit~~. Exemptions from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required in accordance with Sections 105.2.1 through 105.2.3. ~~for the following:~~

105.2.1 ~~105.2.2~~ Repairs. Application or notice to the *code official* is not required for ordinary *repairs* to structures, replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles ~~and items listed in Section 105.2~~. Such *repairs* shall not include the cutting away of any wall, partition, or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required means of egress or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary *repairs* include *addition* to, *alteration* of, replacement, or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent, or similar piping, electric wiring, or mechanical or other work affecting public health or general safety.

105.2.2 ~~105.2.3~~ Public service agencies. A permit shall not be required for the installation, *alteration*, or *repair* of generation, transmission, distribution, or metering or other related equipment that is under the ownership and control of public service agencies by established right.

105.2.3 Specific exemption. The following are specifically exempt from requiring a permit.

105.2.3.1 Building:

1. Sidewalks and driveways not more than 30 inches (762 mm) above grade and not over any basement or story below and that are not part of an accessible route.
2. Painting, papering, tiling, carpeting, cabinets, counter tops, and similar finish work.
3. Temporary motion picture, television, and theater stage sets and scenery.
4. Shade cloth structures constructed for nursery or agricultural purposes, and not including service systems.
5. Window awnings supported by an exterior wall of Group R-3 or Group U occupancies.
6. Movable cases, counters, and partitions not over 69 inches (1753 mm) in height.

105.2.3.2 Electrical:

105.2.3.2.1 Repairs and maintenance: Minor *repair* work, including the replacement of lamps or the connection of approved portable electrical equipment to approved permanently installed receptacles.

105.2.3.2.2 Radio and television transmitting stations: The provisions of this code shall not apply to electrical equipment used for radio and television transmissions, but do apply to equipment and wiring for power supply, the installations of towers, and antennas.

105.2.3.2.3 Temporary testing systems: A permit shall not be required for the installation of any temporary system required for the testing or servicing of electrical equipment or apparatus.

105.2.3.4 Gas:

1. Portable heating appliance.
2. Replacement of any minor part that does not alter approval of equipment or make such equipment unsafe.

105.2.3.5 Mechanical:

1. Portable heating appliance.
2. Portable ventilation equipment.
3. Portable cooling unit.
4. Steam, hot, or chilled water piping within any heating or cooling equipment regulated by this code.
5. Replacement of any part that does not alter its approval or make it unsafe.
6 Portable evaporative cooler.
7. Self-contained refrigeration system containing 10 pounds (4.54 kg) or less of refrigerant and actuated by motors of 1 horsepower (746 W) or less.

105.2.3.6 Plumbing:

1. The stopping of leaks in drains, water, soil, waste, or vent pipe; provided, however, that if any concealed trap, drainpipe, water, soil, waste, or vent pipe becomes defective and it becomes necessary to remove and replace the same with new material, such work shall be considered as new work, and a permit shall be obtained and inspection made as provided in this code.
2. The clearing of stoppages or the repairing of leaks in pipes, valves, or fixtures, and the removal and reinstallation of water closets, provided such *repairs* do not involve or require the replacement or rearrangement of valves, pipes, or fixtures.

105.3 Application for permit. To obtain a permit, the applicant shall first file an application therefor in writing on a form furnished by the department ~~of building safety~~ for that purpose. Such application shall:

1. Identify and describe the project ~~work in accordance with Chapter 3~~ to be covered by the permit for which application is made.
2. Describe the land on which the proposed project ~~work~~ is to be done by legal description, street address, or similar description that will readily identify and definitely locate the proposed building or project ~~work~~.
3. Indicate the use and occupancy for which the proposed project ~~work~~ is intended.
4. Be accompanied by construction documents and other information as required in Section 106~~.3~~.
5. State the valuation of the proposed project ~~work~~.
6. Be signed by the applicant or the applicant's authorized agent.
7. Give such other data and information as required by the *code official*.

105.3.1 ~~108.3 Building~~ Permit valuations. ~~The applicant for a permit shall provide an estimated permit value at time of application.~~ Permit valuations required under Section 105.3(5) shall include total value of the project ~~work~~ including materials and labor ~~for which the permit is being issued~~, ~~such as~~ and electrical, gas, mechanical, plumbing equipment, and other permanent systems for which the permit is being issued. If, in the opinion of the *code official*, the valuation is underestimated on the application, the *permit* shall be denied unless the applicant can show detailed estimates to meet the approval of the *code official*. Final building permit valuation shall be set by the *code official*.

~~105.3.1~~ 105.4 Action on application. The *code official* shall examine or cause to be examined applications for permits and amendments thereto within a reasonable time after filing. If the application or the construction documents do not conform to the requirements of pertinent laws, the *code official* shall reject such application in writing, stating the reasons therefor. If the *code official* is satisfied that the proposed project ~~work~~ conforms to the requirements of this code and laws and ordinances applicable thereto, the *code official* shall issue a permit therefor as soon as practicable.

105.4.1 Preliminary inspection. Before a permit is issued, the code official is authorized to inspect and evaluate the systems, *equipment*, buildings, devices, premises and spaces or areas to be used.

105.4.2 ~~106.3.3 Phased approval~~ Conditional permits. The *code official* is authorized to issue a permit for the construction or operation of part of the project such as the construction of foundations or any other part of a building or structure, or installation of systems or materials, or operation before the construction documents for the entire project ~~whole building or structure~~ have been submitted, provided that adequate information and detailed statements have been filed complying with pertinent requirements of this code. The holder of such permit ~~for the foundation or other parts of a building~~ shall proceed only to the point for which approval has been given, at the permit holder's own risk, ~~with the building operation~~ and without assurance that a permit for the entire project ~~structure~~ will be granted.

~~105.3.2~~ 105.5 Time limitation of application. An application for a permit for any proposed project ~~work~~ shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a permit has been issued.~~; except that~~ The *code official* is authorized to grant one or more extensions of time for additional periods not exceeding ~~90~~ 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

~~105.4~~ 105.6 Validity of permit. The issuance or granting of a permit shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or of any other ordinance of the jurisdiction. Permits presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a permit based on construction documents and other data shall not prevent the *code official* from requiring the correction of errors in the construction documents and other data. ~~The *code official* is also authorized to prevent occupancy or use of a structure where in violation of this code or of any other ordinances of this jurisdiction.~~

105.7 Extension of permit. For an unexpired permit the *code official* is authorized to grant, in writing, one or more extensions of the time, for periods of not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

~~105.5~~ 105.8 Expiration of permit. Every permit issued shall become invalid unless the work on the site authorized by such permit is commenced within 180 days after its issuance, or if the work authorized on the site by such permit is suspended or abandoned for a period of 180 days after the time the work is commenced. ~~The *code official* is authorized to grant, in writing, one or more extensions of time for periods not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.~~

105.8.1 Recommencement of work. Before such work covered under an expired permit recommences, a new permit shall be first obtained. The new permit shall be issued provided no changes have been made or will be made in the original construction documents for such work, and provided further that such suspension or abandonment has not exceeded one year.

~~105.6~~ 105.9 Suspension or revocation of permit. The *code official* is authorized to suspend or revoke a permit issued under the provisions of this code ~~wherever~~ whenever the permit is issued in error or on the basis of incorrect, inaccurate, or incomplete information or in violation of any ordinance or regulation or any of the provisions of this code.

~~105.7 Placement~~ 105.10 Posting of permit. ~~The building permit~~ Issued permits or copy thereof shall be kept on the site of the project ~~work~~ until the completion of the project.

SECTION 106
~~CONSTRUCTION~~ SUBMITTAL DOCUMENTS

106.1 General. Submittal documents consisting of construction documents~~, special inspection and structural observation programs, investigation and evaluation reports,~~ and other supporting data shall be submitted in ~~one~~ two or more sets with each application for a permit, and in such form and detail as required by the *code official*. The *code official* shall require construction documents and other data ~~shall~~ to be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official* is authorized to require ~~additional~~ necessary construction documents to be prepared by a registered design professional.

> **Exception:** The *code official* is authorized to waive the submission of construction documents and other data not required to be prepared by a registered design professional if ~~it is found that~~ the nature of the work applied for is such that ~~reviewing~~ review of construction documents is not necessary to obtain compliance with this code.

106.2 Construction documents. Construction documents shall be in accordance with Sections 106.2.1 through ~~106.2.5~~ 106.2.4.

106.2.1 Information on construction documents ~~Construction documents~~. Construction documents shall be ~~dimensioned and drawn upon suitable material. Electronic media documents are permitted to be submitted when approved by the *code official*. Construction documents shall be~~ of sufficient clarity to indicate the location, nature and extent of the work proposed project, and show in detail that the proposed project ~~it~~ will conform to the provisions of this code and relevant laws, ordinances, rules, and regulations, as determined by the *code official*. Plans shall be to scale and be on suitable material. Electronic media documents are permitted to be submitted when *approved* by the *code official*. ~~The work areas shall be shown.~~

106.2.1.1 Specific information required. Where the quality of the materials is essential for conformity to this code, specific information shall be given to establish such quality. The terms "this code" or "legal" or "its equivalent" shall not be cited or used as a substitute for specific information.

~~106.2.5~~ 106.2.2 Site plan. The construction documents submitted with the application for permit shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from lot lines, the established street grades, and the proposed finished grades and, as applicable, flood hazard areas, floodways, and *design flood* elevations. ~~and it~~ The site plan shall be drawn in accordance with an accurate boundary line survey.

106.2.2.1 Site plan for demolition. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot.

106.2.2.2. Waiver of site plan. The *code official* is authorized to waive or modify the requirement for a site plan when the application for permit is for *alteration*, *repair* or *change of occupancy*.

106.2.3 Specific Information. The following are specific requirements for submittal documents required by this code.

~~106.2.2~~ 106.2.3.1 Fire protection system(s) shop drawings. Shop drawings for the fire protection system(s) shall be submitted to indicate conformance with this code and the construction documents and shall be approved prior to the start of system installation. Shop drawings shall contain all information as required by the referenced installation standards in Chapter 9 of the *International Building Code*.

~~106.2.3~~ 106.2.3.2 Means of egress. The construction documents for *Alterations*–Level 2, *Alterations*–Level 3, *additions* and changes of occupancy shall show in sufficient detail the location, construction, size and character of all portions of the means of egress in compliance with the provisions of this code. The construction documents shall designate the number of occupants to be accommodated in every *work area* of every floor and in all affected rooms and spaces. The construction documents shall indicate any impact the *alteration* has on the design occupant load of the area not within the scope of the work.

~~106.2.4~~ 106.2.3.3 Exterior wall envelope. Construction documents for all work affecting the exterior wall envelope shall describe the exterior wall envelope in sufficient detail to determine compliance with this code. The construction documents shall provide details of the exterior wall envelope as required, including windows, doors, flashing, intersections with dissimilar materials, corners, end details, control joints, intersections at roof, eaves, or parapets, means of drainage, water-resistive membrane, and details around openings.

106.2.3.3.1 The construction documents shall include manufacturer's installation instructions that provide supporting documentation that the proposed penetration and opening details described in the construction documents maintain the wind and weather resistance of the exterior wall envelope. The supporting documentation shall fully describe the exterior wall system which was tested, where applicable, as well as the test procedure used.

~~106.6~~ 106.2.4 Design professional in responsible charge. When it is required that documents be prepared by a registered design professional, the *code official* shall be authorized to require the owner to engage and designate on the building permit application a registered design professional who shall act as the registered design professional in responsible charge. If the circumstances require, the owner shall designate a substitute registered design professional in responsible charge who shall perform the duties required of the original registered design professional in responsible charge. The *code official* shall be notified in writing by the owner if the registered design professional in responsible charge is changed or is unable to continue to perform the duties.

106.2.4.1 Responsibility. The registered design professional in responsible charge shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

106.2.4.2 Observation. Where structural observation is required, the inspection program shall name the individual or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur.

~~106.4~~ 106.3 Deferred submittals. For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the *code official* within a specified period.

106.3.1 Prior approval. Deferral of any submittal items shall have the prior approval of the *code official*. The registered design professional in responsible charge shall list the deferred submittals on the construction documents for review by the *code official*.

106.3.2 Review. ~~Submittal~~ Documents for deferred submittal items shall be submitted to the registered design professional in responsible charge who shall review them and forward them to the *code official* with a notation indicating that the deferred submittal documents have been reviewed and that they have been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until ~~their~~ the deferred submittal documents have been approved by the *code official*.

~~106.3~~ 106.4 Examination of documents. The *code official* shall examine or cause to be examined the submittal documents and shall ascertain by such examinations whether the project ~~construction or occupancy~~ indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

~~106.3.1~~ 106.5 Approval of construction documents. When the *code official* issues a permit, the construction documents and other data shall be ~~approved~~ endorsed, in writing or by stamp as "APPROVED ~~Reviewed for Code Compliance~~." One set of construction documents and other data so reviewed shall be retained by the *code official*. The other set(s) shall be returned to the applicant.~~,~~ One set shall be kept at the site of project ~~work,~~ and shall be open to inspection by the *code official* or a duly authorized representative. Such *approved construction documents* shall not be changed, modified, or altered without authorization from the *code official*. All work shall be done in accordance with the *approved construction documents*.

~~106.4~~ 106.6 Amended construction documents. ~~Work shall be installed in accordance with the reviewed construction documents. and~~ Any changes made during construction that are not in compliance with the approved construction documents shall be resubmitted for approval as an amended set of construction documents.

~~106.5~~ 106.7 Retention of construction documents. One set of approved construction documents shall be retained by the *code official* for a period of not less than 180 days from date of completion of the permitted project, or for the period required for retention of public records.

SECTION 107
MODIFICATIONS, TESTING, AND APPROVAL

107.1 ~~104.10~~ Modifications. Wherever there are practical difficulties involved in carrying out the provisions of this code, , and upon application of the owner or owner's representative, the code official shall have the authority to grant modifications for individual cases ~~upon application of the owner or owner's representative~~, provided the code official shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code, and that such modification does not lessen health, life and fire safety, accessibility, ~~life and fire safety,~~ or structural requirements. The details of action granting modifications shall be recorded and entered in the files of the department ~~of Building Safety~~.

107.1.1 ~~104.10.1~~ Flood hazard areas. For *existing buildings* located in *flood hazard areas* for which *repairs*, *alterations* and *additions* constitute *substantial improvement*, the code official shall not grant modifications to provisions related to flood resistance unless a determination is made that:

1. The applicant has presented good and sufficient cause that the unique characteristics of the size, configuration or topography of the site render compliance with the flood-resistant construction provisions inappropriate.
2. Failure to grant the modification would result in exceptional hardship.
3. The granting of the modification will not result in increased flood heights, additional threats to public safety, extraordinary public expense nor create nuisances, cause fraud on or victimization of the public or conflict with existing laws or ordinances.
4. The modification is the minimum necessary to afford relief, considering the flood hazard.

5. A written notice will be provided to the applicant specifying, if applicable, the difference between the design flood elevation and the elevation to which the building is to be built, stating that the cost of flood Insurance will be commensurate with the increased risk resulting from the reduced floor elevation and that construction below the design flood elevation increases risks to life and property.

107.2 ~~104.9~~ Approved materials and equipment. All materials, equipment, and devices approved by the *code official* shall be constructed and installed in accordance with such approval.

107.3 ~~104.9.1~~ Used materials, appliances and equipment. The use of used materials that meet the requirements of this code for new materials is permitted. Used appliances, equipment and devices shall not be reused unless such elements are in good repair or have been reconditioned and tested when necessary, placed in good and proper working condition, and *approved* by the *code official*. ~~be permitted to be reused subject to the approval of the *code official*.~~

107.4 Listed and labeled material and appliances. Listed and labeled materials, equipment, and appliances shall be used and installed in accordance with the conditions the listing and the manufacturer's instructions.

107.4 ~~104.11.1~~ Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

107.6 Technical assistance. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, or to determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building or premises , the *code official* shall have the authority to require tests be conducted, or a technical opinion, recommendation or report be submitted as evidence of compliance. The tests, opinions, recommendations and reports shall be made at no expense to the jurisdiction.

107.6.1 Preparation. The technical reports and opinions shall be prepared by a qualified engineer, approved specialist or specialty organization, or an *approved agency*.

107.6.2 Test methods. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the code official shall approve the testing procedures.

107.6.3 Testing agency. All tests shall be performed by an *approved agency*.

107.6.4 Retention of reports. The technical opinions, recommendation, reports and test results shall be retained by the code official for the period required for retention of public records.

SECTION 108 ~~109~~
INSPECTIONS

108.1 ~~109.1~~ General. Construction or work for which a permit is required shall be subject to inspection by the *code official*, and such construction or work shall remain accessible and exposed for inspection purposes until approved. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the permit applicant to cause the work to remain accessible and exposed for inspection purposes. Neither the *code official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

108.1.1 Replacement of existing appliance. The requirements of this section shall not be considered to prohibit the operation of any heating or cooling *equipment* or appliances installed to replace such existing *equipment* or appliances serving an occupied portion of a structure provided that a request for inspection of such *equipment* or appliances has been filed with the department not more than 48 hours after such replacement work is completed, and before any portion of such *equipment* or appliances is concealed by any permanent portion of the structure.

~~**109.2 Preliminary inspection.** Before issuing a permit, the *code official* is authorized to examine or cause to be examined buildings and sites for which an application has been filed.~~

108.2 ~~109.3~~ Required inspections. The *code official*, upon notification, shall make the inspections and require the tests set forth in Sections ~~109.3.1~~ 108.2.1 through 108.2.4 ~~109.3.9~~.

108.2.1 Specific inspections. The following are specific inspections and tests required by this code.

108.2.1.1 ~~109.3.1~~ Footing or foundation inspection. Footing and foundation inspections shall be made after excavations for footings are complete and any required reinforcing steel is in place. For concrete foundations, any required forms shall be in place prior to inspection. Materials for the foundation shall be on the job, except where concrete is ready-mixed in accordance with ASTM C 94, the concrete need not be on the job.

108.2.1.2 ~~109.3.2~~ Concrete slab or under-floor inspection. Concrete slab and under-floor inspections shall be made after in-slab or under-floor reinforcing steel and building service equipment, conduit, piping accessories, and other ancillary equipment items are in place but before any concrete is placed or floor sheathing installed, including the sub floor.

108.2.1.3 ~~109.3.3~~ Lowest floor elevation. For *additions* and *substantial improvements* to *existing buildings* in *flood hazard areas*, upon placement of the lowest floor, including basement and, prior to further vertical construction, the elevation documentation required in the *International Building Code* shall be submitted to the *code official*.

108.2.1.4 ~~109.3.4~~ Frame inspection. Framing inspections shall be made after the roof deck or sheathing, all framing, fire blocking, and bracing are in place and pipes, chimneys, and vents to be concealed are complete and the rough electrical, plumbing, heating wires, pipes, and ducts are approved.

108.2.1.5 ~~109.3.5~~ Lath or gypsum board inspection. Lath and gypsum board inspections shall be made after lathing and gypsum board, interior and exterior, is in place but before any plastering is applied or before gypsum board joints and fasteners are taped and finished.

Exception: Gypsum board that is not part of a fire-resistance-rated assembly or a shear assembly.

108.2.1.6 ~~109.3.6~~ Fire and smoke-resistant penetrations. Protection of joints and penetrations in fire-resistance-rated assemblies, smoke barriers and smoke partitions shall not be concealed from view until inspected and approved.

108.2.2 ~~109.3.7~~ Other inspections. In addition to the inspections specified above, the *code official* is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department ~~of Building Safety~~.

108.2.3 ~~109.3.8~~ Special inspections. Special inspections shall be as required ~~in accordance with~~ by this code, the *International Building Code* or the *International Fire Code* as applicable.

108.2.3 Special inspections. Special inspection shall be as required by this code, the *International Building Code* or the *International Fire Code* as applicable.

108.2.4 ~~109.3.9~~ Final inspection. ~~The~~ A final inspection shall be made after all work on a project required by the ~~building~~ permit is completed.

108.3 ~~109.4~~ Inspection agencies. The *code official* is authorized to accept reports of approved inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.

108.4 ~~109.5~~ Inspection requests. It shall be the duty of the holder of the ~~building~~ permit or their duly authorized agent to notify the *code official* when a project ~~work~~ is ready for inspection. It shall be the duty of the permit holder to provide access to and means for any inspections of such work that are required by this code.

108.4.1 Manufacturer's instructions. Manufacturer's instructions for equipment, appliances, and materials installed under the permit shall be available on the work site at the time of inspection.

108.5 ~~109.6~~ Approval required. Work on a project shall not proceed ~~be done~~ beyond the point indicated in each successive inspection without first obtaining the approval of the *code official*. The *code official*, upon notification, shall make the requested inspections and shall either ~~indicate~~ determine the portion of the project ~~construction~~ that is satisfactory as completed or shall notify the permit holder or ~~an~~ authorized agent ~~of the permit holder~~ wherein the same fails to comply with this code. Any portions of the project that do not comply shall be corrected and such portion shall not be covered, ~~or~~ concealed, or used until authorized by the *code official*.

108.6 Notice of approval. After all prescribed inspections or tests indicate the project complies with this code, a certificate of completion complying with Section 109 shall be issued by the code official.

SECTION 109 ~~110~~
CERTIFICATE OF COMPLETION AND OCCUPANCY

109.1 ~~110.1 Altered area use and occupancy classification change~~ Use and occupancy. No ~~altered area of a~~ building, structure, or premises or portion thereof ~~and no relocated building~~ shall be ~~used or~~ occupied until the code official has issued a certificate of occupancy as provided herein. No equipment, appliance or system used, and no change in the existing occupancy classification of a building, structure, premise or portion thereof shall be made until the code official has issued a certificate of completion ~~occupancy therefor~~ as provided herein.

Exceptions:

1. Occupancy shall be permitted during **e**mergency situations as described under Section 105.1.
2. Certificates of completion or occupancy are not required for work exempt from permits under Section 105.2.
3. Occupancy shall be permitted during the replacement of existing appliances as described under Section 108.1.1.
4. Certificates of occupancy are not required for one-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m^2).

109.1.1 Validity. Issuance of a certificate of completion or occupancy shall not be construed as an approval of a violation of the provisions of this code or of other pertinent laws and ordinances of the jurisdiction. Certificates presuming to give authority to violate or cancel the provisions of this code or other laws or ordinances of the jurisdiction shall not be valid.

109.2 ~~110.2~~ Certificate issued. After the *code official* inspects ~~the~~ a project requiring a permit ~~building~~ and finds no violations of the provisions of this code or other laws that are enforced by the department ~~of Building Safety~~, the *code official* shall issue a certificate of completion. After all certificates of completion have been issued by other departments or agencies concerned, the code official shall issue a certificate of occupancy where applicable. ~~that~~ A certificate of completion or occupancy shall contain the following:

1. The ~~building~~ permit number.
2. The address of the premises or structure.
3. The name and address of the owner.
4. A description of the project ~~that portion of the structure~~ for which the certificate is issued.
5. A statement that the described project ~~portion of the structure~~ has been inspected for compliance with the requirements of this code ~~for the occupancy and division of occupancy and the use for which the proposed occupancy is classified~~.
6. The name of the *code official*.
7. The edition of the code under which the permit was issued.
8. The use and occupancy in accordance with Chapter 3 ~~the provisions~~ of the *International Building Code*.
9. The type of construction as defined in Chapter 6 of the *International Building Code*.
10. The design occupant load ~~and any impact the *alteration* has on the design occupant load of the area not within the scope of the work~~.
11. If fire protection systems are provided, whether the fire protection systems are required.
12. Any special stipulations and conditions of the ~~building~~ permit.

Exceptions:

1. A certificate of completion or occupancy shall not be required to indicate the items under Section 109.2, Items 8, 9, and 10 for detached one- and two family dwellings and multiple single-family *dwellings* (*townhouses)* constructed using the *International Residential Code*.
2. The *code official* is shall not be required to indicate on a certificate items under Section 109.2, Items 8, 9, and 10 for the installation of equipment, appliances or systems.

109.3 ~~110.3~~ Temporary occupancy. The *code official* is authorized to issue a temporary certificate of occupancy before the completion of the entire work covered by the permit, provided that such portion or portions shall be occupied safely and without endangerment to life or public welfare. The temporary certificate shall indicate any limitations or restrictions necessary to keep the permit area safe, and items required to obtain the final certificate of occupancy. The *code official* shall set a time period during which the temporary certificate of occupancy is valid.

109.4 ~~110.4~~ Revocation. The *code official* is authorized to, in writing, suspend or revoke a certificate of completion or occupancy ~~or completion~~ issued under the provisions of this code wherever the certificate is issued in error ~~or~~ on the basis of incorrect information supplied, or where it is determined that the building, ~~or~~ structure, premise, or portion thereof, or installation of appliance, equipment or system is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION 110 ~~114~~
STOP WORK ORDER

110.1 ~~114.1~~ Authority. Whenever the ~~*building*~~ *code official* finds any work regulated by this code being performed in a manner contrary to the provisions of this code or in a *dangerous* or unsafe manner, the ~~*building*~~ *code official* is authorized to issue a stop work order.

110.2 ~~114.2~~ Issuance. The stop work order shall be in writing and shall be given to the owner of the property involved or to the owner's agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order and the conditions under which the cited work will be permitted to resume.

110.2.1 Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

110.3 ~~114.3~~ Unlawful continuance. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fees, fines, or penalties as prescribed by this code or other laws or ordinances of the jurisdiction ~~law~~.

SECTION 111 ~~113~~
VIOLATIONS

111.1 Code violations. No person, association, organization, or business entity of any form shall:

1. Erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or premises in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
2. Install or operate any equipment, appliances, or systems regulated by this code that is in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
3. Be non-compliant with the conditions of any permit or certificate issued under the auspices of this code; or
4. Tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*.

111.2 Notice of violation. A *code official* who observes or becomes aware of any code violation shall serve upon the responsible person, association, organization, or business entity a written notice in accordance with Section 111.2.1. In the absence of direct knowledge as to the identity or location of the responsible party, the *code official* shall serve the notice upon the property owner. Service may be effected by personal delivery, first class mail, substituted service, or such other means that may be authorized by state and/or local law.

111.2.1 Form of notice. Such notice of violation shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the violation into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties in accordance with Section 111.3.

111.3 Penalties. Violators who fail to comply with a notice to discontinue or abate a condition in violation of this code, and violators who tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*, shall be subject to the penalties set forth in this code as may be adopted and authorized by state and/or local law.

~~**113.1 Unlawful acts.** It shall be unlawful for any person, firm, or corporation to *repair*, alter, extend, add, move, remove, demolish, or change the occupancy of any building or equipment regulated by this code or cause same to be done in conflict with or in violation of any of the provisions of this code.~~

~~**113.2 Notice of violation.** The *code official* is authorized to serve a notice of violation or order on the person responsible for the *repair*, *alteration*, extension, *addition*, moving, removal, demolition, or change in the occupancy of a building in violation of the provisions of this code or in violation of a permit or certificate issued under the provisions of this code. Such order shall direct the discontinuance of the illegal action or condition and the abatement of the violation.~~

~~**113.3 Prosecution of violation.** If the notice of violation is not complied with promptly, the *code official* is authorized to request the legal counsel of the jurisdiction to institute the appropriate proceeding at law or in equity to restrain, correct, or abate such violation or to require the removal or termination of the unlawful occupancy of the building or structure in violation of the provisions of this code or of the order or direction made pursuant thereto.~~

~~**113.4 Violation penalties.** Any person who violates a provision of this code or fails to comply with any of the requirements thereof or who *repairs* or alters or changes the occupancy of a building or structure in violation of the approved construction documents or directive of the *code official* or of a permit or certificate issued under the provisions of this code shall be subject to penalties as prescribed by law.~~

SECTION 112
~~BOARD~~ MEANS OF APPEALS

112.1 Application for appeal. Any person directly affected by a decision of the *code official* or a notice or order issued under this code shall have the right to appeal to the board of appeals, provided that a written application for appeal is filed within 20 days after the day the decision, notice or order was served. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or the requirements of this code are adequately satisfied by other means.

112.1.1 Stays of enforcement. The filing of an appeal of notice or orders, except for notice or order concerning *Imminent Danger*, shall stay the enforcement of the notice or order until the appeal is heard by the board of appeals.

112.2 Membership of board. The board of appeals shall consist of five members who are qualified by experience and training to pass on matters pertaining to the provisions of this code. The board shall be appointed by the chief appointing authority, and shall serve staggered and overlapping terms.

112.2.1 Alternate members. The chief appointing authority shall appoint two or more alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership and shall be appointed for five years, or until a successor has been appointed.

112.2.2. An employee of the jurisdiction shall not be a member of the board of appeals. The *code official* shall be an ex officio member of the board but shall have no vote on any matter before the board.

112.2.3 Chairman. The board shall annually select one of its members to serve as chairman.

112.2.4 Secretary. The chief administrative officer shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

112.2.5 Qualifications. The board of appeals shall consist of five individuals, one from each of the following professions or disciplines:

1. Registered design professional who is a registered architect; or a builder or superintendent of building construction with at least 10 years' experience, five of which shall have been in responsible charge of work.
2. Registered design professional with structural engineering or architectural experience.
3. Registered design professional with fuel gas and plumbing engineering experience; or a fuel gas contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
4. Registered design professional with electrical engineering experience; or an electrical contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
5. Registered design professional with fire protection engineering experience; or a fire protection contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.

112.2.6 Disqualification of member. A member shall not hear an appeal in which that member has a personal, professional or financial interest.

112.2.7 Terms. The initial members of the board of appeals shall serve as follows: one for five years; one for four years; one for three years; one for two years and one for one year. Thereafter, each new member shall serve for five years or until a successor has been appointed.

112.2.8 Compensation of members. Compensation of members shall be determined by law.

112.3 Hearings and meetings. Hearings on appeals and other meetings of the board of appeals shall be held in conformance with Sections 109.3.1 through 109.3.3.

112.3.1 Procedures. The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

112.3.2 Notice. The board shall hold a hearing upon notice from the chairman, within 10 days of the filing of an appeal, or at stated periodic meetings.

112.3.3 Open hearing. All hearings before the board shall be open to the public. A quorum shall consist of not less than two-thirds of the board membership. The appellant, the appellant's representative, the *code official* and any person whose interests are affected shall be given an opportunity to be heard.

112.3.4 Postponed hearing. When the full board is not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

112.4 Board decision. The board shall modify or reverse the decision of the *code official* by a concurring vote of a majority of the total number of appointed board members.

112.4.1 Resolution. The decision of the board shall be by resolution. Certified copies shall be furnished to the appellant and to the *code official*.

112.4.2 Action by *code official*. The *code official* shall take immediate action in accordance with the decision of the board.

112.5 Court review. Any person, whether or not a previous party to the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

~~**112.1 General.** In order to hear and decide appeals of orders, decisions, or determinations made by the code official relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business.~~

~~**112.2 Limitations on authority.** An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equally good or better form of construction is proposed. The board shall have no authority to waive requirements of this code.~~

~~**112.3 Qualifications.** The board of appeals shall consist of members who are qualified by experience and training to pass on matters pertaining to building construction and are not employees of the jurisdiction.~~

SECTION 113 ~~108~~
FEES

113.1 ~~108.1~~ Payment of fees. A permit or an amendment to a permit shall not be issued ~~valid~~ until the fees prescribed in Section 113.2 ~~by law have been paid~~. ~~Nor shall an amendment to a permit be released until the additional fee, if any, has been paid~~.

113.2 Fee schedule. The fees for permits and other considerations shall be in accordance with the following schedule: [JURISDICTION TO INSERT APPROPRIATE FEE SCHEDULE]

~~**108.2 Schedule of permit fees.** On buildings, electrical, gas, mechanical, and plumbing systems or *alterations* requiring a permit, a fee for each permit shall be paid as required in accordance with the schedule as established by the applicable governing authority.~~

113.3 ~~108.5~~ Related fees. The payment of the fee for ~~the construction, *alteration*, removal, or demolition of~~ work done in connection to or concurrently with the work authorized by a ~~building~~ permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.

113.4 ~~108.4~~ Work commencing before permit issuance. Any person who commences any work on a project requiring a *permit* before obtaining the necessary permits shall be subject to ~~an additional~~ a fee established by the ~~*building*~~ *code official* that shall be in addition to the required permit fees.

113.5 Permit extension. The fee for an extension of a permit in conformance with Section 105.7 shall be one-half the amount required for a new permit for such work.

113.6 Expiration of permit. For permits that have expired, and before such work recommences in conformance with Section 105.8.1, the fee to recommence work shall be one-half the amount required for a new permit for such work.

113.7 Stop work order. Any person who shall continue any work on a project requiring a permit after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.

113.8 Reinspection fee. A reinspection of work not in compliance with this code shall be subject to a fee established by the *code official* that shall be in addition to the required *permit* fees. The fee may be assessed when the *approved* plans are not readily available to the inspector, for failure to provide access on the date for which inspection is requested, for work deviating from the approved, or the work or test is not in compliance with this code.

~~**108.6 Refunds.** The *code official* is authorized to establish a refund policy.~~

113.9 Fee refunds. The code official shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment. The code official shall authorize the refunding of fees as follows:

1. The full amount of any fee paid hereunder which was erroneously paid or collected.
2. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.
3. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid when no work on a project has been performed under a permit issued in accordance with this code.

(SECTIONS 114 THROUGH 119 RESERVED)

PART 3 – GENERAL REQUIREMENTS

SECTION 120 ~~115~~
UNSAFE ~~BUILDINGS~~ STRUCTURES, ~~AND~~ EQUIPMENT, AND CONDITIONS

120.1 General. If any building, structure, premises or part thereof, or appliance, equipment, or system is found to be unsafe by the *code official*, or found in the case of a building or structure to be unfit for human occupancy, the condition shall be abated whenever possible, but if abatement is not achieved or is non-achievable, then condemnation shall be undertaken in accordance with the provisions of this code.

~~**115.1 Conditions.** Buildings, structures or equipment that are or hereafter become unsafe, shall be taken down, removed or made safe as the code official deems necessary and as provided for in this code.~~

120.1.1 Notice to building official. Abatement requiring repairs, *alterations*, remodeling, removing or demolition shall be referred to the *building official*.

120.1.2 Unsafe structures. An unsafe structure is a structure that is dangerous to the life, health, or safety of the public or to the *occupants* when:

1. There are no minimum safeguards provided to protect or warn *occupants* in the event of fire; or
2. Such structure contains unsafe equipment or is so damaged, decayed, dilapidated, is structurally unsound, is of such faulty construction, or has such an unstable foundation, that partial or complete collapse is possible.

120.1.3 Unsafe equipment. Unsafe equipment includes any boiler, heating equipment, elevator, moving stairway, electrical wiring or device, flammable liquid containers or other equipment on the *premises* or within the structure which is in such disrepair or condition that such equipment constitutes a hazard to life, health, property or safety of the public or the *occupants* of the *premises* or structure.

120.1.4 Structure unfit for human occupancy. A structure is unfit for human *occupancy* whenever the *code official* finds that such structure is unsafe, is unlawful or, because its degree of disrepair, or its want of maintenance, is unsanitary, vermin or rat infested, filthy and contaminated, lacking *ventilation*, illumination, sanitary, heating facilities or other essential equipment required by this code, or because the structure is in proximity to an unsafe or dangerous condition that constitutes a hazard to the *occupants* of the structure or to the public.

120.1.5 Unlawful structure. An unlawful structure is one found in whole or in part to be occupied by more persons than permitted under this code, or was erected, altered or occupied contrary to this code.

120.1.6 Structure and premise that are dangerous to the life, health or safety of the public or occupants. For the purpose of this code, any structure or *premises* that have any or all of the following conditions or defects shall be considered dangerous, and shall constitute an unsafe structure:

1. Any door, aisle, passageway, stairway, exit or other means of egress that does not conform to the *approved* building or fire code of the jurisdiction as related to the requirements for existing buildings.
2. The walking surface of any aisle, passageway, stairway, exit or other means of egress is so warped, worn loose, torn or otherwise unsafe as to not provide safe and adequate means of egress.
3. Any portion of a building, structure or appurtenance that has been damaged by fire, earthquake, wind, flood, *deterioration*, *neglect*, abandonment, vandalism or by any other cause to such an extent that it is likely to partially or completely collapse, or to become *detached* or dislodged.
4. Any portion of a building, or any member, appurtenance or ornamentation on the exterior thereof that is not of sufficient strength or stability, or is not so *anchored*, attached or fastened in place so as to be capable of resisting natural or artificial loads of one and one-half the original designed value.
5. The building or structure, or part of the building or structure, because of dilapidation, *deterioration*, decay, faulty construction, the removal or movement of some portion of the ground necessary for the support, or for any other reason, is likely to partially or completely collapse, or some portion of the foundation or underpinning of the building or structure is likely to fail or give way.
6. The building or structure, or any portion thereof, is clearly unsafe for its use and *occupancy*.
7. The building or structure is *neglected*, damaged, dilapidated, unsecured or abandoned so as to become an attractive nuisance to children who might play in the building or structure to their danger, becomes a harbor for vagrants, criminals or immoral persons, or enables persons to resort to the building or structure for committing a nuisance or an unlawful act.
8. Any building or structure has been constructed, exists or is maintained in violation of any specific requirement or prohibition applicable to such building or structure provided by the *approved* building or fire code of the jurisdiction, or of any law or ordinance to such an extent as to present either a substantial risk of fire, building collapse or any other threat to life and safety.
9. A building or structure, used or intended to be used for dwelling purposes, because of inadequate maintenance, dilapidation, decay, damage, faulty construction or arrangement, inadequate light, *ventilation*, mechanical or plumbing system, or otherwise, is determined by the *code official* to be unsanitary, unfit for human habitation or in such a condition that is likely to cause sickness or disease.
10. Any building or structure, because of a lack of sufficient or proper fire-resistance-rated construction, fire protection systems, electrical system, fuel connections, mechanical system, plumbing system or other cause, is determined by the *code official* to be a threat to life or health.
11. Any portion of a building remains on a site after the demolition or destruction of the building or structure or whenever any building or structure is abandoned so as to constitute such building or portion thereof as an attractive nuisance or hazard to the public.

120.2 Closing of vacant structures. If the structure is vacant and unfit for human habitation and *occupancy*, and is not in danger of structural collapse, the *code official* is authorized to post a placard of condemnation on the *premises* and order the structure closed up so as not to be an attractive nuisance. Upon failure of the *owner* to close up the *premises* within the time specified in the order, the *code official* shall cause the *premises* to be closed and secured through any available public agency or by contract or arrangement by private persons, and the cost thereof shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate that may be collected by any legal means.

120.3 Evacuation. The *code official* or the fire department official in charge of an emergency incident shall be authorized to order the immediate evacuation of any occupied building, structure or premises deemed unsafe due to hazardous conditions that present an imminent danger to occupants. *Persons* so notified shall immediately leave the structure or premises and shall not enter or re-enter until authorized to do so by the *code official* or the fire department official in charge of the incident.

120.4 Notice. Whenever the *code official* has *condemned* a structure or equipment under the provisions of this section, notice shall be posted in a conspicuous place in or about the structure affected by such notice and served on the *owner* or the person or persons responsible for the structure or equipment in accordance with Section 120.4.2. If the notice pertains to equipment, it shall also be placed on the *condemned* equipment. The notice shall be in the form prescribed in Section 120.4.1.

~~**115.3 Notice.** If an unsafe condition is found, the *code official* shall serve on the owner, agent, or person in control of the structure a written notice that describes the condition deemed unsafe and specifies the required *repairs* or improvements to be made to abate the unsafe condition, or that requires the unsafe building to be demolished within a stipulated time. Such notice shall require the person thus notified to declare immediately to the *code official* acceptance or rejection of the terms of the order.~~

120.4.1 Form of notice. Such notice of shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the unsafe condition into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties set forth in this code or as may be adopted and authorized by state and/or local law.

120.4.2 ~~115.4 Method of~~ service of notice. Such notice shall be deemed properly served if a copy thereof is (a) delivered to the owner personally; (b) sent by certified or registered mail addressed to the owner at the last known address with the return receipt requested; or (c) delivered in any other manner as prescribed by local law. If the certified or registered letter is returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice. Service of such notice in the foregoing manner upon the owner's agent or upon the person responsible for the structure shall constitute service of notice upon the owner.

120.5 Placarding. Upon failure of the owner or person responsible to comply with the notice provisions within the time given, the *code official* shall post on the premises or on defective equipment a placard bearing the word "UNSAFE" or "CONDEMNED" as applicable, and a statement of the penalties provided for occupying the premises, operating the equipment or removing the placard.

120.5.1 Placard removal. The *code official* shall remove the placard whenever the unsafe conditions have been eliminated. Any person who defaces or removes an unsafe condition placard without the approval of the *code official* shall be subject to the penalties provided for by the jurisdiction.

120.6 Prohibited occupancy. Any structure *condemned* and placarded by the *code official* shall be vacated as ordered by the *code official*. It shall be unlawful for any person to occupy or to allow others to occupy a placarded *premises,* or to operate or allow others to operate any placarded equipment.

120.7 Abatement. The owner, operator, or occupant of a building, structure, premises, or equipment deemed unsafe by the *code official* shall abate or correct such unsafe conditions either by repair, rehabilitation, demolition or other *approved* corrective action.

~~**115.5 Restoration.** The building or equipment determined to be unsafe by the *code official* is permitted to be restored to a safe condition. To the extent that *repairs*, *alterations*, or *additions* are made or a *change of occupancy* occurs during the restoration of the building, such *repairs*, *alterations*, *additions*, or *change of occupancy* shall comply with the requirements of this code.~~

120.7.1 Summary abatement. Where conditions exist that are deemed an *imminent danger* as described in Section 121.1 that will necessarily result in injury to occupants or the public, the *code official* or fire department official in charge of the incident is authorized to summarily abate such unsafe or hazardous conditions.

120.8 ~~115.2~~ Record. The *code official* shall cause a report to be filed on an unsafe condition. The report shall state the occupancy of the structure and the nature of the unsafe condition. The record of an unsafe condition as outlined herein shall be retained by the *code official* for the period required for retention of public records.

SECTION 121 ~~116~~
EMERGENCY MEASURES

121.1 ~~116.1~~ Imminent danger. When, in the opinion of the *code official*, there is imminent danger of failure or collapse of a building or structure that endangers life, or when any building or part of a building has fallen and life is endangered by the occupation of the building, or when there is actual or potential danger to the building occupants or those in the proximity of any structure because of explosives, explosive fumes or vapors, or the presence of toxic fumes, gases, or materials, or operation of defective or *dangerous* equipment, the *code official* is hereby authorized and empowered to order and require the occupants to vacate the premises forthwith. The *code official* shall cause to be posted at each entrance to such structure a notice reading as follows: "This Structure Is Unsafe and Its Occupancy Has Been Prohibited by the *Code Official*." It shall be unlawful for any person to enter such structure except for the purpose of securing the structure, making the required *repairs*, removing the hazardous condition, or of demolishing the same.

121.2 ~~116.2~~ Temporary safeguards. Notwithstanding other provisions of this code, whenever, in the opinion of the *code official*, there is imminent danger due to an unsafe condition, the *code official* shall order the necessary work to be done, including the boarding up of openings, to render such structure temporarily safe whether or not the legal procedure herein described has been instituted; and shall cause such other action to be taken as the *code official* deems necessary to meet such emergency.

121.3 ~~116.3~~ Closing streets. When necessary for public safety, the *code official* shall temporarily close structures and close or order the authority having jurisdiction to close sidewalks, streets, public ways, and places adjacent to unsafe structures, and prohibit the same from being utilized.

121.4 ~~116.4~~ Emergency repairs. For the purposes of this section, the *code official* shall employ the necessary labor and materials to perform the required work as expeditiously as possible.

121.5 ~~116.5~~ Costs of emergency repairs. Costs incurred in the performance of emergency work shall be paid by the jurisdiction. The legal counsel of the jurisdiction shall institute appropriate action against the owner of the premises where the unsafe structure is or was located for the recovery of such costs.

121.6 ~~116.6~~ Hearing. Any person ordered to take emergency measures shall comply with such order forthwith. Any affected person shall thereafter, upon petition directed to the appeals board, be afforded a hearing as described in this code.

SECTION 122 ~~111~~
SERVICE UTILITIES

122.1 ~~111.1~~ Connection of service utilities. No person shall make connections from a utility, source of energy, fuel, ~~or~~ power, water system or *sewer* system to any building, structure or system that is regulated by this code for which a permit is required, until approved by the *code official*.

122.2 ~~111.2~~ Temporary connection. The *code official* shall have the authority to authorize the temporary connection of the building, structure or system to the utility source of energy, fuel, ~~or~~ power, water system or *sewer* system.

122.3 ~~111.3~~ Authority to disconnect service utilities. The *code official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or when such utility connection has been made without the approval required by Section 122.1 or 122.2 ~~111.1 or 111.2~~. The code official shall notify the serving utility and, wherever possible, the owner and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

SECTION 123 ~~107~~
TEMPORARY STRUCTURES, EQUIPMENT, SYSTEMS AND USES

123.1 ~~107.1~~ General. The *code official* is authorized to issue a permit for temporary structures, equipment, systems and uses. Such permits shall be limited as to time of service but shall not be permitted for more than 180 days. The ~~*building*~~ *code official* is authorized to grant extensions for demonstrated cause.

123.2 ~~107.2~~ Conformance. Temporary structures, equipment, systems and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.

123.3 ~~107.4~~ Termination of approval. The ~~*building*~~ *code official* is authorized to terminate such permit ~~for a temporary use~~ and to order the temporary structure, equipment, system or use to be discontinued.

~~**107.3 Temporary power.** The *code official* is authorized to give permission to temporarily supply and use power in part of an electric installation before such installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in NFPA 70.~~

SECTION 124
MAINTENANCE

124.1 Maintenance of safeguards. Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or any other feature is required for compliance with the provisions of this code, or otherwise installed, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be continuously maintained in accordance with this code and applicable referenced standards.

124.2 Testing and operation. Equipment requiring periodic testing or operation to ensure maintenance shall be tested or operated as specified in this code.

124.2.1 Test and inspection records. Required test and inspection records shall be available to the *code official* at all times, or such records as designates shall be filed with the *code official*.

124.2.2 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

124.3 Supervision. Maintenance and testing shall be under the supervision of a responsible *person* who shall ensure that such maintenance and testing are conducted at specified intervals in accordance with this code.

124.4 Rendering equipment inoperable. Portable or fixed fire-extinguishing systems or devices and fire-warning systems shall not be rendered inoperative or inaccessible except as necessary during emergencies, maintenance, repairs, *alterations*, drills or prescribed testing.

SECTION 125 ~~117~~
DEMOLITION

125.1 ~~117.1~~ General. The code *official* shall order the owner of any premises upon which is located any structure that in the code *official's* judgment is ~~so old,~~ deteriorated or dilapidated, or has become so out of *repair* as to be *dangerous*, unsafe, insanitary, or otherwise unfit for human habitation or occupancy, and such that it is unreasonable to *repair* the structure, to demolish and remove such structure; or if such structure is capable of being made safe by *repairs*, to *repair* and make safe and sanitary or to board up and hold for future repair, or to demolish and remove at the owner's option; or where there has been a cessation of normal construction of any structure for a period of more than two years, to board up and hold for recommencement of work, or to demolish and remove such structure. Boarding up the building for future repair or recommencement of work shall not extend beyond one year, unless *approved* by the *code official*.

125.2 ~~117.2~~ Notices and orders. All notices and orders shall comply with Section 111.2 ~~113~~.

125.3 ~~117.3~~ Failure to comply. If the owner of a premises fails to comply with a demolition order within the time prescribed, the code *official* shall cause the structure to be demolished and removed, either through an available public agency or by contract or arrangement with private persons, and the cost of such demolition and removal shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate.

125.4 ~~117.4~~ Salvage materials. When any structure has been ordered demolished and removed in accordance with Section 125.3, the governing body or other designated officer under said contract or arrangement aforesaid shall have the right to sell the salvage and valuable materials at the highest price obtainable. The net proceeds of such sale, after deducting the expenses of such demolition and removal, shall be promptly remitted with a report of such sale or transaction, including the items of expense and the amounts deducted, for the person who is entitled thereto, subject to any order of a court. If such a surplus does not remain to be turned over, the report shall so state.

125.5 Existing remedies. The provisions in this code shall not be construed to abolish or impair existing remedies of the jurisdiction or its officers or agencies relating to the removal or demolition of any structure which is dangerous, unsafe or insanitary.

2. Revise and add the following definitions in the IEBC:

ALTERATION. Any construction or renovation to an existing structure other than ~~a~~ repair or addition that requires a *permit*, or a change in a mechanical, plumbing, fuel gas or other system that involves an extension, addition or change to the arrangement, type or purpose of the original installation that requires a *permit*. Alterations are classified as Level 1, Level 2, and Level 3.

APPLIANCE. A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.

APPROVED. Approval by the code official as the result of review, investigation or tests conducted by the code official or by reason of accepted principles or tests by national authorities, or technical or scientific organizations.

APPROVED AGENCY. An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been *approved* by the *code official*.

BUILDING. Any structure used or intended for supporting or sheltering any use or occupancy.

BUILDING OFFICIAL. The officer or other designated authority charged with the administration and enforcement of the *International Building Code*, or a duly authorized representative.

CERTIFICATE OF COMPLETION. A certificate stating that the project or work for which a permit was issued has been completed in compliance with *approved construction documents* and the requirements of this code.

CONSTRUCTION DOCUMENTS. The written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of the project necessary for obtaining a permit.

CODE OFFICIAL. The officer or other designated authority charged with the administration and enforcement of this code, or a duly authorized representative.

EQUIPMENT OR FIXTURE. Any plumbing, heating, electrical, ventilating, air conditioning, refrigerating, and fire protection equipment, apparatus and devices, all piping ducts, vents, control devices and other systems or components thereof, and elevators, dumb waiters, escalators, boilers, pressure vessels and other mechanical facilities or installations that are related to building services, any of which are specifically regulated in this code. Appliances as defined by this code shall not be considered equipment. Equipment or fixtures shall not include manufacturing, production, or process equipment, but shall include connections from building service to process equipment.

FIRE CODE OFFICIAL. The fire chief or other designated authority charged with the administration and enforcement of the code, or a duly authorized representative.

IMMINENT DANGER. A condition which could cause serious or life-threatening injury or death at any time.

LABELED. Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-*labeled* items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

LISTED. Equipment, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or services that maintains periodic inspection of production of *listed* equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

LOT LINE. A line dividing one lot from another, or from a street or any public place.

PERMIT. An official document or certificate issued by the authority having jurisdiction which authorizes performance of a specified activity.

REGISTERED DESIGN PROFESSIONAL. An architect or engineer who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

REPAIR. The ~~restoration to good or sound condition~~ reconstruction or renewal of any part of an *existing building* for the purpose of its maintenance.

STRUCTURE. That which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

TOWNHOUSE. A single-family *dwelling unit* constructed in a group of three or more attached units in which each unit extends from the foundation to roof and with open space on at least two sides.

PART III – IECC

1. Revise IECC (Item 1-D) as follows:

CHAPTER 1
ADMINISTRATION

PART 1—SCOPE AND APPLICATION

SECTION 101
SCOPE AND GENERAL REQUIREMENTS

101.1 Title. These regulations ~~This code~~ shall be known as the *International Energy Conservation Code* of [NAME OF JURISDICTION], ~~and shall be cited as such. It is referred to~~ herein referred to as "this code."

101.2 Scope. The provisions of this code ~~applies~~ shall apply to *residential* and *commercial buildings*.

101.3 Purpose ~~Intent~~. The purpose of this code ~~shall~~ is to ~~regulate~~ establish the minimum requirements for the design and construction of buildings for the effective use of energy. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve the effective use of energy. This code is not intended to abridge health, safety, ~~health~~ or environmental requirements contained in other applicable codes or ordinances.

101.4 Severability. If a section, subsection, sentence, clause, or phrase of this code is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code.

101.5 Validity ~~105.1 General.~~ ~~If a portion of this code is held to be illegal or void, such a decision shall not affect the validity of the remainder of this code.~~ In the event any part or provision of this code is held to be illegal or void, this shall not have the effect of making illegal or void any of the other parts or provisions hereof, which are determined to be legal; and it shall be presumed that this code would have been adopted without such illegal or invalid parts or provisions.

101.6 ~~106.4~~ Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state, or federal law.

SECTION 102
APPLICABILITY
~~ALTERNATE MATERIALS—METHOD OF CONSTRUCTION, DESIGN OR INSULATING SYSTEMS~~

102.1 General ~~101.4 Applicability~~. ~~Where, in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.~~ Where there is a conflict between a general requirement and a specific requirement of this code, the specific requirement shall be applicable ~~govern~~. Where, in a specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

102.2 ~~106.3~~ Application of references. References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

102.3 Referenced codes and standards ~~**106.1 General.**~~ The codes and standards referenced in this code shall be ~~those listed in Chapter 6, and such codes and standards shall be~~ considered ~~as~~ part of the requirements of this code to the prescribed extent of each such reference. ~~**106.2 Conflicting requirements.**~~ Where ~~the~~ differences occur between the provisions of this code and the referenced codes and standards ~~conflict~~, the provisions of this code shall apply ~~take precedence~~.

Exception: Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing shall govern.

102.4 Appendices. Provisions in the appendices shall not apply unless specifically adopted.

102.5 ~~**101.4.1**~~ **Existing** ~~**buildings**~~ **structures and systems.** The legal occupancy or use of any structure or installed system existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the *International Building Code,* the *International Fire Code,* or the *International Property Maintenance Code*, or as is deemed necessary by the *code official* for the general safety and welfare of the occupants and the public. ~~Except as specified in this chapter, this code shall not be used to require the removal, *alteration* or abandonment of, nor prevent the continued use and maintenance of, an existing building or building system lawfully in existence at the time of adoption of this code.~~

102.5.1 ~~**101.4.2**~~ **Historic buildings.** The provisions of this code relating to the construction, alteration, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures identified and classified by the state or local jurisdiction as historic buildings when such buildings or structures are judged by the code official to be safe and in the public interest of health, safety and welfare regarding any proposed construction, alteration, repair, enlargement, restoration, relocation or moving of buildings. ~~Any building or structure that is listed in the State or National Register of Historic Places; designated as a historic property under local or state designation law or survey; certified as a contributing resource with a National Register listed or locally designated historic district; or with an opinion or certification that the property is eligible to be listed on the National or State Registers of Historic Places either individually or as a contributing building to a historic district by the State Historic Preservation Officer or the Keeper of the National Register of Historic Places, are exempt from this code.~~

102.6 ~~**102.1 General**~~ **Alternative materials, design, methods and equipment.** The provisions of this code ~~is~~ are not intended to prevent the installation of any material, or the use or operation of appliances, equipment, systems, or method, or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative shall be *approved* where the *code official* finds that the proposed alternative is satisfactory and complies with the intent of the provisions of this code, and that the alternative is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, *fire resistance*, durability and safety. ~~use of any material, method of construction, design or insulating system not specifically prescribed herein, provided that such construction, design or insulating system has been *approved* by the *code official* as meeting the intent of this code.~~

102.6.1 Matters regulated by the *International Building Code.* Approvals under the authority herein contained shall be subject to the approval of the *building official* whenever the alternative involves matters regulated by the *International Building Code*.

102.7 Requirements not covered by code. Requirements necessary for the strength, stability, or proper operation of an existing or proposed fixture, structure, or equipment, or for the public safety, health, and general welfare, not specifically covered by this code, shall be determined by the *code official*.

102.8 Subjects not regulated by this code. Where no applicable standards or requirements are set forth in this code, or are contained within other laws, codes, regulations, ordinances, or bylaws adopted by the jurisdiction, compliance with applicable nationally recognized standards, as *approved*, shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the *code official* to determine compliance with codes or standards for those activities or installations within the *code official's* jurisdiction or responsibility.

102.9 ~~**103.3.2**~~ **Previous approvals.** This code shall not require changes in the construction documents, construction or designated occupancy of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

102.10 Contractor's responsibilities. Every contractor who enters into contracts for which a permit is required shall comply with the state and local rules and regulations concerning licensing.

102.11 Specific application of this code. The following are application specific to this code.

102.11.1 ~~101.5~~ Compliance. *Residential buildings* shall meet the provisions of Chapter 4. *Commercial buildings* shall meet the provisions of Chapter 5.

102.11.2 ~~102.1.1~~ Above code programs. The *code official* or other authority having jurisdiction shall be permitted to deem a national, state or local energy efficiency program to exceed the energy efficiency required by this code. Buildings *approved* in writing by such an energy efficiency program shall be considered in compliance with this code. The requirements identified as "mandatory" in Chapters 4 and 5 of this code, as applicable, shall be met.

102.11.3 ~~101.5.2~~ Low energy buildings. The following buildings, or portions thereof, separated from the remainder of the building by *building thermal envelope* assemblies complying with this code shall be exempt from the *building thermal envelope* provisions of this code:

1. Those with a peak design rate of energy usage less than 3.4 Btu/h·ft^2 (10.7 W/m2) or 1.0 watt/ft2 (10.7 W/m2) of floor area for space conditioning purposes.
2. Those that do not contain *conditioned space*.

102.11.4 ~~101.4.3~~ Additions, alterations, renovations or repairs. Additions, alterations, renovations or repairs to an existing building, building system or portion thereof shall conform to the provisions of this code as they relate to new construction without requiring the unaltered portion(s) of the existing building or building system to comply with this code. Additions, alterations, renovations or repairs shall not create an unsafe or hazardous condition or overload existing building systems. An addition shall be deemed to comply with this code if the addition alone complies or if the existing building and addition comply with this code as a single building.

Exception: The following need not comply provided the energy use of the building is not increased:

1. Storm windows installed over existing fenestration.
2. Glass only replacements in an existing sash and frame.
3. Existing ceiling, wall or floor cavities exposed during construction provided that these cavities are filled with insulation.
4. Construction where the existing roof, wall or floor cavity is not exposed.
5. Reroofing for roofs where neither the sheathing nor the insulation is exposed. Roofs without insulation in the cavity and where the sheathing or insulation is exposed during reroofing shall be insulated either above or below the sheathing.
6. Replacement of existing doors that separate *conditioned space* from the exterior shall not require the installation of a vestibule or revolving door, provided, however, that an existing vestibule that separates a *conditioned space* from the exterior shall not be removed,
7. Alterations that replace less than 50 percent of the luminaires in a space, provided that such alterations do not increase the installed interior lighting power.
8. Alterations that replace only the bulb and ballast within the existing luminaires in a space provided that the *alteration* does not increase the installed interior lighting power.

102.11.5 ~~101.4.4~~ Change in occupancy or use. Spaces undergoing a change in occupancy that would result in an increase in demand for either fossil fuel or electrical energy shall comply with this code. Where the use in a space changes from one use in Table 505.5.2 to another use in Table 505.5.2, the installed lighting wattage shall comply with Section 505.5.

102.11.6 ~~101.4.5~~ Change in space conditioning. Any nonconditioned space that is altered to become *conditioned space* shall be required to be brought into full compliance with this code.

102.11.7 ~~101.4.6~~ Mixed occupancy. Where a building includes both *residential* and *commercial* occupancies, each occupancy shall be separately considered and meet the applicable provisions of Chapter 4 for *residential* and Chapter 5 for *commercial*.

PART 2—ADMINISTRATION AND ENFORCEMENT

SECTION 103
DEPARTMENT OF ENERGY CONSERVATION INSPECTION

103.1 General. The Department of Energy Conservation Inspection, herein referred to as "the department," is hereby established within the jurisdiction under the direction of the *code official*. The function of the department shall be the implementation, administration and enforcement of the provisions of this code.

103.2 Appointment. The *code official* shall be appointed by the chief appointing authority of the jurisdiction.

103.3 Deputies. In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the *code official* shall have the authority to appoint a deputy *code official*, related technical officers, inspectors, and other employees. Such employees shall have powers as delegated by the *code official*.

103.4 Liability. The *code official*, member of the board of appeals, officer or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally, and is hereby relieved from all personal liability for any damage accruing to *persons* or property as a result of an act or by reason of an act or omission in the discharge of official duties.

103.5 Legal defense. Any suit instituted against an officer or employee of the department because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings. The *code official* or any subordinate shall not be liable for costs in an action, suit or proceeding that is instituted in pursuance of the provisions of this code. Any officer or employee, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith.

SECTION 104
DUTIES AND POWERS OF CODE OFFICIAL

104.1 General. The *code official* is hereby authorized and directed to enforce the provisions of this code. The *code official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies, and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

104.2 Applications and permits. The *code official* shall receive applications, review *construction documents,* issue *permits* required by this code, inspect the premises for which such *permits* have been issued, and enforce compliance with the provisions of this code.

104.3 Notices and orders. The *code official* shall issue all necessary notices or orders to ensure compliance with this code.

104.4 Inspections. The *code official* shall make all of the required inspections, or the *code official* shall have the authority to accept reports of inspection by *approved agencies* or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such *approved agency* or by the responsible individual. The *code official* is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

104.5 Identification. The *code official* shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

104.6 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the *code official* has reasonable cause to believe that there exists in a structure or upon a premises a condition which is contrary to or in violation of this code which makes the structure or premises unsafe, dangerous, or hazardous, the *code official* is authorized to enter the structure or premises at reasonable times to inspect or to perform the duties imposed by this code, provided that if such structure or premises be occupied, that credentials be presented to the occupant and entry requested. If such structure or premises is unoccupied, the *code official* shall first make a reasonable effort to locate the owner or other person having charge or control of the structure or premises and request entry. If entry is refused, the *code official* shall have recourse to the remedies provided by law to secure entry.

104.6.1 Warrant. When the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner or occupant or person having charge, care or control of the structure or premises shall not fail or neglect, after proper request is made as herein provided, to promptly permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

104.7 Department records. The *code official* shall keep official records of applications received, *permits* and certificates issued, fees collected, reports of inspections, and notices and orders issued. Such records shall be retained in the official records for the period required for retention of public records.

104.8 Assistance of other agencies. The code official is authorized to request, and shall receive so far as is required in the discharge of the duties described in this code, the assistance and cooperation of other officials of the jurisdiction.

104.9 Specific duties. The following are specific duties of the code official. [JURISDICTION TO INSERT CODE OFFICIAL DUTIES SPECIFIC TO THIS CODE]

SECTION 105
PERMITS

105.1 Permit required. Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to construct, erect, install, enlarge, alter, repair, remove, convert, or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the *code official* and obtain the required *permit* for the project. Where laws or regulations are enforceable by other agencies or departments, approval shall be obtained from all agencies or departments concerned.

105.1.1 Annual permit. In lieu of an individual *permit* for each *alteration* to an already *approved* electrical, gas, mechanical or plumbing installation, the *code official* is authorized to issue an annual *permit* upon application therefor to any person, firm or corporation regularly employing one or more qualified tradespersons in the building, structure, or on the premises owned or operated by the applicant for the *permit*.

105.1.1.1 Annual permit records. The person to whom an annual *permit* is issued shall keep a detailed record of *alterations* made under such annual *permit*. The *code official* shall have access to such records at all times, or such records shall be filed with the *code official* as designated.

105.1.2 Emergency repairs. Where equipment replacements and repairs must be performed in an emergency situation, the *permit* application shall be submitted within the next working business day to the *code official*.

105.1.3 Permits specifically required. The following specifically require a permit. [JURISDICTION TO INSERT SPECIFIC ITEMS REQUIRING A PERMIT FOR THIS CODE]

105.2 Permit not required. Exemptions from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. *Permits* shall not be required in accordance with Sections 105.2.1 through 105.2.3.

105.2.1 Repairs. Application or notice to the *code official* is not required for ordinary repairs to structures, replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required *means of egress*, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include *addition* to, *alteration* of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

105.2.2 Public service agencies. A *permit* shall not be required for the installation, *alteration,* or repair of generation, transmission, distribution, or metering or other related equipment that is under the ownership and control of public service agencies by established right.

105.2.3 Specific exemption. The following are specifically exempt from requiring a permit. [JURISDICTION TO INSERT SPECIFIC ITEMS EXEMPT FROM PERMITS FOR THIS CODE]

105.3 Application for permit. To obtain a *permit*, the applicant shall first file an application therefor in writing on a form furnished by the department for that purpose. Such application shall:

1. Identify and describe the project to be covered by the *permit* for which application is made.
2. Describe the land on which the proposed project is to be done by legal description, street address or similar description that will readily identify and definitely locate the proposed building or project.
3. Indicate the use and occupancy for which the proposed project is intended.
4. Be accompanied by *construction documents* and other information as required in Section 106.
5. State the valuation of the proposed project.
6. Be signed by the applicant, or the applicant's authorized agent.
7. Give such other data and information as required by the *code official*.

105.3.1 Permit valuations. *Permit* valuations required under Section 105.3(5) shall include total value of the project, including materials and labor, and electrical, gas, mechanical, plumbing equipment and other permanent systems for which the *permit* is being issued. If, in the opinion of the *code official*, the valuation is underestimated on the application, the *permit* shall be denied, unless the applicant can show detailed estimates to meet the approval of the *code official*. Final building *permit* valuation shall be set by the *code official*.

105.4 Action on application. The *code official* shall examine or cause to be examined applications for *permits* and amendments thereto within a reasonable time after filing. If the application or the *construction documents* do not conform to the requirements of pertinent laws, the *code official* shall reject such application in writing, stating the reasons therefor. If the *code official* is satisfied that the proposed project conforms to the requirements of this code and laws and ordinances applicable thereto, the *code official* shall issue a *permit* therefor as soon as practicable. Where laws or regulations are enforceable by other agencies or departments, approval shall be obtained from all agencies or departments concerned.

105.4.1 Preliminary inspection. Before a permit is issued, the code official is authorized to inspect and evaluate the systems, *equipment*, buildings, devices, premises and spaces or areas to be used.

105.4.2 ~~103.3.3 Phased approval~~ Conditional permits. The *code official* ~~shall have the authority~~ is authorized to issue a permit for the construction or operation of part of ~~an energy conservation system~~ the project such as the construction of foundations or any other part of a building or structure, or installation of systems or materials, or operation before the construction documents for the entire project ~~system~~ have been submitted or *approved*, provided adequate information and detailed statements have been filed complying with ~~all~~ pertinent requirements of this code. The holders of such permit shall proceed only to the point for which approval has been given, at ~~their~~ the permit holder's own risk, and without assurance that ~~the~~ a permit for the entire project ~~energy conservation system~~ will be granted.

105.4.2 Conditional permits. The code official shall have the authority to issue a permit for the construction or operation of part of a project before the *construction documents* for the entire installation have been submitted or *approved*, provided adequate information and detailed statements have been filed complying with all pertinent requirements of this code. The holder of a conditional permit shall proceed only to the point for which approval has been given, at the permit holder's own risk, and without assurance that the permit for the entire project will be granted.

105.5 Time limitation of application. An application for a *permit* for any proposed project shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a *permit* has been issued. The *code official* is authorized to grant one or more extensions of time for additional periods not exceeding 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

105.6 Validity of permit. The issuance or granting of a *permit* shall not be construed to be a *permit* for, or an approval of, any violation of any of the provisions of this code or of any other ordinance of the jurisdiction. *Permits* presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a *permit* based on *construction documents* and other data shall not prevent the *code official* from requiring the correction of errors in the *construction documents* and other data.

105.7 Extensions of permit. For an unexpired permit the *code official* is authorized to grant, in writing, one or more extensions of the time, for periods of not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

105.8 Expiration of permit. Every *permit* issued shall become invalid unless the work on the site authorized by such *permit* is commenced within 180 days after its issuance, or if the work authorized on the site by such *permit* is suspended or abandoned for a period of 180 days after the time the work is commenced.

105.8.1 Recommencement of work. Before such work covered under an expired permit recommences, a new permit shall be first obtained. The new permit shall be issued provided no changes have been made or will be made in the original construction documents for such work, and provided further that such suspension or abandonment has not exceeded one year.

105.9 Suspension or revocation of permit. The *code official* is authorized to suspend or revoke a *permit* issued under the provisions of this code whenever the *permit* is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or regulation or any of the provisions of this code.

105.10 Posting of permit. Issued permits or copy thereof shall be kept on the site of the project until the completion of the project.

SECTION 106 ~~103~~
~~CONSTRUCTION~~ SUBMITTAL DOCUMENTS
~~REFERENCED STANDARDS~~

106.1 ~~103.1~~ General. Submittal documents consisting of construction documents and other supporting data shall be submitted in ~~one~~ two or more sets with each application for a permit, and in such form and detail as required by the *code official*. The *code official* shall require construction documents and other data ~~shall~~ to be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official* is authorized to require necessary construction documents to be prepared by a registered design professional.

Exception: The *code official* is authorized to waive the submission of ~~requirements for~~ *construction documents* or other ~~supporting~~ data not required to be prepared by a *registered design professional* if the nature of the work applied for is such that review of *construction documents* is ~~if the *code official* determines they are~~ not necessary to ~~confirm~~ obtain compliance with this code.

106.2 Construction documents. *Construction documents* shall be in accordance with Sections 106.2.1 through 106.2.4.

106.2.1 ~~103.2~~ Information on construction documents. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the proposed project, and show in detail that the proposed project will conform to the provisions of this code and relevant laws, ordinances, rules, and regulations, as determined by the *code official*. ~~drawn~~ Plans shall be to scale ~~upon~~ and be on suitable material. Electronic media documents are permitted to be submitted when *approved* by the *code official*. ~~Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed.~~

~~**101.5.1 Compliance materials.** The *code official* shall be permitted to approve specific computer software, worksheets, compliance manuals and other similar materials that meet the intent of this code.~~

106.2.1.1 Specific information required. Where the quality of the materials is essential for conformity to this code, specific information shall be given to establish such quality. The terms “this code” or “legal” or “its equivalent” shall not be cited or used as a substitute for specific information.

106.2.2 Site plan. The *construction documents* submitted with the application for *permit* shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from *lot lines*, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and *design flood* elevations. The site plan shall be drawn in accordance with an accurate boundary line survey.

106.2.2.1 Site plan for demolition. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot.

106.2.2.2. Waiver of site plan. The *code official* is authorized to waive or modify the requirement for a site plan when the application for *permit* is for *alteration* or repair or when otherwise warranted.

106.2.3 Specific Information. The following are specific requirements for submittal documents required by this code.

106.2.3.1 Details on construction documents shall include, but are not limited to the following, as applicable:

1. Insulation materials and their *R*-values;
2. Fenestration *U*-factors and SHGCs;
3. Area-weighted *U*-factor and SHGC calculations;
4. Mechanical system design criteria;
5. Mechanical and service water heating system and equipment types, sizes and efficiencies;
6. Economizer description;
7. Equipment and systems controls;
8. Fan motor horsepower (hp) and controls;
9. Duct sealing, duct and pipe insulation and location;
10. Lighting fixture schedule with wattage and control narrative; and
11. Air sealing details.

106.2.4 Design professional in responsible charge. When it is required that documents be prepared by a *registered design professional*, the *code official* shall be authorized to require the owner to engage and designate on the building *permit* application a *registered design professional* who shall act as the *registered design professional in responsible charge*. If the circumstances require, the owner shall designate a substitute *registered design professional in responsible charge* who shall perform the duties required of the original *registered design professional in responsible charge*. The *code official* shall be notified in writing by the owner if the *registered design professional in responsible charge* is changed or is unable to continue to perform the duties.

106.2.4.1 Responsibility. The *registered design professional in responsible charge* shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

106.2.4.2 Observation. Where structural observation is required, the inspection program shall name the individual or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur.

106.3 Deferred submittals. For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the *code official* within a specified period.

106.3.1 Prior approval. Deferral of any submittal items shall have the prior approval of the *code official*. The *registered design professional in responsible charge* shall list the deferred submittals on the *construction documents* for review by the *code official*.

106.3.2 Review. Documents for deferred submittal items shall be submitted to the *registered design professional in responsible charge* who shall review them and forward them to the *code official* with a notation indicating that the deferred submittal documents have been reviewed and been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the deferred submittal documents have been *approved* by the *code official*.

106.4 ~~103.3~~ Examination of documents. The *code official* shall examine or cause to be examined the ~~accompanying construction~~ submittal documents and shall ascertain by such examinations whether the project ~~construction~~ indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

106.5 ~~103.3.1~~ Approval of construction documents. When the *code official* issues a permit ~~where construction documents are required~~, the construction documents shall be endorsed, in writing ~~and~~ or by stamped, as "APPROVED ~~Reviewed for Code Compliance~~." One set of *construction documents* and other data so reviewed shall be retained by the *code official*. The other set(s) shall be returned to the applicant. One set shall be kept at the site of the project and shall be open to inspection by the *code official* or a duly authorized representative. Such *approved* construction documents shall not be changed, modified or altered without authorization from the *code official*. All work shall be done in accordance with the *approved* construction documents. ~~One set of construction documents so reviewed shall be retained by the *code official*. The other set shall be returned to the applicant, kept at the site of work and shall be open to inspection by the *code official* or a duly authorized representative.~~

106.6 ~~103.4~~ Amended construction documents. Any changes made during construction that are not in compliance with the *approved* construction documents shall be resubmitted for approval as an amended set of construction documents.

106.7 ~~103.5~~ Retention of construction documents. One set of *approved* construction documents shall be retained by the *code official* for a period of not less than 180 days from date of completion of the permitted project ~~work~~, or for the period required for retention of public records ~~as required by state or local laws~~.

SECTION 107
MODIFICATIONS, TESTING, AND APPROVAL

107.1 Modifications. Wherever there are practical difficulties involved in carrying out the provisions of this code, and upon application of the owner or owner's representative, the *code official* shall have the authority to grant modifications for individual cases, provided the *code official* shall first find that special individual reason makes the strict letter of this code impractical and the modification is in conformance with the intent and purpose of this code, and that such modification does not lessen health, life and fire safety, accessibility, or structural requirements. The details of action granting modifications shall be recorded and entered in the files of the department.

107.2 Approved materials and equipment. All materials, equipment, and devices *approved* by the *code official* shall be constructed and installed in accordance with such approval.

107.3 Used materials, appliances and equipment. The use of used materials that meet the requirements of this code for new materials is permitted. Used appliances, equipment and devices shall not be reused unless such elements are in good repair or have been reconditioned and tested when necessary, placed in good and proper working condition, and *approved* by the *code official*.

107.4 Listed and labeled material and appliances. Listed and labeled materials, equipment, and appliances shall be used and installed in accordance with the conditions the listing and the manufacturer's instructions.

107.5 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

107.6 Technical assistance. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, or to determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building or premises, the *code official* shall have the authority to require tests conducted, or a technical opinion, recommendation or report be submitted as evidence of compliance. The tests, opinions, recommendations and reports shall be made at no expense to the jurisdiction.

107.6.1 Preparation. The technical reports and opinions shall be prepared by a qualified engineer, approved specialist or specialty organization, or an *approved agency*.

107.6.2 Test methods. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the code official shall approve the testing procedures.

107.6.3 Testing agency. All tests shall be performed by an *approved agency*.

107.6.4 Retention of reports. The technical opinions, recommendation, reports and test results shall be retained by the code official for the period required for retention of public records.

SECTION 108 ~~104~~
INSPECTIONS

108.1 ~~104.1~~ General. Construction or work on a project for which a *permit* is required shall be subject to inspection by the *code official* and such construction or work shall remain accessible and exposed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the *permit* applicant to cause the construction or work to remain accessible and exposed for inspection purposes. Neither the *code official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

108.1.1 Replacement of existing appliance. The requirements of this section shall not be considered to prohibit the operation of any heating or cooling *equipment* or appliances installed to replace such existing *equipment* or appliances serving an occupied portion of a structure provided that a request for inspection of such *equipment* or appliances has been filed with the department not more than 48 hours after such replacement work is completed, and before any portion of such *equipment* or appliances is concealed by any permanent portion of the structure.

~~**104.2 Required approvals.** Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the *code official*. The *code official*, upon notification, shall make the requested inspections and shall either indicate the portion of the construction that is satisfactory as completed, or notify the permit holder or his or her agent wherein the same fails to comply with this code. Any portions that do not comply shall be corrected and such portion shall not be covered or concealed until authorized by the *code official*.~~

108.2 Required inspections and testing. The *code official*, upon notification, shall make the inspections and require the tests set forth in Sections 108.2.1 through 108.2.4.

108.2.1 Specific inspections. The following are specific inspections and tests required by this code.

108.2.1.1 Energy efficiency inspections. Inspections shall be made to determine compliance with this code and shall include, but not be limited to, inspections for envelope insulation *R*- and *U*-values, fenestration *U*-value, duct system *R*-value, and HVAC and water-heating equipment efficiency.

108.2.2 Other inspections. In addition to the inspections specified above, the *code official* is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department.

108.2.3 Special inspections. Special inspection shall be as required by this code, the *International Building Code*, or the *International Fire Code* as applicable.

108.2.4 ~~104.3~~ Final inspection. A final inspection shall be made after all work on a project required by the *permit* is completed. ~~The building shall have a final inspection and not be occupied until *approved*.~~

~~**104.4 Reinspection.** A building shall be reinspected when determined necessary by the *code official*.~~

~~**104.7 Reinspection and testing.** Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.~~

108.3 ~~104.5 Approved~~ Inspection agencies. The *code official* is authorized to accept reports of *approved* inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.

108.4 ~~104.6~~ Inspection requests. It shall be the duty of the holder of the permit or their duly authorized agent to notify the *code official* when a project ~~work~~ is ready for inspection. It shall be the duty of the permit holder to provide access to and means for inspections of such work that are required by this code.

108.4.1 Manufacturer's instructions. Manufacturer's instructions for equipment, appliances, and materials installed under the permit shall be available on the work site at the time of inspection.

108.5 ~~104.8~~ Approval required. Work on a project shall not proceed beyond the point indicated in each successive inspection without first obtaining the approval of the *code official*. The *code official*, upon notification, shall make the requested inspections and shall either determine the portion of the project that is satisfactory as completed, or shall notify the *permit* holder or authorized agent wherein the same fails to comply with this code. Any portions of the project that do not comply shall be corrected and such portion shall not be covered, concealed, or used until authorized by the *code official*.

108.6 Notice of approval. After ~~the~~ all prescribed ~~tests and~~ inspections or tests indicate ~~that~~ the project ~~work~~ complies ~~in all respects~~ with this code, a ~~notice of approval~~ certificate of completion complying with Section 109 shall be issued by the *code official*.

~~**104.8.1 Revocation.** The *code official* is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the certificate is issued in error, or on the basis of incorrect information supplied, or where it is determined that the building or structure, premise, or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.~~

SECTION 109
CERTIFICATE OF COMPLETION AND OCCUPANCY

109.1 Use and occupancy. No building, structure, or premises or portion thereof shall be used or occupied until the code official has issued a certificate of occupancy as provided herein. No equipment, appliance or system used, and no change in the existing occupancy classification of a building, structure, premise or portion thereof shall be made until the code official has issued a certificate of completion as provided herein.

Exceptions:

1. Occupancy shall be permitted during **e**mergency situations as described under Section 105.1.
2. Certificates of completion or occupancy are not required for work exempt from permits under Section 105.2.
3. Occupancy shall be permitted during the replacement of existing appliances as described under Section 108.1.1.
4. Certificates of occupancy are not required for one-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m^2).

109.1.1 Validity. Issuance of a certificate of completion or occupancy shall not be construed as an approval of a violation of the provisions of this code or of other pertinent laws and ordinances of the jurisdiction. Certificates presuming to give authority to violate or cancel the provisions of this code or other laws or ordinances of the jurisdiction shall not be valid.

109.2 Certificate issued. After the *code official* inspects a project requiring a permit and finds no violations of the provisions of this code or other laws that are enforced by the department, the *code official* shall issue a certificate of completion. After all certificates of completion have been issued by other departments or agencies concerned, the code official shall issue a certificate of occupancy where applicable. A certificate of completion or occupancy shall contain the following:

1. The *permit* number.
2. The address of the premises or structure.
3. The name and address of the owner.
4. A description of the project for which the certificate is issued.
5. A statement that the described project has been inspected for compliance with the requirements of this code.
6. The name of the *code official*.
7. The edition of the code under which the *permit* was issued.
8. The use and occupancy in accordance Chapter 3 of the *International Building Code*.
9. The type of construction as defined in Chapter 6 of the *International Building Code*.
10. The design *occupant load*.
11. If fire protection systems are provided, whether the fire protection systems are required.
12. Any special stipulations and conditions of the *permit*.

Exceptions:

1. A certificate of completion or occupancy shall not be required to indicate the items under Section 109.2, Items 8, 9, and 10 for detached one- and two family dwellings and multiple single-family *dwellings* (*townhouses)* constructed using the International Residential Code.
2. The *code official* is shall not be required to indicate on a certificate items under Section 109.2, Items Exceptions 8, 9, and 10 for the installation of equipment, appliances or systems.

109.3 Temporary occupancy. The code official is authorized to issue a temporary certificate of occupancy before the completion of the entire work covered by the permit, provided that such portion or portions shall be occupied safely and without endangerment to life or public welfare. The temporary certificate shall indicate any limitations or restrictions necessary to keep the permit area safe, and items required to obtain the final certificate of occupancy. The code official shall set a time period during which the temporary certificate of occupancy is valid.

109.4 Revocation. The code official is authorized to, in writing, suspend or revoke a certificate of completion or occupancy issued under the provisions of this code wherever the certificate is issued in error on the basis of incorrect information supplied, or where it is determined that the building, structure, premise, or portion thereof, or installation of appliance, equipment or system is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION 110 ~~108~~
STOP WORK ORDER

110.1 ~~108.1~~ Authority. Whenever the *code official* finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or dangerous or unsafe, the *code official* is authorized to issue a stop work order.

110.2 ~~108.2~~ Issuance. The stop work order shall be in writing and shall be given to the owner of the property involved, or to the owner's agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order, and the conditions under which the cited work will be permitted to resume.

110.2.1 ~~108.3~~ Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

110.3 ~~108.4 Failure to comply~~ Unlawful continuance. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fees, fines, or penalties as prescribed by this code or other laws or ordinances of the jurisdiction ~~liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars~~.

SECTION 111
VIOLATIONS

111.1 Code violations. No person, association, organization, or business entity of any form shall:

1. Erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or premises in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
2. Install or operate any equipment, appliances, or systems regulated by this code that is in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
3. Be non-compliant with the conditions of any permit or certificate issued under the auspices of this code; or
4. Tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*.

111.2 Notice of violation. A *code official* who observes or becomes aware of any code violation shall serve upon the responsible person, association, organization, or business entity a written notice in accordance with Section 111.2.1. In the absence of direct knowledge as to the identity or location of the responsible party, the *code official* shall serve the notice upon the property owner. Service may be effected by personal delivery, first class mail, substituted service, or such other means that may be authorized by state and/or local law.

111.2.1 Form of notice. Such notice of violation shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the violation into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties in accordance with Section 111.3.

111.3 Penalties. Violators who fail to comply with a notice to discontinue or abate a condition in violation of this code, and violators who tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*, shall be subject to the penalties set forth in this code as may be adopted and authorized by state and/or local law.

SECTION 112 ~~109~~
~~BOARD~~ MEANS OF APPEALS

112.1 Application for appeal. Any person directly affected by a decision of the *code official* or a notice or order issued under this code shall have the right to appeal to the board of appeals, provided that a written application for appeal is filed within 20 days after the day the decision, notice or order was served. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or the requirements of this code are adequately satisfied by other means.

112.1.1 Stays of enforcement. The filing of an appeal of notice or orders, except for notice or order concerning *Imminent Danger*, shall stay the enforcement of the notice or order until the appeal is heard by the board of appeals.

112.2 Membership of board. The board of appeals shall consist of five members who are qualified by experience and training to pass on matters pertaining to the provisions of this code. The board shall be appointed by the chief appointing authority, and shall serve staggered and overlapping terms.

112.2.1 Alternate members. The chief appointing authority shall appoint two or more alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership and shall be appointed for five years, or until a successor has been appointed.

112.2.2. An employee of the jurisdiction shall not be a member of the board of appeals. The *code official* shall be an ex officio member of the board but shall have no vote on any matter before the board.

112.2.3 Chairman. The board shall annually select one of its members to serve as chairman.

112.2.4 Secretary. The chief administrative officer shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

112.2.5 Qualifications. The board of appeals shall consist of five individuals, one from each of the following professions or disciplines:

1. Registered design professional who is a registered architect; or a builder or superintendent of building construction with at least 10 years' experience, five of which shall have been in responsible charge of work.
2. Registered design professional with structural engineering or architectural experience.
3. Registered design professional with fuel gas and plumbing engineering experience; or a fuel gas contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
4. Registered design professional with electrical engineering experience; or an electrical contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
5. Registered design professional with fire protection engineering experience; or a fire protection contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.

112.2.6 Disqualification of member. A member shall not hear an appeal in which that member has a personal, professional or financial interest.

112.2.7 Terms. The initial members of the board of appeals shall serve as follows: one for five years; one for four years; one for three years; one for two years and one for one year. Thereafter, each new member shall serve for five years or until a successor has been appointed.

112.2.8 Compensation of members. Compensation of members shall be determined by law.

112.3 Hearings and meetings. Hearings on appeals and other meetings of the board of appeals shall be held in conformance with Sections 109.3.1 through 109.3.3.

112.3.1 Procedures. The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

112.3.2 Notice. The board shall hold a hearing upon notice from the chairman, within 10 days of the filing of an appeal, or at stated periodic meetings.

112.3.3 Open hearing. All hearings before the board shall be open to the public. A quorum shall consist of not less than two-thirds of the board membership. The appellant, the appellant's representative, the *code official* and any person whose interests are affected shall be given an opportunity to be heard.

112.3.4 Postponed hearing. When the full board is not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

112.4 Board decision. The board shall modify or reverse the decision of the *code official* by a concurring vote of a majority of the total number of appointed board members.

112.4.1 Resolution. The decision of the board shall be by resolution. Certified copies shall be furnished to the appellant and to the code official.

112.4.2 Action by code official. The *code official* shall take immediate action in accordance with the decision of the board.

112.5 Court review. Any person, whether or not a previous party to the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

~~**109.1 General.** In order to hear and decide appeals of orders, decisions or determinations made by the *code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The *code official* shall be an ex officio member of said board but shall have no vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *code official*.~~

~~**109.2 Limitations on authority.** An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The board shall have no authority to waive requirements of this code.~~

~~**109.3 Qualifications.** The board of appeals shall consist of members who are qualified by experience and training and are not employees of the jurisdiction.~~

SECTION 113 ~~107~~
FEES

113.1 ~~107.1~~ Payment of Fees. A permit or an amendment to a permit shall not be issued until the fees prescribed in Section 113.2 ~~107.2~~ have been paid~~, nor shall an amendment to a permit be released until the additional fee, if any, has been paid~~.

113.2 Fee schedule. The fees for permits and other considerations shall be in accordance with the following schedule: [JURISDICTION TO INSERT APPROPRIATE FEE SCHEDULE]

~~**107.2 Schedule of permit fees.** A fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.~~

113.3 ~~107.4~~ Related fees. The payment of the fee for ~~the construction, *alteration*, removal or demolition of~~ work done in connection to or concurrently with the work ~~or activity~~ authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.

113.4 ~~107.3~~ Work commencing before permit issuance. Any person who commences any work on a project requiring a *permit* before obtaining the necessary permits shall be subject to ~~an additional~~ a fee established by the *code official*, ~~which~~ that shall be in addition to the required permit fees.

113.5 Permit extension. The fee for an extension of a permit in conformance with Section 105.7 shall be one-half the amount required for a new permit for such work.

113.6 Expiration of permit. For permits that have expired, and before such work recommences in conformance with Section 105.8.1, the fee to recommence work shall be one-half the amount required for a new permit for such work.

113.7 Stop work order. Any person who shall continue any work on a project requiring a permit after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.

113.8 Reinspection fee. A reinspection of work not in compliance with this code shall be subject to a fee established by the *code official* that shall be in addition to the required *permit* fees. The fee may be assessed when the *approved* plans are not readily available to the inspector, for failure to provide access on the date for which inspection is requested, for work deviating from the approved, or the work or test is not in compliance with this code.

~~**107.5 Refunds.** The *code official* is authorized to establish a refund policy.~~

113.9 Fee refunds. The code official shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment. The code official shall authorize the refunding of fees as follows:

1. The full amount of any fee paid hereunder which was erroneously paid or collected.
2. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.
3. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid when no work on a project has been performed under a permit issued in accordance with this code.

(SECTIONS 114 THROUGH 119 RESERVED)

PART 3 – GENERAL REQUIREMENTS

SECTION 120
UNSAFE STRUCTURES, EQUIPMENT, AND CONDITIONS

120.1 General. If any building, structure, premises or part thereof, or appliance, equipment, or system is found to be unsafe by the *code official*, or found in the case of a building or structure to be unfit for human occupancy, the condition shall be abated whenever possible, but if abatement is not achieved or is non-achievable, then condemnation shall be undertaken in accordance with the provisions of this code.

120.1.1 Notice to building official. Abatement requiring repairs, *alterations*, remodeling, removing or demolition shall be referred to the *building official*.

120.1.2 Unsafe structures. An unsafe structure is a structure that is dangerous to the life, health, or safety of the public or to the *occupants* when:

1. There are no minimum safeguards provided to protect or warn *occupants* in the event of fire; or
2. Such structure contains unsafe equipment or is so damaged, decayed, dilapidated, is structurally unsound, is of such faulty construction, or has such an unstable foundation, that partial or complete collapse is possible.

120.1.3 Unsafe equipment. Unsafe equipment includes any boiler, heating equipment, elevator, moving stairway, electrical wiring or device, flammable liquid containers or other equipment on the *premises* or within the structure which is in such disrepair or condition that such equipment constitutes a hazard to life, health, property or safety of the public or the *occupants* of the *premises* or structure.

120.1.4 Structure unfit for human occupancy. A structure is unfit for human *occupancy* whenever the *code official* finds that such structure is unsafe, is unlawful or, because its degree of disrepair, or its want of maintenance, is unsanitary, vermin or rat infested, filthy and contaminated, lacking *ventilation*, illumination, sanitary, heating facilities or other essential equipment required by this code, or because the structure is in proximity to an unsafe or dangerous condition that constitutes a hazard to the *occupants* of the structure or to the public.

120.1.5 Unlawful structure. An unlawful structure is one found in whole or in part to be occupied by more persons than permitted under this code, or was erected, altered or occupied contrary to this code.

120.1.6 Structure and premise that are dangerous to the life, health or safety of the public or occupants. For the purpose of this code, any structure or *premises* that have any or all of the following conditions or defects shall be considered dangerous, and shall constitute an unsafe structure:

1. Any door, aisle, passageway, stairway, exit or other means of egress that does not conform to the *approved* building or fire code of the jurisdiction as related to the requirements for existing buildings.
2. The walking surface of any aisle, passageway, stairway, exit or other means of egress is so warped, worn loose, torn or otherwise unsafe as to not provide safe and adequate means of egress.
3. Any portion of a building, structure or appurtenance that has been damaged by fire, earthquake, wind, flood, *deterioration*, *neglect*, abandonment, vandalism or by any other cause to such an extent that it is likely to partially or completely collapse, or to become *detached* or dislodged.
4. Any portion of a building, or any member, appurtenance or ornamentation on the exterior thereof that is not of sufficient strength or stability, or is not so *anchored*, attached or fastened in place so as to be capable of resisting natural or artificial loads of one and one-half the original designed value.
5. The building or structure, or part of the building or structure, because of dilapidation, *deterioration*, decay, faulty construction, the removal or movement of some portion of the ground necessary for the support, or for any other reason, is likely to partially or completely collapse, or some portion of the foundation or underpinning of the building or structure is likely to fail or give way.
6. The building or structure, or any portion thereof, is clearly unsafe for its use and *occupancy*.
7. The building or structure is *neglected*, damaged, dilapidated, unsecured or abandoned so as to become an attractive nuisance to children who might play in the building or structure to their danger, becomes a harbor for vagrants, criminals or immoral persons, or enables persons to resort to the building or structure for committing a nuisance or an unlawful act.
8. Any building or structure has been constructed, exists or is maintained in violation of any specific requirement or prohibition applicable to such building or structure provided by the *approved* building or fire code of the jurisdiction, or of any law or ordinance to such an extent as to present either a substantial risk of fire, building collapse or any other threat to life and safety.

9. A building or structure, used or intended to be used for dwelling purposes, because of inadequate maintenance, dilapidation, decay, damage, faulty construction or arrangement, inadequate light, *ventilation*, mechanical or plumbing system, or otherwise, is determined by the *code official* to be unsanitary, unfit for human habitation or in such a condition that is likely to cause sickness or disease.
10. Any building or structure, because of a lack of sufficient or proper fire-resistance-rated construction, fire protection systems, electrical system, fuel connections, mechanical system, plumbing system or other cause, is determined by the *code official* to be a threat to life or health.
11. Any portion of a building remains on a site after the demolition or destruction of the building or structure or whenever any building or structure is abandoned so as to constitute such building or portion thereof as an attractive nuisance or hazard to the public.

120.2 Closing of vacant structures. If the structure is vacant and unfit for human habitation and *occupancy*, and is not in danger of structural collapse, the *code official* is authorized to post a placard of condemnation on the *premises* and order the structure closed up so as not to be an attractive nuisance. Upon failure of the *owner* to close up the *premises* within the time specified in the order, the *code official* shall cause the *premises* to be closed and secured through any available public agency or by contract or arrangement by private persons, and the cost thereof shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate that may be collected by any legal means.

120.3 Evacuation. The *code official* or the fire department official in charge of an emergency incident shall be authorized to order the immediate evacuation of any occupied building, structure or premises deemed unsafe due to hazardous conditions that present an imminent danger to occupants. *Persons* so notified shall immediately leave the structure or premises and shall not enter or re-enter until authorized to do so by the *code official* or the fire department official in charge of the incident.

120.4 Notice. Whenever the *code official* has *condemned* a structure or equipment under the provisions of this section, notice shall be posted in a conspicuous place in or about the structure affected by such notice and served on the *owner* or the person or persons responsible for the structure or equipment in accordance with Section 120.4.2. If the notice pertains to equipment, it shall also be placed on the *condemned* equipment. The notice shall be in the form prescribed in Section 120.4.1.

120.4.1 Form of notice. Such notice of shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the unsafe condition into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties set forth in this code or as may be adopted and authorized by state and/or local law.

120.4.2 Service of notice. Such notice shall be deemed properly served if a copy thereof is (a) delivered to the owner personally; (b) sent by certified or registered mail addressed to the owner at the last known address with the return receipt requested; or (c) delivered in any other manner as prescribed by local law. If the certified or registered letter is returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice. Service of such notice in the foregoing manner upon the owner's agent or upon the person responsible for the structure shall constitute service of notice upon the owner.

120.5 Placarding. Upon failure of the owner or person responsible to comply with the notice provisions within the time given, the *code official* shall post on the premises or on defective equipment a placard bearing the word "UNSAFE" or "CONDEMNED" as applicable, and a statement of the penalties provided for occupying the premises, operating the equipment or removing the placard.

120.5.1 Placard removal. The *code official* shall remove the placard whenever the unsafe conditions have been eliminated. Any person who defaces or removes an unsafe condition placard without the approval of the *code official* shall be subject to the penalties provided for by the jurisdiction.

120.6 Prohibited occupancy. Any structure *condemned* and placarded by the *code official* shall be vacated as ordered by the *code official*. It shall be unlawful for any person to occupy or to allow others to occupy a placarded *premises,* or to operate or allow others to operate any placarded equipment.

120.7 Abatement. The owner, operator, or occupant of a building, structure, premises, or equipment deemed unsafe by the *code official* shall abate or correct such unsafe conditions either by repair, rehabilitation, demolition or other *approved* corrective action.

120.7.1 Summary abatement. Where conditions exist that are deemed an *imminent danger* as described in Section 121.1 that will necessarily result in injury to occupants or the public, the *code official* or fire department official in charge of the incident is authorized to summarily abate such unsafe or hazardous conditions.

120.8 Record. The *code official* shall cause a report to be filed on an unsafe condition. The report shall state the occupancy of the structure and the nature of the unsafe condition. The record of an unsafe condition as outlined herein shall be retained by the *code official* for the period required for retention of public records.

SECTION 121
EMERGENCY MEASURES

121.1 Imminent danger. When, in the opinion of the *code official*, there is imminent danger of failure or collapse of a building or structure that endangers life, or when any building or part of a building has fallen and life is endangered by the occupation of the building, or when there is actual or potential danger to the building occupants or those in the proximity of any structure because of explosives, explosive fumes or vapors, or the presence of toxic fumes, gases, or materials, or operation of defective or *dangerous* equipment, the *code official* is hereby authorized and empowered to order and require the occupants to vacate the premises forthwith. The *code official* shall cause to be posted at each entrance to such structure a notice reading as follows: "This Structure Is Unsafe and Its Occupancy Has Been Prohibited by the *Code Official*." It shall be unlawful for any person to enter such structure except for the purpose of securing the structure, making the required *repairs*, removing the hazardous condition, or of demolishing the same.

121.2 Temporary safeguards. Notwithstanding other provisions of this code, whenever, in the opinion of the *code official*, there is imminent danger due to an unsafe condition, the *code official* shall order the necessary work to be done, including the boarding up of openings, to render such structure temporarily safe whether or not the legal procedure herein described has been instituted; and shall cause such other action to be taken as the *code official* deems necessary to meet such emergency.

121.3 Closing streets. When necessary for public safety, the *code official* shall temporarily close structures and close or order the authority having jurisdiction to close sidewalks, streets, public ways, and places adjacent to unsafe structures, and prohibit the same from being utilized.

121.4 Emergency repairs. For the purposes of this section, the *code official* shall employ the necessary labor and materials to perform the required work as expeditiously as possible.

121.5 Costs of emergency repairs. Costs incurred in the performance of emergency work shall be paid by the jurisdiction. The legal counsel of the jurisdiction shall institute appropriate action against the owner of the premises where the unsafe structure is or was located for the recovery of such costs.

121.6 Hearing. Any person ordered to take emergency measures shall comply with such order forthwith. Any affected person shall thereafter, upon petition directed to the appeals board, be afforded a hearing as described in this code.

SECTION 122
SERVICE UTILITIES

122.1 Connection of service utilities. No person shall make connections from a utility, source of energy, fuel, power, water system or *sewer* system to any building, structure or system that is regulated by this code for which a permit is required, until approved by the *code official*.

122.2 Temporary connection. The *code official* shall have the authority to authorize the temporary connection of the building, structure or system to the utility source of energy, fuel, power, water system or *sewer* system.

122.3 Authority to disconnect service utilities. The *code official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or when such utility connection has been made without the approval required by Section 122.1 or 122.2. The *code official* shall notify the serving utility and, wherever possible, the owner and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

SECTION 123
TEMPORARY STRUCTURES, EQUIPMENT, SYSTEMS AND USES

123.1 General. The code official is authorized to issue a permit for temporary structures, equipment, systems and uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The code official is authorized to grant extensions for demonstrated cause.

123.2 Conformance. Temporary structures, equipment, systems and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.

123.3 Termination of approval. The code official is authorized to terminate such permit and to order the temporary structure, equipment, system or use to be discontinued.

SECTION 124
MAINTENANCE

124.1 Maintenance of safeguards. Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or any other feature is required for compliance with the provisions of this code, or otherwise installed, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be continuously maintained in accordance with this code and applicable referenced standards.

124.2 Testing and operation. Equipment requiring periodic testing or operation to ensure maintenance shall be tested or operated as specified in this code.

124.2.1 Test and inspection records. Required test and inspection records shall be available to the *code official* at all times, or such records as designates shall be filed with the *code official*.

124.2.2 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

124.3 Supervision. Maintenance and testing shall be under the supervision of a responsible *person* who shall ensure that such maintenance and testing are conducted at specified intervals in accordance with this code.

124.4 Rendering equipment inoperable. Portable or fixed fire-extinguishing systems or devices and fire-warning systems shall not be rendered inoperative or inaccessible except as necessary during emergencies, maintenance, repairs, *alterations*, drills or prescribed testing.

SECTION 125
DEMOLITION

125.1 General. The *code official* shall order the owner of any premises upon which is located any structure that in the *code official's* judgment is deteriorated or dilapidated, or has become so out of *repair* as to be *dangerous*, unsafe, insanitary, or otherwise unfit for human habitation or occupancy, and such that it is unreasonable to *repair* the structure, to demolish and remove such structure; or if such structure is capable of being made safe by *repairs*, to *repair* and make safe and sanitary, or to board up and hold for future repair, or to demolish and remove at the owner's option; or where there has been a cessation of normal construction of any structure for a period of more than two years, to board up and hold for recommencement of work, or to demolish and remove such structure. Boarding up the building for future repair or recommencement of work shall not extend beyond one year, unless *approved* by the *code official*.

125.2 Notices and orders. All notices and orders shall comply with Section 111.2.

125.3 Failure to comply. If the owner of a premises fails to comply with a demolition order within the time prescribed, the *code official* shall cause the structure to be demolished and removed, either through an available public agency or by contract or arrangement with private persons, and the cost of such demolition and removal shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate.

125.4 Salvage materials. When any structure has been ordered demolished and removed in accordance with Section 125.3, the governing body or other designated officer under said contract or arrangement aforesaid shall have the right to sell the salvage and valuable materials at the highest price obtainable. The net proceeds of such sale, after

deducting the expenses of such demolition and removal, shall be promptly remitted with a report of such sale or transaction, including the items of expense and the amounts deducted, for the person who is entitled thereto, subject to any order of a court. If such a surplus does not remain to be turned over, the report shall so state.

125.5 Existing remedies. The provisions in this code shall not be construed to abolish or impair existing remedies of the jurisdiction or its officers or agencies relating to the removal or demolition of any structure which is dangerous, unsafe or insanitary.

2. Revise and add the following definitions in the IECC:

ADDITION. An extension or increase in ~~the *conditioned space*~~ floor area, number of stories, or height of a building or structure.

ALTERATION. Any construction or renovation to an existing structure other than repair or addition that requires a permit~~. Also, a change in a mechanical~~ or a change in a mechanical, plumbing, fuel gas or other system that involves an extension, addition or change to the arrangement, type or purpose of the original installation that requires a permit.

APPLIANCE. A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.

APPROVED. Approval by the *code official* as a result of review, investigation ~~and~~ or tests conducted by ~~him or her~~ the code official, or by reason of accepted principles or tests by ~~nationally recognized~~ national authorities, or technical or scientific organizations.

APPROVED AGENCY. An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been *approved* by the *code official*.

BUILDING OFFICIAL. The officer or other designated authority charged with the administration and enforcement of the *International Building Code*, or a duly authorized representative.

CERTIFICATE OF COMPLETION. A certificate stating that the project or work for which a permit was issued has been completed in compliance with *approved construction documents* and the requirements of this code.

CONSTRUCTION DOCUMENTS. The written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of the project necessary for obtaining a permit.

EQUIPMENT OR FIXTURE. Any plumbing, heating, electrical, ventilating, air conditioning, refrigerating, and fire protection equipment, apparatus and devices, all piping, ducts, vents, control devices and other systems or components thereof, and elevators, dumb waiters, escalators, boilers, pressure vessels and other mechanical facilities or installations that are related to building services, any of which are specifically regulated in this code. Appliances as defined by this code shall not be considered equipment. Equipment or fixtures shall not include manufacturing, production, or process equipment, but shall include connections from building service to process equipment.

FIRE CODE OFFICIAL. The fire chief or other designated authority charged with the administration and enforcement of the code, or a duly authorized representative.

IMMINENT DANGER. A condition which could cause serious or life-threatening injury or death at any time.

LOT LINE. A line dividing one lot from another, or from a street or any public place.

PERMIT. An official document or certificate issued by the authority having jurisdiction which authorizes performance of a specified activity.

REGISTERED DESIGN PROFESSIONAL. An architect or engineer who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A *registered design professional* engaged by the owner to review and coordinate certain aspects of the project, as determined by the *building official*, for compatibility with the design of the building or structure, including submittal documents prepared by others, deferred submittal documents and phased submittal documents.

REPAIR. The reconstruction or renewal of any part of an existing building for the purpose of its maintenance.

STRUCTURE. That which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

TOWNHOUSE. A single-family *dwelling unit* constructed in a group of three or more attached units in which each unit extends from the foundation to roof and with open space on at least two sides.

PART IV – IFC

1. Revise IFC (Item 1-E) as follows:

CHAPTER 1
SCOPE AND ADMINISTRATION

PART 1 - SCOPE AND APPLICATION ~~GENERAL PROVISIONS~~

SECTION 101
GENERAL

101.1 Title. These regulations shall be known as the *Fire Code* of [NAME OF JURISDICTION], hereinafter referred to as "this code."

101.2 Scope. The provisions of this code shall apply ~~establishes regulations affecting or relating~~ to structures, processes, premises and safeguards regarding:

1. The hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices;
2. Conditions hazardous to life, property or public welfare in the occupancy of structures or premises;
3. Fire hazards in the structure or on the premises from occupancy or operation;
4. Matters related to the construction, extension, repair, alteration or removal of fire suppression or alarm systems;
5. Conditions affecting the safety of fire fighters and emergency responders during emergency operations.

101.3 Purpose ~~Intent~~. The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion, or dangerous conditions in new and existing buildings, structures, and premises, and to provide safety to fire fighters and emergency responders during emergency operations.

101.4 Severability. If a section, subsection, sentence, clause, or phrase of this code is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code.

101.5 Validity. In the event any part or provision of this code is held to be illegal or void, this shall not have the effect of making illegal or void ~~or illegal~~ any of the other parts or provisions hereof, which are determined to be legal; and it shall be presumed that this code would have been adopted without such illegal or invalid parts or provisions.

101.6 ~~102.11~~ Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state, or federal law.

SECTION 102
APPLICABILITY

~~102.10~~ 102.1 General ~~Conflicting provisions~~. Where there is a conflict between a general requirement and a specific requirement of this code, the specific requirement shall be applicable. Where, in a specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

~~102.1~~ 102.2 Application of references. References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

~~102.7~~ 102.3 Referenced codes and standards. The codes and standards referenced in this code shall be ~~those that are listed in Chapter 45 and such codes and standards shall be~~ considered part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between the provisions of this code and the referenced codes and standards, the provisions of this code shall apply.

Exception: Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing shall govern.

102.4 ~~101.2.1~~ Appendices. Provisions in the appendices shall not apply unless specifically adopted.

102.5 Existing structures and systems. The legal occupancy or use of any structure or installed system existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the *International Building Code,* or the *International Property Maintenance Code*, or as is deemed necessary by the *fire code official* for the general safety and welfare of the occupants and the public.

102.5.1 ~~102.6~~ Historic buildings. The provisions of this code relating to the construction, *alteration*, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures identified and classified by the state or local jurisdiction as historic buildings when such buildings or structures are judged by the *fire code official* to be safe and in the public interest of health, safety and welfare regarding any proposed construction, alteration, repair, enlargement, restoration, relocation or moving of buildings ~~do not constitute a distinct hazard to life or property~~. ~~Fire protection in designated historic buildings and structures shall be provided in accordance with an *approved* fire protection plan.~~

102.6 ~~104.9~~ Alternative materials, design, methods, and equipment. The provisions of this code are not intended to prevent the installation of any material, or the use or operation of appliances, equipment, systems, or method, or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. ~~The *fire code official* is authorized to approve~~ An alternative ~~material or method of construction~~ shall be *approved* where the *fire code official* finds that the proposed alternative ~~design~~ is satisfactory and complies with the intent of the provisions of this code, and that the alternative ~~material, method or work offered~~ is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, *fire resistance*, durability and safety.

102.6.1 Matters regulated by the *International Building Code*. Approvals under the authority herein contained shall be subject to the approval of the *building official* whenever the alternative involves matters regulated by the *International Building Code*.

102.7 ~~102.9 Matters not provided for~~ Requirements not covered by code. Requirements necessary ~~that are essential~~ for the strength, stability, or proper operation of an existing or proposed fixture, structure, or equipment, or for the public safety, health, and general welfare, ~~of an existing or proposed activity, building or structure, or for the safety of the occupants thereof, which are~~ not specifically ~~provided for~~ covered by this code, shall be determined by the *fire code official*.

102.8 ~~102.8~~ Subjects not regulated by this code. Where no applicable standards or requirements are set forth in this code, or are contained within other laws, codes, regulations, ordinances or bylaws adopted by the jurisdiction, compliance with applicable ~~standards of the National Fire Protection Association or other~~ nationally recognized ~~fire safety~~ standards, as *approved*, shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the *fire code official* to determine compliance with codes or standards for those activities or installations within the *fire code official's* jurisdiction or responsibility.

102.9 Previous approvals. This code shall not require changes in the *construction documents*, construction or designated occupancy of a structure for which a lawful *permit* has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and the project has not been abandoned.

102.10 Contractor's responsibilities. Every contractor who enters into contracts for which a permit is required shall comply with the state and local rules and regulations concerning licensing.

102.11 Specific application of this code. The following are application specific to this code.

102.11.1 ~~102.1~~ Construction and design provisions. The construction and design provisions of this code shall apply to:

1. Structures, facilities and conditions arising after the adoption of this code.
2. Existing structures, facilities and conditions not legally in existence at the time of adoption of this code.
3. Existing structures, facilities and conditions when required in Chapter 46.
4. Existing structures, facilities and conditions which, in the opinion of the *fire code official*, constitute a distinct hazard to life or property.

102.11.2 ~~102.2~~ Administrative, operational and maintenance provisions. The administrative, operational and maintenance provisions of this code shall apply to:

1. Conditions and operations arising after the adoption of this code.
2. Existing conditions and operations.

102.11.3 ~~102.3~~ Change of use or occupancy. No change shall be made in the use or occupancy of any structure that would place the structure in a different division of the same group or occupancy or in a different group of occupancies, unless such structure is made to comply with the requirements of this code and the *International Building Code*. Subject to the approval of the *fire code official*, the use or occupancy of an existing structure shall be allowed to be changed and the structure is allowed to be occupied for purposes in other groups without conforming to all the requirements of this code and the *International Building Code* for those groups, provided the new or proposed use is less hazardous, based on life and fire risk, than the existing use.

102.11.4 ~~102.4~~ Application of building code. The design and construction of new structures shall comply with the *International Building Code*, and any *alterations*, additions, changes in use or changes in structures required by this code, which are within the scope of the *International Building Code*, shall be made in accordance therewith.

102.11.5 ~~102.5~~ Application of residential code. Where structures are designed and constructed in accordance with the *International Residential Code*, the provisions of this code shall apply as follows:

1. Construction and design provisions: Provisions of this code pertaining to the exterior of the structure shall apply including, but not limited to, premises identification, fire apparatus access and water supplies. Where interior or exterior systems or devices are installed, construction permits required by Section 105.7 of this code shall also apply.
2. Administrative, operational and maintenance provisions: All such provisions of this code shall apply.

102.11.6 ~~104.11.2~~ Obstructing operations. No *person* shall obstruct the operations of the fire department in connection with extinguishment or control of any fire, or actions relative to other emergencies, or disobey any lawful command of the fire chief or ~~officer of~~ the fire department official in charge of the emergency, or any part thereof, or any lawful order of a police officer assisting the fire department.

102.11.7 ~~104.11.3~~ Systems and devices. No *person* shall render a system or device inoperative during an emergency unless by direction of the fire chief or fire department official in charge of the incident.

102.11.8 ~~124.6~~ Overcrowding. Overcrowding or admittance of any *person* beyond the *approved* capacity of a building or a portion thereof shall not be allowed. The *fire code official*, upon finding any overcrowding conditions or obstructions in *aisles*, passageways or other *means of egress*, or upon finding any condition which constitutes a life safety hazard, shall be authorized to cause the event to be stopped until such condition or obstruction is corrected.

102.11.9 ~~107.5~~ Owner/occupant responsibility. Correction and abatement of violations of this code shall be the responsibility of the *owner*. If an occupant creates, or allows to be created, hazardous conditions in violation of this code, the occupant shall be held responsible for the abatement of such hazardous conditions.

102.11.10 Fire protection of historic buildings. Fire protection in designated historic buildings and structures shall be provided in accordance with an *approved* fire protection plan.

PART 2 - ADMINISTRATION AND ENFORCEMENT ~~ADMINISTRATIVE PROVISIONS~~

SECTION 103
DEPARTMENT OF FIRE PREVENTION

103.1 General. The Department of Fire Prevention, herein referred to as "the department," is established hereby within the jurisdiction under the direction of the *fire code official*. The function of the department shall be the implementation, administration, and enforcement of the provisions of this code.

103.2 Appointment. The *fire code official* shall be appointed by the chief appointing authority of the jurisdiction.

103.2.1. Removal of fire code official. The *fire code official* shall not be removed from office except for cause and after full opportunity to be heard on specific and relevant charges by and before the appointing authority.

103.3 Deputies. In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the *fire code official* shall have the authority to appoint a deputy *fire code official*, ~~other~~ related technical officers, inspectors, and other employees. Such employees shall have powers as delegated by the *fire code official*.

103.4 Liability. The *fire code official*, member of the board of appeals, officer or employee charged with the enforcement of this code, while acting for the jurisdiction~~,~~ in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally, and is hereby relieved from all personal liability for any damage accruing to *persons* or property as a result of an act or by reason of an act or omission in the discharge of official duties.

103.4.1 Legal defense. Any suit instituted against any officer or employee of the department because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings. The *fire code official* or any subordinate shall not be liable for costs in an action, suit or proceeding that is instituted in pursuance of the provisions of this code. ~~; and~~ Any officer or employee ~~of the department of fire prevention~~, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith.

SECTION 104
DUTIES AND POWERS OF FIRE CODE OFFICIAL
~~GENERAL AUTHORITY AND RESPONSIBILITIES~~

104.1 General. The *fire code official* is hereby authorized to enforce the provisions of this code. ~~and~~ The *fire code official* shall have the authority to render interpretations of this code, and to adopt policies~~,~~ and procedures~~, rules and regulations~~ in order to clarify the application of its provisions. Such interpretations, policies, and procedures~~, rules and regulations~~ shall be in compliance with the intent and purpose of this code. ~~and~~ Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

104.2 Applications and permits. The *fire code official* ~~is authorized to~~ shall receive applications, review *construction documents* and issue permits required by this code ~~for construction regulated by this code, issue permits for operations regulated by this code~~, inspect the premises for which such permits have been issued, and enforce compliance with the provisions of this code.

~~104.5~~ 104.3 Notices and orders. The *fire code official* ~~is authorized to~~ shall issue such notices or orders ~~as are required~~ to ~~affect~~ ensure compliance with this code ~~in accordance with Sections 109.1 and 109.2~~.

104.4 Inspections. The *fire code official* shall make all of the required inspections, or the *fire code official* shall have the authority to accept reports of inspection by *approved agencies* or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such *approved agency* or by the responsible individual. The *fire code official* is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

~~104.4~~ 104.5 Identification. The *fire code official* shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

~~104.4~~ 104.6 Right of entry. ~~Whenever~~ Where it is necessary to make an inspection to enforce the provisions of this code, or ~~whenever~~ where the *fire code official* has reasonable cause to believe that there exists in a ~~building~~ structure or upon ~~any~~ a premises ~~any~~ a ~~conditions~~ condition ~~or violations~~ which is contrary to or in violation of this code which makes the ~~building~~ structure or premises unsafe, dangerous, or hazardous, the *fire code official* ~~shall have the authority~~ is authorized to enter the ~~building~~ structure or premises at ~~all~~ reasonable times to inspect or to perform the duties imposed ~~upon the *fire code official*~~ by this code~~.~~ provided that if such ~~building~~ structure or premises ~~is~~ be occupied, ~~the *fire code official* shall present~~ that credentials be presented to the occupant and ~~request~~ entry requested. If such ~~building~~ structure or premises is unoccupied, the *fire code official* shall first make a reasonable effort to locate the *owner* or other *person* having charge or control of the ~~building~~ structure or premises and request entry. If entry is refused, the *fire code official* ~~has~~ shall have recourse to ~~every remedy~~ the remedies provided by law to secure entry.

~~104.3~~ 104.6.1 Warrant. When the *fire code official* has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an *owner* or occupant or *person* having charge, care or control of the ~~building~~ structure or premises shall not fail or neglect, after proper request is made as herein provided, to permit entry therein by the *fire code official* for the purpose of inspection and examination pursuant to this code.

~~**104.6 Official**~~ **104.7 Department records.** The *fire code official* shall keep official records of applications received, *permits* and certificates issued, fees collected, reports of inspections, and notices and orders issued. Such records shall be retained in the official records for the period required for retention of public records. ~~as required by Sections 104.6.1 through 104.6.4.~~

104.7.1 ~~**104.6.1**~~ **Record of approvals.** A record of approvals shall be maintained by the *fire code official* and shall be available for public inspection during business hours in accordance with applicable laws.

104.7.2 ~~**104.6.2**~~ **Record of Inspections.** The *fire code official* shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

104.7.3 ~~**104.6.3**~~ **Record of Fires** ~~**records.**~~ The fire department shall keep a record of fires occurring within its jurisdiction and of facts concerning the same, including statistics as to the extent of such fires and the damage caused thereby, together with other information as required by the *fire code official*.

104.7.4 Retention of records. Such official records shall be retained for not less than five years or for as long as the structure or activity to which such records relate remains in existence, unless otherwise provided by other regulations.

104.8 Assistance of other agencies. The code official is authorized to request, and shall receive so far as is required in the discharge of the duties described in this code, the assistance and cooperation of other officials of the jurisdiction.

104.9 Specific duties. The following are specific duties of the code official.

104.9.1 ~~**104.6.4**~~ **Administrative.** Application for modification, alternative methods or materials and the final decision of the *fire code official* shall be in writing and shall be officially recorded in the permanent records of the *fire code official*.

104.9.2 ~~**104.10**~~ **Fire investigations.** The *fire code official*, the fire department or other responsible authority shall have the authority to investigate the cause, origin and circumstances of any fire, explosion or other hazardous condition. Information that could be related to trade secrets or processes shall not be made part of the public record except as directed by a court of law.

104.9.3 ~~**104.10.1**~~ **Assistance from other agencies.** Police and other enforcement agencies shall have authority to render necessary assistance in the investigation of fires when requested to do so.

104.9.4 ~~**104.11**~~ **Authority at fires and other emergencies.** The fire chief or ~~officer of~~ the fire department official in charge at the scene of a fire or other emergency involving the protection of life or property or any part thereof, shall have the authority to direct such operation as necessary to extinguish or control any fire, perform any rescue operation, investigate the existence of suspected or reported fires, gas leaks or other hazardous conditions or situations, or take any other action necessary in the reasonable performance of duty. In the exercise of such power, the fire chief is authorized to prohibit any person, vehicle, vessel or thing from approaching the scene and is authorized to remove, or cause to be removed or kept away from the scene, any vehicle, vessel or thing which could impede or interfere with the operations of the fire department and, in the judgment of the fire chief, any person not actually and usefully employed in the extinguishing of such fire or in the preservation of property in the vicinity thereof.

104.9.5 ~~**104.11.1**~~ **Barricades.** The fire chief or ~~officer of~~ the fire department official in charge at the scene of an emergency is authorized to place ropes, guards, barricades or other obstructions across any street, alley, place or private property in the vicinity of such operation so as to prevent accidents or interference with the lawful efforts of the fire department to manage and control the situation and to handle fire apparatus.

SECTION 105
PERMITS

~~**105.1 General.** Permits shall be in accordance with Sections 105.1.1 through 105.7.14.~~

~~**105.1.1**~~ **105.1 Permit~~s~~ required.** Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to construct, erect, install, enlarge, alter, repair, remove, convert, or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the *fire code official* and obtain the required *permit* for the project. Where laws or regulations are enforceable by other agencies or departments, approval shall be obtained from all agencies or departments concerned. ~~Permits required by this code shall be obtained from the *fire code official*. Permit fees, if any, shall be paid prior to issuance of the permit. Issued permits shall be kept on the premises designated therein at all times and shall be readily available for inspection by the *fire code official*.~~

105.1.1 Annual permit. In lieu of an individual *permit* for each *alteration* to an already *approved* electrical, gas, mechanical or plumbing installation, the *fire code official* is authorized to issue an annual *permit* upon application therefor to any person, firm or corporation regularly employing one or more qualified tradespersons in the building, structure, or on the premises owned or operated by the applicant for the *permit*.

105.1.1.1 Annual permit records. The person to whom an annual *permit* is issued shall keep a detailed record of *alterations* made under such annual *permit*. The *fire code official* shall have access to such records at all times, or such records shall be filed with the *fire code official* as designated.

105.1.2 Emergency repairs. Where equipment replacements and repairs must be performed in an emergency situation, the *permit* application shall be submitted within the next working business day to the *fire code official*.

105.1.3 Permits specifically required. The following specifically require a permit.

105.1.3.1 ~~105.3.1~~ Permits are not transferable and any change in occupancy, operation, tenancy or ownership shall require that a new permit be issued.

~~105.1.2~~ 105.1.3.2 Types of permits. There shall be two types of permits as follows:

~~2.~~ 1. Construction permit. A construction permit allows the applicant to install or modify systems and equipment for which a permit is required by Section ~~105.7~~ 105.1.3.4.

~~1.~~ 2. Operational permit. An operational permit allows the applicant to conduct an operation or a business for which a permit is required by Section 123 ~~105.6~~ for either:

~~1.1.~~ 2.1. A prescribed period.

~~1.2.~~ 2.2 Until renewed or revoked.

~~105.1.3~~ 105.1.3.3 Permits for the same location. When more than one permit is required for the same location, the *fire code official* is authorized to consolidate such permits into a single permit provided that each provision is listed in the permit.

~~105.7~~ 105.1.3.4 Required construction permits. The *fire code official* is authorized to issue construction permits for work as set forth in Sections ~~105.7.1~~ 105.1.3.4 through ~~105.7.14~~ 105.1.3.4.14.

~~105.7.1~~ 105.1.3.4.1 Automatic fire-extinguishing systems. A construction permit is required for installation of or modification to an automatic fire-extinguishing system. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

~~105.7.2~~ 105.1.3.4.2 Battery systems. A permit is required to install stationary storage battery systems having a liquid capacity of more than 50 gallons (189 L).

~~105.7.3~~ 105.1.3.4.3 Compressed gases. When the compressed gases in use or storage exceed the amounts listed in Table 105.6.8, a construction permit is required to install, repair damage to, abandon, remove, place temporarily out of service, or close or substantially modify a *compressed gas* system.

Exceptions:

1. Routine maintenance.
2. For emergency repair work performed on an emergency basis, application for permit shall be made within two working days of commencement of work.

~~105.7.4~~ 105.1.3.4.4 Cryogenic fluids. A construction permit is required for installation of or *alteration* to outdoor stationary *cryogenic fluid* storage systems where the system capacity exceeds the amounts listed in Table 126.11 ~~105.6.10~~. Maintenance performed in accordance with this code is not considered an *alteration* and does not require a construction permit.

~~105.7.5~~ 105.1.3.4.5 Fire alarm and detection systems and related equipment. A construction permit is required for installation of or modification to fire alarm and detection systems and related equipment. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

~~105.7.6~~ **105.1.3.4.6 Fire pumps and related equipment.** A construction permit is required for installation of or modification to fire pumps and related fuel tanks, jockey pumps, controllers and generators. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

~~105.7.7~~ **105.1.3.4.7 Flammable and combustible liquids.** A construction permit is required:

1. To install, repair or modify a pipeline for the transportation of flammable or *combustible liquids*.
2. To install, construct or alter tank vehicles, equipment, tanks, plants, terminals, wells, fuel-dispensing stations, refineries, distilleries and similar facilities where flammable and *combustible liquids* are produced, processed, transported, stored, dispensed or used.
3. To install, alter, remove, abandon or otherwise dispose of a flammable or *combustible liquid* tank.

~~105.7.8~~ **105.1.3.4.8 Hazardous materials.** A construction permit is required to install, repair damage to, abandon, remove, place temporarily out of service, or close or substantially modify a storage facility or other area regulated by Chapter 27 when the hazardous materials in use or storage exceed the amounts listed in Table 126.21 ~~105.6.20~~.

Exceptions:

1. Routine maintenance.
2. For emergency repair work performed on an emergency basis, application for permit shall be made within two working days of commencement of work.

~~105.7.9~~ **105.1.3.4.9 Industrial ovens.** A construction permit is required for installation of industrial ovens covered by Chapter 21.

Exceptions:

1. Routine maintenance.
2. For repair work performed on an emergency basis, application for permit shall be made within two working days of commencement of work.

~~105.7.10~~ **105.1.3.4.10 LP-gas.** A construction permit is required for installation of or modification to an LP-gas system.

~~105.7.11~~ **105.1.3.4.11 Private fire hydrants.** A construction permit is required for the installation or modification of private fire hydrants.

~~105.7.12~~ **105.1.3.4.12 Spraying or dipping.** A construction permit is required to install or modify a spray room, dip tank or booth.

~~105.7.13~~ **105.1.3.4.13 Standpipe systems.** A construction permit is required for the installation, modification or removal from service of a standpipe system. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

~~105.7.14~~ **105.1.3.4.14 Temporary membrane structures and tents.** A construction permit is required to erect an air-supported temporary membrane structure or a tent having an area in excess of 400 square feet (37 m^2).

Exceptions:

1. Tents used exclusively for recreational camping purposes.
2. Funeral tents and curtains or extensions attached thereto, when used for funeral services.
3. Tents and awnings open on all sides which comply with all of the following:
   - 3.1. Individual tents shall have a maximum size of 700 square feet (65 m^2).
   - 3.2. The aggregate area of multiple tents placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed 700 square feet (65 m^2) total.
   - 3.3. A minimum clearance of 12 feet (3658 mm) to structures and other tents shall be maintained.

105.2 Permit not required. Exemptions from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. *Permits* shall not be required in accordance with Sections 105.2.1 through 105.2.3.

105.2.1 Repairs. Application or notice to the *fire code official* is not required for ordinary repairs to structures, replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required *means of egress*, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include *addition* to, *alteration* of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

105.2.2 Public service agencies. A *permit* shall not be required for the installation, *alteration,* or repair of generation, transmission, distribution, or metering or other related equipment that is under the ownership and control of public service agencies by established right.

105.2.3 Specific exemption. The following are specifically exempt from requiring a permit. [JURISDICTION TO INSERT SPECIFIC ITEMS EXEMPT FROM PERMITS FOR THIS CODE]

~~**105.2**~~ **105.3 Application for permit.** To obtain a *permit*, the applicant shall first file an application therefor in writing on a form furnished by the department for that purpose. Such application shall:

1. Identify and describe the project to be covered by the *permit* for which application is made.
2. Describe the land on which the proposed project is to be done by legal description, street address or similar description that will readily identify and definitely locate the proposed building or project.
3. Indicate the use and occupancy for which the proposed project is intended.
4. Be accompanied by *construction documents* and other information as required in Section 106.
5. State the valuation of the proposed project.
6. Be signed by the applicant, or the applicant's authorized agent.
7. Give such other data and information as required by the *fire code official*.

105.3.1 Permit valuations. *Permit* valuations required under Section 105.3(5) shall include total value of the project, including materials and labor, and electrical, gas, mechanical, plumbing equipment and other permanent systems for which the *permit* is being issued. If, in the opinion of the *code official*, the valuation is underestimated on the application, the *permit* shall be denied, unless the applicant can show detailed estimates to meet the approval of the *code official*. Final building *permit* valuation shall be set by the *code official*.

~~Application for a permit required by this code shall be made to the *fire code official* in such form and detail as prescribed by the *fire code official*. Applications for permits shall be accompanied by such plans as prescribed by the *fire code official*.~~

~~**105.3.7 Information on the permit.** The *fire code official* shall issue all permits required by this code on an *approved* form furnished for that purpose. The permit shall contain a general description of the operation or occupancy and its location and any other information required by the *fire code official*. Issued permits shall bear the signature of the *fire code official* or other *approved* legal authorization.~~

105.4 Action on application. The *fire code official* shall examine or cause to be examined applications for permits and amendments thereto within a reasonable time after filing. If the application or the *construction documents* do not conform to the requirements of pertinent laws, the *fire code official* shall reject such application in writing, stating the reasons therefor. If the *fire code official* is satisfied that the proposed project ~~work or operation~~ conforms to the requirements of this code and laws and ordinances applicable thereto, the *fire code official* shall issue a permit therefor as soon as practicable.

105.4.1 Preliminary inspection. Before a permit is issued, the *fire code official* is authorized to inspect and evaluate the systems, *equipment*, buildings, devices, premises and spaces or areas to be used.

~~**105. 2.1 Refusal to issue permit.** If the application for a permit describes a use that does not conform to the requirements of this code and other pertinent laws and ordinances, the *fire code official* shall not issue a permit, but shall return the application to the applicant with the refusal to issue such permit. Such refusal shall, when requested, be in writing and shall contain the reasons for refusal.~~

~~**105.3 Conditions of a permit.** A permit shall constitute permission to maintain, store or handle materials; or to conduct processes which produce conditions hazardous to life or property; or to install equipment utilized in connection with such activities; or to install or modify any *fire protection system* or equipment or any other construction, equipment installation or modification in accordance with the provisions of this code where a permit is required by Section 105.6 or 105.7. Such permission shall not be construed as authority to violate, cancel or set aside any of the provisions of this code or other applicable regulations or laws of the jurisdiction.~~

105.4.2 ~~105.4.4.1 Phased approval~~ Conditional permits. The *fire code official* is authorized to issue a permit for the construction or operation of part of ~~a~~ the project such as the construction of foundations or any other part of a building or structure, or installation of systems or materials, or operation before the *construction documents* for the entire project ~~whole structure, system or operation~~ have been submitted, provided that adequate information and detailed statements have been filed complying with pertinent requirements of this code. The holder of such permit ~~for parts of a structure, system or operation~~ shall proceed only to the point for which approval has been given, at the permit holder's own risk, ~~with the building operation~~ and without assurance that a permit for the entire project ~~structure, system or operation~~ will be granted.

~~105.3~~ 105.5 Time limitation of application. An application for a permit for any proposed project ~~work or operation~~ shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been ~~diligently prosecuted~~ pursued in good faith or a permit ~~shall have~~ has been issued.~~; except that~~ The *fire code official* is authorized to grant one or more extensions of time for additional periods not exceeding ~~90~~ 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

~~105.3.8~~ 105.6 Validity of permit. The issuance or granting of a permit shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or of any other ordinances of the jurisdiction. Permits presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a permit based on *construction documents*, ~~operational documents~~ and other data shall not prevent the *fire code official* from requiring the correction of errors in the *construction documents* or other data.

~~**105.3.6 Compliance with code.** The issuance or granting of a permit shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or of any other ordinance of the jurisdiction. Permits presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a permit based on *construction documents* and other data shall not prevent the *fire code official* from requiring the correction of errors in the *construction documents* and other data. Any addition to or alteration of *approved construction documents* shall be *approved* in advance by the *fire code official*, as evidenced by the issuance of a new or amended permit.~~

~~105.3.2~~ 105.7 Extensions of permit. ~~A permittee holding~~ For an unexpired permit ~~shall have the right to apply for an extension of the time within which the permittee will commence work under that permit when work is unable to be commenced within the time required by this section for good and satisfactory reasons.~~ the *fire code official* is authorized to grant, in writing, one or more extensions of the time, ~~period of a permit~~ for periods of not more than 180 days each. ~~Such extensions~~ The extension shall be requested ~~by the permit holder~~ in writing and justifiable cause demonstrated.

105.8. Expiration of permit. ~~A construction permits~~ Every *permit* issued shall ~~automatically~~ become invalid unless the work on the site authorized by such permit is commenced within 180 days after its issuance, or if the work authorized on the site by such permit is suspended or abandoned for a period of 180 days after the time the work is commenced.

105.8.1 Recommencement of work. Before such work covered under an expired permit recommences, a new permit shall be first obtained. ~~and the fee to recommence work, if any, shall be one-half the amount required for a new permit for such work.~~ The new permit shall be issued provided no changes have been made or will be made in the original construction documents for such work, and provided further that such suspension or abandonment has not exceeded one year.

~~105.5~~ 105.9 Suspension or revocation of permit. The *fire code official* is authorized to suspend or revoke a permit issued under the provisions of this code whenever the *permit* is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or regulation or any of the provisions of this code. ~~when it is found by inspection or otherwise that there has been a false statement or misrepresentation as to the material facts in the application or *construction documents* on which the permit or approval was based including, but not limited to, any one of the following:~~

~~1. The permit is used for a location or establishment other than that for which it was issued.~~
~~2. The permit is used for a condition or activity other than that listed in the permit.~~
~~3. Conditions and limitations set forth in the permit have been violated.~~
~~4. There have been any false statements or misrepresentations as to the material fact in the application for permit or plans submitted or a condition of the permit.~~
~~5. The permit is used by a different *person* or firm than the name for which it was issued.~~
~~6. The permittee failed, refused or neglected to comply with orders or notices duly served in accordance with the provisions of this code within the time provided therein.~~
~~7. The permit was issued in error or in violation of an ordinance, regulation or this code.~~

~~105.3.5~~ **105.10 Posting the permit.** Issued permits or copy thereof shall be kept on the site of the project until the completion of the project ~~premises designated therein at all times and shall be readily available for inspection by the *fire code official*~~.

SECTION 106
SUBMITTAL DOCUMENTS

106.1 ~~105.4.1 Submittals~~ General. Submittal documents consisting of *construction documents* and other supporting data shall be submitted in two or more sets with each application for a permit, and in such form and detail as required by the *fire code official*. The *fire code official* shall require *construction documents* and other data to ~~shall~~ be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *fire code official* is authorized to require necessary construction documents to be prepared by a registered design professional.

Exception: The *fire code official* is authorized to waive the submission of *construction documents* and other ~~supporting~~ data not required to be prepared by a registered design professional if ~~it is found that~~ the nature of the work applied for is such that review of *construction documents* is not necessary to obtain compliance with this code.

106.2 ~~105.4~~ Construction documents. *Construction documents* shall be in accordance with ~~this~~ Sections 106.2.1 through 106.2.4.

106.2.1 ~~105.4.2~~ Information on construction documents. *Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the proposed project, and show in detail that the proposed project will conform to the provisions of this code and relevant laws, ordinances, rules, and regulations, as determined by the *fire code official*. ~~drawn~~ Plans shall be to scale ~~upon~~ and be on suitable material. Electronic media documents are ~~allowed~~ permitted to be submitted when *approved* by the *fire code official*. ~~*Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations as determined by the *fire code official*.~~

~~**105.4.3 Applicant responsibility.** It shall be the responsibility of the applicant to ensure that the *construction documents* include all of the fire protection requirements and the shop drawings are complete and in compliance with the applicable codes and standards.~~

106.2.1.1 Specific information required. Where the quality of the materials is essential for conformity to this code, specific information shall be given to establish such quality. The terms “this code” or “legal” or “its equivalent” shall not be cited or used as a substitute for specific information.

106.2.2 Site plan. The *construction documents* submitted with the application for *permit* shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from *lot lines*, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and *design flood* elevations. The site plan shall be drawn in accordance with an accurate boundary line survey.

106.2.2.1 Site plan for demolition. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot.

106.2.2.2. Waiver of site plan. The *fire code official* is authorized to waive or modify the requirement for a site plan when the application for *permit* is for *alteration* or repair or when otherwise warranted.

106.2.3 Specific Information. The following are specific requirements for submittal documents required by this code.

106.2.3.1 ~~105.4.2.1~~ Fire protection system shop drawings. Shop drawings for the fire protections system(s) shall be submitted to indicate compliance with this code and the *construction documents* and shall be *approved* prior to the start of installation. Shop drawings shall contain all information as required by the referenced installation standards in Chapter 9.

106.2.4 Design professional in responsible charge. When it is required that documents be prepared by a *registered design professional*, the *fire code official* shall be authorized to require the owner to engage and designate on the building *permit* application a *registered design professional* who shall act as the *registered design professional in responsible charge*. If the circumstances require, the owner shall designate a substitute *registered design professional*

in responsible charge who shall perform the duties required of the original *registered design professional in responsible charge*. The *fire code official* shall be notified in writing by the owner if the *registered design professional in responsible charge* is changed or is unable to continue to perform the duties.

106.2.4.1 Responsibility. The *registered design professional in responsible charge* shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

106.2.4.2 Observation. Where structural observation is required, the inspection program shall name the individual or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur.

106.3 Deferred submittals. For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the *fire code official* within a specified period.

106.3.1 Prior approval. Deferral of any submittal items shall have the prior approval of the *fire code official*. The *registered design professional in responsible charge* shall list the deferred submittals on the *construction documents* for review by the *fire code official*.

106.3.2 Review. Documents for deferred submittal items shall be submitted to the *registered design professional in responsible charge* who shall review them and forward them to the *fire code official* with a notation indicating that the deferred submittal documents have been reviewed and been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the deferred submittal documents have been *approved* by the *fire code official*.

106.4 ~~105.4.1.1~~ Examination of documents. The *fire code official* shall examine or cause to be examined the ~~accompanying *construction*~~ submittal *documents* and shall ascertain by such examinations whether the project ~~work~~ indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

106.5 ~~105.4.4~~ ~~Approved~~ Approval of construction documents. When the *fire code official* issues a *permit*, the *construction documents* and other data shall be endorsed, in writing or by stamp, as "APPROVED." One set of *construction documents* and other data so reviewed shall be retained by the *fire code official*. The other set(s) shall be returned to the applicant. One set shall be kept at the site of the project and shall be open to inspection by the *fire code official* or a duly authorized representative. Such *approved construction documents* shall not be changed, modified, or altered without authorization from the *fire code official*. All work shall be done in accordance with the *approved construction documents*. ~~*approved* by the *fire code official* are *approved* with the intent that such *construction documents* comply in all respects with this code. Review and approval by the *fire code official* shall not relieve the applicant of the responsibility of compliance with this code.~~

106.6 ~~105.4.5~~ ~~Corrected~~ Amended construction documents. Any changes made during construction that are not in compliance with the *approved construction documents* shall be resubmitted for approval as an amended set of *construction documents*. ~~Where field conditions necessitate any substantial change from the *approved construction documents*, the *fire code official* shall have the authority to require the corrected *construction documents* to be submitted for approval.~~

106.7 ~~105.4.6~~ Retention of construction documents. One set of *approved construction documents* shall be retained by the *fire code official* for a period of not less than 180 days from date of completion of the permitted project ~~work~~, or for the period required for retention of public records ~~as required by state or local laws. One set of *approved construction documents* shall be returned to the applicant, and said set shall be kept on the site of the building or work at all times during which the work authorized thereby is in progress.~~

SECTION 107
MODIFICATIONS, TESTING, AND APPROVAL

107.1 ~~104.8~~ Modifications. Whenever there are practical difficulties involved in carrying out the provisions of this code, and upon application of the owner or owner's representative, the *fire code official* shall have the authority to grant modifications for individual cases, provided the *fire code official* shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, life and fire safety, accessibility, or structural requirements.

The details of action granting modifications shall be recorded and entered in the files of the department ~~of fire prevention~~.

107.2 ~~104.7~~ Approved materials and equipment. All materials, equipment and devices *approved* by the *fire code official* shall be constructed and installed in accordance with such approval.

107.3 ~~104.7.1~~ Used materials, appliances and equipment ~~reuse~~. The use of used materials that meet the requirements of this code for new materials is permitted. Used appliances, equipment and devices shall not be reused unless such elements are in good repair or have been reconditioned and tested when necessary, placed in good and proper working condition, and *approved* by the *code official*. ~~Materials, equipment and devices shall not be reused or reinstalled unless such elements have been reconditioned, tested and placed in good and proper working condition and *approved*.~~

107.4 Listed and labeled material and appliances. Listed and labeled materials, equipment, and appliances shall be used and installed in accordance with the conditions the listing and the manufacturer's instructions.

107.5 ~~104.9.1~~ Research reports. Supporting data, when necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

107.6 ~~104.9.2~~ Technical assistance ~~Tests~~. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, or to determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building or premises, the *fire code official* shall have the authority to require tests be conducted, or a technical opinion, recommendation or report be submitted as evidence of compliance. ~~to~~ The tests, opinions, recommendations and reports shall be made at no expense to the jurisdiction.

107.6.1 Preparation. The technical reports and opinions shall be prepared by a qualified engineer, approved specialist or specialty organization, or an *approved agency*.

107.6.2 Test methods. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the *fire code official* shall approve the testing procedures.

107.6.3 Testing agency. All tests shall be performed by an *approved* agency.

107.6.4 Retention of reports. ~~Reports of such tests~~ The technical opinions, recommendation, reports and test results shall be retained by the *fire code official* for the period required for retention of public records.

~~**104.7.2 Technical assistance.** To determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building or premises subject to inspection by the *fire code official*, the *fire code official* is authorized to require the *owner* or agent to provide, without charge to the jurisdiction, a technical opinion and report. The opinion and report shall be prepared by a qualified engineer, specialist, laboratory or fire safety specialty organization acceptable to the *fire code official* and shall analyze the fire safety properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to recommend necessary changes. The *fire code official* is authorized to require design submittals to be prepared by, and bear the stamp of, a registered design professional.~~

SECTION 108 ~~106~~
INSPECTIONS

108.1 General. Construction or work on a project for which a *permit* is required shall be subject to inspection by the *fire code official* and such construction or work shall remain accessible and exposed for inspection purposes until *approved*. ~~**106.4 Approvals.**~~ Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. ~~**106.3 Concealed work.**~~ It shall be the duty of the *permit* applicant to cause the construction or work to remain accessible and exposed for inspection purposes. Neither the *fire code official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

108.1.1 Replacement of existing appliance. The requirements of this section shall not be considered to prohibit the operation of any heating or cooling *equipment* or appliances installed to replace such existing *equipment* or appliances serving an occupied portion of a structure provided that a request for inspection of such *equipment* or appliances has been filed with the department not more than 48 hours after such replacement work is completed, and before any portion of such *equipment* or appliances is concealed by any permanent portion of the structure.

~~**106.1 Inspection authority.** The *fire code official* is authorized to enter and examine any building, structure, marine vessel, vehicle or premises in accordance with Section 104.3 for the purpose of enforcing this code.~~

108.2 Required inspections and testing. The *fire code official*, upon notification, shall make the inspections and require the tests set forth in Sections 108.2.1 through 108.2.4.

108.2.1 Specific Inspections. The following are specific inspections and tests required by this code.

108.2.1.1 ~~**106.2**~~ **Inspections.** The *fire* code official is authorized to conduct such inspections as are deemed necessary to determine the extent of compliance with the provisions of this code ~~and to approve reports of inspection by *approved* agencies or individuals. All reports of such inspections shall be prepared and submitted in writing for review and approval. Inspection reports shall be certified by a responsible officer of such *approved* agency or by the responsible individual. The *fire code official* is authorized to engage such expert opinion as deemed necessary to report upon unusual, detailed or complex technical issues subject to the approval of the governing body.~~

108.2.2 Other inspections. In addition to the inspections specified above, the *fire code official* is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department.

108.2.3 Special inspections. Special inspection shall be as required by this code, or the *International Building Code* as applicable.

108.2.4 Final inspection. A final inspection shall be made after all work on the project required by the *permit* is completed.

108.3 Inspection agencies. The *fire code official* is authorized to accept reports of *approved* inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability. ~~All reports of such inspections shall be prepared and submitted in writing for review and approval. Inspection reports shall be certified by a responsible officer of such *approved* agency or by the responsible individual.~~

~~The *fire code official* is authorized to engage such expert opinion as deemed necessary to report upon unusual, detailed or complex technical issues subject to the approval of the governing body.~~

108.4 ~~**106.2.1**~~ **Inspection requests.** It shall be the duty of the holder of the permit or their duly authorized agent to notify the *fire code official* when a project ~~work~~ is ready for inspection. It shall be the duty of the permit holder to provide access to and means for inspections of such work that are required by this code.

108.4.1 Manufacturer's instructions. Manufacturer's instructions for equipment, appliances, and materials installed under the permit shall be available on the work site at the time of inspection.

108.5 ~~**106.2.2**~~ **Approval required.** Work on a project shall not proceed ~~be done~~ beyond the point indicated in each successive inspection without first obtaining the approval of the *fire code official*. The *code official*, upon notification, shall make the requested inspections and shall either indicate the portion of the project ~~construction~~ that is satisfactory as completed, or shall notify the permit holder or ~~his or her~~ authorized agent wherein the same fails to comply with this code. Any portions of the project that do not comply shall be corrected and such portion shall not be covered, ~~or~~ concealed, or used until authorized by the *fire code official*.

108.6 Notice of approval. After all prescribed inspections or tests indicate the project complies with this code, a certificate of completion complying with Section 109 shall be issued by the *code official*.

SECTION 109
CERTIFICATE OF COMPLETION AND OCCUPANCY

109.1 Use and occupancy. No building, structure, or premises or portion thereof shall be used or occupied until the code official has issued a certificate of occupancy as provided herein. No equipment, appliance or system used, and no change in the existing occupancy classification of a building, structure, premise or portion thereof shall be made until the code official has issued a certificate of completion as provided herein.

Exceptions:

1. Occupancy shall be permitted during **e**mergency situations as described under Section 105.1.
2. Certificates of completion or occupancy are not required for work exempt from permits under Section 105.2.
3. Occupancy shall be permitted during the replacement of existing appliances as described under Section 108.1.1.
4. Certificates of occupancy are not required for one-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m^2).

~~**105.3.3 Occupancy prohibited before approval.** The building or structure shall not be occupied prior to the *fire code official* issuing a permit and conducting associated inspections indicating the applicable provisions of this code have been met.~~

109.1.1 Validity. Issuance of a certificate of completion or occupancy shall not be construed as an approval of a violation of the provisions of this code or of other pertinent laws and ordinances of the jurisdiction. Certificates presuming to give authority to violate or cancel the provisions of this code or other laws or ordinances of the jurisdiction shall not be valid.

109.2 Certificate issued. After the *code official* inspects a project requiring a permit and finds no violations of the provisions of this code or other laws that are enforced by the department, the *code official* shall issue a certificate of completion. After all certificates of completion have been issued by other departments or agencies concerned, the code official shall issue a certificate of occupancy where applicable. A certificate of completion or occupancy shall contain the following:

1. The *permit* number.
2. The address of the premises or structure.
3. The name and address of the owner.
4. A description of the project for which the certificate is issued.
5. A statement that the described project has been inspected for compliance with the requirements of this code.
6. The name of the *code official*.
7. The edition of the code under which the *permit* was issued.
8. The use and occupancy in accordance Chapter 3 of the International Building Code.
9. The type of construction as defined in Chapter 6 of the International Building Code.
10. The design *occupant load*.
11. If fire protection systems are provided, whether the fire protection systems are required.
12. Any special stipulations and conditions of the *permit*.

Exceptions:

1. A certificate of completion or occupancy shall not be required to indicate the items under Section 109.2, Items 8, 9, and 10 for detached one- and two family dwellings and multiple single-family *dwellings* (*townhouses)* constructed using the *International Residential Code*.
2. The *code official* is shall not be required to indicate on a certificate items under Section 109.2, Items 8, 9, and 10 for the installation of equipment, appliances or systems.

109.3 Temporary occupancy. The code official is authorized to issue a temporary certificate of occupancy before the completion of the entire work covered by the permit, provided that such portion or portions shall be occupied safely and without endangerment to life or public welfare. The temporary certificate shall indicate any limitations or restrictions necessary to keep the permit area safe, and items required to obtain the final certificate of occupancy. The code official shall set a time period during which the temporary certificate of occupancy is valid.

~~**105.3.4 Conditional permits.** Where permits are required and upon the request of a permit applicant, the *fire code official* is authorized to issue a conditional permit to occupy the premises or portion thereof before the entire work or operations on the premises is completed, provided that such portion or portions will be occupied safely prior to full completion or installation of equipment and operations without endangering life or public welfare. The *fire code official* shall notify the permit applicant in writing of any limitations or restrictions necessary to keep the permit area safe. The holder of a conditional permit shall proceed only to the point for which approval has been given, at the permit holder's own risk and without assurance that approval for the occupancy or the utilization of the entire premises, equipment or operations will be granted.~~

109.4 Revocation. The code official is authorized to, in writing, suspend or revoke a certificate of completion or occupancy issued under the provisions of this code wherever the certificate is issued in error on the basis of incorrect information supplied, or where it is determined that the building, structure, premise, or portion thereof, or installation of appliance, equipment or system is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION 110 ~~111~~
STOP WORK ORDER

110.1 ~~111.1 Order~~ Authority. Whenever the *fire code official* finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or ~~in a~~ dangerous or unsafe ~~manner~~, the *fire code official* is authorized to issue a stop work order.

110.2 ~~111.2~~ Issuance. A stop work order shall be in writing and shall be given to the *owner* of the property, or to the *owner's* agent, or to the *person* doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order, and the conditions under which the cited work is authorized to resume.

110.2.1 ~~111.3~~ Emergencies. Where an emergency exists, the *fire code official* shall not be required to give a written notice prior to stopping the work.

110.4 ~~111.4 Failure to comply~~ Unlawful continuance. Any *person* who shall continue any work after having been served with a stop work order, except such work as that *person* is directed to perform to remove a violation or unsafe condition, shall be subject to fees, fines, or penalties as prescribed by this code or other laws or ordinances of the jurisdiction ~~liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars~~.

SECTION 111 ~~109~~
VIOLATIONS

111.1 Code violations. No person, association, organization, or business entity of any form shall:

1. Erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or premises in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
2. Install or operate any equipment, appliances, or systems regulated by this code that is in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
3. Be non-compliant with the conditions of any permit or certificate issued under the auspices of this code; or
4. Tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *fire code official* without the express authorization of the *fire code official*.

111.2 Notice of violation. A *code official* who observes or becomes aware of any code violation shall serve upon the responsible person, association, organization, or business entity a written notice in accordance with Section 111.2.1. In the absence of direct knowledge as to the identity or location of the responsible party, the *code official* shall serve the notice upon the property owner. Service may be effected by personal delivery, first class mail, substituted service, or such other means that may be authorized by state and/or local law.

111.2.1 Form of notice. Such notice of violation shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the violation into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties in accordance with Section 111.3.

111.3 Penalties. Violators who fail to comply with a notice to discontinue or abate a condition in violation of this code, and violators who tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *fire code official* without the express authorization of the *fire code official*, shall be subject to the penalties set forth in this code as may be adopted and authorized by state and/or local law.

~~**109.1 Unlawful acts.** It shall be unlawful for a *person*, firm or corporation to erect, construct, alter, repair, remove, demolish or utilize a building, occupancy, premises or system regulated by this code, or cause same to be done, in conflict with or in violation of any of the provisions of this code.~~

~~**109.2 Notice of violation.** When the *fire code official* finds a building, premises, vehicle, storage facility or outdoor area that is in violation of this code, the *fire code official* is authorized to prepare a written notice of violation describing the conditions deemed unsafe and, when compliance is not immediate, specifying a time for reinspection.~~

~~**109.2.1 Service.** A notice of violation issued pursuant to this code shall be served upon the *owner*, operator, occupant or other *person* responsible for the condition or violation, either by personal service, mail or by delivering the same to, and leaving it with, some *person* of responsibility upon the premises. For unattended or abandoned locations, a copy of such notice of violation shall be posted on the premises in a conspicuous place at or near the entrance to such premises and the notice of violation shall be mailed by certified mail with return receipt requested or a certificate of mailing, to the last known address of the *owner*, occupant or both.~~

~~**109.2.2 Compliance with orders and notices.** A notice of violation issued or served as provided by this code shall be complied with by the *owner*, operator, occupant or other *person* responsible for the condition or violation to which the notice of violation pertains.~~

~~**109.2.3 Prosecution of violations.** If the notice of violation is not complied with promptly, the *fire code official* is authorized to request the legal counsel of the jurisdiction to institute the appropriate legal proceedings at law or in equity to restrain, correct or abate such violation or to require removal or termination of the unlawful occupancy of the structure in violation of the provisions of this code or of the order or direction made pursuant hereto.~~

~~**109.2.4 Unauthorized tampering.** Signs, tags or seals posted or affixed by the *fire code official* shall not be mutilated, destroyed or tampered with or removed without authorization from the *fire code official*.~~

~~**109.3 Violation penalties.** *Persons* who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter, repair or do work in violation of the *approved construction documents* or directive of the *fire code official*, or of a permit or certificate used under provisions of this code, shall be guilty of a [SPECIFY OFFENSE], punishable by a fine of not more than [AMOUNT] dollars or by imprisonment not exceeding [NUMBER OF DAYS], or both such fine and imprisonment. Each day that a violation continues after due notice has been served shall be deemed a separate offense.~~

~~**109.3.1 Abatement of violation.** In addition to the imposition of the penalties herein described, the *fire code official* is authorized to institute appropriate action to prevent unlawful construction or to restrain, correct or abate a violation; or to prevent illegal occupancy of a structure or premises; or to stop an illegal act, conduct of business or occupancy of a structure on or about any premises.~~

SECTION 112 ~~108~~
~~BOARD~~ MEANS OF APPEALS

112.1 Application for appeal. Any person directly affected by a decision of the *fire code official* or a notice or order issued under this code shall have the right to appeal to the board of appeals, provided that a written application for appeal is filed within 20 days after the day the decision, notice or order was served. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or the requirements of this code are adequately satisfied by other means.

112.1.1 Stays of enforcement. The filing of an appeal of notice or orders, except for notice or order concerning *Imminent Danger*, shall stay the enforcement of the notice or order until the appeal is heard by the board of appeals.

112.2 Membership of board. The board of appeals shall consist of five members who are qualified by experience and training to pass on matters pertaining to the provisions of this code. The board shall be appointed by the chief appointing authority, and shall serve staggered and overlapping terms.

112.2.1 Alternate members. The chief appointing authority shall appoint two or more alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership and shall be appointed for five years, or until a successor has been appointed.

112.2.2. An employee of the jurisdiction shall not be a member of the board of appeals. The *fire code official* shall be an ex officio member of the board but shall have no vote on any matter before the board.

112.2.3 Chairman. The board shall annually select one of its members to serve as chairman.

112.2.4 Secretary. The chief administrative officer shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

112.2.5 Qualifications. The board of appeals shall consist of five individuals, one from each of the following professions or disciplines:

1. Registered design professional who is a registered architect; or a builder or superintendent of building construction with at least 10 years' experience, five of which shall have been in responsible charge of work.
2. Registered design professional with structural engineering or architectural experience.
3. Registered design professional with fuel gas and plumbing engineering experience; or a fuel gas contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
4. Registered design professional with electrical engineering experience; or an electrical contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
5. Registered design professional with fire protection engineering experience; or a fire protection contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.

112.2.6 Disqualification of member. A member shall not hear an appeal in which that member has a personal, professional or financial interest.

112.2.7 Terms. The initial members of the board of appeals shall serve as follows: one for five years; one for four years; one for three years; one for two years and one for one year. Thereafter, each new member shall serve for five years or until a successor has been appointed.

112.2.8 Compensation of members. Compensation of members shall be determined by law.

112.3 Hearings and meetings. Hearings on appeals and other meetings of the board of appeals shall be held in conformance with Sections 109.3.1 through 109.3.3.

112.3.1 Procedures. The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

112.3.2 Notice. The board shall hold a hearing upon notice from the chairman, within 10 days of the filing of an appeal, or at stated periodic meetings.

112.3.3 Open hearing. All hearings before the board shall be open to the public. A quorum shall consist of not less than two-thirds of the board membership. The appellant, the appellant's representative, the *fire code official* and any person whose interests are affected shall be given an opportunity to be heard.

112.3.4 Postponed hearing. When the full board is not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

112.4 Board decision. The board shall modify or reverse the decision of the fire *code official* by a concurring vote of a majority of the total number of appointed board members.

112.4.1 Resolution. The decision of the board shall be by resolution. Certified copies shall be furnished to the appellant and to the *fire code official*.

112.4.2 Action by *fire* ***code official*****.** The *fire code official* shall take immediate action in accordance with the decision of the board.

112.5 Court review. Any person, whether or not a previous party to the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

~~**108.1 Board of appeals established.** In order to hear and decide appeals of orders, decisions or determinations made by the *fire code official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The *fire code official* shall be an ex officio member of said board but shall have no vote on any matter before the board. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *fire code official*.~~

~~**108.2 Limitations on authority.** An application for appeal shall be based on a claim that the intent of this code or the rules legally adopted hereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equivalent method of protection or safety is proposed. The board shall have no authority to waive requirements of this code.~~

~~**108.3 Qualifications.** The board of appeals shall consist of members who are qualified by experience and training to pass on matters pertaining to hazards of fire, explosions, hazardous conditions or *fire protection systems* and are not employees of the jurisdiction.~~

SECTION 113
FEES

113.1 Payment of fees. A permit or an amendment to a permit shall not be issued until the fees prescribed in Section 113.2 have been paid~~, nor shall an amendment to a permit be released until the additional fee, if any, has been paid~~.

~~**113.2 Schedule of permit fees.** A fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.~~

113.2 Fee schedule. The fees for permits and other considerations shall be in accordance with the following schedule: [JURISDICTION TO INSERT APPROPRIATE FEE SCHEDULE]

113.3 ~~113.4~~ Related fees. The payment of the fee for ~~the construction, *alteration*, removal or demolition of~~ work done in connection to or concurrently with the work ~~or activity~~ authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.

113.4 ~~113.3~~ Work commencing before permit issuance. Any *person* who commences any work on a project requiring a *permit*~~, activity or operation regulated by this code~~ before obtaining the necessary permits shall be subject to ~~an additional~~ a fee established by the *fire code official* ~~applicable governing authority, which~~ that shall be in addition to the required permit fees.

113.5 Permit extension. The fee for an extension of a permit in conformance with Section 105.7 shall be one-half the amount required for a new permit for such work.

113.6 ~~105.5~~ Expiration of permit. For permits that have expired, and before such work recommences in conformance with Section 105.8.1, the fee to recommence work shall be one-half the amount required for a new permit for such work.~~, a new permit shall be first obtained and the fee to recommence work, if any, shall be one-half the amount required for a new permit for such work, provided no changes have been made or will be made in the original construction documents for such work, and provided further that such suspension or abandonment has not exceeded one year.~~

113.7 Stop work order. Any person who shall continue any work on a project requiring a permit after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.

113.8 Reinspection fee. A reinspection of work not in compliance with this code shall be subject to a fee established by the *code official* that shall be in addition to the required *permit* fees. The fee may be assessed when the *approved* plans are not readily available to the inspector, for failure to provide access on the date for which inspection is requested, for work deviating from the approved, or the work or test is not in compliance with this code.

~~**113.5 Refunds.** The applicable governing authority is authorized to establish a refund policy.~~

113.9 Fee refunds. The *fire code official* shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment. The *fire code official* shall authorize the refunding of fees as follows:

1. The full amount of any fee paid hereunder which was erroneously paid or collected.
2. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.
3. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid when no work on a project has been performed under a permit issued in accordance with this code.

(SECTIONS 114 THROUGH 119 RESERVED)

PART 3 – GENERAL REQUIREMENTS

SECTION 120 ~~110~~
UNSAFE ~~BUILDINGS~~ STRUCTURES, EQUIPMENT, AND CONDITIONS

120.1 General. If any building, structure, premises or part thereof, or appliance, equipment, or system is found to be unsafe by the *code official*, or found in the case of a building or structure to be unfit for human occupancy, the condition shall be abated whenever possible, but if abatement is not achieved or is non-achievable, then condemnation shall be undertaken in accordance with the provisions of this code.

~~**110.1 General.** If during the inspection of a premises, a building or structure or any building system, in whole or in part, constitutes a clear and inimical threat to human life, safety or health, the *fire code official* shall issue such notice or orders to remove or remedy the conditions as shall be deemed necessary in accordance with this section and shall refer the building to the building department for any repairs, *alterations*, remodeling, removing or demolition required.~~

~~**110.1.1 Unsafe conditions.** Structures or existing equipment that are or hereafter become unsafe or deficient because of inadequate *means of egress* or which constitute a fire hazard, or are otherwise dangerous to human life or the public welfare, or which involve illegal or improper occupancy or inadequate maintenance, shall be deemed an unsafe condition. A vacant structure which is not secured against unauthorized entry as required by Section 311 shall be deemed unsafe.~~

120.1.1 Notice to building official. Abatement requiring repairs, *alterations*, remodeling, removing or demolition shall be referred to the *building official*.

~~**110.1.2 Structural hazards.** When an apparent structural hazard is caused by the faulty installation, operation or malfunction of any of the items or devices governed by this code, the *fire code official* shall immediately notify the building code official in accordance with Section 110.1.~~

120.1.2 Unsafe structures. An unsafe structure is a structure that is dangerous to the life, health, or safety of the public or to the *occupants* when:

1. There are no minimum safeguards provided to protect or warn *occupants* in the event of fire; or
2. Such structure contains unsafe equipment or is so damaged, decayed, dilapidated, is structurally unsound, is of such faulty construction, or has such an unstable foundation, that partial or complete collapse is possible.

120.1.3 Unsafe equipment. Unsafe equipment includes any boiler, heating equipment, elevator, moving stairway, electrical wiring or device, flammable liquid containers or other equipment on the *premises* or within the structure which is in such disrepair or condition that such equipment constitutes a hazard to life, health, property or safety of the public or the *occupants* of the *premises* or structure.

120.1.4 Structure unfit for human occupancy. A structure is unfit for human *occupancy* whenever the *code official* finds that such structure is unsafe, is unlawful or, because its degree of disrepair, or its want of maintenance, is unsanitary, vermin or rat infested, filthy and contaminated, lacking *ventilation*, illumination, sanitary, heating facilities or other essential equipment required by this code, or because the structure is in proximity to an unsafe or dangerous condition that constitutes a hazard to the *occupants* of the structure or to the public.

120.1.5 Unlawful structure. An unlawful structure is one found in whole or in part to be occupied by more persons than permitted under this code, or was erected, altered or occupied contrary to this code.

120.1.6 Structure and premise that are dangerous to the life, health or safety of the public or occupants. For the purpose of this code, any structure or *premises* that have any or all of the following conditions or defects shall be considered dangerous, and shall constitute an unsafe structure:

1. Any door, aisle, passageway, stairway, exit or other means of egress that does not conform to the *approved* building or fire code of the jurisdiction as related to the requirements for existing buildings.
2. The walking surface of any aisle, passageway, stairway, exit or other means of egress is so warped, worn loose, torn or otherwise unsafe as to not provide safe and adequate means of egress.
3. Any portion of a building, structure or appurtenance that has been damaged by fire, earthquake, wind, flood, *deterioration*, *neglect*, abandonment, vandalism or by any other cause to such an extent that it is likely to partially or completely collapse, or to become *detached* or dislodged.

4. Any portion of a building, or any member, appurtenance or ornamentation on the exterior thereof that is not of sufficient strength or stability, or is not so *anchored*, attached or fastened in place so as to be capable of resisting natural or artificial loads of one and one-half the original designed value.
5. The building or structure, or part of the building or structure, because of dilapidation, *deterioration*, decay, faulty construction, the removal or movement of some portion of the ground necessary for the support, or for any other reason, is likely to partially or completely collapse, or some portion of the foundation or underpinning of the building or structure is likely to fail or give way.
6. The building or structure, or any portion thereof, is clearly unsafe for its use and *occupancy*.
7. The building or structure is *neglected*, damaged, dilapidated, unsecured or abandoned so as to become an attractive nuisance to children who might play in the building or structure to their danger, becomes a harbor for vagrants, criminals or immoral persons, or enables persons to resort to the building or structure for committing a nuisance or an unlawful act.
8. Any building or structure has been constructed, exists or is maintained in violation of any specific requirement or prohibition applicable to such building or structure provided by the *approved* building or fire code of the jurisdiction, or of any law or ordinance to such an extent as to present either a substantial risk of fire, building collapse or any other threat to life and safety.
9. A building or structure, used or intended to be used for dwelling purposes, because of inadequate maintenance, dilapidation, decay, damage, faulty construction or arrangement, inadequate light, *ventilation*, mechanical or plumbing system, or otherwise, is determined by the *code official* to be unsanitary, unfit for human habitation or in such a condition that is likely to cause sickness or disease.
10. Any building or structure, because of a lack of sufficient or proper fire-resistance-rated construction, fire protection systems, electrical system, fuel connections, mechanical system, plumbing system or other cause, is determined by the *code official* to be a threat to life or health.
11. Any portion of a building remains on a site after the demolition or destruction of the building or structure or whenever any building or structure is abandoned so as to constitute such building or portion thereof as an attractive nuisance or hazard to the public.

120.2 Closing of vacant structures. If the structure is vacant and unfit for human habitation and *occupancy*, and is not in danger of structural collapse, the *code official* is authorized to post a placard of condemnation on the *premises* and order the structure closed up so as not to be an attractive nuisance. Upon failure of the *owner* to close up the *premises* within the time specified in the order, the *code official* shall cause the *premises* to be closed and secured through any available public agency or by contract or arrangement by private persons, and the cost thereof shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate that may be collected by any legal means.

120.3 ~~110.2~~ Evacuation. The *fire code official* or the fire department official in charge of an emergency incident shall be authorized to order the immediate evacuation of any occupied building, structure or premises deemed unsafe due to ~~when such building has~~ hazardous conditions that present imminent danger to ~~building~~ occupants. *Persons* so notified shall immediately leave the structure or premises and shall not enter or re-enter until authorized to do so by the *fire code official* or the fire department official in charge of the incident.

120.4 Notice. Whenever the *code official* has *condemned* a structure or equipment under the provisions of this section, notice shall be posted in a conspicuous place in or about the structure affected by such notice and served on the *owner* or the person or persons responsible for the structure or equipment in accordance with Section 120.4.2. If the notice pertains to equipment, it shall also be placed on the *condemned* equipment. The notice shall be in the form prescribed in Section 120.4.1.

120.4.1 Form of notice. Such notice of shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the unsafe condition into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties set forth in this code or as may be adopted and authorized by state and/or local law.

120.4.2 Service of notice. Such notice shall be deemed properly served if a copy thereof is (a) delivered to the owner personally; (b) sent by certified or registered mail addressed to the owner at the last known address with the return receipt requested; or (c) delivered in any other manner as prescribed by local law. If the certified or registered letter is

returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice. Service of such notice in the foregoing manner upon the owner's agent or upon the person responsible for the structure shall constitute service of notice upon the owner.

120.5 Placarding. Upon failure of the owner or person responsible to comply with the notice provisions within the time given, the *code official* shall post on the premises or on defective equipment a placard bearing the word "UNSAFE" or "CONDEMNED" as applicable, and a statement of the penalties provided for occupying the premises, operating the equipment or removing the placard.

120.5.1 Placard removal. The *code official* shall remove the placard whenever the unsafe conditions have been eliminated. Any person who defaces or removes an unsafe condition placard without the approval of the *code official* shall be subject to the penalties provided for by the jurisdiction.

120.6 Prohibited occupancy. Any structure *condemned* and placarded by the *code official* shall be vacated as ordered by the *code official*. It shall be unlawful for any person to occupy or to allow others to occupy a placarded *premises,* or to operate or allow others to operate any placarded equipment.

120.7 ~~110.4~~ Abatement. The *owner*, operator or occupant of a building, structure, ~~or~~ premises, or equipment deemed unsafe by the *fire code official* shall abate or correct ~~cause to be abated or corrected~~ such unsafe conditions either by repair, rehabilitation, demolition or other *approved* corrective action.

120.7.1 ~~110.3~~ Summary abatement. Where conditions exist that are deemed ~~hazardous to life and property~~ an *imminent danger* as described in Section 121.1 that will necessarily result in injury to occupants or the public, the *fire code official* or fire department official in charge of the incident is authorized to ~~abate~~ summarily abate such unsafe or hazardous conditions ~~that are in violation of this code~~.

120.8 Record. The *code official* shall cause a report to be filed on an unsafe condition. The report shall state the occupancy of the structure and the nature of the unsafe condition. The record of an unsafe condition as outlined herein shall be retained by the *code official* for the period required for retention of public records.

SECTION 121
EMERGENCY MEASURES

121.1 Imminent danger. When, in the opinion of the *fire code official*, there is imminent danger of failure or collapse of a building or structure that endangers life, or when any building or part of a building has fallen and life is endangered by the occupation of the building, or when there is actual or potential danger to the building occupants or those in the proximity of any structure because of explosives, explosive fumes or vapors, or the presence of toxic fumes, gases, or materials, or operation of defective or *dangerous* equipment, the *fire code official* is hereby authorized and empowered to order and require the occupants to vacate the premises forthwith. The *fire code official* shall cause to be posted at each entrance to such structure a notice reading as follows: "This Structure Is Unsafe and Its Occupancy Has Been Prohibited by the Fire Code Official." It shall be unlawful for any person to enter such structure except for the purpose of securing the structure, making the required *repairs*, removing the hazardous condition, or of demolishing the same.

121.2 Temporary safeguards. Notwithstanding other provisions of this code, whenever, in the opinion of the *fire code official*, there is imminent danger due to an unsafe condition, the *fire code official* shall order the necessary work to be done, including the boarding up of openings, to render such structure temporarily safe whether or not the legal procedure herein described has been instituted; and shall cause such other action to be taken as the *fire code official* deems necessary to meet such emergency.

121.3 Closing streets. When necessary for public safety, the *fire code official* shall temporarily close structures and close or order the authority having jurisdiction to close sidewalks, streets, public ways, and places adjacent to unsafe structures, and prohibit the same from being utilized.

121.4 Emergency repairs. For the purposes of this section, the *fire code official* shall employ the necessary labor and materials to perform the required work as expeditiously as possible.

121.5 Costs of emergency repairs. Costs incurred in the performance of emergency work shall be paid by the jurisdiction. The legal counsel of the jurisdiction shall institute appropriate action against the owner of the premises where the unsafe structure is or was located for the recovery of such costs.

121.6 Hearing. Any person ordered to take emergency measures shall comply with such order forthwith. Any affected person shall thereafter, upon petition directed to the appeals board, be afforded a hearing as described in this code.

SECTION 122 ~~112~~
SERVICE UTILITIES

122.1 Connection of service utilities. No person shall make connections from a utility, source of energy, fuel, power, water system or *sewer* system to any building, structure or system that is regulated by this code for which a permit is required, until approved by the *fire code official*.

122.2 Temporary connection. The *fire code official* shall have the authority to authorize the temporary connection of the building, structure or system to the utility source of energy, fuel, power, water system or *sewer* system.

122.3 ~~112.1~~ Authority to disconnect service utilities. The *fire code official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary ~~in order to safely execute emergency operations or~~ to eliminate an immediate hazard to life or property or when such utility connection has been made without the approval required by Section 122.1 or 122.2. The *fire code official* shall notify the serving utility and, whenever possible, the *owner* and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnection, ~~.~~ the *owner* or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

SECTION 123
TEMPORARY STRUCTURES, EQUIPMENT, SYSTEMS AND USES

123.1 General. The *fire code official* is authorized to issue a permit for temporary structures, equipment, systems and uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The *fire code official* is authorized to grant extensions for demonstrated cause.

123.2 Conformance. Temporary structures, equipment, systems and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.

123.3 Termination of approval. The *fire code official* is authorized to terminate such permit and to order the temporary structure, equipment, system or use to be discontinued.

SECTION 124 ~~107~~
MAINTENANCE

124.1 ~~107.1~~ Maintenance of safeguards. Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or any other feature is required for compliance with the provisions of this code, or otherwise installed, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be continuously maintained in accordance with this code and applicable referenced standards.

124.2 ~~107.2~~ Testing and operation. Equipment requiring periodic testing or operation to ensure maintenance shall be tested or operated as specified in this code.

124.2.1 ~~107.2.1~~ Test and inspection records. Required test and inspection records shall be available to the *fire code official* at all times or such records as ~~the~~ designates shall be filed with the *fire code official*.

124.2.2 ~~107.2.2~~ Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *fire code official* for inspection and testing.

124.3 ~~107.3~~ Supervision. Maintenance and testing shall be under the supervision of a responsible *person* who shall ensure that such maintenance and testing are conducted at specified intervals in accordance with this code.

124.4 ~~107.4~~ Rendering equipment inoperable. Portable or fixed fire-extinguishing systems or devices and fire-warning systems shall not be rendered inoperative or inaccessible except as necessary during emergencies, maintenance, repairs, *alterations*, drills or prescribed testing.

SECTION 125
DEMOLITION

125.1 General. The *fire code official* shall order the owner of any premises upon which is located any structure that in the *fire code official's* judgment is deteriorated or dilapidated, or has become so out of *repair* as to be *dangerous*, unsafe, insanitary, or otherwise unfit for human habitation or occupancy, and such that it is unreasonable to *repair* the

structure, to demolish and remove such structure; or if such structure is capable of being made safe by *repairs*, to *repair* and make safe and sanitary, or to board up and hold for future repair, or to demolish and remove at the owner's option; or where there has been a cessation of normal construction of any structure for a period of more than two years, to board up and hold for recommencement of work, or to demolish and remove such structure. Boarding up the building for future repair or recommencement of work shall not extend beyond one year, unless *approved* by the *fire code official*.

125.2 Notices and orders. All notices and orders shall comply with Section 111.2.

125.3 Failure to comply. If the owner of a premises fails to comply with a demolition order within the time prescribed, the *fire code official* shall cause the structure to be demolished and removed, either through an available public agency or by contract or arrangement with private persons, and the cost of such demolition and removal shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate.

125.4 Salvage materials. When any structure has been ordered demolished and removed in accordance with Section 125.3, the governing body or other designated officer under said contract or arrangement aforesaid shall have the right to sell the salvage and valuable materials at the highest price obtainable. The net proceeds of such sale, after deducting the expenses of such demolition and removal, shall be promptly remitted with a report of such sale or transaction, including the items of expense and the amounts deducted, for the person who is entitled thereto, subject to any order of a court. If such a surplus does not remain to be turned over, the report shall so state.

125.5 Existing remedies. The provisions in this code shall not be construed to abolish or impair existing remedies of the jurisdiction or its officers or agencies relating to the removal or demolition of any structure which is dangerous, unsafe or insanitary.

SECTION 126
OPERATIONAL PERMITS

126.1 ~~105.6~~ Required operational permits. The *fire code official* is authorized to issue operational permits for the operations set forth in Sections ~~105.6.1~~ 126.2 through 126.47 ~~105.6.46~~.

126.1.1 ~~105. 2.2~~ Preliminary inspection ~~authorized~~. Before a new operational permit is *approved*, the *fire code official* is authorized to inspect the receptacles, vehicles, buildings, devices, premises, storage spaces or areas to be used to determine compliance with this code or any operational constraints required.

126.1.2 ~~105.3.1~~ Expiration of operational permit. An operational permit shall remain in effect until reissued, renewed, or revoked or for such a period of time as specified in the permit.

126.2 ~~105.6.1~~ Aerosol products. An operational permit is required to manufacture, store or handle an aggregate quantity of Level 2 or Level 3 aerosol products in excess of 500 pounds (227 kg) net weight.

126.3 ~~105.6.2~~ Amusement buildings. An operational permit is required to operate a special amusement building.

126.4 ~~105.6.3~~ Aviation facilities. An operational permit is required to use a Group H or Group S occupancy for aircraft servicing or repair and aircraft fuel-servicing vehicles. Additional permits required by other sections of this code include, but are not limited to, hot work, hazardous materials and flammable or combustible finishes.

126.5 ~~105.6.4~~ Carnivals and fairs. An operational permit is required to conduct a carnival or fair.

126.6 ~~105.6.5~~ Cellulose nitrate film. An operational permit is required to store, handle or use cellulose nitrate film in a Group A occupancy.

126.7 ~~105.6.6~~ Combustible dust-producing operations. An operational permit is required to operate a grain elevator, flour starch mill, feed mill, or a plant pulverizing aluminum, coal, cocoa, magnesium, spices or sugar, or other operations producing *combustible dusts* as defined in Chapter 2.

126.8 ~~105.6.7~~ Combustible fibers. An operational permit is required for the storage and handling of *combustible fibers* in quantities greater than 100 cubic feet (2.8 m3).

Exception: A permit is not required for agricultural storage.

126.9 ~~105.6.8~~ Compressed gases. An operational permit is required for the storage, use or handling at *normal temperature and pressure* (NTP) of *compressed gases* in excess of the amounts listed in Table 126.9 ~~105.6.8~~.

Exception: Vehicles equipped for and using *compressed gas* as a fuel for propelling the vehicle.

TABLE 126.9 ~~105.6.8~~
PERMIT AMOUNTS FOR COMPRESSED GASES

TYPE OF GAS	AMOUNT (cubic feet at NTP)
Corrosive	200
Flammable (except cryogenic fluids and liquefied petroleum gases)	200
Highly toxic	Any Amount
Inert and simple asphyxiant	6,000
Oxidizing (including oxygen)	504
Pyrophoric	Any Amount
Toxic	Any Amount

For SI: 1 cubic foot = 0.02832 m3.

126.10 ~~105.6.9~~ Covered mall buildings. An operational permit is required for:

1. The placement of retail fixtures and displays, concession equipment, displays of highly combustible goods and similar items in the mall.
2. The display of liquid- or gas-fired equipment in the mall.
3. The use of open-flame or flame-producing equipment in the mall.

126.11 ~~105.6.10~~ Cryogenic fluids. An operational permit is required to produce, store, transport on site, use, handle or dispense *cryogenic fluids* in excess of the amounts listed in Table 126.11 ~~105.6.10~~.

Exception: Permits are not required for vehicles equipped for and using *cryogenic fluids* as a fuel for propelling the vehicle or for refrigerating the lading.

TABLE 126.11 ~~105.6.10~~
PERMIT AMOUNTS FOR CRYOGENIC FLUIDS

TYPE OF CRYOGENIC FLUID	INSIDE BUILDING (gallons)	OUTSIDE BUILDING (gallons)
Flammable	More than 1	60
Inert	60	500
Oxidizing (includes oxygen)	10	50
Physical or health hazard not indicated above	Any Amount	Any Amount

For SI: 1 gallon = 3.785 L.

126.12 ~~105.6.11~~ Cutting and welding. An operational permit is required to conduct cutting or welding operations within the jurisdiction.

126.13 ~~105.6.12~~ Dry cleaning plants. An operational permit is required to engage in the business of dry cleaning or to change to a more hazardous cleaning solvent used in existing dry cleaning equipment.

126.14 ~~105.6.13~~ Exhibits and trade shows. An operational permit is required to operate exhibits and trade shows.

126.15 ~~105.6.14~~ Explosives. An operational permit is required for the manufacture, storage, handling, sale or use of any quantity of *explosives*, *explosive materials*, fireworks or pyrotechnic special effects within the scope of Chapter 33.

Exception: Storage in Group R-3 occupancies of smokeless propellant, black powder and small arms primers for personal use, not for resale and in accordance with Section 3306.

126.16 ~~105.6.15~~ Fire hydrants and valves. An operational permit is required to use or operate fire hydrants or valves intended for fire suppression purposes which are installed on water systems and accessible to a fire apparatus access road that is open to or generally used by the public.

Exception: A permit is not required for authorized employees of the water company that supplies the system or the fire department to use or operate fire hydrants or valves.

126.17 ~~105.6.16~~ Flammable and combustible liquids. An operational permit is required:

1. To use or operate a pipeline for the transportation within facilities of flammable or *combustible liquids*. This requirement shall not apply to the off-site transportation in pipelines regulated by the Department of Transportation (DOTn) nor does it apply to piping systems.
2. To store, handle or use Class I liquids in excess of 5 gallons (19 L) in a building or in excess of 10 gallons (37.9 L) outside of a building, except that a permit is not required for the following:
   2.1. The storage or use of Class I liquids in the fuel tank of a motor vehicle, aircraft, motorboat, mobile power plant or mobile heating plant, unless such storage, in the opinion of the *fire code official*, would cause an unsafe condition.
   2.2. The storage or use of paints, oils, varnishes or similar flammable mixtures when such liquids are stored for maintenance, painting or similar purposes for a period of not more than 30 days.
3. To store, handle or use Class II or Class IIIA liquids in excess of 25 gallons (95 L) in a building or in excess of 60 gallons (227 L) outside a building, except for fuel oil used in connection with oil-burning equipment.
4. To store, handle or use Class IIIB liquids in tanks or portable tanks for fueling motor vehicles at motor fuel-dispensing facilities or where connected to fuel-burning equipment.

   Exception: Fuel oil and used motor oil used for space heating or water heating.

5. To remove Class I or II liquids from an underground storage tank used for fueling motor vehicles by any means other than the *approved*, stationary on-site pumps normally used for dispensing purposes.
6. To operate tank vehicles, equipment, tanks, plants, terminals, wells, fuel-dispensing stations, refineries, distilleries and similar facilities where flammable and *combustible liquids* are produced, processed, transported, stored, dispensed or used.
7. To place temporarily out of service (for more than 90 days) an underground, protected above-ground or above-ground flammable or *combustible liquid* tank.
8. To change the type of contents stored in a flammable or *combustible liquid* tank to a material that poses a greater hazard than that for which the tank was designed and constructed.
9. To manufacture, process, blend or refine flammable or *combustible liquids*.
10. To engage in the dispensing of liquid fuels into the fuel tanks of motor vehicles at commercial, industrial, governmental or manufacturing establishments.
11. To utilize a site for the dispensing of liquid fuels from tank vehicles into the fuel tanks of motor vehicles, marine craft and other special equipment at commercial, industrial, governmental or manufacturing establishments.

126.18 ~~105.6.17~~ Floor finishing. An operational permit is required for floor finishing or surfacing operations exceeding 350 square feet (33 m2) using Class I or Class II liquids.

126.19 ~~105.6.18~~ Fruit and crop ripening. An operational permit is required to operate a fruit- or crop-ripening facility or conduct a fruit-ripening process using ethylene gas.

126.20 ~~105.6.19~~ Fumigation and thermal insecticidal fogging. An operational permit is required to operate a business of fumigation or thermal insecticidal fogging and to maintain a room, vault or chamber in which a toxic or flammable fumigant is used.

126.21 ~~105.6.20~~ Hazardous materials. An operational permit is required to store, transport on site, dispense, use or handle hazardous materials in excess of the amounts listed in Table 126.21 ~~105.6.20~~.

126.22 ~~105.6.21~~ HPM facilities. An operational permit is required to store, handle or use hazardous production materials.

126.23 ~~105.6.22~~ High-piled storage. An operational permit is required to use a building or portion thereof as a *high-piled storage area* exceeding 500 square feet (46 m2).

126.24 ~~105.6.23~~ Hot work operations. An operational permit is required for hot work including, but not limited to:

1. Public exhibitions and demonstrations where hot work is conducted.
2. Use of portable hot work equipment inside a structure.

Exception: Work that is conducted under a construction permit.

3. Fixed-site hot work equipment such as welding booths.
4. Hot work conducted within a wildfire risk area.
5. Application of roof coverings with the use of an open-flame device.
6. When *approved*, the *fire code official* shall issue a permit to carry out a hot work program. This program allows *approved* personnel to regulate their facility's hot work operations. The *approved* personnel shall be trained in the fire safety aspects denoted in this chapter and shall be responsible for issuing permits requiring compliance with the requirements found in Chapter 26. These permits shall be issued only to their employees or hot work operations under their supervision.

126.25 ~~105.6.24~~ Industrial ovens. An operational permit is required for operation of industrial ovens regulated by Chapter 21.

TABLE 126.21 ~~105.6.20~~
PERMIT AMOUNTS FOR HAZARDOUS MATERIALS

TYPE OF MATERIAL	AMOUNT
Combustible liquids	See Section 105.6.16
Corrosive materials	
Gases	See Section 105.6.8
Liquids	55 gallons
Solids	1000 pounds
Explosive materials	See Section 105.6.14
Flammable materials	
Gases	See Section 105.6.8
Liquids	See Section 105.6.16
Solids	100 pounds
Highly toxic materials	
Gases	See Section 105.6.8
Liquids	Any Amount
Solids	Any Amount
Oxidizing materials	
Gases	See Section 105.6.8
Liquids	
Class 4	Any Amount
Class 3	1 gallon[a]
Class 2	10 gallons
Class 1	55 gallons
Solids	
Class 4	Any Amount
Class 3	10 pounds[b]
Class 2	100 pounds
Class 1	500 pounds
Organic peroxides	
Liquids	
Class I	Any Amount
Class II	Any Amount
Class III	1 gallon
Class IV	2 gallons
Class V	No Permit Required
Solids	
Class I	Any Amount
Class II	Any Amount
Class III	10 pounds
Class IV	20 pounds
Class V	No Permit Required
Pyrophoric materials	
Gases	Any Amount
Liquids	Any Amount
Solids	Any Amount
Toxic materials	

Gases	See Section 105.6.8
Liquids	10 gallons
Solids	100 pounds
Unstable (reactive) materials	
Liquids	
Class 4	Any Amount
Class 3	Any Amount
Class 2	5 gallons
Class 1	10 gallons
Solids	
Class 4	Any Amount
Class 3	Any Amount
Class 2	50 pounds
Class 1	100 pounds
Water-reactive materials	
Liquids	
Class 3	Any Amount
Class 2	5 gallons
Class 1	55 gallons
Solids	
Class 3	Any Amount
Class 2	50 pounds
Class 1	500 pounds

For SI: 1 gallon = 3.785 L, 1 pound = 0.454 kg.

a. 20 gallons when Table 2703.1.1(1) Note k applies and hazard identification signs in accordance with Section 2703.5 are provided for quantities of 20 gallons or less.

b. 200 pounds when Table 2703.1.1(1) Note k applies and hazard identification signs in accordance with Section 2703.5 are provided for quantities of 200 pounds or less.

126.26 ~~105.6.25~~ Lumber yards and woodworking plants. An operational permit is required for the storage or processing of lumber exceeding 100,000 board feet (8,333 ft^3) (236 m^3).

126.27 ~~105.6.26~~ Liquid- or gas-fueled vehicles or equipment in assembly buildings. An operational permit is required to display, operate or demonstrate liquid- or gas-fueled vehicles or equipment in assembly buildings.

126.28 ~~105.6.27~~ LP-gas. An operational permit is required for:

1. Storage and use of LP-gas.

   Exception: A permit is not required for individual containers with a 500-gallon (1893 L) water capacity or less serving occupancies in Group R-3.

2. Operation of cargo tankers that transport LP-gas.

126.29 ~~105.6.28~~ Magnesium. An operational permit is required to melt, cast, heat treat or grind more than 10 pounds (4.54 kg) of magnesium.

126.30 ~~105.6.29~~ Miscellaneous combustible storage. An operational permit is required to store in any building or upon any premises in excess of 2,500 cubic feet (71m^3) gross volume of combustible empty packing cases, boxes, barrels or similar containers, rubber tires, rubber, cork or similar combustible material.

126.31 ~~105.6.30~~ Open burning. An operational permit is required for the kindling or maintaining of an open fire or a fire on any public street, alley, road, or other public or private ground. Instructions and stipulations of the permit shall be adhered to.

Exception: *Recreational fires*.

126.32 ~~105.6.31~~ Open flames and torches. An operational permit is required to remove paint with a torch; or to use a torch or open-flame device in a wildfire risk area.

126.33 ~~105.6.32~~ Open flames and candles. An operational permit is required to use open flames or candles in connection with assembly areas, dining areas of restaurants or drinking establishments.

126.34 ~~105.6.33~~ Organic coatings. An operational permit is required for any organic-coating manufacturing operation producing more than 1 gallon (4 L) of an organic coating in one day.

126.35 ~~105.6.34~~ Places of assembly. An operational permit is required to operate a place of assembly.

126.36 ~~105.6.35~~ Private fire hydrants. An operational permit is required for the removal from service, use or operation of private fire hydrants.

Exception: A permit is not required for private industry with trained maintenance personnel, private fire brigade or fire departments to maintain, test and use private hydrants.

126.37 ~~105.6.36~~ Pyrotechnic special effects material. An operational permit is required for use and handling of pyrotechnic special effects material.

126.38 ~~105.6.37~~ Pyroxylin plastics. An operational permit is required for storage or handling of more than 25 pounds (11 kg) of cellulose nitrate (pyroxylin) plastics and for the assembly or manufacture of articles involving pyroxylin plastics.

126.39 ~~105.6.38~~ Refrigeration equipment. An operational permit is required to operate a mechanical refrigeration unit or system regulated by Chapter 6.

126.40 ~~105.6.39~~ Repair garages and motor fuel-dispensing facilities. An operational permit is required for operation of repair garages and automotive, marine and fleet motor fuel-dispensing facilities.

126.41 ~~105.6.40~~ Rooftop heliports. An operational permit is required for the operation of a rooftop heliport.

123.42 ~~105.6.41~~ Spraying or dipping. An operational permit is required to conduct a spraying or dipping operation utilizing flammable or *combustible liquids* or the application of combustible powders regulated by Chapter 15.

126.43 ~~105.6.42~~ Storage of scrap tires and tire byproducts. An operational permit is required to establish, conduct or maintain storage of scrap tires and tire byproducts that exceeds 2,500 cubic feet (71m3) of total volume of scrap tires and for indoor storage of tires and tire byproducts.

126.44 ~~105.6.43~~ Temporary membrane structures and tents. An operational permit is required to operate an air-supported temporary membrane structure or a tent having an area in excess of 400 square feet (37 m^2).

Exceptions:

1. Tents used exclusively for recreational camping purposes.
2. Tents open on all sides, which comply with all of the following:
   - 2.1. Individual tents having a maximum size of 700 square feet (65 m^2).
   - 2.2. The aggregate area of multiple tents placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed 700 square feet (65 m^2) total.
   - 2.3. A minimum clearance of 12 feet (3658 mm) to structures and other tents shall be provided.

126.45 ~~105.6.44~~ Tire-rebuilding plants. An operational permit is required for the operation and maintenance of a tire-rebuilding plant.

126.46 ~~105.6.45~~ Waste handling. An operational permit is required for the operation of wrecking yards, junk yards and waste material-handling facilities.

126.47 ~~105.6.46~~ Wood products. An operational permit is required to store chips, hogged material, lumber or plywood in excess of 200 cubic feet (6 m^3).

2. Revise and add the following definitions in the IFC:

ADDITION. An extension or increase in floor area, number of stories, or height of a building or structure.

[EB] ALTERATION. Any construction or renovation to an existing structure other than a repair or addition that requires a *permit*, or a change in a mechanical, plumbing, fuel gas or other system that involves an extension, addition or change to the arrangement, type or purpose of the original installation that requires a *permit*. Alterations are classified as Level 1, Level 2 and Level 3.

APPLIANCE. A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.

APPROVED. ~~Acceptable to the *fire code official*.~~ Approval by the code official as the result of review, investigation or tests conducted by the code official or by reason of accepted principles or tests by national authorities, or technical or scientific organizations.

APPROVED AGENCY. An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been *approved* by the *code official*.

CERTIFICATE OF COMPLETION. A certificate stating that the project or work for which a permit was issued has been completed in compliance with approved construction documents and the requirements of this code.

EQUIPMENT OR FIXTURE. Any plumbing, heating, electrical, ventilating, air conditioning, refrigerating, and fire protection equipment, apparatus and devices, all piping, ducts, vents, control devices and other systems or components thereof, and elevators, dumb waiters, escalators, boilers, pressure vessels and other mechanical facilities or installations that are related to building services, any of which are specifically regulated in this code. Appliances as defined by this code shall not be considered equipment. Equipment or fixtures shall not include manufacturing, production, or process equipment, but shall include connections from building service to process equipment.

IMMINENT DANGER. A condition which could cause serious or life-threatening injury or death at any time.

LOT LINE. A line dividing one lot from another, or from a street or any public place.

[B] REGISTERED DESIGN PROFESSIONAL. An architect or engineer~~,~~ who is registered or licensed to practice ~~professional architecture or engineering~~ their respective design profession, as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A *registered design professional* engaged by the owner to review and coordinate certain aspects of the project, as determined by the *building official*, for compatibility with the design of the building or structure, including submittal documents prepared by others, deferred submittal documents and phased submittal documents.

REPAIR. The reconstruction or renewal of any part of an existing building for the purpose of its maintenance.

STRUCTURE. That which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

PART V – IFGC

1. Revise IFGC (Item 1-F) as follows:

CHAPTER 1
SCOPE AND ADMINISTRATION

PART 1—SCOPE AND APPLICATION

SECTION 101 (IFGC)
GENERAL

101.1 Title. These regulations shall be known as the *Fuel Gas Code* of [NAME OF JURISDICTION], hereinafter referred to as "this code."

101.2 Scope. The provisions of this code shall apply to the installation of fuel gas *piping* systems, fuel gas appliances, gaseous hydrogen systems and related accessories ~~in accordance with Sections 101.2.1 through 101.2.5.~~

Exception: Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane ~~high~~ with a separate means of egress and their accessory structures shall comply with the *International Residential Code*.

~~**101.4**~~ **101.3 Purpose** ~~**Intent.**~~ The purpose of this code is to ~~provide~~ establish the minimum requirements ~~standards~~ to safeguard life or limb, health, property, and public welfare by regulating and controlling the design, construction, installation, quality of materials, location, operation, and maintenance or use of fuel gas systems.

~~**101.5**~~ **101.4 Severability.** If a section, subsection, sentence, clause, or phrase of this code is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code.

101.5 Validity. In the event any part or provision of this code is held to be illegal or void, this shall not have the effect of making illegal or void any of the other parts or provisions hereof, which are determined to be legal; and it shall be presumed that this code would have been adopted without such illegal or invalid parts or provisions.

~~**102.10**~~ **101.6 Other laws.** The provisions of this code shall not be deemed to nullify any provisions of local, state, or federal law.

SECTION 102 (IFGC)
APPLICABILITY

102.1 General. Where there is a conflict between a general requirement and a specific requirement of this code, the specific requirement shall be applicable ~~govern~~. Where, in a specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

~~**102.11**~~ **102.2 Application of references.** Reference to chapter section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

~~**102.8**~~ **102.3 Referenced codes and standards.** The codes and standards referenced in this code shall be ~~those that are *listed* in Chapter 8 and such codes and standards shall be~~ considered part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between the provisions of this code and the referenced codes and standards, the provisions of this code shall apply.

Exception: Where enforcement of a code provision would violate the conditions of the listing of the *equipment* or *appliance*, the conditions of the listing ~~and the manufacturer's installation instructions~~ shall govern ~~apply~~.

102.4 ~~**101.3**~~ **Appendices.** Provisions in the appendices shall not apply unless specifically adopted.

102.5 ~~**102.2**~~ **Existing structures and systems** ~~**installations.**~~ The legal occupancy or use of any structure or installed system existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the *International Building Code,* the *International Fire Code,* or the *International Property Maintenance Code*, or as is deemed necessary by the *code official* for the general safety and welfare of the occupants and the public. ~~Except as otherwise provided for in this chapter, a provision in this code shall not require the removal, *alteration* or abandonment of, nor prevent the continued utilization and maintenance of, existing installations lawfully in existence at the time of the adoption of this code.~~

102.5.1 ~~**102.6**~~ **Historic buildings.** The provisions of this code relating to the construction, *alteration*, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures identified and classified by the state or local jurisdiction as historic buildings when such buildings or structures are judged by the code official to be safe and in the public interest of health, safety and welfare regarding any proposed construction, *alteration*, repair, enlargement, restoration, relocation or moving of buildings.

102.6 ~~**105.2**~~ **Alternative materials, design, ~~and~~ methods, ~~appliances~~ and equipment.** The provisions of this code are not intended to prevent the installation of any material, or the use or operation of appliances, equipment, systems, or method, or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative ~~material or method of construction~~ shall be *approved* where the code official finds that the proposed alternative ~~design~~ is satisfactory and complies with the intent of the provisions of this code, and that the alternative ~~material, method or work offered~~ is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

102.6.1 Matters regulated by the *International Building Code.* Approvals under the authority herein contained shall be subject to the approval of the *building official* whenever the alternative involves matters regulated by the *International Building Code*.

102.7 ~~102.9~~ Requirements not covered by code. Requirements necessary for the strength, stability or proper operation of an existing or proposed fixture, structure, or equipment ~~installation~~, or for the public safety, health, and general welfare, not specifically covered by this code, shall be determined by the code official.

102.8 Subjects not regulated by this code. Where no applicable standards or requirements are set forth in this code, or are contained within other laws, codes, regulations, ordinances, or bylaws adopted by the jurisdiction, compliance with applicable nationally recognized standards, as *approved*, shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the *code official* to determine compliance with codes or standards for those activities or installations within the *code official's* jurisdiction or responsibility.

102.9 ~~106.5.7~~ Previous approvals. This code shall not require changes in the *construction documents*, construction or designated *occupancy* of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

102.10 Contractor's responsibilities. Every contractor who enters into contracts for which a permit is required shall comply with the state and local rules and regulations concerning licensing.

102.11 Specific application of this code. The following are application specific to this code.

[EB] 102.11.1 ~~102.2.1~~ Existing buildings. Additions, alterations, renovations or repairs related to building or structural issues shall be regulated by the *International Building Code*.

102.11.2 ~~101.2.2~~ Piping systems. These regulations cover *piping* systems for natural gas with an operating pressure of 125 pounds per square inch gauge (psig) (862 kPa gauge) or less, and for LP-gas with an operating pressure of 20 psig (140 kPa gauge) or less, except as provided in Section 402.6. Coverage shall extend from the *point of delivery* to the outlet of the *appliance* shutoff valves. *Piping* system requirements shall include design, materials, components, fabrication, assembly, installation, testing, inspection, operation and maintenance.

102.11.3 ~~101.2.3~~ Gas appliances. Requirements for gas appliances and related accessories shall include installation, combustion and ventilation air and venting and connections to *piping* systems.

102.11.4 ~~101.2.1~~ Gaseous hydrogen systems. Gaseous hydrogen systems shall be regulated by Chapter 7.

102.11.5 ~~101.2.5~~ Other fuels. The requirements for the design, installation, maintenance, *alteration* and inspection of mechanical systems operating with fuels other than fuel gas shall be regulated by the *International Mechanical Code*.

102.11.6 ~~102.3~~ Maintenance. Installations, both existing and new, and parts thereof shall be maintained in proper operating condition in accordance with the original design and in a safe condition. Devices or safeguards which are required by this code shall be maintained in compliance with the code edition under which they were installed. The owner or the owner's designated agent shall be responsible for maintenance of installations. To determine compliance with this provision, the code official shall have the authority to require an installation to be reinspected.

102.11.7 ~~102.4~~ Additions, alterations or repairs. Additions, alterations, renovations or repairs to installations shall conform to that required for new installations without requiring the existing installation to comply with all of the requirements of this code. Additions, alterations or repairs shall not cause an existing installation to become unsafe, hazardous or overloaded. Minor additions, alterations, renovations and repairs to existing installations shall meet the provisions for new construction, unless such work is done in the same manner and arrangement as was in the existing system, is not hazardous and is *approved*.

102.11.8 ~~102.5~~ Change in occupancy. It shall be unlawful to make a change in the *occupancy* of a structure which will subject the structure to the special provisions of this code applicable to the new *occupancy* without approval. The code official shall certify that such structure meets the intent of the provisions of law governing building construction for the proposed new *occupancy* and that such change of *occupancy* does not result in any hazard to the public health, safety or welfare.

102.11.9 ~~102.7~~ Moved buildings. Except as determined by Section **102.5** ~~102.2~~, installations that are a part of buildings or structures moved into or within the jurisdiction shall comply with the provisions of this code for new installations.

102.11.10 ~~101.2.4~~ Systems, appliances and equipment outside the scope. This code shall not apply to the following:

1. Portable LP-gas appliances and *equipment* of all types that is not connected to a fixed fuel *piping* system.
2. Installation of farm appliances and *equipment* such as brooders, dehydrators, dryers and irrigation *equipment*.
3. Raw material (feedstock) applications except for *piping* to special atmosphere generators.
4. Oxygen-fuel gas cutting and welding systems.
5. Industrial gas applications using gases such as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen and nitrogen.
6. Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms and natural gas processing plants.
7. Integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by, or used in, chemical reactions.
8. LP-gas installations at utility gas plants.
9. Liquefied natural gas (LNG) installations.
10. Fuel gas *piping* in power and atomic energy plants.
11. Proprietary items of *equipment*, apparatus or instruments such as gas-generating sets, compressors and calorimeters.
12. LP-gas *equipment* for vaporization, gas mixing and gas manufacturing.
13. Temporary LP-gas *piping* for buildings under construction or renovation that is not to become part of the permanent *piping* system.
14. Installation of LP-gas systems for railroad switch heating.
15. Installation of hydrogen gas, LP-gas and compressed natural gas (CNG) systems on vehicles.
16. Except as provided in Section 401.1.1, gas *piping*, meters, gas pressure regulators and other appurtenances used by the serving gas supplier in the distribution of gas, other than undiluted LP-gas.
17. Building design and construction, except as specified herein.
18. *Piping* systems for mixtures of gas and air within the flammable range with an operating pressure greater than 10 psig (69 kPa gauge).
19. Portable fuel cell appliances that are neither connected to a fixed *piping* system nor interconnected to a power grid.

PART 2—ADMINISTRATION AND ENFORCEMENT

SECTION 103 (IFGC)
DEPARTMENT OF FUEL GAS INSPECTION

103.1 General. The Department of Fuel Gas Inspection, herein referred to as "the department," is hereby ~~created and the executive official in charge thereof shall be known as~~ established within the jurisdiction under the direction of the code official. The function of the department shall be the implementation, administration, and enforcement of the provisions of this code.

103.2 Appointment. The *code official* shall be appointed by the chief appointing authority of the jurisdiction.

103.3 Deputies. In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the *code official* shall have the authority to appoint a deputy code official, ~~other~~ related technical officers, inspectors, and other employees. Such employees shall have powers as delegated by the code official.

103.4 Liability. The *code official*, member of the Board of Appeals, officer, or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally, and is hereby relieved from all personal liability for any damage accruing to persons or property as a result of an act or by reason of an act or omission in the discharge of official duties.

103.5 Legal defense. Any suit instituted against any officer or employee of the department because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in an action, suit, or proceeding that is instituted in pursuance of the provisions of this code. Any officer or employee, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith.

SECTION 104 (IFGC)

DUTIES AND POWERS OF THE CODE OFFICIAL

104.1 General. The code official is hereby authorized and directed to enforce the provisions of this code. The code official shall have the authority to render interpretations of this code and to adopt policies, and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

104.2 Applications and permits. The code official shall receive applications, review *construction documents*, ~~and~~ issue permits required by this code ~~for installations and alterations of fuel gas systems~~, inspect the premises for which such permits have been issued, and enforce compliance with the provisions of this code.

~~104.6~~ 104.3 Notices and orders. The code official shall issue all necessary notices or orders to ensure compliance with this code.

~~104.3~~ 104.4 Inspections. The code official shall make all of the required inspections, or code official shall have the authority to accept reports of inspection by *approved* agencies or individuals. ~~All~~ Reports of such inspections shall be in writing and ~~shall~~ be certified by a responsible officer of such *approved* agency or by the responsible individual. The code official is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

104.5 Identification. The code official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

~~104.4~~ 104.6 Right of entry. ~~Whenever~~ Where it is necessary to make an inspection to enforce the provisions of this code, or ~~whenever~~ where the code official has reasonable cause to believe that there exists in a ~~building~~ structure or upon ~~any~~ a premises ~~any~~ a condition ~~conditions or violations of this code that~~ which is contrary to or in violation of this code which makes the ~~building~~ structure or premises unsafe, dangerous, or hazardous, the code official ~~shall have the authority~~ is authorized to enter the ~~building~~ structure or premises at ~~all~~ reasonable times to inspect or to perform the duties imposed ~~upon the code official~~ by this code, ~~.~~ provided that if such ~~building~~ structure or premises ~~is~~ be occupied, ~~the code official shall present~~ that credentials be presented to the occupant and ~~request~~ entry requested. If such ~~building~~ structure or premises is unoccupied, the code official shall first make a reasonable effort to locate the owner or other person having charge or control of the ~~building~~ structure or premises and request entry. If entry is refused, the code official ~~has~~ shall have recourse to ~~every remedy~~ the remedies provided by law to secure entry.

104.6.1 Warrant. When the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner or occupant or person having charge, care or control of the ~~building~~ structure or premises shall not fail or neglect, after proper request is made as herein provided, to promptly permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

104.7 Department records. The code official shall keep official records of applications received, permits and certificates issued, fees collected, reports of inspections, and notices and orders issued. Such records shall be retained in the official records for the period required for the retention of public records.

104.8 Assistance of other agencies. The code official is authorized to request, and shall receive so far as is required in the discharge of the duties described in this code, the assistance and cooperation of other officials of the jurisdiction.

104.9 Specific duties. The following are specific duties of the code official. [JURISDICTION TO INSERT CODE OFFICIAL DUTIES SPECIFIC TO THIS CODE]

SECTION 105 ~~106~~ (IFGC)
PERMITS

105.1 ~~106.1~~ ~~Where~~ Permit required. ~~An~~ Any owner, authorized agent ~~or contractor~~ who ~~desires~~ intends to ~~erect, install,~~ construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to construct, erect, install, enlarge, alter, repair, remove, convert, or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the *code official* and obtain the required *permit* for the project. Where laws or regulations are enforceable by other agencies or departments, approval shall be obtained from all agencies or departments concerned. ~~remove, convert or replace an installation regulated by this code, or to cause such work to be done, shall first make application to the code official and obtain the required permit for the work.~~

~~**Exception:** Where *appliance* and *equipment* replacements and repairs are required to be performed in an emergency situation, the permit application shall be submitted within the next working business day of the Department of Inspection.~~

105.1.1 Annual permit. In lieu of an individual *permit* for each *alteration* to an already *approved* electrical, gas, mechanical or plumbing installation, the *code official* is authorized to issue an annual *permit* upon application therefor to any person, firm or corporation regularly employing one or more qualified tradespersons in the building, structure, or on the premises owned or operated by the applicant for the *permit*.

105.1.1.1 Annual permit records. The person to whom an annual *permit* is issued shall keep a detailed record of *alterations* made under such annual *permit*. The *code official* shall have access to such records at all times, or such records shall be filed with the *code official* as designated.

105.1.2 Emergency repairs. Where equipment replacements and repairs must be performed in an emergency situation, the *permit* application shall be submitted within the next working business day to the *code official*.

105.1.3 Permits specifically required. The following specifically require a permit. [JURISDICTION TO INSERT SPECIFIC ITEMS REQUIRING A PERMIT FOR THIS CODE]

105.2 ~~106.2~~ Permits ~~not~~ required. Exemptions from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required in accordance with Sections 105.2.1 through 105.2.3. ~~for the following:~~

~~Exemption from the permit requirements of this code shall not be deemed to grant authorization for work to be done in violation of the provisions of this code or of other laws or ordinances of this jurisdiction.~~

105.2.1 Repairs. Application or notice to the *code official* is not required for ordinary repairs to structures, replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required *means of egress*, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include *addition* to, *alteration* of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

105.2.2 Public service agencies. A *permit* shall not be required for the installation, *alteration,* or repair of generation, transmission, distribution, or metering or other related equipment that is under the ownership and control of public service agencies by established right.

105.2.3 Specific exemption. The following are specifically exempt from requiring a permit:

1. Any portable heating *appliance*.
2. Replacement of any minor component of an *appliance* or *equipment* that does not alter approval of such *appliance* or *equipment* or make such *appliance* or *equipment* unsafe.

105.3 ~~106.3~~ Application for permit. ~~Each application for a permit, with the required fee, shall be filed with the code official on a form furnished for that purpose and shall contain a general description of the proposed work and its location. The application shall be signed by the owner or an authorized agent. The permit application shall indicate the proposed *occupancy* of all parts of the building and of that portion of the site or lot, if any, not covered by the building or structure and shall contain such other information required by the code official.~~
To obtain a *permit*, the applicant shall first file an application therefor in writing on a form furnished by the department for that purpose. Such application shall:

1. Identify and describe the project to be covered by the *permit* for which application is made.
2. Describe the land on which the proposed project is to be done by legal description, street address or similar description that will readily identify and definitely locate the proposed building or project.
3. Indicate the use and occupancy for which the proposed project is intended.
4. Be accompanied by *construction documents* and other data as required in Section 106.
5. State the valuation of the proposed project.
6. Be signed by the applicant, or the applicant's authorized agent.
7. Give such other data and information as required by the *code official*.

105.3.1 Permit valuations. *Permit* valuations required under Section 105.3(5) shall include total value of the project, including materials and labor, and electrical, gas, mechanical, plumbing equipment and other permanent systems for which the *permit* is being issued. If, in the opinion of the *code official*, the valuation is underestimated on the application, the *permit* shall be denied, unless the applicant can show detailed estimates to meet the approval of the *code official*. Final building *permit* valuation shall be set by the *code official*.

105.4 ~~106.5~~ Action on application ~~Permit issuance~~. The *code official* shall examine or cause to be examined applications for *permits* and amendments thereto within a reasonable time after filing. If the application or the *construction documents* do not conform to the requirements of pertinent laws, the *code official* shall reject such application in writing, stating the reasons therefor. If the *code official* is satisfied that the proposed project conforms to the requirements of this code and laws and ordinances applicable thereto, the *code official* shall issue a *permit* therefor as soon as practicable. ~~The application, *construction documents* and other data filed by an applicant for a permit shall be reviewed by the code official. If the code official finds that the proposed work conforms to the requirements of this code and all laws and ordinances applicable thereto, and that the fees specified in Section 106.6 have been paid, a permit shall be issued to the applicant.~~

105.4.1 ~~106.4~~ Preliminary inspection. Before a permit is issued, the code official is authorized to inspect and evaluate the systems, *equipment*, buildings, devices, premises and spaces or areas to be used.

105.4.2 ~~106.5.1~~ Conditional permits. The code official ~~shall have the authority~~ is authorized to issue a permit for the construction or operation of part of a project ~~an installation~~ such as the construction of foundations or any other part of a building or structure, or installation of systems or materials, or operation before the *construction documents* for the entire project ~~installation~~ have been submitted or *approved*, provided that adequate information and detailed statements have been filed complying with ~~all~~ pertinent requirements of this code. The holder of such permit shall proceed only to the point for which approval has been given, at ~~his or her~~ the permit holder's own risk, and without assurance that the permit for the entire project ~~installation~~ will be granted.

105.5 ~~106.3.2~~ Time limitation of application. An application for a permit for any proposed project ~~work~~ shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a permit has been issued; except that the code official is authorized ~~shall have the authority~~ to grant one or more extensions of time for additional periods not exceeding 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

105.6 ~~106.5.2~~ Validity of permit. The issuance ~~of a permit or approval of *construction documents* shall not be construed to be~~ or granting of a *permit* shall not be construed to be a *permit* for, or an approval of, any violation of any of the provisions of this code or of other ordinances of the jurisdiction. ~~A permit~~ Permits presuming to give authority to violate or cancel the provisions of this code shall not be valid ~~invalid~~. The issuance of a *permit* based upon *construction documents* and other data shall not prevent the code official from ~~thereafter~~ requiring the correction of errors in the ~~said~~ *construction documents* and other data ~~or from preventing building operations from being carried on thereunder when in violation of this code or of other ordinances of this jurisdiction~~.

105.7 ~~106.5.4~~ Extensions of permit. ~~A permittee holding~~ For an unexpired permit, ~~shall have the right to apply for an extension of the time within which he or she will commence work under that permit when work is unable to be commenced within the time required by this section for good and satisfactory reasons.~~ the *code official* ~~shall extend the time for action by the permittee~~ is authorized to grant, in writing, one or more extensions of the time, for a periods not more than ~~exceeding~~ 180 days each. The extension shall be requested in writing and justifiable cause demonstrated. ~~if there is reasonable cause. A permit shall not be extended more than once. The fee for an extension shall be one-half the amount required for a new permit for such work.~~

105.8 ~~106.5.3~~ Expiration of permit. Every permit issued ~~by the code official under the provisions of this code shall expire by limitation and become null and void if~~ shall become invalid unless the work on the site authorized by such permit is ~~not~~ commenced within 180 days after its issuance ~~from the date of such permit~~, or if the work authorized on the site by such *permit* is suspended or abandoned ~~at any time after the work is commenced~~ for a period of 180 days after the time the work is commenced.

105.8.1 Recommencement of work. Before such work covered under an expired permit recommences, a new permit shall be first obtained. ~~and the fee, therefor, shall be one-half the amount required for a~~ The new permit ~~for such work,~~ shall be issued provided no changes have been or will be made in the original *construction documents* for such work, and provided further that such suspension or abandonment has not exceeded one year.

105.9 ~~106.5.5~~ Suspension or revocation of permit. The *code official* ~~shall have the authority~~ is authorized to suspend or revoke a permit issued under the provisions of this code ~~wherever~~ whenever the *permit* is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or regulation or any of the provisions of this code.

105.10 ~~106.5.8~~ Posting of permit. ~~The permit~~ Issued *permits* or ~~a~~ copy thereof shall be kept on the site of the project ~~work~~ until the completion of the project.

SECTION 106
SUBMITTAL DOCUMENTS

106.1 ~~106.3.1~~ General ~~Construction documents~~. Submittal documents consisting of **c***onstruction documents*~~,~~ ~~engineering calculations, diagrams~~ and other supporting data shall be submitted in two or more sets with each application for a permit, and in such form and detail as required by the *code official*. The code official shall require *construction documents* and other data ~~, computations and specifications~~ to be prepared ~~and designed~~ by a registered design professional ~~when~~ where required by the statutes of the jurisdiction in which the project is to be constructed ~~state law~~. Where special conditions exist, the *code official* is authorized to require necessary construction documents to be prepared by a registered design professional.

> **Exception:** The code official ~~shall have the authority~~ is authorized to waive the submission of *construction documents*~~, calculations or~~ and other data not required to be prepared by a *registered design professional* if the nature of the work applied for is such that reviewing of *construction documents* is not necessary to ~~determine~~ obtain compliance with this code.

106.2 Construction documents. *Construction documents* shall be in accordance with Sections 106.2.1 through 106.2.4.

106.2.1 Information on construction documents. *Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the proposed project, and show in detail that the proposed project will conform to the provisions of this code and relevant laws, ordinances, rules, and regulations, as determined by the *code official*. ~~drawn~~ Plans shall be to scale and be on suitable material. ~~shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that the work conforms to the provisions of this code.~~ Electronic media documents are permitted to be submitted when *approved* by the *code official*.

106.2.1.1 Specific information required. Where the quality of the materials is essential for conformity to this code, specific information shall be given to establish such quality. The terms “this code” or “legal” or “its equivalent” shall not be cited or used as a substitute for specific information.

106.2.2 Site plan. The *construction documents* submitted with the application for *permit* shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from *lot lines*, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and *design flood* elevations. The site plan shall be drawn in accordance with an accurate boundary line survey.

106.2.2.1 Site plan for demolition. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot.

106.2.2.2. Waiver of site plan. The *code official* is authorized to waive or modify the requirement for a site plan when the application for *permit* is for *alteration* or repair or when otherwise warranted.

106.2.3 Specific Information. The following are specific requirements for submittal documents required by this code.

106.2.3.1 Buildings more than two stories in height. *Construction documents* for buildings more than two stories in height shall indicate where penetrations will be made for installations and shall indicate the materials and methods for maintaining required structural safety, fire-resistance rating and fireblocking.

106.2.4 Design professional in responsible charge. When it is required that documents be prepared by a *registered design professional*, the *code official* shall be authorized to require the owner to engage and designate on the building *permit* application a *registered design professional* who shall act as the *registered design professional in responsible charge*. If the circumstances require, the owner shall designate a substitute *registered design professional in*

responsible charge who shall perform the duties required of the original *registered design professional in responsible charge*. The *code official* shall be notified in writing by the owner if the *registered design professional in responsible charge* is changed or is unable to continue to perform the duties.

106.2.4.1 Responsibility. The *registered design professional in responsible charge* shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

106.2.4.2 Observation. Where structural observation is required, the inspection program shall name the individual or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur.

106.3 Deferred submittals. For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the *code official* within a specified period.

106.3.1 Prior approval. Deferral of any submittal items shall have the prior approval of the *code official*. The *registered design professional in responsible charge* shall list the deferred submittals on the *construction documents* for review by the *code official*.

106.3.2 Review. Documents for deferred submittal items shall be submitted to the *registered design professional in responsible charge* who shall review them and forward them to the *code official* with a notation indicating that the deferred submittal documents have been reviewed and been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the deferred submittal documents have been *approved* by the *code official*.

106.4 Examination of documents. The *code official* shall examine or cause to be examined the submittal documents and shall ascertain by such examinations whether the project indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

106.5~~.1~~ ~~Approved~~ Approval of construction documents. When the code official issues the permit ~~where~~ the *construction documents* ~~are required, the *construction documents*~~ and other data shall be endorsed, in writing ~~and stamped~~ or by stamp, as "APPROVED." One set of *construction documents* and other data so reviewed shall be retained by the *code official*. The other set(s) shall be returned to the applicant. One set shall be kept at the site of the project and shall be open to inspection by the *code official* or a duly authorized representative. Such *approved construction documents* shall not be changed, modified or altered without authorization from the code official. All work shall be done in accordance with the *approved construction documents*.

106.6 Amended construction documents. Any changes made during construction that are not in compliance with the *approved construction documents* shall be resubmitted for approval as an amended set of *construction documents*.

106.7 ~~106.5.6~~ Retention of construction documents. One set of *approved construction documents* shall be retained by the code official for a period of not less than 180 days from date of completion of the permitted project ~~work~~, or for the period required for retention of public records ~~as required by state or local laws~~. ~~One set of *approved construction documents* shall be returned to the applicant, and said set shall be kept on the site of the building or work at all times during which the work authorized thereby is in progress.~~

SECTION 107 ~~105~~ (IFGC)
MODIFICATIONS, TESTING, AND APPROVAL

107.1 ~~105.1~~ Modifications. Whenever there are practical difficulties involved in carrying out the provisions of this code, and upon application of the owner or owner's representative, the code official shall have the authority to grant modifications for individual cases, ~~upon application of the owner or owner's representative,~~ provided ~~that~~ the code official shall first find that special individual reason makes the strict letter of this code impractical and ~~that such~~ the modification is in conformance ~~compliance~~ with the intent and purpose of this code, and that such modification does not lessen health, life and fire safety, accessibility, or structural requirements. The details of action granting modifications shall be recorded and entered in the files of the department ~~of inspection~~.

107.2 ~~105.5~~ Approved materials and equipment. Materials, *equipment*, and devices *approved* by the code official shall be constructed and installed in accordance with such approval.

107.3 ~~105.4~~ Used material, appliances and equipment. The use of used materials ~~which~~ that meet the requirements of this code for new materials is permitted. Used appliances, *equipment* and devices shall not be reused unless such elements are in good repair or have been reconditioned~~,~~ tested when necessary, and placed in good and proper working condition, and *approved* by the code official.

107.4 Listed and labeled material and appliances. Listed and labeled materials, equipment, and appliances shall be used and installed in accordance with the conditions the listing and the manufacturer's instructions.

107.5 ~~105.2.1~~ Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

107.6 ~~105.3~~ ~~Required testing~~ Technical assistance. Whenever there is insufficient evidence of compliance with the provisions of this code, evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, , or to determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building or premises, the code official shall have the authority to require tests be conducted, or a technical opinion, recommendation or report be submitted as evidence of compliance. ~~to~~ The tests, opinions, recommendations and reports shall be made at no expense to the jurisdiction.

107.6.1 Preparation. The technical reports and opinions shall be prepared by a qualified engineer, approved specialist or specialty organization, or an *approved agency*.

107.6.2 ~~105.3.1~~ Test methods. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the code official shall approve the testing procedures.

107.6.3 ~~105.3.2~~ Testing agency. All tests shall be performed by an *approved* agency.

107.6.4 ~~105.3.3~~ ~~Test~~ Retention of reports. ~~Reports of tests~~ The technical opinions, recommendation, reports and test results shall be retained by the code official for the period required for retention of public records.

SECTION 108 ~~107~~ (IFGC)
INSPECTIONS ~~AND TESTING~~

108.1 ~~107.1~~ General. ~~The code official is authorized to conduct such inspections as are deemed necessary to determine compliance with the provisions of this code.~~ Construction or work on a project for which a permit is required shall be subject to inspection by the code official, and such construction or work shall remain accessible and exposed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the *permit* applicant to cause the construction or work to remain accessible and exposed for inspection purposes. Neither the *code official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

108.1.1 Replacement of existing appliance. The requirements of this section shall not be considered to prohibit the operation of any heating or cooling *equipment* or *appliances* installed to replace such existing ~~heating~~ *equipment* or *appliance* serving an occupied portion of a structure ~~in the event~~ provided that a request for inspection of such ~~heating~~ *equipment* or *appliance* has been filed with the department not more than 48 hours after such replacement work is completed, and before any portion of such *equipment* or *appliance* is concealed by any permanent portion of the structure.

108.2 ~~107.2~~ Required inspections and testing. The code official, upon notification, ~~from the permit holder or the permit holder's agent,~~ shall make the inspections and require the tests set forth in Sections 108.2.1 through 108.2.4. ~~following inspections and other such inspections as necessary, and shall either release that portion of the construction or notify the permit holder or the permit holder's agent of violations that are required to be corrected. The holder of the permit shall be responsible for scheduling such inspections.~~

108.2.1 Specific Inspections. The following are specific inspections and tests required by this code.

108.2.1.1 Underground inspection. An underground inspection shall be made after trenches or ditches are excavated and bedded, *piping* is installed and before backfill is put in place. When excavated soil contains rocks, broken concrete, frozen chunks and other rubble that would damage or break the *piping* or cause corrosive action, clean backfill shall be on the job site.

108.2.1.2 Rough-in Inspection. A rough-in inspection shall be made after the roof, framing, fireblocking and bracing are in place and components to be concealed are complete, and prior to the installation of wall or ceiling membranes.

108.2.1.3 ~~107.3~~ Leak and defect testing. Installations shall be tested as required in this code and in accordance with Sections ~~107.3.1~~ 108.2.1.3.1 through 108.2.1.3.2 ~~107.3.3~~. Tests shall be made by the permit holder and observed by the code official.

108.2.1.3.1 ~~107.3.1~~ New, altered, extended or repaired installations. New installations and parts of existing installations, which have been altered, extended, renovated or repaired, shall be tested as prescribed herein to disclose leaks and defects.

108.2.1.3.2 ~~107.3.2~~ Apparatus, instruments, material and labor for tests. Apparatus, instruments, material and labor required for testing an installation or part thereof shall be furnished by the permit holder.

108.2.1.4 Prefabricated construction. Inspection of prefabricated construction shall comply with Sections 108.2.1.4.1 through 108.2.1.4.4.

108.2.1.4.1 ~~107.2.5~~ Evaluation and follow-up inspection services. Prior to the approval of a prefabricated construction assembly having concealed work and the issuance of a permit, the code official shall require the submittal of an evaluation report on each prefabricated construction assembly, indicating the complete details of the installation, including a description of the system and its components, the basis upon which the system is being evaluated, test results and similar information and other data as necessary for the code official to determine conformance to this code.

108.2.1.4.2 ~~107.2.5.1~~ Evaluation service. The code official shall designate the evaluation service of an *approved* agency as the evaluation agency, and review such agency's evaluation report for adequacy and conformance to this code.

108.2.1.4.3 ~~107.2.5.2~~ Follow-up inspection. Except where ready *access* is provided to installations, appliances, service *equipment* and accessories for complete inspection at the site without disassembly or dismantling, the code official shall conduct the in-plant inspections as frequently as necessary to ensure conformance to the *approved* evaluation report or shall designate an independent, *approved* inspection agency to conduct such inspections. The inspection agency shall furnish the code official with the follow-up inspection manual and a report of inspections upon request, and the installation shall have an identifying label permanently affixed to the system indicating that factory inspections have been performed.

108.2.1.4.4 ~~107.2.5.3~~ Test and inspection records. Required test and inspection records shall be available to the code official at all times during the fabrication of the installation and the erection of the building; or such records as the code official designates shall be filed.

~~**107.3.3 Reinspection and testing.** Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the code official for inspection and testing.~~

108.2.2 ~~107.2.1~~ Other inspections. In addition to the inspections specified above, the code official is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department.

108.2.3 Special inspections. Special inspection shall be as required by this code, the *International Building Code*, or the *International Fire Code* as applicable.

108.2.4 Final inspection. A final inspection shall be made ~~upon completion of the installation~~ after all work on the project required by the *permit* is completed.

108.3 ~~107.2.4~~ ~~Approved~~ Inspection agencies. The code official is authorized to accept reports of *approved* inspection agencies, provided ~~that~~ such agencies satisfy the requirements as to qualifications and reliability.

108.4 ~~107.2.2~~ Inspection requests. It shall be the duty of the holder of the permit or ~~his or her~~ duly authorized agent to notify the code official when a project ~~work~~ is ready for inspection. It shall be the duty of the permit holder to provide *access* to and means for inspections of such work that are required by this code.

108.4.1 Manufacturer's instructions. Manufacturer's instructions for equipment, appliances, and materials installed under the permit shall be available on the work site at the time of inspection.

108.5 ~~107.2.3~~ Approval required. Work on a project shall not proceed ~~be done~~ beyond the point indicated in each successive inspection without first obtaining the approval of the code official. The code official, upon notification, shall make the requested inspections and shall either indicate the portion of the project ~~construction~~ that is satisfactory as completed, or notify the permit holder or ~~his or her~~ authorized agent wherein the same fails to comply with this code. Any portions of the project that do not comply shall be corrected and such portion shall not be covered, ~~or~~ concealed, or used until authorized by the code official.

108.6 ~~107.4~~ Notice of approval. After ~~the~~ all prescribed ~~tests and~~ inspections or tests indicate that the project ~~work~~ complies ~~in all respects~~ with this code, a ~~notice of approval~~ certificate of completion complying with Section 109 shall be issued by the code official.

~~**107.4.1 Revocation.** The code official is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the notice is issued in error, or on the basis of incorrect information supplied or where it is determined that the building or structure, premise, or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.~~

SECTION 109
CERTIFICATE OF COMPLETION AND OCCUPANCY

109.1 Use and occupancy. No building, structure, or premises or portion thereof shall be used or occupied until the code official has issued a certificate of occupancy as provided herein. No equipment, appliance or system used, and no change in the existing occupancy classification of a building, structure, premise or portion thereof shall be made until the code official has issued a certificate of completion as provided herein.

Exceptions:

1. Occupancy shall be permitted during **e**mergency situations as described under Section 105.1.
2. Certificates of completion or occupancy are not required for work exempt from permits under Section 105.2.
3. Occupancy shall be permitted during the replacement of existing appliances as described under Section 108.1.1.
4. Certificates of occupancy are not required for one-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m^2).

109.1.1 Validity. Issuance of a certificate of completion or occupancy shall not be construed as an approval of a violation of the provisions of this code or of other pertinent laws and ordinances of the jurisdiction. Certificates presuming to give authority to violate or cancel the provisions of this code or other laws or ordinances of the jurisdiction shall not be valid.

109.2 Certificate issued. After the *code official* inspects a project requiring a permit and finds no violations of the provisions of this code or other laws that are enforced by the department, the *code official* shall issue a certificate of completion. After all certificates of completion have been issued by other departments or agencies concerned, the code official shall issue a certificate of occupancy where applicable. A certificate of completion or occupancy shall contain the following:

1. The *permit* number.
2. The address of the premises or structure.
3. The name and address of the owner.
4. A description of the project for which the certificate is issued.
5. A statement that the described project has been inspected for compliance with the requirements of this code.
6. The name of the *code official*.
7. The edition of the code under which the *permit* was issued.
8. The use and occupancy in accordance Chapter 3 of the International Building Code.
9. The type of construction as defined in Chapter 6 of the International Building Code.
10. The design *occupant load*.
11. If fire protection systems are provided, whether the fire protection systems are required.
12. Any special stipulations and conditions of the *permit*.

Exceptions:

1. A certificate of completion or occupancy shall not be required to indicate the items under Section 109.2, Items 8, 9, and 10 for detached one- and two family dwellings and multiple single-family *dwellings* (*townhouses)* constructed using the *International Residential Code*.
2. The *code official* is shall not be required to indicate on a certificate items under Section 109.2, Items 8, 9, and 10 for the installation of equipment, appliances or systems.

109.3 Temporary occupancy. The code official is authorized to issue a temporary certificate of occupancy before the completion of the entire work covered by the permit, provided that such portion or portions shall be occupied safely and without endangerment to life or public welfare. The temporary certificate shall indicate any limitations or restrictions necessary to keep the permit area safe, and items required to obtain the final certificate of occupancy. The code official shall set a time period during which the temporary certificate of occupancy is valid.

109.4 Revocation. The code official is authorized to, in writing, suspend or revoke a certificate of completion or occupancy issued under the provisions of this code wherever the certificate is issued in error on the basis of incorrect information supplied, or where it is determined that the building, structure, premise, or portion thereof, or installation of appliance, equipment or system is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION 110
STOP WORK ORDER

110.1 Authority. Whenever the *code official* finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or dangerous or unsafe, the *code official* is authorized to issue a stop work order.

110.2 Issuance. The stop work order shall be in writing and shall be given to the owner of the property involved, or to the owner's agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order, and the conditions under which the cited work will be permitted to resume.

110.2.1 Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

110.3 Unlawful continuance. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fees, fines, or penalties as prescribed by this code or other laws or ordinances of the jurisdiction.

~~**108.5 Stop work orders.** Upon notice from the code official that work is being done contrary to the provisions of this code or in a dangerous or unsafe manner, such work shall immediately cease. Such notice shall be in writing and shall be given to the owner of the property, the owner's agent, or the person doing the work. The notice shall state the conditions under which work is authorized to resume. Where an emergency exists, the code official shall not be required to give a written notice prior to stopping the work. Any person who shall continue any work on the system after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable for a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.~~

~~**108.6 Abatement of violation.** The imposition of the penalties herein prescribed shall not preclude the legal officer of the jurisdiction from instituting appropriate action to prevent unlawful construction, restrain, correct or abate a violation, prevent illegal occupancy of a building, structure or premises, or stop an illegal act, conduct, business or utilization of the installations on or about any premises.~~

SECTION 111 ~~108~~ (IFGC)
VIOLATIONS

111.1 Code violations. No person, association, organization, or business entity of any form shall:

1. Erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or premises in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
2. Install or operate any equipment, appliances, or systems regulated by this code that is in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or

3. Be non-compliant with the conditions of any permit or certificate issued under the auspices of this code; or
4. Tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*.

111.2 Notice of violation. A *code official* who observes or becomes aware of any code violation shall serve upon the responsible person, association, organization, or business entity a written notice in accordance with Section 111.2.1. In the absence of direct knowledge as to the identity or location of the responsible party, the *code official* shall serve the notice upon the property owner. Service may be effected by personal delivery, first class mail, substituted service, or such other means that may be authorized by state and/or local law.

111.2.1 Form of notice. Such notice of violation shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the violation into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties in accordance with Section 111.3.

111.3 Penalties. Violators who fail to comply with a notice to discontinue or abate a condition in violation of this code, and violators who tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*, shall be subject to the penalties set forth in this code as may be adopted and authorized by state and/or local law.

~~**108.1 Unlawful acts.** It shall be unlawful for a person, firm or corporation to erect, construct, alter, repair, remove, demolish or utilize an installation, or cause same to be done, in conflict with or in violation of any of the provisions of this code.~~

~~**108.2 Notice of violation.** The code official shall serve a notice of violation or order to the person responsible for the erection, installation, *alteration*, extension, repair, removal or demolition of work in violation of the provisions of this code, or in violation of a detail statement or the *approved construction documents* thereunder, or in violation of a permit or certificate issued under the provisions of this code. Such order shall direct the discontinuance of the illegal action or condition and the abatement of the violation.~~

~~**108.3 Prosecution of violation.** If the notice of violation is not complied with promptly, the code official shall request the legal counsel of the jurisdiction to institute the appropriate proceeding at law or in equity to restrain, correct or abate such violation, or to require the removal or termination of the unlawful *occupancy* of the structure in violation of the provisions of this code or of the order or direction made pursuant thereto.~~

~~**108.4 Violation penalties.** Persons who shall violate a provision of this code, fail to comply with any of the requirements thereof or erect, install, alter or repair work in violation of the *approved construction documents* or directive of the code official, or of a permit or certificate issued under the provisions of this code, shall be guilty of a [SPECIFY OFFENSE], punishable by a fine of not more than [AMOUNT] dollars or by imprisonment not exceeding [NUMBER OF DAYS], or both such fine and imprisonment. Each day that a violation continues after due notice has been served shall be deemed a separate offense.~~

SECTION 112 ~~109~~ (IFGC)
MEANS OF APPEAL

112.1 ~~109.1~~ Application for appeal. A person directly affected by a decision of the *code official* or a notice or order issued under this code shall have the right to appeal to the board of appeals, provided that a written application for appeal is filed within 20 days after the day the decision, notice or order was served ~~a decision of the code official to the board of appeals~~. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or the requirements of this code are adequately satisfied by other means ~~an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the code official within 20 days after the notice was served~~.

112.1.1 Stays of enforcement. The filing of an appeal of notice or orders, except for notice or order concerning *Imminent Danger*, shall stay the enforcement of the notice or order until the appeal is heard by the board of appeals.

112.2 ~~109.2~~ Membership of board. The board of appeals shall consist of five members who are qualified by experience and training to pass on matters pertaining to the provisions of this code. The board shall be appointed by the chief appointing authority, and shall serve staggered and overlapping terms ~~as follows: one for five years; one for four years; one for three years; one for two years and one for one year. Thereafter, each new member shall serve for five years or until a successor has been appointed~~.

112.2.1 ~~109.2.2~~ Alternate members. The chief appointing authority shall appoint two or more alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership and shall be appointed for five years, or until a successor has been appointed.

112.2.2. An employee of the jurisdiction shall not be a member of the board of appeals. The *code official* shall be an ex officio member of the board but shall have no vote on any matter before the board.

112.2.3 ~~109.2.3~~ Chairman. The board shall annually select one of its members to serve as chairman.

112.2.4 ~~109.2.5~~ Secretary. The chief administrative officer shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

112.2.5 ~~109.2.1~~ Qualifications. The board of appeals shall consist of five individuals, one from each of the following professions or disciplines:

1. Registered design professional who is a registered architect; or a builder or superintendent of building construction with at least 10 years' experience, five of which shall have been in responsible charge of work.
2. Registered design professional with structural engineering or architectural experience.
3. Registered design professional with fuel gas and plumbing engineering experience; or a fuel gas contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
4. Registered design professional with electrical engineering experience; or an electrical contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
5. Registered design professional with fire protection engineering experience; or a fire protection contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.

112.2.6 ~~109.2.4~~ Disqualification of member. A member shall not hear an appeal in which that member has a personal, professional or financial interest.

112.2.7 Terms. The initial members of the board of appeals shall serve as follows: one for five years; one for four years; one for three years; one for two years and one for one year. Thereafter, each new member shall serve for five years or until a successor has been appointed.

112.2.8 ~~109.2.6~~ Compensation of members. Compensation of members shall be determined by law.

112.3 Hearings and meetings. Hearings on appeals and other meetings of the board of appeals shall be held in conformance with Sections 109.3.1 through 109.3.3.

112.3.1 ~~109.4.1~~ Procedure. The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

112.3.2 ~~109.3~~ Notice ~~of meeting~~. The board shall meet upon notice from the chairman, within 10 days of the filing of an appeal, or at stated periodic meetings.

112.3.3 ~~109.4~~ Open hearing. All hearings before the board shall be open to the public. A quorum shall consist of not less than two-thirds of the board membership. The appellant, the appellant's representative, the code official and any person whose interests are affected shall be given an opportunity to be heard.

112.3.4 ~~109.5~~ Postponed hearing. When the full board is ~~five members are~~ not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

112.4 ~~109.6~~ Board decision. The board shall modify or reverse the decision of the code official by a concurring vote of a majority of the total number of appointed board t~~hree~~ members.

112.4.1 ~~109.6.1~~ Resolution. The decision of the board shall be by resolution. Certified copies shall be furnished to the appellant and to the code official.

112.4.2 ~~109.6.2 Administration~~ Action by code official. The code official shall take immediate action in accordance with the decision of the board.

112.5 ~~109.7~~ Court review. Any person, whether or not a previous party to the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

SECTION 113
FEES

113.1 ~~106.6~~ Payment of fees. A permit or an amendment to a permit shall not be issued until the fees prescribed in Section 113.2 ~~106.6.2~~ have been paid~~, nor shall an amendment to a permit be released until the additional fee, if any, due to an increase of the installation, has been paid.~~
prescribed in Section 113.2 have been paid.

113.2 ~~106.6.2~~ Fee schedule. The fees for ~~work~~ permits and other considerations shall be ~~as indicated~~ in accordance with the following schedule. [JURISDICTION TO INSERT APPROPRIATE SCHEDULE]

113.3 Related fees. The payment of the fee for work done in connection to or concurrently with the work authorized by a *permit* shall not relieve the applicant or holder of the *permit* from the payment of other fees that are prescribed by law.

113.4 ~~106.6.1~~ Work commencing before permit issuance. Any person who commences any work on a project requiring a *permit* ~~on an installation~~ before obtaining the necessary permits shall be subject to a fee established by the *code official* ~~100 percent of the usual permit fee~~ that shall be in addition to the required permit fees.

113.5 ~~106.4.4~~ Permit extension. The fee for an extension of a permit in conformance with Section 105.7 shall be one-half the amount required for a new permit for such work.

113.6 Expiration of permit. For permits that have expired, and before such work recommences in conformance with Section 105.8.1, the fee to recommence work shall be one-half the amount required for a new permit for such work.

113.7 Stop work order. Any person who shall continue any work on a project requiring a permit after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.

113.8 Reinspection fee. A reinspection of work not in compliance with this code shall be subject to a fee established by the *code official* that shall be in addition to the required *permit* fees. The fee may be assessed when the *approved* plans are not readily available to the inspector, for failure to provide access on the date for which inspection is requested, for work deviating from the approved, or the work or test is not in compliance with this code.

113.9 ~~106.6.3~~ Fee refunds. The code official shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment. The code official shall authorize the refunding of fees as follows:

1. The full amount of any fee paid hereunder which was erroneously paid or collected.

~~3~~. 2. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.

~~2~~. 3. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid when no work on a project has been done under a permit issued in accordance with this code.

~~The code official shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment.~~

(SECTIONS 114 THROUGH 119 RESERVED)

PART 3 – GENERAL REQUIREMENTS

SECTION 120
UNSAFE STRUCTURES, EQUIPMENT, AND CONDITIONS

120.1 General. If any building, structure, premises or part thereof, or appliance, equipment, or system is found to be unsafe by the *code official*, or found in the case of a building or structure to be unfit for human occupancy, the condition shall be abated whenever possible, but if abatement is not achieved or is non-achievable, then condemnation shall be undertaken in accordance with the provisions of this code.

~~**108.7 Unsafe installations.** An installation that is unsafe, constitutes a fire or health hazard, or is otherwise dangerous to human life, as regulated by this code, is hereby declared an unsafe installation. Use of an installation regulated by this code constituting a hazard to health, safety or welfare by reason of inadequate maintenance, dilapidation, fire hazard, disaster, damage or abandonment is hereby declared an unsafe use. Such unsafe installations are hereby declared to be a public nuisance and shall be abated by repair, rehabilitation, demolition or removal.~~

120.1.1 Notice to building official. Abatement requiring repairs, *alterations*, remodeling, removing or demolition shall be referred to the *building official*.

120.1.2 Unsafe structures. An unsafe structure is a structure that is dangerous to the life, health, or safety of the public or to the *occupants* when:

1. There are no minimum safeguards provided to protect or warn *occupants* in the event of fire; or
2. Such structure contains unsafe equipment or is so damaged, decayed, dilapidated, is structurally unsound, is of such faulty construction, or has such an unstable foundation, that partial or complete collapse is possible.

120.1.3 Unsafe equipment. Unsafe equipment includes any boiler, heating equipment, elevator, moving stairway, electrical wiring or device, flammable liquid containers or other equipment on the *premises* or within the structure which is in such disrepair or condition that such equipment constitutes a hazard to life, health, property or safety of the public or the *occupants* of the *premises* or structure.

120.1.4 Structure unfit for human occupancy. A structure is unfit for human *occupancy* whenever the *code official* finds that such structure is unsafe, is unlawful or, because its degree of disrepair, or its want of maintenance, is unsanitary, vermin or rat infested, filthy and contaminated, lacking *ventilation*, illumination, sanitary, heating facilities or other essential equipment required by this code, or because the structure is in proximity to an unsafe or dangerous condition that constitutes a hazard to the *occupants* of the structure or to the public.

120.1.5 Unlawful structure. An unlawful structure is one found in whole or in part to be occupied by more persons than permitted under this code, or was erected, altered or occupied contrary to this code.

120.1.6 Structure and premise that are dangerous to the life, health or safety of the public or occupants. For the purpose of this code, any structure or *premises* that have any or all of the following conditions or defects shall be considered dangerous, and shall constitute an unsafe structure:

1. Any door, aisle, passageway, stairway, exit or other means of egress that does not conform to the *approved* building or fire code of the jurisdiction as related to the requirements for existing buildings.
2. The walking surface of any aisle, passageway, stairway, exit or other means of egress is so warped, worn loose, torn or otherwise unsafe as to not provide safe and adequate means of egress.
3. Any portion of a building, structure or appurtenance that has been damaged by fire, earthquake, wind, flood, *deterioration*, *neglect*, abandonment, vandalism or by any other cause to such an extent that it is likely to partially or completely collapse, or to become *detached* or dislodged.
4. Any portion of a building, or any member, appurtenance or ornamentation on the exterior thereof that is not of sufficient strength or stability, or is not so *anchored*, attached or fastened in place so as to be capable of resisting natural or artificial loads of one and one-half the original designed value.
5. The building or structure, or part of the building or structure, because of dilapidation, *deterioration*, decay, faulty construction, the removal or movement of some portion of the ground necessary for the support, or for any other reason, is likely to partially or completely collapse, or some portion of the foundation or underpinning of the building or structure is likely to fail or give way.
6. The building or structure, or any portion thereof, is clearly unsafe for its use and *occupancy*.

7. The building or structure is *neglected*, damaged, dilapidated, unsecured or abandoned so as to become an attractive nuisance to children who might play in the building or structure to their danger, becomes a harbor for vagrants, criminals or immoral persons, or enables persons to resort to the building or structure for committing a nuisance or an unlawful act.
8. Any building or structure has been constructed, exists or is maintained in violation of any specific requirement or prohibition applicable to such building or structure provided by the *approved* building or fire code of the jurisdiction, or of any law or ordinance to such an extent as to present either a substantial risk of fire, building collapse or any other threat to life and safety.
9. A building or structure, used or intended to be used for dwelling purposes, because of inadequate maintenance, dilapidation, decay, damage, faulty construction or arrangement, inadequate light, *ventilation*, mechanical or plumbing system, or otherwise, is determined by the *code official* to be unsanitary, unfit for human habitation or in such a condition that is likely to cause sickness or disease.
10. Any building or structure, because of a lack of sufficient or proper fire-resistance-rated construction, fire protection systems, electrical system, fuel connections, mechanical system, plumbing system or other cause, is determined by the *code official* to be a threat to life or health.
11. Any portion of a building remains on a site after the demolition or destruction of the building or structure or whenever any building or structure is abandoned so as to constitute such building or portion thereof as an attractive nuisance or hazard to the public.

120.2 Closing of vacant structures. If the structure is vacant and unfit for human habitation and *occupancy*, and is not in danger of structural collapse, the *code official* is authorized to post a placard of condemnation on the *premises* and order the structure closed up so as not to be an attractive nuisance. Upon failure of the *owner* to close up the *premises* within the time specified in the order, the *code official* shall cause the *premises* to be closed and secured through any available public agency or by contract or arrangement by private persons, and the cost thereof shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate that may be collected by any legal means.

120.3 Evacuation. The *code official* or the fire department official in charge of an emergency incident shall be authorized to order the immediate evacuation of any occupied building, structure or premises deemed unsafe due to hazardous conditions that present an imminent danger to occupants. *Persons* so notified shall immediately leave the structure or premises and shall not enter or re-enter until authorized to do so by the *code official* or the fire department official in charge of the incident.

120.4 Notice. Whenever the *code official* has *condemned* a structure or equipment under the provisions of this section, notice shall be posted in a conspicuous place in or about the structure affected by such notice and served on the *owner* or the person or persons responsible for the structure or equipment in accordance with Section 120.4.2. If the notice pertains to equipment, it shall also be placed on the *condemned* equipment. The notice shall be in the form prescribed in Section 120.4.1.

~~**108.7.1 Authority to condemn installations.** Whenever the code official determines that any installation, or portion thereof, regulated by this code has become hazardous to life, health or property, he or she shall order in writing that such installations either be removed or restored to a safe condition. A time limit for compliance with such order shall be specified in the written notice. A person shall not use or maintain a defective installation after receiving such notice. When such installation is to be disconnected, written notice as prescribed in Section 108.2 shall be given. In cases of immediate danger to life or property, such disconnection shall be made immediately without such notice.~~

120.4.1 Form of notice. Such notice of shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the unsafe condition into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties set forth in this code or as may be adopted and authorized by state and/or local law.

120.4.2 Service of notice. Such notice shall be deemed properly served if a copy thereof is (a) delivered to the owner personally; (b) sent by certified or registered mail addressed to the owner at the last known address with the return receipt requested; or (c) delivered in any other manner as prescribed by local law. If the certified or registered letter is

returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice. Service of such notice in the foregoing manner upon the owner's agent or upon the person responsible for the structure shall constitute service of notice upon the owner.

120.5 Placarding. Upon failure of the owner or person responsible to comply with the notice provisions within the time given, the *code official* shall post on the premises or on defective equipment a placard bearing the word "UNSAFE" or "CONDEMNED" as applicable, and a statement of the penalties provided for occupying the premises, operating the equipment or removing the placard.

120.5.1 Placard removal. The *code official* shall remove the placard whenever the unsafe conditions have been eliminated. Any person who defaces or removes an unsafe condition placard without the approval of the *code official* shall be subject to the penalties provided for by the jurisdiction.

120.6 Prohibited occupancy. Any structure *condemned* and placarded by the *code official* shall be vacated as ordered by the *code official*. It shall be unlawful for any person to occupy or to allow others to occupy a placarded *premises,* or to operate or allow others to operate any placarded equipment.

120.7 Abatement. The owner, operator, or occupant of a building, structure, premises, or equipment deemed unsafe by the *code official* shall abate or correct such unsafe conditions either by repair, rehabilitation, demolition or other *approved* corrective action.

120.7.1 Summary abatement. Where conditions exist that are deemed an *imminent danger* as described in Section 121.1 that will necessarily result in injury to occupants or the public, the *code official* or fire department official in charge of the incident is authorized to summarily abate such unsafe or hazardous conditions.

120.8 Record. The *code official* shall cause a report to be filed on an unsafe condition. The report shall state the occupancy of the structure and the nature of the unsafe condition. The record of an unsafe condition as outlined herein shall be retained by the *code official* for the period required for retention of public records.

SECTION 121
EMERGENCY MEASURES

121.1 Imminent danger. When, in the opinion of the *code official*, there is imminent danger of failure or collapse of a building or structure that endangers life, or when any building or part of a building has fallen and life is endangered by the occupation of the building, or when there is actual or potential danger to the building occupants or those in the proximity of any structure because of explosives, explosive fumes or vapors, or the presence of toxic fumes, gases, or materials, or operation of defective or *dangerous* equipment, the *code official* is hereby authorized and empowered to order and require the occupants to vacate the premises forthwith. The *code official* shall cause to be posted at each entrance to such structure a notice reading as follows: "This Structure Is Unsafe and Its Occupancy Has Been Prohibited by the *Code Official*." It shall be unlawful for any person to enter such structure except for the purpose of securing the structure, making the required *repairs*, removing the hazardous condition, or of demolishing the same.

121.2 Temporary safeguards. Notwithstanding other provisions of this code, whenever, in the opinion of the *code official*, there is imminent danger due to an unsafe condition, the *code official* shall order the necessary work to be done, including the boarding up of openings, to render such structure temporarily safe whether or not the legal procedure herein described has been instituted; and shall cause such other action to be taken as the *code official* deems necessary to meet such emergency.

121.3 Closing streets. When necessary for public safety, the *code official* shall temporarily close structures and close or order the authority having jurisdiction to close sidewalks, streets, public ways, and places adjacent to unsafe structures, and prohibit the same from being utilized.

121.4 Emergency repairs. For the purposes of this section, the *code official* shall employ the necessary labor and materials to perform the required work as expeditiously as possible.

121.5 Costs of emergency repairs. Costs incurred in the performance of emergency work shall be paid by the jurisdiction. The legal counsel of the jurisdiction shall institute appropriate action against the owner of the premises where the unsafe structure is or was located for the recovery of such costs.

121.6 Hearing. Any person ordered to take emergency measures shall comply with such order forthwith. Any affected person shall thereafter, upon petition directed to the appeals board, be afforded a hearing as described in this code.

SECTION 122
SERVICE UTILITIES

122.1 ~~108.7.3 107.6~~ Connection of service utilities ~~after order to disconnect.~~ ~~A~~ No person shall ~~not~~ make connections from a utility, source of energy, fuel, ~~or~~ power, water system or *sewer* system to any building or system that is regulated by this code for which a permit is required, until authorized by the code official. ~~A person shall not make energy source connections to installations regulated by this code which have been disconnected or ordered to be disconnected by the code official, or the use of which has been ordered to be discontinued by the code official until the code official authorizes the reconnection and use of such installations.~~

~~When an installation is maintained in violation of this code, and in violation of a notice issued pursuant to the provisions of this section, the code official shall institute appropriate action to prevent, restrain, correct or abate the violation.~~

122.2 ~~107.5~~ Temporary connection. The code official shall have the authority to allow the temporary connection of the building, structure or system to the utility source of energy, fuel, power, water system or *sewer* system ~~an installation to the sources of energy for the purpose of testing the installation or for use under a temporary certificate of *occupancy*~~.

122.3 ~~108.7.2~~ Authority to disconnect service utilities. The code official shall have the authority to ~~require~~ authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards ~~the technical codes~~ in case of emergency where necessary to eliminate an immediate hazard to life or property or when such utility connection has been made without the approval required by Section 111.1 or 111.2. The code official shall notify the serving utility~~,~~ and, wherever possible, the owner and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnection, the owner or occupant of the building, structure or service system shall be notified in writing, as soon as practicable thereafter.

SECTION 123 110 (IFGC)
TEMPORARY STRUCTURES, EQUIPMENT, SYSTEMS AND USES

123.1 ~~110.1~~ General. The code official is authorized to issue a permit for temporary structures, *equipment*, systems and uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The code official is authorized to grant extensions for demonstrated cause.

123.2 ~~110.2~~ Conformance. Temporary structures, *equipment*, systems and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.

123.3 ~~110.4~~ Termination of approval. The code official is authorized to terminate such permit ~~for a temporary structure or use~~ and to order the temporary structure, equipment, system or use to be discontinued.

~~**110.3 Temporary utilities.** The code official is authorized to give permission to temporarily supply utilities before an installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in the code.~~

SECTION 124
MAINTENANCE

124.1 Maintenance of safeguards. Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or any other feature is required for compliance with the provisions of this code, or otherwise installed, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be continuously maintained in accordance with this code and applicable referenced standards.

124.2 Testing and operation. Equipment requiring periodic testing or operation to ensure maintenance shall be tested or operated as specified in this code.

124.2.1 Test and inspection records. Required test and inspection records shall be available to the *code official* at all times, or such records as designates shall be filed with the *code official*.

124.2.2 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

124.3 Supervision. Maintenance and testing shall be under the supervision of a responsible *person* who shall ensure that such maintenance and testing are conducted at specified intervals in accordance with this code.

124.4 Rendering equipment inoperable. Portable or fixed fire-extinguishing systems or devices and fire-warning systems shall not be rendered inoperative or inaccessible except as necessary during emergencies, maintenance, repairs, *alterations*, drills or prescribed testing.

SECTION 125
DEMOLITION

125.1 General. The *code official* shall order the owner of any premises upon which is located any structure that in the *code official's* judgment is deteriorated or dilapidated, or has become so out of *repair* as to be *dangerous*, unsafe, insanitary, or otherwise unfit for human habitation or occupancy, and such that it is unreasonable to *repair* the structure, to demolish and remove such structure; or if such structure is capable of being made safe by *repairs*, to *repair* and make safe and sanitary, or to board up and hold for future repair, or to demolish and remove at the owner's option; or where there has been a cessation of normal construction of any structure for a period of more than two years, to board up and hold for **r**ecommencement of work, or to demolish and remove such structure. Boarding up the building for future repair or recommencement of work shall not extend beyond one year, unless *approved* by the *code official*.

125.2 Notices and orders. All notices and orders shall comply with Section 111.2.

125.3 Failure to comply. If the owner of a premises fails to comply with a demolition order within the time prescribed, the *code official* shall cause the structure to be demolished and removed, either through an available public agency or by contract or arrangement with private persons, and the cost of such demolition and removal shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate.

125.4 Salvage materials. When any structure has been ordered demolished and removed in accordance with Section 125.3, the governing body or other designated officer under said contract or arrangement aforesaid shall have the right to sell the salvage and valuable materials at the highest price obtainable. The net proceeds of such sale, after deducting the expenses of such demolition and removal, shall be promptly remitted with a report of such sale or transaction, including the items of expense and the amounts deducted, for the person who is entitled thereto, subject to any order of a court. If such a surplus does not remain to be turned over, the report shall so state.

125.5 Existing remedies. The provisions in this code shall not be construed to abolish or impair existing remedies of the jurisdiction or its officers or agencies relating to the removal or demolition of any structure which is dangerous, unsafe or insanitary.

2. Revise and add the following definitions in the IFGC:

ADDITION. An extension or increase in floor area, number of stories, or height of a building or structure.

ALTERATION. ~~A change in a system that involves an extension, addition or change to the arrangement, type or purpose of the original installation.~~ Any construction or renovation to an existing structure other than repair or addition that requires a *permit*, or a change in a mechanical, plumbing, fuel gas or other system that involves an extension, addition or change to the arrangement, type or purpose of the original installation that requires a *permit*.

APPLIANCE. ~~Any apparatus or device that utilizes gas as a fuel or raw material to produce light, heat, power, refrigeration or *air conditioning*.~~ A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.

APPROVED. ~~Acceptable to the code official or other authority having jurisdiction.~~ Approval by the code official as the result of review, investigation or tests conducted by the code official or by reason of accepted principles or tests by national authorities, or technical or scientific organizations.

APPROVED AGENCY. An established and recognized agency ~~that is *approved* by the code official and~~ regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved by the code official.

BUILDING. Any structure used or intended for supporting or sheltering any use or occupancy.

BUILDING OFFICIAL. The officer or other designated authority charged with the administration and enforcement of the *International Building Code*, or a duly authorized representative.

CERTIFICATE OF COMPLETION. A certificate stating that the project or work for which a permit was issued has been completed in compliance with *approved construction documents* and the requirements of this code.

CONSTRUCTION DOCUMENTS. ~~All of~~ The written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of the project necessary for obtaining a ~~mechanical~~ permit.

EQUIPMENT. ~~Apparatus and devices other than appliances.~~ Any plumbing, heating, electrical, ventilating, air conditioning, refrigerating, and fire protection equipment, apparatus and devices, all piping, ducts, vents, control devices and other systems or components thereof, and elevators, dumb waiters, escalators, boilers, pressure vessels and other mechanical facilities or installations that are related to building services, any of which are specifically regulated in this code. Appliances as defined by this code shall not be considered equipment. Equipment or fixtures shall not include manufacturing, production, or process equipment, but shall include connections from building service to process equipment.

FIRE CODE OFFICIAL. The fire chief or other designated authority charged with the administration and enforcement of the code, or a duly authorized representative.

IMMINENT DANGER. A condition which could cause serious or life-threatening injury or death at any time.

LOT LINE. A line dividing one lot from another, or from a street or any public place.

PERMIT. An official document or certificate issued by the authority having jurisdiction which authorizes performance of a specified activity.

REGISTERED DESIGN PROFESSIONAL. An ~~individual~~ architect or engineer who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A *registered design professional* engaged by the owner to review and coordinate certain aspects of the project, as determined by the *building official*, for compatibility with the design of the building or structure, including submittal documents prepared by others, deferred submittal documents and phased submittal documents.

REPAIR. The reconstruction or renewal of any part of an existing building for the purpose of its maintenance.

STRUCTURE. That which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

TOWNHOUSE. A single-family *dwelling unit* constructed in a group of three or more attached units in which each unit extends from the foundation to roof and with open space on at least two sides.

PART VI – IMC

1. Revise IMC (Item 1-G) as follows:

CHAPTER 1
SCOPE AND ADMINISTRATION

PART I—SCOPE AND APPLICATION

SECTION 101
GENERAL

101.1 Title. These regulations shall be known as the *Mechanical Code* of [NAME OF JURISDICTION], hereinafter referred to as "this code."

101.2 Scope. The provisions of this code shall ~~regulate~~ apply to the design, installation, maintenance, *alteration* and inspection of mechanical systems that are permanently installed and utilized to provide control of environmental conditions and related processes within buildings. This code shall also apply to ~~regulate~~ those mechanical systems, system components, *equipment* and appliances specifically addressed herein. The installation of fuel gas distribution piping and *equipment*, fuel gas-fired appliances and fuel gas-fired *appliance* venting systems shall be regulated by the *International Fuel Gas Code*.

> **Exception:** Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane ~~high~~ with a separate means of egress and their accessory structures shall comply with the *International Residential Code.*

101.3 Purpose ~~Intent~~. The purpose of this code is to ~~provide~~ establish the minimum requirements ~~standards~~ to safeguard life or limb, health, property, and public welfare by regulating and controlling the design, construction, installation, quality of materials, location, operation, and maintenance or use of mechanical systems.

101.4 Severability. If a section, subsection, sentence, clause, or phrase of this code is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code.

101.5 Validity. In the event any part or provision of this code is held to be illegal or void, this shall not have the effect of making illegal or void any of the other parts or provisions hereof, which are determined to be legal; and it shall be presumed that this code would have been adopted without such illegal or invalid parts or provisions.

101.6 ~~102.10~~ Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state, or federal law.

SECTION 102
APPLICABILITY

102.1 General. Where there is a conflict between a general requirement and a specific requirement of this code, the specific requirement shall be applicable ~~govern~~. Where, in a specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

~~102.11~~ 102.2 Application of references. Reference to chapter section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

~~102.8~~ 102.3 Referenced codes and standards. The codes and standards referenced ~~herein~~ in this code shall be ~~those that are listed in Chapter 15 and such codes and standards shall be~~ considered ~~as~~ part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between the provisions of this code and the referenced codes and standards, the provisions of this code shall apply.

> **Exception:** Where enforcement of a code provision would violate the conditions of the listing of the *equipment* or *appliance*, the conditions of the listing ~~and the manufacturer's installation instructions~~ shall govern ~~apply~~.

102.4 ~~101.2.1~~ Appendices. Provisions in the appendices shall not apply unless specifically adopted.

102.5 ~~102.2~~ Existing structures and systems ~~installations~~. The legal occupancy or use of any structure or installed system existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the *International Building Code,* the *International Fire Code,* or the *International Property Maintenance Code*, or as is deemed necessary by the *code official* for the general safety and welfare of the occupants and the public. ~~Except as otherwise provided for in this chapter, a provision in this code shall not require the removal, *alteration* or abandonment of, nor prevent the continued utilization and maintenance of, a mechanical system lawfully in existence at the time of the adoption of this code.~~

102.5.1 ~~102.6~~ Historic buildings. The provisions of this code relating to the construction, *alteration*, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures identified and classified by the state or local jurisdiction as historic buildings when such buildings or structures are judged by the code official to be safe and in the public interest of health, safety and welfare regarding any proposed construction, *alteration*, repair, enlargement, restoration, relocation or moving of buildings.

102.6 ~~105.2~~ Alternative materials, design, ~~and~~ methods, and equipment ~~and appliances~~. The provisions of this code are not intended to prevent the installation of any material, or the use or operation of appliances, equipment, systems, or method, or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative ~~material or method of construction~~ shall be *approved* where the code official finds that the proposed alternative ~~design~~ is satisfactory and complies with the intent of the provisions of this code, and that the alternative ~~material, method or work offered~~ is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

102.6.1 Matters regulated by the *International Building Code*. Approvals under the authority herein contained shall be subject to the approval of the *building official* whenever the alternative involves matters regulated by the *International Building Code*.

102.7 ~~102.9~~ Requirements not covered by this code. Requirements necessary for the strength, stability or proper operation of an existing or proposed ~~mechanical system~~ fixture, structure, or equipment, or for the public safety, health and general welfare, not specifically covered by this code, shall be determined by the code official.

102.8 Subjects not regulated by this code. Where no applicable standards or requirements are set forth in this code, or are contained within other laws, codes, regulations, ordinances, or bylaws adopted by the jurisdiction, compliance with applicable nationally recognized standards, as *approved*, shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the *code official* to determine compliance with codes or standards for those activities or installations within the *code official's* jurisdiction or responsibility.

102.9 ~~106.4.7~~ Previous approvals. This code shall not require changes in the *construction documents*, construction or designated *occupancy* of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

102.10 Contractor's responsibilities. Every contractor who enters into contracts for which a permit is required shall comply with the state and local rules and regulations concerning licensing.

102.11 Specific application of this code. The following are application specific to this code.

102.11.1 ~~102.4~~ Additions, alterations or repairs. Additions, alterations, renovations or repairs to a mechanical system shall conform to that required for a new mechanical system without requiring the existing mechanical system to comply with all of the requirements of this code. Additions, alterations or repairs shall not cause an existing mechanical system to become unsafe, hazardous or overloaded. Minor additions, alterations, renovations and repairs to existing mechanical systems shall meet the provisions for new construction, unless such work is done in the same manner and arrangement as was in the existing system, is not hazardous and is *approved*.

102.11.2 ~~102.5~~ Change in occupancy. It shall be unlawful to make a change in the *occupancy* of any structure which will subject the structure to any special provision of this code applicable to the new *occupancy* without approval. The code official shall certify that such structure meets the intent of the provisions of law governing building construction for the proposed new *occupancy* and that such change of *occupancy* does not result in any hazard to the public health, safety or welfare.

102.11.3 ~~102.7~~ Moved buildings. Except as determined by Section 102.5 ~~102.2~~, mechanical systems that are a part of buildings or structures moved into or within the jurisdiction shall comply with the provisions of this code for new installations.

PART 2—ADMINISTRATION AND ENFORCEMENT

SECTION 103
DEPARTMENT OF MECHANICAL INSPECTION

103.1 General. The Department of Mechanical Inspection, herein referred to as "the department," is hereby ~~created and the executive official in charge thereof shall be known as~~ established within the jurisdiction under the direction of the code official. The function of the department shall be the implementation, administration, and enforcement of the provisions of this code.

103.2 Appointment. The code official shall be appointed by the chief appointing authority of the jurisdiction.

103.3 Deputies. In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the code official shall have the authority to appoint a deputy code official, ~~other~~ related technical officers, inspectors, and other employees. Such employees shall have powers as delegated by the code official.

103.4 Liability. The code official, member of the Board of Appeals, or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally, and is hereby relieved from personal liability for any damage accruing to persons or property as a result of an act or by reason of an act or omission in the discharge of official duties.

103.5 Legal defense. Any suit instituted against any officer or employee of the department because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in an action, suit, or proceeding that is instituted in pursuance of the provisions of this code. Any officer or employee, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith.

SECTION 104
DUTIES AND POWERS OF THE CODE OFFICIAL

104.1 General. The code official is hereby authorized and directed to enforce the provisions of this code. The code official shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies, and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

104.2 Applications and permits. The code official shall receive applications, review *construction documents*, ~~and~~ issue permits required by this code ~~for the installation and *alteration* of mechanical systems~~, inspect the premises for which such permits have been issued, and enforce compliance with the provisions of this code.

~~104.6~~ 104.3 Notices and orders. The code official shall issue all necessary notices or orders to ensure compliance with this code.

~~104.3~~ 104.4 Inspections. The code official shall make all of the required inspections, or code official shall have the authority to accept reports of inspection by *approved* agencies or individuals. ~~All~~ Reports of such inspections shall be in writing and be certified by a responsible officer of such *approved* agency or by the responsible individual. The code official is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

104.5 Identification. The code official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

~~104.4~~ 104.6 Right of entry. ~~Whenever~~ Where it is necessary to make an inspection to enforce the provisions of this code, or ~~whenever~~ where the code official has reasonable cause to believe that there exists in a ~~building~~ structure or upon ~~any~~ a premises ~~any conditions or violations~~ a condition which is contrary to or in violation of this code which

makes the ~~building~~ structure or premises unsafe, ~~insanitary,~~ dangerous or hazardous, the code official ~~shall have the authority~~ is authorized to enter the ~~building~~ structure or premises at ~~all~~ reasonable times to inspect or to perform the duties imposed ~~upon the code official~~ by this code~~,~~. provided that if such ~~building~~ structure or premises is occupied, ~~the code official shall present~~ that credentials be presented to the occupant and ~~request~~ entry requested. If such ~~building~~ structure or premises is unoccupied, the code official shall first make a reasonable effort to locate the owner or other person having charge or control of the ~~building~~ structure or premises and request entry. If entry is refused, the code official ~~has~~ shall have recourse to ~~every remedy~~ the remedies provided by law to secure entry.

104.6.1 Warrant. When the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner or occupant or person having charge, care or control of the ~~building~~ structure or premises shall not fail or neglect, after proper request is made as herein provided, to promptly permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

104.7 Department records. The code official shall keep official records of applications received, permits and certificates issued, fees collected, reports of inspections, and notices and orders issued. Such records shall be retained in the official records for the period required for retention of public records.

104.8 Assistance of other agencies. The code official is authorized to request, and shall receive so far as is required in the discharge of the duties described in this code, the assistance and cooperation of other officials of the jurisdiction.

104.9 Specific duties. The following are specific duties of the code official. [JURISDICTION TO INSERT CODE OFFICIAL DUTIES SPECIFIC TO THIS CODE]

SECTION 105 ~~106~~
PERMITS

105.1 ~~106.1~~ ~~When~~ Permit required. ~~An~~ Any owner~~,~~ or authorized agent ~~or contractor~~ who ~~desires~~ intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or construct, erect, install, enlarge, alter, repair, remove, convert or replace ~~a~~ any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause such work to be done, shall first make application to the code official and obtain the required permit for the project ~~work~~. Where laws or regulations are enforceable by other agencies or departments, approval shall be obtained from all agencies or departments concerned.

105.1.1 Annual permit. In lieu of an individual *permit* for each *alteration* to an already *approved* electrical, gas, mechanical or plumbing installation, the *code official* is authorized to issue an annual *permit* upon application therefor to any person, firm or corporation regularly employing one or more qualified tradespersons in the building, structure, or on the premises owned or operated by the applicant for the *permit*.

105.1.1.1 Annual permit records. The person to whom an annual *permit* is issued shall keep a detailed record of *alterations* made under such annual *permit*. The *code official* shall have access to such records at all times, or such records shall be filed with the *code official* as designated.

105.1.2 Emergency repairs. ~~**Exception:**~~ Where *equipment* ~~and *appliance*~~ replacements ~~or~~ and repairs must be performed in an emergency situation, the permit application shall be submitted within the next working business day of the *code official* ~~department of mechanical inspection~~.

105.1.3 Permits specifically required. The following specifically require a permit. [JURISDICTION TO INSERT SPECIFIC ITEMS REQUIRING A PERMIT FOR THIS CODE]

105.2 ~~106.2~~ Permits not required. ~~Permits shall not be required for the following.~~ Exemptions from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required in accordance with Sections 105.2.1 through 105.2.3. ~~for the following:~~

105.2.1 Repairs. Application or notice to the *code official* is not required for ordinary repairs to structures, replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required *means of egress*, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include *addition* to, *alteration* of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

105.2.2 Public service agencies. A *permit* shall not be required for the installation, *alteration,* or repair of generation, transmission, distribution, or metering or other related equipment that is under the ownership and control of public service agencies by established right.

105.2.3 Specific exemption. The following are specifically exempt from requiring a permit.

1. Portable heating appliances;
2. Portable ventilation appliances and *equipment*;
3. Portable cooling units;
4. Steam, hot water or chilled water piping within any heating or cooling *equipment* or appliances regulated by this code;
5. The replacement of any minor part that does not alter the approval of *equipment* or an *appliance* or make such *equipment* or *appliance* unsafe;
6. Portable evaporative coolers;
7. Self-contained refrigeration systems that contain 10 pounds (4.5 kg) or less of refrigerant, or that are actuated by motors of 1 horsepower (0.75 kW) or less; and
8. Portable fuel cell appliances that are not connected to a fixed piping system and are not interconnected to a power grid.

105.3 ~~106.3~~ Application for permit. ~~Each application for a permit, with the required fee, shall be filed with the code official on a form furnished for that purpose and shall contain a general description of the proposed work and its location. The application shall be signed by the owner or an authorized agent. The permit application shall indicate the proposed *occupancy* of all parts of the building and of that portion of the site or lot, if any, not covered by the building or structure and shall contain such other information required by the code official.~~
To obtain a *permit*, the applicant shall first file an application therefor in writing on a form furnished by the department for that purpose. Such application shall:

1. Identify and describe the project to be covered by the *permit* for which application is made.
2. Describe the land on which the proposed project is to be done by legal description, street address or similar description that will readily identify and definitely locate the proposed building or project.
3. Indicate the use and occupancy for which the proposed project is intended.
4. Be accompanied by *construction documents* and other data as required in Section 106.
5. State the valuation of the proposed project.
6. Be signed by the applicant, or the applicant's authorized agent.
7. Give such other data and information as required by the *code official*.

105.3.1 Permit valuations. *Permit* valuations required under Section 105.3(5) shall include total value of the project, including materials and labor, and electrical, gas, mechanical, plumbing equipment and other permanent systems for which the *permit* is being issued. If, in the opinion of the *code official*, the valuation is underestimated on the application, the *permit* shall be denied, unless the applicant can show detailed estimates to meet the approval of the *code official*. Final building *permit* valuation shall be set by the *code official*.

105.4 ~~106.4~~ Action on application ~~Permit issuance~~. The *code official* shall examine or cause to be examined applications for *permits* and amendments thereto within a reasonable time after filing. If the application or the *construction documents* do not conform to the requirements of pertinent laws, the *code official* shall reject such application in writing, stating the reasons therefor. If the *code official* is satisfied that the proposed project conforms to the requirements of this code and laws and ordinances applicable thereto, the *code official* shall issue a *permit* therefor as soon as practicable. ~~The application, *construction documents* and other data filed by an applicant for a permit shall be reviewed by the code official. If the code official finds that the proposed work conforms to the requirements of this code and all laws and ordinances applicable thereto, and that the fees specified in Section 106.5 have been paid, a permit shall be issued to the applicant.~~

105.4 Action on application. The *code official* shall examine or cause to be examined applications for *permits* and amendments thereto within a reasonable time after filing. If the application or the *construction documents* do not conform to the requirements of pertinent laws, the *code official* shall reject such application in writing, stating the reasons therefor. If the *code official* is satisfied that the proposed project conforms to the requirements of this code and laws and ordinances applicable thereto, the *code official* shall issue a *permit* therefor as soon as practicable.

105.4.1 ~~106.3.2~~ Preliminary inspection. Before a permit is issued, the code official is authorized to inspect and evaluate the systems, *equipment*, buildings, devices, premises and spaces or areas to be used.

105.4.2 ~~106.4.1~~ Conditional permits. The code official ~~shall have the authority~~ is authorized to issue a permit for the construction or operation of part of the project such as the construction of foundations or any other of part of a ~~mechanical system~~ building or structure, or installation of systems or materials, or operation before the *construction documents* for the entire project ~~system~~ have been submitted ~~or *approved*~~, provided that adequate information and detailed statements have been filed complying with ~~all~~ pertinent requirements of this code. The holder of such permit shall proceed only to the point for which approval has been given, at ~~his or her~~ the permit holder's own risk and without assurance that the permit for the entire project ~~mechanical system~~ will be granted.

105.5 ~~106.3.3~~ Time limitation of application. An application for a permit for any proposed project ~~work~~ shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a permit has been issued; except that the code official shall have the authority to grant one or more extensions of time for additional periods not exceeding 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

105.6 ~~106.4.2~~ Validity of permit. The issuance ~~of a permit or approval of *construction documents* shall not be construed to be~~ or granting of a permit shall not be construed to be a *permit* for, or an approval of, any violation of any of the provisions of this code or of other ordinances of the jurisdiction. ~~A permit~~ Permits presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid ~~invalid~~. The issuance of a permit based upon *construction documents* and other data shall not prevent the code official from ~~thereafter~~ requiring the correction of errors in the ~~said~~ *construction documents* and other data ~~or from preventing building operations from being carried on thereunder when in violation of this code or of other ordinances of this jurisdiction~~.

105.7 ~~106.4.4~~ Extensions of permit. ~~A permittee holding~~ For an unexpired permit, ~~shall have the right to apply For an extension of the time within which the permittee will commence work under that permit when work is unable to be commenced within the time required by this section for good and satisfactory reasons.~~ the code official ~~shall extend the time for action by the permittee~~ is authorized to grant, in writing, one or more extensions of the time, for a period not exceeding 180 days each. The extension shall be requested in writing and justifiable cause demonstrated. ~~if there is reasonable cause. A permit shall not be extended more than once. The fee for an extension shall be one-half the amount required for a new permit for such work.~~

105.8 ~~106.4.3~~ Expiration of permit. Every permit issued ~~by the code official under the provisions of this code~~ shall become invalid ~~expire by limitation and become null and void if~~ unless the work on the site authorized by such permit is ~~not~~ commenced within 180 days after its issuance ~~from the date of such permit~~, or if the work on the site authorized by such permit is suspended or abandoned for a period of 180 days after the time ~~at any time after~~ the work is commenced ~~for a period of 180 days~~.

105.8.1 Recommencement of work. Before such work covered under an expired permit recommences, a new permit shall be first obtained. ~~and the fee, therefore, shall be one-half the amount required for a new permit for such work,~~ The new permit shall be issued provided no changes have been made or will be made in the original *construction documents* for such work, and provided further that such suspension or abandonment has not exceeded one year.

105.9 ~~106.4.5~~ Suspension or revocation of permit. The code official ~~shall have the authority~~ is authorized to suspend or revoke a permit issued under the provisions of this code ~~wherever~~ whenever the permit is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or regulation or any of the provisions of this code.

105.10 ~~106.4.8~~ Posting of permit. ~~The permit~~ Issued permits or ~~a~~ copy thereof shall be kept on the site of the project ~~work~~ until the completion of the project.

SECTION 106
SUBMITTAL DOCUMENTS

106.1 ~~106.3.1~~ ~~Construction documents~~ General. Submittal documents consisting of *construction documents*~~, engineering calculations, diagrams~~ and other supporting data shall be submitted in two or more sets with each application for a permit , and in such form and detail as required by the *code official*. The code official shall require *construction documents*~~, computations and specifications~~ and other data to be prepared ~~and designed~~ by a *registered design professional* when required by the statutes of the jurisdiction in which the project is to be constructed ~~state law~~. Where special conditions exist, the code official is authorized to require ~~additional~~ necessary *construction documents* to be prepared by a *registered design professional*.

Exception: The code official ~~shall have the authority~~ is authorized to waive the submission of *construction documents*~~, calculations or~~ and other data not required to be prepared by a *registered design professional* if the nature of the work applied for is such that review ~~reviewing~~ of *construction documents* is not necessary to ~~determine~~ obtain compliance with this code.

106.2 Construction documents. *Construction documents* shall be in accordance with Sections 106.2.1 through 106.2.4.

106.2.1 Information on construction documents. *Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the proposed project, and show in detail that the proposed project will conform to the provisions of this code and relevant laws, ordinances, rules, and regulations, as determined by the *code official*. ~~drawn~~ Plans shall be to scale and be on suitable material ~~shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that the work conforms to the provisions of this code~~. Electronic media documents are permitted to be submitted when *approved* by the *code official*.

106.2.1.1 Specific information required. Where the quality of the materials is essential for conformity to this code, specific information shall be given to establish such quality. The terms "this code" or "legal" or "its equivalent" shall not be cited or used as a substitute for specific information.

106.2.2 Site plan. The *construction documents* submitted with the application for *permit* shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from *lot lines*, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and *design flood* elevations. The site plan shall be drawn in accordance with an accurate boundary line survey.

106.2.2.1 Site plan for demolition. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot.

106.2.2.2. Waiver of site plan. The *code official* is authorized to waive or modify the requirement for a site plan when the application for *permit* is for *alteration* or repair or when otherwise warranted.

106.2.3 Specific Information. The following are specific requirements for submittal documents required by this code.

106.2.3.1 Buildings more that two stories in height. *Construction documents* for buildings more than two stories in height shall indicate where penetrations will be made for mechanical systems, and the materials and methods for maintaining required structural safety, fire-resistance rating and fireblocking

106.2.4 Design professional in responsible charge. When it is required that documents be prepared by a *registered design professional*, the *code official* shall be authorized to require the owner to engage and designate on the building *permit* application a *registered design professional* who shall act as the *registered design professional in responsible charge*. If the circumstances require, the owner shall designate a substitute *registered design professional in responsible charge* who shall perform the duties required of the original *registered design professional in responsible charge*. The *code official* shall be notified in writing by the owner if the *registered design professional in responsible charge* is changed or is unable to continue to perform the duties.

106.2.4.1 Responsibility. The *registered design professional in responsible charge* shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

106.2.4.2 Observation. Where structural observation is required, the inspection program shall name the individual or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur.

106.3 Deferred submittals. For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the *code official* within a specified period.

106.3.11 Prior approval. Deferral of any submittal items shall have the prior approval of the *code official*. The *registered design professional in responsible charge* shall list the deferred submittals on the *construction documents* for review by the *code official*.

106.3.2 Review. Documents for deferred submittal items shall be submitted to the *registered design professional in responsible charge* who shall review them and forward them to the *code official* with a notation indicating that the deferred submittal documents have been reviewed and been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the deferred submittal documents have been *approved* by the *code official*.

106.4 Examination of documents. The *code official* shall examine or cause to be examined the submittal documents and shall ascertain by such examinations whether the project indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

106.5 ~~106.4.1 Approved~~ Approval of construction documents. When the code official issues the permit ~~where *construction documents* are required~~, the *construction documents* and other data shall be endorsed, in writing ~~and stamped~~ or by stamp, as "*APPROVED*." One set of *construction documents* and other data so reviewed shall be retained by the *code official*. The other set(s) shall be returned to the applicant. One set shall be kept at the site of the project and shall be open to inspection by the *code official* or a duly authorized representative. Such *approved construction documents* shall not be changed, modified or altered without authorization from the code official. All work shall be done in accordance with the *approved construction documents*.

106.5.1 Phased approval. The code official ~~shall have the authority~~ is authorized to issue a permit for part of the project such as the construction of foundations or any other of part of a ~~mechanical system~~ building or structure, or installation of systems or materials, or operation before the *construction documents* for the entire project ~~system~~ have been submitted ~~or *approved*~~, provided that adequate information and detailed statements have been filed complying with ~~all~~ pertinent requirements of this code. The holder of such permit shall proceed at ~~his or her~~ the holder's own risk and without assurance that the permit for the entire project ~~mechanical system~~ will be granted.

106.6 Amended construction documents. Any changes made during construction that are not in compliance with the *approved construction documents* shall be resubmitted for approval as an amended set of *construction documents*.

106.7 ~~106.4.6~~ Retention of construction documents. One set of *approved construction documents* shall be retained by the code official for a period of not less than 180 days from date of completion of the permitted project ~~work~~, or for the period required for retention of public records ~~as required by state or local laws~~. ~~One set of *approved construction documents* shall be returned to the applicant, and said set shall be kept on the site of the building or job at all times during which the work authorized thereby is in progress.~~

SECTION 107 ~~105~~
MODIFICATIONS, TESTING, AND APPROVAL

107.1 ~~105.1~~ Modifications. Whenever there are practical difficulties involved in carrying out the provisions of this code, and upon application of the owner or owner's representative, the code official shall have the authority to grant modifications for individual cases ~~upon application of the owner or owner's representative~~, provided ~~that~~ the code official shall first find that special individual reason makes the strict letter of this code impractical and the modification is in conformance ~~compliance~~ with the intent and purpose of this code, and that such modification does not lessen health, life and fire safety, accessibility, or structural requirements. The details of action granting modifications shall be recorded and entered in the files of the department ~~mechanical inspection~~.

107.2 ~~105.4~~ Approved materials and equipment. All materials, *equipment*, and devices *approved* by the code official shall be constructed and installed in accordance with such approval.

107.3 ~~105.5~~ Used materials, appliances and equipment ~~and appliance reuse~~. The use of used materials that meet the requirements of this code for new materials is permitted. Used appliances, equipment and devices shall not be reused unless such elements are in good repair or have been reconditioned and tested when necessary, placed in good and proper working condition, and *approved* by the *code official*. ~~Materials, *equipment*, appliances and devices shall not be reused unless such elements have been reconditioned, tested and placed in good and proper working condition and *approved*.~~

107.4 Listed and labeled material and appliances. Listed and labeled materials, equipment, and appliances shall be used and installed in accordance with the conditions the listing and the manufacturer's instructions.

107.5 ~~105.2.1~~ Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

107.6 ~~105.3 Required testing~~ Technical assistance. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, or to determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building or premises, the code official shall have the authority to require tests be conducted, or a technical opinion, recommendation or report be submitted as evidence of compliance. ~~to~~ The tests, opinions, recommendations and reports shall be made at no expense to the jurisdiction.

107.6.1 Preparation. The technical reports and opinions shall be prepared by a qualified engineer, approved specialist or specialty organization, or an *approved agency*.

107.6.2 ~~105.3.1~~ Test methods. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the code official shall approve the testing procedures.

107.6.3 ~~105.3.2~~ Testing agency. All tests shall be performed by an *approved* agency.

107.6.4 ~~105.3.3 Test~~ Retention of reports. ~~Reports of tests~~ The technical opinions, recommendation, reports and test results shall be retained by the code official for the period required for retention of public records.

SECTION 108 ~~107~~
INSPECTIONS ~~AND TESTING~~

108.1 ~~107.1~~ General. ~~The code official is authorized to conduct such inspections as are deemed necessary to determine compliance with the provisions of this code.~~ Construction or work on a project for which a permit is required shall be subject to inspection by the code official, and such construction or work shall remain accessible and exposed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the *permit* applicant to cause the construction or work to remain accessible and exposed for inspection purposes. Neither the *code official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

108.1.1 Replacement of existing appliance. The requirements of this section shall not be considered to prohibit the operation of any heating or cooling *equipment* or appliances installed to replace such existing ~~heating~~ *equipment* or appliances serving an occupied portion of a structure provided that a request for inspection of such ~~heating~~ *equipment* or appliances has been filed with the department not more than 48 hours after such replacement work is completed, and before any portion of such *equipment* or appliances is concealed by any permanent portion of the structure.

108.2 ~~107.2~~ Required inspections and testing. The code official, upon notification ~~from the permit holder or the permit holder's agent,~~ shall make the inspections and require the tests set forth in Sections 108.2.1 through 108.2.4. ~~following inspections and other such inspections as necessary, and shall either release that portion of the construction or shall notify the permit holder or the permit holder's agent of violations that must be corrected. The holder of the permit shall be responsible for the scheduling of such inspections.~~

108.2.1 Specific Inspections. The following are specific inspections and tests required by this code.

108.2.1.1 Underground inspection. An underground inspection shall be made after trenches or ditches are excavated and bedded, piping installed, and before backfill is put in place. When excavated soil contains rocks, broken concrete, frozen chunks and other rubble that would damage or break the piping or cause corrosive action, clean backfill shall be on the job site.

> **Exception:** Ground-source heat pump loop systems tested in accordance with Section 1208.1.1 shall be permitted to be backfilled prior to inspection.

108.2.1.2 Rough-n Inspection. A Rough-in inspection shall be made after the roof, framing, fireblocking and bracing are in place and all ducting and other components to be concealed are complete, and prior to the installation of wall or ceiling membranes.

108.2.1.3 ~~107.3~~ Testing. Mechanical systems shall be tested as required in this code and in accordance with Sections ~~107.2.1~~ 108.3.3.1 through 108.3.3.3 ~~107.2.3~~. Tests shall be made by the permit holder and observed by the code official.

108.2.1.3.1 ~~107.3.1~~ New, altered, extended or repaired systems. New mechanical systems and parts of existing systems, which have been altered, extended, renovated or repaired, shall be tested as prescribed herein to disclose leaks and defects.

108.2.1.3.2 ~~107.3.2~~ Apparatus, material and labor for tests. Apparatus, material and labor required for testing a mechanical system or part thereof shall be furnished by the permit holder.

108.2.1.4 Prefabricated construction. Inspection of prefabricated construction shall comply with Sections 108.2.1.4.1 through 108.2.1.4.4.

108.2.1.4.1 ~~107.2.5~~ Evaluation and follow-up inspection services. Prior to the approval of a prefabricated construction assembly having concealed mechanical work and the issuance of a mechanical permit, the code official shall require the submittal of an evaluation report on each prefabricated construction assembly, indicating the complete details of the mechanical system, including a description of the system and its components, the basis upon which the system is being evaluated, test results and similar information, and other data as necessary for the code official to determine conformance to this code.

108.2.1.4.2 ~~107.2.5.1~~ Evaluation service. The code official shall designate the evaluation service of an *approved* agency as the evaluation agency, and review such agency's evaluation report for adequacy and conformance to this code.

108.2.1.4.3 ~~107.2.5.2~~ Follow-up inspection. Except where ready access is provided to mechanical systems, service *equipment* and accessories for complete inspection at the site without disassembly or dismantling, the code official shall conduct the in-plant inspections as frequently as necessary to ensure conformance to the *approved* evaluation report or shall designate an independent, *approved* inspection agency to conduct such inspections. The inspection agency shall furnish the code official with the follow-up inspection manual and a report of inspections upon request, and the mechanical system shall have an identifying label permanently affixed to the system indicating that factory inspections have been performed.

108.2.1.4.4 ~~107.2.5.3~~ Test and inspection records. Required test and inspection records shall be available to the code official at all times during the fabrication of the mechanical system and the erection of the building; or such records as the code official designates shall be filed.

~~**107.3.3 Reinspection and testing.** Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the code official for inspection and testing.~~

108.2.2 ~~107.2.1~~ Other inspections. In addition to the inspections specified above, the code official is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department.

108.2.3 Special inspections. Special inspection shall be as required by this code, the *International Building Code*, or the *International Fire Code* as applicable.

108.2.4 Final inspection. A final inspection shall be made ~~upon completion of the mechanical system~~ after all work on the project required by the *permit* is completed.

108.3 ~~107.2.4~~ ~~Approved~~ Inspection agencies. The code official is authorized to accept reports of *approved* inspection agencies, provided ~~that~~ such agencies satisfy the requirements as to qualifications and reliability.

108.4 ~~107.2.2~~ Inspection requests. It shall be the duty of the holder of the permit or their duly authorized agent to notify the code official when a project ~~work~~ is ready for inspection. It shall be the duty of the permit holder to provide *access* to and means for inspections of such work that are required by this code.

108.4.1 Manufacturer's instructions. Manufacturer's instructions for equipment, appliances, and materials installed under the permit shall be available on the work site at the time of inspection.

108.5 ~~107.2.3~~ Approval required. Work on a project shall not proceed ~~be done~~ beyond the point indicated in each successive inspection without first obtaining the approval of the code official. The code official, upon notification, shall make the requested inspections and shall either indicate the portion of the project ~~construction~~ that is satisfactory as completed, or notify the permit holder or ~~his or her~~ authorized agent wherein the same fails to comply with this code. Any portions of the project that do not comply shall be corrected and such portion shall not be covered, ~~or~~ concealed, or used until authorized by the code official.

108.6 ~~107.4~~ Notice of approval. After ~~the~~ all prescribed inspections or tests ~~and inspections~~ indicate that the project ~~work~~ complies ~~in all respects~~ with this code, a ~~notice of approval~~ certificate of completion complying with Section 109 shall be issued by the code official.

~~**107.4.1 Revocation.** The code official is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the notice is issued in error, on the basis of incorrect information supplied, or where it is determined that the building or structure, premise or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.~~

SECTION 109
CERTIFICATE OF COMPLETION AND OCCUPANCY

109.1 Use and occupancy. No building, structure, or premises or portion thereof shall be used or occupied until the code official has issued a certificate of occupancy as provided herein. No equipment, appliance or system used, and no change in the existing occupancy classification of a building, structure, premise or portion thereof shall be made until the code official has issued a certificate of completion as provided herein.

Exceptions:

1. Occupancy shall be permitted during **e**mergency situations as described under Section 105.1.
2. Certificates of completion or occupancy are not required for work exempt from permits under Section 105.2.
3. Occupancy shall be permitted during the replacement of existing appliances as described under Section 108.1.1.
4. Certificates of occupancy are not required for one-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m^2).

109.1.1 Validity. Issuance of a certificate of completion or occupancy shall not be construed as an approval of a violation of the provisions of this code or of other pertinent laws and ordinances of the jurisdiction. Certificates presuming to give authority to violate or cancel the provisions of this code or other laws or ordinances of the jurisdiction shall not be valid.

109.2 Certificate issued. After the *code official* inspects a project requiring a permit and finds no violations of the provisions of this code or other laws that are enforced by the department, the *code official* shall issue a certificate of completion. After all certificates of completion have been issued by other departments or agencies concerned, the code official shall issue a certificate of occupancy where applicable. A certificate of completion or occupancy shall contain the following:

1. The *permit* number.
2. The address of the premises or structure.
3. The name and address of the owner.
4. A description of the project for which the certificate is issued.
5. A statement that the described project has been inspected for compliance with the requirements of this code.
6. The name of the *code official*.
7. The edition of the code under which the *permit* was issued.
8. The use and occupancy in accordance Chapter 3 of the International Building Code.
9. The type of construction as defined in Chapter 6 of the International Building Code.
10. The design *occupant load*.
11. If fire protection systems are provided, whether the fire protection systems are required.
12. Any special stipulations and conditions of the *permit*.

Exceptions:

1. A certificate of completion or occupancy shall not be required to indicate the items under Section 109.2, Items 8, 9, and 10 for detached one- and two family dwellings and multiple single-family *dwellings* (*townhouses)* constructed using the *International Residential Code*.
2. The *code official* is shall not be required to indicate on a certificate items under Section 109.2, Items 8, 9, and 10 for the installation of equipment, appliances or systems.

109.3 Temporary occupancy. The code official is authorized to issue a temporary certificate of occupancy before the completion of the entire work covered by the permit, provided that such portion or portions shall be occupied safely and without endangerment to life or public welfare. The temporary certificate shall indicate any limitations or restrictions necessary to keep the permit area safe, and items required to obtain the final certificate of occupancy. The code official shall set a time period during which the temporary certificate of occupancy is valid.

109.4 Revocation. The code official is authorized to, in writing, suspend or revoke a certificate of completion or occupancy issued under the provisions of this code wherever the certificate is issued in error on the basis of incorrect information supplied, or where it is determined that the building, structure, premise, or portion thereof, or installation of appliance, equipment or system is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION 110
STOP WORK ORDER

110.1 Authority. Whenever the *code official* finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or dangerous or unsafe, the *code official* is authorized to issue a stop work order.

110.2 Issuance. The stop work order shall be in writing and shall be given to the owner of the property involved, or to the owner's agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order, and the conditions under which the cited work will be permitted to resume.

110.2.1 Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

110.3 Unlawful continuance. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fees, fines, or penalties as prescribed by this code or other laws or ordinances of the jurisdiction.

~~**108.5 Stop work orders.** Upon notice from the code official that mechanical work is being done contrary to the provisions of this code or in a dangerous or unsafe manner, such work shall immediately cease. Such notice shall be in writing and shall be given to the owner of the property, or to the owner's agent, or to the person doing the work. The notice shall state the conditions under which work is authorized to resume. Where an emergency exists, the code official shall not be required to give a written notice prior to stopping the work. Any person who shall continue any work on the system after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable for a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.~~

SECTION 111 ~~108~~
VIOLATIONS

111.1 Code violations. No person, association, organization, or business entity of any form shall:

1. Erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or premises in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
2. Install or operate any equipment, appliances, or systems regulated by this code that is in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
3. Be non-compliant with the conditions of any permit or certificate issued under the auspices of this code; or
4. Tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*.

111.2 Notice of violation. A *code official* who observes or becomes aware of any code violation shall serve upon the responsible person, association, organization, or business entity a written notice in accordance with Section 111.2.1. In the absence of direct knowledge as to the identity or location of the responsible party, the *code official* shall serve the notice upon the property owner. Service may be effected by personal delivery, first class mail, substituted service, or such other means that may be authorized by state and/or local law.

111.2.1 Form of notice. Such notice of violation shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the violation into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties in accordance with Section 111.3.

111.3 Penalties. Violators who fail to comply with a notice to discontinue or abate a condition in violation of this code, and violators who tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*, shall be subject to the penalties set forth in this code as may be adopted and authorized by state and/or local law.

~~**108.1 Unlawful acts.** It shall be unlawful for a person, firm or corporation to erect, construct, alter, repair, remove, demolish or utilize a mechanical system, or cause same to be done, in conflict with or in violation of any of the provisions of this code.~~

~~**108.2 Notice of violation.** The code official shall serve a notice of violation or order to the person responsible for the erection, installation, *alteration*, extension, repair, removal or demolition of mechanical work in violation of the provisions of this code, or in violation of a detail statement or the *approved construction documents* thereunder, or in violation of a permit or certificate issued under the provisions of this code. Such order shall direct the discontinuance of the illegal action or condition and the abatement of the violation.~~

~~**108.3 Prosecution of violation.** If the notice of violation is not complied with promptly, the code official shall request the legal counsel of the jurisdiction to institute the appropriate proceeding at law or in equity to restrain, correct or abate such violation, or to require the removal or termination of the unlawful *occupancy* of the structure in violation of the provisions of this code or of the order or direction made pursuant thereto.~~

~~**108.4 Violation penalties.** Persons who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter or repair mechanical work in violation of the *approved construction documents* or directive of the code official, or of a permit or certificate issued under the provisions of this code, shall be guilty of a [SPECIFY OFFENSE], punishable by a fine of not more than [AMOUNT] dollars or by imprisonment not exceeding [NUMBER OF DAYS], or both such fine and imprisonment. Each day that a violation continues after due notice has been served shall be deemed a separate offense.~~

~~**108.6 Abatement of violation.** The imposition of the penalties herein prescribed shall not preclude the legal officer of the jurisdiction from instituting appropriate action to prevent unlawful construction or to restrain, correct or abate a violation, or to prevent illegal *occupancy* of a building, structure or premises, or to stop an illegal act, conduct, business or utilization of the mechanical system on or about any premises.~~

SECTION 112 ~~109~~
MEANS OF APPEAL

112.1 ~~109.1~~ Application for appeal. Any person directly affected by a decision of the *code official* or a notice or order issued under this code shall have the right to appeal to the board of appeals, provided that a written application for appeal is filed within 20 days after the day the decision, notice or order was served. ~~A person shall have the right to appeal a decision of the code official to the board of appeals.~~ An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or requirements of this code are adequately satisfied by other means ~~an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the code official within 20 days after the notice was served~~.

~~**109.1.1 Limitation of authority.** The board of appeals shall have no authority relative to interpretation of the administration of this code nor shall such board be empowered to waive requirements of this code.~~

112.1.1 Stays of enforcement. The filing of an appeal of notice or orders, except for notice or order concerning *Imminent Danger*, shall stay the enforcement of the notice or order until the appeal is heard by the board of appeals.

112.2 ~~109.2~~ Membership of board. The board of appeals shall consist of five members who are qualified by experience and training to pass on matters pertaining to the provisions of this code. The board shall be appointed by the chief appointing authority, and shall serve staggered and overlapping terms. ~~appointed by the chief appointing authority as follows: one for five years; one for four years; one for three years; one for two years; and one for one year. Thereafter, each new member shall serve for five years or until a successor has been appointed.~~

112.2.1 ~~109.2.2~~ Alternate members. The chief appointing authority shall appoint two or more alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership and shall be appointed for five years, or until a successor has been appointed.

112.2.2. An employee of the jurisdiction shall not be a member of the board of appeals. The *code official* shall be an ex officio member of the board but shall have no vote on any matter before the board.

112.12.3 ~~109.2.3~~ Chairman. The board shall annually select one of its members to serve as chairman.

112.2.4 ~~109.2.5~~ Secretary. The chief administrative officer shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

112.2.5 ~~109.2.1~~ Qualifications. The board of appeals shall consist of five individuals, one from each of the following professions or disciplines:

1. *Registered design professional* who is a registered architect; or a builder or superintendent of building construction with at least 10 years' experience, five of which shall have been in responsible charge of work.
2. *Registered design professional* with structural engineering or architectural experience.
3. *Registered design professional* with mechanical and plumbing engineering experience; or a mechanical contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
4. *Registered design professional* with electrical engineering experience; or an electrical contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
5. *Registered design professional* with fire protection engineering experience; or a fire protection contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.

112.2.6 ~~109.2.4~~ Disqualification of member. A member shall not hear an appeal in which that member has a personal, professional or financial interest.

112.2.7 Terms. The initial members of the board of appeals shall serve as follows: one for five years; one for four years; one for three years; one for two years and one for one year. Thereafter, each new member shall serve for five years or until a successor has been appointed.

112.8 ~~109.2.6~~ Compensation of members. Compensation of members shall be determined by law.

112.3 Hearings and meetings. Hearings on appeals and other meetings of the board of appeals shall be held in conformance with Sections 109.3.1 through 109.3.3.

112.3.1 ~~109.4.1~~ Procedure. The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

112.3.2 ~~109.3~~ Notice ~~of meeting~~. The board shall meet upon notice from the chairman, within ten days of the filing of an appeal, or at stated periodic meetings.

112.3.3 ~~109.4~~ Open hearing. All hearings before the board shall be open to the public. A quorum shall consist of not less than two-thirds of the board membership. The appellant, the appellant's representative, the code official and any person whose interests are affected shall be given an opportunity to be heard.

112.3.4 ~~109.5~~ Postponed hearing. When the full board is ~~five members are~~ not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

112.4 ~~109.6~~ Board decision. The board shall modify or reverse the decision of the code official by a concurring vote of a majority of the total number of appointed board ~~three~~ members.

112.4.1 ~~109.6.1~~ Resolution. The decision of the board shall be by resolution. Certified copies shall be furnished to the appellant and to the code official.

112.4.2 ~~109.6.2 Administration~~ Action by code official. The code official shall take immediate action in accordance with the decision of the board.

112.5 ~~109.7~~ Court review. Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

SECTION 113
FEES

113.1 ~~106.5~~ Payment of fees. A permit or an amendment to a permit shall not be issued until the fees prescribed in Section 113.2 ~~106.5.2~~ have been paid~~, nor shall an amendment to a permit be released until the additional fee, if any, due to an increase of the mechanical system, has been paid~~.

113.2 ~~106.5.2~~ Fee schedule. The fees for permits and other considerations ~~for mechanical work~~ shall be in accordance with ~~as indicated in~~ the following schedule. [JURISDICTION TO INSERT APPROPRIATE SCHEDULE]

113.3 Related fees. The payment of the fee for work done in connection to or concurrently with the work authorized by a *permit* shall not relieve the applicant or holder of the *permit* from the payment of other fees that are prescribed by law.

113.4 ~~106.5.1~~ Work commencing before permit issuance. Any person who commences any work on a project requiring a *permit* ~~on a mechanical system~~ before obtaining the necessary permits shall be subject to ~~100 percent of the usual permit~~ a fee established by the *code official* that shall be in addition to the required permit fees.

113.5 ~~106.4.4~~ Permit extension. The fee for an extension of a permit in conformance with Section 105.7 shall be one-half the amount required for a new permit for such work.

113.6 Expiration of permit. For permits that have expired, and before such work recommences in conformance with Section 105.8.1, the fee to recommence work shall be one-half the amount required for a new permit for such work.

113.7 Stop work order. Any person who shall continue any work on a project requiring a permit after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.

113.8 Reinspection fee. A reinspection of work not in compliance with this code shall be subject to a fee established by the *code official* that shall be in addition to the required *permit* fees. The fee may be assessed when the *approved* plans are not readily available to the inspector, for failure to provide access on the date for which inspection is requested, for work deviating from the approved, or the work or test is not in compliance with this code.

113.9 ~~106.5.3~~ Fee refunds. The code official shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment. The code official shall authorize the refunding of fees as follows.

1. The full amount of any fee paid hereunder which was erroneously paid or collected.
~~3.~~ 2. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.
~~2.~~ 3. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid when no work has been done on a project under a permit issued in accordance with this code.

~~The code official shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment.~~

(SECTIONS 114 THROUGH 119 RESERVED)

PART 3 – GENERAL REQUIREMENTS

SECTION 120
UNSAFE STRUCTURES, EQUIPMENT, AND CONDITIONS

120.1 General. If any building, structure, premises or part thereof, or appliance, equipment, or system is found to be unsafe by the *code official*, or found in the case of a building or structure to be unfit for human occupancy, the condition shall be abated whenever possible, but if abatement is not achieved or is non-achievable, then condemnation shall be undertaken in accordance with the provisions of this code.

120.1.1 Notice to building official. Abatement requiring repairs, *alterations*, remodeling, removing or demolition shall be referred to the *building official*.

120.1.2 Unsafe structures. An unsafe structure is a structure that is dangerous to the life, health, or safety of the public or to the *occupants* when:

1. There are no minimum safeguards provided to protect or warn *occupants* in the event of fire; or
2. Such structure contains unsafe equipment or is so damaged, decayed, dilapidated, is structurally unsound, is of such faulty construction, or has such an unstable foundation, that partial or complete collapse is possible.

120.1.3 Unsafe equipment. Unsafe equipment includes any boiler, heating equipment, elevator, moving stairway, electrical wiring or device, flammable liquid containers or other equipment on the *premises* or within the structure which is in such disrepair or condition that such equipment constitutes a hazard to life, health, property or safety of the public or the *occupants* of the *premises* or structure.

120.1.4 Structure unfit for human occupancy. A structure is unfit for human *occupancy* whenever the *code official* finds that such structure is unsafe, is unlawful or, because its degree of disrepair, or its want of maintenance, is unsanitary, vermin or rat infested, filthy and contaminated, lacking *ventilation*, illumination, sanitary, heating facilities or other essential equipment required by this code, or because the structure is in proximity to an unsafe or dangerous condition that constitutes a hazard to the *occupants* of the structure or to the public.

120.1.5 Unlawful structure. An unlawful structure is one found in whole or in part to be occupied by more persons than permitted under this code, or was erected, altered or occupied contrary to this code.

120.1.6 Structure and premise that are dangerous to the life, health or safety of the public or occupants. For the purpose of this code, any structure or *premises* that have any or all of the following conditions or defects shall be considered dangerous, and shall constitute an unsafe structure:

1. Any door, aisle, passageway, stairway, exit or other means of egress that does not conform to the *approved* building or fire code of the jurisdiction as related to the requirements for existing buildings.
2. The walking surface of any aisle, passageway, stairway, exit or other means of egress is so warped, worn loose, torn or otherwise unsafe as to not provide safe and adequate means of egress.
3. Any portion of a building, structure or appurtenance that has been damaged by fire, earthquake, wind, flood, *deterioration*, *neglect*, abandonment, vandalism or by any other cause to such an extent that it is likely to partially or completely collapse, or to become *detached* or dislodged.
4. Any portion of a building, or any member, appurtenance or ornamentation on the exterior thereof that is not of sufficient strength or stability, or is not so *anchored*, attached or fastened in place so as to be capable of resisting natural or artificial loads of one and one-half the original designed value.
5. The building or structure, or part of the building or structure, because of dilapidation, *deterioration*, decay, faulty construction, the removal or movement of some portion of the ground necessary for the support, or for any other reason, is likely to partially or completely collapse, or some portion of the foundation or underpinning of the building or structure is likely to fail or give way.
6. The building or structure, or any portion thereof, is clearly unsafe for its use and *occupancy*.
7. The building or structure is *neglected*, damaged, dilapidated, unsecured or abandoned so as to become an attractive nuisance to children who might play in the building or structure to their danger, becomes a harbor for vagrants, criminals or immoral persons, or enables persons to resort to the building or structure for committing a nuisance or an unlawful act.
8. Any building or structure has been constructed, exists or is maintained in violation of any specific requirement or prohibition applicable to such building or structure provided by the *approved* building or fire code of the jurisdiction, or of any law or ordinance to such an extent as to present either a substantial risk of fire, building collapse or any other threat to life and safety.
9. A building or structure, used or intended to be used for dwelling purposes, because of inadequate maintenance, dilapidation, decay, damage, faulty construction or arrangement, inadequate light, *ventilation*, mechanical or plumbing system, or otherwise, is determined by the *code official* to be unsanitary, unfit for human habitation or in such a condition that is likely to cause sickness or disease.
10. Any building or structure, because of a lack of sufficient or proper fire-resistance-rated construction, fire protection systems, electrical system, fuel connections, mechanical system, plumbing system or other cause, is determined by the *code official* to be a threat to life or health.
11. Any portion of a building remains on a site after the demolition or destruction of the building or structure or whenever any building or structure is abandoned so as to constitute such building or portion thereof as an attractive nuisance or hazard to the public.

120.2 Closing of vacant structures. If the structure is vacant and unfit for human habitation and *occupancy*, and is not in danger of structural collapse, the *code official* is authorized to post a placard of condemnation on the *premises* and order the structure closed up so as not to be an attractive nuisance. Upon failure of the *owner* to close up the *premises* within the time specified in the order, the *code official* shall cause the *premises* to be closed and secured through any available public agency or by contract or arrangement by private persons, and the cost thereof shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate that may be collected by any legal means.

120.3 Evacuation. The *code official* or the fire department official in charge of an emergency incident shall be authorized to order the immediate evacuation of any occupied building, structure or premises deemed unsafe due to hazardous conditions that present an imminent danger to occupants. *Persons* so notified shall immediately leave the structure or premises and shall not enter or re-enter until authorized to do so by the *code official* or the fire department official in charge of the incident.

120.4 Notice. Whenever the *code official* has *condemned* a structure or equipment under the provisions of this section, notice shall be posted in a conspicuous place in or about the structure affected by such notice and served on the *owner* or the person or persons responsible for the structure or equipment in accordance with Section 120.4.2. If the notice pertains to equipment, it shall also be placed on the *condemned* equipment. The notice shall be in the form prescribed in Section 120.4.1.

120.4.1 Form of notice. Such notice of shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the unsafe condition into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties set forth in this code or as may be adopted and authorized by state and/or local law.

120.4.2 Service of notice. Such notice shall be deemed properly served if a copy thereof is (a) delivered to the owner personally; (b) sent by certified or registered mail addressed to the owner at the last known address with the return receipt requested; or (c) delivered in any other manner as prescribed by local law. If the certified or registered letter is returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice. Service of such notice in the foregoing manner upon the owner's agent or upon the person responsible for the structure shall constitute service of notice upon the owner.

120.5 Placarding. Upon failure of the owner or person responsible to comply with the notice provisions within the time given, the *code official* shall post on the premises or on defective equipment a placard bearing the word "UNSAFE" or "CONDEMNED" as applicable, and a statement of the penalties provided for occupying the premises, operating the equipment or removing the placard.

120.5.1 Placard removal. The *code official* shall remove the placard whenever the unsafe conditions have been eliminated. Any person who defaces or removes an unsafe condition placard without the approval of the *code official* shall be subject to the penalties provided for by the jurisdiction.

120.6 Prohibited occupancy. Any structure *condemned* and placarded by the *code official* shall be vacated as ordered by the *code official*. It shall be unlawful for any person to occupy or to allow others to occupy a placarded *premises,* or to operate or allow others to operate any placarded equipment.

120.7 Abatement. The owner, operator, or occupant of a building, structure, premises, or equipment deemed unsafe by the *code official* shall abate or correct such unsafe conditions either by repair, rehabilitation, demolition or other *approved* corrective action.

120.7.1 Summary abatement. Where conditions exist that are deemed an *imminent danger* as described in Section 121.1 that will necessarily result in injury to occupants or the public, the *code official* or fire department official in charge of the incident is authorized to summarily abate such unsafe or hazardous conditions.

120.8 Record. The *code official* shall cause a report to be filed on an unsafe condition. The report shall state the occupancy of the structure and the nature of the unsafe condition. The record of an unsafe condition as outlined herein shall be retained by the *code official* for the period required for retention of public records.

SECTION 121
EMERGENCY MEASURES

121.1 Imminent danger. When, in the opinion of the *code official*, there is imminent danger of failure or collapse of a building or structure that endangers life, or when any building or part of a building has fallen and life is endangered by the occupation of the building, or when there is actual or potential danger to the building occupants or those in the proximity of any structure because of explosives, explosive fumes or vapors, or the presence of toxic fumes, gases, or materials, or operation of defective or *dangerous* equipment, the *code official* is hereby authorized and empowered to order and require the occupants to vacate the premises forthwith. The *code official* shall cause to be posted at each entrance to such structure a notice reading as follows: "This Structure Is Unsafe and Its Occupancy Has Been Prohibited by the *Code Official*." It shall be unlawful for any person to enter such structure except for the purpose of securing the structure, making the required *repairs*, removing the hazardous condition, or of demolishing the same.

121.2 Temporary safeguards. Notwithstanding other provisions of this code, whenever, in the opinion of the *code official*, there is imminent danger due to an unsafe condition, the *code official* shall order the necessary work to be done, including the boarding up of openings, to render such structure temporarily safe whether or not the legal procedure herein described has been instituted; and shall cause such other action to be taken as the *code official* deems necessary to meet such emergency.

121.3 Closing streets. When necessary for public safety, the *code official* shall temporarily close structures and close or order the authority having jurisdiction to close sidewalks, streets, public ways, and places adjacent to unsafe structures, and prohibit the same from being utilized.

121.4 Emergency repairs. For the purposes of this section, the *code official* shall employ the necessary labor and materials to perform the required work as expeditiously as possible.

121.5 Costs of emergency repairs. Costs incurred in the performance of emergency work shall be paid by the jurisdiction. The legal counsel of the jurisdiction shall institute appropriate action against the owner of the premises where the unsafe structure is or was located for the recovery of such costs.

121.6 Hearing. Any person ordered to take emergency measures shall comply with such order forthwith. Any affected person shall thereafter, upon petition directed to the appeals board, be afforded a hearing as described in this code.

SECTION 122
SERVICE UTILITIES

122.1 ~~107.6~~ Connection of service utilities. No person shall make connections from a utility, source of energy, fuel, ~~or~~ power, water system or *sewer* system to any building, structure or system that is regulated by this code for which a permit is required, until authorized by the code official.

122.2 ~~107.5~~ Temporary connection. The code official shall have the authority to authorize the temporary connection of the building, structure or system to the utility source of energy, fuel, power, water system or *sewer* system ~~a mechanical system to the sources of energy for the purpose of testing mechanical systems or for use under a temporary certificate of *occupancy*~~.

122.3 ~~108.7.2~~ Authority to disconnect service utilities ~~order disconnection of energy sources~~. The code official shall have the authority to ~~order~~ authorize disconnection of ~~energy sources supplied~~ utility service to ~~a~~ the building, structure or ~~mechanical~~ system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or when such utility connection has been made without the approval required by Section 122.1 or 122.2 ~~, when it is determined that the mechanical system or any portion thereof has become hazardous or unsafe~~. The *code official* shall notify the serving utility and, wherever possible, the owner and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter. ~~Written notice of such order to disconnect service and the causes therefore shall be given within 24 hours to the owner and occupant of such building, structure or premises, provided, however, that in cases of immediate danger to life or property, such disconnection shall be made immediately without such notice. Where energy sources are provided by a public utility, the code official shall immediately notify the serving utility in writing of the issuance of such order to disconnect.~~

~~**108.7 Unsafe mechanical systems.** A mechanical system that is unsafe, constitutes a fire or health hazard, or is otherwise dangerous to human life, as regulated by this code, is hereby declared as an unsafe mechanical system. Use of a mechanical system regulated by this code constituting a hazard to health, safety or welfare by reason of inadequate maintenance, dilapidation, fire hazard, disaster, damage or abandonment is hereby declared an unsafe use. Such unsafe *equipment* and appliances are hereby declared to be a public nuisance and shall be abated by repair, rehabilitation, demolition or removal.~~

~~**108.7.1 Authority to condemn mechanical systems.** Whenever the code official determines that any mechanical system, or portion thereof, regulated by this code has become hazardous to life, health, property, or has become insanitary, the code official shall order in writing that such system either be removed or restored to a safe condition. A time limit for compliance with such order shall be specified in the written notice. A person shall not use or maintain a defective mechanical system after receiving such notice. When such mechanical system is to be disconnected, written notice as prescribed in Section 108.2 shall be given. In cases of immediate danger to life or property, such disconnection shall be made immediately without such notice.~~

~~**108.7.3 Connection after order to disconnect.** A person shall not make energy source connections to mechanical systems regulated by this code which have been disconnected or ordered to be disconnected by the code official, or the use of which has been ordered to be discontinued by the code official until the code official authorizes the reconnection and use of such mechanical systems. When a mechanical system is maintained in violation of this code, and in violation of a notice issued pursuant to the provisions of this section, the code official shall institute appropriate action to prevent, restrain, correct or abate the violation.~~

SECTION 123 ~~110~~
TEMPORARY STRUCTURES, EQUIPMENT, SYSTEMS AND USES

123.1 ~~110.1~~ General. The code official is authorized to issue a permit for temporary structures, *equipment*, systems and uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The code official is authorized to grant extensions for demonstrated cause.

123.2 ~~110.2~~ Conformance. Temporary structures, *equipment*, systems and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.

123.3 ~~110.4~~ Termination of approval. The code official is authorized to terminate such permit ~~for temporary *equipment*, systems or uses~~ and to order the temporary structure, *equipment*, system~~s~~ or use~~s~~ to be discontinued.

~~**110.3 Temporary utilities.** The code official is authorized to give permission to temporarily supply utilities before an installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in the code.~~

SECTION 124
MAINTENANCE

124.1 Maintenance of safeguards. Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or any other feature is required for compliance with the provisions of this code, or otherwise installed, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be continuously maintained in accordance with this code and applicable referenced standards.

124.1.1 ~~102.3~~ Specific maintenance. Mechanical systems, both existing and new, and parts thereof shall be maintained in proper operating condition in accordance with the original design and in a safe and sanitary condition. Devices or safeguards which are required by this code shall be maintained in compliance with the code edition under which they were installed. The owner or the owner's designated agent shall be responsible for maintenance of mechanical systems. To determine compliance with this provision, the code official shall have the authority to require a mechanical system to be reinspected.

124.2 Testing and operation. Equipment requiring periodic testing or operation to ensure maintenance shall be tested or operated as specified in this code.

124.2.1 Test and inspection records. Required test and inspection records shall be available to the *code official* at all times, or such records as designates shall be filed with the *code official*.

124.2.2 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

124.3 Supervision. Maintenance and testing shall be under the supervision of a responsible *person* who shall ensure that such maintenance and testing are conducted at specified intervals in accordance with this code.

124.4 Rendering equipment inoperable. Portable or fixed fire-extinguishing systems or devices and fire-warning systems shall not be rendered inoperative or inaccessible except as necessary during emergencies, maintenance, repairs, *alterations*, drills or prescribed testing.

SECTION 125
DEMOLITION

125.1 General. The *code official* shall order the owner of any premises upon which is located any structure that in the *code official's* judgment is deteriorated or dilapidated, or has become so out of *repair* as to be *dangerous*, unsafe, insanitary, or otherwise unfit for human habitation or occupancy, and such that it is unreasonable to *repair* the structure, to demolish and remove such structure; or if such structure is capable of being made safe by *repairs*, to *repair* and make safe and sanitary, or to board up and hold for future repair, or to demolish and remove at the owner's option; or where there has been a cessation of normal construction of any structure for a period of more than two years, to board up and hold for recommencement of work, or to demolish and remove such structure. Boarding up the building for future repair or recommencement of work shall not extend beyond one year, unless *approved* by the *code official*.

125.2 Notices and orders. All notices and orders shall comply with Section 111.2.

125.3 Failure to comply. If the owner of a premises fails to comply with a demolition order within the time prescribed, the *code official* shall cause the structure to be demolished and removed, either through an available public agency or by contract or arrangement with private persons, and the cost of such demolition and removal shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate.

125.4 Salvage materials. When any structure has been ordered demolished and removed in accordance with Section 125.3, the governing body or other designated officer under said contract or arrangement aforesaid shall have the right to sell the salvage and valuable materials at the highest price obtainable. The net proceeds of such sale, after deducting the expenses of such demolition and removal, shall be promptly remitted with a report of such sale or transaction, including the items of expense and the amounts deducted, for the person who is entitled thereto, subject to any order of a court. If such a surplus does not remain to be turned over, the report shall so state.

125.5 Existing remedies. The provisions in this code shall not be construed to abolish or impair existing remedies of the jurisdiction or its officers or agencies relating to the removal or demolition of any structure which is dangerous, unsafe or insanitary.

2. Revise and add the following definitions to the IMC:

ADDITION. An extension or increase in floor area, number of stories, or height of a building or structure.

ALTERATION. Any construction or renovation to an existing structure other than repair or addition that requires a *permit*, or a change in a mechanical, plumbing, fuel gas or other system that involves an extension, addition or change to the arrangement, type or purpose of the original installation that requires a *permit*.

APPROVED. ~~Acceptable to the code official or other authority having jurisdiction.~~ Approval by the code official as the result of review, investigation or tests conducted by the code official or by reason of accepted principles or tests by national authorities, or technical or scientific organizations.

APPROVED AGENCY. An established and recognized agency ~~that is *approved* by the code official and~~ regularly engaged in conducting tests or furnishing inspection services, when such agency has been *approved* by the *code official*.

BUILDING. Any structure ~~occupied~~ used or intended for supporting or sheltering any use or *occupancy*.

BUILDING OFFICIAL. The officer or other designated authority charged with the administration and enforcement of the *International Building Code*, or a duly authorized representative.

CERTIFICATE OF COMPLETION. A certificate stating that the project or work for which a permit was issued has been completed in compliance with *approved construction documents* and the requirements of this code.

CONSTRUCTION DOCUMENTS. ~~All of~~ The written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of the project necessary for obtaining a ~~building~~ permit. ~~The construction drawings shall be drawn to an appropriate scale.~~

EQUIPMENT OR FIXTURE. Any plumbing, heating, electrical, ventilating, air conditioning, refrigerating, and fire protection equipment, apparatus and devices, all piping, ducts, vents, control devices and other ~~components of~~ systems or components thereof, ~~other than appliances which are permanently installed and integrated to provide control of environmental conditions for buildings~~ and elevators, dumb waiters, escalators, boilers, pressure vessels and other mechanical facilities or installations that are related to building services, any of which are specifically regulated in this code. Appliances as defined by this code shall not be considered equipment. Equipment or fixtures shall not include manufacturing, production, or process equipment, but shall include connections from building service to process equipment. ~~This definition shall also include other systems specifically regulated in this code.~~

FIRE CODE OFFICIAL. The fire chief or other designated authority charged with the administration and enforcement of the code, or a duly authorized representative.

IMMINENT DANGER. A condition which could cause serious or life-threatening injury or death at any time.

LOT LINE. A line dividing one lot from another, or from a street or any public place.

PERMIT. An official document or certificate issued by the authority having jurisdiction which authorizes performance of a specified activity.

REGISTERED DESIGN PROFESSIONAL. An ~~individual~~ architect or engineer who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A *registered design professional* engaged by the owner to review and coordinate certain aspects of the project, as determined by the *building official*, for compatibility with the design of the building or structure, including submittal documents prepared by others, deferred submittal documents and phased submittal documents.

REPAIR. The reconstruction or renewal of any part of an existing building for the purpose of its maintenance.

STRUCTURE. That which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

TOWNHOUSE. A single-family *dwelling unit* constructed in a group of three or more attached units in which each unit extends from the foundation to roof and with open space on at least two sides.

PART VII – IPC

1. Revise IPC (Item 1-H) as follows:

CHAPTER 1
SCOPE AND ADMINISTRATION

PART 1—SCOPE AND APPLICATION

SECTION 101
GENERAL

101.1 Title. These regulations shall be known as the *International Plumbing Code* of [NAME OF JURISDICTION] hereinafter referred to as "this code."

101.2 Scope. The provisions of this code shall apply to the erection, installation, alteration, repairs, relocation, replacement, addition to, use or maintenance of plumbing systems within this jurisdiction. This code shall also regulate nonflammable medical gas, inhalation anesthetic, vacuum piping, nonmedical oxygen systems and sanitary and condensate vacuum collection systems. The installation of fuel gas distribution piping and equipment, fuel-gas-fired water heaters and water heater venting systems shall be regulated by the *International Fuel Gas Code*. ~~Provisions in the appendices shall not apply unless specifically adopted.~~

> **Exception:** Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane ~~high~~ with a separate means of egress and their accessory structures shall comply with the *International Residential Code*.

101.3 Purpose ~~Intent~~. The purpose of this code is to ~~provide~~ establish the minimum requirements ~~standards~~ to safeguard life or limb, health, property, and public welfare by regulating and controlling the design, construction, installation, quality of materials, location, operation, and maintenance or use of plumbing equipment and systems.

101.4 Severability. If any section, subsection, sentence, clause, or phrase of this code is for any reason held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code.

101.5 Validity. In the event any part or provision of this code is held to be illegal or void, this shall not have the effect of making illegal or void any of the other parts or provisions hereof, which are determined to be legal; and it shall be presumed that this code would have been adopted without such illegal or invalid parts or provisions.

101.6 ~~102.10~~ Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state, or federal law.

SECTION 102
APPLICABILITY

102.1 General. Where there is a conflict between a general requirement and a specific requirement of this code, the specific requirement shall be applicable ~~govern~~. Where, in a ~~any~~ specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

~~102.11~~ 102.2 Application of references. Reference to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

~~102.8~~ 102.3 Referenced codes and standards. The codes and standards referenced in this code shall be ~~those that are listed in Chapter 13 and such codes and standards shall be~~ considered ~~as~~ part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between the provisions of this code and the referenced codes and standards, the provisions of this code shall apply ~~be the minimum requirements~~.

> **Exception:** Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing shall govern.

102.4 Appendices. Provisions in the appendices shall not apply unless specifically adopted.

102.5 ~~102.2~~ Existing structures and systems ~~installations~~. The legal occupancy or use of any structure or installed system existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the *International Building Code,* the *International Fire Code,* or the *International Property Maintenance Code*, or as is deemed necessary by the *code official* for the general safety and welfare of the occupants and the public. ~~Plumbing systems lawfully in existence at the time of the adoption of this code shall be permitted to have their use and maintenance continued if the use, maintenance or repair is in accordance with the original design and no hazard to life, health or property is created by such plumbing system.~~

102.5.1 ~~102.6~~ Historic buildings. The provisions of this code relating to the construction, alteration, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures identified and classified by the state or local jurisdiction as historic buildings when such buildings or structures are judged by the code official to be safe and in the public interest of health, safety and welfare regarding any proposed construction, alteration, repair, enlargement, restoration, relocation or moving of buildings.

102.6 ~~105.2~~ Alternative materials, design, methods, and equipment. The provisions of this code are not intended to prevent the installation of any material, or the use or operation of appliances, equipment, systems, or method, or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative ~~material or method of construction~~ shall be *approved* where the code official finds that the proposed alternative ~~material, method or equipment~~ is satisfactory and complies with the intent of the provisions of this code, and that the alternative ~~and~~ is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, *fire resistance*, durability and safety.

102.6.1 Matters regulated by the *International Building Code.* Approvals under the authority herein contained shall be subject to the approval of the *building official* whenever the alternative involves matters regulated by the *International Building Code*.

102.5.1.4 ~~102.9~~ Requirements not covered by code. ~~Any~~ Requirements necessary for the strength, stability or proper operation of an existing or proposed fixture, structure, or equipment ~~plumbing system~~, or for the public safety, health, and general welfare, not specifically covered by this code shall be determined by the code official.

102.8 Subjects not regulated by this code. Where no applicable standards or requirements are set forth in this code, or are contained within other laws, codes, regulations, ordinances, or bylaws adopted by the jurisdiction, compliance with applicable nationally recognized standards, as *approved*, shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the *code official* to determine compliance with codes or standards for those activities or installations within the *code official's* jurisdiction or responsibility.

102.9 ~~106.5.7~~ Previous approvals. This code shall not require changes in the construction documents, construction or designated *occupancy* of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

102.10 Contractor's responsibilities. Every contractor who enters into contracts for which a permit is required shall comply with the state and local rules and regulations concerning licensing.

102.11 Specific application of this code. The following are application specific to this code.

102.11.1 ~~102.4~~ Additions, alterations or repairs. Additions, alterations, renovations or repairs to any plumbing system shall conform to that required for a new plumbing system without requiring the existing plumbing system to comply with all the requirements of this code. Additions, alterations or repairs shall not cause an existing system to become unsafe, insanitary or overloaded.

102.11.2 Minor additions, alterations, renovations and repairs to existing plumbing systems shall meet the provisions for new construction, unless such work is done in the same manner and arrangement as was in the existing system, is not hazardous and is *approved*.

102.11.3 ~~102.5~~ Change in occupancy. It shall be unlawful to make any change in the *occupancy* of any structure that will subject the structure to any special provision of this code applicable to the new *occupancy* without approval of the code official. The code official shall certify that such structure meets the intent of the provisions of law governing building construction for the proposed new *occupancy* and that such change of *occupancy* does not result in any hazard to the public health, safety or welfare.

102.11.4 ~~102.7~~ Moved buildings. Except as determined by Section **102.5** ~~102.2~~, plumbing systems that are a part of buildings or structures moved into or within the jurisdiction shall comply with the provisions of this code for new installations.

PART 2—ADMINISTRATION AND ENFORCEMENT

SECTION 103
DEPARTMENT OF PLUMBING INSPECTION

103.1 General. The Department of Plumbing Inspection, herein referred to as "the department," is hereby ~~created and the executive official in charge thereof shall be known as~~ established within the jurisdiction under the direction of the code official. The function of the department shall be the implementation, administration, and enforcement of the provisions of this code.

103.2 Appointment. The code official shall be appointed by the chief appointing authority of the jurisdiction.

103.3 Deputies. In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the code official shall have the authority to appoint a deputy code official, ~~other~~ related technical officers, inspectors, and other employees. Such employees shall have powers as delegated by the code official.

103.4 Liability. The code official, member of the Board of Appeals, officer, or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally, and is hereby relieved from all personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties.

103.5 Legal defense. Any suit instituted against any officer or employee of the department because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in ~~any~~ an action, suit, or proceeding that is instituted in pursuance of the provisions of this code. Any officer or employee, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith.

SECTION 104
DUTIES AND POWERS OF THE CODE OFFICIAL

104.1 General. The code official is hereby authorized and directed to enforce the provisions of this code. The code official shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies, and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

104.2 Applications and permits. The code official shall receive applications, review construction documents, ~~and~~ issue permits required by this code ~~for the installation and alteration of plumbing systems~~, inspect the premises for which such permits have been issued, and enforce compliance with the provisions of this code.

~~**104.6**~~ **104.3 Notices and orders.** The code official shall issue all necessary notices or orders to ensure compliance with this code.

~~**104.3**~~ **104.4 Inspections.** The code official shall make all the required inspections, or the *code official* shall have the authority to accept reports of inspection by *approved* agencies or individuals. ~~All~~ Reports of such inspections shall be in writing and be certified by a responsible officer of such *approved* agency or by the responsible individual. The code official is authorized to engage such expert opinion as deemed necessary to report on unusual technical issues that arise, subject to the approval of the appointing authority.

104.5 Identification. The code official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

~~**104.4**~~ **104.6 Right of entry.** ~~Whenever~~ Where it is necessary to make an inspection to enforce the provisions of this code, or ~~whenever~~ where the code official has reasonable cause to believe that there exists in a ~~any~~ ~~building~~ structure or upon ~~any~~ a premises ~~any conditions or violations~~ a condition which is contrary to or in violation of this code ~~that~~ which makes the ~~building~~ structure or premises unsafe, ~~insanitary,~~ dangerous or hazardous, the code official ~~shall have the authority~~ is authorized to enter the ~~building~~ structure or premises at ~~all~~ reasonable times to inspect or to perform the duties imposed ~~upon the code official~~ by this code, ~~.~~ provided that if such ~~building~~ structure or premises ~~is~~ be occupied, ~~the code official shall present~~ that credentials be presented to the occupant and ~~request~~ entry requested. If such ~~building~~ structure or premises is unoccupied, the code official shall first make a reasonable effort to locate the owner or other person having charge or control of the ~~building~~ structure or premises and request entry. If entry is refused, the code official shall have recourse to ~~every remedy~~ the remedies provided by law to secure entry.

104.6.1 Warrant. When the code official ~~shall have~~ has first obtained a proper inspection warrant or other remedy provided by law to secure entry, ~~no~~ an owner or occupant or person having charge, care or control of any ~~building~~ structure or premises shall fail or neglect, after proper request is made as herein provided, to promptly permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

104.7 Department records. The code official shall keep official records of applications received, permits and certificates issued, fees collected, reports of inspections, and notices and orders issued. Such records shall be retained in the official records for the period required for the retention of public records.

104.8 Assistance of other agencies. The code official is authorized to request, and shall receive so far as is required in the discharge of the duties described in this code, the assistance and cooperation of other officials of the jurisdiction.

104.9 Specific duties. The following are specific duties of the code official. [JURISDICTION TO INSERT CODE OFFICIAL DUTIES SPECIFIC TO THIS CODE]

SECTION 105 ~~106~~
PERMITS

105.1 ~~106.1~~ ~~When~~ Permit required. Any owner~~,~~ or authorized agent ~~or contractor~~ who ~~desires~~ intends to construct, enlarge, alter, repair, move, demolish or change the *occupancy* of a building or structure, or to construct, erect, install, enlarge, alter, repair, remove, convert, or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the code official and obtain the required permit for the project ~~work~~. Where laws or regulations are enforceable by other agencies or departments, approval shall be obtained from all agencies or departments concerned.

105.1.1 Annual permit. In lieu of an individual *permit* for each *alteration* to an already *approved* electrical, gas, mechanical or plumbing installation, the *code official* is authorized to issue an annual *permit* upon application therefor to any person, firm or corporation regularly employing one or more qualified tradespersons in the building, structure, or on the premises owned or operated by the applicant for the *permit*.

105.1.1.1 Annual permit records. The person to whom an annual *permit* is issued shall keep a detailed record of *alterations* made under such annual *permit*. The *code official* shall have access to such records at all times, or such records shall be filed with the *code official* as designated.

105.1.2 Emergency repairs. Where equipment replacements and repairs must be performed in an emergency situation, the *permit* application shall be submitted within the next working business day to the *code official*.

105.1.3 Permits specifically required. The following specifically require a permit. [JURISDICTION TO INSERT SPECIFIC ITEMS REQUIRING A PERMIT FOR THIS CODE]

105.2 ~~106.2~~ Permit not required ~~Exempt work.~~ ~~The following work shall be exempt from the requirement for a permit:~~ Exemptions from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this *jurisdiction*. *Permits* shall not be required in accordance with Sections 105.2.1 through 105.2.3.

105.2.1 Repairs. Application or notice to the *code official* is not required for ordinary repairs to structures, replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required *means of egress*, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include *addition* to, *alteration* of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

105.2.2 Public service agencies. A *permit* shall not be required for the installation, *alteration,* or repair of generation, transmission, distribution, or metering or other related equipment that is under the ownership and control of public service agencies by established right.

105.2.3 Specific exemption. The following are specifically exempt from requiring a permit:

1. The stopping of leaks in drains, water, soil, waste or vent pipe provided, however, that if any concealed trap, drainpipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with new material, such work shall be considered as new work and a permit shall be obtained and inspection made as provided in this code.
2. The clearing of stoppages or the repairing of leaks in pipes, valves or fixtures, and the removal and reinstallation of water closets, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

105.3 ~~106.3~~ Application for permit. ~~Each application for a permit, with the required fee, shall be filed with the code official on a form furnished for that purpose and shall contain a general description of the proposed work and its location. The application shall be signed by the owner or an authorized agent. The permit application shall indicate the proposed *occupancy* of all parts of the building and of that portion of the site or lot, if any, not covered by the building or structure and shall contain such other information required by the code official.~~
To obtain a *permit*, the applicant shall first file an application therefor in writing on a form furnished by the department for that purpose. Such application shall:

1. Identify and describe the project to be covered by the *permit* for which application is made.
2. Describe the land on which the proposed project is to be done by legal description, street address or similar description that will readily identify and definitely locate the proposed building or project.
3. Indicate the use and occupancy for which the proposed project is intended.
4. Be accompanied by *construction documents* and other data as required in Section 106.
5. State the valuation of the proposed project.
6. Be signed by the applicant, or the applicant's authorized agent.
7. Give such other data and information as required by the *code official*.

105.3.1 Permit valuations. *Permit* valuations required under Section 105.3(5) shall include total value of the project, including materials and labor, and electrical, gas, mechanical, plumbing equipment and other permanent systems for which the *permit* is being issued. If, in the opinion of the *code official*, the valuation is underestimated on the application, the *permit* shall be denied, unless the applicant can show detailed estimates to meet the approval of the *code official*. Final building *permit* valuation shall be set by the *code official*.

105.3.1 ~~106.4~~ By whom application is made. Application for a permit shall be made by the person or agent to install all or part of any plumbing system. The applicant shall meet all qualifications established by statute, or by rules promulgated by this code, or by ordinance or by resolution. The full name and address of the applicant shall be stated in the application.

105.4 ~~106.5~~ Action on application ~~Permit issuance~~. The *code official* shall examine or cause to be examined applications for *permits* and amendments thereto within a reasonable time after filing. If the application or the *construction documents* do not conform to the requirements of pertinent laws, the *code official* shall reject such application in writing, stating the reasons therefor. ~~The application, construction documents and other data filed by an applicant for permit shall be reviewed by the code official.~~ If the code official is satisfied ~~finds~~ that the proposed project ~~work~~ conforms to the requirements of this code and ~~all~~ laws and ordinances applicable thereto, the *code official* shall issue a *permit* therefor as soon as practicable ~~and that the fees specified in Section 106.6 have been paid, a permit shall be issued to the applicant~~.

105.4.1 ~~106.3.2~~ Preliminary inspection. Before a permit is issued, the code official is authorized to inspect and evaluate the systems, equipment, buildings, devices, premises and spaces or areas to be used.

105.4.2 ~~106.5.1~~ Conditional permits. The code official ~~shall have the authority~~ is authorized to issue a permit for the construction or operation of part of the project such as the construction of ~~a~~ foundations or any other part of a ~~plumbing system~~ building or structure, or installation of systems or materials, or operation before the ~~entire~~ construction documents for the entire project ~~whole system~~ have been submitted ~~or *approved*~~, provided that adequate information and detailed statements have been filed complying with ~~all~~ pertinent requirements of this code. The holder~~s~~ of such permit shall proceed only to the point for which approval has been given, at ~~their own~~ the permit holder's own risk, and without assurance that ~~the~~ a permit for the entire project ~~plumbing system~~ will be granted.

105.5 ~~106.3.3~~ Time limitation of application. An application for a permit for any proposed project ~~work~~ shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a permit has been issued; except that the code official ~~shall have the authority~~ is authorized to grant one or more extensions of time for additional periods not exceeding 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

105.6 ~~106.5.2~~ Validity of permit. The issuance ~~of a permit or approval of construction documents shall not be construed to be~~ or granting of a permit shall not be construed to be a *permit* for, or an approval of, any violation of any of the provisions of this code or any other ordinance of the jurisdiction. ~~No permit~~ Permits presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not ~~be~~ valid. The issuance of a permit based upon construction documents and other data shall not prevent the code official from ~~thereafter~~ requiring the correction of errors in ~~said~~ the construction documents and other data ~~or from preventing building operations being carried on thereunder when in violation of this code or of other ordinances of this jurisdiction~~.

105.7 ~~106.5.4~~ Extensions of permit. ~~Any permittee holding~~ For an unexpired permit, ~~shall have the right to apply for an extension of the time within which the permittee will commence work under that permit when work is unable to be commenced within the time required by this section for good and satisfactory reasons.~~ the code official ~~shall extend the time for action by the permittee for a period not exceeding~~ is authorized to grant, in writing, one or more extensions of the time, for periods of not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated. ~~if there is reasonable cause. No permit shall be extended more than once. The fee for an extension shall be one-half the amount required for a new permit for such work.~~

105.8 ~~106.5.3~~ Expiration of permit. Every permit issued ~~by the code official under the provisions of this code~~ shall become invalid ~~expire by limitation and become null and void if the work authorized by such permit is not~~ unless the work on the site authorized by such *permit* is commenced within 180 days after its issuance ~~from the date of such permit~~, or if the work authorized on the site by such permit is suspended or abandoned for a period of 180 days ~~at any time~~ after the work is commenced ~~for a period of 180 days~~.

105.8.1 Recommencement of work. Before such work ~~can be recommenced on~~ covered under an expired permit, a new permit shall be first obtained. ~~and the fee therefor shall be one-half the amount required for a new permit for such work.~~ The new permit shall be issued provided no changes have been made or will be made in the original construction documents for such work, and provided further that such suspension or abandonment has not exceeded ~~1~~ one year.

105.9 ~~106.5.5~~ Suspension or revocation of permit. The code official ~~shall have the authority~~ is authorized to suspend or revoke a permit issued under the provisions of this code ~~wherever~~ whenever the permit is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or regulation or any of the provisions of this code.

105.10 ~~106.5.8~~ Posting of permit. ~~The permit~~ Issued permits or ~~a~~ copy thereof shall be kept on the site of the project ~~work~~ until the completion of the project.

SECTION 106
SUBMITTAL DOCUMENTS

106.1 ~~106.3.1~~ ~~Construction documents~~ General. Submittal documents consisting of *construction documents*~~,~~ ~~engineering calculations, diagrams~~ and other ~~such~~ supporting data shall be submitted in two or more sets with each application for a permit, and in such form and detail as required by the *code official*. The code official shall require construction documents and other data~~, computations and specifications~~ to be prepared ~~and designed~~ by a registered design professional ~~when~~ where required by the statutes of the jurisdiction in which the project is to be constructed ~~state law~~. Where special conditions exist, the *code official* is authorized to require necessary construction documents to be prepared by a registered design professional.

> **Exception:** The code official ~~shall have the authority~~ is authorized to waive the submission of construction documents~~, calculations or~~ and other data not required to be prepared by a *registered design professional* if the nature of the work applied for is such that ~~reviewing~~ review of construction documents is not necessary to ~~determine~~ obtain compliance with this code.

106.2 Construction documents. *Construction documents* shall be in accordance with Sections 106.2.1 through 106.2.4.

106.2.1 Information on construction documents. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work project, and show in detail that the proposed project will conform to the provisions of this code and relevant laws, ordinances, rules, and regulations, as determined by the *code official*. ~~drawn~~ Plans shall be to scale and be on suitable material ~~shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that the work conforms to the provisions of this code~~. Electronic media documents are permitted to be submitted when *approved* by the *code official*.

106.2.1.1 Specific information required. Where the quality of the materials is essential for conformity to this code, specific information shall be given to establish such quality. The terms “this code” or “legal” or “its equivalent” shall not be cited or used as a substitute for specific information.

106.2.2 Site plan. The *construction documents* submitted with the application for *permit* shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from *lot lines*, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and *design flood* elevations. The site plan shall be drawn in accordance with an accurate boundary line survey.

106.2.2.1 Site plan for demolition. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot.

106.2.2.2. Waiver of site plan. The *code official* is authorized to waive or modify the requirement for a site plan when the application for *permit* is for *alteration* or repair or when otherwise warranted.

106.2.3 Specific Information. The following are specific requirements for submittal documents required by this code.

106.2.3.1 Buildings more than two stories in height. Construction documents for buildings more than two stories in height shall indicate where penetrations will be made for pipes, fittings and components and shall indicate the materials and methods for maintaining required structural safety, fire-resistance rating and fireblocking.

106.2.4 Design professional in responsible charge. When it is required that documents be prepared by a *registered design professional*, the *code official* shall be authorized to require the owner to engage and designate on the building *permit* application a *registered design professional* who shall act as the *registered design professional in responsible charge*. If the circumstances require, the owner shall designate a substitute *registered design professional in responsible charge* who shall perform the duties required of the original *registered design professional in responsible charge*. The *code official* shall be notified in writing by the owner if the *registered design professional in responsible charge* is changed or is unable to continue to perform the duties.

106.2.4.1 Responsibility. The *registered design professional in responsible charge* shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

106.2.4.2 Observation. Where structural observation is required, the inspection program shall name the individual or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur.

106.3 Deferred submittals. For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the *code official* within a specified period.

106.3.1 Prior approval. Deferral of any submittal items shall have the prior approval of the *code official*. The *registered design professional in responsible charge* shall list the deferred submittals on the *construction documents* for review by the *code official*.

106.3.2 Review. Documents for deferred submittal items shall be submitted to the *registered design professional in responsible charge* who shall review them and forward them to the *code official* with a notation indicating that the deferred submittal documents have been reviewed and been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the deferred submittal documents have been *approved* by the *code official*.

106.4 Examination of documents. The *code official* shall examine or cause to be examined the submittal documents and shall ascertain by such examinations whether the project indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

~~**106.5.1 Approved**~~ **106.5 Approval of construction documents.** When the code official issues ~~the~~ a permit~~, where~~ the construction documents and other data ~~are required, the construction documents~~ shall be endorsed, in writing ~~and stamped~~ or by stamp, as "APPROVED." One set of *construction documents* and other data so reviewed shall be retained by the *code official*. The other set(s) shall be returned to the applicant. One set shall be kept at the site of the project and shall be open to inspection by the *code official* or a duly authorized representative. Such *approved* construction documents shall not be changed, modified or altered without authorization from the code official. All work shall be done in accordance with the *approved* construction documents.

106.6 Amended construction documents. Any changes made during construction that are not in compliance with the *approved construction documents* shall be resubmitted for approval as an amended set of *construction documents*.

106.7 ~~**106.5.6**~~ **Retention of construction documents.** One set of *approved* construction documents shall be retained by the code official for a period of not less than 180 days from date of completion of the permitted project ~~work~~, or for the period required for retention of public records ~~as required by state or local laws~~.

~~One set of *approved* construction documents shall be returned to the applicant, and said set shall be kept on the site of the building or work at all times during which the work authorized thereby is in progress.~~

SECTION 107 ~~105~~
MODIFICATIONS, TESTING, AND APPROVAL

107.1 ~~105.1~~ Modifications. Whenever there are practical difficulties involved in carrying out the provisions of this code, and upon application of the owner or owner's representative, the code official shall have the authority to grant modifications for individual cases, ~~upon application of the owner or owner's representative,~~ provided the code official shall first find that special individual reason makes the strict letter of this code impractical and the modification conforms to the intent and purpose of this code and that such modification does not lessen health, life and fire safety, accessibility, or structural requirements. The details of action granting modifications shall be recorded and entered in the files of the ~~plumbing inspection~~ department.

107.2 ~~105.5~~ Approved materials and equipment. All materials, equipment, and devices *approved* by the code official shall be constructed and installed in accordance with such approval.

107.3 ~~105.5.1~~ Used material, appliances and equipment. The use of used materials that meet the requirements of this code for new materials is permitted. Used appliances, equipment and devices shall not be reused unless such elements are in good repair or have been reconditioned and tested when necessary, placed in good and proper working condition, and *approved* by the *code official*. ~~Materials, equipment and devices shall not be reused unless such elements have been reconditioned, tested, placed in good and proper working condition and *approved*.~~

107.4 Listed and labeled material and appliances. Listed and labeled materials, equipment, and appliances shall be used and installed in accordance with the conditions the listing and the manufacturer's instructions.

107.5 ~~105.2.1~~ Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

107.6 ~~105.3~~ ~~Required testing~~ Technical assistance. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternate materials or methods, or to determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building or premises, the code official shall have the authority to require tests be conducted, or a technical opinion, recommendation or report be submitted as evidence of compliance. ~~to~~ The tests, opinions, recommendations and reports shall be made at no expense to the jurisdiction.

107.6.1 Preparation. The technical reports and opinions shall be prepared by a qualified engineer, approved specialist or specialty organization, or an *approved agency*.

107.6.2 ~~105.3.1~~ Test methods. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the code official shall approve the testing procedures.

107.6.3 ~~105.3.2~~ Testing agency. All tests shall be performed by an *approved* agency.

107.6.4 ~~105.3.3~~ ~~Test~~ Retention of reports. ~~Reports of tests~~ The technical opinions, recommendation, reports and test results shall be retained by the code official for the period required for retention of public records.

SECTION 108 ~~107~~
INSPECTIONS ~~AND TESTING~~

108.1 ~~107.1~~ General. ~~The code official is authorized to conduct such inspections as are deemed necessary to determine compliance with the provisions of this code.~~ Construction or work on a project for which a permit is required shall be subject to inspection by the code official~~,~~ and such construction or work shall remain accessible and exposed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the permit applicant to cause the construction or work to remain accessible and exposed for inspection purposes. Neither the code official nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

108.1.1 Replacement of existing appliance. The requirements of this section shall not be considered to prohibit the operation of any heating or cooling *equipment* or appliances installed to replace such existing *equipment* or appliances serving an occupied portion of a structure provided that a request for inspection of such *equipment* or appliances has been filed with the department not more than 48 hours after such replacement work is completed, and before any portion of such *equipment* or appliances is concealed by any permanent portion of the structure.

108.2 ~~107.2~~ Required inspections and testing. The code official, upon notification ~~from the permit holder or the permit holder's agent~~, shall make the inspections and require the tests set forth in Sections 108.2.1 through 108.2.4. ~~following inspections and such other inspections as necessary, and shall either release that portion of the construction or shall notify the permit holder or an agent of any violations that must be corrected. The holder of the permit shall be responsible for the scheduling of such inspections.~~

108.2.1 Specific inspections. The following are specific inspections and tests required by this code.

108.2.1.1 Underground inspection. An underground inspection shall be made after trenches or ditches are excavated and bedded, piping installed, and before any backfill is put in place.

108.2.1.2 Rough-in Inspection. A rough-in inspection shall be made after the roof, framing, fireblocking, firestopping, draftstopping and bracing is in place and all sanitary, storm and water distribution piping is roughed-in, and prior to the installation of wall or ceiling membranes.

108.2.1.3 ~~107.4~~ Testing. Plumbing work and systems shall be tested as required in Section 312 and in accordance with Sections ~~107.4.1~~ 108.3.1.3.1 through 108.3.1.3.2 ~~107.4.3~~. Tests shall be made by the permit holder and observed by the code official.

108.2.1.3.1 ~~107.4.1~~ New, altered, extended or repaired systems. New plumbing systems and parts of existing systems that have been altered, extended or repaired shall be tested as prescribed herein to disclose leaks and defects, except that testing is not required in the following cases:

1. In any case that does not include addition to, replacement, alteration or relocation of any water supply, drainage or vent piping.
2. In any case where plumbing equipment is set up temporarily for exhibition purposes.

108.2.1.3.2 ~~107.4.2~~ Equipment, material and labor for tests. All equipment, material and labor required for testing a plumbing system or part thereof shall be furnished by the permit holder.

108.2.1.4 Prefabricated construction. Inspection of prefabricated construction shall comply with Sections 108.2.1.4.1 through 108.2.1.4.4.

108.3.1.4.1 ~~107.2.5~~ Evaluation and follow-up inspection services. Prior to the approval of a closed, prefabricated plumbing system and the issuance of a plumbing permit, the code official shall require the submittal of an evaluation report on each prefabricated plumbing system indicating the complete details of the plumbing system, including a description of the system and its components, the basis upon which the plumbing system is being evaluated, test results and similar information, and other data as necessary for the code official to determine conformance to this code.

108.2.1.4.2 ~~107.2.5.1~~ Evaluation service. The code official shall designate the evaluation service of an *approved* agency as the evaluation agency, and review such agency's evaluation report for adequacy and conformance to this code.

108.2.1.4.3 ~~107.2.5.2~~ Follow-up inspection. Except where ready *access* is provided to all plumbing systems, service equipment and accessories for complete inspection at the site without disassembly or dismantling, the code official shall conduct the frequency of in-plant inspections necessary to ensure conformance to the *approved* evaluation report or shall designate an independent, *approved* inspection agency to conduct such inspections. The inspection agency shall furnish the code official with the follow-up inspection manual and a report of inspections upon request, and the plumbing system shall have an identifying label permanently affixed to the system indicating that factory inspections have been performed.

108.2.1.4.4 ~~107.2.5.3~~ Test and inspection records. All required test and inspection records shall be available to the code official at all times during the fabrication of the plumbing system and the erection of the building, or such records as the code official designates shall be filed.

108.2.1.5 ~~107.3~~ Alternative engineered designs ~~Special inspections~~. Special inspections of *alternative engineered design* plumbing systems shall be conducted in accordance with Sections ~~107.3.1~~ 108.2.3.1.1 and 108.2.3.1.2 ~~107.3.2~~.

108.2.5.1 ~~107.3.1~~ Periodic inspection. The registered design professional or designated inspector shall periodically inspect and observe the *alternative engineered design* to determine that the installation is in accordance with the *approved* construction documents. All discrepancies shall be brought to the immediate attention of the plumbing contractor for correction. Records shall be kept of all inspections.

108.2.1.5.2 ~~107.3.2~~ Written report. The registered design professional shall submit a final report in writing to the code official upon completion of the installation, certifying that the *alternative engineered design* conforms to the *approved* construction documents. A notice of approval for the plumbing system shall not be issued until a written certification has been submitted.

108.2.2 ~~107.2.1~~ Other inspections. In addition to the inspections specified above, the code official is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department.

~~**107.4.3 Reinspection and testing.** Where any work or installation does not pass any initial test or inspection, the necessary corrections shall be made to comply with this code. The work or installation shall then be resubmitted to the code official for inspection and testing.~~

108.2.3 Special inspections. Special inspection shall be as required by this code, the *International Building Code*, or the *International Fire Code* as applicable.

108.2.4 Final inspection. A final inspection shall be made after ~~the building is complete, all plumbing fixtures are in place and properly connected,~~ all work on a project required by the *permit* is completed. ~~and the structure is ready for occupancy~~.

108.3 ~~107.2.4 Approved~~ Inspection agencies. The code official is authorized to accept reports of *approved* inspection agencies, provided ~~that~~ such agencies satisfy the requirements as to qualifications and reliability.

108.4 ~~107.2.2~~ Inspection requests. It shall be the duty of the holder of the permit or their duly authorized agent to notify the code official when a project ~~work~~ is ready for inspection. It shall be the duty of the permit holder to provide *access* to and means for inspections of such work that are required by this code.

108.4.1 Manufacturer's instructions. Manufacturer's instructions for equipment, appliances, and materials installed under the permit shall be available on the work site at the time of inspection.

108.5 ~~107.2.3~~ Approval required. Work on a project shall not proceed ~~be done~~ beyond the point indicated in each successive inspection without first obtaining the approval of the code official. The code official, upon notification, shall make the requested inspections and shall either indicate the portion of the project ~~construction~~ that is satisfactory as completed, or notify the permit holder or ~~his or her~~ authorized agent wherein the same fails to comply with this code. Any portions of the project that do not comply shall be corrected and such portion shall not be covered, ~~or~~ concealed, or used until authorized by the code official.

108.6 ~~107.5~~ Notice of approval. After ~~the~~ all prescribed ~~tests and~~ inspections or tests indicate that the project ~~work~~ complies ~~in all respects~~ with this code, a ~~notice of approval~~ certificate of completion complying with Section 109 shall be issued by the code official.

~~**107.5.1 Revocation.** The code official is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the notice is issued in error, or on the basis of incorrect information supplied, or where it is determined that the building or structure, premise or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.~~

SECTION 109
CERTIFICATE OF COMPLETION AND OCCUPANCY

109.1 Use and occupancy. No building, structure, or premises or portion thereof shall be used or occupied until the code official has issued a certificate of occupancy as provided herein. No equipment, appliance or system used, and no change in the existing occupancy classification of a building, structure, premise or portion thereof shall be made until the code official has issued a certificate of completion as provided herein.

Exceptions:

1. Occupancy shall be permitted during **e**mergency situations as described under Section 105.1.
2. Certificates of completion or occupancy are not required for work exempt from permits under Section 105.2.
3. Occupancy shall be permitted during the replacement of existing appliances as described under Section 108.1.1.
4. Certificates of occupancy are not required for one-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m^2).

109.1.1 Validity. Issuance of a certificate of completion or occupancy shall not be construed as an approval of a violation of the provisions of this code or of other pertinent laws and ordinances of the jurisdiction. Certificates presuming to give authority to violate or cancel the provisions of this code or other laws or ordinances of the jurisdiction shall not be valid.

109.2 Certificate issued. After the *code official* inspects a project requiring a permit and finds no violations of the provisions of this code or other laws that are enforced by the department, the *code official* shall issue a certificate of completion. After all certificates of completion have been issued by other departments or agencies concerned, the code official shall issue a certificate of occupancy where applicable. A certificate of completion or occupancy shall contain the following:

1. The *permit* number.
2. The address of the premises or structure.
3. The name and address of the owner.
4. A description of the project for which the certificate is issued.
5. A statement that the described project has been inspected for compliance with the requirements of this code.
6. The name of the *code official*.
7. The edition of the code under which the *permit* was issued.
8. The use and occupancy in accordance Chapter 3 of the International Building Code.
9. The type of construction as defined in Chapter 6 of the International Building Code.
10. The design *occupant load*.
11. If fire protection systems are provided, whether the fire protection systems are required.
12. Any special stipulations and conditions of the *permit*.

Exceptions:

1. A certificate of completion or occupancy shall not be required to indicate the items under Section 109.2, Items 8, 9, and 10 for detached one- and two family dwellings and multiple single-family *dwellings* (*townhouses)* constructed using the *International Residential Code*.
2. The *code official* is shall not be required to indicate on a certificate items under Section 109.2, Items 8, 9, and 10 for the installation of equipment, appliances or systems.

109.3 Temporary occupancy. The code official is authorized to issue a temporary certificate of occupancy before the completion of the entire work covered by the permit, provided that such portion or portions shall be occupied safely and without endangerment to life or public welfare. The temporary certificate shall indicate any limitations or restrictions necessary to keep the permit area safe, and items required to obtain the final certificate of occupancy. The code official shall set a time period during which the temporary certificate of occupancy is valid.

109.4 Revocation. The code official is authorized to, in writing, suspend or revoke a certificate of completion or occupancy issued under the provisions of this code wherever the certificate is issued in error on the basis of incorrect information supplied, or where it is determined that the building, structure, premise, or portion thereof, or installation of appliance, equipment or system is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION 110
STOP WORK ORDER

110.1 Authority. Whenever the *code official* finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or dangerous or unsafe, the *code official* is authorized to issue a stop work order.

110.2 Issuance. The stop work order shall be in writing and shall be given to the owner of the property involved, or to the owner's agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order, and the conditions under which the cited work will be permitted to resume.

110.2.1 Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

110.3 Unlawful continuance. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fees, fines, or penalties as prescribed by this code or other laws or ordinances of the jurisdiction.

~~**108.5 Stop work orders.** Upon notice from the code official, work on any plumbing system that is being done contrary to the provisions of this code or in a dangerous or unsafe manner shall immediately cease. Such notice shall be in writing and shall be given to the owner of the property, or to the owner's agent, or to the person doing the work. The notice shall state the conditions under which work is authorized to resume. Where an emergency exists, the code official shall not be required to give a written notice prior to stopping the work. Any person who shall continue any work in or about the structure after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.~~

SECTION 111 ~~108~~
VIOLATIONS

111.1 Code violations. No person, association, organization, or business entity of any form shall:

1. Erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or premises in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
2. Install or operate any equipment, appliances, or systems regulated by this code that is in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
3. Be non-compliant with the conditions of any permit or certificate issued under the auspices of this code; or
4. Tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*.

111.2 Notice of violation. A *code official* who observes or becomes aware of any code violation shall serve upon the responsible person, association, organization, or business entity a written notice in accordance with Section 111.2.1. In the absence of direct knowledge as to the identity or location of the responsible party, the *code official* shall serve the notice upon the property owner. Service may be effected by personal delivery, first class mail, substituted service, or such other means that may be authorized by state and/or local law.

111.2.1 Form of notice. Such notice of violation shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the violation into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties in accordance with Section 111.3.

111.3 Penalties. Violators who fail to comply with a notice to discontinue or abate a condition in violation of this code, and violators who tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*, shall be subject to the penalties set forth in this code as may be adopted and authorized by state and/or local law.

~~**108.1 Unlawful acts.** It shall be unlawful for any person, firm or corporation to erect, construct, alter, repair, remove, demolish or utilize any plumbing system, or cause same to be done, in conflict with or in violation of any of the provisions of this code.~~

~~**108.2 Notice of violation.** The code official shall serve a notice of violation or order to the person responsible for the erection, installation, alteration, extension, repair, removal or demolition of plumbing work in violation of the provisions of this code, or in violation of a detail statement or the *approved* construction documents thereunder, or in violation of a permit or certificate issued under the provisions of this code. Such order shall direct the discontinuance of the illegal action or condition and the abatement of the violation.~~

~~**108.3 Prosecution of violation.** If the notice of violation is not complied with promptly, the code official shall request the legal counsel of the jurisdiction to institute the appropriate proceeding at law or in equity to restrain, correct or abate such violation, or to require the removal or termination of the unlawful occupancy of the structure in violation of the provisions of this code or of the order or direction made pursuant thereto.~~

~~**108.4 Violation penalties.** Any person who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter or repair plumbing work in violation of the *approved* construction documents or directive of the code official, or of a permit or certificate issued under the provisions of this code, shall be guilty of a [SPECIFY OFFENSE], punishable by a fine of not more than [AMOUNT] dollars or by imprisonment not exceeding [NUMBER OF DAYS], or both such fine and imprisonment. Each day that a violation continues after due notice has been served shall be deemed a separate offense.~~

~~**108.6 Abatement of violation.** The imposition of the penalties herein prescribed shall not preclude the legal officer of the jurisdiction from instituting appropriate action to prevent unlawful construction or to restrain, correct or abate a violation, or to prevent illegal occupancy of a building, structure or premises, or to stop an illegal act, conduct, business or utilization of the plumbing on or about any premises.~~

SECTION 112 ~~109~~
MEANS OF APPEAL

112.1 ~~109.1~~ Application for appeal. Any person directly affected by a decision of the *code official* or a notice or order issued under this code shall have the right to appeal ~~a decision of the code official~~ to the board of appeals provided that a written application for appeal is filed within 20 days after the day the decision, notice or order was served. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or the requirements of this code are adequately satisfied by other means ~~an equally good or better form of construction is proposed. The application shall be filed on a form obtained from the code official within 20 days after the notice was served.~~

112.1.1 Stays of enforcement. The filing of an appeal of notice or orders, except for notice or order concerning *Imminent Danger*, shall stay the enforcement of the notice or order until the appeal is heard by the board of appeals.

112.2 ~~109.2~~ Membership of board. The board of appeals shall consist of five members who are qualified by experience and training to pass on matters pertaining to the provisions of this code. The board shall be appointed by the chief appointing authority, and shall serve staggered and overlapping terms ~~as follows: one for 5 years, one for 4 years, one for 3 years, one for 2 years and one for 1 year. Thereafter, each new member shall serve for 5 years or until a successor has been appointed~~.

112.2.1 ~~109.2.2~~ Alternate members. The chief appointing authority shall appoint two or more alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership, and shall be appointed for 5 years or until a successor has been appointed.

112.2.2. An employee of the jurisdiction shall not be a member of the board of appeals. The *code official* shall be an ex officio member of the board but shall have no vote on any matter before the board.

112.2.3 ~~109.2.3~~ Chairman. The board shall annually select one of its members to serve as chairman.

112.2.4 ~~109.2.5~~ Secretary. The chief administrative officer shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

112.2.5 ~~109.2.1~~ Qualifications. The board of appeals shall consist of five individuals, one from each of the following professions or disciplines:

1. Registered design professional who is a registered architect; or a builder or superintendent of building construction with at least 10 years' experience, 5 years of which shall have been in responsible charge of work.
2. Registered design professional with structural engineering or architectural experience.
3. Registered design professional with mechanical and plumbing engineering experience; or a mechanical and plumbing contractor with at least 10 years' experience, 5 years of which shall have been in responsible charge of work.
4. Registered design professional with electrical engineering experience; or an electrical contractor with at least 10 years' experience, 5 years of which shall have been in responsible charge of work.
5. Registered design professional with fire protection engineering experience; or a fire protection contractor with at least 10 years' experience, 5 years of which shall have been in responsible charge of work.

112.2.6 ~~109.2.4~~ Disqualification of member. A member shall not hear an appeal in which that member has any personal, professional or financial interest.

112.2.7 Terms. The initial members of the board of appeals shall serve as follows: one for five years; one for four years; one for three years; one for two years and one for one year. Thereafter, each new member shall serve for five years or until a successor has been appointed.

112.2.8 ~~109.2.6~~ Compensation of members. Compensation of members shall be determined by law.

112.3 Hearings and meetings. Hearings on appeals and other meetings of the board of appeals shall be held in conformance with Sections 109.3.1 through 109.3.3.

112.3.1 ~~109.4.1~~ Procedure. The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

112.3.2 ~~109.3~~ Notice ~~of meeting~~. The board shall meet upon notice from the chairman, within 10 days of the filing of an appeal or at stated periodic meetings.

112.3.3 ~~109.4~~ Open hearing. All hearings before the board shall be open to the public. A quorum shall consist of not less than two-thirds of the board membership. The appellant, the appellant's representative, the code official and any person whose interests are affected shall be given an opportunity to be heard.

112.3.4 ~~109.5~~ Postponed hearing. When the full board is ~~five members are~~ not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

112.4 ~~109.6~~ Board decision. The board shall modify or reverse the decision of the code official by a concurring vote of a majority of the total number of appointed board ~~three~~ members.

112.4.1 ~~109.6.1~~ Resolution. The decision of the board shall be by resolution. Certified copies shall be furnished to the appellant and to the code official.

112.4.2 ~~109.6.2 Administration~~ Action by code official. The code official shall take immediate action in accordance with the decision of the board.

112.5 ~~109.7~~ Court review. Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

SECTION 113 ~~110~~
FEES

113.1 ~~106.6~~ Payment of fees. A permit or an amendment to a permit shall not be issued until the fees prescribed in Section 113.2 ~~106.6.2~~ have been paid~~, and an amendment to a permit shall not be released until the additional fee, if any, due to an increase of the plumbing systems, has been paid.~~

113.2 ~~106.6.2~~ Fee schedule. The fees for permits and other considerations ~~all plumbing work~~ shall be ~~as indicated~~ in accordance with the following schedule: [JURISDICTION TO INSERT APPROPRIATE SCHEDULE]

113.3 Related fees. The payment of the fee for work done in connection to or concurrently with the work authorized by a *permit* shall not relieve the applicant or holder of the *permit* from the payment of other fees that are prescribed by law.

113.4 ~~106.6.1~~ Work commencing before permit issuance. Any person who commences any work on a project requiring a *permit* ~~on a plumbing system~~ before obtaining the necessary permits shall be subject to ~~100 percent of the usual permit~~ a fee established by the *code official* that shall be in addition to the required permit fees.

113.5 ~~106.4.4~~ Permit extension. The fee for an extension of a permit in conformance with Section 105.7 shall be one-half the amount required for a new permit for such work.

113.6 Expiration of permit. For permits that have expired, and before such work recommences in conformance with Section 105.8.1, the fee to recommence work shall be one-half the amount required for a new permit for such work.

113.7 Stop work order. Any person who shall continue any work on a project requiring a permit after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.

113.8 Reinspection fee. A reinspection of work not in compliance with this code shall be subject to a fee established by the *code official* that shall be in addition to the required *permit* fees. The fee may be assessed when the *approved* plans are not readily available to the inspector, for failure to provide access on the date for which inspection is requested, for work deviating from the approved, or the work or test is not in compliance with this code.

113.9 ~~106.6.3~~ Fee refunds. The code official shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment. The code official shall authorize the refunding of fees as follows:

1. The full amount of any fee paid hereunder that was erroneously paid or collected.
~~3.~~ 2. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.
~~2.~~ 3. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid when no work has been done on a project under a permit issued in accordance with this code.

~~The code official shall not authorize the refunding of any fee paid except upon written application filed by the original permittee not later than 180 days after the date of fee payment.~~

(SECTIONS 114 THROUGH 119 RESERVED)

PART 3 – GENERAL REQUIREMENTS

SECTION 120
UNSAFE STRUCTURES, EQUIPMENT, AND CONDITIONS

120.1 General. If any building, structure, premises or part thereof, or appliance, equipment, or system is found to be unsafe by the *code official*, or found in the case of a building or structure to be unfit for human occupancy, the condition shall be abated whenever possible, but if abatement is not achieved or is non-achievable, then condemnation shall be undertaken in accordance with the provisions of this code.

120.1.1 Notice to building official. Abatement requiring repairs, *alterations*, remodeling, removing or demolition shall be referred to the *building official*.

120.1.2 Unsafe structures. An unsafe structure is a structure that is dangerous to the life, health, or safety of the public or to the *occupants* when:

1. There are no minimum safeguards provided to protect or warn *occupants* in the event of fire; or
2. Such structure contains unsafe equipment or is so damaged, decayed, dilapidated, is structurally unsound, is of such faulty construction, or has such an unstable foundation, that partial or complete collapse is possible.

120.1.3 Unsafe equipment. Unsafe equipment includes any boiler, heating equipment, elevator, moving stairway, electrical wiring or device, flammable liquid containers or other equipment on the *premises* or within the structure which is in such disrepair or condition that such equipment constitutes a hazard to life, health, property or safety of the public or the *occupants* of the *premises* or structure.

120.1.4 Structure unfit for human occupancy. A structure is unfit for human *occupancy* whenever the *code official* finds that such structure is unsafe, is unlawful or, because its degree of disrepair, or its want of maintenance, is unsanitary, vermin or rat infested, filthy and contaminated, lacking *ventilation*, illumination, sanitary, heating facilities or other essential equipment required by this code, or because the structure is in proximity to an unsafe or dangerous condition that constitutes a hazard to the *occupants* of the structure or to the public.

120.1.5 Unlawful structure. An unlawful structure is one found in whole or in part to be occupied by more persons than permitted under this code, or was erected, altered or occupied contrary to this code.

120.1.6 Structure and premise that are dangerous to the life, health or safety of the public or occupants. For the purpose of this code, any structure or *premises* that have any or all of the following conditions or defects shall be considered dangerous, and shall constitute an unsafe structure:

1. Any door, aisle, passageway, stairway, exit or other means of egress that does not conform to the *approved* building or fire code of the jurisdiction as related to the requirements for existing buildings.
2. The walking surface of any aisle, passageway, stairway, exit or other means of egress is so warped, worn loose, torn or otherwise unsafe as to not provide safe and adequate means of egress.
3. Any portion of a building, structure or appurtenance that has been damaged by fire, earthquake, wind, flood, *deterioration*, *neglect*, abandonment, vandalism or by any other cause to such an extent that it is likely to partially or completely collapse, or to become *detached* or dislodged.
4. Any portion of a building, or any member, appurtenance or ornamentation on the exterior thereof that is not of sufficient strength or stability, or is not so *anchored*, attached or fastened in place so as to be capable of resisting natural or artificial loads of one and one-half the original designed value.
5. The building or structure, or part of the building or structure, because of dilapidation, *deterioration*, decay, faulty construction, the removal or movement of some portion of the ground necessary for the support, or for any other reason, is likely to partially or completely collapse, or some portion of the foundation or underpinning of the building or structure is likely to fail or give way.
6. The building or structure, or any portion thereof, is clearly unsafe for its use and *occupancy*.
7. The building or structure is *neglected*, damaged, dilapidated, unsecured or abandoned so as to become an attractive nuisance to children who might play in the building or structure to their danger, becomes a harbor for vagrants, criminals or immoral persons, or enables persons to resort to the building or structure for committing a nuisance or an unlawful act.
8. Any building or structure has been constructed, exists or is maintained in violation of any specific requirement or prohibition applicable to such building or structure provided by the *approved* building or fire code of the jurisdiction, or of any law or ordinance to such an extent as to present either a substantial risk of fire, building collapse or any other threat to life and safety.
9. A building or structure, used or intended to be used for dwelling purposes, because of inadequate maintenance, dilapidation, decay, damage, faulty construction or arrangement, inadequate light, *ventilation*, mechanical or plumbing system, or otherwise, is determined by the *code official* to be unsanitary, unfit for human habitation or in such a condition that is likely to cause sickness or disease.
10. Any building or structure, because of a lack of sufficient or proper fire-resistance-rated construction, fire protection systems, electrical system, fuel connections, mechanical system, plumbing system or other cause, is determined by the *code official* to be a threat to life or health.
11. Any portion of a building remains on a site after the demolition or destruction of the building or structure or whenever any building or structure is abandoned so as to constitute such building or portion thereof as an attractive nuisance or hazard to the public.

120.2 Closing of vacant structures. If the structure is vacant and unfit for human habitation and *occupancy*, and is not in danger of structural collapse, the *code official* is authorized to post a placard of condemnation on the *premises* and order the structure closed up so as not to be an attractive nuisance. Upon failure of the *owner* to close up the *premises* within the time specified in the order, the *code official* shall cause the *premises* to be closed and secured through any available public agency or by contract or arrangement by private persons, and the cost thereof shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate that may be collected by any legal means.

120.3 Evacuation. The *code official* or the fire department official in charge of an emergency incident shall be authorized to order the immediate evacuation of any occupied building, structure or premises deemed unsafe due to hazardous conditions that present an imminent danger to occupants. *Persons* so notified shall immediately leave the structure or premises and shall not enter or re-enter until authorized to do so by the *code official* or the fire department official in charge of the incident.

120.4 Notice. Whenever the *code official* has *condemned* a structure or equipment under the provisions of this section, notice shall be posted in a conspicuous place in or about the structure affected by such notice and served on the *owner* or the person or persons responsible for the structure or equipment in accordance with Section 120.4.2. If the notice pertains to equipment, it shall also be placed on the *condemned* equipment. The notice shall be in the form prescribed in Section 120.4.1.

120.4.1 Form of notice. Such notice of shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the unsafe condition into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties set forth in this code or as may be adopted and authorized by state and/or local law.

120.4.2 Service of notice. Such notice shall be deemed properly served if a copy thereof is (a) delivered to the owner personally; (b) sent by certified or registered mail addressed to the owner at the last known address with the return receipt requested; or (c) delivered in any other manner as prescribed by local law. If the certified or registered letter is returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice. Service of such notice in the foregoing manner upon the owner's agent or upon the person responsible for the structure shall constitute service of notice upon the owner.

120.5 Placarding. Upon failure of the owner or person responsible to comply with the notice provisions within the time given, the *code official* shall post on the premises or on defective equipment a placard bearing the word "UNSAFE" or "CONDEMNED" as applicable, and a statement of the penalties provided for occupying the premises, operating the equipment or removing the placard.

120.5.1 Placard removal. The *code official* shall remove the placard whenever the unsafe conditions have been eliminated. Any person who defaces or removes an unsafe condition placard without the approval of the *code official* shall be subject to the penalties provided for by the jurisdiction.

120.6 Prohibited occupancy. Any structure *condemned* and placarded by the *code official* shall be vacated as ordered by the *code official*. It shall be unlawful for any person to occupy or to allow others to occupy a placarded *premises,* or to operate or allow others to operate any placarded equipment.

120.7 Abatement. The owner, operator, or occupant of a building, structure, premises, or equipment deemed unsafe by the *code official* shall abate or correct such unsafe conditions either by repair, rehabilitation, demolition or other *approved* corrective action.

120.7.1 Summary abatement. Where conditions exist that are deemed an *imminent danger* as described in Section 121.1 that will necessarily result in injury to occupants or the public, the *code official* or fire department official in charge of the incident is authorized to summarily abate such unsafe or hazardous conditions.

120.8 Record. The *code official* shall cause a report to be filed on an unsafe condition. The report shall state the occupancy of the structure and the nature of the unsafe condition. The record of an unsafe condition as outlined herein shall be retained by the *code official* for the period required for retention of public records.

SECTION 121
EMERGENCY MEASURES

121.1 Imminent danger. When, in the opinion of the *code official*, there is imminent danger of failure or collapse of a building or structure that endangers life, or when any building or part of a building has fallen and life is endangered by the occupation of the building, or when there is actual or potential danger to the building occupants or those in the proximity of any structure because of explosives, explosive fumes or vapors, or the presence of toxic fumes, gases, or materials, or operation of defective or *dangerous* equipment, the *code official* is hereby authorized and empowered to order and require the occupants to vacate the premises forthwith. The *code official* shall cause to be posted at each entrance to such structure a notice reading as follows: "This Structure Is Unsafe and Its Occupancy Has Been Prohibited by the *Code Official*." It shall be unlawful for any person to enter such structure except for the purpose of securing the structure, making the required *repairs*, removing the hazardous condition, or of demolishing the same.

121.2 Temporary safeguards. Notwithstanding other provisions of this code, whenever, in the opinion of the *code official*, there is imminent danger due to an unsafe condition, the *code official* shall order the necessary work to be done, including the boarding up of openings, to render such structure temporarily safe whether or not the legal procedure herein described has been instituted; and shall cause such other action to be taken as the *code official* deems necessary to meet such emergency.

121.3 Closing streets. When necessary for public safety, the *code official* shall temporarily close structures and close or order the authority having jurisdiction to close sidewalks, streets, public ways, and places adjacent to unsafe structures, and prohibit the same from being utilized.

121.4 Emergency repairs. For the purposes of this section, the *code official* shall employ the necessary labor and materials to perform the required work as expeditiously as possible.

121.5 Costs of emergency repairs. Costs incurred in the performance of emergency work shall be paid by the jurisdiction. The legal counsel of the jurisdiction shall institute appropriate action against the owner of the premises where the unsafe structure is or was located for the recovery of such costs.

121.6 Hearing. Any person ordered to take emergency measures shall comply with such order forthwith. Any affected person shall thereafter, upon petition directed to the appeals board, be afforded a hearing as described in this code.

SECTION 122
SERVICE UTILITIES

122.1 ~~**107.7**~~ **Connection of service utilities.** No person shall ~~not~~ make connections from a utility, source of energy, fuel, power, water system or *sewer* system to any building, structure or system that is regulated by this code for which a permit is required until authorized by the code official.

~~**108.7.3 Connection after order to disconnect.** No person shall make connections from any energy, fuel, power supply or water distribution system or supply energy, fuel or water to any equipment regulated by this code that has been disconnected or ordered to be disconnected by the code official or the use of which has been ordered to be discontinued by the code official until the code official authorizes the reconnection and use of such equipment.~~

~~When any plumbing is maintained in violation of this code, and in violation of any notice issued pursuant to the provisions of this section, the code official shall institute any appropriate action to prevent, restrain, correct or abate the violation.~~

108.8.1 ~~**107.6**~~ **Temporary connection.** The code official shall have the authority to authorize the temporary connection of the building, structure or system to the utility source of energy, fuel, power, water system or *sewer* system ~~for the purpose of testing plumbing systems or for use under a temporary certificate of occupancy~~.

122.3 **108.7.2 Authority to disconnect service utilities.** The code official shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards ~~the technical codes~~ in case of an emergency, where necessary, to eliminate an immediate danger to life or property or when such utility connection has been made without the approval required by Section 122.1 or 122.2. The *code official* shall notify the serving utility and, ~~Where~~ wherever possible, the owner and occupant of the building, structure or service system ~~shall be notified~~ of the decision to disconnect ~~utility service~~ prior to taking such action. If not notified prior to disconnecting, the owner or occupant of the building, structure or service system~~s~~ shall be notified in writing, as soon as practical thereafter.

~~**108.7 Unsafe plumbing.** Any plumbing regulated by this code that is unsafe or that constitutes a fire or health hazard, insanitary condition, or is otherwise dangerous to human life is hereby declared unsafe. Any use of plumbing regulated by this code constituting a hazard to safety, health or public welfare by reason of inadequate maintenance, dilapidation, obsolescence, fire hazard, disaster, damage or abandonment is hereby declared an unsafe use. Any such unsafe equipment is hereby declared to be a public nuisance and shall be abated by repair, rehabilitation, demolition or removal.~~

~~**108.7.1 Authority to condemn equipment.** Whenever the code official determines that any plumbing, or portion thereof, regulated by this code has become hazardous to life, health or property or has become insanitary, the code official shall order in writing that such plumbing either be removed or restored to a safe or sanitary condition. A time~~

~~limit for compliance with such order shall be specified in the written notice. No person shall use or maintain defective plumbing after receiving such notice. When such plumbing is to be disconnected, written notice as prescribed in Section 108.2 shall be given. In cases of immediate danger to life or property, such disconnection shall be made immediately without such notice.~~

SECTION 123 ~~110~~
TEMPORARY STRUCTURES, EQUIPMENT, SYSTEMS AND USES

123.1 ~~110.1~~ General. The code official is authorized to issue a permit for temporary structures, equipment, systems and uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The code official is authorized to grant extensions for demonstrated cause.

123.2 ~~110.2~~ Conformance. Temporary structures, equipment, systems and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.

123.3 ~~110.4~~ Termination of approval. The code official is authorized to terminate such permit ~~for temporary equipment, systems or uses~~ and to order the temporary structures, equipment, system~~s~~ or use~~s~~ to be discontinued.

~~**110.3 Temporary utilities.** The code official is authorized to give permission to temporarily supply utilities before an installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in the code.~~

SECTION 124
MAINTENANCE

124.1 Maintenance of safeguards. Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or any other feature is required for compliance with the provisions of this code, or otherwise installed, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be continuously maintained in accordance with this code and applicable referenced standards.

124.1.1 ~~102.3~~ Specific maintenance. All plumbing systems, materials and appurtenances, both existing and new, and all parts thereof, shall be maintained in proper operating condition in accordance with the original design in a safe and sanitary condition. All devices or safeguards required by this code shall be maintained in compliance with the code edition under which they were installed. The owner or the owner's designated agent shall be responsible for maintenance of plumbing systems. To determine compliance with this provision, the code official shall have the authority to require any plumbing system to be reinspected.

124.2 Testing and operation. Equipment requiring periodic testing or operation to ensure maintenance shall be tested or operated as specified in this code.

124.2.1 Test and inspection records. Required test and inspection records shall be available to the *code official* at all times, or such records as designates shall be filed with the *code official*.

124.2.2 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

124.3 Supervision. Maintenance and testing shall be under the supervision of a responsible *person* who shall ensure that such maintenance and testing are conducted at specified intervals in accordance with this code.

124.4 Rendering equipment inoperable. Portable or fixed fire-extinguishing systems or devices and fire-warning systems shall not be rendered inoperative or inaccessible except as necessary during emergencies, maintenance, repairs, *alterations*, drills or prescribed testing.

SECTION 125
DEMOLITION

125.1 General. The *code official* shall order the owner of any premises upon which is located any structure that in the *code official's* judgment is deteriorated or dilapidated, or has become so out of *repair* as to be *dangerous*, unsafe, insanitary, or otherwise unfit for human habitation or occupancy, and such that it is unreasonable to *repair* the

structure, to demolish and remove such structure; or if such structure is capable of being made safe by *repairs*, to *repair* and make safe and sanitary, or to board up and hold for future repair, or to demolish and remove at the owner's option; or where there has been a cessation of normal construction of any structure for a period of more than two years, to board up and hold for recommencement of work, or to demolish and remove such structure. Boarding up the building for future repair or recommencement of work shall not extend beyond one year, unless *approved* by the *code official*.

125.2 Notices and orders. All notices and orders shall comply with Section 111.2.

125.3 Failure to comply. If the owner of a premises fails to comply with a demolition order within the time prescribed, the *code official* shall cause the structure to be demolished and removed, either through an available public agency or by contract or arrangement with private persons, and the cost of such demolition and removal shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate.

125.4 Salvage materials. When any structure has been ordered demolished and removed in accordance with Section 125.3, the governing body or other designated officer under said contract or arrangement aforesaid shall have the right to sell the salvage and valuable materials at the highest price obtainable. The net proceeds of such sale, after deducting the expenses of such demolition and removal, shall be promptly remitted with a report of such sale or transaction, including the items of expense and the amounts deducted, for the person who is entitled thereto, subject to any order of a court. If such a surplus does not remain to be turned over, the report shall so state.

125.5 Existing remedies. The provisions in this code shall not be construed to abolish or impair existing remedies of the jurisdiction or its officers or agencies relating to the removal or demolition of any structure which is dangerous, unsafe or insanitary.

2. Revise and add the following definitions to the IPC:

ADDITION. An extension or increase in floor area, number of stories, or height of a building or structure.

ALTERATION. Any construction or renovation to an existing structure other than repair or addition that requires a *permit*, or a change in a mechanical, plumbing, fuel gas or other system that involves an extension, addition or change to the arrangement, type or purpose of the original installation that requires a *permit*.

APPLIANCE. A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.

APPROVED. Acceptable ~~to the code official or other authority having jurisdiction.~~ Approval by the code official as the result of review, investigation or tests conducted by the code official or by reason of accepted principles or tests by national authorities, or technical or scientific organizations.

APPROVED AGENCY. An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been *approved* by the *code official*.

BUILDING. Any structure ~~occupied~~ used or intended for supporting or sheltering any use or *occupancy*.

BUILDING OFFICIAL. The officer or other designated authority charged with the administration and enforcement of the *International Building Code*, or a duly authorized representative.

CERTIFICATE OF COMPLETION. A certificate stating that the project or work for which a permit was issued has been completed in compliance with *approved construction documents* and the requirements of this code.

CONSTRUCTION DOCUMENTS. ~~All of~~ The written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of the project necessary for obtaining a ~~building~~ permit. ~~The construction drawings shall be drawn to an appropriate scale.~~

EQUIPMENT OR FIXTURE. Any plumbing, heating, electrical, ventilating, air conditioning, refrigerating, and fire protection equipment, apparatus and devices, all piping, ducts, vents, control devices and other systems or components thereof, and elevators, dumb waiters, escalators, boilers, pressure vessels and other mechanical facilities or installations that are related to building services, any of which are specifically regulated in this code. Appliances as defined by this code shall not be considered equipment. Equipment or fixtures shall not include manufacturing, production, or process equipment, but shall include connections from building service to process equipment.

FIRE CODE OFFICIAL. The fire chief or other designated authority charged with the administration and enforcement of the code, or a duly authorized representative.

IMMINENT DANGER. A condition which could cause serious or life-threatening injury or death at any time.

LABELED. Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-*labeled* items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

LISTED. Equipment, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or services that maintains periodic inspection of production of *listed* equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

LOT LINE. A line dividing one lot from another, or from a street or any public place.

PERMIT. An official document or certificate issued by the authority having jurisdiction which authorizes performance of a specified activity.

REGISTERED DESIGN PROFESSIONAL. An ~~individual~~ architect or engineer who is registered or licensed to practice their respective design profession ~~professional architecture or engineering~~ as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A *registered design professional* engaged by the owner to review and coordinate certain aspects of the project, as determined by the *building official*, for compatibility with the design of the building or structure, including submittal documents prepared by others, deferred submittal documents and phased submittal documents.

REPAIR. The reconstruction or renewal of any part of an existing building for the purpose of its maintenance.

STRUCTURE. That which is built or constructed ~~or a portion thereof~~ an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

TOWNHOUSE. A single-family *dwelling unit* constructed in a group of three or more attached units in which each unit extends from the foundation to roof and with open space on at least two sides.

PART VIII – IPMC

1. Revise IPMC (Item 1-I) as follows:

CHAPTER 1
SCOPE AND ADMINISTRATION

PART 1—SCOPE AND APPLICATION

SECTION 101
GENERAL

101.1 Title. These regulations shall be known as the ~~*International*~~ *Property Maintenance Code* of [NAME OF JURISDICTION], hereinafter referred to as "this code."

101.2 Scope. The provisions of this code shall apply to all existing residential and nonresidential structures, and all existing *premises* and constitute minimum requirements and standards for *premises*, structures, equipment, and facilities for light, *ventilation*, space, heating, sanitation, protection from the elements, life safety, safety from fire, and other hazards, and for safe and sanitary maintenance; the responsibility of *owners*, *operator*s, and *occupants*; the *occupancy* of existing structures and *premises*, and for administration, enforcement, and penalties.

101.3 Purpose ~~Intent~~. The purpose of this code ~~shall be construed to secure its expressed intent, which is to ensure~~ is to establish the minimum requirements to safeguard the public health, safety, and welfare insofar as they are affected by the continued *occupancy* and maintenance of structures and *premises*. Existing structures and *premises* that do not comply with these provisions shall be altered or repaired to provide a minimum level of health and safety as required herein.

101.4 Severability. If a section, subsection, sentence, clause, or phrase of this code is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code.

101.5 Validity. In the event any part or provision of this code is held to be illegal or void, this shall not have the effect of making illegal or void any of the other parts or provisions hereof, which are determined to be legal; and it shall be presumed that this code would have been adopted without such illegal or invalid parts or provisions.

102.6 ~~102.10~~ Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state, or federal law.

SECTION 102
APPLICABILITY

102.1 General. Where there is a conflict between a general requirement and a specific requirement of this code, the specific requirement shall be applicable ~~govern~~. ~~Where differences occur between provisions of this code and the referenced standards, the provisions of this code shall apply.~~ Where, in a specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

102.2 ~~102.9~~ Application of references. References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

102.3 ~~102.7~~ Referenced codes and standards. The codes and standards referenced in this code shall be ~~those that are listed in Chapter 8 and~~ considered part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between the provisions of this code and the referenced codes and standards, the provisions of this code shall apply.

> **Exception:** Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing shall govern ~~apply~~.

102.4 Appendices. Provisions in the appendices shall not apply unless specifically adopted.

102.5 Existing structures and systems. The legal occupancy or use of any structure or installed system existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the *International Building Code,* or the *International Fire Code*, or as is deemed necessary by the *code official* for the general safety and welfare of the occupants and the public.

102.5.1 ~~102.6~~ Historic buildings. The provisions of this code relating to the construction, alteration, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures ~~designated~~ identified and classified by the state or local jurisdiction as historic buildings when such buildings or structures are judged by the *code official* to be safe and in the public interest of health, safety and welfare regarding any proposed construction, alteration, repair, enlargement, restoration, relocation or moving of buildings.

102.6 ~~105.2~~ Alternative materials, design, methods, and equipment. The provisions of this code are not intended to prevent the installation of any material, or the use or operation of appliances, equipment, systems, or method, or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative ~~material or method of construction~~ shall be *approved* where the *code official* finds that the proposed alternative ~~design~~ is satisfactory and complies with the intent of the provisions of this code, and that the alternative ~~material, method, or work offered~~ is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

102.6.1 Matters regulated by the *International Building Code.* Approvals under the authority herein contained shall be subject to the approval of the *building official* whenever the alternative involves matters regulated by the *International Building Code*.

102.7 ~~102.8~~ Requirements not covered by code. Requirements necessary for the strength, stability, or proper operation of an existing or proposed fixture, structure, or equipment, or for the public safety, health and general welfare, not specifically covered by this code, shall be determined by the *code official*.

102.8 Subjects not regulated by this code. Where no applicable standards or requirements are set forth in this code, or are contained within other laws, codes, regulations, ordinances, or bylaws adopted by the jurisdiction, compliance with applicable nationally recognized standards, as *approved*, shall be deemed as prima facie evidence of compliance

with the intent of this code. Nothing herein shall derogate from the authority of the *code official* to determine compliance with codes or standards for those activities or installations within the *code official's* jurisdiction or responsibility.

102.9 Previous approvals. This code shall not require changes in the *construction documents*, construction or designated occupancy of a structure for which a lawful *permit* has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

102.10 Contractor's responsibilities. Every contractor who enters into contracts for which a permit is required shall comply with the state and local rules and regulations concerning licensing.

102.11 Specific application of this code. The following are application specific to this code.

102.11.1 ~~102.3 Application of~~ Other codes. Repairs, additions or alterations to a structure, or changes of *occupancy*, shall be done in accordance with the procedures and provisions of the *International Building Code, International Fuel Gas Code, International Mechanical Code* and NFPA 70. Nothing in this code shall be construed to cancel, modify or set aside any provision of the *International Zoning Code*.

102.11.2 ~~102.5~~ Workmanship. Repairs, maintenance work, alterations or installations which are caused directly or indirectly by the enforcement of this code shall be executed and installed in a *workmanlike* manner and installed in accordance with the manufacturer's installation instructions.

PART 2—ADMINISTRATION AND ENFORCEMENT

SECTION 103
DEPARTMENT OF PROPERTY MAINTENANCE INSPECTION

103.1 General. The Department of Property Maintenance Inspection, herein referred to as "the department," is hereby ~~created and the executive official in charge thereof shall be known as~~ established within the jurisdiction under the direction of the *code official*. The function of the department shall be the implementation, administration, and enforcement of the provisions of this code.

103.2 Appointment. The *code official* shall be appointed by the chief appointing authority of the jurisdiction.

103.3 Deputies. In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the *code official* shall have the authority to appoint a deputy *code official*, related technical officers, inspectors, and other employees ~~deputy(s)~~. Such employees shall have powers as delegated by the *code official*.

103.4 Liability. The *code official*, member of the Board of Appeals, officer, or employee charged with the enforcement of this code, while acting for the jurisdiction~~,~~ in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally, and is hereby relieved from all personal liability for any damage accruing to persons or property as a result of an act or by reason of an act or omission in the discharge of official duties.

103.5 Legal defense. Any suit instituted against any officer or employee of the department because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings. The *code official* or any subordinate shall not be liable for costs in an action, suit, or proceeding that is instituted in pursuance of the provisions of this code. Any officer or employee, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith.

SECTION 104
DUTIES AND POWERS OF THE CODE OFFICIAL

104.1 General. The *code official* is hereby authorized and directed to enforce the provisions of this code. The *code official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies, and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

104.2 Applications and permits. The *code official* shall receive applications, review *construction documents,* issue *permits* required by this code, inspect the premises for which such *permits* have been issued, and enforce compliance with the provisions of this code.

104.3 ~~104.5~~ Notices and orders. The *code official* shall issue all necessary notices or orders to ensure compliance with this code.

104.4 ~~104.2~~ Inspections. The *code official* shall make all of the required inspections, or shall accept reports of inspection by *approved* agencies or individuals. All reports of such inspections shall be in writing and be certified by a responsible officer of such *approved* agency or by the responsible individual. The *code official* is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

104.5 ~~104.4~~ Identification. The *code official* shall carry proper identification when inspecting *structure*s or *premises* in the performance of duties under this code.

104.6 ~~104.3~~ Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or ~~whenever~~ where the *code official* has reasonable cause to believe that there exists in a *structure* or upon a *premises* a condition which is contrary to or in violation of this code which makes the structure or premises unsafe, dangerous, or hazardous, the *code official* is authorized to enter the structure or *premises* at reasonable times to inspect or perform the duties imposed by this code, provided that if such *structure* or *premises* ~~is~~ be occupied, ~~the *code official* shall present~~ that credentials be presented to the *occupant* and ~~request~~ entry requested. If such structure or *premises* is unoccupied, the *code official* shall first make a reasonable effort to locate the *owner* or other person having charge or control of the *structure* or *premises* and request entry. If entry is refused, the *code official* shall have recourse to the remedies provided by law to secure entry.

104.6.1 Warrant. When the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner or occupant or person having charge, care or control of the structure or premises shall not fail or neglect, after proper request is made as herein provided, to promptly permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

104.7 ~~104.6~~ Department records. The *code official* shall keep official records of applications received, *permits* and certificates issued, fees collected, reports of inspections, and notices and orders issued ~~all business and activities of the department specified in the provisions of this code~~. Such records shall be retained in the official records for the period required for retention of public records.

104.8 Assistance of other agencies. The code official is authorized to request, and shall receive so far as is required in the discharge of the duties described in this code, the assistance and cooperation of other officials of the jurisdiction.

104.9 Specific duties. The following are specific duties of the code official. [JURISDICTION TO INSERT CODE OFFICIAL DUTIES SPECIFIC TO THIS CODE]

SECTION 105
PERMITS

105.1 Permit required. Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to construct, erect, install, enlarge, alter, repair, remove, convert, or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the *code official* and obtain the required *permit* for the project. Where laws or regulations are enforceable by other agencies or departments, approval shall be obtained from all agencies or departments concerned.

105.1.1 Annual permit. In lieu of an individual *permit* for each *alteration* to an already *approved* electrical, gas, mechanical or plumbing installation, the *code official* is authorized to issue an annual *permit* upon application therefor to any person, firm or corporation regularly employing one or more qualified tradespersons in the building, structure, or on the premises owned or operated by the applicant for the *permit*.

105.1.1.1 Annual permit records. The person to whom an annual *permit* is issued shall keep a detailed record of *alterations* made under such annual *permit*. The *code official* shall have access to such records at all times, or such records shall be filed with the *code official* as designated.

105.1.2 Emergency repairs. Where equipment replacements and repairs must be performed in an emergency situation, the *permit* application shall be submitted within the next working business day to the *code official*.

105.1.3 Permits specifically required. The following specifically require a permit. [JURISDICTION TO INSERT SPECIFIC ITEMS REQUIRING A PERMIT FOR THIS CODE]

105.2 Permit not required. Exemptions from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. *Permits* shall not be required in accordance with Sections 105.2.1 through 105.2.3.

105.2.1 Repairs. Application or notice to the *code official* is not required for ordinary repairs to structures, replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required *means of egress*, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include *addition* to, *alteration* of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

105.2.2 Public service agencies. A *permit* shall not be required for the installation, *alteration,* or repair of generation, transmission, distribution, or metering or other related equipment that is under the ownership and control of public service agencies by established right.

105.2.3 Specific exemption. The following are specifically exempt from requiring a permit. [JURISDICTION TO INSERT SPECIFIC ITEMS EXEMPT FROM PERMITS FOR THIS CODE]

105.3 Application for permit. To obtain a *permit*, the applicant shall first file an application therefor in writing on a form furnished by the department for that purpose. Such application shall:

1. Identify and describe the project to be covered by the *permit* for which application is made.
2. Describe the land on which the proposed project is to be done by legal description, street address or similar description that will readily identify and definitely locate the proposed building or project.
3. Indicate the use and occupancy for which the proposed project is intended.
4. Be accompanied by *construction documents* and other data as required in Section 106.
5. State the valuation of the proposed project.
6. Be signed by the applicant, or the applicant's authorized agent.
7. Give such other data and information as required by the *code official*.

105.3.1 Permit valuations. *Permit* valuations required under Section 105.3(5) shall include total value of the project, including materials and labor, and electrical, gas, mechanical, plumbing equipment and other permanent systems for which the *permit* is being issued. If, in the opinion of the *code official*, the valuation is underestimated on the application, the *permit* shall be denied, unless the applicant can show detailed estimates to meet the approval of the *code official*. Final building *permit* valuation shall be set by the *code official*.

105.4 Action on application. The *code official* shall examine or cause to be examined applications for *permits* and amendments thereto within a reasonable time after filing. If the application or the *construction documents* do not conform to the requirements of pertinent laws, the *code official* shall reject such application in writing, stating the reasons therefor. If the *code official* is satisfied that the proposed project conforms to the requirements of this code and laws and ordinances applicable thereto, the *code official* shall issue a *permit* therefor as soon as practicable.

105.4.1 Preliminary inspection. Before a permit is issued, the code official is authorized to inspect and evaluate the systems, *equipment*, buildings, devices, premises and spaces or areas to be used.

105.4.2 Conditional permits. The *code official* is authorized to issue a *permit* for the construction or operation of part of the project such as the construction of foundations or any other part of a building or structure, or installation of systems or materials, or operation before the *construction documents* for the entire project have been submitted or *approved*, provided that adequate information and detailed statements have been filed complying with pertinent requirements of this code. The holder of such *permit* shall proceed only to the point for which approval has been given, at the permit holder's own risk, and without assurance that a *permit* for the entire project will be granted.

105.5 Time limitation of application. An application for a *permit* for any proposed project shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a *permit* has been issued. The *code official* is authorized to grant one or more extensions of time for additional periods not exceeding 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

105.6 Validity of permit. The issuance or granting of a *permit* shall not be construed to be a *permit* for, or an approval of, any violation of any of the provisions of this code or of any other ordinance of the jurisdiction. *Permits* presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a *permit* based on *construction documents* and other data shall not prevent the *code official* from requiring the correction of errors in the *construction documents* and other data.

105.7 Extensions of permit. For an unexpired permit the *code official* is authorized to grant, in writing, one or more extensions of the time, for periods of not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

105.8 Expiration of permit. Every *permit* issued shall become invalid unless the work on the site authorized by such *permit* is commenced within 180 days after its issuance, or if the work authorized on the site by such *permit* is suspended or abandoned for a period of 180 days after the time the work is commenced.

105.8.1 Recommencement of work. Before such work covered under an expired permit recommences, a new permit shall be first obtained. The new permit shall be issued provided no changes have been made or will be made in the original construction documents for such work, and provided further that such suspension or abandonment has not exceeded one year.

105.9 Suspension or revocation of permit. The *code official* is authorized to suspend or revoke a *permit* issued under the provisions of this code whenever the *permit* is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or regulation or any of the provisions of this code.

105.10 Posting of permit. Issued permits or copy thereof shall be kept on the site of the project until the completion of the project.

SECTION 106
SUBMITTAL DOCUMENTS

106.1 General. Submittal documents consisting of construction documents and other supporting data shall be submitted in two or more sets with each application for a permit, and in such form and detail as required by the *code official*. The *code official* shall require construction documents and other data to be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official* is authorized to require necessary construction documents to be prepared by a registered design professional.

> **Exception:** The *code official* is authorized to waive the submission of *construction documents* and other data not required to be prepared by a *registered design professional* if the nature of the work applied for is such that review of *construction documents* is not necessary to obtain compliance with this code.

106.2 Construction documents. *Construction documents* shall be in accordance with Sections 106.2.1 through 106.2.4.

106.2.1 Information on construction documents. *Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the proposed project, and show in detail that the project will conform to the provisions of this code and relevant laws, ordinances, rules, and regulations, as determined by the *code official*. Plans shall be to scale and be on suitable material. Electronic media documents are permitted to be submitted when *approved* by the *code official*.

106.2.1.1 Specific information required. Where the quality of the materials is essential for conformity to this code, specific information shall be given to establish such quality. The terms “this code” or “legal” or “its equivalent” shall not be cited or used as a substitute for specific information.

106.2.2 Site plan. The *construction documents* submitted with the application for *permit* shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from *lot lines*, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and *design flood* elevations. The site plan shall be drawn in accordance with an accurate boundary line survey.

106.2.2.1 Site plan for demolition. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot.

106.2.2.2. Waiver of site plan. The *code official* is authorized to waive or modify the requirement for a site plan when the application for *permit* is for *alteration* or repair or when otherwise warranted.

106.2.3 Specific Information. The following are specific requirements for submittal documents required by this code. [JURISDICTION TO INSERT SPECIFIC REQUIREMENTS TO THIS CODE]

106.2.4 Design professional in responsible charge. When it is required that documents be prepared by a *registered design professional*, the *code official* shall be authorized to require the owner to engage and designate on the building *permit* application a *registered design professional* who shall act as the *registered design professional in responsible charge*. If the circumstances require, the owner shall designate a substitute *registered design professional in responsible charge* who shall perform the duties required of the original *registered design professional in responsible charge*. The *code official* shall be notified in writing by the owner if the *registered design professional in responsible charge* is changed or is unable to continue to perform the duties.

106.2.4.1 Responsibility. The *registered design professional in responsible charge* shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

106.2.4.2 Observation. Where structural observation is required, the inspection program shall name the individual or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur.

106.3 Deferred submittals. For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the *code official* within a specified period.

106.3.1 Prior approval. Deferral of any submittal items shall have the prior approval of the *code official*. The *registered design professional in responsible charge* shall list the deferred submittals on the *construction documents* for review by the *code official*.

106.3.2 Review. Documents for deferred submittal items shall be submitted to the *registered design professional in responsible charge* who shall review them and forward them to the *code official* with a notation indicating that the deferred submittal documents have been reviewed and been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the deferred submittal documents have been *approved* by the *code official*.

106.4 Examination of documents. The *code official* shall examine or cause to be examined the submittal documents and shall ascertain by such examinations whether the project indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

106.5 Approval of construction documents. When the *code official* issues a *permit*, the *construction documents* and other data shall be endorsed, in writing or by stamp, as "APPROVED." One set of *construction documents* and other data so reviewed shall be retained by the *code official*. The other set(s) shall be returned to the applicant. One set shall be kept at the site of the project and shall be open to inspection by the *code official* or a duly authorized representative. Such *approved construction documents* shall not be changed, modified, or altered without authorization from the *code official*. All work shall be done in accordance with the *approved construction documents*.

106.6 Amended construction documents. Any changes made during construction that are not in compliance with the *approved construction documents* shall be resubmitted for approval as an amended set of *construction documents*.

106.7 Retention of construction documents. One set of *approved construction documents* shall be retained by the *code official* for a period of not less than 180 days from date of completion of the permitted project, or for the period required for retention of public records.

SECTION 107 ~~105~~
MODIFICATIONS, TESTING, AND APPROVAL

107.1 ~~105.1~~ Modifications. Whenever there are practical difficulties involved in carrying out the provisions of this code, and upon application of the owner or owner's representative, the *code official* shall have the authority to grant modifications for individual cases ~~upon application of the *owner* or *owner*'s representative~~, provided the *code official*

shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, life and fire safety, accessibility, or structural requirements. The details of action granting modifications shall be recorded and entered in the ~~department~~ files of the department.

107.2 ~~105.5~~ Approved materials and equipment. All materials, equipment, and devices *approved* by the *code official* shall be constructed and installed in accordance with such approval.

107.3 ~~105.4~~ Used material, appliances and equipment. The use of used materials ~~which~~ that meet the requirements of this code for new materials is permitted. ~~Materials,~~ Used appliances, equipment and devices shall not be reused unless such elements are in good repair or have been reconditioned and tested when necessary, placed in good and proper working condition, and *approved* by the *code official*.

107.4 Listed and labeled material and appliances. Listed and labeled materials, equipment, and appliances shall be used and installed in accordance with the conditions the listing and the manufacturer's instructions.

107.5 ~~105.6~~ Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

107.6 ~~105.3~~ ~~Required testing~~ Technical assistance. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, or to determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building or premises, the *code official* shall have the authority to require tests be conducted, or a technical opinion, recommendation or report be submitted to be made as evidence of compliance. The tests, opinions, recommendations and reports shall be made at no expense to the jurisdiction.

107.6.1 Preparation. The technical reports and opinions shall be prepared by a qualified engineer, approved specialist or specialty organization, or an *approved agency*.

107.6.2 ~~105.3.1~~ Test methods. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the *code official* shall ~~be permitted to~~ approve ~~appropriate~~ the testing procedures.

107.6.3 Testing agency. All tests shall be performed by an *approved agency*.

107.6.4 ~~105.3.2~~ ~~Test~~ Retention of reports. ~~Reports of tests~~ The technical opinions, recommendation, reports and test results shall be retained by the *code official* for the period required for retention of public records.

SECTION 108
INSPECTIONS

108.1 General. Construction or work on a project for which a *permit* is required shall be subject to inspection by the *code official* and such construction or work shall remain accessible and exposed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the *permit* applicant to cause the construction or work to remain accessible and exposed for inspection purposes. Neither the *code official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

108.1.1 Replacement of existing appliance. The requirements of this section shall not be considered to prohibit the operation of any heating or cooling *equipment* or appliances installed to replace such existing *equipment* or appliances serving an occupied portion of a structure provided that a request for inspection of such *equipment* or appliances has been filed with the department not more than 48 hours after such replacement work is completed, and before any portion of such *equipment* or appliances is concealed by any permanent portion of the structure.

108.2 Required inspections and testing. The *code official*, upon notification, shall make the inspections and require the tests set forth in Sections 108.2.1 through 108.2.4.

108.2.1 Specific Inspections. The following are specific inspections and tests required by this code. [JURISDICTION TO INSERT SPECIFIC REQUIRED INSPECTIONS]
(See Reason statement of this Proposal for current specific required inspections)

108.2.2 Other inspections. In addition to the inspections specified above, the *code official* is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department.

108.2.3 Special inspections. Special inspection shall be as required by this code, the *International Building Code*, or the *International Fire Code* as applicable.

108.2.4 Final inspection. A final inspection shall be made after all work on the project required by the *permit* is completed.

108.3 Inspection agencies. The *code official* is authorized to accept reports of *approved* inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.

108.4 Inspection requests. It shall be the duty of the holder of the *permit* or their duly authorized agent to notify the *code official* when a project is ready for inspection. It shall be the duty of the *permit* holder to provide access to and means for inspections of such work that are required by this code.

108.4.1 Manufacturer's instructions. Manufacturer's instructions for equipment, appliances, and materials installed under the permit shall be available on the work site at the time of inspection.

108.5 Approval required. Work on a project shall not proceed beyond the point indicated in each successive inspection without first obtaining the approval of the *code official*. The *code official*, upon notification, shall make the requested inspections and shall either determine the portion of the project that is satisfactory as completed, or shall notify the *permit* holder or authorized agent wherein the same fails to comply with this code. Any portions of the project that do not comply shall be corrected and such portion shall not be covered, concealed, or used until authorized by the *code official*.

108.6 Notice of approval. After all prescribed inspections or tests indicate the project complies with this code, a certificate of completion complying with Section 109 shall be issued by the code official.

SECTION 109
CERTIFICATE OF COMPLETION AND OCCUPANCY

109.1 Use and occupancy. No building, structure, or premises or portion thereof shall be used or occupied until the code official has issued a certificate of occupancy as provided herein. No equipment, appliance or system used, and no change in the existing occupancy classification of a building, structure, premise or portion thereof shall be made until the code official has issued a certificate of completion as provided herein.

Exceptions:

1. Occupancy shall be permitted during emergency situations as described under Section 105.1.
2. Certificates of completion or occupancy are not required for work exempt from permits under Section 105.2.
3. Occupancy shall be permitted during the replacement of existing appliances as described under Section 108.1.1.
4. Certificates of occupancy are not required for one-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m^2).

109.1.1 Validity. Issuance of a certificate of completion or occupancy shall not be construed as an approval of a violation of the provisions of this code or of other pertinent laws and ordinances of the jurisdiction. Certificates presuming to give authority to violate or cancel the provisions of this code or other laws or ordinances of the jurisdiction shall not be valid.

109.2 Certificate issued. After the *code official* inspects a project requiring a permit and finds no violations of the provisions of this code or other laws that are enforced by the department, the *code official* shall issue a certificate of completion. After all certificates of completion have been issued by other departments or agencies concerned, the code official shall issue a certificate of occupancy where applicable. A certificate of completion or occupancy shall contain the following:

1. The *permit* number.
2. The address of the premises or structure.
3. The name and address of the owner.
4. A description of the project for which the certificate is issued.
5. A statement that the described project has been inspected for compliance with the requirements of this code.
6. The name of the *code official*.
7. The edition of the code under which the *permit* was issued.
8. The use and occupancy in accordance Chapter 3 of the International Building Code.
9. The type of construction as defined in Chapter 6 of the International Building Code.
10. The design *occupant load*.
11. If fire protection systems are provided, whether the fire protection systems are required.
12. Any special stipulations and conditions of the *permit*.

Exceptions:

1. A certificate of completion or occupancy shall not be required to indicate the items under Section 109.2, Items 8, 9, and 10 for detached one- and two family dwellings and multiple single-family *dwellings* (*townhouses)* constructed using the *International Residential Code*.
2. The *code official* is shall not be required to indicate on a certificate items under Section 109.2, Items 8, 9, and 10 for the installation of equipment, appliances or systems.

109.3 Temporary occupancy. The code official is authorized to issue a temporary certificate of occupancy before the completion of the entire work covered by the permit, provided that such portion or portions shall be occupied safely and without endangerment to life or public welfare. The temporary certificate shall indicate any limitations or restrictions necessary to keep the permit area safe, and items required to obtain the final certificate of occupancy. The code official shall set a time period during which the temporary certificate of occupancy is valid.

109.4 Revocation. The code official is authorized to, in writing, suspend or revoke a certificate of completion or occupancy issued under the provisions of this code wherever the certificate is issued in error on the basis of incorrect information supplied, or where it is determined that the building, structure, premise, or portion thereof, or installation of appliance, equipment or system is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION 110 ~~112~~
STOP WORK ORDER

110.1 ~~112.1~~ Authority. Whenever the *code official* finds any work regulated by this code being performed in a manner contrary to the provisions of this code or ~~in a~~ dangerous or unsafe ~~manner~~, the *code official* is authorized to issue a stop work order.

110.2 ~~112.2~~ Issuance. A stop work order shall be in writing and shall be given to the *owner* of the property involved, or to the *owner's* agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order and the conditions under which the cited work is authorized to resume.

110.2.1 ~~112.3~~ Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

110.3 ~~112.4 Failure to comply~~ Unlawful continuance. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fees, fines, or penalties as prescribed by this code or other laws or ordinances of the jurisdiction ~~liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars~~.

SECTION 111 ~~106~~
VIOLATIONS

111.1 Code violations. No person, association, organization, or business entity of any form shall:

1. Erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or premises in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or

2. Install or operate any equipment, appliances, or systems regulated by this code that is in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
3. Be non-compliant with the conditions of any permit or certificate issued under the auspices of this code; or
4. Tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*.

111.2 Notice of violation. A *code official* who observes or becomes aware of any code violation shall serve upon the responsible person, association, organization, or business entity a written notice in accordance with Section 111.2.1. In the absence of direct knowledge as to the identity or location of the responsible party, the *code official* shall serve the notice upon the property owner. Service may be effected by personal delivery, first class mail, substituted service, or such other means that may be authorized by state and/or local law.

111.2.1 ~~107.2~~ Form of notice. Such notice of violation shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the ~~*dwelling unit* or structure~~ violation into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties ~~right to file a lien~~ in accordance with Section 111.3 ~~106.3~~.

111.3 Penalties. Violators who fail to comply with a notice to discontinue or abate a condition in violation of this code, and violators who tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*, shall be subject to the penalties set forth in this code as may be adopted and authorized by state and/or local law.

~~**106.1 Unlawful acts.** It shall be unlawful for a person, firm or corporation to be in conflict with or in violation of any of the provisions of this code.~~

~~**106.2 Notice of violation.** The *code official* shall serve a notice of violation or order in accordance with Section 107.~~

~~**106.3 Prosecution of violation.** Any person failing to comply with a notice of violation or order served in accordance with Section 107 shall be deemed guilty of a misdemeanor or civil infraction as determined by the local municipality, and the violation shall be deemed a *strict liability offense*. If the notice of violation is not complied with, the *code official* shall institute the appropriate proceeding at law or in equity to restrain, correct or abate such violation, or to require the removal or termination of the unlawful *occupancy* of the structure in violation of the provisions of this code or of the order or direction made pursuant thereto. Any action taken by the authority having jurisdiction on such *premises* shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate.~~

~~**106.4 Violation penalties.** Any person who shall violate a provision of this code, or fail to comply therewith, or with any of the requirements thereof, shall be prosecuted within the limits provided by state or local laws. Each day that a violation continues after due notice has been served shall be deemed a separate offense.~~

~~**106.5 Abatement of violation.** The imposition of the penalties herein prescribed shall not preclude the legal officer of the jurisdiction from instituting appropriate action to restrain, correct or abate a violation, or to prevent illegal *occupancy* of a building, structure or *premises*, or to stop an illegal act, conduct, business or utilization of the building, structure or *premises*.~~

~~**SECTION 107**~~
~~**NOTICES AND ORDERS**~~

~~**107.1 Notice to person responsible.** Whenever the *code official* determines that there has been a violation of this code or has grounds to believe that a violation has occurred, notice shall be given in the manner prescribed in Sections 107.2 and 107.3 to the person responsible for the violation as specified in this code. Notices for condemnation procedures shall also comply with Section 108.3.~~

~~**107.3 Method of service.** Such notice shall be deemed to be properly served if a copy thereof is:~~

~~1. Delivered personally;~~
~~2. Sent by certified or first-class mail addressed to the last known address; or~~

~~3. If the notice is returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice.~~

~~**107.4 Unauthorized tampering.** Signs, tags or seals posted or affixed by the *code official* shall not be mutilated, destroyed or tampered with, or removed without authorization from the *code official*.~~

~~**107.5 Penalties.** Penalties for noncompliance with orders and notices shall be as set forth in Section 106.4.~~

~~**107.6 Transfer of ownership.** It shall be unlawful for the *owner* of any *dwelling unit* or structure who has received a compliance order or upon whom a notice of violation has been served to sell, transfer, mortgage, lease or otherwise dispose of such *dwelling unit* or structure to another until the provisions of the compliance order or notice of violation have been complied with, or until such *owner* shall first furnish the grantee, transferee, mortgagee or lessee a true copy of any compliance order or notice of violation issued by the *code official* and shall furnish to the *code official* a signed and notarized statement from the grantee, transferee, mortgagee or lessee, acknowledging the receipt of such compliance order or notice of violation and fully accepting the responsibility without condition for making the corrections or repairs required by such compliance order or notice of violation.~~

SECTION 112 ~~111~~
MEANS OF APPEAL

112.1 ~~111.1~~ Application for appeal. Any person directly affected by a decision of the *code official* or a notice or order issued under this code shall have the right to appeal to the board of appeals, provided that a written application for appeal is filed within 20 days after the day the decision, notice or order was served. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or the requirements of this code are adequately satisfied by other means.

112.1.1 ~~111.8~~ Stays of enforcement. The filing of an appeal~~s~~ of notice or orders, except for notice or order concerning ~~(other than *Imminent Danger* notices)~~, shall stay the enforcement of the notice or order until the appeal is heard by the board of appeals.

112.2 ~~111.2~~ Membership of board. The board of appeals shall consist of five members ~~a minimum of three members~~ who are qualified by experience and training to pass on matters pertaining to the provisions of this code ~~property maintenance and who are not employees of the jurisdiction. The *code official* shall be an ex-officio member but shall have no vote on any matter before the board~~. The board shall be appointed by the chief appointing authority, and shall serve staggered and overlapping terms.

112.2.1 ~~111.2.1~~ Alternate members. The chief appointing authority shall appoint two or more alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership and shall be appointed for five years, or until a successor has been appointed.

112.2.2. An employee of the jurisdiction shall not be a member of the board of appeals. The *code official* shall be an ex officio member of the board but shall have no vote on any matter before the board.

112.2.3 ~~111.2.2~~ Chairman. The board shall annually select one of its members to serve as chairman.

112.2.4 ~~111.2.4~~ Secretary. The chief administrative officer shall designate a qualified person to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

112.2.5 Qualifications. The board of appeals shall consist of five individuals, one from each of the following professions or disciplines.

1. Registered design professional who is a registered architect; or a builder or superintendent of building construction with at least 10 years' experience, five of which shall have been in responsible charge of work.
2. Registered design professional with structural engineering or architectural experience.
3. Registered design professional with fuel gas and plumbing engineering experience; or a fuel gas contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
4. Registered design professional with electrical engineering experience; or an electrical contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.

5. Registered design professional with fire protection engineering experience; or a fire protection contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.

112.2.6 ~~111.2.3~~ Disqualification of member. A member shall not hear an appeal in which that member has a personal, professional or financial interest.

112.2.7 Terms. The initial members of the board of appeals shall serve as follows: one for five years; one for four years; one for three years; one for two years and one for one year. Thereafter, each new member shall serve for five years or until a successor has been appointed.

112.2.8 ~~111.2.5~~ Compensation of members. Compensation of members shall be determined by law.

112.3 Hearings and meetings. Hearings on appeals and other meetings of the board of appeals shall be held in conformance with Sections 109.3.1 through 109.3.3.

112.3.1 ~~111.4.1~~ Procedure. The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

112.3.2 ~~111.3~~ Notice ~~of meeting~~. The board shall a hearing ~~meet~~ upon notice from the chairman, within 10 ~~20~~ days of the filing of an appeal, or at stated periodic meetings.

112.3.3 ~~111.4~~ Open hearing. All hearings before the board shall be open to the public. A quorum shall consist of not less than two-thirds of the board membership. The appellant, the appellant's representative, the *code official* and any person whose interests are affected shall be given an opportunity to be heard. ~~A quorum shall consist of not less than two-thirds of the board membership.~~

112.3.4 ~~111.5~~ Postponed hearing. When the full board is not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

112.4 ~~111.6~~ Board decision. The board shall modify or reverse the decision of the *code official* ~~only~~ by a concurring vote of a majority of the total number of appointed board members.

112.4.1 ~~111.6.1 Records and copies~~ Resolution. The decision of the board shall be by resolution ~~recorded~~. Certified copies shall be furnished to the appellant and to the code official.

112.4.2 ~~111.6.2 Administration~~ Action by code official. The *code official* shall take immediate action in accordance with the decision of the board.

112.5 ~~111.7~~ Court review. Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

SECTION 113
FEES

113.1 Payment of fees. A permit or an amendment to a permit shall not be issued until the fees prescribed in Section 113.2 have been paid.

113.2 Fee schedule. The fees for permits and other considerations shall be in accordance with the following schedule: [JURISDICTION TO INSERT APPROPRIATE FEE SCHEDULE]

113.3 Related fees. The payment of the fee for work done in connection to or concurrently with the work authorized by a *permit* shall not relieve the applicant or holder of the *permit* from the payment of other fees that are prescribed by law.

113.4 Work commencing before permit issuance. Any person who commences any work on a project requiring a *permit* before obtaining the necessary permits shall be subject to a fee established by the *code official* that shall be in addition to the required *permit* fees.

113.5 Permit extension. The fee for an extension of a permit in conformance with Section 105.7 shall be one-half the amount required for a new permit for such work.

113.6 Expiration of permit. For permits that have expired, and before such work recommences in conformance with Section 105.8.1, the fee to recommence work shall be one-half the amount required for a new permit for such work.

113.7 Stop work order. Any person who shall continue any work on a project requiring a permit after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.

113.8 Reinspection fee. A reinspection of work not in compliance with this code shall be subject to a fee established by the *code official* that shall be in addition to the required *permit* fees. The fee may be assessed when the *approved* plans are not readily available to the inspector, for failure to provide access on the date for which inspection is requested, for work deviating from the approved, or the work or test is not in compliance with this code.

113.9 Fee refunds. The code official shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment. The code official shall authorize the refunding of fees as follows:

1. The full amount of any fee paid hereunder which was erroneously paid or collected.
2. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.
3. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid when no work on a project has been performed under a permit issued in accordance with this code.

~~**103.5 Fees.** The fees for activities and services performed by the department in carrying out its responsibilities under this code shall be as indicated in the following schedule. *[JURISDICTION TO INSERT APPROPRIATE SCHEDULE.]*~~

(SECTIONS 114 THROUGH 119 RESERVED)

PART 3 – GENERAL REQUIREMENTS

SECTION 120 ~~108~~
UNSAFE STRUCTURES, ~~AND~~ EQUIPMENT, AND CONDITIONS

120.1 ~~108.1~~ General. ~~When a~~ If any building, structure, ~~or~~ premises or part thereof, or appliance, equipment, or system is found to be unsafe by the *code official* ~~to be unsafe~~, or ~~when a structure is~~ found in the case of a building or structure to be unfit for human *occupancy*, the condition shall be abated whenever possible, but if abatement is not achieved or is non-achievable, then condemnation shall be undertaken in accordance with the ~~or is found unlawful, such structure shall be *condemned* pursuant to~~ the provisions of this code.

120.1.1 Notice to building official. Abatement requiring repairs, *alterations*, remodeling, removing or demolition shall be referred to the *building official*.

120.1.2 ~~108.1.1~~ Unsafe structures. An unsafe structure is ~~one~~ a structure that is ~~found to be~~ dangerous to the life, health~~, property~~ or safety of the public or the *occupants* when:

1. There are no ~~of the structure by not providing~~ minimum safeguards provided to protect or warn *occupants* in the event of fire, or
2. ~~Because~~ such structure contains unsafe equipment or is so damaged, decayed, dilapidated, is structurally unsound, ~~unsafe or~~ is of such faulty construction, or has such an unstable foundation, that partial or complete collapse is possible.

120.1.3 ~~108.1.2~~ Unsafe equipment. Unsafe equipment includes any boiler, heating equipment, elevator, moving stairway, electrical wiring or device, flammable liquid containers or other equipment on the *premises* or within the structure which is in such disrepair or condition that such equipment ~~is~~ constitutes a hazard to life, health, property or safety of the public or the *occupants* of the *premises* or structure.

120.1.4 ~~108.1.3~~ Structure unfit for human occupancy. A structure is unfit for human *occupancy* whenever the *code official* finds that such structure is unsafe, is unlawful or, because of the degree ~~to which the structure is in~~ of disrepair or l~~acks~~ its want of maintenance, is insanitary, vermin or rat infested, ~~contains filth~~ filthy and contaminated ~~contamination~~, ~~or lacks~~ lacking *ventilation*, illumination, sanitary or heating facilities or other essential equipment required by this code, or because the ~~location of the~~ structure is in proximity to an unsafe or dangerous condition that constitutes a hazard to the *occupants* of the structure or to the public.

120.1.5 ~~108.1.4~~ Unlawful structure. An unlawful structure is one found in whole or in part to be occupied by more persons than permitted under this code, or was erected, altered or occupied contrary to this code ~~law~~.

120.1.6 ~~108.1.5~~ ~~Dangerous~~ *~~S~~tructure* ~~or *premises*~~ and premise that are dangerous to the life, health or safety of the public or occupants. For the purpose of this code, any structure or *premises* that has any or all of the following conditions or defects ~~described below~~ shall be considered dangerous, and shall constitute an unsafe structure:

1. Any door, aisle, passageway, stairway, exit or other means of egress that does not conform to the *approved* building or fire code of the jurisdiction as related to the requirements for existing buildings.
2. The walking surface of any aisle, passageway, stairway, exit or other means of egress is so warped, worn loose, torn or otherwise unsafe as to not provide safe and adequate means of egress.
3. Any portion of a building, structure or appurtenance that has been damaged by fire, earthquake, wind, flood, *deterioration*, *neglect*, abandonment, vandalism or by any other cause to such an extent that it is likely to partially or completely collapse, or to become *detached* or dislodged.
4. Any portion of a building, or any member, appurtenance or ornamentation on the exterior thereof that is not of sufficient strength or stability, or is not so *anchored*, attached or fastened in place so as to be capable of resisting natural or artificial loads of one and one-half the original designed value.
5. The building or structure, or part of the building or structure, because of dilapidation, *deterioration*, decay, faulty construction, the removal or movement of some portion of the ground necessary for the support, or for any other reason, is likely to partially or completely collapse, or some portion of the foundation or underpinning of the building or structure is likely to fail or give way.
6. The building or structure, or any portion thereof, is clearly unsafe for its use and *occupancy*.
7. The building or structure is *neglected*, damaged, dilapidated, unsecured or abandoned so as to become an attractive nuisance to children who might play in the building or structure to their danger, becomes a harbor for vagrants, criminals or immoral persons, or enables persons to resort to the building or structure for committing a nuisance or an unlawful act.
8. Any building or structure has been constructed, exists or is maintained in violation of any specific requirement or prohibition applicable to such building or structure provided by the *approved* building or fire code of the jurisdiction, or of any law or ordinance to such an extent as to present either a substantial risk of fire, building collapse or any other threat to life and safety.
9. A building or structure, used or intended to be used for dwelling purposes, because of inadequate maintenance, dilapidation, decay, damage, faulty construction or arrangement, inadequate light, *ventilation*, mechanical or plumbing system, or otherwise, is determined by the *code official* to be unsanitary, unfit for human habitation or in such a condition that is likely to cause sickness or disease.
10. Any building or structure, because of a lack of sufficient or proper fire-resistance-rated construction, fire protection systems, electrical system, fuel connections, mechanical system, plumbing system or other cause, is determined by the *code official* to be a threat to life or health.
11. Any portion of a building remains on a site after the demolition or destruction of the building or structure or whenever any building or structure is abandoned so as to constitute such building or portion thereof as an attractive nuisance or hazard to the public.

120.2 ~~108.2~~ Closing of vacant structures. If the structure is vacant and unfit for human habitation and *occupancy*, and is not in danger of structural collapse, the *code official* is authorized to post a placard of condemnation on the *premises* and order the structure closed up so as not to be an attractive nuisance. Upon failure of the *owner* to close up the *premises* within the time specified in the order, the *code official* shall cause the *premises* to be closed and secured through any available public agency or by contract or arrangement by private persons, and the cost thereof shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate and may be collected by any ~~other~~ legal means ~~resource~~.

120.3 Evacuation. The *code official* or the fire department official in charge of an emergency incident shall be authorized to order the immediate evacuation of any occupied building, structure or premises deemed unsafe due to hazardous conditions that present an imminent danger to occupants. *Persons* so notified shall immediately leave the structure or premises and shall not enter or re-enter until authorized to do so by the *code official* or the fire department official in charge of the incident.

120.4 ~~108.3~~ Notice. Whenever the *code official* has *condemned* a structure or equipment under the provisions of this section, notice shall be posted in a conspicuous place in or about the structure affected by such notice and served on the *owner* or the person or persons responsible for the structure or equipment in accordance with Section 120.4.2 ~~107.3~~. If the notice pertains to equipment, it shall also be placed on the *condemned* equipment. The notice shall be in the form prescribed in Section 120.4.1 ~~107.2~~.

120.4.1 Form of notice. Such notice of shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the unsafe condition into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties set forth in this code or as may be adopted and authorized by state and/or local law.

120.4.2 Service of notice. Such notice shall be deemed properly served if a copy thereof is (a) delivered to the owner personally; (b) sent by certified or registered mail addressed to the owner at the last known address with the return receipt requested; or (c) delivered in any other manner as prescribed by local law. If the certified or registered letter is returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice. Service of such notice in the foregoing manner upon the owner's agent or upon the person responsible for the structure shall constitute service of notice upon the owner.

120.5 ~~108.4~~ Placarding. Upon failure of the *owner* or person responsible to comply with the notice provisions within the time given, the *code official* shall post on the *premises* or on defective equipment a placard bearing the word "UNSAFE" or "Condemned" as applicable, and a statement of the penalties provided for occupying the *premises*, operating the equipment or removing the placard.

120.5.1 ~~108.4.1~~ Placard removal. The *code official* shall remove the ~~condemnation~~ placard whenever the unsafe conditions ~~defect or defects upon which the condemnation and placarding action were based~~ have been eliminated. Any person who defaces or removes a condemnation placard without the approval of the *code official* shall be subject to the penalties provided for by the jurisdiction ~~this code~~.

120.6 ~~108.5~~ Prohibited occupancy. Any ~~occupied~~ structure *condemned* and placarded by the *code official* shall be vacated as ordered by the *code official*. It shall be unlawful for any person to occupy or to allow others to occupy a placarded *premises,* or to operate or allow others to operate any placarded equipment. ~~Any person who shall occupy a placarded *premises* or shall operate placarded equipment, and any *owner* or any person responsible for the *premises* who shall let anyone occupy a placarded *premises* or operate placarded equipment shall be liable for the penalties provided by this code.~~

120.7 ~~108.6~~ Abatement ~~methods~~. The *owner*, *operator* or *occupant* of a building, structure, *premises,* or equipment deemed unsafe by the *code official* shall abate or correct ~~cause to be abated or corrected~~ such unsafe conditions either by repair, rehabilitation, demolition or other *approved* corrective action.

120.7.1 Summary abatement. Where conditions exist that are deemed an *imminent danger* as described in Section 121.1 that will necessarily result in injury to occupants or the public, the *code official* or fire department official in charge of the incident is authorized to summarily abate such unsafe or hazardous conditions.

120.8 ~~108.7~~ Record. The *code official* shall cause a report to be filed on an unsafe condition. The report shall state the *occupancy* of the structure and the nature of the unsafe condition. The record of an unsafe condition as outlined herein shall be retained by the *code official* for the period required for retention of public records.

SECTION 121 ~~109~~
EMERGENCY MEASURES

121.1 ~~109.1~~ Imminent danger. When, in the opinion of the *code official*, there is *imminent danger* of failure or collapse of a building or structure ~~which~~ that endangers life, or when any ~~structure~~ building or part of a ~~structure~~ building has fallen and life is endangered by the occupation of the ~~structure~~ building, or when there is actual or potential danger to the building *occupants* or those in the proximity of any structure because of explosives, explosive fumes or vapors or the presence of toxic fumes, gases or materials, or operation of defective or dangerous equipment, the *code official* is

hereby authorized and empowered to order and require the *occupants* to vacate the *premises* forthwith. The *code official* shall cause to be posted at each entrance to such structure a notice reading as follows: "This *Structure* Is Unsafe and Its *Occupancy* Has Been Prohibited by the *Code Official*." It shall be unlawful for any person to enter such structure except for the purpose of securing the structure, making the required repairs, removing the hazardous condition or of demolishing the same.

121.2 ~~109.2~~ Temporary safeguards. Notwithstanding other provisions of this code, whenever, in the opinion of the *code official*, there is *imminent danger* due to an unsafe condition, the *code official* shall order the necessary work to be done, including the boarding up of openings, to render such structure temporarily safe whether or not the legal procedure herein described has been instituted; and shall cause such other action to be taken as the *code official* deems necessary to meet such emergency.

121.3 ~~109.3~~ Closing streets. When necessary for public safety, the *code official* shall temporarily close structures and close, or order the authority having jurisdiction to close, sidewalks, streets, *public ways* and places adjacent to unsafe structures, and prohibit the same from being utilized.

121.4 ~~109.4~~ Emergency repairs. For the purposes of this section, the *code official* shall employ the necessary labor and materials to perform the required work as expeditiously as possible.

121.5 ~~109.5~~ Costs of emergency repairs. Costs incurred in the performance of emergency work shall be paid by the jurisdiction. The legal counsel of the jurisdiction shall institute appropriate action against the *owner* of the *premises* where the unsafe structure is or was located for the recovery of such costs.

121.6 ~~109.6~~ Hearing. Any person ordered to take emergency measures shall comply with such order forthwith. Any affected person shall thereafter, upon petition directed to the appeals board, be afforded a hearing as described in this code.

SECTION 122
SERVICE UTILITIES

122.1 Connection of service utilities. No person shall make connections from a utility, source of energy, fuel, power, water system or *sewer* system to any building, structure or system that is regulated by this code for which a permit is required, until approved by the *code official*.

122.2 Temporary connection. The *code official* shall have the authority to authorize the temporary connection of the building, structure or system to the utility source of energy, fuel, or power.

122.3 ~~108.2.1~~ Authority to disconnect service utilities. The *code official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards ~~set forth in Section 102.7~~ in case of emergency where necessary to eliminate an immediate hazard to life or property or when such utility connection has been made without the approval required by Section 122.1 or 122.2. The *code official* shall notify the serving utility and, whenever possible, the *owner* and *occupant* of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnection the *owner* or *occupant* of the building structure or service system shall be notified in writing as soon as practical thereafter.

SECTION 123
TEMPORARY STRUCTURES, EQUIPMENT, SYSTEMS AND USES

123.1 General. The code official is authorized to issue a permit for temporary structures, equipment, systems and uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The code official is authorized to grant extensions for demonstrated cause.

123.2 Conformance. Temporary structures, equipment, systems and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.

123.3 Termination of approval. The code official is authorized to terminate such permit and to order the temporary structure, equipment, system or use to be discontinued.

SECTION 124
MAINTENANCE

124.1 Maintenance of safeguards. Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or any other feature is required for compliance with the provisions of this code, or otherwise installed, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be continuously maintained in accordance with this code and applicable referenced standards.

124.1.1 ~~102.2~~ Specific maintenance. Equipment, systems, devices and safeguards required by this code or a previous regulation or code under which the structure or *premises* was constructed, altered or repaired shall be maintained in good working order. No *owner*, *operator* or *occupant* shall cause any service, facility, equipment or utility which is required under this section to be removed from or shut off from or discontinued for any occupied dwelling, except for such temporary interruption as necessary while repairs or alterations are in progress. The requirements of this code are not intended to provide the basis for removal or abrogation of fire protection and safety systems and devices in existing structures. Except as otherwise specified herein, the *owner* or the *owner's* designated agent shall be responsible for the maintenance of buildings, structures and *premises*.

124.2 Testing and operation. Equipment requiring periodic testing or operation to ensure maintenance shall be tested or operated as specified in this code.

124.2.1 Test and inspection records. Required test and inspection records shall be available to the *code official* at all times, or such records as designates shall be filed with the *code official*.

124.2.2 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

124.3 Supervision. Maintenance and testing shall be under the supervision of a responsible *person* who shall ensure that such maintenance and testing are conducted at specified intervals in accordance with this code.

124.4 Rendering equipment inoperable. Portable or fixed fire-extinguishing systems or devices and fire-warning systems shall not be rendered inoperative or inaccessible except as necessary during emergencies, maintenance, repairs, *alterations*, drills or prescribed testing.

SECTION 125 ~~110~~
DEMOLITION

125.1 ~~110.1~~ General. The *code official* shall order the *owner* of any *premises* upon which is located any structure, ~~which~~ that in the *code official* judgment ~~after review~~ is ~~so~~ deteriorated or dilapidated or has become so out of repair as to be dangerous, unsafe, insanitary or otherwise unfit for human habitation or occupancy, and such that it is unreasonable to repair the structure, to demolish and remove such structure; or if such structure is capable of being made safe by repairs, to repair and make safe and sanitary, or to board up and hold for future repair or to demolish and remove at the *owner's* option; or where there has been a cessation of normal construction of any structure for a period of more than two years, ~~the *code official* shall order the *owner*~~ to board up and hold for recommencement of work, or to demolish and remove such structure, ~~or board up until future repair~~. Boarding the building up for future repair or recommencement of work shall not extend beyond one year, unless *approved* by the ~~building~~ *code official*.

125.2 ~~110.2~~ Notices and orders. All notices and orders shall comply with Section 111.2 ~~107~~.

125.3 ~~110.3~~ Failure to comply. If the *owner* of a *premises* fails to comply with a demolition order within the time prescribed, the *code official* shall cause the structure to be demolished and removed, either through an available public agency or by contract or arrangement with private persons, and the cost of such demolition and removal shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate.

125.4 ~~110.4~~ Salvage materials. When any structure has been ordered demolished and removed in accordance with Section 125.3, the governing body or other designated officer under said contract or arrangement aforesaid shall have the right to sell the salvage and valuable materials at the highest price obtainable. The net proceeds of such sale, after deducting the expenses of such demolition and removal, shall be promptly remitted with a report of such sale or transaction, including the items of expense and the amounts deducted, for the person who is entitled thereto, subject to any order of a court. If such a surplus does not remain to be turned over, the report shall so state.

125.5 ~~110.5~~ Existing remedies. The provisions in this code shall not be construed to abolish or impair existing remedies of the jurisdiction or its officers or agencies relating to the removal or demolition of any structure which is dangerous, unsafe ~~and~~ or insanitary.

2. Revise and add the following definitions to the IPMC:

ADDITION. An extension or increase in floor area, number of stories, or height of a building or structure.

ALTERATION. Any construction or renovation to an existing structure other than repair or addition that requires a *permit*, or a change in a mechanical, plumbing, fuel gas or other system that involves an extension, addition or change to the arrangement, type or purpose of the original installation that requires a *permit*.

APPLIANCE. A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.

APPROVED. ~~*Approved*~~ Approval by the *code official* as the result of review, investigation or tests conducted by the code official or by reason of accepted principles or tests by national authorities, or technical or scientific organizations.

APPROVED AGENCY. An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been *approved* by the *code official*.

BUILDING. Any structure used or intended for supporting or sheltering any use or occupancy.

BUILDING OFFICIAL. The officer or other designated authority charged with the administration and enforcement of the *International Building Code*, or a duly authorized representative.

CODE OFFICIAL. The officer or other designated authority charged with the administration and enforcement of this code, or a duly authorized representative.

CERTIFICATE OF COMPLETION. A certificate stating that the project or work for which a permit was issued has been completed in compliance with *approved construction documents* and the requirements of this code.

CONSTRUCTION DOCUMENTS. The written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of the project necessary for obtaining a permit.

EQUIPMENT OR FIXTURE. Any plumbing, heating, electrical, ventilating, air conditioning, refrigerating, and fire protection equipment, apparatus and devices, all piping, ducts, vents, control devices and other systems or components thereof, and elevators, dumb waiters, escalators, boilers, pressure vessels and other mechanical facilities or installations that are related to building services, any of which are specifically regulated in this code. Appliances as defined by this code shall not be considered equipment. Equipment or fixtures shall not include manufacturing, production, or process equipment, but shall include connections from building service to process equipment.

FIRE CODE OFFICIAL. The fire chief or other designated authority charged with the administration and enforcement of the code, or a duly authorized representative.

LISTED. Equipment, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or services that maintains periodic inspection of production of *listed* equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

LOT LINE. A line dividing one lot from another, or from a street or any public place.

PERMIT. An official document or certificate issued by the authority having jurisdiction which authorizes performance of a specified activity.

REGISTERED DESIGN PROFESSIONAL. An architect or engineer who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A *registered design professional* engaged by the owner to review and coordinate certain aspects of the project, as determined by the *building official*, for compatibility with the design of the building or structure, including submittal documents prepared by others, deferred submittal documents and phased submittal documents.

REPAIR. The reconstruction or renewal of any part of an existing building for the purpose of its maintenance.

STRUCTURE. ~~That which is built or constructed or a portion thereof.~~ That which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

TOWNHOUSE. A single-family *dwelling unit* constructed in a group of three or more attached units in which each unit extends from the foundation to roof and with open space on at least two sides.

PART IX – IPSDC

1. Revise IPSDC (Item 1-J) as follows:

CHAPTER 1
SCOPE AND ADMINISTRATION

PART 1—SCOPE AND APPLICATION

SECTION 101
GENERAL

101.1 Title. These regulations shall be known as the Private Sewage Disposal Code of [NAME OF JURISDICTION] hereinafter referred to as "this code."

101.2 Scope. The provisions of this code shall apply to the erection, installation, alteration, repairs, relocation, replacement, addition to, use or maintenance of *private sewage disposal systems*. Septic tank and effluent absorption systems or other treatment tank and effluent disposal systems shall be permitted where a public sewer is not available to the property served. Unless specifically approved, the *private sewage disposal system* of each building shall be entirely separate from and independent of any other building. The use of a common system or a system on a parcel other than the parcel where the structure is located shall be subject to the full requirements of this code as for systems serving public buildings.

101.3 ~~101.6~~ Purpose ~~Intent~~. The purpose of this code is to ~~provide~~ establish the minimum requirements ~~standards~~ to safeguard life or limb, health, property, and public welfare by regulating and controlling the design, construction, installation, quality of materials, location, operation, and maintenance or use of *private sewage disposal systems*.

101.4 ~~101.7~~ Severability. If any section, subsection, sentence, clause, or phrase of this code is for any reason held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code.

101.5 Validity. In the event any part or provision of this code is held to be illegal or void, this shall not have the effect of making illegal or void any of the other parts or provisions hereof, which are determined to be legal; and it shall be presumed that this code would have been adopted without such illegal or invalid parts or provisions.

101.6 ~~102.2~~ Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state, or federal law.

SECTION 102
APPLICABILITY

102.1 General. Where there is a conflict between a general requirement and a specific requirement of this code, the specific requirement shall be applicable ~~govern~~. Where, in a ~~any~~ specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

102.2 ~~102.3~~ Application of references. References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

102.3 ~~102.10~~ Referenced codes and standards. The codes and standards referenced in this code shall be ~~those that are listed in Chapter 14 and such codes and standards shall be~~ considered ~~to be~~ part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between the provisions of this code and the referenced codes and standards, the provisions of this code shall apply.

Exception: Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing shall govern ~~and the manufacturer's installation instructions shall apply~~.

102.4 ~~101.2.1~~ Appendices. Provisions in the appendices shall not apply unless specifically adopted.

102.5 ~~102.4~~ Existing structures and systems ~~installations~~. The legal occupancy or use of any structure or installed system existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the *International Building Code,* the *International Fire Code,* or the *International Property Maintenance Code*, or as is deemed necessary by the *code official* for the general safety and welfare of the occupants and the public. ~~*Private sewage disposal systems* lawfully in existence at the time of the adoption of this code shall be permitted to have their use and maintenance continued if the use, maintenance or repair is in accordance with the original design and no hazard to life, health or property is created by the system.~~

102.5.1 ~~102.8~~ Historic buildings. The provisions of this code relating to the construction, alteration, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures identified and classified by the state or local jurisdiction as historic buildings when such buildings or structures are judged by the code official to be safe and in the public interest of health, safety and welfare regarding any proposed construction, alteration, repair, enlargement, restoration, relocation or moving of buildings.

102.6 ~~105.2~~ Alternative materials, design, methods, and equipment. The provisions of this code are not intended to prevent the installation of any material, or the use or operation of appliances, equipment, systems, or method, or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative ~~material or method of construction~~ shall be approved where the code official finds that the proposed alternative ~~design~~ is satisfactory and complies with the intent of the provisions of this code, and that the alternative ~~material, method, or work offered~~ is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

102.6.1 Matters regulated by the *International Building Code.* Approvals under the authority herein contained shall be subject to the approval of the *building official* whenever the alternative involves matters regulated by the *International Building Code*.

102.7 ~~102.11~~ Requirements not covered by code. ~~Any~~ Requirements necessary for the strength, stability, or proper operation of an existing or proposed fixture, structure, or equipment ~~*private sewage disposal system*~~, or for the public safety, health, and general welfare, not specifically covered by this code, shall be determined by the code official.

102.8 Subjects not regulated by this code. Where no applicable standards or requirements are set forth in this code, or are contained within other laws, codes, regulations, ordinances, or bylaws adopted by the jurisdiction, compliance with applicable nationally recognized standards, as *approved*, shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the *code official* to determine compliance with codes or standards for those activities or installations within the *code official's* jurisdiction or responsibility.

102.9 ~~106.2.4~~ Previous approvals. This code shall not require changes in the construction documents, construction or designated occupancy of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

102.10 ~~107.3~~ Contractor's responsibilities. ~~It shall be the duty of~~ Every contractor who enters into contracts ~~for the installation or repair of *private sewage disposal systems*~~ for which a permit is required ~~to~~ shall comply with ~~adopted~~ state and local rules and regulations concerning licensing.

102.11 Specific application of this code. The following are application specific to this code.

102.11.1 ~~101.3~~ Public sewer connection. Where public sewers become available to the premises served, the use of the *private sewage disposal system* shall be discontinued within that period of time required by law, but such period shall not exceed 1 year. The building sewer shall be disconnected from the *private sewage disposal system* and connected to the public sewer.

102.11.2 ~~101.4~~ Abandoned systems. Abandoned *private sewage disposal systems* shall be plugged or capped in an approved manner. Abandoned treatment tanks and *seepage pits* shall have the contents pumped and discarded in an approved manner. The top or entire tank shall be removed and the remaining portion of the tank or excavation shall be filled immediately.

102.11.3 ~~101.5~~ Failing system. When a *private sewage disposal system* fails or malfunctions, the system shall be corrected or use of the system shall be discontinued within that period of time required by the code official, but such period shall not exceed 1 year.

102.11.3.1 ~~101.5.1~~ Failure. A failing *private sewage disposal system* shall be one causing or resulting in any of the following conditions:

1. The failure to accept sewage discharges and backup of sewage into the structure served by the *private sewage disposal system*.
2. The discharge of sewage to the surface of the ground or to a drain tile.
3. The discharge of sewage to any surface or ground waters.
4. The introduction of sewage into saturation zones adversely affecting the operation of a *private sewage disposal system*.

102.11.4 ~~102.6~~ Additions, alterations or repairs. Additions, alterations, renovations or repairs to any *private sewage disposal system* shall conform to that required for a new system without requiring the existing system to comply with all the requirements of this code. Additions, alterations or repairs shall not cause an existing system to become unsafe, insanitary or overloaded. Minor additions, alterations, renovations and repairs to existing systems shall meet the provisions for new construction, unless such work is done in the same manner and arrangement as was in the existing system, is not hazardous and is approved.

102.11.5 ~~102.7~~ Change in occupancy. It shall be unlawful to make any change in the occupancy of any structure that will subject the structure to any special provision of this code applicable to the new occupancy without approval of the code official. The code official shall certify that such structure meets the intent of the provisions of law governing building construction for the proposed new occupancy and that such change of occupancy does not result in any hazard to the public health, safety or welfare.

102.11.6 ~~102.9~~ Moved buildings. Except as determined by Section 102.5.1.1 ~~102.4~~, *Private sewage disposal systems* that are a part of buildings or structures moved into or within the jurisdiction shall comply with the provisions of this code for new installations.

PART 2—ADMINISTRATION AND ENFORCEMENT

SECTION 103
DEPARTMENT OF PRIVATE SEWAGE DISPOSAL INSPECTION

103.1 General. The Department of Private Sewage Disposal Inspection, herein referred to as "the department," is hereby ~~created and the executive official in charge thereof shall be known as~~ established within the jurisdiction under the direction of the code official. The function of the department shall be the implementation, administration, and enforcement of the provisions of this code.

103.2 Appointment. The code official shall be appointed by the chief appointing authority of the jurisdiction.

103.3 Deputies. In accordance with the prescribed procedures of the jurisdiction and with the concurrence of the appointing authority, the code official shall have the authority to appoint a deputy code official, ~~other~~ related technical officers, inspectors, and other employees. Such employees shall have powers as delegated by the code official.

103.4 Liability. The code official, member of the Board of Appeals, officer, or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally, and is hereby relieved from all personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties.

103.5 Legal defense. Any suit instituted against any officer or employee of the department because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings. The code official or any subordinate shall not be liable for costs in any action, suit, or proceeding that is instituted in pursuance of the provisions of this code. Any officer or employee, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith.

SECTION 104
DUTIES AND POWERS OF THE CODE OFFICIAL

104.1 General. The code official is hereby authorized and directed to enforce the provisions of this code. The code official shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies, and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

104.2 Applications and permits. The code official shall receive applications, review construction documents, ~~and~~ issue permits required by this code ~~for the installation and alteration of *private sewage disposal systems*~~, inspect the premises for which such permits have been issued, and enforce compliance with the provisions of this code.

104.3 ~~104.6~~ Notices and orders. The code official shall issue all necessary notices or orders to ensure compliance with this code.

104.4 ~~104.3~~ Inspections. The code official shall make all of the required inspections, or the *code official* shall have the authority to accept reports of inspection by approved agencies or individuals. ~~All~~ Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The code official is authorized to engage such expert opinion as deemed necessary to report on unusual technical issues that arise, subject to the approval of the appointing authority.

104.5 Identification. The code official shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

104.6 ~~104.4~~ Right of entry. ~~Whenever~~ Where it is necessary to make an inspection to enforce the provisions of this code, or ~~whenever~~ where the code official has reasonable cause to believe that there exists in ~~any building~~ a structure or upon ~~any~~ a premises ~~any conditions or violations~~ a condition which is contrary to or in violation of this code ~~that make~~ which makes the ~~building~~ structure or premises unsafe, ~~insanitary,~~ dangerous, or hazardous, the code official shall ~~have the authority~~ is authorized to enter the ~~building~~ structure or premises at ~~all~~ reasonable times to inspect or to perform the duties imposed ~~on the code official~~ by this code, ~~.~~ provided that if such ~~building~~ structure or premises ~~is~~ be occupied, ~~the code official shall present~~ that credentials be presented to the occupant and ~~request~~ entry requested. If such ~~building~~ structure or premises is unoccupied, the code official shall first make a reasonable effort to locate the owner or other person having charge or control of the ~~building~~ structure or premises and ~~request~~ entry requested. If entry is refused, the code official ~~has~~ shall have recourse to ~~every remedy~~ the remedies provided by law to secure entry.

104.6.1 Warrant. When the code official ~~shall have~~ has first obtained a proper inspection warrant or other remedy provided by law to secure entry, ~~no~~ an owner or occupant or person having charge, care or control of any ~~building~~ structure or premises shall not fail or neglect, after proper request is made as herein provided, to promptly permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

104.7 Department records. The code official shall keep official records of applications received, permits and certificates issued, fees collected, reports of inspections, and notices and orders issued. Such records shall be retained in the official records for the period required for retention of public records.

104.8 Assistance of other agencies. The code official is authorized to request, and shall receive so far as is required in the discharge of the duties described in this code, the assistance and cooperation of other officials of the jurisdiction.

104.9 Specific duties. The following are specific duties of the code official. [JURISDICTION TO INSERT CODE OFFICIAL DUTIES SPECIFIC TO THIS CODE]

SECTION 105 ~~106~~
PERMITS

105.1 ~~106.1 When~~ Permit required. Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to construct, erect, install, enlarge, alter, repair, remove, convert, or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the *code official* and obtain the required *permit* for the project. Where laws or regulations are enforceable by other agencies or departments, approval shall be obtained from all agencies or departments concerned. ~~Work on a *private sewage disposal system* shall not commence until a permit for such work has been issued by the code official.~~

105.1.1 Annual permit. In lieu of an individual *permit* for each *alteration* to an already *approved* electrical, gas, mechanical or plumbing installation, the *code official* is authorized to issue an annual *permit* upon application therefor to any person, firm or corporation regularly employing one or more qualified tradespersons in the building, structure, or on the premises owned or operated by the applicant for the *permit*.

105.1.1.1 Annual permit records. The person to whom an annual *permit* is issued shall keep a detailed record of *alterations* made under such annual *permit*. The *code official* shall have access to such records at all times, or such records shall be filed with the *code official* as designated.

105.1.2 Emergency repairs. Where equipment replacements and repairs must be performed in an emergency situation, the *permit* application shall be submitted within the next working business day to the *code official*.

105.1.3 Permits specifically required. The following specifically require a permit. [JURISDICTION TO INSERT SPECIFIC ITEMS REQUIRING A PERMIT FOR THIS CODE]

105.2 Permit not required. Exemptions from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. *Permits* shall not be required in accordance with Sections 105.2.1 through 105.2.3.

105.2.1 Repairs. Application or notice to the *code official* is not required for ordinary repairs to structures, replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required *means of egress*, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include *addition* to, *alteration* of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

105.2.2 Public service agencies. A *permit* shall not be required for the installation, *alteration,* or repair of generation, transmission, distribution, or metering or other related equipment that is under the ownership and control of public service agencies by established right.

105.2.3 Specific exemption. The following are specifically exempt from requiring a permit. [JURISDICTION TO INSERT SPECIFIC ITEMS EXEMPT FROM PERMITS FOR THIS CODE]

105.3 ~~106.2~~ Application for permit. ~~Each application for a permit, with the required fee, shall be filed with the code official on a form furnished for that purpose and shall contain a general description of the proposed work and its location. The application shall contain a description of the type of system, the system location, the occupancy of all parts of the structure and all portions of the site or lot not covered by the structure, and such additional information as is required by the code official. The maximum number of bedrooms for residential occupancies shall be indicated.~~ To obtain a *permit*, the applicant shall first file an application therefor in writing on a form furnished by the department for that purpose. Such application shall:

1. Identify and describe the project to be covered by the *permit* for which application is made.
2. Describe the land on which the proposed project is to be done by legal desription, street address or similar description that will readily identify and definitely locate the proposed building or project.
3. Indicate the use and occupancy for which the proposed project is intended.
4. Be accompanied by *construction documents* and other data as required in Section 106.
5. State the valuation of the proposed project.
6. Be signed by the applicant, or the applicant's authorized agent.
7. Give such other data and information as required by the *code official*.

105.3.1 Permit valuations. *Permit* valuations required under Section 105.3(5) shall include total value of the project, including materials and labor, and electrical, gas, mechanical, plumbing equipment and other permanent systems for which the *permit* is being issued. If, in the opinion of the *code official*, the valuation is underestimated on the application, the *permit* shall be denied, unless the applicant can show detailed estimates to meet the approval of the *code official*. Final building *permit* valuation shall be set by the *code official*.

105.4 ~~106.3~~ Action on application ~~Permit issuance~~. The *code official* shall examine or cause to be examined applications for *permits* and amendments thereto within a reasonable time after filing. If the application or the *construction documents* do not conform to the requirements of pertinent laws, the *code official* shall reject such application in writing, stating the reasons therefor. If the *code official* is satisfied that the proposed project conforms to the requirements of this code and laws and ordinances applicable thereto, the *code official* shall issue a *permit* therefor as soon as practicable. ~~The application, construction documents and other data filed by an applicant for permit shall be reviewed by the code official. If the code official finds that the proposed work conforms to the requirements of this code and all laws and ordinances applicable thereto, and that the fees specified in Section 106.4 have been paid, a permit shall be issued to the applicant. A *private sewage disposal system* permit shall not be transferable.~~

105.4.1 ~~106.2.2~~ Preliminary inspection. Before a permit is issued, the code official is authorized to inspect and evaluate the systems, equipment, buildings, devices, premises and spaces or areas to be used.

105.4.2 ~~106.3.1~~ Conditional permits. The code official ~~shall have the authority~~ is authorized to issue a permit for the construction or operation of ~~a~~ part of a project ~~a *private sewage disposal system*~~ such as the construction of foundations or any other part of a building or structure, or installation of systems or materials, or operation before the construction documents for the entire project ~~whole system~~ have been submitted or approved, provided that adequate information and detailed statements have been filed complying with ~~all~~ pertinent requirements of this code. The holder of such permit shall proceed only to the point for which approval has been given, at ~~his or her~~ the permit holder's own risk, and without assurance that the permit for the entire ~~system~~ project will be granted.

105.5 ~~106.2.3~~ Time limitation of application. An application for a permit for any proposed project ~~work~~ shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a permit has been issued; except that the code official ~~shall have the authority~~ is authorized to grant one or more extensions of time for additional periods not exceeding 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

105.6 ~~106.3.2~~ Validity of permit. The issuance or granting of a permit ~~or approval of construction documents~~ shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or of other ordinances of the jurisdiction. ~~No permit~~ Permits presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a permit based on construction documents and other data shall not prevent the code official from ~~thereafter~~ requiring the correction of errors in ~~said~~ the construction documents and other data ~~or from preventing building operations being carried on thereunder when in violation of this code or of other ordinances of the jurisdiction~~.

105.7 ~~106.3.4~~ Extensions of permit. ~~Any permittee holding~~ For an unexpired permit, ~~shall have the right to apply for an extension of the time within which the permittee will commence work under that permit when work cannot be commenced within the time required by this section for good and satisfactory reasons.~~ the code official ~~shall extend the time for action by the permittee for a period not exceeding~~ is authorized to grant, in writing, one or more extensions of the time, for periods of not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated. ~~if there is reasonable cause. No permit shall be extended more than once. The fee for an extension shall be one-half the amount required for a new permit for such work.~~

105.8 ~~106.3.3~~ Expiration of permit. Every permit issued ~~by the code official under the provisions of this code~~ shall become invalid unless ~~expire by limitation and become null and void if~~ the work authorized by such permit is ~~not~~ commenced within 180 days after its issuance ~~from the date of the permit~~, or if the work authorized on the site by such permit is suspended or abandoned for a period of 180 days ~~at any time~~ after the work is commenced ~~for a period of 180 days~~.

105.8.1 Recommencement of work. Before such work covered under an expired permit recommences ~~can be recommenced~~, a new permit shall be first ~~be~~ obtained. ~~and the fee therefor shall be one-half the amount required for a new permit for such work,~~ The new permit shall be issued provided no changes have been or will be made in the original construction documents for such work, and provided further that such suspension or abandonment has not exceeded ~~1~~ one year.

105.9 ~~106.3.5~~ Suspension or revocation of permit. The code official ~~shall have the authority~~ is authorized to suspend or revoke a permit issued under the provisions of this code ~~wherever~~ whenever the permit is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or regulation or any of the provisions of this code.

105.10 ~~106.3.7~~ Posting of permit. ~~The permit~~ Issued permits or ~~a~~ copy thereof shall be kept on the site of the project ~~work~~ until the completion of the project.

SECTION 106
SUBMITTAL DOCUMENTS

106.1 ~~106.2.1 Construction documents~~ General. Submittal documents consisting of construction documents and other supporting data shall be submitted in two or more sets with each application for a permit, and in such form and detail as required by the *code official*. The *code official* shall require construction documents and other data to be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official* is authorized to require necessary construction documents to be prepared by a registered design professional.

~~An application for a permit shall be accompanied by not less than two copies of construction documents drawn to scale, with sufficient clarity and detail dimensions showing the nature and character of the work to be performed~~

Exception: The code official is ~~permitted~~ authorized to waive the ~~requirements for filing~~ submission of construction documents and other data not required to be prepared by a *registered design professional* if the nature of the work applied for is such that review of *construction documents* is not necessary to obtain compliance with this code. ~~where the work involved is of a minor nature. Where the quality of the materials is essential for conformity to this code, specific information shall be given to establish such quality, and this code shall not be cited, or the term "legal" or its equivalent used as a substitute for specific information.~~

106.2 Construction documents. *Construction documents* shall be in accordance with Sections 106.2.1 through 106.2.4.

106.2.1 Information on construction documents. *Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the work proposed project, and show in detail that the proposed project will conform to the provisions of this code and relevant laws, ordinances, rules, and regulations, as determined by the *code official*. Plans shall be to scale and be on suitable material. Electronic media documents are permitted to be submitted when *approved* by the *code official*.

106.2.1.1 Specific information required. Where the quality of the materials is essential for conformity to this code, specific information shall be given to establish such quality. The terms "this code" or "legal" or "its equivalent" shall not be cited or used as a substitute for specific information.

106.2.2 Site plan. The *construction documents* submitted with the application for *permit* shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from *lot lines*, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and *design flood* elevations. The site plan shall be drawn in accordance with an accurate boundary line survey.

106.2.2.1 Site plan for demolition. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot.

106.2.2.2. Waiver of site plan. The *code official* is authorized to waive or modify the requirement for a site plan when the application for *permit* is for *alteration* or repair or when otherwise warranted.

106.2.3 Specific information. The following are specific requirements for submittal documents required by this code.

~~106.2.6~~ 106.2.3.1 Additional site plan information. A site plan shall be filed showing, to scale, the following:

1. The location of all septic tanks, holding tanks or other treatment tanks;
2. Building sewers; wells;
3. Water mains;

4. Water service;
5. Streams and lakes;
6. *Flood hazard area*s;
7. Dosing or pumping chambers;
8. Distribution boxes;
9. Effluent systems;
10. Dual disposal systems;
11. Replacement system areas; and
12. The location of all buildings or structures.
13. All separating distances and dimensions ~~shall be shown~~, including any distance to adjoining property.
14. A vertical elevation reference point and a horizontal reference point shall be indicated.
15. For other than single-family dwellings, grade slope with contours shall be shown for the grade elevation of the entire area of the soil absorption system and the area on all sides for a distance of 25 feet (7620 mm).

106.2.3.2 Specifications shall include pumps and controls, dose volume, elevation differences (vertical lift), pipe friction loss, pump performance curve, pump model and pump manufacturer.

106.2.3.3 ~~106.2.5~~ Soil data. Soil test reports shall be submitted indicating *soil boring* and percolation test data related to the undisturbed and finished grade elevations, vertical elevation reference point and horizontal reference point. Surface elevations shall be given for all *soil borings*. Soil reports shall bear the signature of a soil tester.

106.2.4 Design professional in responsible charge. When it is required that documents be prepared by a *registered design professional*, the *code official* shall be authorized to require the owner to engage and designate on the building *permit* application a *registered design professional* who shall act as the *registered design professional in responsible charge*. If the circumstances require, the owner shall designate a substitute *registered design professional in responsible charge* who shall perform the duties required of the original *registered design professional in responsible charge*. The *code official* shall be notified in writing by the owner if the *registered design professional in responsible charge* is changed or is unable to continue to perform the duties.

106.2.4.1 Responsibility. The *registered design professional in responsible charge* shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

106.2.4.2 Observation. Where structural observation is required, the inspection program shall name the individual or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur.

106.3 Deferred submittals. For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the *code official* within a specified period.

106.3.1 Prior approval. Deferral of any submittal items shall have the prior approval of the *code official*. The *registered design professional in responsible charge* shall list the deferred submittals on the *construction documents* for review by the *code official*.

106.3.2 Review. Documents for deferred submittal items shall be submitted to the *registered design professional in responsible charge* who shall review them and forward them to the *code official* with a notation indicating that the deferred submittal documents have been reviewed and been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the deferred submittal documents have been *approved* by the *code official*.

106.4 Examination of documents. The *code official* shall examine or cause to be examined the submittal documents and shall ascertain by such examinations whether the project indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

106.5 ~~106.3.1~~ ~~Approved~~ Approval of construction documents. When the code official issues ~~the~~ a permit ~~where construction documents are required~~, the construction documents and other data shall be endorsed in writing ~~and stamped~~ or by stamp, as "APPROVED." One set of *construction documents* and other data so reviewed shall be retained by the *code official*. The other set(s) shall be returned to the applicant. One set shall be kept at the site of the project and shall be open to inspection by the *code official* or a duly authorized representative. Such approved construction documents shall not be changed, modified or altered without authorization from the code official. All work shall be done in accordance with the approved construction documents.

106.6 Amended construction documents. Any changes made during construction that are not in compliance with the *approved construction documents* shall be resubmitted for approval as an amended set of *construction documents*.

106.7 ~~106.3.6~~ Retention of construction documents. One set of approved construction documents shall be retained by the code official for a period of not less than 180 days from date of completion of the permitted project ~~work~~, or for the period required for retention of public records ~~as required by state or local laws. One set of approved construction documents shall be returned to the applicant, and said set shall be kept on the site of the building or work at all times during which the work authorized thereby is in progress.~~

SECTION 107 ~~105~~
MODIFICATIONS, TESTING, AND APPROVAL

107.1 ~~105.1~~ Modifications. Whenever there are practical difficulties involved in carrying out the provisions of this code, and upon application of the owner or owner's representative, the code official shall have the authority to grant modifications for individual cases, ~~upon application of the owner or owner's representative~~ provided ~~that~~ the code official shall first find that special individual reason makes the strict letter of this code impractical~~,~~ and the modification is in conformance ~~conformity~~ with the intent and purpose of this code, and that such modification does not lessen health, ~~and fire- and life-safety~~ life and fire safety, accessibility, or structural requirements. The details of action granting modifications shall be recorded and entered in the files of the ~~Private Sewage Disposal Inspection~~ department.

107.2 ~~105.6~~ Approved materials and equipment. All materials, equipment, and devices approved by the code official shall be constructed and installed in accordance with such approval.

107.3 ~~105.5~~ Used materials, appliances and equipment. The use of used materials ~~which~~ that meet the requirements of this code for new materials is permitted. ~~Materials,~~ Used appliances, equipment and devices shall not be reused unless such elements are in good repair or have been reconditioned~~,~~ and tested when necessary, ~~and~~ placed in good and proper working condition, and approved by the code official.

107.4 Listed and labeled material and appliances. Listed and labeled materials, equipment, and appliances shall be used and installed in accordance with the conditions the listing and the manufacturer's instructions.

107.5 ~~105.2.1~~ Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

107.6 ~~105.3~~ ~~Required testing~~ Technical assistance. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternate materials or methods, or to determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building or premises, the code official shall have the authority to require ~~testing~~ tests be conducted, or a technical opinion, recommendation or report be submitted as evidence of compliance. The tests, opinions, recommendations and reports shall be made at no expense to the jurisdiction.

107.6.1 Preparation. The technical reports and opinions shall be prepared by a qualified engineer, approved specialist or specialty organization, or an *approved agency*.

107.6.2 ~~105.3.1~~ Test methods. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the code official shall approve the testing procedures.

107.6.3 ~~105.3.2~~ Testing agency. All tests shall be performed by an approved agency.

107.6.4 ~~105.3.3~~ ~~Test~~ Retention of reports. ~~Reports of tests~~ The technical opinions, recommendation, reports and test results shall be retained by the code official for the period required for retention of public records.

SECTION 108 ~~107~~
INSPECTIONS

108.1 General. Construction or work on a project for which a *permit* is required shall be subject to inspection by the *code official* and such construction or work shall remain accessible and exposed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions

of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. **~~107.1.1 Concealed work.~~** It shall be the duty of the *permit* applicant to cause the construction or work to remain accessible and exposed for inspection purposes. Neither the *code official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

108.1.1 Replacement of existing appliance. The requirements of this section shall not be considered to prohibit the operation of any heating or cooling *equipment* or appliances installed to replace such existing *equipment* or appliances serving an occupied portion of a structure provided that a request for inspection of such *equipment* or appliances has been filed with the department not more than 48 hours after such replacement work is completed, and before any portion of such *equipment* or appliances is concealed by any permanent portion of the structure.

108.2 ~~107.1~~ Required inspections and testing. The *code official*, upon notification, shall make the inspections and require the tests set forth in Sections 108.2.1 through 108.2.4. ~~After issuing a permit, the code official shall conduct inspections from time to time during and upon completion of the work for which a permit has been issued. A record of all such examinations and inspections and of all violations of this code shall be maintained by the code official.~~

108.2.1 Specific inspections. The following are specific inspections and tests required by this code.

108.2.1.1 Underground inspection. An underground inspection shall be made after trenches or ditches are excavated and bedded, piping installed, and before any backfill is put in place.

108.2.1.2 ~~107.6~~ Testing. Installations shall be tested as required in this code and in accordance with Sections ~~107.6.1~~ 108.2.1.2.1 through 108.2.1.2.2 ~~107.6.3~~. Tests shall be made by the permit holder and observed by the code official.

108.2.1.2.1 ~~107.6.1~~ New, altered, extended or repaired installations. New installations and parts of existing installations, which have been altered, extended, renovated or repaired, shall be tested as prescribed herein to disclose leaks and defects.

108.2.1.2.2 ~~107.6.2~~ Apparatus, instruments, material and labor for tests. Apparatus, instruments, material and labor required for testing an installation or part thereof shall be furnished by the permit holder.

108.2.1.3 Prefabricated construction. Inspection of prefabricated construction shall comply with Sections 108.2.1.3.1 through 108.2.1.3.4.

108.2.1.3.1 ~~107.5~~ Evaluation and follow-up inspection services. Prior to the approval of a prefabricated construction assembly having concealed work and the issuance of a permit, the code official shall require the submittal of an evaluation report on each prefabricated construction assembly, indicating the complete details of the *private sewage disposal system*, including a description of the system and its components, the basis upon which the system is being evaluated, test results and similar information and other data as necessary for the code official to determine conformance to this code.

108.2.1.3.2 ~~107.5.1~~ Evaluation service. The code official shall designate the evaluation service of an approved agency as the evaluation agency, and review such agency's evaluation report for adequacy and conformance to this code.

108.2.1.3.3 ~~107.5.2~~ Follow-up inspection. Except where ready access is provided to *private sewage disposal systems*, service equipment and accessories for complete inspection at the site without disassembly or dismantling, the code official shall conduct the in-plant inspections as frequently as necessary to ensure conformance to the approved evaluation report or shall designate an independent, approved inspection agency to conduct such inspections. The inspection agency shall furnish the code official with the follow-up inspection manual and a report of inspections upon request, and the installation shall have an identifying label permanently affixed to the system indicating that factory inspections have been performed.

108.2.1.3.4 ~~107.5.3~~ Test and inspection records. Required test and inspection records shall be available to the code official at all times during the fabrication of the installation and the erection of the building; or such records as the code official designates shall be filed.

108.2.1.4 ~~107.2~~ Alternative engineered designs ~~Special inspections~~. Special inspections of alternative engineered design *private sewage disposal system*s shall be conducted in accordance with Sections ~~107.2.1~~ 108.2.4.1 and 108.2.4.2 ~~107.2.2~~.

108.2.1.4.1 ~~107.2.1~~ Periodic inspection. The registered design professional or designated inspector shall periodically inspect and observe the alternative engineered design to determine that the installation is in accordance with the approved plans. All discrepancies shall be brought to the immediate attention of the *private sewage disposal system* contractor for correction. Records shall be kept of all inspections.

108.2.1.4.2 ~~107.2.2~~ Written report. The registered design professional shall submit a final report in writing to the code official upon completion of the installation, certifying that the alternative engineered design conforms to the approved construction documents. A notice of approval for the *private sewage disposal system* shall not be issued until a written certification has been submitted.

108.2.2 ~~107.1.2~~ Other inspections. In addition to the inspections specified above, **t**he code official is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department.

~~**107.6.3 Reinspection and testing.** Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the code official for inspection and testing.~~

108.2.3 Special inspections. Special inspection shall be as required by this code, the *International Building Code*, or the *International Fire Code* as applicable.

108.2.4 Final inspection. A final inspection shall be made after all work on a project required by the *permit* is completed.

108.3 ~~107.1.3~~ ~~Approved~~ Inspection agencies. The code official ~~shall~~ is authorized to accept reports of approved inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.

108.4 ~~107.3.1~~ Inspection requests. It shall be the duty of the holder of the permit or their duly authorized agent to notify the code official when a project ~~work~~ is ready for inspection. It shall be the duty of the permit holder to provide access to and means for inspections of such work that are required by this code.

108.4.1 Manufacturer's instructions. Manufacturer's instructions for equipment, appliances, and materials installed under the permit shall be available on the work site at the time of inspection.

108.5 ~~107.4~~ Approval required. Work on a project shall not proceed ~~be done~~ beyond the point indicated in each successive inspection without first obtaining the approval of the code official. The code official, upon notification, shall make the requested inspections and shall either ~~indicate~~ determine the portion of the project ~~construction~~ that is satisfactory as completed, or shall notify the permit holder or ~~his or her~~ authorized agent wherein the same fails to comply with this code. Any portions of the project that do not comply shall be corrected and such portion shall not be covered, ~~or~~ concealed, or used until authorized by the code official.

108.6 ~~107.7~~ Notice of approval. After ~~the~~ all prescribed inspections or tests indicate ~~that~~ the work complies ~~in all respects~~ with this code, a ~~notice of approval~~ certificate of completion complying with Section 109 shall be issued by the code official.

~~**107.7.1 Revocation.** The code official is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the notice is issued in error, on the basis of incorrect information supplied, or where it is determined that the building or structure, premise or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.~~

SECTION 109
CERTIFICATE OF COMPLETION AND OCCUPANCY

109.1 Use and occupancy. No building, structure, or premises or portion thereof shall be used or occupied until the code official has issued a certificate of occupancy as provided herein. No equipment, appliance or system used, and no change in the existing occupancy classification of a building, structure, premise or portion thereof shall be made until the code official has issued a certificate of completion as provided herein.

Exceptions:

1. Occupancy shall be permitted during emergency situations as described under Section 105.1.
2. Certificates of completion or occupancy are not required for work exempt from permits under Section 105.2.
3. Occupancy shall be permitted during the replacement of existing appliances as described under Section 108.1.1.
4. Certificates of occupancy are not required for one-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m^2).

109.1.1 Validity. Issuance of a certificate of completion or occupancy shall not be construed as an approval of a violation of the provisions of this code or of other pertinent laws and ordinances of the jurisdiction. Certificates presuming to give authority to violate or cancel the provisions of this code or other laws or ordinances of the jurisdiction shall not be valid.

109.2 Certificate issued. After the *code official* inspects a project requiring a permit and finds no violations of the provisions of this code or other laws that are enforced by the department, the *code official* shall issue a certificate of completion. After all certificates of completion have been issued by other departments or agencies concerned, the code official shall issue a certificate of occupancy where applicable. A certificate of completion or occupancy shall contain the following:

1. The *permit* number.
2. The address of the premises or structure.
3. The name and address of the owner.
4. A description of the project for which the certificate is issued.
5. A statement that the described project has been inspected for compliance with the requirements of this code.
6. The name of the *code official*.
7. The edition of the code under which the *permit* was issued.
8. The use and occupancy in accordance Chapter 3 of the International Building Code.
9. The type of construction as defined in Chapter 6 of the International Building Code.
10. The design *occupant load*.
11. If fire protection systems are provided, whether the fire protection systems are required.
12. Any special stipulations and conditions of the *permit*.

Exceptions:

1. A certificate of completion or occupancy shall not be required to indicate the items under Section 109.2, Items 8, 9, and 10 for detached one- and two family dwellings and multiple single-family *dwellings* (*townhouses)* constructed using the *International Residential Code*.
2. The *code official* is shall not be required to indicate on a certificate items under Section 109.2, Items 8, 9, and 10 for the installation of equipment, appliances or systems.

109.3 Temporary occupancy. The code official is authorized to issue a temporary certificate of occupancy before the completion of the entire work covered by the permit, provided that such portion or portions shall be occupied safely and without endangerment to life or public welfare. The temporary certificate shall indicate any limitations or restrictions necessary to keep the permit area safe, and items required to obtain the final certificate of occupancy. The code official shall set a time period during which the temporary certificate of occupancy is valid.

109.4 Revocation. The code official is authorized to, in writing, suspend or revoke a certificate of completion or occupancy issued under the provisions of this code wherever the certificate is issued in error on the basis of incorrect information supplied, or where it is determined that the building, structure, premise, or portion thereof, or installation of appliance, equipment or system is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION 110
STOP WORK ORDER

110.1 Authority. Whenever the *code official* finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or dangerous or unsafe, the *code official* is authorized to issue a stop work order.

110.2 Issuance. The stop work order shall be in writing and shall be given to the owner of the property involved, or to the owner's agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order, and the conditions under which the cited work will be permitted to resume.

110.2.1 Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

110.3 Unlawful continuance. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fees, fines, or penalties as prescribed by this code or other laws or ordinances of the jurisdiction.

~~**108.5 Stop work orders.** Upon notice from the code official, work on any *private sewage disposal system* that is being done contrary to the provisions of this code or in a dangerous or unsafe manner shall immediately cease. Such notice shall be in writing and shall be given to the owner of the property, to the owner's agent or to the person doing the work. The notice shall state the conditions under which work is authorized to resume. Where an emergency exists, the code official shall not be required to give a written notice prior to stopping the work. Any person who shall continue any work on the system after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.~~

~~**108.6 Abatement of violation.** The imposition of the penalties herein prescribed shall not preclude the legal officer of the jurisdiction from instituting appropriate action to prevent unlawful construction or to restrain, correct or abate a violation; to prevent illegal occupancy of a building, structure or premises or to stop an illegal act, conduct, business or use of the *private sewage disposal system* on or about any premises.~~

SECTION 111 ~~108~~
VIOLATIONS

111.1 Code violations. No person, association, organization, or business entity of any form shall:

1. Erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or premises in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
2. Install or operate any equipment, appliances, or systems regulated by this code that is in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
3. Be non-compliant with the conditions of any permit or certificate issued under the auspices of this code; or
4. Tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*.

111.2 Notice of violation. A *code official* who observes or becomes aware of any code violation shall serve upon the responsible person, association, organization, or business entity a written notice in accordance with Section 111.2.1. In the absence of direct knowledge as to the identity or location of the responsible party, the *code official* shall serve the notice upon the property owner. Service may be effected by personal delivery, first class mail, substituted service, or such other means that may be authorized by state and/or local law.

111.2.1 Form of notice. Such notice of violation shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the violation into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties in accordance with Section 111.3.

111.3 Penalties. Violators who fail to comply with a notice to discontinue or abate a condition in violation of this code, and violators who tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*, shall be subject to the penalties set forth in this code as may be adopted and authorized by state and/or local law.

~~**108.1 Unlawful acts.** It shall be unlawful for any person, firm or corporation to erect, construct, alter, repair, remove, demolish or use any *private sewage disposal system*, or cause same to be done, in conflict with or in violation of any of the provisions of this code.~~

~~**108.2 Notice of violation.** The code official shall serve a notice of violation or order to the person responsible for the erection, installation, alteration, extension, repair, removal or demolition of private sewage disposal work in violation of the provisions of this code; in violation of a detailed statement or the approved construction documents thereunder or in violation of a permit or certificate issued under the provisions of this code. Such order shall direct the discontinuance of the illegal action or condition and the abatement of the violation.~~

~~**108.3 Prosecution of violation.** If the notice of violation is not complied with promptly, the code official shall request the legal counsel of the jurisdiction to institute the appropriate proceeding at law or in equity to restrain, correct or abate such violation, or to require the removal or termination of the unlawful system in violation of the provisions of this code or of the order or direction made pursuant thereto.~~

~~**108.4 Violation penalties.** Any person who shall violate a provision of this code or fail to comply with any of the requirements thereof or who shall erect, install, alter or repair private sewage disposal work in violation of the approved construction documents or directive of the code official, or of a permit or certificate issued under the provisions of this code, shall be guilty of a [SPECIFY OFFENSE], punishable by a fine of not more than [AMOUNT] dollars or by imprisonment not exceeding [NUMBER OF DAYS], or both such fine and imprisonment. Each day that a violation continues after due notice has been served shall be deemed a separate offense.~~

SECTION 112 ~~109~~
MEANS OF APPEAL

112.1 ~~109.1~~ Application for appeal. Any person directly affected by a decision of the *code official* or a notice or order issued under this code shall have the right to appeal to the board of appeals, provided that a written application for appeal is filed within 20 days after the day the decision, notice or order was served ~~shall have the right to appeal a decision of the code official to the board of appeals~~. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder has been incorrectly interpreted, the provisions of this code do not fully apply or the requirements of this code are adequately satisfied by other means ~~an equally good or better form of construction is proposed~~. ~~The application shall be filed on a form obtained from the code official within 20 days after the notice was served.~~

112.1.1 Stays of enforcement. The filing of an appeal of notice or orders, except for notice or order concerning *Imminent Danger*, shall stay the enforcement of the notice or order until the appeal is heard by the board of appeals.

112.2 ~~109.2~~ Membership of board. The board of appeals shall consist of five members who are qualified by experience and training to pass on matters pertaining to the provisions of this code. The board shall be appointed by the chief appointing authority, and shall serve staggered and overlapping terms. ~~appointed by the chief appointing authority as follows: one for 5 years, one for 4 years, one for 3 years, one for 2 years and one for 1 year. Thereafter, each new member shall serve for 5 years or until a successor has been appointed.~~

112.2.1 ~~109.2.2~~ Alternate members. The chief appointing authority shall appoint two or more alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership, and shall be appointed for ~~5~~ five years or until a successor has been appointed.

112.2.2. An employee of the jurisdiction shall not be a member of the board of appeals. The *code official* shall be an ex officio member of the board but shall have no vote on any matter before the board.

112.2.3 ~~109.2.3~~ Chairman. The board shall annually select one of its members to serve as chairman.

112.2.4 ~~109.2.5~~ Secretary. The chief administrative officer shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

112.2.5 ~~109.2.1~~ Qualifications. The board of appeals shall consist of five individuals, one from each of the following professions or disciplines.

1. Registered design professional that is a registered architect; or a builder or superintendent of building construction with at least 10 years' experience, 5 years of which shall have been in responsible charge of work.
2. Registered design professional with structural engineering or architectural experience.
3. Registered design professional with mechanical and plumbing engineering experience; or a mechanical and plumbing contractor with at least 10 years' experience, 5 years of which shall have been in responsible charge of work.
4. Registered design professional with electrical engineering experience; or an electrical contractor with at least 10 years' experience, 5 years of which shall have been in responsible charge of work.
5. Registered design professional with fire protection engineering experience; or a fire-protection contractor with at least 10 years' experience, 5 years of which shall have been in responsible charge of work.

112.2.6 ~~**109.2.4**~~ **Disqualification of a member.** A member shall not hear an appeal in which that member has any personal, professional or financial interest.

112.2.7 Terms. The initial members of the board of appeals shall serve as follows: one for five years; one for four years; one for three years; one for two years and one for one year. Thereafter, each new member shall serve for five years or until a successor has been appointed.

112.2.8 ~~**109.2.6**~~ **Compensation of members.** Compensation of members shall be determined by law.

112.3 Hearings and meetings. Hearings on appeals and other meetings of the board of appeals shall be held in conformance with Sections 109.3.1 through 109.3.3.

112.3.1 ~~**109.4.1**~~ **Procedure.** The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

112.3.2 ~~**109.3**~~ **Notice** ~~**of meeting**~~**.** The board shall meet upon notice from the chairman, within 10 days of the filing of an appeal, or at stated periodic meetings.

112.3.3 ~~**109.4**~~ **Open hearing.** All hearings before the board shall be open to the public. A quorum shall consist of not less than two-thirds of the board membership. The appellant, the appellant's representative, the code official and any person whose interests are affected shall be given an opportunity to be heard.

112.3.4 ~~**109.5**~~ **Postponed hearing.** When the full board is ~~five members are~~ not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

112.4 ~~**109.6**~~ **Board decision.** The board shall modify or reverse the decision of the code official by a concurring vote of a majority of the total number of appointed board members ~~three members~~.

112.4.1 ~~**109.6.1**~~ **Resolution.** The decision of the board shall be by resolution. Certified copies shall be furnished to the appellant and to the code official.

112.4.2 ~~**109.6.2 Administration**~~ **Action by code official.** The code official shall take immediate action in accordance with the decision of the board.

112.5 ~~**109.7**~~ **Court review.** Any person, whether or not a previous party of the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

SECTION 113
FEES

113.1 ~~**106.4**~~ **Payment of fees.** A permit or an amendment to a permit shall not be issued until the fees prescribed in Section 113.2 ~~106.4.2~~ have been paid, ~~and an amendment to a permit shall not be released until the additional fee, if any, due to an increase of the *private sewage disposal system*, has been paid.~~

113.2 ~~**106.4.2**~~ **Fee schedule.** The fees for permits and other considerations ~~all private sewage disposal work~~ shall be ~~as indicated~~ in accordance with the following schedule: [JURISDICTION TO INSERT APPROPRIATE SCHEDULE]

113.3 Related fees. The payment of the fee for work done in connection to or concurrently with the work authorized by a *permit* shall not relieve the applicant or holder of the *permit* from the payment of other fees that are prescribed by law.

113.4 ~~106.4.1~~ Work commencing before permit issuance. Any person who commences any work on a project requiring a *permit* ~~on a *private sewage disposal system*~~ before obtaining the necessary permits shall be subject to ~~100 percent of the usual permit~~ a fee established by the *code official* that shall be in addition to the required permit fees.

113.5 ~~106.4.4~~ Permit extension. The fee for an extension of a permit in conformance with Section 105.7 shall be one-half the amount required for a new permit for such work.

113.6 Expiration of permit. For permits that have expired, and before such work recommences in conformance with Section 105.8.1, the fee to recommence work shall be one-half the amount required for a new permit for such work.

113.7 Stop work order. Any person who shall continue any work on a project requiring a permit after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.

113.8 Reinspection fee. A reinspection of work not in compliance with this code shall be subject to a fee established by the *code official* that shall be in addition to the required *permit* fees. The fee may be assessed when the *approved* plans are not readily available to the inspector, for failure to provide access on the date for which inspection is requested, for work deviating from the approved, or the work or test is not in compliance with this code.

113.9 ~~106.4.3~~ Fee refunds. The code official shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment. The code official shall authorize the refunding of fees as follows:

1. The full amount of any fee paid hereunder that was erroneously paid or collected.
~~3~~ 2. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.
~~2.~~ 3. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid when no work on a project has been done under a permit issued in accordance with this code.

~~The code official shall not authorize the refunding of any fee paid except upon written application filed by the original permittee no later than 180 days after the date of fee payment.~~

(SECTIONS 114 THROUGH 119 RESERVED)

PART 3 – GENERAL REQUIREMENTS

SECTION 120
UNSAFE STRUCTURES, EQUIPMENT, AND CONDITIONS

120.1 General. If any building, structure, premises or part thereof, or appliance, equipment, or system is found to be unsafe by the *code official*, or found in the case of a building or structure to be unfit for human occupancy, the condition shall be abated whenever possible, but if abatement is not achieved or is non-achievable, then condemnation shall be undertaken in accordance with the provisions of this code.

~~**108.7 Unsafe systems.** Any *private sewage disposal system* regulated by this code that is unsafe or constitutes a health hazard, insanitary condition or is otherwise dangerous to human life is hereby declared unsafe. Any use of *private sewage disposal systems* regulated by this code constituting a hazard to safety, health or public welfare by reason of inadequate maintenance, dilapidation, obsolescence, disaster, damage or abandonment is hereby declared an unsafe use. Any such unsafe equipment is hereby declared to be a public *nuisance* and shall be abated by repair, rehabilitation, demolition or removal.~~

120.1.1 Notice to building official. Abatement requiring repairs, *alterations*, remodeling, removing or demolition shall be referred to the *building official*.

120.1.2 Unsafe structures. An unsafe structure is a structure that is dangerous to the life, health, or safety of the public or to the *occupants* when:

1. There are no minimum safeguards provided to protect or warn *occupants* in the event of fire; or
2. Such structure contains unsafe equipment or is so damaged, decayed, dilapidated, is structurally unsound, is of such faulty construction, or has such an unstable foundation, that partial or complete collapse is possible.

120.1.3 Unsafe equipment. Unsafe equipment includes any boiler, heating equipment, elevator, moving stairway, electrical wiring or device, flammable liquid containers or other equipment on the *premises* or within the structure which is in such disrepair or condition that such equipment constitutes a hazard to life, health, property or safety of the public or the *occupants* of the *premises* or structure.

120.1.4 Structure unfit for human occupancy. A structure is unfit for human *occupancy* whenever the *code official* finds that such structure is unsafe, is unlawful or, because its degree of disrepair, or its want of maintenance, is unsanitary, vermin or rat infested, filthy and contaminated, lacking *ventilation*, illumination, sanitary, heating facilities or other essential equipment required by this code, or because the structure is in proximity to an unsafe or dangerous condition that constitutes a hazard to the *occupants* of the structure or to the public.

120.1.5 Unlawful structure. An unlawful structure is one found in whole or in part to be occupied by more persons than permitted under this code, or was erected, altered or occupied contrary to this code.

120.1.6 Structure and premise that are dangerous to the life, health or safety of the public or occupants. For the purpose of this code, any structure or *premises* that have any or all of the following conditions or defects shall be considered dangerous, and shall constitute an unsafe structure:

1. Any door, aisle, passageway, stairway, exit or other means of egress that does not conform to the *approved* building or fire code of the jurisdiction as related to the requirements for existing buildings.
2. The walking surface of any aisle, passageway, stairway, exit or other means of egress is so warped, worn loose, torn or otherwise unsafe as to not provide safe and adequate means of egress.
3. Any portion of a building, structure or appurtenance that has been damaged by fire, earthquake, wind, flood, *deterioration*, *neglect*, abandonment, vandalism or by any other cause to such an extent that it is likely to partially or completely collapse, or to become *detached* or dislodged.
4. Any portion of a building, or any member, appurtenance or ornamentation on the exterior thereof that is not of sufficient strength or stability, or is not so *anchored*, attached or fastened in place so as to be capable of resisting natural or artificial loads of one and one-half the original designed value.
5. The building or structure, or part of the building or structure, because of dilapidation, *deterioration*, decay, faulty construction, the removal or movement of some portion of the ground necessary for the support, or for any other reason, is likely to partially or completely collapse, or some portion of the foundation or underpinning of the building or structure is likely to fail or give way.
6. The building or structure, or any portion thereof, is clearly unsafe for its use and *occupancy*.
7. The building or structure is *neglected*, damaged, dilapidated, unsecured or abandoned so as to become an attractive nuisance to children who might play in the building or structure to their danger, becomes a harbor for vagrants, criminals or immoral persons, or enables persons to resort to the building or structure for committing a nuisance or an unlawful act.
8. Any building or structure has been constructed, exists or is maintained in violation of any specific requirement or prohibition applicable to such building or structure provided by the *approved* building or fire code of the jurisdiction, or of any law or ordinance to such an extent as to present either a substantial risk of fire, building collapse or any other threat to life and safety.
9. A building or structure, used or intended to be used for dwelling purposes, because of inadequate maintenance, dilapidation, decay, damage, faulty construction or arrangement, inadequate light, *ventilation*, mechanical or plumbing system, or otherwise, is determined by the *code official* to be unsanitary, unfit for human habitation or in such a condition that is likely to cause sickness or disease.
10. Any building or structure, because of a lack of sufficient or proper fire-resistance-rated construction, fire protection systems, electrical system, fuel connections, mechanical system, plumbing system or other cause, is determined by the *code official* to be a threat to life or health.
11. Any portion of a building remains on a site after the demolition or destruction of the building or structure or whenever any building or structure is abandoned so as to constitute such building or portion thereof as an attractive nuisance or hazard to the public.

120.2 Closing of vacant structures. If the structure is vacant and unfit for human habitation and *occupancy*, and is not in danger of structural collapse, the *code official* is authorized to post a placard of condemnation on the *premises* and order the structure closed up so as not to be an attractive nuisance. Upon failure of the *owner* to close up the *premises* within the time specified in the order, the *code official* shall cause the *premises* to be closed and secured through any available public agency or by contract or arrangement by private persons, and the cost thereof shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate that may be collected by any legal means.

120.3 Evacuation. The *code official* or the fire department official in charge of an emergency incident shall be authorized to order the immediate evacuation of any occupied building, structure or premises deemed unsafe due to hazardous conditions that present an imminent danger to occupants. *Persons* so notified shall immediately leave the structure or premises and shall not enter or re-enter until authorized to do so by the *code official* or the fire department official in charge of the incident.

120.4 Notice. Whenever the *code official* has *condemned* a structure or equipment under the provisions of this section, notice shall be posted in a conspicuous place in or about the structure affected by such notice and served on the *owner* or the person or persons responsible for the structure or equipment in accordance with Section 120.4.2. If the notice pertains to equipment, it shall also be placed on the *condemned* equipment. The notice shall be in the form prescribed in Section 120.4.1.

~~**108.7.1 Authority to condemn equipment.** Whenever the code official determines that any *private sewage disposal system*, or portion thereof, regulated by this code has become hazardous to life, health or property or has become insanitary, the code official shall order in writing that such system be either removed or restored to a safe or sanitary condition. A time limit for compliance with such order shall be specified in the written notice. No person shall use or maintain a defective *private sewage disposal system* after receiving such notice. When such system is to be disconnected, written notice as prescribed in Section 108.2 shall be given. In cases of immediate danger to life or property, such disconnection shall be made immediately without such notice.~~

120.4.1 Form of notice. Such notice of shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the unsafe condition into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties set forth in this code or as may be adopted and authorized by state and/or local law.

120.4.2 Service of notice. Such notice shall be deemed properly served if a copy thereof is (a) delivered to the owner personally; (b) sent by certified or registered mail addressed to the owner at the last known address with the return receipt requested; or (c) delivered in any other manner as prescribed by local law. If the certified or registered letter is returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice. Service of such notice in the foregoing manner upon the owner's agent or upon the person responsible for the structure shall constitute service of notice upon the owner.

120.5 Placarding. Upon failure of the owner or person responsible to comply with the notice provisions within the time given, the *code official* shall post on the premises or on defective equipment a placard bearing the word "UNSAFE" or "CONDEMNED" as applicable, and a statement of the penalties provided for occupying the premises, operating the equipment or removing the placard.

120.5.1 Placard removal. The *code official* shall remove the placard whenever the unsafe conditions have been eliminated. Any person who defaces or removes an unsafe condition placard without the approval of the *code official* shall be subject to the penalties provided for by the jurisdiction.

120.6 Prohibited occupancy. Any structure *condemned* and placarded by the *code official* shall be vacated as ordered by the *code official*. It shall be unlawful for any person to occupy or to allow others to occupy a placarded *premises,* or to operate or allow others to operate any placarded equipment.

120.7 Abatement. The owner, operator, or occupant of a building, structure, premises, or equipment deemed unsafe by the *code official* shall abate or correct such unsafe conditions either by repair, rehabilitation, demolition or other *approved* corrective action.

120.7.1 Summary abatement. Where conditions exist that are deemed an *imminent danger* as described in Section 121.1 that will necessarily result in injury to occupants or the public, the *code official* or fire department official in charge of the incident is authorized to summarily abate such unsafe or hazardous conditions.

120.8 Record. The *code official* shall cause a report to be filed on an unsafe condition. The report shall state the occupancy of the structure and the nature of the unsafe condition. The record of an unsafe condition as outlined herein shall be retained by the *code official* for the period required for retention of public records.

SECTION 121
EMERGENCY MEASURES

121.1 Imminent danger. When, in the opinion of the *code official*, there is imminent danger of failure or collapse of a building or structure that endangers life, or when any building or part of a building has fallen and life is endangered by the occupation of the building, or when there is actual or potential danger to the building occupants or those in the proximity of any structure because of explosives, explosive fumes or vapors, or the presence of toxic fumes, gases, or materials, or operation of defective or *dangerous* equipment, the *code official* is hereby authorized and empowered to order and require the occupants to vacate the premises forthwith. The *code official* shall cause to be posted at each entrance to such structure a notice reading as follows: "This Structure Is Unsafe and Its Occupancy Has Been Prohibited by the *Code Official*." It shall be unlawful for any person to enter such structure except for the purpose of securing the structure, making the required *repairs*, removing the hazardous condition, or of demolishing the same.

121.2 Temporary safeguards. Notwithstanding other provisions of this code, whenever, in the opinion of the *code official*, there is imminent danger due to an unsafe condition, the *code official* shall order the necessary work to be done, including the boarding up of openings, to render such structure temporarily safe whether or not the legal procedure herein described has been instituted; and shall cause such other action to be taken as the *code official* deems necessary to meet such emergency.

121.3 Closing streets. When necessary for public safety, the *code official* shall temporarily close structures and close or order the authority having jurisdiction to close sidewalks, streets, public ways, and places adjacent to unsafe structures, and prohibit the same from being utilized.

121.4 Emergency repairs. For the purposes of this section, the *code official* shall employ the necessary labor and materials to perform the required work as expeditiously as possible.

121.5 Costs of emergency repairs. Costs incurred in the performance of emergency work shall be paid by the jurisdiction. The legal counsel of the jurisdiction shall institute appropriate action against the owner of the premises where the unsafe structure is or was located for the recovery of such costs.

121.6 Hearing. Any person ordered to take emergency measures shall comply with such order forthwith. Any affected person shall thereafter, upon petition directed to the appeals board, be afforded a hearing as described in this code.

SECTION 122
SERVICE UTILITIES

122.1 ~~107.9~~ Connection of service utilities. No person shall make connections from a utility, source of energy, fuel, ~~or~~ power, water system or *sewer* system to any building, structure or system that is regulated by this code for which a permit is required, until authorized by the code official.

122.2 ~~107.8~~ Temporary connection. The code official shall have the authority to allow the temporary connection of ~~an installation~~ the building, structure or system to the sources of energy, fuel, power, water system or *sewer* system ~~for the purpose of testing the installation or for use under a temporary certificate of occupancy~~.

122.3 ~~108.7.2~~ Authority to disconnect service utilities. The code official shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards ~~the technical codes~~ in case of emergency, where necessary, to eliminate an immediate danger to life or property or when such utility connection has been made without the approval required by Section 122.1 or 122.2. The

code official shall notify the serving utility and, ~~Where~~ wherever possible, the owner and occupant of the building, structure or service system ~~shall be notified~~ of the decision to disconnect ~~utility service~~ prior to taking such action. If not notified prior to disconnecting, the owner or occupant of the building, structure or service system~~s~~ shall be notified in writing, as soon as is practical thereafter.

SECTION 123 ~~110~~
TEMPORARY STRUCTURES, EQUIPMENT, SYSTEMS AND USES

123.1 ~~110.1~~ General. The code official is authorized to issue a permit for temporary structures, equipment, systems and uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The code official is authorized to grant extensions for demonstrated cause.

123.2 ~~110.2~~ Conformance. Temporary structures, equipment, systems and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.

123.3 ~~110.4~~ Termination of approval. The code official is authorized to terminate such permit ~~for a temporary structure or use~~ and to order the temporary structure, equipment, system or use to be discontinued.

~~**110.3 Temporary utilities.** The code official is authorized to give permission to temporarily supply utilities before an installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in the code.~~

SECTION 124
MAINTENANCE

124.1 Maintenance of safeguards. Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or any other feature is required for compliance with the provisions of this code, or otherwise installed, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be continuously maintained in accordance with this code and applicable referenced standards.

124.1.1 ~~102.5~~ Specific maintenance. *Private sewage disposal systems*, materials and appurtenances, both existing and new, and all parts thereof shall be maintained in proper operating condition in accordance with the original design in a safe and sanitary condition. Devices or safeguards that are required by this code shall be maintained in compliance with the code edition under which they were installed. The owner or the owner's designated agent shall be responsible for maintenance of *private sewage disposal systems*. To determine compliance with this provision, the code official shall have the authority to require reinspection of any *private sewage disposal system*.

124.2 Testing and operation. Equipment requiring periodic testing or operation to ensure maintenance shall be tested or operated as specified in this code.

124.2.1 Test and inspection records. Required test and inspection records shall be available to the *code official* at all times, or such records as designates shall be filed with the *code official*.

124.2.2 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

124.3 Supervision. Maintenance and testing shall be under the supervision of a responsible *person* who shall ensure that such maintenance and testing are conducted at specified intervals in accordance with this code.

124.4 Rendering equipment inoperable. Portable or fixed fire-extinguishing systems or devices and fire-warning systems shall not be rendered inoperative or inaccessible except as necessary during emergencies, maintenance, repairs, *alterations*, drills or prescribed testing.

SECTION 125
DEMOLITION

125.1 General. The *code official* shall order the owner of any premises upon which is located any structure that in the *code official's* judgment is deteriorated or dilapidated, or has become so out of *repair* as to be *dangerous*, unsafe, insanitary, or otherwise unfit for human habitation or occupancy, and such that it is unreasonable to *repair* the

structure, to demolish and remove such structure; or if such structure is capable of being made safe by *repairs*, to *repair* and make safe and sanitary, or to board up and hold for future repair, or to demolish and remove at the owner's option; or where there has been a cessation of normal construction of any structure for a period of more than two years, to board up and hold for recommencement of work, or to demolish and remove such structure. Boarding up the building for future repair or recommencement of work shall not extend beyond one year, unless *approved* by the *code official*.

125.2 Notices and orders. All notices and orders shall comply with Section 111.2.

125.3 Failure to comply. If the owner of a premises fails to comply with a demolition order within the time prescribed, the *code official* shall cause the structure to be demolished and removed, either through an available public agency or by contract or arrangement with private persons, and the cost of such demolition and removal shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate.

125.4 Salvage materials. When any structure has been ordered demolished and removed in accordance with Section 125.3, the governing body or other designated officer under said contract or arrangement aforesaid shall have the right to sell the salvage and valuable materials at the highest price obtainable. The net proceeds of such sale, after deducting the expenses of such demolition and removal, shall be promptly remitted with a report of such sale or transaction, including the items of expense and the amounts deducted, for the person who is entitled thereto, subject to any order of a court. If such a surplus does not remain to be turned over, the report shall so state.

125.5 Existing remedies. The provisions in this code shall not be construed to abolish or impair existing remedies of the jurisdiction or its officers or agencies relating to the removal or demolition of any structure which is dangerous, unsafe or insanitary.

2. Revise and add the following definitions to the IPSDC:

ADDITION. An extension or increase in floor area, number of stories, or height of a building or structure.

ALTERATION. Any construction or renovation to an existing structure other than repair or addition that requires a *permit*, or a change in a mechanical, plumbing, fuel gas or other system that involves an extension, addition or change to the arrangement, type or purpose of the original installation that requires a *permit*.

APPLIANCE. A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.

APPROVED. Approval by the code official as the result of review, investigation or tests conducted by the code official or by reason of accepted principles or tests by national authorities, or technical or scientific organizations.

APPROVED AGENCY. An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been *approved* by the *code official*.

BUILDING. Any structure used or intended for supporting or sheltering any use or occupancy.

BUILDING OFFICIAL. The officer or other designated authority charged with the administration and enforcement of the *International Building Code*, or a duly authorized representative.

CERTIFICATE OF COMPLETION. A certificate stating that the project or work for which a permit was issued has been completed in compliance with *approved construction documents* and the requirements of this code.

CODE OFFICIAL. The officer or other designated authority charged with the administration and enforcement of this code or a duly authorized representative.

CONSTRUCTION DOCUMENTS. ~~All~~ The written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of the project necessary for obtaining a building permit. ~~The construction drawings shall be drawn to an appropriate scale.~~

EQUIPMENT OR FIXTURE. Any plumbing, heating, electrical, ventilating, air conditioning, refrigerating, and fire protection equipment, apparatus and devices, all piping, ducts, vents, control devices and other systems or components thereof, and elevators, dumb waiters, escalators, boilers, pressure vessels and other mechanical facilities

or installations that are related to building services, any of which are specifically regulated in this code. Appliances as defined by this code shall not be considered equipment. Equipment or fixtures shall not include manufacturing, production, or process equipment, but shall include connections from building service to process equipment.

FIRE CODE OFFICIAL. The fire chief or other designated authority charged with the administration and enforcement of the code, or a duly authorized representative.

IMMINENT DANGER. A condition which could cause serious or life-threatening injury or death at any time.

LABELED. Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-*labeled* items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

LISTED. Equipment, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or services that maintains periodic inspection of production of *listed* equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

LOT LINE. A line dividing one lot from another, or from a street or any public place.

PERMIT. An official document or certificate issued by the authority having jurisdiction which authorizes performance of a specified activity.

REGISTERED DESIGN PROFESSIONAL. An ~~individual~~ architect or engineer who is registered or licensed to practice their respective design profession, as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A *registered design professional* engaged by the owner to review and coordinate certain aspects of the project, as determined by the *building official*, for compatibility with the design of the building or structure, including submittal documents prepared by others, deferred submittal documents and phased submittal documents.

REPAIR. The reconstruction or renewal of any part of an existing building for the purpose of its maintenance.

STRUCTURE. That which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

TOWNHOUSE. A single-family *dwelling unit* constructed in a group of three or more attached units in which each unit extends from the foundation to roof and with open space on at least two sides.

PART X – IWUIC

1. Revise IWUIC (Item 1-L) as follows:

CHAPTER 1
SCOPE AND ADMINISTRATION

PART 1 - GENERAL PROVISIONS

SECTION 101
SCOPE AND GENERAL REQUIREMENTS

101.1 Title. These regulations shall be known as the *Wildland-Urban Interface Code* of [NAME OF JURISDICTION], hereinafter referred to as "this code."

101.2 Scope. The provisions of this code shall apply to the construction, alteration, movement, repair, maintenance and use of any building, structure, or premises within ~~the~~ *wildland-urban interface areas* ~~in this jurisdiction~~.

~~Buildings or conditions in existence at the time of the adoption of this code are allowed to have their use or occupancy continued, if such condition, use or occupancy was legal at the time of the adoption of this code, provided such continued use does not constitute a distinct danger to life or property.~~

101.3 Purpose ~~Objective~~. The ~~objective~~ purpose of this code is to establish minimum requirements ~~regulations~~ consistent with nationally recognized good practice for the safeguarding of life and property. The regulations in this code are intended to mitigate the risk to life and structures from intrusion of fire from wildland fire exposures and fire exposures from adjacent structures, and to mitigate structure fires from spreading to wildland fuels. The extent of this regulation is intended to be tiered commensurate with the relative level of hazard present.

101.3.1 Safeguards The unrestricted use of property in *wildland-urban interface areas* is a potential threat to life and property from fire and resulting erosion. Safeguards to prevent the occurrence of fires and to provide adequate fire-protection facilities to control the spread of fire in *wildland-urban interface areas* shall be in accordance with this code.

101.4 Severability. If a section, subsection, sentence, clause, or phrase of this code is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code.

~~102.5~~ 101.5 Validity ~~Partial invalidity~~. In the event that any part or provision of this code is held to be illegal or void, this shall not have the effect of making illegal or void ~~or illegal~~ any of the other parts or provisions hereof, which are determined to be legal; and it shall be presumed that this code would have been adopted without such illegal or invalid parts or provisions.

101.6 ~~102.2~~ Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state, or federal law.

SECTION 102
APPLICABILITY

102.1 General. Where there is a conflict between a general requirement and a specific requirement of this code, the specific requirement shall be applicable ~~govern~~. Where, in a ~~any~~ specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

~~102.3~~ 102.2 Application of references. References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

~~102.4~~ 102.3 Referenced codes and standards. The codes and standards referenced in this code shall be ~~those that are listed in Chapter 7 and such codes and standards shall be~~ considered ~~as~~ part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between the provisions of this code and the referenced codes and standards, the provisions of this code shall apply ~~govern~~.

Exception: Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing shall govern.

102.4 ~~101.2.1~~ Appendices. Provisions in the appendices shall not apply unless specifically adopted.

~~102.6~~ 102.5 Existing structures and systems ~~conditions~~. The legal occupancy or use of any structure or installed system ~~condition~~ existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the *International Building Code,* the *International Fire Code,* or the *International Property Maintenance Code* ~~or the *International Fire Code*~~, or as is deemed necessary by the code official for the general safety and welfare of the occupants and the public.

102.5.1 Historic buildings. The provisions of this code relating to the construction, alteration, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures identified and classified by the state or local jurisdiction as historic buildings when such buildings or structures are judged by the code official to be safe and in the public interest of health, safety and welfare regarding any proposed construction, alteration, repair, enlargement, restoration, relocation or moving of buildings.

102.6 ~~105.3~~ Alternative materials, design, ~~or~~ methods and equipment. ~~The code official, in concurrence with approval from the *building official* and fire chief, is authorized to approve alternative materials or methods, provided that the~~ The provisions of this code are not intended to prevent the installation of any material, or the use or operation

of appliances, equipment, systems, or method, or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative shall be *approved* where code official finds that the proposed alternative ~~design, use or operation satisfactorily~~ is satisfactory and complies with the intent of the provisions of this code and that the alternative is, for the purpose intended, at least equivalent ~~to the level~~ of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety ~~prescribed by this code~~.

102.6.1 Matters regulated by the *International Building Code*. Approvals under the authority herein contained shall be subject to the approval of the *building official* whenever the alternate ~~material or method~~ involves matters regulated by the *International Building Code*.

102.7 ~~104.5~~ Requirements not covered by code ~~Matters not provided for~~. Requirements that are ~~essential~~ necessary for the ~~public safety~~ strength, stability, or proper operation of an existing or proposed ~~activity, building or~~ fixture, structure, or for the public safety , health, and general welfare, ~~of the occupants thereof, which are~~ not specifically ~~provided for~~ covered by this code, shall be determined by the code official ~~consistent with the necessity to establish the minimum requirements to safeguard the public health, safety and general welfare.~~

102.8 ~~104.4~~ Subjects not regulated by this code. Where no applicable standards or requirements are set forth in this code, or are contained within other laws, codes, regulations, ordinances, or ~~policies~~ bylaws adopted by the jurisdiction, compliance with applicable ~~standards of other~~ nationally recognized ~~safety~~ standards, as *approved*, shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the *code official* to determine compliance with codes or standards for those activities or installations within the *code official's* jurisdiction or responsibility.

102.9 ~~108.11~~ Previous approvals. This code shall not require changes in the construction documents, construction or designated occupancy of a structure for which a lawful permit has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

102.10 Contractor's responsibilities. Every contractor who enters into contracts for which a permit is required shall comply with the state and local rules and regulations concerning licensing.

102.11 Specific application of this code. The following are application specific to this code.

102.11.1 Supplement of other codes. This code shall supplement the jurisdiction's building and fire codes, if such codes have been adopted, to provide for special regulations to mitigate the fire- and life-safety hazards of the *wildland-urban interface areas*.

102.11.2 ~~101.4~~ Retroactivity. The provisions of the code shall apply to conditions arising after the adoption thereof, conditions not legally in existence at the adoption of this code and conditions which, in the opinion of the code official, constitute a distinct hazard to life or property.

Exception: Provisions of this code that specifically apply to existing conditions are retroactive.

102.11.3 ~~101.5~~ Additions or alterations. Additions or alterations shall be permitted to be made to any building or structure without requiring the existing building or structure to comply with all of the requirements of this code, provided the addition or alteration conforms to that required for a new building or structure.

Exception: Provisions of this code that specifically apply to existing conditions are retroactive.

102.11.3.1 Additions or alterations shall not be made to an existing building or structure that will cause the existing building or structure to be in violation of any of the provisions of this code nor shall such additions or alterations cause the existing building or structure to become unsafe. An unsafe condition shall be deemed to have been created if an addition or alteration will cause the existing building or structure to become structurally unsafe or overloaded; will not provide adequate access in compliance with the provisions of this code or will obstruct existing exits or access; will create a fire hazard; will reduce required fire resistance or will otherwise create conditions dangerous to human life.

102.11.4 ~~101.2~~ Moved buildings. Buildings or structures moved into or within the jurisdiction shall comply with the provisions of this code for new buildings or structures.

102.11.5 Unusual circumstances. If the code official determines that difficult terrain, danger of erosion or other unusual circumstances make strict compliance with the vegetation control provisions of the code detrimental to safety or impractical, enforcement thereof may be suspended, provided that reasonable alternative measures are taken.

PART 2 - ADMINISTRATION AND ENFORCEMENT ~~ADMINISTRATIVE PROVISIONS~~

SECTION 103
DEPARTMENT OF WILDLAND-URBAN INTERFACE ENFORCEMENT ~~AGENCY~~

103.1 ~~Creation of enforcement agency~~ General. The Department of Wildland-Urban Interface, herein referred to as "the department," ~~[~~INSERT NAME OF DEPARTMENT~~]~~ is hereby ~~created and the official in charge thereof shall be known as~~ established within the jurisdiction under the direction of the code official. The function of the department shall be the implementation, administration, and enforcement of the provisions of this code.

103.2 Appointment. The code official shall be appointed by the chief appointing authority of the jurisdiction.

103.3 Deputies. In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the code official shall have the authority to appoint a deputy *code official*, related technical officers, inspectors, and other employees ~~deputy(s)~~. Such employees shall have powers as delegated by the code official.

103.4 ~~104.3~~ Liability ~~of the code official~~. The code official, member of the Board of Appeals, officer, or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered ~~personally~~ liable personally, and is hereby relieved from all personal liability for any damages ~~that may accrue~~ accruing to persons or property as a result of an act or by reason of an act or omission in the discharge of ~~such~~ official duties.

103.5 Legal defense. ~~A~~ Any suit ~~brought~~ instituted against ~~the code official~~ an officer or employee of the department because of such act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings. The *code official* or any subordinate shall not be liable for costs in an action, suit, or proceeding that is instituted in pursuance of the provisions of this code. Any officer or employee, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith. ~~or omission performed by the code official or employee in the enforcement of any provision of such codes or other pertinent laws or ordinances implemented through the enforcement of this code or enforced by the code enforcement agency shall be defended by this jurisdiction until final termination of such proceedings, and any judgment resulting therefrom shall be assumed by this jurisdiction. The code enforcement agency or its parent jurisdiction shall not be held as assuming any liability by reason of the inspections authorized by this code or any permits or certificates issued under this code.~~

SECTION 104
DUTIES AND POWERS ~~AUTHORITY~~ OF THE CODE OFFICIAL

104.1 General ~~Powers and duties of the code official~~. The code official is hereby authorized and directed to enforce the provisions of this code. The code official shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies, and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

~~**104.2 Interpretations, rules and regulations.** The code official shall have the power to render interpretations of this code and to adopt and enforce rules and supplemental regulations to clarify the application of its provisions. Such interpretations, rules and regulations shall be in conformance to the intent and purpose of this code.~~

104.1.1 A copy of such ~~rules and regulations~~ policies and procedures shall be filed with the clerk of the jurisdiction and shall be in effect immediately thereafter. Additional copies shall be available for distribution to the public.

104.2~~6~~ Applications and permits. The code official is authorized to receive applications, review construction documents, ~~and~~ issue permits required ~~for construction regulated~~ by this code~~, issue permits for operations regulated by this code~~, inspect the premises for which such permits have been issued, and enforce compliance with the provisions of this code.

104.3 Notices and orders. The *code official* shall issue all necessary notices or orders to ensure compliance with this code.

104.10 109.2 Enforcement. Enforcement shall be in accordance with Sections 109.2.1 and 109.2.2.

104.10.1 109.2.1 Authorization to issue corrective orders and notices. When the code official finds any building or premises that are in violation of this code, the code official is authorized to issue corrective orders and notices.

104.10.2 109.2.2 Service of orders and notices. Orders and notices authorized or required by this code shall be given or served on the owner, operator, occupant or other person responsible for the condition or violation either by verbal notification, personal service, or delivering the same to, and leaving it with, a person of suitable age and discretion on the premises; or, if no such person is found on the premises, by affixing a copy thereof in a conspicuous place on the door to the entrance of said premises and by mailing a copy thereof to such person by registered or certified mail to the person's last known address.

104.10.3 Orders or notices that are given verbally shall be confirmed by service in writing as herein provided.

104.4 Inspections. The *code official* shall make all of the required inspections, or the *code official* shall have the authority to accept reports of inspection by *approved agencies* or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such *approved agency* or by the responsible individual. The *code official* is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

104.5 Identification. The *code official* shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

104.6 109.3 Right of entry. Whenever Where necessary to make an inspection to enforce any of the provisions of this code, or whenever where the code official has reasonable cause to believe that there exists in any building a structure or upon any a premises any condition that makes such a condition which is contrary to or in violation of this code which makes the building structure or premises unsafe, dangerous, or hazardous, the code official is authorized to enter such building structure or premises at all reasonable times to inspect the same or to perform any duty authorized the duties imposed by this code, provided that if such building structure or premises is be occupied, the code official shall first present proper that credentials be presented to the occupant and request entry requested.; and If such building structure or premises is unoccupied, the code official shall first make a reasonable effort to locate the owner or other persons person having charge or control of the building structure or premises and request entry. If such entry is refused, the code official shall have recourse to every remedy the remedies provided by law to secure entry.

104.6.1 Warrant. When the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner or occupant or person Owners, occupants or any other persons having charge, care or control of any building structure or premises, shall not fail or neglect, after proper request is made as herein provided, to promptly permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

104.7 Department records. The *code official* shall keep official records of applications received, *permits* and certificates issued, fees collected, reports of inspections, and notices and orders issued. Such records shall be retained in the official records for the period required for retention of public records.

104.7 104.8 Assistance of other agencies. The code official is authorized to request, and shall receive so far as is required in the discharge of the duties described in this code, the assistance and cooperation of other officials of the jurisdiction. When requested to do so by the code official, other officials of this jurisdiction shall assist and cooperate with the code official in the discharge of the duties required by this code.

104.9 Specific duties. The following are specific duties of the code official. [JURISDICTION TO INSERT CODE OFFICIAL DUTIES SPECIFIC TO THIS CODE]

SECTION 105 107
PERMITS

107.1 General. When not otherwise provided in the requirements of the building or fire code, permits are required in accordance with Sections 107.2 through 107.10.

105.1 ~~107.2~~ Permit~~s~~ required. Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to construct, erect, install, enlarge, alter, repair, remove, convert, or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the *code official* and obtain the required *permit* for the project. Where laws or regulations are enforceable by other agencies or departments, approval shall be obtained from all agencies or departments concerned. ~~Unless otherwise exempted, no building or structure regulated by this code shall be erected, constructed, altered, repaired, moved, removed, converted, demolished or changed in use or occupancy unless a separate permit for each building or structure has first been obtained from the code official.~~

105.1.1 Annual permit. In lieu of an individual *permit* for each *alteration* to an already *approved* electrical, gas, mechanical or plumbing installation, the *code official* is authorized to issue an annual *permit* upon application therefor to any person, firm or corporation regularly employing one or more qualified tradespersons in the building, structure, or on the premises owned or operated by the applicant for the *permit*.

105.1.1.1 Annual permit records. The person to whom an annual *permit* is issued shall keep a detailed record of *alterations* made under such annual *permit*. The *code official* shall have access to such records at all times, or such records shall be filed with the *code official* as designated.

105.1.2 Emergency repairs. Where equipment replacements and repairs must be performed in an emergency situation, the *permit* application shall be submitted within the next working business day to the *code official*.

105.1.3 Permits specifically required. The following specifically require a permit.

105.1.3.1 Other permits required. When required by the code official, a permit shall be obtained for the following activities, operations, practices or functions within a ~~an~~ *wildland-urban interface area*:

1. Automobile wrecking yard.
2. Candles and open flames in assembly areas.
3. Explosives or blasting agents.
4. Fireworks.
5. Flammable or combustible liquids.
6. Hazardous materials.
7. Liquefied petroleum gases.
8. Lumberyards.
9. Motor vehicle fuel-dispensing stations.
10. Open burning.
11. Pyrotechnical special effects material.
12. Tents, canopies and temporary membrane structures.
13. Tire storage.
14. Welding and cutting operations.

105.1.3.2 Temporary uses. For buildings or structures erected for temporary uses, see Section 123 and Appendix A, Section A108.3, ~~of this code~~.

105.2 ~~107.3~~ Permit not required ~~Work exempt from permit~~. ~~Unless otherwise provided in the requirements of the *International Building Code* or *International Fire Code*, a permit shall not be required for the following.~~ Exemption from the permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. *Permits* shall not be required in accordance with Sections 105.2.1 through 105.2.3.

105.2.2 Repairs. Application or notice to the *code official* is not required for ordinary repairs to structures, replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required *means of egress*, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include *addition* to, *alteration* of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

105.2.3 Public service agencies. A *permit* shall not be required for the installation, *alteration,* or repair of generation, transmission, distribution, or metering or other related equipment that is under the ownership and control of public service agencies by established right.

105.2.3 Specific exemption. The following are specifically exempt from requiring a permit.

1. One-story detached accessory buildings used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11.15m2) and the structure is located more than 50 feet (15 240 mm) from the nearest adjacent structure.
2. Fences not over 6 feet (1829 mm) high.

105.3 ~~107.4~~ Application for permit ~~application~~. To obtain a permit, the applicant shall first file an application therefor in writing on a form furnished by the department ~~code enforcement agency~~ for that purpose. ~~Every~~ Such application shall:

1. Identify and describe the project ~~work~~, ~~activity, operation, practice or function~~ to be covered by the permit for which application is made.
2. Describe the land on which the proposed project ~~work~~, ~~activity, operation, practice or function~~ is to be done by legal description, street address or similar description that will readily identify and definitely locate the proposed building~~,~~ or project ~~work, activity, operation, practice or function~~.
3. Indicate the use or occupancy for which the proposed project ~~work, activity, operation, practice or function~~ is intended.
4. Be accompanied by *construction documents* ~~plans, diagrams, computation and specifications~~ and other data as required in Section 106 ~~108~~ of this code.
5. State the valuation of the proposed project ~~any new building or structure or any addition, remodeling or alteration to an existing building~~.
6. Be signed by the applicant, or the applicant's authorized agent.
7. Give such other data and information as ~~may be~~ required by the code official.

105.3.1 Permit valuations. *Permit* valuations required under Section 105.3(5) shall include total value of the project, including materials and labor, and electrical, gas, mechanical, plumbing equipment and other permanent systems for which the *permit* is being issued. If, in the opinion of the *code official*, the valuation is underestimated on the application, the *permit* shall be denied, unless the applicant can show detailed estimates to meet the approval of the *code official*. Final building *permit* valuation shall be set by the *code official*.

105.4 ~~107.5~~ Action on application ~~Permit approval~~. ~~Before a permit is issued,~~ The code official~~, or an authorized representative,~~ shall examine or cause to be examined applications for *permits* and amendments thereto within a reasonable time after filing If the application or the *construction documents* do not conform to the requirements of pertinent laws, the *code official* shall reject such application in writing, stating the reasons therefor. If the *code official* is satisfied that the proposed project conforms to the requirements of this code and laws and ordinances applicable thereto, the *code official* shall issue a permit therefor as soon as practicable. ~~review and approve all permitted uses, occupancies or structures. Where laws or regulations are enforceable by other agencies or departments, a joint approval shall be obtained from all agencies or departments concerned~~.

105.4.1 ~~107.4.1~~ Preliminary inspection. Before a permit is issued, the code official is authorized to inspect and ~~approve~~ evaluate the systems, equipment, buildings, devices, premises and spaces or areas to be used.

105.4.2 ~~108.12~~ ~~Phased approval~~ Conditional permits. The code official is authorized to issue a permit for the construction or operation of part of the project such as the construction of foundations or any other part of a building or structure, or installation of systems or materials, or operation before the construction documents for the entire project ~~whole building or structure~~ have been submitted, provided that adequate information and detailed statements have been filed complying with pertinent requirements of this code. The holder of such permit ~~for the foundation or other parts of a building or structure~~ shall proceed only to the point for which approval has been given, at the permit holder's own risk, ~~with the building operation~~ and without assurance that a permit for the entire project ~~structure~~ will be granted.

~~The code official is authorized to stipulate conditions for permits. Permits shall not be issued when public safety would be at risk, as determined by the code official.~~

~~**107.6 Permit issuance.** The application, plans, specifications and other data filed by an applicant for a permit shall be reviewed by the code official. If the code official finds that the work described in an application for a permit and the plan, specifications and other data filed therewith conform to the requirements of this code, the code official is allowed to issue a permit to the applicant.~~

~~**107.6.1 Refusal to issue a permit.** Where the application or construction documents do not conform to the requirements of pertinent laws, the code official shall reject such application in writing, stating the reasons therefor.~~

105.5 ~~**107.4.2**~~ **Time limitation of application.** An application for a permit for any proposed project ~~work~~ shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a permit has been issued; except that the code official is authorized to grant one or more extensions of time for additional periods not exceeding 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

105.6 ~~**107.7**~~ **Validity of permit.** The issuance or granting of a permit ~~or approval of plans, specifications and computations~~ shall not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or of any other ordinance of the jurisdiction. Permits presuming to give authority to violate or cancel ~~conceal~~ the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a *permit* based on *construction documents* and other data shall not prevent the *code official* from requiring the correction of errors in the *construction documents* and other data.

105.7 Extensions of permit. ~~Any permittee holding~~ For an unexpired permit, ~~may apply for an extension of the time within which work may commence under that permit when the permittee is unable to commence work within the time required by this section for good and satisfactory reasons.~~ the code official ~~may extend the time for action by the permittee for a period not exceeding~~ is authorized to grant, in writing, one or more extensions of the time, for periods of not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated. ~~on written request by the permittee showing that circumstances beyond the control of the permittee have prevented action from being taken. No permit shall be extended more than once.~~

105.8 ~~**107.8**~~ **Expiration of permit.** Every permit issued ~~by the code official under the provisions of this code~~ shall ~~expire by limitation and become null and void if the building, use or~~ become invalid unless the work on the site authorized by such permit is ~~not~~ commenced within 180 days after its issuance ~~from the date of such permit~~, or if the ~~building, use or~~ work authorized on the site by such permit is suspended or abandoned ~~at any time after the work is commenced~~ for a period of 180 days after the time the work is commenced.

105.8.1 Recommencement of work. Before such work covered under an expired permit recommences, a new permit shall be first obtained. The new permit shall be issued provided no changes have been made or will be made in the original construction documents for such work, and provided further that such suspension or abandonment has not exceeded one year.

105.9 ~~**107.10**~~ **Suspension or revocation of permits.** The *code official* is authorized to suspend or revoke a *permit* issued under the provisions of this code whenever the *permit* is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or regulation or any of the provisions of this code. ~~Permits issued under this code may be suspended or revoked when it is determined by the code official that:~~

~~1. It is used by a person other than the person to whom the permit was issued.~~
~~2. It is used for a location other than that for which the permit was issued.~~
~~3. Any of the conditions or limitations set forth in the permit have been violated.~~
~~4. The permittee fails, refuses or neglects to comply with any order or notice duly served on him under the provisions of this code within the time provided therein.~~
~~5. There has been any false statement or misrepresentation as to material fact in the application or plans on which the permit or application was made.~~
~~6. When the permit is issued in error or in violation of any other ordinance, regulations or provisions of this code.~~

~~The code official is allowed to, in writing, suspend or revoke a permit issued under the provisions of this code whenever the permit is issued in error or on the basis of incorrect information supplied, or in violation of any ordinance or regulation or any of the provisions of this code.~~

105.10 ~~**107.9**~~ **Posting of permit.** ~~**Retention of permits.**~~ Issued permits or copy thereof shall be kept on the site of the project until the completion of the project. ~~Permits shall at all times be kept on the premises designated therein and shall at all times be subject to inspection by the code official or other authorized representative.~~

SECTION 106 ~~108~~
SUBMITTAL DOCUMENTS
~~PLANS AND SPECIFICATIONS~~

106.1 ~~108.1~~ General. ~~Plans, engineering calculations, diagrams~~ Submittal documents consisting of construction documents and other supporting data shall be submitted in ~~at least~~ two or more sets with each application for a permit, and in such form and detail as required by the *code official*. The *code official* shall require construction documents and other data to ~~shall~~ be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the code official is authorized to require ~~additional~~ necessary construction documents to be prepared by a registered design professional.

Exception: The *code official* is authorized to waive the submission of ~~plans, calculations, construction inspection requirements~~ *construction documents* and other data not required to be prepared by a *registered design professional*, if ~~it is found that~~ the nature of the work applied for is such that ~~reviewing~~ review of *construction documents* ~~plans~~ is not necessary to obtain compliance with this code.

106.2 Construction documents. *Construction documents* shall be in accordance with Sections 106.2.1 through 106.2.4.

106.2.1 ~~108.2~~ Information on construction documents ~~plans and specifications~~. *Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the proposed project, and show in detail that the proposed project will conform to the provisions of this code and relevant laws, ordinances, rules, and regulations, as determined by the *code official*. Plans a~~nd specifications~~ shall be ~~drawn~~ to scale and be on suitable material. ~~upon substantial paper or cloth and shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in detail that it will conform to the provisions of this code and all relevant laws, ordinances, rules and regulations.~~ Electronic media documents are permitted to be submitted when *approved* by the *code official*.

106.2.1.1 Specific information required. Where the quality of the materials is essential for conformity to this code, specific information shall be given to establish such quality. The terms “this code” or “legal” or “its equivalent” shall not be cited or used as a substitute for specific information.

106.2.2 Site plan. The *construction documents* submitted with the application for *permit* shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from *lot lines*, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and *design flood* elevations. The site plan shall be drawn in accordance with an accurate boundary line survey.

106.2.2.1 Site plan for demolition. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot.

106.2.2.2. Waiver of site plan. The *code official* is authorized to waive or modify the requirement for a site plan when the application for *permit* is for *alteration* or repair or when otherwise warranted.

106.2.3 Specific Information. The following are specific requirements for submittal documents required by this code.

106.2.3.1 ~~108.3~~ Additional site plan information. In addition to the requirements for plans in the *International Building Code*, site plans shall include:

1. topography,
2. width and percent of grade of access roads,
3. landscape and vegetation details,
4. locations of structures or building envelopes,
5. existing or proposed overhead utilities,
6. occupancy classification of buildings,
7. types of ignition-resistant construction of buildings, structures and their appendages,
8. roof classification of buildings, and
9. site water supply systems.

~~The code official is authorized to waive or modify the requirement for a site plan when the application for permit is for alteration or repair or when otherwise warranted.~~

106.2.3.2 ~~108.4~~ Vegetation management plans. When utilized by the permit applicant pursuant to Section 502, vegetation management plans shall be prepared and shall be submitted to the code official for review and approval as part of the plans required for a permit.

106.2.3.3 ~~108.5~~ Fire protection plan. When required by the code official pursuant to Section 405, a fire protection plan shall be prepared and shall be submitted to the code official for review and *approved* as a part of the plans required for a permit.

106.2.3.4 ~~108.7~~ Vicinity plan. In addition to the requirements for site plans, plans shall include details regarding the vicinity within 300 feet (91 440 mm) of property lines, including other structures, slope, vegetation, *fuel breaks*, water supply systems and access roads.

106.2.3.5 ~~108.6~~ Other data and substantiation. When required by the code official, the plans and specifications shall include classification of fuel loading, fuel model light, medium or heavy, and substantiating data to verify classification of fire-resistive vegetation.

106.2.4 Design professional in responsible charge. When it is required that documents be prepared by a *registered design professional*, the *code official* shall be authorized to require the owner to engage and designate on the building *permit* application a *registered design professional* who shall act as the *registered design professional in responsible charge*. If the circumstances require, the owner shall designate a substitute *registered design professional in responsible charge* who shall perform the duties required of the original *registered design professional in responsible charge*. The *code official* shall be notified in writing by the owner if the *registered design professional in responsible charge* is changed or is unable to continue to perform the duties.

106.2.4.1 Responsibility. The *registered design professional in responsible charge* shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

106.2.4.2 Observation. Where structural observation is required, the inspection program shall name the individual or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur.

106.3 Deferred submittals. For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the *code official* within a specified period.

106.3.1 Prior approval. Deferral of any submittal items shall have the prior approval of the *code official*. The *registered design professional in responsible charge* shall list the deferred submittals on the *construction documents* for review by the *code official*.

106.3.2 Review. Documents for deferred submittal items shall be submitted to the *registered design professional in responsible charge* who shall review them and forward them to the *code official* with a notation indicating that the deferred submittal documents have been reviewed and been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the deferred submittal documents have been *approved* by the *code official*.

106.4 ~~108.9~~ Examination of documents. The code official shall examine or cause to be examined the ~~accompanying~~ submittal ~~construction~~ documents and shall ascertain by such examinations whether the ~~construction~~ project indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

106.5 ~~107.6~~ Approval of construction documents. When the code official issues ~~the~~ a permit, the ~~code official~~ *construction documents* and other data shall endorsed, in writing or by stamp, as ~~the plans and specifications~~ "APPROVED." One set of *construction documents* and other data so reviewed shall be retained by the *code official*. The other set(s) shall be returned to the applicant. One set shall be kept at the site of the project and shall be open to inspection by the *code official* or a duly authorized representative. Such *approved* ~~plans and specifications~~ *construction documents* shall not be changed, modified or altered without authorization from the code official.~~, and~~ All work ~~regulated by this code~~ shall be done in accordance with the *approved construction documents* ~~plans~~.

106.6 ~~108.10~~ Amended construction documents. Any changes made during construction that are not in compliance with the *approved construction* documents shall be resubmitted for approval as an amended set of construction documents.

106.7 ~~108.8~~ Retention of construction documents ~~plans.~~ One set of *approved construction documents* ~~plans, specifications and computations~~ shall be retained by the code official for a period of not less than 180 days from date of completion of the permitted project ~~work~~ or for the period required for retention of public records. ~~as required by state or local laws; and one set of *approved* plans and specifications shall be returned to the applicant, and said set shall be kept on the site of the building, use or work at all times during which the work authorized thereby is in progress.~~

SECTION 107 ~~105~~
MODIFICATIONS, TESTING, AND APPROVAL
~~COMPLIANCE ALTERNATIVES~~

105.1 Modifications ~~Practical difficulties.~~ ~~When~~ Wherever there are practical difficulties involved in carrying out the provisions of this code, and upon application of the owner or owner's representative, the code official is authorized to grant modifications for individual cases ~~on application in writing by the owner or a duly authorized representative~~. provided the code official shall first find that a special individual reason makes ~~enforcement of~~ the strict letter of this code impractical~~,~~ and the modification is in conformance ~~to~~ with the intent and purpose of this code, and ~~the~~ that such modification does not lessen ~~any fire protection requirements or any degree of~~ health, life and fire safety, accessibility, or structural requirements ~~integrity~~. The details of any action granting modifications shall be recorded and entered into the files of the department ~~code enforcement agency~~.

~~The code official shall require that sufficient evidence or proof be submitted to substantiate any claims that may be made regarding its use. The details of any action granting approval of an alternate shall be recorded and entered in the files of the code enforcement agency.~~

107.2 Approved materials and equipment. All materials, equipment, and devices *approved* by the *code official* shall be constructed and installed in accordance with such approval.

107.3 Used materials, appliances and equipment. The use of used materials that meet the requirements of this code for new materials is permitted. Used appliances, equipment and devices shall not be reused unless such elements are in good repair or have been reconditioned and tested when necessary, placed in good and proper working condition, and *approved* by the *code official*.

107.4 Listed and labeled material and appliances. Listed and labeled materials, equipment, and appliances shall be used and installed in accordance with the conditions the listing and the manufacturer's instructions.

107.5 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

107.6 ~~105.2~~ Technical assistance. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, or to determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building or premises ~~subject to the inspection of the code official~~, the code official ~~is~~ shall have the authority ~~authorized~~ to require be tests conducted, or a technical opinion, recommendation or report be submitted as evidence of compliance. ~~the owner or the person in possession or control of the building or premises to provide,~~ The tests, opinions, recommendations and reports shall be made at no expense ~~without charge~~ to the jurisdiction. ~~, a technical opinion and report. The opinion and report shall be prepared by a qualified engineer, specialist, laboratory or fire safety specialty organization acceptable to the code official and the owner and shall analyze the fire safety of the design, operation or use of the building or premises, the facilities and appurtenances situated thereon and fuel management for purposes of establishing fire hazard severity to recommend necessary changes.~~

107.6.1 Preparation. The technical reports and opinions shall be prepared by a qualified engineer, approved specialist or specialty organization, or an *approved agency*.

107.6.2 Test methods. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the code official shall approve the testing procedures.

107.6.3 Testing agency. All tests shall be performed by an *approved agency*.

107.6.4 Retention of reports. The technical opinions, recommendation, reports and test results shall be retained by the code official for the period required for retention of public records.

SECTION 108 ~~109~~
INSPECTION ~~AND ENFORCEMENT~~

108.1 ~~109.1.1~~ General. ~~All~~ Construction or work on a project for which a *permit* is required shall be subject to inspection by the ~~*building*~~ *code official* and such construction or work shall remain accessible and exposed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the *permit* applicant to cause the construction or work to remain accessible and exposed for inspection purposes. Neither the ~~*building*~~ *code official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

108.1.1 Replacement of existing appliance. The requirements of this section shall not be considered to prohibit the operation of any heating or cooling *equipment* or appliances installed to replace such existing *equipment* or appliances serving an occupied portion of a structure provided that a request for inspection of such *equipment* or appliances has been filed with the department not more than 48 hours after such replacement work is completed, and before any portion of such *equipment* or appliances is concealed by any permanent portion of the structure.

108.2 ~~109.1~~ ~~Inspection~~ Required inspections and testing. ~~Inspections shall be in accordance with~~ The *code official*, upon notification, shall make the inspections and require the tests set forth in Sections ~~109.1.1~~ 108.2.1 through 108.2.4 ~~109.1.4.3~~.

108.2.1 Specific Inspections. The following are specific inspections and tests required by this code.

108.2.1.1 ~~109.1.2 Authority to inspect.~~ The code official shall inspect, as often as necessary, buildings and premises, including such other hazards or appliances designated by the code official for the purpose of ascertaining and causing to be corrected any conditions that could reasonably be expected to cause fire or contribute to its spread, or any violation of the purpose of this code and of any other law or standard affecting fire safety.

108.2.1.2 Where required by the code official, a survey of the lot shall be provided to verify that the mitigation features are provided and the building or structure is located in accordance with the *approved* plans.

108.2.1.3 ~~109.1.4~~ Testing. Installations shall be tested as required in this code and in accordance with Sections ~~109.1.4.1~~ **108.2.3.1** through **108.2.3.2** ~~109.1.4.3~~. Tests shall be made by the permit holder or authorized agent and observed by the code official.

108.2.1.3.1 ~~109.1.4.1~~ New, altered, extended or repaired installations. New installations and parts of existing installations, which have been altered, extended, renovated or repaired, shall be tested as prescribed herein to disclose defects.

108.2.1.3.2 ~~109.1.4.2~~ Apparatus, instruments, material and labor for tests. Apparatus, instruments, material and labor required for testing an installation or part thereof shall be furnished by the permit holder or authorized agent.

~~**109.1.3 Reinspections.** To determine compliance with this code, the code official may cause a structure to be reinspected. A fee may be assessed for each inspection or Reinspection when such portion of work for which inspection is called is not complete or when corrections called for are not made. Reinspection fees may be assessed when the *approved* plans are not readily available to the inspector, for failure to provide access on the date for which inspection is requested or for deviating from plans requiring the approval of the code official. To obtain a reinspection, the applicant shall pay the Reinspection fee as set forth in the fee schedule adopted by the jurisdiction. When reinspection fees have been assessed, no additional inspection of the work will be performed until the required fees have been paid.~~

~~**109.1.4.3 Reinspection and testing.** Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the code official for inspection and testing.~~

108.2.2 Other inspections. In addition to the inspections specified above, the *code official* is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department.

108.2.3 Special inspections. Special inspection shall be as required by this code, the *International Building Code*, or the *International Fire Code* as applicable.

108.2.4 Final inspection. A final inspection shall be made after all work on a project required by the *permit* is completed.

108.3 ~~109.1.2.1 Approved~~ Inspection agencies. The code official is authorized to accept reports of *approved* inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.

108.4 ~~109.1.2.2~~ Inspection requests. It shall be the duty of the holder of the permit or their duly authorized agent to notify the code official when a project ~~work~~ is ready for inspection. It shall be the duty of the permit holder to provide access to and means for inspections of such work that are required by this code.

108.4.1 Manufacturer's instructions. Manufacturer's instructions for equipment, appliances, and materials installed under the permit shall be available on the work site at the time of inspection.

108.5 ~~109.1.2.3~~ Approval required. Work on a project shall not proceed ~~be done~~ beyond the point indicated in each successive inspection without first obtaining the approval of the code official. The code official, upon notification, shall make the requested inspections and shall either ~~indicate~~ determine the portion of the project ~~construction~~ that is satisfactory as completed, or notify the permit holder or ~~his or her~~ authorized agent wherein the same fails to comply with this code. Any portions of the project that do not comply shall be corrected and such portion shall not be covered, ~~or~~ concealed, or used until authorized by the code official.

108.6 Notice of approval. After all prescribed inspections or tests indicate the work complies with this code, a certificate of completion complying with Section 109 shall be issued by the code official.

SECTION 109 ~~110~~ CERTIFICATE OF COMPLETION AND OCCUPANCY

109.1 ~~110.1 General~~ Use and occupancy. No building, structure or premises or portion thereof shall be used or occupied until the code official has issued a certificate of occupancy as provided herein. No equipment, appliance or system used, and no change in the existing occupancy classification of a building, structure, premise or portion thereof shall be made until the code official has issued a certificate of completion ~~therefor~~ as provided herein. ~~The certificate of occupancy shall not be issued until the certificate of completion indicating that the project is in compliance with this code has been issued by the code official.~~

Exceptions:

1. Occupancy shall be permitted during **e**mergency situations as described under Section 105.1.
~~1.~~ 2. Certificates of occupancy or completion are not required for work exempt from permits under Section 105.2 ~~107.3~~.
3. Occupancy shall be permitted during the replacement of existing appliances as described under Section 108.1.1.
~~2.~~ 4. Certificates of occupancy are not required for one-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m^2).

109.1.1 Validity. ~~110.2 Certificate of occupancy.~~ Issuance of a certificate of occupancy or occupancy shall not be construed as an approval of a violation of the provisions of this code or of other pertinent laws and ordinances of the jurisdiction. Certificates presuming to give authority to violate or cancel the provisions of this code or other laws or ordinances of the jurisdiction shall not be valid.

109.2 Certificate issued. After the *code official* inspects a project requiring a permit and finds no violations of the provisions of this code or other laws that are enforced by the department, the *code official* shall issue a certificate of completion. After all certificates of completion have been issued by other departments or agencies concerned, the code official shall issue a certificate of occupancy where applicable. A certificate of completion or occupancy shall contain the following:

1. The *permit* number.
2. The address of the premises or structure.

3. The name and address of the owner.
4. A description of the project for which the certificate is issued.
5. A statement that the described project has been inspected for compliance with the requirements of this code.
6. The name of the *code official*.
7. The edition of the code under which the *permit* was issued.
8. The use and occupancy in accordance Chapter 3 of the International Building Code.
9. The type of construction as defined in Chapter 6 of the International Building Code.
10. The design *occupant load*.
11. If fire protection systems are provided, whether the fire protection systems are required.
12. Any special stipulations and conditions of the *permit*.

Exceptions:

1. A certificate of completion or occupancy shall not be required to indicate the items under Section 109.2, Items 8, 9, and 10 for detached one- and two family dwellings and multiple single-family *dwellings* (*townhouses)* constructed using the *International Residential Code*.
2. The *code official* is shall not be required to indicate on a certificate items under Section 109.2, Items 8, 9, and 10 for the installation of equipment, appliances or systems.

109.3 ~~110.3~~ Temporary occupancy. The code official is authorized to issue a temporary certificate of occupancy before the completion of the entire work covered by the permit, provided that such portion or portions shall be occupied safely and without endangerment to life or public welfare. The temporary certificate shall indicate any limitations or restrictions necessary to keep the permit area safe, and items required to obtain the final certificate of occupancy. The code official shall set a time period during which the temporary certificate of occupancy is valid.

109.4 ~~110.4~~ Revocation. The code official is authorized to, in writing, suspend or revoke a certificate of occupancy or completion issued under the provisions of this code wherever the certificate is issued in error~~,~~ on the basis of incorrect information supplied, or where it is determined that the building, ~~or~~ structure, premise, or portion thereof, or installation of appliance, equipment or system is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION 110 ~~114~~
STOP WORK ORDER

110.1 ~~114.1~~ Authority. Whenever the *code official* finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or dangerous or unsafe, the *code official* is authorized to issue a stop work order.

110.2 ~~114.2~~ Issuance. The stop work order shall be in writing and shall be given to the owner of the property involved, or to the owner's ~~authorized~~ agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order, and the conditions under which the cited work will be permitted to resume.

110.2.1 ~~114.3~~ Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

110.3 ~~114.4 Failure to comply~~ Unlawful continuance. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fees, fines, or penalties as prescribed by this code or other laws or ordinances of the jurisdiction ~~liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars~~.

SECTION 111
VIOLATIONS

111.1 Code violations. No person, association, organization, or business entity of any form shall:

1. Erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or premises in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
2. Install or operate any equipment, appliances, or systems regulated by this code that is in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
3. Be non-compliant with the conditions of any permit or certificate issued under the auspices of this code; or

4. Tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*.

111.2 Notice of violation. A *code official* who observes or becomes aware of any code violation shall serve upon the responsible person, association, organization, or business entity a written notice in accordance with Section 111.2.1. In the absence of direct knowledge as to the identity or location of the responsible party, the *code official* shall serve the notice upon the property owner. Service may be effected by personal delivery, first class mail, substituted service, or such other means that may be authorized by state and/or local law.

111.2.1 Form of notice. Such notice of violation shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the violation into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties in accordance with Section 111.3.

111.3 Penalties. Violators who fail to comply with a notice to discontinue or abate a condition in violation of this code, and violators who tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*, shall be subject to the penalties set forth in this code as may be adopted and authorized by state and/or local law.

~~**109.4 Compliance with orders and notices.** Compliance with orders and notices shall be in accordance with Sections 109.4.1 through 109.4.8.~~

~~**109.4.1 General compliance.** Orders and notices issued or served as provided by this code shall be complied with by the owner, operator, occupant or other person responsible for the condition or violation to which the corrective order or notice pertains. If the building or premises is not occupied, such corrective orders or notices shall be complied with by the owner.~~

~~**109.4.2 Compliance with tags.** A building or premises shall not be used when in violation of this code as noted on a tag affixed in accordance with Section 109.4.1.~~

~~**109.4.3 Removal and destruction of signs and tags.** A sign or tag posted or affixed by the code official shall not be mutilated, destroyed or removed without authorization by the code official.~~

~~**109.4.4 Citations.** Persons operating or maintaining an occupancy, premises or vehicle subject to this code who allow a hazard to exist or fail to take immediate action to abate a hazard on such occupancy, premises or vehicle when ordered or notified to do so by the code official shall be guilty of a misdemeanor.~~

~~**109.4.6 Prosecution of violation.** If the notice of violation is not complied with promptly, the code official is authorized to request the legal counsel of the jurisdiction to institute the appropriate proceeding at law or in equity to restrain, correct or abate such violation, or to require the removal or termination of the unlawful occupancy of the building or structure in violation of the provisions of this code or of the order or direction made pursuant thereto.~~

~~**109.4.7 Violation penalties.** Persons who shall violate a provision of this code or shall fail to comply with any of the requirements thereof or who shall erect, install, alter, repair or do work in violation of the *approved* construction documents or directive of the code official, or of a permit or certificate used under provisions of this code, shall be guilty of a [SPECIFY OFFENSE], punishable by a fine of not more than [AMOUNT] dollars or by imprisonment not exceeding [NUMBER OF DAYS], or both such fine and imprisonment. Each day that a violation continues after due notice has been served shall be deemed a separate offense.~~

~~**109.4.8 Abatement of violation.** In addition to the imposition of the penalties herein described, the code official is authorized to institute appropriate action to prevent unlawful construction or to restrain, correct or abate a violation; or to prevent illegal occupancy of a structure or premises; or to stop an illegal act, conduct of business or occupancy of a structure on or about any premises.~~

SECTION 112 ~~106~~
MEANS OF APPEALS

112.1 Application for appeal. Any person directly affected by a decision of the *code official* or a notice or order issued under this code shall have the right to appeal to the board of appeals, provided that a written application for appeal is filed within 20 days after the day the decision, notice or order was served. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or the requirements of this code are adequately satisfied by other means.

112.1.1 Stays of enforcement. The filing of an appeal of notice or orders, except for notice or order concerning *Imminent Danger*, shall stay the enforcement of the notice or order until the appeal is heard by the board of appeals.

112.2 Membership of board. The board of appeals shall consist of five members who are qualified by experience and training to pass on matters pertaining to the provisions of this code. The board shall be appointed by the chief appointing authority, and shall serve staggered and overlapping terms.

112.2.1 Alternate members. The chief appointing authority shall appoint two or more alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership and shall be appointed for five years, or until a successor has been appointed.

112.2.2. An employee of the jurisdiction shall not be a member of the board of appeals. The *code official* shall be an ex officio member of the board but shall have no vote on any matter before the board.

112.2.3 Chairman. The board shall annually select one of its members to serve as chairman.

112.2.4 Secretary. The chief administrative officer shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

112.2.5 Qualifications. The board of appeals shall consist of five individuals, one from each of the following professions or disciplines.

1. Registered design professional who is a registered architect; or a builder or superintendent of building construction with at least 10 years' experience, five of which shall have been in responsible charge of work.
2. Registered design professional with structural engineering or architectural experience.
3. Registered design professional with fuel gas and plumbing engineering experience; or a fuel gas contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
4. Registered design professional with electrical engineering experience; or an electrical contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
5. Registered design professional with fire protection engineering experience; or a fire protection contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.

112.2.6 Disqualification of member. A member shall not hear an appeal in which that member has a personal, professional or financial interest.

112.2.7 Terms. The initial members of the board of appeals shall serve as follows: one for five years; one for four years; one for three years; one for two years and one for one year. Thereafter, each new member shall serve for five years or until a successor has been appointed.

112.2.8 Compensation of members. Compensation of members shall be determined by law.

112.3 Hearings and meetings. Hearings on appeals and other meetings of the board of appeals shall be held in conformance with Sections 109.3.1 through 109.3.3.

112.3.1 Procedures. The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

112.3.2 Notice. The board shall hold a hearing upon notice from the chairman, within 10 days of the filing of an appeal, or at stated periodic meetings.

112.3.3 Open hearing. All hearings before the board shall be open to the public. A quorum shall consist of not less than two-thirds of the board membership. The appellant, the appellant's representative, the *code official* and any person whose interests are affected shall be given an opportunity to be heard.

112.3.4 Postponed hearing. When the full board is not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

112.4 Board decision. The board shall modify or reverse the decision of the *code official* by a concurring vote of a majority of the total number of appointed board members.

112.4.1 Resolution. The decision of the board shall be by resolution. Certified copies shall be furnished to the appellant and to the code official.

112.4.2 Action by code official. The *code official* shall take immediate action in accordance with the decision of the board.

112.5 Court review. Any person, whether or not a previous party to the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

~~**106.1 General.** To determine the suitability of alternative materials and methods and to provide for reasonable interpretations of the provisions of this code, there shall be and hereby is created a board of appeals consisting of five members who are qualified by experience and training to pass judgment on pertinent matters. The code official, *building official* and fire chief shall be ex officio members, and the code official shall act as secretary of the board. The board of appeals shall be appointed by the legislative body and shall hold office at their discretion. The board shall adopt reasonable rules and regulations for conducting its investigations and shall render decisions and findings in writing to the code official, with a duplicate copy to the applicant.~~

~~**106.2 Limitations of authority.** The board of appeals shall not have authority relative to interpretation of the administrative provisions of this code and shall not have authority to waive requirements of this code.~~

SECTION 113 ~~112~~
FEES

113.1 ~~112.1~~ Payment of fees. A permit or an amendment to a permit shall not be issued until the fees prescribed in Section 113.2 ~~112.2~~ have been paid~~, nor shall an amendment to a permit be released until the additional fee, if any, has been paid~~.

~~**112.2 Schedule of permit fees.** A fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.~~

113.2 Fee schedule. The fees for permits and other considerations shall be in accordance with the following schedule: [JURISDICTION TO INSERT APPROPRIATE FEE SCHEDULE]

113.3 ~~112.4~~ Related fees. The payment of the fee for ~~the construction, alteration, removal or demolition of~~ work done in connection to or concurrently with the work ~~or activity~~ authorized by a permit shall not relieve the applicant or holder of the permit from the payment of other fees that are prescribed by law.

113.4 ~~112.3~~ Work commencing before permit issuance. Any person who commences any work on a project requiring a *permit* before obtaining the necessary permits shall be subject to ~~an additional~~ a fee established by the *code official* that ~~applicable governing authority, which~~ shall be in addition to the required permit fees.

113.5 Permit extension. The fee for an extension of a permit in conformance with Section 105.7 shall be one-half the amount required for a new permit for such work.

113.6 Expiration of permit. For permits that have expired, and before such work recommences in conformance with Section 105.8.1, the fee to recommence work shall be one-half the amount required for a new permit for such work.

113.7 Stop work order. Any person who shall continue any work on a project requiring a permit after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.

113.8 Reinspection fee. A reinspection of work not in compliance with this code shall be subject to a fee established by the *code official* that shall be in addition to the required *permit* fees. The fee may be assessed when the *approved* plans are not readily available to the inspector, for failure to provide access on the date for which inspection is requested, for work deviating from the approved, or the work or test is not in compliance with this code.

~~**112.5 Refunds.** The applicable governing authority is authorized to establish a refund policy.~~

113.9 Fee refunds. The code official shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment. The code official shall authorize the refunding of fees as follows:

1. The full amount of any fee paid hereunder which was erroneously paid or collected.
2. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.
3. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid when no work on a project has been performed under a permit issued in accordance with this code.

(SECTIONS 114 THROUGH 119 RESERVED)

PART 3 – GENERAL REQUIREMENTS

SECTION 120
UNSAFE STRUCTURES, EQUIPMENT, AND CONDITIONS

120.1 General. If any building, structure, premises or part thereof, or appliance, equipment, or system is found to be unsafe by the *code official*, or found in the case of a building or structure to be unfit for human occupancy, the condition shall be abated whenever possible, but if abatement is not achieved or is non-achievable, then condemnation shall be undertaken in accordance with the provisions of this code.

~~**109.4.5 Unsafe conditions.** Buildings, structures or premises that constitute a fire hazard or are otherwise dangerous to human life, or which in relation to existing use constitute a hazard to safety or health or public welfare, by reason of inadequate maintenance, dilapidation, obsolescence, fire hazard, disaster damage or abandonment as specified in this code or any other ordinance, are unsafe conditions. Unsafe buildings or structures shall not be used. Unsafe buildings are hereby declared to be public nuisances and shall be abated by repair, rehabilitation, demolition or removal, pursuant to applicable state and local laws and codes.~~

120.1.1 Notice to building official. Abatement requiring repairs, *alterations*, remodeling, removing or demolition shall be referred to the *building official*.

120.1.2 Unsafe structures. An unsafe structure is a structure that is dangerous to the life, health, or safety of the public or to the *occupants* when:

1. There are no minimum safeguards provided to protect or warn *occupants* in the event of fire; or
2. Such structure contains unsafe equipment or is so damaged, decayed, dilapidated, is structurally unsound, is of such faulty construction, or has such an unstable foundation, that partial or complete collapse is possible.

120.1.3 Unsafe equipment. Unsafe equipment includes any boiler, heating equipment, elevator, moving stairway, electrical wiring or device, flammable liquid containers or other equipment on the *premises* or within the structure which is in such disrepair or condition that such equipment constitutes a hazard to life, health, property or safety of the public or the *occupants* of the *premises* or structure.

120.1.4 Structure unfit for human occupancy. A structure is unfit for human *occupancy* whenever the *code official* finds that such structure is unsafe, is unlawful or, because its degree of disrepair, or its want of maintenance, is unsanitary, vermin or rat infested, filthy and contaminated, lacking *ventilation*, illumination, sanitary, heating facilities or other essential equipment required by this code, or because the structure is in proximity to an unsafe or dangerous condition that constitutes a hazard to the *occupants* of the structure or to the public.

120.1.5 Unlawful structure. An unlawful structure is one found in whole or in part to be occupied by more persons than permitted under this code, or was erected, altered or occupied contrary to this code.

120.1.6 Structure and premise that are dangerous to the life, health or safety of the public or occupants. For the purpose of this code, any structure or *premises* that have any or all of the following conditions or defects shall be considered dangerous, and shall constitute an unsafe structure:

1. Any door, aisle, passageway, stairway, exit or other means of egress that does not conform to the *approved* building or fire code of the jurisdiction as related to the requirements for existing buildings.
2. The walking surface of any aisle, passageway, stairway, exit or other means of egress is so warped, worn loose, torn or otherwise unsafe as to not provide safe and adequate means of egress.
3. Any portion of a building, structure or appurtenance that has been damaged by fire, earthquake, wind, flood, *deterioration*, *neglect*, abandonment, vandalism or by any other cause to such an extent that it is likely to partially or completely collapse, or to become *detached* or dislodged.
4. Any portion of a building, or any member, appurtenance or ornamentation on the exterior thereof that is not of sufficient strength or stability, or is not so *anchored*, attached or fastened in place so as to be capable of resisting natural or artificial loads of one and one-half the original designed value.
5. The building or structure, or part of the building or structure, because of dilapidation, *deterioration*, decay, faulty construction, the removal or movement of some portion of the ground necessary for the support, or for any other reason, is likely to partially or completely collapse, or some portion of the foundation or underpinning of the building or structure is likely to fail or give way.
6. The building or structure, or any portion thereof, is clearly unsafe for its use and *occupancy*.
7. The building or structure is *neglected*, damaged, dilapidated, unsecured or abandoned so as to become an attractive nuisance to children who might play in the building or structure to their danger, becomes a harbor for vagrants, criminals or immoral persons, or enables persons to resort to the building or structure for committing a nuisance or an unlawful act.
8. Any building or structure has been constructed, exists or is maintained in violation of any specific requirement or prohibition applicable to such building or structure provided by the *approved* building or fire code of the jurisdiction, or of any law or ordinance to such an extent as to present either a substantial risk of fire, building collapse or any other threat to life and safety.
9. A building or structure, used or intended to be used for dwelling purposes, because of inadequate maintenance, dilapidation, decay, damage, faulty construction or arrangement, inadequate light, *ventilation*, mechanical or plumbing system, or otherwise, is determined by the *code official* to be unsanitary, unfit for human habitation or in such a condition that is likely to cause sickness or disease.
10. Any building or structure, because of a lack of sufficient or proper fire-resistance-rated construction, fire protection systems, electrical system, fuel connections, mechanical system, plumbing system or other cause, is determined by the *code official* to be a threat to life or health.
11. Any portion of a building remains on a site after the demolition or destruction of the building or structure or whenever any building or structure is abandoned so as to constitute such building or portion thereof as an attractive nuisance or hazard to the public.

120.2 Closing of vacant structures. If the structure is vacant and unfit for human habitation and *occupancy*, and is not in danger of structural collapse, the *code official* is authorized to post a placard of condemnation on the *premises* and order the structure closed up so as not to be an attractive nuisance. Upon failure of the *owner* to close up the *premises* within the time specified in the order, the *code official* shall cause the *premises* to be closed and secured through any available public agency or by contract or arrangement by private persons, and the cost thereof shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate that may be collected by any legal means.

120.3 ~~109.4.5.6~~ Evacuation. The code official or the fire department official in charge of an emergency incident shall be authorized to order the immediate evacuation of any occupied building, structure or premises deemed unsafe due to ~~when such~~ hazardous conditions ~~exist~~ that present imminent danger to the occupants. Persons so notified shall immediately leave the structure or premises and shall not enter or re-enter until authorized to do so by the code official or the fire department official in charge of the incident.

120.4 Notice. Whenever the *code official* has *condemned* a structure or equipment under the provisions of this section, notice shall be posted in a conspicuous place in or about the structure affected by such notice and served on the *owner* or the person or persons responsible for the structure or equipment in accordance with Section 120.4.2. If the notice pertains to equipment, it shall also be placed on the *condemned* equipment. The notice shall be in the form prescribed in Section 120.4.1.

~~**109.4.5.2 Notice.** Where an unsafe condition is found, the code official shall serve on the owner, agent or person in control of the building, structure or premises, a written notice that describes the condition deemed unsafe and specifies the required repairs or improvements to be made to abate the unsafe condition, or that requires the unsafe structure to be demolished within a stipulated time. Such notice shall require the person thus notified, or their designee, to declare within a stipulated time to the code official acceptance or rejection of the terms of the order.~~

120.4.1 Form of notice. Such notice of shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the unsafe condition into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties set forth in this code or as may be adopted and authorized by state and/or local law.

120.4.2 ~~109.4.5.2.1 Method of~~ service of notice. Such notice shall be deemed properly served if a copy thereof is (a) delivered to the owner personally; (b) sent by certified or registered mail addressed to the owner at the last known address with the return receipt requested; or (c) delivered in any other manner as prescribed by local law. If the certified or registered letter is returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice. Service of such notice in the foregoing manner upon the owner's agent or upon the person responsible for the structure shall constitute service of notice upon the owner.

120.5 ~~109.4.5.3~~ Placarding. Upon failure of the owner or person responsible to comply with the notice provisions within the time given, the code official shall post on the premises or on defective equipment a placard bearing the word "UNSAFE" or "CONDEMNED" as applicable, and a statement of the penalties provided for occupying the premises, operating the equipment or removing the placard.

120.5.1 ~~109.4.5.3.1~~ Placard removal. The code official shall remove the ~~unsafe condition~~ placard whenever the ~~defect or defects upon which the unsafe condition and placarding action were based~~ unsafe conditions have been eliminated. Any person who defaces or removes an unsafe condition placard without the approval of the code official shall be subject to the penalties provided for by the jurisdiction ~~this code~~.

120.6 Prohibited occupancy. Any structure *condemned* and placarded by the *code official* shall be vacated as ordered by the *code official*. It shall be unlawful for any person to occupy or to allow others to occupy a placarded *premises,* or to operate or allow others to operate any placarded equipment.

120.7 ~~109.4.5.4~~ Abatement. The owner, operator or occupant of a building, structure, ~~or~~ premises, or equipment deemed unsafe by the code official shall abate or correct ~~or cause to be abated or corrected~~ such unsafe conditions either by repair, rehabilitation, demolition or other *approved* corrective action.

120.7.1 ~~109.4.5.5~~ Summary abatement. Where conditions exist that are deemed ~~hazardous to life and property~~ an *imminent danger* as described in Section 121.1 that will necessarily result in injury to occupants or the public, the code official or fire department official in charge of the incident is authorized to ~~abate or correct~~ summarily abate such hazardous conditions ~~that are in violation of this code~~.

120.8 ~~109.4.5.1~~ Record. The code official shall cause a report to be filed on an unsafe condition. The report shall state the occupancy of the structure and the nature of the unsafe condition. The record of an unsafe condition as outlined herein shall be retained by the *code official* for the period required for retention of public records.

SECTION 121
EMERGENCY MEASURES

121.1 Imminent danger. When, in the opinion of the *code official*, there is imminent danger of failure or collapse of a building or structure that endangers life, or when any building or part of a building has fallen and life is endangered by the occupation of the building, or when there is actual or potential danger to the building occupants or those in the proximity of any structure because of explosives, explosive fumes or vapors, or the presence of toxic fumes, gases, or materials, or operation of defective or *dangerous* equipment, the *code official* is hereby authorized and empowered to order and require the occupants to vacate the premises forthwith. The *code official* shall cause to be posted at each entrance to such structure a notice reading as follows: "This Structure Is Unsafe and Its Occupancy Has Been Prohibited by the *Code Official*." It shall be unlawful for any person to enter such structure except for the purpose of securing the structure, making the required *repairs*, removing the hazardous condition, or of demolishing the same.

121.1.1 Summary abatement during an incident. Where conditions exist that are deemed an *imminent danger* that will necessarily result in injury to occupants or the public, the *code official* or fire department official in charge of the incident is authorized to summarily abate such unsafe or hazardous conditions.

121.2 Temporary safeguards. Notwithstanding other provisions of this code, whenever, in the opinion of the *code official*, there is imminent danger due to an unsafe condition, the *code official* shall order the necessary work to be done, including the boarding up of openings, to render such structure temporarily safe whether or not the legal procedure herein described has been instituted; and shall cause such other action to be taken as the *code official* deems necessary to meet such emergency.

121.3 Closing streets. When necessary for public safety, the *code official* shall temporarily close structures and close or order the authority having jurisdiction to close sidewalks, streets, public ways, and places adjacent to unsafe structures, and prohibit the same from being utilized.

121.4 Emergency repairs. For the purposes of this section, the *code official* shall employ the necessary labor and materials to perform the required work as expeditiously as possible.

121.5 Costs of emergency repairs. Costs incurred in the performance of emergency work shall be paid by the jurisdiction. The legal counsel of the jurisdiction shall institute appropriate action against the owner of the premises where the unsafe structure is or was located for the recovery of such costs.

121.6 Hearing. Any person ordered to take emergency measures shall comply with such order forthwith. Any affected person shall thereafter, upon petition directed to the appeals board, be afforded a hearing as described in this code.

SECTION 122 ~~113~~
SERVICE UTILITIES

122.1 ~~113.1~~ Connection of service utilities. No person shall make connections from a utility, source of energy, fuel, ~~or~~ power, water system or *sewer* system to any building, structure or system that is regulated by this code for which a permit is required until ~~released~~ *approved* by the *code official*.

122.2 Temporary connection. The *code official* shall have the authority to authorize the temporary connection of the building, structure or system to the utility source of energy, fuel, or power.

122.3 ~~113.2~~ Authority to disconnect service utilities. The *code official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards ~~set forth in Section 102.4~~ in case of emergency where necessary to eliminate an immediate hazard to life or property or when such utility connection has been made without the ~~release~~ approval required by Section 122.1 or 122.2 ~~113.1~~. The *code official* shall notify the serving utility and, ~~whenever~~ wherever possible, the owner and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnection, ~~.~~ the owner or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

SECTION 123 ~~111~~
TEMPORARY STRUCTURES, EQUIPMENT, SYSTEMS AND USES

123.1 ~~111.1~~ General. The code official is authorized to issue a permit for temporary structures, equipment, systems and ~~temporary~~ uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The code official is authorized to grant extensions for demonstrated cause.

123.2 ~~111.2~~ Conformance. Temporary structures, equipment, systems and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.

123.3 ~~111.3~~ Termination of approval. The code official is authorized to terminate such permit ~~for a temporary structure or use~~ and to order the temporary structure, equipment, system or use to be discontinued.

SECTION 124
MAINTENANCE

124.1 Maintenance of safeguards. Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or any other feature is required for compliance with the provisions of this code, or otherwise installed, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be continuously maintained in accordance with this code and applicable referenced standards.

124.1.1 ~~101.6~~ Specific maintenance. All buildings, structures, landscape materials, vegetation, *defensible space* or other devices or safeguards required by this code shall be maintained in conformance to the code edition under which installed. The owner or the owner's designated agent shall be responsible for the maintenance of buildings, structures, landscape materials and vegetation.

124.2 Testing and operation. Equipment requiring periodic testing or operation to ensure maintenance shall be tested or operated as specified in this code.

124.2.1 Test and inspection records. Required test and inspection records shall be available to the *code official* at all times, or such records as designates shall be filed with the *code official*.

124.2.2 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

124.3 Supervision. Maintenance and testing shall be under the supervision of a responsible *person* who shall ensure that such maintenance and testing are conducted at specified intervals in accordance with this code.

124.4 Rendering equipment inoperable. Portable or fixed fire-extinguishing systems or devices and fire-warning systems shall not be rendered inoperative or inaccessible except as necessary during emergencies, maintenance, repairs, *alterations*, drills or prescribed testing.

SECTION 125
DEMOLITION

125.1 General. The *code official* shall order the owner of any premises upon which is located any structure that in the *code official's* judgment is deteriorated or dilapidated, or has become so out of *repair* as to be *dangerous*, unsafe, insanitary, or otherwise unfit for human habitation or occupancy, and such that it is unreasonable to *repair* the structure, to demolish and remove such structure; or if such structure is capable of being made safe by *repairs*, to *repair* and make safe and sanitary, or to board up and hold for future repair, or to demolish and remove at the owner's option; or where there has been a cessation of normal construction of any structure for a period of more than two years, to board up and hold for recommencement of work, or to demolish and remove such structure. Boarding up the building for future repair or recommencement of work shall not extend beyond one year, unless *approved* by the *code official*.

125.2 Notices and orders. All notices and orders shall comply with Section 111.2.

125.3 Failure to comply. If the owner of a premises fails to comply with a demolition order within the time prescribed, the *code official* shall cause the structure to be demolished and removed, either through an available public agency or by contract or arrangement with private persons, and the cost of such demolition and removal shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate.

125.4 Salvage materials. When any structure has been ordered demolished and removed in accordance with Section 125.3, the governing body or other designated officer under said contract or arrangement aforesaid shall have the right to sell the salvage and valuable materials at the highest price obtainable. The net proceeds of such sale, after deducting the expenses of such demolition and removal, shall be promptly remitted with a report of such sale or transaction, including the items of expense and the amounts deducted, for the person who is entitled thereto, subject to any order of a court. If such a surplus does not remain to be turned over, the report shall so state.

125.5 Existing remedies. The provisions in this code shall not be construed to abolish or impair existing remedies of the jurisdiction or its officers or agencies relating to the removal or demolition of any structure which is dangerous, unsafe or insanitary.

2. Revise and add the following definitions to the IWUIC:

ADDITION. An extension or increase in floor area, number of stories, or height of a building or structure.

ALTERATION. Any construction or renovation to an existing structure other than repair or addition that requires a *permit*, or a change in a mechanical, plumbing, fuel gas or other system that involves an extension, addition or change to the arrangement, type or purpose of the original installation that requires a *permit*.

APPLIANCE. A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.

APPROVED AGENCY. An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been *approved* by the *code official*.

BUILDING OFFICIAL. The officer or other designated authority charged with the administration and enforcement of the *International Building Code*, or ~~the building official's~~ a duly authorized representative.

CERTIFICATE OF COMPLETION. ~~Written documentation~~ A certificate stating that the project or work for which a permit was issued has been completed in ~~conformance~~ compliance with approved construction documents and the requirements of this code.

CODEOFFICIAL. The ~~official~~ officer or other designated authority ~~by the jurisdiction to interpret and enforce this code, or the code official's authorized representative~~ charged with the administration and enforcement of this code, or a duly authorized representative.

CONSTRUCTION DOCUMENTS. The written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of the project necessary for obtaining a permit.

EQUIPMENT OR FIXTURE. Any plumbing, heating, electrical, ventilating, air conditioning, refrigerating, and fire protection equipment, apparatus and devices, all piping, ducts, vents, control devices and other systems or components thereof, and elevators, dumb waiters, escalators, boilers, pressure vessels and other mechanical facilities or installations that are related to building services, any of which are specifically regulated in this code. Appliances as defined by this code shall not be considered equipment. Equipment or fixtures shall not include manufacturing, production, or process equipment, but shall include connections from building service to process equipment.

FIRE CODE OFFICIAL. The fire chief or other designated authority charged with the administration and enforcement of the code, or a duly authorized representative.

IMMINENT DANGER. A condition which could cause serious or life-threatening injury or death at any time.

LABELED. Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-*labeled* items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

LISTED. Equipment, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or services that maintains periodic inspection of production of *listed* equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

LOT LINE. A line dividing one lot from another, or from a street or any public place.

PERMIT. An official document or certificate issued by the authority having jurisdiction which authorizes performance of a specified activity.

REGISTERED DESIGN PROFESSIONAL. An architect or engineer who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A *registered design professional* engaged by the owner to review and coordinate certain aspects of the project, as determined by the *building official*, for compatibility with the design of the building or structure, including submittal documents prepared by others, deferred submittal documents and phased submittal documents.

REPAIR. The reconstruction or renewal of any part of an existing building for the purpose of its maintenance.

STRUCTURE. That which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

TOWNHOUSE. A single-family *dwelling unit* constructed in a group of three or more attached units in which each unit extends from the foundation to roof and with open space on at least two sides.

PART XI – IZC

1. Revise IZC (Item 1-M) as follows:

CHAPTER 1
SCOPE AND ADMINISTRATION

PART 1 - SCOPE AND APPLICATION

SECTION 101
GENERAL

101.1 Title. These regulations shall be known as the *Zoning Code* of [NAME OF JURISDICTION], hereinafter referred to as "this code."

101.2 ~~101.3~~ Scope. The provisions of this code shall apply to the construction, addition, alteration, moving, repair, and use of any building, structure, parcel of land, or *sign* within a jurisdiction, except work located primarily in a *public way*, public utility towers and poles, and public utilities unless specifically addressed herein ~~mentioned in this code~~.

101.3 ~~101.2~~ Purpose ~~Intent~~. The purpose of this code is to establish the minimum requirements to safeguard the health, property, and public welfare by controlling the design, location, use, or occupancy of all buildings and structures through the regulated and orderly development of land and land uses ~~within this jurisdiction~~.

101.4 Severability. If a section, subsection, sentence, clause, or phrase of this code is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code.

101.5 Validity. ~~If any portion of this code is held invalid for any reason, the remaining herein shall not be affected.~~ In the event any part or provision of this code is held to be illegal or void, this shall not have the effect of making illegal or void any of the other parts or provisions hereof, which are determined to be legal; and it shall be presumed that this code would have been adopted without such illegal or invalid parts or provisions.

101.6 Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state, or federal law.

SECTION 102
APPLICABILITY
~~FEES~~

102.1 General. Where there is a conflict between a general requirement and a specific requirement of this code, the specific requirement shall be applicable. Where, in a ~~any~~ specific case, different sections of this code specify different materials, methods of construction or other requirements, the ~~more~~ most restrictive shall govern.

102.2 Application of references. References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

102.3 Referenced codes and standards. The codes and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between the provisions of this code and the referenced codes and standards, the provisions of this code shall apply.

Exception: Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing shall govern.

102.4 Appendices. Provisions in the appendices shall not apply unless specifically adopted.

102.5 ~~103.1~~ Existing structures and systems ~~General~~. The legal occupancy or use of any structure or installed system existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the *International Building Code,* the *International Fire Code,* or the *International Property Maintenance Code*, or as is deemed necessary by the *code official* for the general safety and welfare of the occupants and the public. ~~Lawfully established buildings and uses in existence at the time of the adoption of this code shall be permitted to have their existing use or occupancy continued, provided such continued use is not dangerous to life.~~

102.5.1 Historic buildings. The provisions of this code relating to the construction, alteration, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures identified and classified by the state or local jurisdiction as historic buildings when such buildings or structures are judged by the code official to be safe and in the public interest of health, safety and welfare regarding any proposed construction, alteration, repair, enlargement, restoration, relocation or moving of buildings.

102.6 Alternative materials, design, methods and equipment. The provisions of this code are not intended to prevent the installation of any material, or the use or operation of appliances, equipment, systems, or method, or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative shall be *approved* where the *code official* finds that the proposed alternative is satisfactory and complies with the intent of the provisions of this code, and that the alternative is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, *fire resistance*, durability and safety.

102.6.1 Matters regulated by the *International Building Code.* Approvals under the authority herein contained shall be subject to the approval of the *building official* whenever the alternative involves matters regulated by the *International Building Code*.

102.7 Requirements not covered by code. Requirements necessary for the strength, stability, or proper operation of an existing or proposed fixture, structure, or equipment, or for the public safety, health, and general welfare, not specifically covered by this code, shall be determined by the *code official*.

102.8 Subjects not regulated by this code. Where no applicable standards or requirements are set forth in this code, or are contained within other laws, codes, regulations, ordinances, or bylaws adopted by the jurisdiction, compliance with applicable nationally recognized standards, as *approved*, shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the *code official* to determine compliance with codes or standards for those activities or installations within the *code official's* jurisdiction or responsibility.

102.9 Previous approvals. This code shall not require changes in the *construction documents*, construction or designated occupancy of a structure for which a lawful *permit* has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

102.10 Contractor's responsibilities. Every contractor who enters into contracts for which a permit is required shall comply with the state and local rules and regulations concerning licensing.

102.11 Specific application of this code. The following are application specific to this code.

102.11.1 ~~104.6~~ Variations of uses. Uses are permitted within the various zones as described in this code and as otherwise provided herein. It is recognized that all possible uses and variations of uses that might arise cannot reasonably be listed or categorized. Mixed uses/sites or any use not specifically mentioned or about which there is any question shall be administratively classified by comparison with other uses identified in the zones described in this code. If the proposed use resembles identified uses in terms of intensity and character, and is consistent with the purpose of this code and the individual zone's classification, it shall be considered as a permitted/nonpermitted use within a general zone classification, subject to the regulations for the use it most nearly resembles. If a use does not resemble other identified allowable uses within a zone, it may be permitted as determined by the hearing body in public hearing as an amendment to this code pursuant to Section 117.5 ~~109.3~~.

102.11.2 ~~**103.5**~~ **Illegal uses.** Uses that were illegally established prior to the adoption of this code shall remain illegal.

102.11.3 ~~**103.2**~~ **Additions, alterations or repairs.** Additions, alterations or repairs shall be permitted to be made to any building or use without requiring the existing building or use to comply with the requirements of this code, provided the addition, alteration or repair conforms to that required for a new building or use.

102.11.4 ~~**103.4**~~ **Moved** ~~**and temporary**~~ **buildings, structures** ~~**and uses.**~~ Buildings or structures moved into or within the jurisdictions shall comply with the provisions of this code for new buildings and structures.

102.11.5 ~~**104.7**~~ **Responsibility of owner.** This code shall not be construed to relieve from or lessen the responsibility of any person owning, operating or controlling any building or parcel of land for any damages to persons or property caused by defects~~, nor shall the enforcement agency or its jurisdiction be held as assuming any such liability by reason of the reviews or permits issued under this code~~.

102.11.6 ~~**109.3**~~ **Amendments.** This code shall be permitted to be amended, but all proposed amendments shall be submitted to the code official for review and recommendation to the commission.

PART 2 - ADMINISTRATION AND ENFORCEMENT

SECTION 103
DEPARTMENT OF ZONING
~~**EXISTING BUILDINGS AND USES**~~

103.1 General. The Department of Zoning, herein referred to as "the department," is hereby established within the jurisdiction under the direction of the code official. The function of the department shall be the implementation, administration and enforcement of the provisions of this code.

103.2 Appointment. The code official shall be appointed by the chief appointing authority of the jurisdiction.

103.3 ~~**104.2**~~ **Deputies.** In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the *code official* shall have the authority to appoint a deputy *code official*, related technical officers, inspectors, and other employees. Such employees shall have powers as delegated by the *code official*. ~~The code official may appoint such number of technical officers and other employees as shall be authorized from time to time. The code official shall be permitted to deputize such employees as may be necessary to carry out the functions of this code.~~

103.4 ~~**104.7**~~ **Liability.** The code official, ~~or designee,~~ member of the Board of Appeals, officer, or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties ~~described in~~ required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally, and is hereby relieved from all personal liability ~~personally liable~~ for any damage ~~that may accrue~~ accruing to persons or property as a result of an act or by reason of an act or omission in the discharge of ~~such~~ official duties.

103.5 Legal defense. ~~A~~ Any suit brought against ~~the code official~~ an officer or employee of the department because ~~such~~ an act ~~or omission~~ performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings. The *code official* or any subordinate shall not be liable for costs in an action, suit, or proceeding that is instituted in pursuance of the provisions of this code. Any officer or employee, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith. ~~the code official or employee in the enforcement of any provision of such codes or other pertinent laws or ordinances implemented through the enforcement of this code or enforced by the enforcement agency shall be defended by the jurisdiction until final termination of such proceedings, and any judgment resulting therefrom shall be assumed by the jurisdiction.~~

~~**101.3** In fulfilling these purposes, this ordinance is intended to benefit the public as a whole and not any specific person or class of persons. Although, through the implementation, administration and enforcement of this code, benefits and detriments will be enjoyed or suffered by specific individuals, such is merely a byproduct of the overall benefit to the whole community. Therefore, unintentional breaches of the obligations of administration and enforcement imposed on the jurisdiction hereby shall not be enforceable in tort.~~

SECTION 104
DUTIES AND POWERS OF THE ZONING CODE OFFICIAL

104.1 General. The code official is hereby authorized and directed to enforce the provisions of this code. The code official shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies, and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code. ~~This section establishes the duties and responsibilities for the zoning code official and other officials and agencies, with respect to the administration of this code.~~

~~**104.6 Interpretations.** The interpretation and application of the provisions of this code shall be by the *code official*. An appeal of an interpretation by the *code official* shall be submitted to the board of adjustment, who, unless otherwise provided, is authorized to interpret the code, and such interpretation shall be considered final.~~

104.1.1 Code official. The zoning code official and/or designee shall be referred to ~~hereafter~~ herein as "the code official."

104.2 Applications and permits. The *code official* shall receive applications, review *construction documents,* issue *permits* required by this code, inspect the premises for which such *permits* have been issued, and enforce compliance with the provisions of this code. ~~**104.3 Reviews and approvals.** The code official shall be authorized to undertake reviews, make recommendations and grant approvals as set forth in this code.~~

104.3 Notices and orders. The *code official* shall issue all necessary notices or orders to ensure compliance with this code.

104.4 Inspections. The *code official* shall make all of the required inspections, or the *code official* shall have the authority to accept reports of inspection by *approved agencies* or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such *approved agency* or by the responsible individual. The *code official* is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

104.5 Identification. The *code official* shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

104.6 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the *code official* has reasonable cause to believe that there exists in a structure or upon a premises a condition which is contrary to or in violation of this code which makes the structure or premises unsafe, dangerous, or hazardous, the *code official* is authorized to enter the structure or premises at reasonable times to inspect or to perform the duties imposed by this code, provided that if such structure or premises be occupied, that credentials be presented to the occupant and entry requested. If such structure or premises is unoccupied, the *code official* shall first make a reasonable effort to locate the owner or other person having charge or control of the structure or premises and request entry. If entry is refused, the *code official* shall have recourse to the remedies provided by law to secure entry.

104.6.1 Warrant. When the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner or occupant or person having charge, care or control of the structure or premises shall not fail or neglect, after proper request is made as herein provided, to promptly permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

104.7 Department records. The *code official* shall keep official records of applications received, *permits* and certificates issued, fees collected, reports of inspections, and notices and orders issued. Such records shall be retained in the official records for the period required for retention of public records.

104.8 ~~Cooperation of other officials and officers~~ Assistance of other agencies. The code official shall ~~be authorized~~ is to request, and shall receive so far as is required in the discharge of the duties described in this code, the assistance and cooperation of other officials of the jurisdiction.

104.9 Specific duties. The following are specific duties of the code official.

SECTION 105 ~~111~~
PERMITS ~~AND APPROVALS~~

~~104.5 Administrative reviews and permits.~~ ~~Administrative reviews and permits shall be in accordance with Sections 104.5.1 through 104.5.4.~~

105.1 Permit required. Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to construct, erect, install, enlarge, alter, repair, remove, convert, or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the *code official* and obtain the required *permit* for the project. Where laws or regulations are enforceable by other agencies or departments, approval shall be obtained from all agencies or departments concerned.

105.1.1 Annual permit. In lieu of an individual *permit* for each *alteration* to an already *approved* electrical, gas, mechanical or plumbing installation, the *code official* is authorized to issue an annual *permit* upon application therefor to any person, firm or corporation regularly employing one or more qualified tradespersons in the building, structure, or on the premises owned or operated by the applicant for the *permit*.

105.1.1.1 Annual permit records. The person to whom an annual *permit* is issued shall keep a detailed record of *alterations* made under such annual *permit*. The *code official* shall have access to such records at all times, or such records shall be filed with the *code official* as designated.

105.1.2 Emergency repairs. Where equipment replacements and repairs must be performed in an emergency situation, the *permit* application shall be submitted within the next working business day to the *code official*.

105.1.3 Permits specifically required. The following specifically require a permit.[JURISDICTION TO INSERT SPECIFIC ITEMS REQUIRING A PERMIT FOR THIS CODE]

105.2 Permit not required. Exemptions from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. *Permits* shall not be required in accordance with Sections 105.2.1 through 105.2.3.

105.2.1 Repairs. Application or notice to the *code official* is not required for ordinary repairs to structures, replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required *means of egress*, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include *addition* to, *alteration* of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

105.2.2 Public service agencies. A *permit* shall not be required for the installation, *alteration,* or repair of generation, transmission, distribution, or metering or other related equipment that is under the ownership and control of public service agencies by established right.

105.2.3 Specific exemption. The following are specifically exempt from requiring a permit. [JURISDICTION TO INSERT SPECIFIC ITEMS EXEMPT FROM PERMITS FOR THIS CODE]

105.3 Application for permit. To obtain a *permit*, the applicant shall first file an application therefore in writing on a form furnished by the department for that purpose. Such application shall:

1. Identify and describe the project to be covered by the *permit* for which application is made.
2. Describe the land on which the proposed project is to be done by legal description, street address or similar description that will readily identify and definitely locate the proposed building or project.
3. Indicate the use and occupancy for which the proposed project is intended.
4. Be accompanied by *construction documents* and other data as required in Section 106.
5. State the valuation of the proposed project.
6. Be signed by the applicant, or the applicant's authorized agent.
7. Give such other data and information as required by the *code official*.

105.3.1 Permit valuations. *Permit* valuations required under Section 105.3(5) shall include total value of the project, including materials and labor, and electrical, gas, mechanical, plumbing equipment and other permanent systems for which the *permit* is being issued. If, in the opinion of the *code official*, the valuation is underestimated on the application, the *permit* shall be denied, unless the applicant can show detailed estimates to meet the approval of the *code official*. Final building *permit* valuation shall be set by the *code official*.

105.4 Action on application. The *code official* shall examine or cause to be examined applications for *permits* and amendments thereto within a reasonable time after filing. If the application or the *construction documents* do not conform to the requirements of pertinent laws, the *code official* shall reject such application in writing, stating the reasons therefor. If the *code official* is satisfied that the proposed project conforms to the requirements of this code and laws and ordinances applicable thereto, the *code official* shall issue a *permit* therefor as soon as practicable.

105.4.1 Preliminary inspection. Before a permit is issued, the code official is authorized to inspect and evaluate the systems, *equipment*, buildings, devices, premises and spaces or areas to be used.

105.4.2 Conditional permits. The *code official* is authorized to issue a *permit* for the construction or operation of part of the project such as the construction of foundations or any other part of a building or structure, or installation of systems or materials, or operation before the *construction documents* for the entire project have been submitted or *approved*, provided that adequate information and detailed statements have been filed complying with pertinent requirements of this code. The holder of such *permit* shall proceed only to the point for which approval has been given, at the permit holder's own risk, and without assurance that a *permit* for the entire project will be granted.

105.5 Time limitation of application. An application for a *permit* for any proposed project shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a *permit* has been issued. The *code official* is authorized to grant one or more extensions of time for additional periods not exceeding 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

~~**111.1 General.** All departments, officials and employees which are charged with the duty or authority to issue permits or approvals shall issue no permit or approval for uses or purposes where the same would be in conflict with this code. Any permit or approval, if issued in conflict with this code, shall be null and void.~~

~~**104.5.1 Review of building permits.** All applications for building permits and amendments thereto shall be submitted to the code official for review and approved prior to permit issuance. Each application shall include a set of building plans and all data necessary to show that the requirements of this code are met.~~

~~**104.5.2 Site plan reviews.** The code official shall receive all applications for site plan review and review for completeness and prepare submittals for review by the appropriate body.~~

~~**104.5.3 Conditional-use permits and variances.** The code official shall receive all applications for conditional uses and variances or other plans as shall be permitted or approved as required by this code, review for completeness and prepare submittals for review by the appropriate body.~~

105.6 ~~111.3~~ Validity of permit ~~licenses, permits and approvals~~. The issuance or granting of a *permit* shall not be construed to be a *permit* for, or an approval of, any violation of any of the provisions of this code or of any other ordinance of the jurisdiction. *Permits* presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a *permit* based on *construction documents* and other data shall not prevent the *code official* from requiring the correction of errors in the *construction documents* and other data. ~~For the issuance of any license, permit or approval for which the commission or board is responsible, the code official shall require that the development or use in question proceed only in accordance with the terms of such license, permit or approval, including any requirements or conditions established as a condition of issuance. Except as specifically provided for in this code and conditions of approval, the securing of one required review or approval shall not exempt the recipient from the necessity of securing any other required review or approval.~~

105.7 Extensions of permit. For an unexpired permit the *code official* is authorized to grant, in writing, one or more extensions of the time, for periods of not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

105.8 ~~111.2~~ Expiration of permit ~~or cancellation~~. ~~Each license,~~ Every permit ~~or approval~~ issued shall ~~expire after~~ become invalid unless the work on the site authorized by such *permit* is commenced within 180 days after its issuance, or if the work authorized on the site by such *permit* is suspended or abandoned for a period of 180 days after the time

the work is commenced. ~~if no work is undertaken or such use or activity is not established, unless a different time of issuance of the license or permit is allowed in this code, or unless an extension is granted by the issuing agency prior to expiration.~~

105.8.1 Recommencement of work. Before such work covered under an expired permit recommences, a new permit shall be first obtained. The new permit shall be issued provided no changes have been made or will be made in the original construction documents for such work, and provided further that such suspension or abandonment has not exceeded one year.

105.9 Suspension or revocation of permit. The *code official* is authorized to suspend or revoke a *permit* issued under the provisions of this code whenever the *permit* is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or regulation or any of the provisions of this code.
~~Failure to comply fully with the terms of any permit, license or approval shall be permitted to be grounds for cancellation or revocation. Action to cancel any license, permit or approval shall be permitted to be taken on proper grounds by the code official. Cancellation of a permit or approval by the commission or board shall be permitted to be appealed in the same manner as its original action.~~

105.10 Posting of permit. Issued permits or copy thereof shall be kept on the site of the project until the completion of the project.

SECTION 106
SUBMITTAL DOCUMENTS

106.1 General. Submittal documents consisting of construction documents and other supporting data shall be submitted in two or more sets with each application for a permit, and in such form and detail as required by the *code official*. The *code official* shall require construction documents and other data to be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official* is authorized to require necessary construction documents to be prepared by a registered design professional.

> **Exception:** The *code official* is authorized to waive the submission of *construction documents* and other data not required to be prepared by a *registered design professional* if the nature of the work applied for is such that review of *construction documents* is not necessary to obtain compliance with this code.

106.2 Construction documents. *Construction documents* shall be in accordance with Sections 106.2.1 through 106.2.4.

106.2.1 Information on construction documents. *Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the proposed project, and show in detail that the proposed project will conform to the provisions of this code and relevant laws, ordinances, rules, and regulations, as determined by the *code official*. Plans shall be to scale and be on suitable material. Electronic media documents are permitted to be submitted when *approved* by the *code official*.

106.2.1.1 Specific information required. Where the quality of the materials is essential for conformity to this code, specific information shall be given to establish such quality. The terms “this code” or “legal” or “its equivalent” shall not be cited or used as a substitute for specific information.

106.2.2 Site plan. The *construction documents* submitted with the application for *permit* shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from *lot lines*, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and *design flood* elevations. The site plan shall be drawn in accordance with an accurate boundary line survey.

106.2.2.1 Site plan for demolition. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot.

106.2.2.2. Waiver of site plan. The *code official* is authorized to waive or modify the requirement for a site plan when the application for *permit* is for *alteration* or repair or when otherwise warranted.

106.2.3 Specific Information. The following are specific requirements for submittal documents required by this code.

106.2.3.1 Site plan. The site plan shall include an outline the use and development of the tract of land.

106.2.4 Design professional in responsible charge. When it is required that documents be prepared by a *registered design professional*, the *code official* shall be authorized to require the owner to engage and designate on the building *permit* application a *registered design professional* who shall act as the *registered design professional in responsible charge*. If the circumstances require, the owner shall designate a substitute *registered design professional in responsible charge* who shall perform the duties required of the original *registered design professional in responsible charge*. The *code official* shall be notified in writing by the owner if the *registered design professional in responsible charge* is changed or is unable to continue to perform the duties.

106.2.4.1 Responsibility. The *registered design professional in responsible charge* shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

106.2.4.2 Observation. Where structural observation is required, the inspection program shall name the individual or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur.

106.3 Deferred submittals. For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the *code official* within a specified period.

106.3.1 Prior approval. Deferral of any submittal items shall have the prior approval of the *code official*. The *registered design professional in responsible charge* shall list the deferred submittals on the *construction documents* for review by the *code official*.

106.3.2 Review. Documents for deferred submittal items shall be submitted to the *registered design professional in responsible charge* who shall review them and forward them to the *code official* with a notation indicating that the deferred submittal documents have been reviewed and been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the deferred submittal documents have been *approved* by the *code official*.

106.4 Examination of documents. The *code official* shall examine or cause to be examined the submittal documents and shall ascertain by such examinations whether the project indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

106.5 Approval of construction documents. When the *code official* issues a *permit*, the *construction documents* and other data shall be endorsed, in writing or by stamp, as "APPROVED." One set of *construction documents* and other data so reviewed shall be retained by the *code official*. The other set(s) shall be returned to the applicant. One set shall be kept at the site of the project and shall be open to inspection by the *code official* or a duly authorized representative. Such *approved construction documents* shall not be changed, modified, or altered without authorization from the *code official*. All work shall be done in accordance with the *approved construction documents*.

106.6 Amended construction documents. Any changes made during construction that are not in compliance with the *approved construction documents* shall be resubmitted for approval as an amended set of *construction documents*.

106.7 Retention of construction documents. One set of *approved construction documents* shall be retained by the *code official* for a period of not less than 180 days from date of completion of the permitted project, or for the period required for retention of public records.

SECTION 107
MODIFICATIONS, TESTING, AND APPROVAL

107.1 Modifications. Wherever there are practical difficulties involved in carrying out the provisions of this code, and upon application of the owner or owner's representative, the *code official* shall have the authority to grant modifications for individual cases, provided the *code official* shall first find that special individual reason makes the strict letter of this code impractical and the modification is in conformance with the intent and purpose of this code, and that such modification does not lessen health, life and fire safety, accessibility, or structural requirements. The details of action granting modifications shall be recorded and entered in the files of the department.

107.2 Approved materials and equipment. All materials, equipment, and devices *approved* by the *code official* shall be constructed and installed in accordance with such approval.

107.3 Used materials, appliances and equipment. The use of used materials that meet the requirements of this code for new materials is permitted. Used appliances, equipment and devices shall not be reused unless such elements are in good repair or have been reconditioned and tested when necessary, placed in good and proper working condition, and *approved* by the *code official*.

107.4 Listed and labeled material and appliances. Listed and labeled materials, equipment, and appliances shall be used and installed in accordance with the conditions the listing and the manufacturer's instructions.

107.5 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

107.6 Technical assistance. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, or to determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building or premises, the *code official* shall have the authority to require tests conducted, or a technical opinion, recommendation or report be submitted as evidence of compliance. The tests, opinions, recommendations and reports shall be made at no expense to the jurisdiction.

107.6.1 Preparation. The technical reports and opinions shall be prepared by a qualified engineer, approved specialist or specialty organization, or an *approved agency*.

107.6.2 Test methods. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the code official shall approve the testing procedures.

107.6.3 Testing agency. All tests shall be performed by an *approved agency*.

107.6.4 Retention of reports. The technical opinions, recommendation, reports and test results shall be retained by the code official for the period required for retention of public records.

SECTION 108
INSPECTIONS

108.1 General. Construction or work on a project for which a *permit* is required shall be subject to inspection by the *code official* and such construction or work shall remain accessible and exposed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the *permit* applicant to cause the construction or work to remain accessible and exposed for inspection purposes. Neither the *code official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

108.1.1 Replacement of existing appliance. The requirements of this section shall not be considered to prohibit the operation of any heating or cooling *equipment* or appliances installed to replace such existing *equipment* or appliances serving an occupied portion of a structure provided that a request for inspection of such *equipment* or appliances has been filed with the department not more than 48 hours after such replacement work is completed, and before any portion of such *equipment* or appliances is concealed by any permanent portion of the structure.

108.2 Required inspections and testing. The *code official*, upon notification, shall make the inspections and require the tests set forth in Sections 108.2.1 through 108.2.4.

108.2.1 Specific Inspections. The following are specific inspections and tests required by this code. [JURISDICTION TO INSERT SPECIFIC REQUIRED INSPECTIONS]

108.2.2 Other inspections. In addition to the inspections specified above, the *code official* is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department.

108.2.3 Special inspections. Special inspection shall be as required by this code, the *International Building Code*, or the *International Fire Code* as applicable.

108.2.4 Final inspection. A final inspection shall be made after all work on the project required by the *permit* is completed.

108.3 Inspection agencies. The *code official* is authorized to accept reports of *approved* inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.

108.4 Inspection requests. It shall be the duty of the holder of the *permit* or their duly authorized agent to notify the *code official* when a project is ready for inspection. It shall be the duty of the *permit* holder to provide access to and means for inspections of such work that are required by this code.

108.4.1 Manufacturer's instructions. Manufacturer's instructions for equipment, appliances, and materials installed under the permit shall be available on the work site at the time of inspection.

108.5 Approval required. Work on a project shall not proceed beyond the point indicated in each successive inspection without first obtaining the approval of the *code official*. The *code official*, upon notification, shall make the requested inspections and shall either determine the portion of the project that is satisfactory as completed, or shall notify the *permit* holder or authorized agent wherein the same fails to comply with this code. Any portions of the project that do not comply shall be corrected and such portion shall not be covered, concealed, or used until authorized by the *code official*.

108.6 Notice of approval. After all prescribed inspections or tests indicate the project complies with this code, a certificate of completion complying with Section 109 shall be issued by the code official.

SECTION 109
CERTIFICATE OF COMPLETION AND OCCUPANCY

109.1 Use and occupancy. No building, structure, or premises or portion thereof shall be used or occupied until the code official has issued a certificate of occupancy as provided herein. No equipment, appliance or system used, and no change in the existing occupancy classification of a building, structure, premise or portion thereof shall be made until the code official has issued a certificate of completion as provided herein.

Exceptions:

1. Occupancy shall be permitted during emergency situations as described under Section 105.1.
2. Certificates of completion or occupancy are not required for work exempt from permits under Section 105.2.
3. Occupancy shall be permitted during the replacement of existing appliances as described under Section 108.1.1.
4. Certificates of occupancy are not required for one-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m^2).

109.1.1 Validity. Issuance of a certificate of completion or occupancy shall not be construed as an approval of a violation of the provisions of this code or of other pertinent laws and ordinances of the jurisdiction. Certificates presuming to give authority to violate or cancel the provisions of this code or other laws or ordinances of the jurisdiction shall not be valid.

109.2 Certificate issued. After the *code official* inspects a project requiring a permit and finds no violations of the provisions of this code or other laws that are enforced by the department, the *code official* shall issue a certificate of completion. After all certificates of completion have been issued by other departments or agencies concerned, the code official shall issue a certificate of occupancy where applicable. A certificate of completion or occupancy shall contain the following:

1. The *permit* number.
2. The address of the premises or structure.
3. The name and address of the owner.
4. A description of the project for which the certificate is issued.

5. A statement that the described project has been inspected for compliance with the requirements of this code.
6. The name of the *code official*.
7. The edition of the code under which the *permit* was issued.
8. The use and occupancy in accordance Chapter 3 of the International Building Code.
9. The type of construction as defined in Chapter 6 of the International Building Code.
10. The design *occupant load*.
11. If fire protection systems are provided, whether the fire protection systems are required.
12. Any special stipulations and conditions of the *permit*.

Exceptions:

1. A certificate of completion or occupancy shall not be required to indicate the items under Section 109.2, Items 8, 9, and 10 for detached one- and two family dwellings and multiple single-family *Dwellings* (*townhouses)* constructed using the *International Residential Code*.
2. The *code official* is shall not be required to indicate on a certificate items under Section 109.2, Items 8, 9, and 10 for the installation of equipment, appliances or systems.

109.3 Temporary occupancy. The code official is authorized to issue a temporary certificate of occupancy before the completion of the entire work covered by the permit, provided that such portion or portions shall be occupied safely and without endangerment to life or public welfare. The temporary certificate shall indicate any limitations or restrictions necessary to keep the permit area safe, and items required to obtain the final certificate of occupancy. The code official shall set a time period during which the temporary certificate of occupancy is valid.

109.4 Revocation. The code official is authorized to, in writing, suspend or revoke a certificate of completion or occupancy issued under the provisions of this code wherever the certificate is issued in error on the basis of incorrect information supplied, or where it is determined that the building, structure, premise, or portion thereof, or installation of appliance, equipment or system is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION 110
STOP WORK ORDERS

110.1 Authority. Whenever the *code official* finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or dangerous or unsafe, the *code official* is authorized to issue a stop work order.

110.2 Issuance. The stop work order shall be in writing and shall be given to the owner of the property involved, or to the owner's agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order, and the conditions under which the cited work will be permitted to resume.

110.2.1 Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

110.3 Unlawful continuance. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fees, fines, or penalties as prescribed by this code or other laws or ordinances of the jurisdiction.

SECTION 111 ~~110~~
VIOLATIONS

111.1 Code violations. No person, association, organization, or business entity of any form shall:

1. Erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or premises in conflict with or in violation of any provision of this code or other ordinances of this jurisdiction; or
2. Install or operate any equipment, appliances, or systems regulated by this code that is in conflict with or in violation of any provision of this code or other ordinances of this jurisdiction; or
3. Be non-compliant with the conditions of any permit or certificate issued under the auspices of this code; or
4. Tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*.

111.2 Notice of violation. A *code official* who observes or becomes aware of any code violation shall serve upon the responsible person, association, organization, or business entity a written notice in accordance with Section 111.2.1. In the absence of direct knowledge as to the identity or location of the responsible party, the *code official* shall serve the notice upon the property owner. Service may be effected by personal delivery, first class mail, substituted service, or such other means that may be authorized by state and/or local law.

111.2.1 Form of notice. Such notice of violation shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the violation into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties in accordance with Section 111.3.

111.3 Penalties. Violators who fail to comply with a notice to discontinue or abate a condition in violation of this code, and violators who tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*, shall be subject to the penalties set forth in this code as may be adopted and authorized by state and/or local law.

~~**110.1 Unlawful acts.** It shall be unlawful for any person to erect, construct, enlarge, alter, repair, move, improve, remove, convert or demolish, equip, use, occupy, or maintain any building or land or cause or permit the same to be done in violation of this code. When any building or parcel of land regulated by this code is being used contrary to this code, the code official shall be permitted to order such use discontinued and the structure, parcel of land, or portion thereof, vacated by notice served on any person causing such use to be continued. Such person shall discontinue the use within the time prescribed by the code official after receipt of such notice to make the structure, parcel of land, or portion thereof, comply with the requirements of this code.~~

SECTION 112 ~~109~~
MEANS OF APPEALS
~~HEARINGS, APPEALS AND AMENDMENTS~~

112.1 Application for appeal. Any person directly affected by a decision of the *code official* or a notice or order issued under this code shall have the right to appeal to the board of appeals, provided that a written application for appeal is filed within 20 days after the day the decision, notice or order was served. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or the requirements of this code are adequately satisfied by other means.

~~**109.2 Appeals.** Appeals shall be in accordance with Sections 109.2.1 through 109.2.3.~~

~~**109.2.1 Filing.** Any person with standing, aggrieved or affected by any decision of the code official shall be permitted to appeal to the examiner, board or commission by written request with the code official. Upon furnishing the proper information, the code official shall transmit to the examiner, board or commission all papers and pertinent data related to the appeal.~~

~~**109.2.2 Time limit.** An appeal shall only be considered if filed within [NUMBER OF WORKING DAYS] after the cause arises or the appeal shall not be considered. If such an appeal is not made, the decision of the code official shall be considered final.~~

112.1.1 Stays of enforcement. The filing of an appeal of notice or orders, except for notice or order concerning *Imminent Danger*, shall stay the enforcement of the notice or order until the appeal is heard by the board of appeals.

~~**109.2.3 Stays of proceedings.** An appeal stays all proceedings from further action unless there is immediate danger to public health and safety.~~

112.2 Membership of board. The board of appeals shall consist of five members who are qualified by experience and training to pass on matters pertaining to the provisions of this code. The board shall be appointed by the chief appointing authority, and shall serve staggered and overlapping terms.

112.2.1 Alternate members. The chief appointing authority shall appoint two or more alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership and shall be appointed for five years, or until a successor has been appointed.

112.2.2. An employee of the jurisdiction shall not be a member of the board of appeals. The *code official* shall be an ex officio member of the board but shall have no vote on any matter before the board.

112.2.3 Chairman. The board shall annually select one of its members to serve as chairman.

112.2.4 Secretary. The chief administrative officer shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

112.2.5 Qualifications. The board of appeals shall consist of five individuals, one from each of the following professions or disciplines.

1. Registered design professional who is a registered architect; or a builder or superintendent of building construction with at least 10 years' experience, five of which shall have been in responsible charge of work.
2. Registered design professional with structural engineering or architectural experience.
3. Registered design professional with fuel gas and plumbing engineering experience; or a fuel gas contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
4. Registered design professional with electrical engineering experience; or an electrical contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
5. Registered design professional with fire protection engineering experience; or a fire protection contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.

112.2.6 Disqualification of member. A member shall not hear an appeal in which that member has a personal, professional or financial interest.

112.2.7 Terms. The initial members of the board of appeals shall serve as follows: one for five years; one for four years; one for three years; one for two years and one for one year. Thereafter, each new member shall serve for five years or until a successor has been appointed.

112.2.8 Compensation of members. Compensation of members shall be determined by law.

112.3 Hearings and meetings. Hearings on appeals and other meetings of the board of appeals shall be held in conformance with Sections 109.3.1 through 109.3.3.

112.3.1 Procedures. The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

112.3.2 Notice. The board shall hold a hearing upon notice from the chairman, within 10 days of the filing of an appeal, or at stated periodic meetings.

112.3.3 Open hearing. All hearings before the board shall be open to the public. A quorum shall consist of not less than two-thirds of the board membership. The appellant, the appellant's representative, the *code official* and any person whose interests are affected shall be given an opportunity to be heard.

112.3.4 Postponed hearing. When the full board is not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

~~**109.1 Hearings.** Upon receipt of an application in proper form, the code official shall arrange to advertise the time and place of public hearing. Such advertisement shall be given by at least one publication in a newspaper of general circulation within the jurisdiction. Such notice shall state the nature of the request, the location of the property, and the time and place of hearing. Reasonable effort shall also be made to give notice by regular mail of the time and place of hearing to each surrounding property owner; the extent of the area to be notified shall be set by the code official. A notice of such hearing shall be posted in a conspicuous manner on the subject property.~~

112.4 Board decision. The board shall modify or reverse the decision of the *code official* by a concurring vote of a majority of the total number of appointed board members.

~~**109.4 Voting and notice of decision.** There shall be a vote of a majority of the board and commission present in order to decide any matter under consideration. Each decision shall be entered in the minutes by the secretary. All appeals shall be kept in accordance with state regulations and such appeals shall be open to the public.~~

112.4.1 Resolution. The decision of the board shall be by resolution. Certified copies shall be furnished to the appellant and to the code official.

~~Notice in writing of the decision and the disposition of each appeal shall be given to the code official and each appellant by mail or otherwise.~~

112.4.2 Action by code official. The *code official* shall take immediate action in accordance with the decision of the board.

112.5 Court review. Any person, whether or not a previous party to the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

SECTION 113
FEES

113.1 Payment of fees. A permit or an amendment to a permit shall not be issued until the fees prescribed in Section 113.2 have been paid.

113.2 Fee schedule. The fees for permits and other considerations shall be in accordance with the following schedule: [JURISDICTION TO INSERT APPROPRIATE FEE SCHEDULE]

113.3 Related fees. The payment of the fee for work done in connection to or concurrently with the work authorized by a *permit* shall not relieve the applicant or holder of the *permit* from the payment of other fees that are prescribed by law.

113.4 Work commencing before permit issuance. Any person who commences any work on a project requiring a *permit* before obtaining the necessary permits shall be subject to a fee established by the *code official* that shall be in addition to the required *permit* fees.

113.5 Permit extension. The fee for an extension of a permit in conformance with Section 105.7 shall be one-half the amount required for a new permit for such work.

113.6 Expiration of permit. For permits that have expired, and before such work recommences in conformance with Section 105.8.1, the fee to recommence work shall be one-half the amount required for a new permit for such work.

113.7 Stop work order. Any person who shall continue any work on a project requiring a permit after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.

113.8 Reinspection fee. A reinspection of work not in compliance with this code shall be subject to a fee established by the *code official* that shall be in addition to the required *permit* fees. The fee may be assessed when the *approved* plans are not readily available to the inspector, for failure to provide access on the date for which inspection is requested, for work deviating from the approved, or the work or test is not in compliance with this code.

113.9 Fee refunds. The code official shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment. The code official shall authorize the refunding of fees as follows:

1. The full amount of any fee paid hereunder which was erroneously paid or collected.
2. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.
3. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid when no work on a project has been performed under a permit issued in accordance with this code.

~~**102.1 Fees.** A fee for services shall be charged. All fees shall be set by the jurisdiction and schedules shall be available at the office of the code official.~~

SECTION 114 ~~105~~
PLANNING COMMISSION

114.1 ~~105.1~~ General. This section addresses the duties and responsibilities of a planning commission, hereafter referred to as "the commission," and other officials and agencies, with respect to the administration of this code.

114.2 ~~105.2~~ Establishment of the commission. The establishment of the commission shall be in accordance with the policies and procedures as set forth in state law. The commission shall consist of the number of members as specified in state law.

115.2.1 Legislative liaison. ~~Additionally,~~ One member of the legislative body shall be permitted to be appointed as liaison to the commission. Such member shall have the right to attend all meetings and take part in all discussions, but shall not vote on commission decisions.

114.2.2 ~~105.4~~ Selection of members. All members shall be appointed and approved by the legislative body of the jurisdiction ~~served~~. ~~The terms of office for the commission members shall be staggered at intervals so as to provide continuity in policy and personnel.~~ Members of the commission shall be residents of the jurisdiction ~~served~~. ~~Compensation of members shall be set by the legislative body of the jurisdiction. Any vacancy for the unexpired term of any member whose term is not completed shall be filled. A member shall continue to serve until a successor has been appointed and approved by the legislative body of the jurisdiction.~~

114.2.3 ~~105.5~~ ~~Chairperson election and rules adoption~~ Chairman. The commission shall annually elect one of its members to serve as chairman ~~elect from its membership a chairperson~~. ~~It shall also establish and adopt rules for its organization and transaction of business and shall keep a public record of its proceedings~~.

114.2.4 ~~105.6~~ ~~Commission~~ Secretary. ~~A secretary to assist the commission shall be appointed by~~ The code official shall designate a qualified clerk to serve as secretary to the commission. The secretary shall keep a public record of the commission's proceedings including minutes of the commission meetings, ~~for public record~~ and conduct all correspondence, including the notification of decisions. The secretary shall also certify records. The secretary shall prepare and submit the minutes of commission meetings to the ~~chairperson~~ chairman and the commission.

114.2.5 ~~105.3~~ Terms for members. The terms of office for the members of the commission shall be as set forth in state law. The terms of office for the commission members shall be staggered at intervals so as to provide continuity in policy and personnel. Any vacancy for the unexpired term of any member whose term is not completed shall be filled. A member shall continue to serve until a successor has been appointed and approved by the legislative body of the jurisdiction. Members shall be permitted to be removed for cause upon written charges and after a public hearing before the legislative body of the jurisdiction, if such a hearing is requested.

114.2.6 Compensation of members. Compensation shall be set by the legislative body of the jurisdiction.

114.3 Procedures. ~~It~~ The commission shall ~~also establish and~~ adopt and make available to the public through the secretary rules for its organization and the transaction of business. ~~and shall keep a public record of its proceedings.~~

114.3 ~~105.7~~ Duties and powers. The duties and powers of the planning commission shall be in accordance with Sections ~~105.7.1~~ 114.3.1 through 114.3.5 ~~105.7.5~~.

114.3.1 Comprehensive plan. The planning commission shall develop a comprehensive plan in accordance with Section 116.

114.3.1.1 ~~105.7.1~~ The commission shall ~~be permitted also to~~ recommend amendments to the comprehensive plan regarding the administration or maintenance of this code.

114.3.2 ~~105.7.2~~ Zoning code. ~~It shall be the duty of~~ The commission ~~to~~ shall develop and recommend to the legislative body a zoning code, in accordance with the guidelines of the comprehensive plan, establishing zones within the jurisdiction. Such a code shall be made in regards to the character of each district and the most appropriate use of land within the jurisdiction. The commission shall make periodic reports and recommendations to the legislative body.

114.3.3 ~~105.7.3~~ Division of land regulations. ~~It shall be the duty of~~ The commission ~~to~~ shall develop and certify regulations governing the division of land. All divisions of land shall be in accordance with the adopted regulations.

114.3.4 ~~105.7.4~~ Conditional-use permits. ~~It shall be the duty of~~ The commission ~~to~~ shall review conditional-use permit applications. The application shall be accompanied by maps, drawings or other documentation in support of the request. The granting of a conditional-use permit shall not exempt the applicant from compliance with other relevant provisions of related ordinances.

114.3.5 ~~105.7.5~~ Official zoning map. The legislative body shall adopt an official zoning map for all areas included within the jurisdiction.

114.4 ~~105.8~~ Appeals and hearings. Any person with standing aggrieved by any decision of the commission shall have the right to make such appeals as shall be permitted to be provided by this code or state law. Such appeals shall be based on the record.

SECTION 115 ~~107~~
BOARD OF ADJUSTMENT

115.1 ~~107.1~~ General. This section addresses the duties and responsibilities of a board of adjustment, hereafter referred to as "the board," and other officials and agencies, with respect to the administration of this code.

115.2 ~~107.2~~ Establishment of the board. The establishment of the board shall be in accordance with the procedures and policies set forth in state law. The board shall consist of the number of members as specified in state law.

115.2.1 Planning commission liaison. ~~Additionally,~~ One member of the planning commission shall be appointed as liaison to the board. Such member shall have the right to attend all meetings and take part in all discussions, but shall not vote on board decisions.

115.2.2 ~~107.4~~ Selection of members. All members shall be appointed and approved by the legislative body of the jurisdiction served. ~~The terms of office shall be staggered at intervals, so as to provide continuity in policy and personnel.~~ Members of the board shall be residents of the jurisdiction ~~served~~. ~~Compensation shall be set by the legislative body of the jurisdiction. Any vacancy for the unexpired term of any member whose term is not completed shall be filled. A member shall continue to serve until a successor has been appointed and approved by the legislative body of the jurisdiction.~~

115.2.3 ~~107.5~~ ~~Chairperson election and rules adoption~~ Chairman. The board shall annually select one of its members to serve as chairman ~~elect from its membership a chairperson~~.

115.2.4 ~~107.6~~ ~~Board~~ Secretary. ~~A secretary to assist the board shall be appointed by~~ The code official shall designate a qualified clerk to serve as secretary to the board. The secretary shall keep a public record of the board's proceedings including minutes of the board meetings, ~~for public record~~ and conduct all correspondence, including the notification of decisions. The secretary shall also certify records. The secretary shall prepare and submit the minutes of board meetings to the ~~chairperson~~ chairman and the board.

115.2.5 ~~107.3~~ Terms ~~for members~~. The terms of office for the members of the board shall be as set forth in state law. The terms of office shall be staggered at intervals, so as to provide continuity in policy and personnel. Any vacancy for the unexpired term of any member whose term is not completed shall be filled. A member shall continue to serve until a successor has been appointed and approved by the legislative body of the jurisdiction. Members shall be permitted to be removed for cause upon written charges and after a public hearing before the legislative body of the jurisdiction, if such hearing is requested.

115.2.6 Compensation of members. Compensation shall be set by the legislative body of the jurisdiction.

115.3 Procedures. ~~It~~ The board shall ~~also establish and~~ adopt and make available to the public through the secretary rules for its organization and the transaction of business. ~~and shall keep a public record of its proceedings.~~

~~**107.7 Duties and powers.** The duties and powers of the board of adjustment shall be in accordance with Sections 107.7.1 through 107.7.3.~~

~~**107.7.1 Errors.** The board shall have the power to hear and decide on appeals where it is alleged that there is an error in any order, requirement, decision, determination or interpretation by the code official.~~

115.4 ~~107.7.2~~ Variances. The board shall have the power to hear ~~and decide on appeals wherein~~ a request for a variance to the ~~terms~~ provisions of this code ~~is proposed~~. Limitations as to the board's authorization shall be as set forth in this code.

115.5 Appeals and hearings. Any person with standing aggrieved by any decision of the board shall have the right to make such appeals as shall be permitted to be provided by this code or state law. Such appeals shall be based on the record.

SECTION 116 ~~106~~
COMPREHENSIVE PLAN
~~COMPLIANCE WITH THE CODE~~

116.1 106.1 General. Upon adoption of this code by the legislative body, no use, building or structure, whether publicly or privately owned, shall be constructed or authorized until the location and extent thereof conform to ~~said~~ the comprehensive plan of the jurisdiction.

116.2 ~~105.7.1~~ Comprehensive plan. ~~It shall be the duty of~~ The commission, after holding public hearings, ~~to~~ shall create and recommend to the legislative body a comprehensive plan for the physical development of the jurisdiction, which shall be permitted to include areas outside its boundaries that bear consideration to the planning of the jurisdiction. **~~104.4 Comprehensive plan.~~** The code official shall assist the planning commission in the development and implementation of the comprehensive plan.

116.2.1 Elements of the comprehensive plan. At a minimum, the comprehensive plan shall include ~~at least~~ the following elements:

1. Official maps.
2. Growth and land use.
3. Commercial/industrial uses.
4. Transportation and utilities.
5. Community facilities.
6. Housing.
7. Environmental.
8. Geologic/natural hazards.

116.3 ~~104.5.4~~ Amendments. All requests for amendments or changes to the comprehensive plan or this code or map shall be submitted to the code official for processing.

SECTION 117
VARIANCES

117.1 ~~107.7.3~~ ~~Variance review criteria~~ General. The board of adjustment shall be permitted to approve, approve with conditions or deny a request for a variance to the provisions of this code.

117.2 Variance review criteria. Each request for a variance shall be consistent with the following criteria:

1. Limitations on the use of the property due to physical, topographical and geologic features.
2. The grant of the variance will not grant any special privilege to the property owner.
3. The applicant can demonstrate that without a variance there can be no reasonable use of the property.
4. The grant of the variance is not based solely on economic reasons.
5. The necessity for the variance was not created by the property owner.
6. The variance requested is the minimum variance necessary to allow reasonable use of the property.
7. The grant of the variance will not be injurious to the public health, safety or welfare.
8. The property subject to the variance request possesses one or more unique characteristics generally not applicable to similarly situated properties.

117.3 ~~107.8~~ Use variance. The board ~~of adjustment~~ shall not grant a variance to allow the establishment of a use in a zoning district when such use is prohibited by the provisions of this code.

117.4 ~~107.9~~ Decisions. The board shall be permitted to decide in any manner it sees fit; however, it shall not have the authority to alter or change this code or zoning map or allow as a use that which would be inconsistent with the requirements of this code, provided, however, that in interpreting and applying the provisions of this code, the requirements shall be deemed to be the spirit and intent of the code and do not constitute the granting of a special privilege.

~~SECTION 108~~

~~**HEARING EXAMINER**~~

~~**108.1 General.** This section addresses the duties and responsibilities of a hearing examiner, hereafter referred to as the "examiner," and other officials and agencies with respect to the administration of this code.~~

117.5 ~~108.2~~ Appointment of an examiner. ~~The~~ A hearing examiner, hereafter referred to as the "examiner," shall be appointed and approved by the legislative body of the jurisdiction ~~served~~. ~~Compensation shall be set by same.~~

117.5.1 ~~108.3~~ Duties and powers. The examiner shall hear and consider all applications for discretionary land rezones and use decisions as authorized by the legislative body by resolution. Such considerations shall be set for public hearing. The examiner shall be bound by the same standards of conduct as the commission and board, with respect to the administration of this code.

117.5.2 ~~108.4~~ Decisions. The examiner shall, within 10 working days, render a decision. Notice in writing of the decision and the minutes of record shall be given to the code official for distribution as required. All decisions shall be kept in accordance with state regulations and such decisions shall be open to the public.

117.5.3 Appeals and hearings. Any person with standing aggrieved by any decision of the examiner shall have the right to make such appeals as shall be permitted to be provided by this code or state law. Such appeals shall be based on the record.

(SECTIONS 118 THROUGH 119 RESERVED)

PART 3 – GENERAL REQUIREMENTS

SECTION 120
UNSAFE STRUCTURES, EQUIPMENT, AND CONDITIONS

120.1 General. If any building, structure, premises or part thereof, or appliance, equipment, or system is found to be unsafe by the *code official*, or found in the case of a building or structure to be unfit for human occupancy, the condition shall be abated whenever possible, but if abatement is not achieved or is non-achievable, then condemnation shall be undertaken in accordance with the provisions of this code.

120.1.1 Notice to building official. Abatement requiring repairs, *alterations*, remodeling, removing or demolition shall be referred to the *building official*.

120.1.2 Unsafe structures. An unsafe structure is a structure that is dangerous to the life, health, or safety of the public or to the *occupants* when:

1. There are no minimum safeguards provided to protect or warn *occupants* in the event of fire; or
2. Such structure contains unsafe equipment or is so damaged, decayed, dilapidated, is structurally unsound, is of such faulty construction, or has such an unstable foundation, that partial or complete collapse is possible.

120.1.3 Unsafe equipment. Unsafe equipment includes any boiler, heating equipment, elevator, moving stairway, electrical wiring or device, flammable liquid containers or other equipment on the *premises* or within the structure which is in such disrepair or condition that such equipment constitutes a hazard to life, health, property or safety of the public or the *occupants* of the *premises* or structure.

120.1.4 Structure unfit for human occupancy. A structure is unfit for human *occupancy* whenever the *code official* finds that such structure is unsafe, is unlawful or, because its degree of disrepair, or its want of maintenance, is unsanitary, vermin or rat infested, filthy and contaminated, lacking *ventilation*, illumination, sanitary, heating facilities or other essential equipment required by this code, or because the structure is in proximity to an unsafe or dangerous condition that constitutes a hazard to the *occupants* of the structure or to the public.

120.1.5 Unlawful structure. An unlawful structure is one found in whole or in part to be occupied by more persons than permitted under this code, or was erected, altered or occupied contrary to this code.

120.1.6 Structure and premise that are dangerous to the life, health or safety of the public or occupants. For the purpose of this code, any structure or *premises* that have any or all of the following conditions or defects shall be considered dangerous, and shall constitute an unsafe structure:

1. Any door, aisle, passageway, stairway, exit or other means of egress that does not conform to the *approved* building or fire code of the jurisdiction as related to the requirements for existing buildings.
2. The walking surface of any aisle, passageway, stairway, exit or other means of egress is so warped, worn loose, torn or otherwise unsafe as to not provide safe and adequate means of egress.
3. Any portion of a building, structure or appurtenance that has been damaged by fire, earthquake, wind, flood, *deterioration*, *neglect*, abandonment, vandalism or by any other cause to such an extent that it is likely to partially or completely collapse, or to become *detached* or dislodged.
4. Any portion of a building, or any member, appurtenance or ornamentation on the exterior thereof that is not of sufficient strength or stability, or is not so *anchored*, attached or fastened in place so as to be capable of resisting natural or artificial loads of one and one-half the original designed value.
5. The building or structure, or part of the building or structure, because of dilapidation, *deterioration*, decay, faulty construction, the removal or movement of some portion of the ground necessary for the support, or for any other reason, is likely to partially or completely collapse, or some portion of the foundation or underpinning of the building or structure is likely to fail or give way.
6. The building or structure, or any portion thereof, is clearly unsafe for its use and *occupancy*.
7. The building or structure is *neglected*, damaged, dilapidated, unsecured or abandoned so as to become an attractive nuisance to children who might play in the building or structure to their danger, becomes a harbor for vagrants, criminals or immoral persons, or enables persons to resort to the building or structure for committing a nuisance or an unlawful act.
8. Any building or structure has been constructed, exists or is maintained in violation of any specific requirement or prohibition applicable to such building or structure provided by the *approved* building or fire code of the jurisdiction, or of any law or ordinance to such an extent as to present either a substantial risk of fire, building collapse or any other threat to life and safety.
9. A building or structure, used or intended to be used for dwelling purposes, because of inadequate maintenance, dilapidation, decay, damage, faulty construction or arrangement, inadequate light, *ventilation*, mechanical or plumbing system, or otherwise, is determined by the *code official* to be unsanitary, unfit for human habitation or in such a condition that is likely to cause sickness or disease.
10. Any building or structure, because of a lack of sufficient or proper fire-resistance-rated construction, fire protection systems, electrical system, fuel connections, mechanical system, plumbing system or other cause, is determined by the *code official* to be a threat to life or health.
11. Any portion of a building remains on a site after the demolition or destruction of the building or structure or whenever any building or structure is abandoned so as to constitute such building or portion thereof as an attractive nuisance or hazard to the public.

120.2 Closing of vacant structures. If the structure is vacant and unfit for human habitation and *occupancy*, and is not in danger of structural collapse, the *code official* is authorized to post a placard of condemnation on the *premises* and order the structure closed up so as not to be an attractive nuisance. Upon failure of the *owner* to close up the *premises* within the time specified in the order, the *code official* shall cause the *premises* to be closed and secured through any available public agency or by contract or arrangement by private persons, and the cost thereof shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate that may be collected by any legal means.

120.3 Evacuation. The *code official* or the fire department official in charge of an emergency incident shall be authorized to order the immediate evacuation of any occupied building, structure or premises deemed unsafe due to hazardous conditions that present an imminent danger to occupants. *Persons* so notified shall immediately leave the structure or premises and shall not enter or re-enter until authorized to do so by the *code official* or the fire department official in charge of the incident.

120.4 Notice. Whenever the *code official* has *condemned* a structure or equipment under the provisions of this section, notice shall be posted in a conspicuous place in or about the structure affected by such notice and served on the *owner* or the person or persons responsible for the structure or equipment in accordance with Section 120.4.2. If the notice pertains to equipment, it shall also be placed on the *condemned* equipment. The notice shall be in the form prescribed in Section 120.4.1.

120.4.1 Form of notice. Such notice of shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.

4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the unsafe condition into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties set forth in this code or as may be adopted and authorized by state and/or local law.

120.4.2 Service of notice. Such notice shall be deemed properly served if a copy thereof is (a) delivered to the owner personally; (b) sent by certified or registered mail addressed to the owner at the last known address with the return receipt requested; or (c) delivered in any other manner as prescribed by local law. If the certified or registered letter is returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice. Service of such notice in the foregoing manner upon the owner's agent or upon the person responsible for the structure shall constitute service of notice upon the owner.

120.5 Placarding. Upon failure of the owner or person responsible to comply with the notice provisions within the time given, the *code official* shall post on the premises or on defective equipment a placard bearing the word "UNSAFE" or "CONDEMNED" as applicable, and a statement of the penalties provided for occupying the premises, operating the equipment or removing the placard.

120.5.1 Placard removal. The *code official* shall remove the placard whenever the unsafe conditions have been eliminated. Any person who defaces or removes an unsafe condition placard without the approval of the *code official* shall be subject to the penalties provided for by the jurisdiction.

120.6 Prohibited occupancy. Any structure *condemned* and placarded by the *code official* shall be vacated as ordered by the *code official*. It shall be unlawful for any person to occupy or to allow others to occupy a placarded *premises,* or to operate or allow others to operate any placarded equipment.

120.7 Abatement. The owner, operator, or occupant of a building, structure, premises, or equipment deemed unsafe by the *code official* shall abate or correct such unsafe conditions either by repair, rehabilitation, demolition or other *approved* corrective action.

120.7.1 Summary abatement. Where conditions exist that are deemed an *imminent danger* as described in Section 121.1 that will necessarily result in injury to occupants or the public, the *code official* or fire department official in charge of the incident is authorized to summarily abate such unsafe or hazardous conditions.

120.8 Record. The *code official* shall cause a report to be filed on an unsafe condition. The report shall state the occupancy of the structure and the nature of the unsafe condition. The record of an unsafe condition as outlined herein shall be retained by the *code official* for the period required for retention of public records.

SECTION 121
EMERGENCY MEASURES

121.1 Imminent danger. When, in the opinion of the *code official*, there is imminent danger of failure or collapse of a building or structure that endangers life, or when any building or part of a building has fallen and life is endangered by the occupation of the building, or when there is actual or potential danger to the building occupants or those in the proximity of any structure because of explosives, explosive fumes or vapors, or the presence of toxic fumes, gases, or materials, or operation of defective or *dangerous* equipment, the *code official* is hereby authorized and empowered to order and require the occupants to vacate the premises forthwith. The *code official* shall cause to be posted at each entrance to such structure a notice reading as follows: "This Structure Is Unsafe and Its Occupancy Has Been Prohibited by the *Code Official*." It shall be unlawful for any person to enter such structure except for the purpose of securing the structure, making the required *repairs*, removing the hazardous condition, or of demolishing the same.

121.2 Temporary safeguards. Notwithstanding other provisions of this code, whenever, in the opinion of the *code official*, there is imminent danger due to an unsafe condition, the *code official* shall order the necessary work to be done, including the boarding up of openings, to render such structure temporarily safe whether or not the legal procedure herein described has been instituted; and shall cause such other action to be taken as the *code official* deems necessary to meet such emergency.

121.3 Closing streets. When necessary for public safety, the *code official* shall temporarily close structures and close or order the authority having jurisdiction to close sidewalks, streets, public ways, and places adjacent to unsafe structures, and prohibit the same from being utilized.

121.4 Emergency repairs. For the purposes of this section, the *code official* shall employ the necessary labor and materials to perform the required work as expeditiously as possible.

121.5 Costs of emergency repairs. Costs incurred in the performance of emergency work shall be paid by the jurisdiction. The legal counsel of the jurisdiction shall institute appropriate action against the owner of the premises where the unsafe structure is or was located for the recovery of such costs.

121.6 Hearing. Any person ordered to take emergency measures shall comply with such order forthwith. Any affected person shall thereafter, upon petition directed to the appeals board, be afforded a hearing as described in this code.

SECTION 122
SERVICE UTILITIES

122.1 Connection of service utilities. No person shall make connections from a utility, source of energy, fuel, power, water system or *sewer* system to any building, structure or system that is regulated by this code for which a permit is required, until approved by the *code official*.

122.2 Temporary connection. The *code official* shall have the authority to authorize the temporary connection of the building, structure or system to the utility source of energy, fuel, or power.

122.3 Authority to disconnect service utilities. The *code official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or when such utility connection has been made without the approval required by Section 122.1 or 122.2. The *code official* shall notify the serving utility and, wherever possible, the owner and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

SECTION 123
TEMPORARY STRUCTURES, EQUIPMENT, SYSTEMS AND USES

123.1 General. The code official is authorized to issue a permit for temporary structures, equipment, systems and uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The code official is authorized to grant extensions for demonstrated cause.

123.2 Conformance. Temporary structures, equipment, systems and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.

123.3 Termination of approval. The code official is authorized to terminate such permit and to order the temporary structure, equipment, system or use to be discontinued.

~~**103.4** *Temporary buildings*, structures and uses such as reviewing stands and other miscellaneous structures, sheds, canopies or fences used for the protection of the public shall be permitted to be erected, provided a special approval is received from the code official for a limited period of time. *Temporary buildings* or structures shall be completely removed upon the expiration of the time limit stated in the permit.~~

SECTION 124
MAINTENANCE

124.1 Maintenance of safeguards. Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or any other feature is required for compliance with the provisions of this code, or otherwise installed, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be continuously maintained in accordance with this code and applicable referenced standards.

124.1.1 ~~103.3~~ Specific maintenance. All buildings or uses, both existing and new, and all parts thereof, shall be maintained. The owner or designated agent shall be responsible for the maintenance of buildings and parcels of land. To determine compliance with this section, the code official shall be permitted to cause any structure or use to be inspected.

124.2 Testing and operation. Equipment requiring periodic testing or operation to ensure maintenance shall be tested or operated as specified in this code.

124.2.1 Test and inspection records. Required test and inspection records shall be available to the *code official* at all times, or such records as designates shall be filed with the *code official*.

124.2.2 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

124.3 Supervision. Maintenance and testing shall be under the supervision of a responsible *person* who shall ensure that such maintenance and testing are conducted at specified intervals in accordance with this code.

124.4 Rendering equipment inoperable. Portable or fixed fire-extinguishing systems or devices and fire-warning systems shall not be rendered inoperative or inaccessible except as necessary during emergencies, maintenance, repairs, *alterations*, drills or prescribed testing.

SECTION 125
DEMOLITION

125.1 General. The *code official* shall order the owner of any premises upon which is located any structure that in the *code official's* judgment is deteriorated or dilapidated, or has become so out of *repair* as to be *dangerous*, unsafe, insanitary, or otherwise unfit for human habitation or occupancy, and such that it is unreasonable to *repair* the structure, to demolish and remove such structure; or if such structure is capable of being made safe by *repairs*, to *repair* and make safe and sanitary, or to board up and hold for future repair, or to demolish and remove at the owner's option; or where there has been a cessation of normal construction of any structure for a period of more than two years, to board up and hold for recommencement of work, or to demolish and remove such structure. Boarding up the building for future repair or recommencement of work shall not extend beyond one year, unless *approved* by the *code official*.

125.2 Notices and orders. All notices and orders shall comply with Section 111.2.

125.3 Failure to comply. If the owner of a premises fails to comply with a demolition order within the time prescribed, the *code official* shall cause the structure to be demolished and removed, either through an available public agency or by contract or arrangement with private persons, and the cost of such demolition and removal shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate.

125.4 Salvage materials. When any structure has been ordered demolished and removed in accordance with Section 125.3, the governing body or other designated officer under said contract or arrangement aforesaid shall have the right to sell the salvage and valuable materials at the highest price obtainable. The net proceeds of such sale, after deducting the expenses of such demolition and removal, shall be promptly remitted with a report of such sale or transaction, including the items of expense and the amounts deducted, for the person who is entitled thereto, subject to any order of a court. If such a surplus does not remain to be turned over, the report shall so state.

125.5 Existing remedies. The provisions in this code shall not be construed to abolish or impair existing remedies of the jurisdiction or its officers or agencies relating to the removal or demolition of any structure which is dangerous, unsafe or insanitary.

2. Revise and add the following definitions to the IZC:

ADDITION. An extension or increase in floor area, number of stories, or height of a building or structure.

ALTERATION. Any construction or renovation to an existing structure other than repair or addition that requires a *permit*, or a change in a mechanical, plumbing, fuel gas or other system that involves an extension, addition or change to the arrangement, type or purpose of the original installation that requires a *permit*.

APPLIANCE. A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.

APPROVED. Approval by the code official as the result of review, investigation or tests conducted by the code official or by reason of accepted principles or tests by national authorities, or technical or scientific organizations.

APPROVED AGENCY. An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been *approved* by the *code official*.

BUILDING OFFICIAL. The officer or other designated authority charged with the administration and enforcement of the *International Building Code*, or a duly authorized representative.

CERTIFICATE OF COMPLETION. A certificate stating that the project or work for which a permit was issued has been completed in compliance with *approved construction documents* and the requirements of this code.

CODE OFFICIAL. The officer or other designated authority charged with the administration and enforcement of this code, or a duly authorized representative.

CONSTRUCTION DOCUMENTS. The written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of the project necessary for obtaining a permit.

EQUIPMENT OR FIXTURE. Any plumbing, heating, electrical, ventilating, air conditioning, refrigerating, and fire protection equipment, apparatus and devices, all piping, ducts, vents, control devices and other systems or components thereof, and elevators, dumb waiters, escalators, boilers, pressure vessels and other mechanical facilities or installations that are related to building services, any of which are specifically regulated in this code. Appliances as defined by this code shall not be considered equipment. Equipment or fixtures shall not include manufacturing, production, or process equipment, but shall include connections from building service to process equipment.

FIRE CODE OFFICIAL. The fire chief or other designated authority charged with the administration and enforcement of the code, or a duly authorized representative.

IMMINENT DANGER. A condition which could cause serious or life-threatening injury or death at any time.

LABELED. Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation that maintains periodic inspection of the production of the above-*labeled* items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

LISTED. Equipment, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or services that maintains periodic inspection of production of *listed* equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

LOT LINE. A line dividing one lot from another, or from a street or any public place.

PERMIT. An official document or certificate issued by the authority having jurisdiction which authorizes performance of a specified activity.

REGISTERED DESIGN PROFESSIONAL. An architect or engineer who is registered or licensed to practice ~~professional architecture or engineering~~ their respective profession as defined by statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A *registered design professional* engaged by the owner to review and coordinate certain aspects of the project, as determined by the *building official*, for compatibility with the design of the building or structure, including submittal documents prepared by others, deferred submittal documents and phased submittal documents.

REPAIR. The reconstruction or renewal of any part of an existing building for the purpose of its maintenance.

TOWNHOUSE. A single-family *dwelling unit* constructed in a group of three or more attached units in which each unit extends from the foundation to roof and with open space on at least two sides.

PART XII – IRC BUILDING/ENERGY

1. Revise as follows:

CHAPTER 1
SCOPE AND ADMINISTRATION

PART I - SCOPE AND APPLICATION

SECTION R101
GENERAL

R101.1 Title. These ~~provisions~~ regulations shall be known as the *Residential Code for One- and Two-family Dwellings* of [NAME OF JURISDICTION], ~~and shall be cited as such and will be referred to~~ herein referred to as "this code."

R101.2 Scope. The provisions of this code ~~the *International Residential Code for One- and Two-family Dwellings*~~ shall apply to the construction, *alteration*, movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal, and demolition of detached one- and two-family dwellings and townhouses not more than three stories in height above *grade plane* ~~in height~~ with a separate means of egress and their *accessory structures*.

> **Exception:** Live/work units complying with the requirements of Section 419 of the *International Building Code* shall be permitted to be built as one- and two-family *dwellings* or townhouses. Fire suppression required by Section 419.5 of the *International Building Code* when constructed under the *International Residential Code for One- and Two-family Dwellings* shall conform to Section 903.3.1.3 of the *International Building Code*.

R101.3 Purpose ~~Intent~~. The purpose of this code is to establish minimum requirements to safeguard the public health, safety, ~~health~~ and general welfare through affordability, structural strength, means of egress facilities, stability, sanitation, light and ventilation, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment, and to provide safety to fire fighters and emergency responders during emergency operations.

R101.4 Severability. If a section, subsection, sentence, clause, or phrase of this code is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code.

R101.5 Validity ~~R102.6 Partial invalidity~~. In the event any part or provision of this code is held to be illegal or void, this shall not have the effect of making illegal or void ~~or illegal~~ any of the other parts or provisions hereof, which are determined to be legal; and it shall be presumed that this code would have been adopted without such illegal or invalid parts or provisions..

R102.2 Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state, or federal law.

SECTION R102
APPLICABILITY

R102.1 General. Where there is a conflict between a general requirement and a specific requirement of this code, the specific requirement shall be applicable. Where, in a ~~any~~ specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

R102.2 ~~R102.3~~ Application of references. References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

R102.3 ~~R102.4~~ Referenced codes and standards. The codes and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between the provisions of this code and referenced codes and standards, the provisions of this code shall apply.

> **Exception:** Where enforcement of a code provision would violate the conditions of the *listing* of the *equipment* or *appliance*, the conditions of the *listing* ~~and manufacturer's instructions~~ shall govern ~~apply~~.

R102.4 ~~R102.5~~ Appendices. Provisions in the appendices shall not apply unless specifically adopted ~~referenced in the adopting ordinance~~.

R102.5 ~~R102.7~~ Existing structures and systems. The legal occupancy or use of any structure or installed system existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the *International Building Code,* the *International Fire Code,* or the *International Property Maintenance Code* ~~or the *International Fire Code*~~, or as is deemed necessary by the *building official* for the general safety and welfare of the occupants and the public.

R102.5.1 Historic buildings. The provisions of this code relating to the construction, alteration, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures identified and classified by the state or local jurisdiction as historic buildings when such buildings or structures are judged by the *building official* to be safe and in the public interest of health, safety and welfare regarding any proposed construction, alteration, repair, enlargement, restoration, relocation or moving of buildings.

R102.6 ~~R104.11~~ Alternative materials, design, ~~and~~ methods ~~of construction,~~ and equipment. The provisions of this code are not intended to prevent the installation of any material, or the use or operation of appliances, equipment, systems, or method, or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative ~~material, design or method of construction~~ shall be *approved* where the *building official* finds that the proposed alternative ~~design~~ is satisfactory and complies with the intent of the provisions of this code, and that the alternative ~~material, method or work offered~~ is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, *fire resistance*, durability and safety.

R102.6.1 Matters regulated by the *International Building Code.* Approvals under the authority herein contained shall be subject to the approval of the *building official* whenever the alternative involves matters regulated by the *International Building Code*.

R102.7 Requirements not covered by code. Requirements necessary for the strength, stability, or proper operation of an existing or proposed fixture, structure, or equipment, or for the public safety, health, and general welfare, not specifically covered by this code, shall be determined by the *building official*.

R102.8 Subjects not regulated by this code. Where no applicable standards or requirements are set forth in this code, or are contained within other laws, codes, regulations, ordinances, or bylaws adopted by the jurisdiction, compliance with applicable nationally recognized standards, as *approved*, shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the *building official* to determine compliance with codes or standards for those activities or installations within the *building official's* jurisdiction or responsibility.

R102.9 ~~106.3.2~~ Previous approvals. This code shall not require changes in the *construction documents*, construction or designated occupancy of a structure for which a lawful *permit* has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

102.10 Contractor's responsibilities. Every contractor who enters into contracts for which a permit is required shall comply with the state and local rules and regulations concerning licensing.

R102.11 Specific application of this code. The following are application specific to this code.

R102.11.1 Performance-based provisions. Compliance with the specific performance-based provisions of the International Codes in lieu of specific requirements of this code shall also be permitted as an alternate.

R102.11.2 ~~R102.7.1~~ Additions, alterations or repairs. *Additions*, *alterations* or repairs to any structure shall conform to the requirements for a new structure without requiring the existing structure to comply with all of the requirements of this code, unless otherwise stated. *Additions*, *alterations* or repairs shall not cause an existing structure to become unsafe or adversely affect the performance of the building.

R102.11.3 ~~R110.2~~ Change in use. Changes in the character or use of an existing structure shall not be made except as specified in Sections 3406 and 3407 of the *International Building Code*.

PART II - ADMINISTRATION AND ENFORCEMENT

SECTION R103
DEPARTMENT OF BUILDING SAFETY

R103.1 General ~~Creation of enforcement agency~~. The Department of Building Safety, herein referred to as "the department," is hereby ~~created and the official in charge thereof shall be known as~~ established within the jurisdiction under the direction of the *building official*. The function of the department shall be the implementation, administration, and enforcement of the provisions of this code.

R103.2 Appointment. The *building official* shall be appointed by the chief appointing authority of the *jurisdiction*.

R103.3 Deputies. In accordance with the prescribed procedures of this *jurisdiction* and with the concurrence of the appointing authority, the *building official* shall have the authority to appoint a deputy *building official*, ~~the~~ related technical officers, inspectors, ~~plan examiners~~ and other employees. Such employees shall have powers as delegated by the *building official*.

R103.4 ~~104.8~~ Liability. The *building official*, member of the Board of Appeals, officer, or employee charged with the enforcement of this code, while acting for the *jurisdiction* in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally, and is hereby relieved from personal liability for any damage accruing to persons or property as a result of any act or by reason of an act or omission in the discharge of official duties.

R103.5 Legal defense. Any suit instituted against an officer or employee of the department because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by legal representative of the *jurisdiction* until the final termination of the proceedings. The *building official* or any subordinate shall not be liable for cost in ~~any~~ an action, suit, or proceeding that is instituted in pursuance of the provisions of this code. Any officer or employee, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith.

SECTION R104
DUTIES AND POWERS OF THE BUILDING OFFICIAL

R104.1 General. The *building official* is hereby authorized and directed to enforce the provisions of this code. The *building official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies, and procedures shall be in ~~conformance~~ compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

R104.2 Applications and permits. The *building official* shall receive applications, review *construction documents* and issue permits required by this code ~~for the erection and alteration of buildings and structures~~, inspect the premises for which such permits have been issued, and enforce compliance with the provisions of this code.

R104.3 Notices and orders. The *building official* shall issue all necessary notices or orders to ensure compliance with this code.

R104.4 Inspections. The *building official* ~~is authorized to~~ shall make all of the required inspections, or the *building official* shall have the authority to accept reports of inspection by *approved agencies* or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such *approved* agency or by the responsible individual. The *building official* is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

R104.5 Identification. The *building official* shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

R104.6 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the *building official* has reasonable cause to believe that there exists in a structure or upon a premises a condition which is contrary to or in violation of this code which makes the structure or premises unsafe, dangerous, or hazardous, the *building official* ~~or designee~~ is authorized to enter the structure or premises at reasonable times to

inspect or to perform the duties imposed by this code, provided that if such structure or premises be occupied, that credentials be presented to the occupant and entry requested. If such structure or premises ~~be~~ is unoccupied, the *building official* shall first make a reasonable effort to locate the owner or other person having charge or control of the structure or premises and request entry. If entry is refused, the *building official* shall have recourse to the remedies provided by law to secure entry.

104.6.1 Warrant. When the *building official* has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner or occupant or person having charge, care or control of the structure or premises shall not fail or neglect, after proper request is made as herein provided, to promptly permit entry therein by the *building official* for the purpose of inspection and examination pursuant to this code.

R104.7 Department records. The *building official* shall keep official records of applications received, permits and certificates issued, fees collected, reports of inspections, and notices and orders issued. Such records shall be retained in the official records for the period required for the retention of public records.

104.8 Assistance of other agencies. The code official is authorized to request, and shall receive so far as is required in the discharge of the duties described in this code, the assistance and cooperation of other officials of the jurisdiction.

104.9 Specific duties. The following are specific duties of the code official. [JURISDICTION TO INSERT CODE OFFICIAL DUTIES SPECIFIC TO THIS CODE]

SECTION R105
PERMITS

R105.1 Permit required. Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish or change the occupancy of a building or structure, or to construct, erect, install, enlarge, alter, repair, remove, convert or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the *building official* and obtain the required *permit* for the project. Where laws or regulations are enforceable by other agencies or departments, approval shall be obtained from all agencies or departments concerned.

105.1.1 Annual permit. In lieu of an individual *permit* for each *alteration* to an already *approved* electrical, gas, mechanical or plumbing installation, the *building official* is authorized to issue an annual *permit* upon application therefor to any person, firm or corporation regularly employing one or more qualified tradespersons in the building, structure, or on the premises owned or operated by the applicant for the *permit*.

105.1.1.1 Annual permit records. The person to whom an annual *permit* is issued shall keep a detailed record of *alterations* made under such annual *permit*. The *building official* shall have access to such records at all times, or such records shall be filed with the *building official* as designated.

R105.1.2 ~~R105.2.1~~ Emergency repairs. Where *equipment* replacements and repairs must be performed in an emergency situation, the *permit* application shall be submitted within the next working business day to the *building official*.

105.1.3 Permits specifically required. The following specifically require a permit. [JURISDICTION TO INSERT SPECIFIC ITEMS REQUIRING A PERMIT FOR THIS CODE]

R105.2 Permit not required ~~Work exempt from permit.~~ Exemption from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this *jurisdiction*. *Permits* shall not be required in accordance with Sections 105.2.1 through 105.2.3. ~~for the following:~~

R105.2.1 ~~R105.2.2~~ Repairs. Application or notice to the *building official* is not required for ordinary repairs to structures, replacement of lamps or the connection of *approved* portable electrical *equipment* to *approved* permanently installed receptacles. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required means of egress, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include *addition* to, *alteration* of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

R105.2.2 ~~R105.2.3~~ Public service agencies. A *permit* shall not be required for the installation, alteration or repair of generation, transmission, distribution, metering or other related *equipment* that is under the ownership and control of public service agencies by established right.

105.2.3 Specific exemption. The following are specifically exempt from requiring a permit.

105.2.3.1 Building:

1. One-story detached *accessory structures* used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 200 square feet (18.58 m2).
2. Fences not over 6 feet (1829 mm) high.
3.. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge.
4. Water tanks supported directly upon *grade* if the capacity does not exceed 5,000 gallons (18 927 L) and the ratio of height to diameter or width does not exceed 2 to 1.
5. Sidewalks and driveways.
6. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
7. Prefabricated swimming pools that are less than 24 inches (610 mm) deep.
8. Swings and other playground equipment.
9. Window awnings supported by an exterior wall which do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support.
10. Decks not exceeding 200 square feet (18.58m2) in area, that are not more than 30 inches (762 mm) above *grade* at any point, are not attached to a *dwelling* and do not serve the exit door required by Section R311.4.

105.2.3.2 Electrical:

1. *Listed* cord-and-plug connected temporary decorative lighting.
2. Reinstallation of attachment plug receptacles but not the outlets therefor.
3. Replacement of branch circuit overcurrent devices of the required capacity in the same location.
4. Electrical wiring, devices, *appliances,* apparatus or *equipment* operating at less than 25 volts and not capable of supplying more than 50 watts of energy.
5. Minor repair work, including the replacement of lamps or the connection of *approved* portable electrical *equipment* to *approved* permanently installed receptacles.

105.2.3.3 Gas:

1. Portable heating, cooking or clothes drying *appliances*.
2. Replacement of any minor part that does not alter approval of *equipment* or make such *equipment* unsafe.
3. Portable-fuel-cell *appliances* that are not connected to a fixed piping system and are not interconnected to a power grid.

105.2.3.4 Mechanical:

1. Portable heating *appliances*.
2. Portable ventilation *appliances*.
3. Portable cooling units.
4. Steam, hot- or chilled-water piping within any heating or cooling *equipment* regulated by this code.
5. Replacement of any minor part that does not alter approval of *equipment* or make such *equipment* unsafe.
6. Portable evaporative coolers.
7. Self-contained refrigeration systems containing 10 pounds (4.54 kg) or less of refrigerant or that are actuated by motors of 1 horsepower (746 W) or less.
8. Portable-fuel-cell *appliances* that are not connected to a fixed piping system and are not interconnected to a power grid.

105.2.3.5 Plumbing:

1. The stopping of leaks in drains, water, soil, waste or vent pipe; provided, however, that if any concealed trap, drainpipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with new material, such work shall be considered as new work and a *permit* shall be obtained and inspection made as provided in this code.

2. The clearing of stoppages or the repairing of leaks in pipes, valves or fixtures, and the removal and reinstallation of water closets, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

R105.3 Application for permit. To obtain a *permit*, the applicant shall first file an application therefor in writing on a form furnished by the department ~~of building safety~~ for that purpose. Such application shall:

1. Identify and describe the project ~~work~~ to be covered by the *permit* for which application is made.
2. Describe the land on which the proposed project ~~work~~ is to be done by legal description, street address or similar description that will readily identify and definitely locate the proposed building or project ~~work~~.
3. Indicate the use and occupancy for which the proposed project ~~work~~ is intended.
4. Be accompanied by *construction documents* and other information as required in Section R107~~6.1~~.
5. State the valuation of the proposed project ~~work~~.
6. Be signed by the applicant or the applicant's authorized agent.
7. Give such other data and information as required by the *building official*.

105.3.1 ~~R108.3 Building~~ Permit valuations. ~~Building~~ *Permit* valuations required under Section 105.3(5) shall include total value of the project ~~work~~, including materials and labor, ~~for which the *permit* is being issued~~, ~~such as~~ and electrical, gas, mechanical, plumbing equipment and other permanent systems for which the *permit* is being issued ~~including materials and labor~~. If, in the opinion of the *building official*, the valuation is underestimated on the application, the *permit* shall be denied, unless the applicant can show detailed estimates to meet the approval of the *building official*. Final building *permit* valuation shall be set by the *building official*.

R105.4 ~~R105.3.1~~ Action on application. The *building official* shall examine or cause to be examined applications for permits and amendments thereto within a reasonable time after filing. If the application or the *construction documents* do not conform to the requirements of pertinent laws, the *building official* shall reject such application in writing, stating the reasons therefor. If the *building official* is satisfied that the proposed project ~~work~~ conforms to the requirements of this code and laws and ordinances applicable thereto, the *building official* shall issue a *permit* therefor as soon as practicable.

R105.4.1 ~~R105.9~~ Preliminary inspection. Before issuing a *permit,* the *building official* is authorized to examine or cause to be examined buildings, structures and sites for which an application has been filed.

R105.4.2 ~~R106.3.3 Phased approval~~ Conditional permits. The *building official* is authorized to issue a *permit* for the construction or operation of part of the project such as the construction of foundations or any other part of a building or structure, or installation of systems or materials, or operation before the *construction documents* for the entire project ~~whole building, or structure~~ have been submitted or *approved*, provided that adequate information and detailed statements have been filed complying with pertinent requirements of this code. The holder of such *permit* ~~for the foundation or other parts of a building or structure~~ shall proceed only to the point for which approval has been given, at the permit holder's own risk, ~~with the building operation~~ and without assurance that a *permit* for the entire project ~~structure~~ will be granted.

R105.5 ~~R105.3.2~~ Time limitation of application. An application for a *permit* for any proposed project ~~work~~ shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a *permit* has been issued; except that the *building official* is authorized to grant one or more extensions of time for additional periods not exceeding 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

R105.6 ~~R105.4~~ Validity of permit. The issuance or granting of a *permit* shall not be construed to be a *permit* for, or an *approval* of, any violation of any of the provisions of this code or of any other ordinance of the *jurisdiction*. Permits presuming to give authority to violate or cancel the provisions of this code or other ordinances of the *jurisdiction* shall not be valid. The issuance of a *permit* based on *construction documents* and other data shall not prevent the *building official* from requiring the correction of errors in the *construction documents* and other data. ~~The *building official* is also authorized to prevent occupancy or use of a structure where in violation of this code or of any other ordinances of this *jurisdiction.*~~

105.7 Extensions of permit. For an unexpired permit the *building official* is authorized to grant, in writing, one or more extensions of the time, for periods of not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

R105.8 ~~R105.5~~ Expiration of permit. Every *permit* issued shall become invalid unless the work on the site authorized by such *permit* is commenced within 180 days after its issuance, or if the work authorized on the site by such *permit* is suspended or abandoned for a period of 180 days after the time the work is commenced.

105.8.1 Recommencement of work. Before such work covered under an expired permit recommences, a new permit shall be first obtained. The new permit shall be issued provided no changes have been made or will be made in the original construction documents for such work, and provided further that such suspension or abandonment has not exceeded one year. ~~The *building official* is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.~~

R105.9 ~~R105.6~~ Suspension or revocation of permit. The *building official* is authorized to suspend or revoke a *permit* issued under the provisions of this code ~~wherever~~ whenever the *permit* is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or regulation or any of the provisions of this code.

R105.10 ~~R105.7~~ ~~Placement~~ Posting of permit. ~~The building *permit*~~ Issued permits or copy thereof shall be kept on the site of the project ~~work~~ until the completion of the project.

SECTION R106
~~CONSTRUCTION~~ SUBMITTAL DOCUMENTS

R106.1 ~~Submittal documents~~ General. Submittal documents consisting of *construction documents*~~,~~ and other supporting data shall be submitted in two or more sets with each application for a *permit*, and in such form and detail as required by the *building official*. The *building official* shall require *construction documents* ~~shall~~ and other data to be prepared by a registered *design professional* where required by the statutes of the *jurisdiction* in which the project is to be constructed. Where special conditions exist, the *building official* is authorized to require ~~additional~~ necessary *construction documents* to be prepared by a registered *design professional*.

> **Exception:** The *building official* is authorized to waive the submission of *construction documents* and other data not required to be prepared by a registered *design professional* if ~~it is found that~~ the nature of the work applied for is such that ~~reviewing~~ review of *construction documents* is not necessary to obtain compliance with this code.

R106.2 Construction documents. *Construction documents* shall be in accordance with Sections 106.2.1 through 106.2.4.

R106.2.1 ~~R106.1.1~~ Information on construction documents. *Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the proposed project, and show in detail that the proposed project will conform to the provisions of this code and relevant laws, ordinances, rules, and regulations, as determined by the *building official*. ~~drawn upon~~ Plans shall be to scale and be on suitable material. Electronic media documents are permitted to be submitted when *approved* by the *building official*. ~~*Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the *building official*~~

R106.2.1.1 Specific information required. Where the quality of the materials is essential for conformity to this code, specific information shall be given to establish such quality. The terms “this code” or “legal” or “its equivalent” shall not be cited or used as a substitute for specific information.

R106.2.2 ~~R106.2~~ Site plan ~~or plot plan~~. The *construction documents* submitted with the application for *permit* shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, ~~and~~ distances from *lot lines*, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and *design flood* elevations. The site plan shall be drawn in accordance with an accurate boundary line survey.

106.2.2.1 Site plan for demolition. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot.

106.2.2.2. Waiver of site plan. The *building official* is authorized to waive or modify the requirement for a site plan when the application for permit is for alteration or repair or when otherwise warranted.

106.2.3 Specific Information. The following are specific requirements for submittal documents required by this code.

R106.2.3.1 Where required by the *building official*, all braced wall lines, shall be identified on the *construction documents* and all pertinent information including, but not limited to, bracing methods, location and length of braced wall panels, foundation requirements of braced wall panels at top and bottom shall be provided

R106.2.3.2 ~~R106.1.3~~ Information for construction in flood hazard areas. For buildings and structures located in whole or in part in flood hazard areas as established by Table R301.2(1), *construction documents* shall include:

1. Delineation of flood hazard areas, floodway boundaries and flood zones and the design flood elevation, as appropriate;
2. The elevation of the proposed lowest floor, including *basement*; in areas of shallow flooding (AO Zones), the height of the proposed lowest floor, including *basement*, above the highest adjacent *grade*;
3. The elevation of the bottom of the lowest horizontal structural member in coastal high hazard areas (V Zone); and
4. If design flood elevations are not included on the community's Flood Insurance Rate Map (FIRM), the *building official* and the applicant shall obtain and reasonably utilize any design flood elevation and floodway data available from other sources.

R106.2.3.3 ~~R105.3.1.1 Determination of substantially improved or substantially damaged~~ Existing buildings in flood hazard areas. For applications for reconstruction, rehabilitation, *addition* or other improvement of existing buildings or structures located in an area prone to flooding as established by Table R301.2(1), the *building official* shall examine or cause to be examined the *construction documents* and shall prepare a finding with regard to the value of the proposed work. For buildings that have sustained damage of any origin, the value of the proposed work shall include the cost to repair the building or structure to its predamaged condition. If the *building official* finds that the value of proposed work equals or exceeds 50 percent of the market value of the building or structure before the damage has occurred or the improvement is started, the finding shall be provided to the board of appeals for a determination of substantial improvement or substantial damage. Applications determined by the board of appeals to constitute substantial improvement or substantial damage shall require all existing portions of the entire building or structure to meet the requirements of Section R322.

R106.2.4 Design professional in responsible charge. When it is required that documents be prepared by a *registered design professional*, the *building official* shall be authorized to require the owner to engage and designate on the building *permit* application a *registered design professional* who shall act as the *registered design professional in responsible charge*. If the circumstances require, the owner shall designate a substitute *registered design professional in responsible charge* who shall perform the duties required of the original *registered design professional in responsible charge*. The *building official* shall be notified in writing by the owner if the *registered design professional in responsible charge* is changed or is unable to continue to perform the duties.

R106.2.4.1 Responsibility. The *registered design professional in responsible charge* shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

R106.2.4.2 Observation. Where structural observation is required, the inspection program shall name the individual or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur.

R106.3 Deferred submittals. For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the *building official* within a specified period.

R106.3.1 Prior approval. Deferral of any submittal items shall have the prior approval of the *building official*. The *registered design professional in responsible charge* shall list the deferred submittals on the *construction documents* for review by the *building official*.

R106.3.2 Review. Documents for deferred submittal items shall be submitted to the *registered design professional in responsible charge* who shall review them and forward them to the *building official* with a notation indicating that the deferred submittal documents have been reviewed and been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the deferred submittal documents have been *approved* by the *building official*.

R106.4 ~~R106.3~~ Examination of documents. The *building official* shall examine or cause to be examined ~~*construction documents* for code compliance~~ submittal documents and shall ascertain by such examinations whether the project indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

R106.5 ~~R106.3.1~~ Approval of construction documents. When the *building official* issues a *permit*, the *construction documents* and other data shall be ~~*approved*~~ endorsed, in writing or by a stamp, as ~~which states~~ "APPROVED ~~REVIEWED FOR CODE COMPLIANCE~~." One set of *construction documents* and other data so reviewed shall be retained by the *building official*. The other set(s) shall be returned to the applicant.~~,~~ One set shall be kept at the site of the project ~~work~~ and shall be open to inspection by the *building official* or ~~his or her~~ a duly authorized representative. Such *approved construction documents* shall not be changed, modified, or altered without authorization from the *building official*. All work shall be done in accordance with the *approved construction documents*.

~~**R105.8 Responsibility.** It shall be the duty of every person who performs work for the installation or repair of building, structure, electrical, gas, mechanical or plumbing systems, for which this code is applicable, to comply with this code.~~

R106.6 ~~R106.4~~ Amended ~~construction~~ documents. ~~Work shall be installed in accordance with the *approved construction documents*, and~~ Any changes made during construction that are not in compliance with the *approved construction documents* shall be resubmitted for approval as an amended set of *construction documents*.

R106.~~7~~5 ~~R106.5~~ Retention of construction documents. One set of *approved construction documents* shall be retained by the *building official* for a period of not less than 180 days from date of completion of the permitted project ~~work~~, or for the period required for retention of public records ~~as required by state or local laws~~.

SECTION R107 ~~105~~
MODIFICATIONS, TESTING, AND APPROVAL

R107.1 ~~104.10~~ Modifications. Wherever there are practical difficulties involved in carrying out the provisions of this code, and upon application of the owner or owner's representative, the *building official* shall have the authority to grant modifications for individual cases, provided the *building official* shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, life and fire safety, accessibility, or structural requirements ~~or structural~~. The details of action granting modifications shall be recorded and entered in the files of the department ~~of building safety~~.

R107.1.1 ~~104.10.1~~ Areas prone to flooding. The *building official* shall not grant modifications to any provision related to areas prone to flooding as established by Table R301.2(1) without the granting of a variance to such provisions by the board of appeals.

R107.2 ~~104.9~~ Approved materials and equipment. All materials, *equipment*, and devices *approved* by the *building official* shall be constructed and installed in accordance with such approval.

R107.3 ~~104.9.1~~ Used materials, appliances and equipment. The use of used materials, that meet the requirements of this code for new materials is permitted. Used appliances, *equipment* and devices shall not be reused unless such elements are in good repair or have been reconditioned and tested when necessary, placed in good and proper working condition, and *approved* by the *building official.*

R107.4 Listed and labeled material and appliances. Listed and labeled materials, equipment, and appliances shall be used and installed in accordance with the conditions the listing and the manufacturer's instructions.

R107.5 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

R107.6 ~~104.11.1~~ ~~Tests~~ Technical assistance. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, or to determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building or premises, the *building official* shall have the authority to require tests be conducted, or a technical opinion, recommendation or report be submitted as evidence of compliance. ~~to~~ The tests, opinions, recommendations and reports shall be made at no expense to the *jurisdiction*.

107.6.1 Preparation. The technical reports and opinions shall be prepared by a qualified engineer, approved specialist or specialty organization, or an *approved agency*.

107.6.2 Test methods. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the *building official* shall approve the testing procedures.

107.6.3 Testing agency. All tests shall be performed by an *approved agency*.

107.6.4 Retention of reports. ~~Reports of such tests~~ The technical opinions, recommendation, reports and test results shall be retained by the *building official* for the period required for retention of public records.

SECTION R108 ~~R109~~
INSPECTIONS

R108.1 General. Construction or work on a project for which a *permit* is required shall be subject to inspection by the *building official* and such construction or work shall remain accessible and exposed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the *permit* applicant to cause the construction or work to remain accessible and exposed for inspection purposes. Neither the *building official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

R108.1.1 Replacement of existing appliance. The requirements of this section shall not be considered to prohibit the operation of any heating or cooling *equipment* or appliances installed to replace such existing *equipment* or appliances serving an occupied portion of a structure provided that a request for inspection of such *equipment* or appliances has been filed with the department not more than 48 hours after such replacement work is completed, and before any portion of such *equipment* or appliances is concealed by any permanent portion of the structure.

R108.2 ~~R109.1~~ ~~Types of~~ Required inspections and testing. The *building official*, upon notification, shall make the inspections and require the tests set forth in Sections R108.2.1 through R108.2.4. ~~For onsite construction, from time to time the *building official*, upon notification from the *permit* holder or his agent, shall make or cause to be made any necessary inspections and shall either approve that portion of the construction as completed or shall notify the *permit* holder or his or her agent wherein the same fails to comply with this code.~~

R108.2.1 Specific Inspections. The following are specific inspections and tests required by this code.

R108.2.1.1 ~~R109.1.1~~ Foundation inspection. Inspection of the foundation shall be made after poles or piers are set or trenches or *basement* areas are excavated and any required forms erected and any required reinforcing steel is in place and supported prior to the placing of concrete. The foundation inspection shall include excavations for thickened slabs intended for the support of bearing walls, partitions, structural supports, or *equipment* and special requirements for wood foundations.

R108.2.1.2 ~~R109.1.2~~ Plumbing, mechanical, gas and electrical systems inspection. Rough inspection of plumbing, mechanical, gas and electrical systems shall be made prior to covering or concealment, before fixtures or *appliances* are set or installed, and prior to framing inspection.

> **Exception:** Back-filling of ground-source heat pump loop systems tested in accordance with Section M2105. 1 prior to inspection shall be permitted.

R108.2.1.3 ~~R109.1.3~~ Floodplain inspections. For construction in areas prone to flooding as established by Table R301.2(1), upon placement of the lowest floor, including *basement*, and prior to further vertical construction, the *building official* shall require submission of documentation, prepared and sealed by a registered *design professional*, of the elevation of the lowest floor, including *basement*, required in Section R322.

R108.2.1.4 ~~R109.1.4~~ Frame and masonry inspection. Inspection of framing and masonry construction shall be made after the roof, masonry, all framing, firestopping, draftstopping and bracing are in place and after the plumbing, mechanical and electrical rough inspections are *approved*.

R108.2.1.5 ~~R109.1.5.1~~ Fire-resistance-rated construction inspection. Where fire-resistance-rated construction is required between *dwelling units* or due to location on property, the *building official* shall require an inspection of such construction after all lathing and/or wallboard is in place, but before any plaster is applied, or before wallboard joints and fasteners are taped and finished.

R108.2.2 ~~R109.1.5~~ Other inspections. In addition to the ~~called~~ inspections specified above, the *building official* ~~may~~ is authorized to make or require ~~any~~ other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department ~~*building official*~~.

R108.2.3 Special inspections. Special inspection shall be as required by this code, the *International Building Code*, or the *International Fire Code* as applicable.

R108.2.4 ~~R109.1.6~~ Final inspection. Final inspection shall be made after ~~the permitted~~ all work on a project required by the *permit* is completed ~~and prior to occupancy~~.

R108.3 ~~R109.2~~ Inspection agencies. The *building official* is authorized to accept reports of *approved* inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.

R108.4 ~~R109.3~~ Inspection requests. It shall be the duty of the *permit* holder or their duly authorized agent to notify the *building official* ~~that such~~ when on a project ~~work~~ is ready for inspection. It shall be the duty of the *permit* holder ~~person requesting any inspections required by this code~~ to provide access to and means for inspection of such work that are required by this code.

R108.4.1 ~~R106.1.2~~ Manufacturer's ~~installation~~ instructions. Manufacturer's ~~installation~~ instructions for equipment, appliances, and materials installed under the permit~~, as required by this code,~~ shall be available on the ~~job~~ work site at the time of inspection.

R108.5 ~~R109.4~~ Approval required. Work on a project shall not proceed ~~be done~~ beyond the point indicated in each successive inspection without first obtaining the approval of the *building official*. The *building official*, upon notification, shall make the requested inspections and shall either ~~indicate~~ determine the portion of the project ~~construction~~ that is satisfactory as completed, or shall notify the *permit* holder or ~~an~~ authorized agent ~~of the *permit* holder~~ wherein the same fails to comply with this code. Any portions of the project that do not comply shall be corrected and such portion shall not be covered, ~~or~~ concealed, or used until authorized by the *building official*.

R108.6 Notice of approval. After all prescribed inspections or tests indicate the work complies with this code, a certificate of completion complying with Section 109 shall be issued by the *building official*.

SECTION R109 ~~R110~~
CERTIFICATE OF COMPLETION AND OCCUPANCY

R109.1 ~~R110.1~~ Use and occupancy. No building, ~~or~~ structure or premises or portion thereof shall be used or occupied until the code official has issued a certificate of occupancy as provided herein. No equipment, appliance or system used, and no change in the existing occupancy classification of a building, ~~or~~ structure, or portion thereof shall be made until the *building official* has issued a certificate of completion ~~occupancy therefor~~ as provided herein.

Exceptions:

1. Occupancy shall be permitted during emergency situations as described under Section 105.1.
~~1.~~ 2. Certificates of completion or occupancy are not required for work exempt from permits under Section R105.2.
3. Occupancy shall be permitted during the replacement of existing appliances as described under Section 108.1.1.
~~2.~~ 4. Certificates of occupancy are not required for one-story detached accessory buildings ~~or structures~~ used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m2).

109.1.1 Validity. Issuance of a certificate of completion or occupancy shall not be construed as an approval of a violation of the provisions of this code or of other pertinent laws and ordinances of the *jurisdiction*. Certificates presuming to give authority to violate or cancel the provisions of this code or other laws or ordinances of the *jurisdiction* shall not be valid.

R109.2 ~~R110.3~~ Certificate issued. After the *building official* inspects ~~the~~ a project requiring a permit ~~building or structure~~ and finds no violations of the provisions of this code or other laws that are enforced by the department ~~of Building Safety~~, the *building official* shall issue a certificate of completion. ~~Occupancy which~~ After all certificates of completion have been issued by other departments or agencies concerned, the code official shall issue a certificate of occupancy where applicable. A certificate of completion or occupancy shall contain the following:

1. The ~~building~~ *permit* number.
2. The address of the premises or structure.
3. The name and address of the owner.
4. A description of the project ~~that portion of the structure~~ for which the certificate is issued.
5. A statement that the described project ~~portion of the structure~~ has been inspected for compliance with the requirements of this code.
6. The name of the *building official*.
7. The edition of the code under which the *permit* was issued.
8. The use and occupancy in accordance with Chapter 3 of the *International Building Code*.
9. The type of construction as defined in Chapter 6 of the *International Building Code*.
10. The design *occupant load*.
11. If ~~an *automatic sprinkler system* is~~ fire protection systems are provided, whether the ~~sprinkler system is~~ protection systems are required.
12. Any special stipulations and conditions of the ~~building~~ *permit*.

Exceptions:

1. A certificate of completion or occupancy shall not be required to indicate the items under Section 109.2, Items 8, 9, and 10 for detached one- and two family dwellings and multiple single-family *dwellings* (*townhouses)* constructed using the *International Residential Code*.
2. The *code official* is shall not be required to indicate on a certificate items under Section 109.2, Items 8, 9, and 10 for the installation of equipment, appliances or systems.

R109.3 ~~R110.4~~ Temporary occupancy. The *building official* is authorized to issue a temporary certificate of occupancy before the completion of the entire work covered by the *permit*, provided that such portion or portions shall be occupied safely and without endangerment to life or public welfare. The temporary certificate shall indicate any limitations or restrictions necessary to keep the permit area safe, and items required to obtain the final certificate of occupancy. The *building official* shall set a time period during which the temporary certificate of occupancy is valid.

R109.4 ~~R110.5~~ Revocation. The *building official* ~~shall~~ is authorized to, in writing, suspend or revoke a certificate of completion or occupancy issued under the provisions of this code wherever the certificate is issued in error~~, or~~ on the basis of incorrect information supplied, or where it is determined that the building, ~~or~~ structure, premise, or portion thereof, or installation of appliance, equipment or system is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION R110 ~~R114~~
STOP WORK ORDER

R110.1 Authority. Whenever the *building official* finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or dangerous or unsafe, the *building official* is authorized to issue a stop work order.

R110.2 Issuance. The stop work order shall be in writing and shall be given to the owner of the property involved, or to the owner's agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order, and the conditions under which the cited work will be permitted to resume.

R110.2.1 Emergencies. Where an emergency exists, the *building official* shall not be required to give a written notice prior to stopping the work.

R110.3 ~~R114.2~~ Unlawful continuance. Any person who shall continue any work ~~in or about the structure~~ after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fees, fines, or penalties as prescribed by code or other laws or ordinances of the jurisdiction ~~law~~.

~~**R114.1 Notice to owner.** Upon notice from the *building official* that work on any building or structure is being prosecuted contrary to the provisions of this code or in an unsafe and dangerous manner, such work shall be immediately stopped. The stop work order shall be in writing and shall be given to the owner of the property involved, or to the owner's agent or to the person doing the work and shall state the conditions under which work will be permitted to resume.~~

SECTION R111 ~~R113~~
VIOLATIONS

R111.1 Code violations. No person, association, organization, or business entity of any form shall:

1. Erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or premises in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
2. Install or operate any equipment, appliances, or systems regulated by this code that is in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
3. Be non-compliant with the conditions of any permit or certificate issued under the auspices of this code; or
4. Tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *building official* without the express authorization of the *building official*.

R111.2 Notice of violation. A *code official* who observes or becomes aware of any code violation shall serve upon the responsible person, association, organization, or business entity a written notice in accordance with Section 111.2.1. In the absence of direct knowledge as to the identity or location of the responsible party, the *code official* shall serve the notice upon the property owner. Service may be effected by personal delivery, first class mail, substituted service, or such other means that may be authorized by state and/or local law.

R111.2.1 Form of notice. Such notice of violation shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the violation into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties in accordance with Section 111.3.

R 111.3 Penalties. Violators who fail to comply with a notice to discontinue or abate a condition in violation of this code, and violators who tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *building official* without the express authorization of the *building official*, shall be subject to the penalties set forth in this code as may be adopted and authorized by state and/or local law.

~~**R113.1 Unlawful acts.** It shall be unlawful for any person, firm or corporation to erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or *equipment* regulated by this code, or cause same to be done, in conflict with or in violation of any of the provisions of this code.~~

~~**R113.2 Notice of violation.** The *building official* is authorized to serve a notice of violation or order on the person responsible for the erection, construction, alteration, extension, repair, moving, removal, demolition or occupancy of a building or structure in violation of the provisions of this code, or in violation of a detail statement or a plan *approved* thereunder, or in violation of a *permit* or certificate issued under the provisions of this code. Such order shall direct the discontinuance of the illegal action or condition and the abatement of the violation.~~

~~**R113.3 Prosecution of violation.** If the notice of violation is not complied with in the time prescribed by such notice, the *building official* is authorized to request the legal counsel of the *jurisdiction* to institute the appropriate proceeding at law or in equity to restrain, correct or abate such violation, or to require the removal or termination of the unlawful occupancy of the building or structure in violation of the provisions of this code or of the order or direction made pursuant thereto.~~

~~**R113.4 Violation penalties.** Any person who violates a provision of this code or fails to comply with any of the requirements thereof or who erects, constructs, alters or repairs a building or structure in violation of the *approved construction documents* or directive of the *building official,* or of a *permit* or certificate issued under the provisions of this code, shall be subject to penalties as prescribed by law.~~

SECTION R112
~~BOARD~~ MEANS OF APPEALS

R 112.1 Application for appeal. Any person directly affected by a decision of the *building official* or a notice or order issued under this code shall have the right to appeal to the board of appeals, provided that a written application for appeal is filed within 20 days after the day the decision, notice or order was served. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or the requirements of this code are adequately satisfied by other means.

R112.1.1 Stays of enforcement. The filing of an appeal of notice or orders, except for notice or order concerning *Imminent Danger*, shall stay the enforcement of the notice or order until the appeal is heard by the board of appeals.

R112.2 Membership of board. The board of appeals shall consist of five members who are qualified by experience and training to pass on matters pertaining to the provisions of this code. The board shall be appointed by the chief appointing authority, and shall serve staggered and overlapping terms.

R112.2.1 Alternate members. The chief appointing authority shall appoint two or more alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership and shall be appointed for five years, or until a successor has been appointed.

R112.2.2. An employee of the jurisdiction shall not be a member of the board of appeals. The *building official* shall be an ex officio member of the board but shall have no vote on any matter before the board.

R112.2.3 Chairman. The board shall annually select one of its members to serve as chairman.

R112.2.4 Secretary. The chief administrative officer shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

R112.2.5 Qualifications. The board of appeals shall consist of five individuals, one from each of the following professions or disciplines.

1. Registered design professional who is a registered architect; or a builder or superintendent of building construction with at least 10 years' experience, five of which shall have been in responsible charge of work.
2. Registered design professional with structural engineering or architectural experience.
3. Registered design professional with fuel gas and plumbing engineering experience; or a fuel gas contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
4. Registered design professional with electrical engineering experience; or an electrical contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
5. Registered design professional with fire protection engineering experience; or a fire protection contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.

R112.2.6 Disqualification of member. A member shall not hear an appeal in which that member has a personal, professional or financial interest.

R112.2.7 Terms. The initial members of the board of appeals shall serve as follows: one for five years; one for four years; one for three years; one for two years and one for one year. Thereafter, each new member shall serve for five years or until a successor has been appointed.

R112.2.8 Compensation of members. Compensation of members shall be determined by law.

R112.3 Hearings and meetings. Hearings on appeals and other meetings of the board of appeals shall be held in conformance with Sections 109.3.1 through 109.3.3.

R112.3.1 Procedures. The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

R 112.3.2 Notice. The board shall hold a hearing upon notice from the chairman, within 10 days of the filing of an appeal, or at stated periodic meetings.

R112.3.3 Open hearing. All hearings before the board shall be open to the public. A quorum shall consist of not less than two-thirds of the board membership. The appellant, the appellant's representative, the *building official* and any person whose interests are affected shall be given an opportunity to be heard.

R112.3.4 Postponed hearing. When the full board is not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

R112.4 Board decision. The board shall modify or reverse the decision of the *building official* by a concurring vote of a majority of the total number of appointed board members.

R112.4.1 Resolution. The decision of the board shall be by resolution. Certified copies shall be furnished to the appellant and to the *building official*.

R112.4.2 Action by *building official*. The *building official* shall take immediate action in accordance with the decision of the board.

R112.5 Court review. Any person, whether or not a previous party to the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

~~**R112.2.1**~~ **112.6 Determination of substantial improvement in areas prone to flooding.** When the *building official* provides a finding required in Section R105.3.1.1, the board of appeals shall determine whether the value of the proposed work constitutes a substantial improvement. A substantial improvement means any repair, reconstruction, rehabilitation, *addition* or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the building or structure before the improvement or repair is started. If the building or structure has sustained substantial damage, all repairs are considered substantial improvement regardless of the actual repair work performed. The term does not include:

1. Improvements of a building or structure required to correct existing health, sanitary or safety code violations identified by the *building official* and which are the minimum necessary to assure safe living conditions; or
2. Any alteration of an historic building or structure, provided that the alteration will not preclude the continued designation as an historic building or structure. For the purpose of this exclusion, an historic building is:
   2.1. *Listed* or preliminarily determined to be eligible for *listing* in the National Register of Historic Places; or
   2.2. Determined by the Secretary of the U.S. Department of Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined to qualify as an historic district; or
   2.3. Designated as historic under a state or local historic preservation program that is *approved* by the Department of Interior.

~~**R112.2.2**~~ **112.6.1 Criteria for issuance of a variance for areas prone to flooding.** A variance shall be issued only upon:

1. A showing of good and sufficient cause that the unique characteristics of the size, configuration or topography of the site render the elevation standards in Section R322 inappropriate.
2. A determination that failure to grant the variance would result in exceptional hardship by rendering the *lot* undevelopable.
3. A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.
4. A determination that the variance is the minimum necessary to afford relief, considering the flood hazard.
5. Submission to the applicant of written notice specifying the difference between the design flood elevation and the elevation to which the building is to be built, stating that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation, and stating that construction below the design flood elevation increases risks to life and property.

~~**R112.1 General.** In order to hear and decide appeals of orders, decisions or determinations made by the *building official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The *building official* shall be an ex officio member of said board but shall have no vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *building official*.~~

~~**R112.2 Limitations on authority.** An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equally good or better form of construction is proposed. The board shall have no authority to waive requirements of this code.~~

~~**R112.3 Qualifications.** The board of appeals shall consist of members who are qualified by experience and training to pass on matters pertaining to building construction and are not employees of the *jurisdiction*.~~

~~**R112.4 Administration.** The *building official* shall take immediate action in accordance with the decision of the board.~~

SECTION R113 ~~R108~~
FEES

R113.1 ~~R108.1~~ Payment of fees. A *permit* or an amendment to a permit shall not be ~~valid~~ issued until the fees prescribed in Section 113.2 ~~by law~~ have been paid. ~~Nor shall an amendment to a *permit* be released until the additional fee, if any, has been paid.~~

~~**R108.2 Schedule of permit fees.** On buildings, structures, electrical, gas, mechanical and plumbing systems or *alterations* requiring a *permit*, a fee for each *permit* shall be paid as required, in accordance with the schedule as established by the applicable governing authority.~~

R113.2 Fee schedule. The fees for permits and other considerations shall be in accordance with the following schedule: [JURISDICTION TO INSERT APPROPRIATE FEE SCHEDULE]

R113.3 ~~R108.4~~ Related fees. The payment of the fee for ~~the construction, alteration, removal or demolition for~~ work done in connection to ~~with~~ or concurrently with the work authorized by a ~~building~~ *permit* shall not relieve the applicant or holder of the *permit* from the payment of other fees that are prescribed by law.

R113.4 ~~R108.6~~ Work commencing before permit issuance. Any person who commences any work on a project requiring a *permit* ~~on a building, structure, electrical, gas, mechanical or plumbing system~~ before obtaining the necessary permits shall be subject to a fee established by the *building official* ~~applicable governing authority~~ that shall be in addition to the required *permit* fees.

R113.5 Permit extension. The fee for an extension of a permit in conformance with Section 105.7 shall be one-half the amount required for a new permit for such work.

R113.6 Expiration of permit. For permits that have expired, and before such work recommences in conformance with Section 105.8.1, the fee to recommence work shall be one-half the amount required for a new permit for such work.

113.7 Stop work order. Any person who shall continue any work on a project requiring a permit after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.

113.8 Reinspection fee. A reinspection of work not in compliance with this code shall be subject to a fee established by the *code official* that shall be in addition to the required *permit* fees. The fee may be assessed when the *approved* plans are not readily available to the inspector, for failure to provide access on the date for which inspection is requested, for work deviating from the approved, or the work or test is not in compliance with this code.

~~**R108.5 Refunds.** The *building official* is authorized to establish a refund policy.~~

R113.9 Fee refunds. The *building official* shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment. The *building* official shall authorize the refunding of fees as follows:

1. The full amount of any fee paid hereunder which was erroneously paid or collected.
2. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.
3. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid when no work on a project has been performed under a permit issued in accordance with this code.

(SECTIONS 114 THROUGH 119 RESERVED)

PART 3 – GENERAL REQUIREMENTS

SECTION 120
UNSAFE STRUCTURES, EQUIPMENT, AND CONDITIONS

120.1 General. If any building, structure, premises or part thereof, or appliance, equipment, or system is found to be unsafe by the *code official*, or found in the case of a building or structure to be unfit for human occupancy, the condition shall be abated whenever possible, but if abatement is not achieved or is non-achievable, then condemnation shall be undertaken in accordance with the provisions of this code.

120.1.1 Notice to building official. Abatement requiring repairs, *alterations*, remodeling, removing or demolition shall be referred to the *building official*.

120.1.2 Unsafe structures. An unsafe structure is a structure that is dangerous to the life, health, or safety of the public or to the *occupants* when:

1. There are no minimum safeguards provided to protect or warn *occupants* in the event of fire; or
2. Such structure contains unsafe equipment or is so damaged, decayed, dilapidated, is structurally unsound, is of such faulty construction, or has such an unstable foundation, that partial or complete collapse is possible.

120.1.3 Unsafe equipment. Unsafe equipment includes any boiler, heating equipment, elevator, moving stairway, electrical wiring or device, flammable liquid containers or other equipment on the *premises* or within the structure which is in such disrepair or condition that such equipment constitutes a hazard to life, health, property or safety of the public or the *occupants* of the *premises* or structure.

120.1.4 Structure unfit for human occupancy. A structure is unfit for human *occupancy* whenever the *code official* finds that such structure is unsafe, is unlawful or, because its degree of disrepair, or its want of maintenance, is unsanitary, vermin or rat infested, filthy and contaminated, lacking *ventilation*, illumination, sanitary, heating facilities or other essential equipment required by this code, or because the structure is in proximity to an unsafe or dangerous condition that constitutes a hazard to the *occupants* of the structure or to the public.

120.1.5 Unlawful structure. An unlawful structure is one found in whole or in part to be occupied by more persons than permitted under this code, or was erected, altered or occupied contrary to this code.

120.1.6 Structure and premise that are dangerous to the life, health or safety of the public or occupants. For the purpose of this code, any structure or *premises* that have any or all of the following conditions or defects shall be considered dangerous, and shall constitute an unsafe structure:

1. Any door, aisle, passageway, stairway, exit or other means of egress that does not conform to the *approved* building or fire code of the jurisdiction as related to the requirements for existing buildings.
2. The walking surface of any aisle, passageway, stairway, exit or other means of egress is so warped, worn loose, torn or otherwise unsafe as to not provide safe and adequate means of egress.
3. Any portion of a building, structure or appurtenance that has been damaged by fire, earthquake, wind, flood, *deterioration*, *neglect*, abandonment, vandalism or by any other cause to such an extent that it is likely to partially or completely collapse, or to become *detached* or dislodged.
4. Any portion of a building, or any member, appurtenance or ornamentation on the exterior thereof that is not of sufficient strength or stability, or is not so *anchored*, attached or fastened in place so as to be capable of resisting natural or artificial loads of one and one-half the original designed value.
5. The building or structure, or part of the building or structure, because of dilapidation, *deterioration*, decay, faulty construction, the removal or movement of some portion of the ground necessary for the support, or for any other reason, is likely to partially or completely collapse, or some portion of the foundation or underpinning of the building or structure is likely to fail or give way.
6. The building or structure, or any portion thereof, is clearly unsafe for its use and *occupancy*.
7. The building or structure is *neglected*, damaged, dilapidated, unsecured or abandoned so as to become an attractive nuisance to children who might play in the building or structure to their danger, becomes a harbor for vagrants, criminals or immoral persons, or enables persons to resort to the building or structure for committing a nuisance or an unlawful act.
8. Any building or structure has been constructed, exists or is maintained in violation of any specific requirement or prohibition applicable to such building or structure provided by the *approved* building or fire code of the jurisdiction, or of any law or ordinance to such an extent as to present either a substantial risk of fire, building collapse or any other threat to life and safety.
9. A building or structure, used or intended to be used for dwelling purposes, because of inadequate maintenance, dilapidation, decay, damage, faulty construction or arrangement, inadequate light, *ventilation*, mechanical or plumbing system, or otherwise, is determined by the *code official* to be unsanitary, unfit for human habitation or in such a condition that is likely to cause sickness or disease.
10. Any building or structure, because of a lack of sufficient or proper fire-resistance-rated construction, fire protection systems, electrical system, fuel connections, mechanical system, plumbing system or other cause, is determined by the *code official* to be a threat to life or health.
11. Any portion of a building remains on a site after the demolition or destruction of the building or structure or whenever any building or structure is abandoned so as to constitute such building or portion thereof as an attractive nuisance or hazard to the public.

120.2 Closing of vacant structures. If the structure is vacant and unfit for human habitation and *occupancy*, and is not in danger of structural collapse, the *code official* is authorized to post a placard of condemnation on the *premises* and order the structure closed up so as not to be an attractive nuisance. Upon failure of the *owner* to close up the *premises* within the time specified in the order, the *code official* shall cause the *premises* to be closed and secured through any available public agency or by contract or arrangement by private persons, and the cost thereof shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate that may be collected by any legal means.

120.3 Evacuation. The *code official* or the fire department official in charge of an emergency incident shall be authorized to order the immediate evacuation of any occupied building, structure or premises deemed unsafe due to hazardous conditions that present an imminent danger to occupants. *Persons* so notified shall immediately leave the structure or premises and shall not enter or re-enter until authorized to do so by the *code official* or the fire department official in charge of the incident.

120.4 Notice. Whenever the *code official* has *condemned* a structure or equipment under the provisions of this section, notice shall be posted in a conspicuous place in or about the structure affected by such notice and served on the *owner* or the person or persons responsible for the structure or equipment in accordance with Section 120.4.2. If the notice pertains to equipment, it shall also be placed on the *condemned* equipment. The notice shall be in the form prescribed in Section 120.4.1.

120.4.1 Form of notice. Such notice of shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the unsafe condition into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties set forth in this code or as may be adopted and authorized by state and/or local law.

120.4.2 Service of notice. Such notice shall be deemed properly served if a copy thereof is (a) delivered to the owner personally; (b) sent by certified or registered mail addressed to the owner at the last known address with the return receipt requested; or (c) delivered in any other manner as prescribed by local law. If the certified or registered letter is returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice. Service of such notice in the foregoing manner upon the owner's agent or upon the person responsible for the structure shall constitute service of notice upon the owner.

120.5 Placarding. Upon failure of the owner or person responsible to comply with the notice provisions within the time given, the *code official* shall post on the premises or on defective equipment a placard bearing the word "UNSAFE" or "CONDEMNED" as applicable, and a statement of the penalties provided for occupying the premises, operating the equipment or removing the placard.

120.5.1 Placard removal. The *code official* shall remove the placard whenever the unsafe conditions have been eliminated. Any person who defaces or removes an unsafe condition placard without the approval of the *code official* shall be subject to the penalties provided for by the jurisdiction.

120.6 Prohibited occupancy. Any structure *condemned* and placarded by the *code official* shall be vacated as ordered by the *code official*. It shall be unlawful for any person to occupy or to allow others to occupy a placarded *premises,* or to operate or allow others to operate any placarded equipment.

120.7 Abatement. The owner, operator, or occupant of a building, structure, premises, or equipment deemed unsafe by the *code official* shall abate or correct such unsafe conditions either by repair, rehabilitation, demolition or other *approved* corrective action.

120.7.1 Summary abatement. Where conditions exist that are deemed an *imminent danger* as described in Section 121.1 that will necessarily result in injury to occupants or the public, the *code official* or fire department official in charge of the incident is authorized to summarily abate such unsafe or hazardous conditions.

120.8 Record. The *code official* shall cause a report to be filed on an unsafe condition. The report shall state the occupancy of the structure and the nature of the unsafe condition. The record of an unsafe condition as outlined herein shall be retained by the *code official* for the period required for retention of public records.

SECTION 121
EMERGENCY MEASURES

121.1 Imminent danger. When, in the opinion of the *building official*, there is imminent danger of failure or collapse of a building or structure that endangers life, or when any building or part of a building has fallen and life is endangered by the occupation of the building, or when there is actual or potential danger to the building occupants or those in the proximity of any structure because of explosives, explosive fumes or vapors, or the presence of toxic fumes, gases, or materials, or operation of defective or *dangerous* equipment, the *building official* is hereby authorized and empowered to order and require the occupants to vacate the premises forthwith. The *building official* shall cause to be posted at each entrance to such structure a notice reading as follows: "This Structure Is Unsafe and Its Occupancy Has Been Prohibited by the Building Official." It shall be unlawful for any person to enter such structure except for the purpose of securing the structure, making the required *repairs*, removing the hazardous condition, or of demolishing the same.

121.2 Temporary safeguards. Notwithstanding other provisions of this code, whenever, in the opinion of the *building official*, there is imminent danger due to an unsafe condition, the *building official* shall order the necessary work to be done, including the boarding up of openings, to render such structure temporarily safe whether or not the legal procedure herein described has been instituted; and shall cause such other action to be taken as the *building official* deems necessary to meet such emergency.

121.3 Closing streets. When necessary for public safety, the *building official* shall temporarily close structures and close or order the authority having jurisdiction to close sidewalks, streets, public ways, and places adjacent to unsafe structures, and prohibit the same from being utilized.

121.4 Emergency repairs. For the purposes of this section, the *building official* shall employ the necessary labor and materials to perform the required work as expeditiously as possible.

121.5 Costs of emergency repairs. Costs incurred in the performance of emergency work shall be paid by the jurisdiction. The legal counsel of the jurisdiction shall institute appropriate action against the owner of the premises where the unsafe structure is or was located for the recovery of such costs.

121.6 Hearing. Any person ordered to take emergency measures shall comply with such order forthwith. Any affected person shall thereafter, upon petition directed to the appeals board, be afforded a hearing as described in this code.

SECTION R122 ~~R111~~
SERVICE UTILITIES

R122.1 ~~R111.1~~ Connection of service utilities. No person shall make connections from a utility, source of energy, fuel, ~~or~~ power, water system or *sewer* system to any building, structure or system that is regulated by this code for which a *permit* is required, until *approved* by the *building official*.

R122.2 ~~R111.2~~ Temporary connection. The *building official* shall have the authority to authorize ~~and approve~~ the temporary connection of the building, structure or system to the utility, source of energy, fuel or power.

R122.3 ~~R111.3~~ Authority to disconnect service utilities. The *building official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards ~~set forth in Section R102.4~~ in case of emergency where necessary to eliminate an immediate hazard to life or property or when such utility connection has been made without the approval required by Section 122.1 or 122.2 ~~R111.1 or R111.2~~. The *building official* shall notify the serving utility and whenever possible the owner and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnection, the owner or occupant of the building, structure or service system shall be notified in writing as soon as practical thereafter.

SECTION R123 ~~R107~~
TEMPORARY STRUCTURES, EQUIPMENT, SYSTEMS AND USES

R123.1 ~~R107.1~~ General. The *building official* is authorized to issue a *permit* for temporary structures, equipment, systems and ~~temporary~~ uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The *building official* is authorized to grant extensions for demonstrated cause.

R123.2 ~~R107.2~~ Conformance. Temporary structures, equipment, systems and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.

R123.3 ~~R107.4~~ Termination of approval. The *building official* is authorized to terminate such *permit* ~~for a temporary structure or use~~ and to order the temporary structure, equipment, system or use to be discontinued.

~~**R107.3 Temporary power.** The *building official* is authorized to give permission to temporarily supply and use power in part of an electric installation before such installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in NFPA 70.~~

SECTION R124
MAINTENANCE

R124.1 Maintenance of safeguards. Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or any other feature is required for compliance with the provisions of this code, or otherwise installed, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be continuously maintained in accordance with this code and applicable referenced standards.

R124.2 Testing and operation. Equipment requiring periodic testing or operation to ensure maintenance shall be tested or operated as specified in this code.

R124.2.1 Test and inspection records. Required test and inspection records shall be available to the *building official* at all times, or such records as designates shall be filed with the *building official*.

R124.2.2 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *building official* for inspection and testing.

R124.3 Supervision. Maintenance and testing shall be under the supervision of a responsible *person* who shall ensure that such maintenance and testing are conducted at specified intervals in accordance with this code.

R124.4 Rendering equipment inoperable. Portable or fixed fire-extinguishing systems or devices and fire-warning systems shall not be rendered inoperative or inaccessible except as necessary during emergencies, maintenance, repairs, *alterations*, drills or prescribed testing.

SECTION R125
DEMOLITION

R125.1 General. The *building official* shall order the owner of any premises upon which is located any structure that in the *building official's* judgment is deteriorated or dilapidated, or has become so out of *repair* as to be *dangerous*, unsafe, insanitary, or otherwise unfit for human habitation or occupancy, and such that it is unreasonable to *repair* the structure, to demolish and remove such structure; or if such structure is capable of being made safe by *repairs*, to *repair* and make safe and sanitary, or to board up and hold for future repair, or to demolish and remove at the owner's option; or where there has been a cessation of normal construction of any structure for a period of more than two years, to board up and hold for recommencement of work, or to demolish and remove such structure. Boarding up the building for future repair or recommencement of work shall not extend beyond one year, unless *approved* by the *building official*.

R125.2 Notices and orders. All notices and orders shall comply with Section 111.2.

R125.3 Failure to comply. If the owner of a premises fails to comply with a demolition order within the time prescribed, the *building official* shall cause the structure to be demolished and removed, either through an available public agency or by contract or arrangement with private persons, and the cost of such demolition and removal shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate.

R125.4 Salvage materials. When any structure has been ordered demolished and removed in accordance with Section 125.3, the governing body or other designated officer under said contract or arrangement aforesaid shall have the right to sell the salvage and valuable materials at the highest price obtainable. The net proceeds of such sale, after

deducting the expenses of such demolition and removal, shall be promptly remitted with a report of such sale or transaction, including the items of expense and the amounts deducted, for the person who is entitled thereto, subject to any order of a court. If such a surplus does not remain to be turned over, the report shall so state.

R125.5 Existing remedies. The provisions in this code shall not be construed to abolish or impair existing remedies of the jurisdiction or its officers or agencies relating to the removal or demolition of any structure which is dangerous, unsafe or insanitary.

2. Revise and add the following definitions to the IRC:

ADDITION. An extension or increase in floor area, number of stories, or height of a building or structure.

ALTERATION. Any construction or renovation to an existing structure other than repair or addition that requires a *permit*. ~~Also,~~ or a change in a mechanical, plumbing, fuel gas or other system that involves an extension, addition or change to the arrangement, type or purpose of the original installation that requires a *permit*.

APPROVED. ~~Acceptable to the *building official*.~~ Approval by the code official as the result of review, investigation or tests conducted by the code official or by reason of accepted principles or tests by national authorities, or technical or scientific organizations.

CERTIFICATE OF COMPLETION. A certificate stating that the project or work for which a permit was issued has been completed in compliance with *approved construction documents* and the requirements of this code.

CONSTRUCTION DOCUMENTS. The written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of a project necessary for obtaining a ~~building~~ *permit*. ~~Construction drawings shall be drawn to an appropriate scale.~~

EQUIPMENT. Any plumbing, heating, electrical, ventilating, air conditioning, refrigerating, and fire protection equipment, apparatus and devices, all piping, ducts, vents, control devices and other ~~components of~~ systems, or components thereof, ~~other than *appliances* that are permanently installed and integrated to provide control of environmental conditions for buildings. This definition shall also include other systems specifically regulated in this code~~ and elevators, dumb waiters, escalators, boilers, pressure vessels and other mechanical facilities or installations that are related to building services, any of which are specifically regulated in this code. Appliances as defined by this code shall not be considered equipment. Equipment or fixtures shall not include manufacturing, production, or process equipment, but shall include connections from building service to process equipment.

FIRE CODE OFFICIAL. The fire chief or other designated authority charged with the administration and enforcement of the code, or a duly authorized representative.

IMMINENT DANGER. A condition which could cause serious or life-threatening injury or death at any time.

REGISTERED DESIGN PROFESSIONAL. An ~~individual~~ architect or engineer who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or *jurisdiction* in which the project is to be constructed.

REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A *registered design professional* engaged by the owner to review and coordinate certain aspects of the project, as determined by the *building official*, for compatibility with the design of the building or structure, including submittal documents prepared by others, deferred submittal documents and phased submittal documents.

STRUCTURE. That which is built or constructed, an edifice or building of any kind, or any piece of work artificially built up or composed of parts joined together in some definite manner.

Reason: Item #1: **ITEM 1: TEMPLATE: All I-Codes:** Change the Chapter One provisions above for all I-Codes to the following text template.

(**NOTE:** Strikeout/underline format is not being used for the ease in understanding. Though the term “code official” is used below, it is intended that the term “building official” be used for the IBC and IRC, and the term “fire code official” be used for the IFC. See above legislative version for each I-Code for changes.)

CHAPTER 1
SCOPE AND ADMINISTRATION

PART 1—SCOPE AND APPLICATION

SECTION 101
GENERAL

101.1 Title. These regulations shall be known as the *Building Code* of [NAME OF JURISDICTION], hereinafter referred to as "this code."

101.2 Scope. The provisions of this code shall apply to the construction, *alteration*, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures.

101.3 Purpose. The purpose of this code is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, *means of egress* facilities, stability, sanitation, adequate light and ventilation, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations.

101.4 Severability. If a section, subsection, sentence, clause or phrase of this code is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this code.

101.5 Validity. In the event any part or provision of this code is held to be illegal or void, this shall not have the effect of making illegal or void any of the other parts or provisions hereof, which are determined to be legal; and it shall be presumed that this code would have been adopted without such illegal or invalid parts or provisions.

101.6 Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law.

SECTION 102
APPLICABILITY

102.1 General. Where there is a conflict between a general requirement and a specific requirement of this code, the specific requirement shall be applicable. Where, in a specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive shall govern.

102.2 Application of references. References to chapter or section numbers, or to provisions not specifically identified by number, shall be construed to refer to such chapter, section or provision of this code.

102.3 Referenced codes and standards. The codes and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between the provisions of this code and the referenced codes and standards, the provisions of this code shall apply.

> **Exception:** Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing shall govern.

102.4 Appendices. Provisions in the appendices shall not apply unless specifically adopted.

102.5 Existing structures and systems. The legal occupancy or use of any structure or installed system existing on the date of adoption of this code shall be permitted to continue without change, except as is specifically covered in this code, the *International Building Code,* the *International Fire Code,* or the *International Property Maintenance Code*, or as is deemed necessary by the *code official* for the general safety and welfare of the occupants and the public.

102.5.1 Historic buildings. The provisions of this code relating to the construction, alteration, repair, enlargement, restoration, relocation or moving of buildings or structures shall not be mandatory for existing buildings or structures identified and classified by the state or local jurisdiction as historic buildings when such buildings or structures are judged by the *code official* to be safe and in the public interest of health, safety and welfare regarding any proposed construction, alteration, repair, enlargement, restoration, relocation or moving of buildings.

(IBC / IEBC Only)
102.5.1 Historic buildings. The application of this code relating to *historic buildings* shall be in accordance with Section 3409 / 308.

102.6 Alternative materials, design, methods and equipment. The provisions of this code are not intended to prevent the installation of any material, or the use or operation of appliances, equipment, systems, or method, or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative shall be *approved* where the *code official* finds that the proposed alternative is satisfactory and complies with the intent of the provisions of this code, and that the alternative is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, *fire resistance*, durability and safety.

102.6.1 Matters regulated by the *International Building Code.* Approvals under the authority herein contained shall be subject to the approval of the *code official* whenever the alternative involves matters regulated by the *International Building Code*.

102.7 Requirements not covered by code. Requirements necessary for the strength, stability, or proper operation of an existing or proposed fixture, structure, or equipment, or for the public safety, health, and general welfare, not specifically covered by this code, shall be determined by the *code official*.

102.8 Subjects not regulated by this code. Where no applicable standards or requirements are set forth in this code, or are contained within other laws, codes, regulations, ordinances, or bylaws adopted by the jurisdiction, compliance with applicable nationally recognized standards, as *approved*, shall be deemed as prima facie evidence of compliance with the intent of this code. Nothing herein shall derogate from the authority of the *code official* to determine compliance with codes or standards for those activities or installations within the *code official's* jurisdiction or responsibility.

102.9 Previous approvals. This code shall not require changes in the *construction documents*, construction or designated occupancy of a structure for which a lawful *permit* has been heretofore issued or otherwise lawfully authorized, and the construction of which has been pursued in good faith within 180 days after the effective date of this code and has not been abandoned.

102.10 Contractor's responsibilities. Every contractor who enters into contracts for which a permit is required shall comply with the state and local rules and regulations concerning licensing.

102.11 Specific application of this code. The following are application specific to this code. [JURISDICTION TO INSERT APPLICATION PROVISIONS SPECIFIC TO THIS CODE]
(Please see the legislative text version for each Code above for the specific application for that Code.)

PART 2—ADMINISTRATIVE PROVISIONS

SECTION 103
DEPARTMENT OF FIRE PREVENTION

103.1 General. The Department of Fire Prevention, herein referred to as "the department," is hereby established within the jurisdiction under the direction of the *code official*. The function of the department shall be the implementation, administration, and enforcement of the provisions of this code.

103.2 Appointment. The *code official* shall be appointed by the chief appointing authority of the jurisdiction.

103.3 Deputies. In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the *code official* shall have the authority to appoint a deputy *code official*, related technical officers, inspectors, and other employees. Such employees shall have powers as delegated by the *code official*.

103.4 Liability. The *code official*, member of the Board of Appeals, officer, or employee charged with the enforcement of this code, while acting for the jurisdiction in good faith and without malice in the discharge of the duties required by this code or other pertinent law or ordinance, shall not thereby be rendered liable personally, and is hereby relieved from all personal liability for any damage accruing to *persons* or property as a result of an act or by reason of an act or omission in the discharge of official duties.

103.5 Legal defense. Any suit instituted against an officer or employee of the department because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings. The *code official* or any subordinate shall not be liable for costs in an action, suit, or proceeding that is instituted in pursuance of the provisions of this code. Any officer or employee, acting in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith.

SECTION 104
DUTIES AND POWERS OF CODE OFFICIAL

104.1 General. The *code official* is hereby authorized and directed to enforce the provisions of this code. The *code official* shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies, and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.

104.2 Applications and permits. The *code official* shall receive applications, review *construction documents,* issue *permits* required by this code, inspect the premises for which such *permits* have been issued, and enforce compliance with the provisions of this code.

104.3 Notices and orders. The *code official* shall issue all necessary notices or orders to ensure compliance with this code.

104.4 Inspections. The *code official* shall make all of the required inspections, or the *code official* shall have the authority to accept reports of inspection by *approved agencies* or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such *approved agency* or by the responsible individual. The *code official* is authorized to engage such expert opinion as deemed necessary to report upon unusual technical issues that arise, subject to the approval of the appointing authority.

104.5 Identification. The *code official* shall carry proper identification when inspecting structures or premises in the performance of duties under this code.

104.6 Right of entry. Where it is necessary to make an inspection to enforce the provisions of this code, or where the *code official* has reasonable cause to believe that there exists in a structure or upon a premises a condition which is contrary to or in violation of this code which makes the structure or premises unsafe, dangerous, or hazardous, the *code official* is authorized to enter the structure or premises at reasonable times to inspect or to perform the duties imposed by this code, provided that if such structure or premises be occupied, that credentials be presented to the occupant and entry requested. If such structure or premises is unoccupied, the *code official* shall first make a reasonable effort to locate the owner or other person having charge or control of the structure or premises and request entry. If entry is refused, the *code official* shall have recourse to the remedies provided by law to secure entry.

104.6.1 Warrant. When the code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner or occupant or person having charge, care or control of the structure or premises shall not fail or neglect, after proper request is made as herein provided, to promptly permit entry therein by the code official for the purpose of inspection and examination pursuant to this code.

104.7 Department records. The *code official* shall keep official records of applications received, *permits* and certificates issued, fees collected, reports of inspections, and notices and orders issued. Such records shall be retained in the official records for the period required for retention of public records.

104.8 Assistance of other agencies. The code official is authorized to request, and shall receive so far as is required in the discharge of the duties described in this code, the assistance and cooperation of other officials of the jurisdiction.

104.9 Specific duties. The following are specific duties of the code official. [JURISDICTION TO INSERT CODE OFFICIAL DUTIES SPECIFIC TO THIS CODE]
(Please see the above legislative text version for each Code below for the specific duties for that Code.)

SECTION 105
PERMITS

105.1 Permit required. Any owner or authorized agent who intends to construct, enlarge, alter, repair, move, demolish, or change the occupancy of a building or structure, or to construct, erect, install, enlarge, alter, repair, remove, convert, or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be done, shall first make application to the *code official* and obtain the required *permit* for the project. Where laws or regulations are enforceable by other agencies or departments, approval shall be obtained from all agencies or departments concerned.

105.1.1 Annual permit. In lieu of an individual *permit* for each *alteration* to an already *approved* electrical, gas, mechanical or plumbing installation, the *code official* is authorized to issue an annual *permit* upon application therefor to any person, firm or corporation regularly employing one or more qualified tradespersons in the building, structure, or on the premises owned or operated by the applicant for the *permit*.

105.1.1.1 Annual permit records. The person to whom an annual *permit* is issued shall keep a detailed record of *alterations* made under such annual *permit*. The *code official* shall have access to such records at all times, or such records shall be filed with the *code official* as designated.

105.1.2 Emergency repairs. Where equipment replacements and repairs must be performed in an emergency situation, the *permit* application shall be submitted within the next working business day to the *code official*.

105.1.3 Permits specifically required. The following specifically require a permit. [JURISDICTION TO INSERT SPECIFIC ITEMS REQUIRING A PERMIT FOR THIS CODE]
(Please see the above legislative text version for each Code below for the specific work that requires a permit for that Code.)

105.2 Permit not required. Exemptions from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. *Permits* shall not be required in accordance with Sections 105.2.1 through 105.2.3.

105.2.1 Repairs. Application or notice to the *code official* is not required for ordinary repairs to structures, replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles. Such repairs shall not include the cutting away of any wall, partition or portion thereof, the removal or cutting of any structural beam or load-bearing support, or the removal or change of any required *means of egress*, or rearrangement of parts of a structure affecting the egress requirements; nor shall ordinary repairs include *addition* to, *alteration* of, replacement or relocation of any standpipe, water supply, sewer, drainage, drain leader, gas, soil, waste, vent or similar piping, electric wiring or mechanical or other work affecting public health or general safety.

105.2.2 Public service agencies. A *permit* shall not be required for the installation, *alteration,* or repair of generation, transmission, distribution, or metering or other related equipment that is under the ownership and control of public service agencies by established right.

105.2.3 Specific exemption. The following are specifically exempt from requiring a permit. [JURISDICTION TO INSERT SPECIFIC ITEMS EXEMPT FROM PERMITS FOR THIS CODE]
(Please see the above legislative text version for each Code below for the specific work that is exempt from requiring a permit for that Code.)

105.3 Application for permit. To obtain a *permit*, the applicant shall first file an application therefor in writing on a form furnished by the department for that purpose. Such application shall:

1. Identify and describe the project to be covered by the *permit* for which application is made.
2. Describe the land on which the proposed project is to be done by legal description, street address or similar description that will readily identify and definitely locate the proposed building or project.
3. Indicate the use and occupancy for which the proposed project is intended.
4. Be accompanied by *construction documents* and other data as required in Section 106.
5. State the valuation of the proposed project.
6. Be signed by the applicant, or the applicant's authorized agent.
7. Give such other data and information as required by the *code official*.

105.3.1 Permit valuations. *Permit* valuations required under Section 105.3(5) shall include total value of the project, including materials and labor, and electrical, gas, mechanical, plumbing equipment and other permanent systems for which the *permit* is being issued. If, in the opinion of the *code official*, the valuation is underestimated on the application, the *permit* shall be denied, unless the applicant can show detailed estimates to meet the approval of the *code official*. Final building *permit* valuation shall be set by the *code official*.

105.4 Action on application. The *code official* shall examine or cause to be examined applications for *permits* and amendments thereto within a reasonable time after filing. If the application or the *construction documents* do not conform to the requirements of pertinent laws, the *code official* shall reject such application in writing, stating the reasons therefor. If the *code official* is satisfied that the proposed project conforms to the requirements of this code and laws and ordinances applicable thereto, the *code official* shall issue a *permit* therefor as soon as practicable.

105.4.1 Preliminary inspection. Before a permit is issued, the *code official* is authorized to inspect and evaluate the systems, *equipment*, buildings, devices, premises and spaces or areas to be used.

105.4.2 Conditional permits. The *code official* is authorized to issue a *permit* for the construction or operation of part of the project such as the construction of foundations or any other part of a building or structure, or installation of systems or materials, or operation before the *construction documents* for the entire project have been submitted or *approved*, provided that adequate information and detailed statements have been filed complying with pertinent requirements of this code. The holder of such *permit* shall proceed only to the point for which approval has been given, at the permit holder's own risk, and without assurance that a *permit* for the entire project will be granted.

105.5 Time limitation of application. An application for a *permit* for any proposed project shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a *permit* has been issued. The *code official* is authorized to grant one or more extensions of time for additional periods not exceeding 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

105.6 Validity of permit. The issuance or granting of a *permit* shall not be construed to be a *permit* for, or an approval of, any violation of any of the provisions of this code or of any other ordinance of the jurisdiction. *Permits* presuming to give authority to violate or cancel the provisions of this code or other ordinances of the jurisdiction shall not be valid. The issuance of a *permit* based on *construction documents* and other data shall not prevent the *code official* from requiring the correction of errors in the *construction documents* and other data.

105.7 Extensions of permit. For an unexpired permit the *code official* is authorized to grant, in writing, one or more extensions of the time, for periods of not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

105.8 Expiration of permit. Every *permit* issued shall become invalid unless the work on the site authorized by such *permit* is commenced within 180 days after its issuance, or if the work authorized on the site by such *permit* is suspended or abandoned for a period of 180 days after the time the work is commenced.

105.8.1 Recommencement of work. Before such work covered under an expired permit recommences, a new permit shall be first obtained. The new permit shall be issued provided no changes have been made or will be made in the original construction documents for such work, and provided further that such suspension or abandonment has not exceeded one year.

105.9 Suspension or revocation of permit. The *code official* is authorized to suspend or revoke a *permit* issued under the provisions of this code whenever the *permit* is issued in error or on the basis of incorrect, inaccurate or incomplete information, or in violation of any ordinance or regulation or any of the provisions of this code.

105.10 Posting of permit. Issued permits or copy thereof shall be kept on the site of the project until the completion of the project.

SECTION 106
SUBMITTAL DOCUMENTS

106.1 General. Submittal documents consisting of construction documents and other supporting data shall be submitted in two or more sets with each application for a permit, and in such form and detail as required by the *code official*. The *code official* shall require construction documents and other data to be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official* is authorized to require necessary construction documents to be prepared by a registered design professional.

> **Exception:** The *code official* is authorized to waive the submission of *construction documents* and other data not required to be prepared by a *registered design professional* if the nature of the work applied for is such that review of *construction documents* is not necessary to obtain compliance with this code.

106.2 Construction documents. *Construction documents* shall be in accordance with Sections 106.2.1 through 106.2.4.

106.2.1 Information on construction documents. *Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the proposed project, and show in detail that the project will conform to the provisions of this code and relevant laws, ordinances, rules, and regulations, as determined by the *code official*. Plans shall be to scale and be on suitable material. Electronic media documents are permitted to be submitted when *approved* by the *code official*.

106.2.1.1 Specific information required. Where the quality of the materials is essential for conformity to this code, specific information shall be given to establish such quality. The terms “this code” or “legal” or “its equivalent” shall not be cited or used as a substitute for specific information.

106.2.2 Site plan. The *construction documents* submitted with the application for *permit* shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from *lot lines*, the established street grades and the proposed finished grades and, as applicable, flood hazard areas, floodways, and *design flood* elevations. The site plan shall be drawn in accordance with an accurate boundary line survey.

106.2.2.1 Site plan for demolition. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot.

106.2.2.2. Waiver of site plan. The *code official* is authorized to waive or modify the requirement for a site plan when the application for *permit* is for *alteration* or repair or when otherwise warranted.

106.2.3 Specific Information. The following are specific requirements for submittal documents required by this code. [JURISDICTION TO INSERT SPECIFIC SUBMITTAL DOCUMENT REQUIREMENTS FOR THIS CODE]
(Please see the above legislative text version for each Code below for the specific requirement for submittal documents for that Code.)

106.2.4 Design professional in responsible charge. When it is required that documents be prepared by a *registered design professional*, the *code official* shall be authorized to require the owner to engage and designate on the building *permit* application a *registered design professional* who shall act as the *registered design professional in responsible charge*. If the circumstances require, the owner shall designate a substitute *registered design professional in responsible charge* who shall perform the duties required of the original *registered design professional in responsible charge*. The *code official* shall be notified in writing by the owner if the *registered design professional in responsible charge* is changed or is unable to continue to perform the duties.

106.2.4.1 Responsibility. The *registered design professional in responsible charge* shall be responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

106.2.4.2 Observation. Where structural observation is required, the inspection program shall name the individual or firms who are to perform structural observation and describe the stages of construction at which structural observation is to occur.

106.3 Deferred submittals. For the purposes of this section, deferred submittals are defined as those portions of the design that are not submitted at the time of the application and that are to be submitted to the *code official* within a specified period.

106.3.1 Prior approval. Deferral of any submittal items shall have the prior approval of the *code official*. The *registered design professional in responsible charge* shall list the deferred submittals on the *construction documents* for review by the *code official*.

106.3.2 Review. Documents for deferred submittal items shall be submitted to the *registered design professional in responsible charge* who shall review them and forward them to the *code official* with a notation indicating that the deferred submittal documents have been reviewed and been found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the deferred submittal documents have been *approved* by the *code official*.

106.4 Examination of documents. The *code official* shall examine or cause to be examined the submittal documents and shall ascertain by such examinations whether the project indicated and described is in accordance with the requirements of this code and other pertinent laws or ordinances.

106.5 Approval of construction documents. When the *code official* issues a *permit*, the *construction documents* and other data shall be endorsed, in writing or by stamp, as "APPROVED." One set of *construction documents* and other data so reviewed shall be retained by the *code official*. The other set(s) shall be returned to the applicant. One set shall be kept at the site of the project and shall be open to inspection by the *code official* or a duly authorized representative. Such *approved construction documents* shall not be changed, modified, or altered without authorization from the *code official*. All work shall be done in accordance with the *approved construction documents*.

106.6 Amended construction documents. Any changes made during construction that are not in compliance with the *approved construction documents* shall be resubmitted for approval as an amended set of *construction documents*.

106.7 Retention of construction documents. One set of *approved construction documents* shall be retained by the *code official* for a period of not less than 180 days from date of completion of the permitted project, or for the period required for retention of public records.

SECTION 107
MODIFICATIONS, TESTING, AND APPROVAL

107.1 Modifications. Wherever there are practical difficulties involved in carrying out the provisions of this code, and upon application of the owner or owner's representative, the *code official* shall have the authority to grant modifications for individual cases, provided the *code official* shall first find that special individual reason makes the strict letter of this code impractical and the modification is in conformance with the intent and purpose of this code, and that such modification does not lessen health, life and fire safety, accessibility, or structural requirements. The details of action granting modifications shall be recorded and entered in the files of the department.

107.2 Approved materials and equipment. All materials, equipment, and devices *approved* by the *code official* shall be constructed and installed in accordance with such approval.

107.3 Used materials, appliances and equipment. The use of used materials that meet the requirements of this code for new materials is permitted. Used appliances, equipment and devices shall not be reused unless such elements are in good repair or have been reconditioned and tested when necessary, placed in good and proper working condition, and *approved* by the *code official*.

107.4 Listed and labeled material and appliances. Listed and labeled materials, equipment, and appliances shall be used and installed in accordance with the conditions the listing and the manufacturer's instructions.

107.5 Research reports. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from *approved* sources.

107.6 Technical assistance. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, or to determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building or premises, the *code official* shall have the authority to require tests conducted, or a technical opinion, recommendation or report be submitted as evidence of compliance. The tests, opinions, recommendations and reports shall be made at no expense to the jurisdiction.

107.6.1 Preparation. The technical reports and opinions shall be prepared by a qualified engineer, approved specialist or specialty organization, or an *approved agency*.

107.6.2 Test methods. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the *code official* shall approve the testing procedures.

107.6.3 Testing agency. All tests shall be performed by an *approved agency*.

107.6.4 Retention of reports. The technical opinions, recommendation, reports and test results shall be retained by the *code official* for the period required for retention of public records.

SECTION 108
INSPECTIONS

108.1 General. Construction or work on a project for which a *permit* is required shall be subject to inspection by the *code official* and such construction or work shall remain accessible and exposed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give

authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the *permit* applicant to cause the construction or work to remain accessible and exposed for inspection purposes. Neither the *code official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

108.1.1 Replacement of existing appliance. The requirements of this section shall not be considered to prohibit the operation of any heating or cooling *equipment* or appliances installed to replace such existing *equipment* or appliances serving an occupied portion of a structure provided that a request for inspection of such *equipment* or appliances has been filed with the department not more than 48 hours after such replacement work is completed, and before any portion of such *equipment* or appliances is concealed by any permanent portion of the structure.

108.2 Required inspections and testing. The *code official*, upon notification, shall make the inspections and require the tests set forth in Sections 108.2.1 through 108.2.4.

108.2.1 Specific Inspections. The following are specific inspections and tests required by this code. [JURISDICTION TO INSERT SPECIFIC REQUIRED INSPECTIONS AND TESTS]
(Please see the above legislative text version for each Code below for the specific required inspections and tests for that Code.)

108.2.2 Other inspections. In addition to the inspections specified above, the *code official* is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department.

108.2.3 Special inspections. Special inspection shall be as required by this code, the *International Building Code*, or the *International Fire Code* as applicable.

108.2.4 Final inspection. A final inspection shall be made after all work on the project required by the *permit* is completed.

108.3 Inspection agencies. The *code official* is authorized to accept reports of *approved* inspection agencies, provided such agencies satisfy the requirements as to qualifications and reliability.

108.4 Inspection requests. It shall be the duty of the holder of the *permit* or their duly authorized agent to notify the *code official* when a project is ready for inspection. It shall be the duty of the *permit* holder to provide access to and means for inspections of such work that are required by this code.

108.4.1 Manufacturer's instructions. Manufacturer's instructions for equipment, appliances, and materials installed under the permit shall be available on the work site at the time of inspection.

108.5 Approval required. Work on a project shall not proceed beyond the point indicated in each successive inspection without first obtaining the approval of the *code official*. The *code official*, upon notification, shall make the requested inspections and shall either determine the portion of the project that is satisfactory as completed, or shall notify the *permit* holder or authorized agent wherein the same fails to comply with this code. Any portions of the project that do not comply shall be corrected and such portion shall not be covered, concealed, or used until authorized by the *code official*.

108.6 Notice of approval. After all prescribed inspections or tests indicate the project complies with this code, a certificate of completion complying with Section 109 shall be issued by the *code official*.

SECTION 109
CERTIFICATE OF COMPLETION AND OCCUPANCY

109.1 Use and occupancy. No building, structure, or premises or portion thereof shall be used or occupied until the *code official* has issued a certificate of occupancy as provided herein. No equipment, appliance or system used, and no change in the existing occupancy classification of a building, structure, premise or portion thereof shall be made until the *code official* has issued a certificate of completion as provided herein.

Exceptions:

1. Occupancy shall be permitted during **e**mergency situations as described under Section 105.1.
2. Certificates of completion or occupancy are not required for work exempt from permits under Section 105.2.
3. Occupancy shall be permitted during the replacement of existing appliances as described under Section 108.1.1.
4. Certificates of occupancy are not required for one-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m2).

109.1.1 Validity. Issuance of a certificate of completion or occupancy shall not be construed as an approval of a violation of the provisions of this code or of other pertinent laws and ordinances of the jurisdiction. Certificates presuming to give authority to violate or cancel the provisions of this code or other laws or ordinances of the jurisdiction shall not be valid.

109.2 Certificate issued. After the *code official* inspects a project requiring a permit and finds no violations of the provisions of this code or other laws that are enforced by the department, the *code official* shall issue a certificate of completion. After all certificates of completion have been issued by other departments or agencies concerned, the *code official* shall issue a certificate of occupancy where applicable. A certificate of completion or occupancy shall contain the following:

1. The *permit* number.
2. The address of the premises or structure.
3. The name and address of the owner.
4. A description of the project for which the certificate is issued.
5. A statement that the described project has been inspected for compliance with the requirements of this code.
6. The name of the *code official*.
7. The edition of the code under which the *permit* was issued.
8. The use and occupancy in accordance Chapter 3 of the International Building Code.
9. The type of construction as defined in Chapter 6 of the International Building Code.

10. The design *occupant load*.
11. If fire protection systems are provided, whether the fire protection systems are required.
12. Any special stipulations and conditions of the *permit*.

Exceptions:

1. A certificate of completion or occupancy shall not be required to indicate the items under Section 109.2(8), (9), and (10) for detached one- and two family dwellings and multiple single-family *dwellings* (*townhouses)* constructed using the International Residential Code.
2. The *code official* is shall not be required to indicate on a certificate items under Section 109.2(8), (9), and (10) for the installation of equipment, appliances or systems.

109.3 Temporary occupancy. The *code official* is authorized to issue a temporary certificate of occupancy before the completion of the entire work covered by the permit, provided that such portion or portions shall be occupied safely and without endangerment to life or public welfare. The temporary certificate shall indicate any limitations or restrictions necessary to keep the permit area safe, and items required to obtain the final certificate of occupancy. The *code official* shall set a time period during which the temporary certificate of occupancy is valid.

109.4 Revocation. The *code official* is authorized to, in writing, suspend or revoke a certificate of completion or occupancy issued under the provisions of this code wherever the certificate is issued in error on the basis of incorrect information supplied, or where it is determined that the building, structure, premise, or portion thereof, or installation of appliance, equipment or system is in violation of any ordinance or regulation or any of the provisions of this code.

SECTION 110
STOP WORK ORDER

110.1 Authority. Whenever the *code official* finds any work regulated by this code being performed in a manner either contrary to the provisions of this code or dangerous or unsafe, the *code official* is authorized to issue a stop work order.

110.2 Issuance. The stop work order shall be in writing and shall be given to the owner of the property involved, or to the owner's agent, or to the person doing the work. Upon issuance of a stop work order, the cited work shall immediately cease. The stop work order shall state the reason for the order, and the conditions under which the cited work will be permitted to resume.

110.2.1 Emergencies. Where an emergency exists, the *code official* shall not be required to give a written notice prior to stopping the work.

110.3 Unlawful continuance. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fees, fines, or penalties as prescribed by this code or other laws or ordinances of the jurisdiction.

SECTION 111
VIOLATIONS

111.1 Code Violations. No person, association, organization, or business entity of any form shall:

1. Erect, construct, alter, extend, repair, move, remove, demolish or occupy any building, structure or premises in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
2. Install or operate any equipment, appliances, or systems regulated by this code that is in conflict with or in violation of any provision of this code or other ordinances of the jurisdiction; or
3. Be non-compliant with the conditions of any permit or certificate issued under the auspices of this code; or
4. Tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*.

111.2 Notice of violation. A *code official* who observes or becomes aware of any code violation shall serve upon the responsible person, association, organization, or business entity a written notice in accordance with Section 111.2.1. In the absence of direct knowledge as to the identity or location of the responsible party, the *code official* shall serve the notice upon the property owner. Service may be effected by personal delivery, first class mail, substituted service, or such other means that may be authorized by state and/or local law.

111.2.1 Form of notice. Such notice of violation shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the violation into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties in accordance with Section 111.3.

111.3 Penalties. Violators who fail to comply with a notice to discontinue or abate a condition in violation of this code, and violators who tamper, destroy, mutilate, or remove any sign, tag, or seal posted or affixed by the *code official* without the express authorization of the *code official*, shall be subject to the penalties set forth in this code as may be adopted and authorized by state and/or local law.

SECTION 112
MEANS OF APPEALS

112.1 Application for appeal. Any person directly affected by a decision of the *code official* or a notice or order issued under this code shall have the right to appeal to the board of appeals, provided that a written application for appeal is filed within 20 days after the day the decision, notice or order was served. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or the requirements of this code are adequately satisfied by other means.

112.1.1 Stays of enforcement. The filing of an appeal of notice or orders, except for notice or order concerning *Imminent Danger*, shall stay the enforcement of the notice or order until the appeal is heard by the board of appeals.

112.2 Membership of board. The board of appeals shall consist of five members who are qualified by experience and training to pass on matters pertaining to the provisions of this code. The board shall be appointed by the chief appointing authority.

112.2.1 Alternate members. The chief appointing authority shall appoint two or more alternate members who shall be called by the board chairman to hear appeals during the absence or disqualification of a member. Alternate members shall possess the qualifications required for board membership and shall be appointed for five years, or until a successor has been appointed.

112.2.2 Department staff. An employee of the jurisdiction shall not be a member of the board of appeals. The *code official* shall be an ex officio member of the board but shall have no vote on any matter before the board.

112.2.3 Chairman. The board shall annually select one of its members to serve as chairman.

112.2.4 Secretary. The chief administrative officer shall designate a qualified clerk to serve as secretary to the board. The secretary shall file a detailed record of all proceedings in the office of the chief administrative officer.

112.2.5 Qualifications. The board of appeals shall consist of five individuals, one from each of the following professions or disciplines.

1. Registered design professional who is a registered architect; or a builder or superintendent of building construction with at least 10 years' experience, five of which shall have been in responsible charge of work.
2. Registered design professional with structural engineering or architectural experience.
3. Registered design professional with fuel gas and plumbing engineering experience; or a fuel gas contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
4. Registered design professional with electrical engineering experience; or an electrical contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.
5. Registered design professional with fire protection engineering experience; or a fire protection contractor with at least 10 years' experience, five of which shall have been in responsible charge of work.

112.2.6 Disqualification of member. A member shall not hear an appeal in which that member has a personal, professional or financial interest.

112.2.7 Terms. The board members shall serve staggered and overlapping terms. The initial members of the board of appeals shall serve as follows: one for five years; one for four years; one for three years; one for two years and one for one year. Thereafter, each new member shall serve for five years or until a successor has been appointed.

112.2.8 Compensation of members. Compensation of members shall be determined by law.

112.3 Hearings and meetings. Hearings on appeals and other meetings of the board of appeals shall be held in accordance with Sections 112.3.1 through 112.3.4.

112.3.1 Procedures. The board shall adopt and make available to the public through the secretary procedures under which a hearing will be conducted. The procedures shall not require compliance with strict rules of evidence, but shall mandate that only relevant information be received.

112.3.2 Notice. The board shall hold a hearing upon notice from the chairman, within 10 days of the filing of an appeal, or at stated periodic meetings.

112.3.3 Open hearing. All hearings before the board shall be open to the public. A quorum shall consist of not less than two-thirds of the board membership. The appellant, the appellant's representative, the *code official* and any person whose interests are affected shall be given an opportunity to be heard.

112.3.4 Postponed hearing. When the full board is not present to hear an appeal, either the appellant or the appellant's representative shall have the right to request a postponement of the hearing.

112.4 Board decision. The board shall modify or reverse the decision of the *code official* by a concurring vote of a majority of the total number of appointed board members.

112.4.1 Resolution. The decision of the board shall be by resolution. Certified copies shall be furnished to the appellant and to the *code official*.

112.4.2 Action by code official. The *code official* shall take immediate action in accordance with the decision of the board.

112.5 Court review. Any person, whether or not a previous party to the appeal, shall have the right to apply to the appropriate court for a writ of certiorari to correct errors of law. Application for review shall be made in the manner and time required by law following the filing of the decision in the office of the chief administrative officer.

SECTION 113
FEES

113.1 Payment of fees. A permit or an amendment to a permit shall not be issued until the fees prescribed in Section 113.2 have been paid.

113.2 Fee schedule. The fees for permits and other considerations shall be in accordance with the following schedule: [JURISDICTION TO INSERT APPROPRIATE FEE SCHEDULE]

113.3 Related fees. The payment of the fee for work done in connection to or concurrently with the work authorized by a *permit* shall not relieve the applicant or holder of the *permit* from the payment of other fees that are prescribed by law.

113.4 Work commencing before permit issuance. Any person who commences any work on a project requiring a *permit* before obtaining the necessary permits shall be subject to a fee established by the *code official* that shall be in addition to the required *permit* fees.

113.5 Permit extension. The fee for an extension of a permit in conformance with Section 105.7 shall be one-half the amount required for a new permit for such work.

113.6 Expiration of permit. For permits that have expired, and before such work recommences in conformance with Section 105.8.1, the fee to recommence work shall be one-half the amount required for a new permit for such work.

113.7 Stop work order. Any person who shall continue any work on a project requiring a permit after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than [AMOUNT] dollars or more than [AMOUNT] dollars.

113.8 Reinspection fee. A reinspection of work not in compliance with this code shall be subject to a fee established by the *code official* that shall be in addition to the required *permit* fees. The fee may be assessed when the *approved* plans are not readily available to the inspector, for failure to provide access on the date for which inspection is requested, for work deviating from the approved, or the work or test is not in compliance with this code.

113.9 Fee refunds. The *code official* shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than 180 days after the date of fee payment. The *code official* shall authorize the refunding of fees as follows:

1. The full amount of any fee paid hereunder which was erroneously paid or collected.
2. Not more than [SPECIFY PERCENTAGE] percent of the plan review fee paid when an application for a permit for which a plan review fee has been paid is withdrawn or canceled before any plan review effort has been expended.
3. Not more than [SPECIFY PERCENTAGE] percent of the permit fee paid when no work on a project has been performed under a permit issued in accordance with this code.

(SECTIONS 114 THROUGH 119 RESERVED)

PART 3 – GENERAL REQUIREMENTS

SECTION 120
UNSAFE STRUCTURES, EQUIPMENT, AND CONDITIONS

120.1 General. If any building, structure, premises or part thereof, or appliance, equipment, or system is found to be unsafe by the *code official*, or found in the case of a building or structure to be unfit for human occupancy, the condition shall be abated whenever possible, but if abatement is not achieved or is non-achievable, then condemnation shall be undertaken in accordance with the provisions of this code.

120.1.1 Notice to building official. Abatement requiring repairs, *alterations*, remodeling, removing or demolition shall be referred to the *building official*.

120.1.2 Unsafe structures. An unsafe structure is a structure that is dangerous to the life, health, or safety of the public or to the *occupants* when:

1. There are no minimum safeguards provided to protect or warn *occupants* in the event of fire; or
2. Such structure contains unsafe equipment or is so damaged, decayed, dilapidated, is structurally unsound, is of such faulty construction, or has such an unstable foundation, that partial or complete collapse is possible.

120.1.3 Unsafe equipment. Unsafe equipment includes any boiler, heating equipment, elevator, moving stairway, electrical wiring or device, flammable liquid containers or other equipment on the *premises* or within the structure which is in such disrepair or condition that such equipment constitutes a hazard to life, health, property or safety of the public or the *occupants* of the *premises* or structure.

120.1.4 Structure unfit for human occupancy. A structure is unfit for human *occupancy* whenever the *code official* finds that such structure is unsafe, is unlawful or, because its degree of disrepair, or its want of maintenance, is unsanitary, vermin or rat infested, filthy and contaminated, lacking *ventilation*, illumination, sanitary, heating facilities or other essential equipment required by this code, or because the structure is in proximity to an unsafe or dangerous condition that constitutes a hazard to the *occupants* of the structure or to the public.

120.1.5 Unlawful structure. An unlawful structure is one found in whole or in part to be occupied by more persons than permitted under this code, or was erected, altered or occupied contrary to this code.

120.1.6 Structure and premise that are dangerous to the life, health or safety of the public or occupants. For the purpose of this code, any structure or *premises* that have any or all of the following conditions or defects shall be considered dangerous, and shall constitute an unsafe structure:

1. Any door, aisle, passageway, stairway, exit or other means of egress that does not conform to the *approved* building or fire code of the jurisdiction as related to the requirements for existing buildings.
2. The walking surface of any aisle, passageway, stairway, exit or other means of egress is so warped, worn loose, torn or otherwise unsafe as to not provide safe and adequate means of egress.
3. Any portion of a building, structure or appurtenance that has been damaged by fire, earthquake, wind, flood, *deterioration*, *neglect*, abandonment, vandalism or by any other cause to such an extent that it is likely to partially or completely collapse, or to become *detached* or dislodged.
4. Any portion of a building, or any member, appurtenance or ornamentation on the exterior thereof that is not of sufficient strength or stability, or is not so *anchored*, attached or fastened in place so as to be capable of resisting natural or artificial loads of one and one-half the original designed value.
5. The building or structure, or part of the building or structure, because of dilapidation, *deterioration*, decay, faulty construction, the removal or movement of some portion of the ground necessary for the support, or for any other reason, is likely to partially or completely collapse, or some portion of the foundation or underpinning of the building or structure is likely to fail or give way.

6. The building or structure, or any portion thereof, is clearly unsafe for its use and *occupancy*.
7. The building or structure is *neglected*, damaged, dilapidated, unsecured or abandoned so as to become an attractive nuisance to children who might play in the building or structure to their danger, becomes a harbor for vagrants, criminals or immoral persons, or enables persons to resort to the building or structure for committing a nuisance or an unlawful act.
8. Any building or structure has been constructed, exists or is maintained in violation of any specific requirement or prohibition applicable to such building or structure provided by the *approved* building or fire code of the jurisdiction, or of any law or ordinance to such an extent as to present either a substantial risk of fire, building collapse or any other threat to life and safety.
9. A building or structure, used or intended to be used for dwelling purposes, because of inadequate maintenance, dilapidation, decay, damage, faulty construction or arrangement, inadequate light, *ventilation*, mechanical or plumbing system, or otherwise, is determined by the *code official* to be unsanitary, unfit for human habitation or in such a condition that is likely to cause sickness or disease.
10. Any building or structure, because of a lack of sufficient or proper fire-resistance-rated construction, fire protection systems, electrical system, fuel connections, mechanical system, plumbing system or other cause, is determined by the *code official* to be a threat to life or health.
11. Any portion of a building remains on a site after the demolition or destruction of the building or structure or whenever any building or structure is abandoned so as to constitute such building or portion thereof as an attractive nuisance or hazard to the public.

120.2 Closing of vacant structures. If the structure is vacant and unfit for human habitation and *occupancy*, and is not in danger of structural collapse, the *code official* is authorized to post a placard of condemnation on the *premises* and order the structure closed up so as not to be an attractive nuisance. Upon failure of the *owner* to close up the *premises* within the time specified in the order, the *code official* shall cause the *premises* to be closed and secured through any available public agency or by contract or arrangement by private persons, and the cost thereof shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate that may be collected by any legal means.

120.3 Evacuation. The *code official* or the fire department official in charge of an emergency incident shall be authorized to order the immediate evacuation of any occupied building, structure or premises deemed unsafe due to hazardous conditions that present an imminent danger to occupants. *Persons* so notified shall immediately leave the structure or premises and shall not enter or re-enter until authorized to do so by the *code official* or the fire department official in charge of the incident.

120.4 Notice. Whenever the *code official* has *condemned* a structure or equipment under the provisions of this section, notice shall be posted in a conspicuous place in or about the structure affected by such notice and served on the *owner* or the person or persons responsible for the structure or equipment in accordance with Section 120.4.2. If the notice pertains to equipment, it shall also be placed on the *condemned* equipment. The notice shall be in the form prescribed in Section 120.4.1.

120.4.1 Form of notice. Such notice of shall be in accordance with all of the following:

1. Be in writing.
2. Include a description of the real estate sufficient for identification.
3. Include a statement of the violation or violations and why the notice is being issued.
4. Include a correction order allowing a reasonable time to make the repairs and improvements required to bring the unsafe condition into compliance with the provisions of this code.
5. Inform the property *owner* of the right to appeal.
6. Include a statement of the penalties set forth in this code or as may be adopted and authorized by state and/or local law.

120.4.2 Service of notice. Such notice shall be deemed properly served if a copy thereof is (a) delivered to the owner personally; (b) sent by certified or registered mail addressed to the owner at the last known address with the return receipt requested; or (c) delivered in any other manner as prescribed by local law. If the certified or registered letter is returned showing that the letter was not delivered, a copy thereof shall be posted in a conspicuous place in or about the structure affected by such notice. Service of such notice in the foregoing manner upon the owner's agent or upon the person responsible for the structure shall constitute service of notice upon the owner.

120.5 Placarding. Upon failure of the owner or person responsible to comply with the notice provisions within the time given, the *code official* shall post on the premises or on defective equipment a placard bearing the word "UNSAFE" or "CONDEMNED" as applicable, and a statement of the penalties provided for occupying the premises, operating the equipment or removing the placard.

120.5.1 Placard removal. The *code official* shall remove the placard whenever the unsafe conditions have been eliminated. Any person who defaces or removes an unsafe condition placard without the approval of the *code official* shall be subject to the penalties provided for by the jurisdiction.

120.6 Prohibited occupancy. Any structure *condemned* and placarded by the *code official* shall be vacated as ordered by the *code official*. It shall be unlawful for any person to occupy or to allow others to occupy a placarded *premises,* or to operate or allow others to operate any placarded equipment.

120.7 Abatement. The owner, operator, or occupant of a building, structure, premises, or equipment deemed unsafe by the *code official* shall abate or correct such unsafe conditions either by repair, rehabilitation, demolition or other *approved* corrective action.

120.7.1 Summary abatement. Where conditions exist that are deemed an *imminent danger* as described in Section 121.1 that will necessarily result in injury to occupants or the public, the *code official* or fire department official in charge of the incident is authorized to summarily abate such unsafe or hazardous conditions.

120.8 Record. The *code official* shall cause a report to be filed on an unsafe condition. The report shall state the occupancy of the structure and the nature of the unsafe condition. The record of an unsafe condition as outlined herein shall be retained by the *code official* for the period required for retention of public records.

SECTION 121
EMERGENCY MEASURES

121.1 Imminent danger. When, in the opinion of the *code official*, there is imminent danger of failure or collapse of a building or structure that endangers life, or when any building or part of a building has fallen and life is endangered by the occupation of the building, or when there is actual or potential danger to the building occupants or those in the proximity of any structure because of explosives, explosive fumes or vapors, or the presence of toxic fumes, gases, or materials, or operation of defective or *dangerous* equipment, the *code official* is hereby authorized and empowered to order and require the occupants to vacate the premises forthwith. The *code official* shall cause to be posted at each entrance to such structure a notice reading as follows: "This Structure Is Unsafe and Its Occupancy Has Been Prohibited by the *Code Official*." It shall be unlawful for any person to enter such structure except for the purpose of securing the structure, making the required *repairs*, removing the hazardous condition, or of demolishing the same.

121.2 Temporary safeguards. Notwithstanding other provisions of this code, whenever, in the opinion of the *code official*, there is imminent danger due to an unsafe condition, the *code official* shall order the necessary work to be done, including the boarding up of openings, to render such structure temporarily safe whether or not the legal procedure herein described has been instituted; and shall cause such other action to be taken as the *code official* deems necessary to meet such emergency.

121.3 Closing streets. When necessary for public safety, the *code official* shall temporarily close structures and close or order the authority having jurisdiction to close sidewalks, streets, public ways, and places adjacent to unsafe structures, and prohibit the same from being utilized.

121.4 Emergency repairs. For the purposes of this section, the *code official* shall employ the necessary labor and materials to perform the required work as expeditiously as possible.

121.5 Costs of emergency repairs. Costs incurred in the performance of emergency work shall be paid by the jurisdiction. The legal counsel of the jurisdiction shall institute appropriate action against the owner of the premises where the unsafe structure is or was located for the recovery of such costs.

121.6 Hearing. Any person ordered to take emergency measures shall comply with such order forthwith. Any affected person shall thereafter, upon petition directed to the appeals board, be afforded a hearing as described in this code.

SECTION 122
SERVICE UTILITIES

122.1 Connection of service utilities. No person shall make connections from a utility, source of energy, fuel, power, water system or *sewer* system to any building, structure or system that is regulated by this code for which a permit is required, until approved by the *code official*.

122.2 Temporary connection. The *code official* shall have the authority to authorize the temporary connection of the building, structure or system to the utility source of energy, fuel, power, water system or *sewer* system.

122.3 Authority to disconnect service utilities. The *code official* shall have the authority to authorize disconnection of utility service to the building, structure or system regulated by this code and the referenced codes and standards in case of emergency where necessary to eliminate an immediate hazard to life or property or when such utility connection has been made without the approval required by Section 122.1 or 122.2. The *code official* shall notify the serving utility and, wherever possible, the owner and occupant of the building, structure or service system of the decision to disconnect prior to taking such action. If not notified prior to disconnecting, the owner or occupant of the building, structure or service system shall be notified in writing, as soon as practical thereafter.

SECTION 123
TEMPORARY STRUCTURES, EQUIPMENT, SYSTEMS AND USES

123.1 General. The *code official* is authorized to issue a permit for temporary structures, equipment, systems and uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The *code official* is authorized to grant extensions for demonstrated cause.

123.2 Conformance. Temporary structures, equipment, systems and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.

123.3 Termination of approval. The *code official* is authorized to terminate such permit and to order the temporary structure, equipment, system or use to be discontinued.

SECTION 124
MAINTENANCE

124.1 Maintenance of safeguards. Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or any other feature is required for compliance with the provisions of this code, or otherwise installed, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be continuously maintained in accordance with this code and applicable referenced standards.

124.2 Testing and operation. Equipment requiring periodic testing or operation to ensure maintenance shall be tested or operated as specified in this code.

124.2.1 Test and inspection records. Required test and inspection records shall be available to the *code official* at all times, or such records as designates shall be filed with the *code official*.

124.2.2 Reinspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

124.3 Supervision. Maintenance and testing shall be under the supervision of a responsible *person* who shall ensure that such maintenance and testing are conducted at specified intervals in accordance with this code.

124.4 Rendering equipment inoperable. Portable or fixed fire-extinguishing systems or devices and fire-warning systems shall not be rendered inoperative or inaccessible except as necessary during emergencies, maintenance, repairs, *alterations*, drills or prescribed testing.

SECTION 125
DEMOLITION

125.1 General. The *code official* shall order the owner of any premises upon which is located any structure that in the *code official's* judgment is deteriorated or dilapidated, or has become so out of *repair* as to be *dangerous*, unsafe, insanitary, or otherwise unfit for human habitation or occupancy, and such that it is unreasonable to *repair* the structure, to demolish and remove such structure; or if such structure is capable of being made safe by *repairs*, to *repair* and make safe and sanitary, or to board up and hold for future repair, or to demolish and remove at the owner's option; or where there has been a cessation of normal construction of any structure for a period of more than two years, to board up and hold for recommencement of work, or to demolish and remove such structure. Boarding up the building for future repair or recommencement of work shall not extend beyond one year, unless *approved* by the *code official*.

125.2 Notices and orders. All notices and orders shall comply with Section 111.2.

125.3 Failure to comply. If the owner of a premises fails to comply with a demolition order within the time prescribed, the *code official* shall cause the structure to be demolished and removed, either through an available public agency or by contract or arrangement with private persons, and the cost of such demolition and removal shall be charged against the real estate upon which the structure is located and shall be a lien upon such real estate.

125.4 Salvage materials. When any structure has been ordered demolished and removed in accordance with Section 125.3, the governing body or other designated officer under said contract or arrangement aforesaid shall have the right to sell the salvage and valuable materials at the highest price obtainable. The net proceeds of such sale, after deducting the expenses of such demolition and removal, shall be promptly remitted with a report of such sale or transaction, including the items of expense and the amounts deducted, for the person who is entitled thereto, subject to any order of a court. If such a surplus does not remain to be turned over, the report shall so state.

125.5 Existing remedies. The provisions in this code shall not be construed to abolish or impair existing remedies of the jurisdiction or its officers or agencies relating to the removal or demolition of any structure which is dangerous, unsafe or insanitary.

The purpose of this proposal is to provide correlation of all Chapter One provisions between all I-Codes. Though many provisions have been editorially changed, the intent and application of all Chapter One requirements remain unchanged. Provisions that are specific to a particular code have not been changed.

To achieve this correlation, the main Sections and Subsections of Chapter 1 are reorganized in an order that is more relative to their hierarchy. Also, these Main Sections may be relocated to the correct Part 1 (SCOPE AND APPLICATION), or Part 2 (ADMINISTRATION AND ENFORCEMENT) of Chapter One.

This proposal also adds a new Part 3 (GENERAL REQUIREMENTS) that includes those requirements that are neither applicable to scope, application, administration, or enforcement, but are general in nature to that particular code. These general requirements include: *Unsafe Structures, Equipment, and Conditions*; *Emergency Measures*; *Service Utilities*; *Temporary Structures, Equipment, Systems and Uses*; *Maintenance*; *Demolition*; and in the IFC, *Operational Permits*. These general requirements start at Section 120.

With the exception of the IZC, Sections 114 through 119 are shown as "Reserved". This will allow future Sections for provisions relative to administration and enforcement to be added without the need for extensive section renumbering. In the case of the IZC, Sections 114 through 117 are already used.

For the purpose of clarity, Item #1 is not shown in legislative text. It is intended that Item #1 be the template for all I-Codes Chapter One's. Items #1A through #1M are shown in legislative text to allow one to see the changes of incorporating the template into each I-Code. As a few punctuation marks or words may have slipped through the cracks during editing, it is intended that the master template shown in Item #1 be used for all I-Codes, with those requirements that are specific to a particular code be inserted into the template for that code.

For additional correlation between all I-Codes, some main Sections and Subsections that appear in other I-Codes are added, or current Subsections within a code may be moved into a new Main Section. As an example, some codes may have only one or two Subsections (paragraphs) relating to a particular topic (e.g., "Violations", "Fees", etc.). In these cases these Subsections are incorporated into a new full Main Section.

You will also notice that six new charging provisions have been added for those items that are specific to that code. These item specific areas are **1)** Section 102.11 - *Specific application of this code*; **2)** Section 104.9 - *Specific duties* (of the code official); **3)** Section 105.1.3 - *Permits specifically required*; **4)** Section 105.2.3 - *Specific exemption* (to permit requirements); **5)** Section 106.2.3 - *Specific Information* (for submittal documents); and **6)** Section 108.2.1 - *Specific Inspections*. This will locate those specific requirements in one Subsection, and allow future specific requirements to be inserted into those Subsections without the need to radically change the Section numbering.

In other instances a general provision that can be applicable to all I-Codes may only occur in one or a few of the I-Codes, but are applicable to all I-Codes. As such, these types of provisions have been incorporated into all I-Codes. An example of this is Section 102.10 – *Contractor's responsibility*, and Section 104.8 – *Assistance of other agencies*.

In all, this will correlate all related Chapter One requirements in all I-Codes by having the same text of the main provisions and the same Section number sequence. This will provide the ability to incorporate future changes, be them applicable to all I-Codes or just a specific Code, in a more easy manner, and citation to be uniform. Although it may seem that not all of the provisions included in Chapter 1 are applicable to each I-Code individually, from an administration and enforcement standpoint all of the Chapter 1 requirements are applicable for the overall administration and enforcement of the encompassing ICC family of codes and standards.

If during your review of this Proposal you have questions or concerns, please do not hesitate to contact me at either (800) 368-5242 or lbrown@nahb.org in advance of the October Code Development Hearings. This will allow any needed modifications to be developed prior to the hearings.

DEFINITIONS: The addition of these definitions, all currently found in one or more I-Codes, are needed to define these terms as used in Chapter One. These definitions are general in nature and are applicable to all I-Codes in the same manner and use. In some cases the same terms was defined using different text in different I-Codes, though the intent and meaning of the definition was the same. In these cases the text of the different definitions were combined into one revised definition for use in all I-Codes.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART IV – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART V – IFGC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART VI – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART VII – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART VIII – IPMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART IX – IPSDC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART X – IWUIC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART XI – IZC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART XII – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ADM2–09/10
IBC 101.2; IEBC 101.2

Proponent: Patrick Vandergriff, Vandergriff Code Consulting Services

Revise as follows:

IBC 101.2 (IEBC 101.2) Scope. The provisions of this code shall apply to the construction, *alteration*, ~~movement~~ relocation, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures.

Reason: The proposed change uses the phrase relocation which is used thirteen times in the International Existing Building /Code and other areas of the code and provides uniformity in language.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: VANDERGRIFF-ADM1-107.1 COMP.DOC

ADM3–09/10
PART I: IBC 101.3, K101.3; IMC 101.3; IFGC 101.4; IPC 101.3; IPSDC 101.3, IECC 101.3; IFC 101.3; IEBC 101.3; IPMC 101.3; IWUIC 101.3; IZC 101.2

PART II: IRC R101.3

Proponent: Zaida Basora, AIA, Building Official, City of Dallas; in consultation with the Codes Committee of the U.S. Green Building Council

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC, IMC, IFGC, IPC, IPSDC, IECC, IFC, IEBC, IPMC, IWUIC, IZC

1. IBC – Revise as follows:

101.3 Intent. The purpose of this code is to establish the minimum requirements for the built environment to safeguard the public health, safety and general welfare through provisions that address:

1. Structural strength, means of egress facilities, stability, durability, sanitation, adequate light and ventilation, energy conservation and accessibility;
2. Safety to life and property from fire and other hazards attributed to the built environment; ~~and to provide~~
3. Safety ~~to~~ of fire fighters and emergency responders during emergency operations; and
4. Sustainable practices in building design, construction and use.

K101.3 Intent. The purpose of this code is to establish the minimum requirements for electrical equipment and systems in the built environment to safeguard the public safety, health and general welfare through provisions that address:

1. Design, quality of materials, construction and installation, durability, operation and maintenance;
2. Safety to life and property from fire and other hazards attributed to the built environment; and
3. Sustainable practices in building design, construction and use.

2. IMC – Delete and substitute in its entirety as follows:

~~**101.3 Intent.** The purpose of this code is to provide minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, installation, quality of materials, location, operation and maintenance or use of mechanical systems.~~

101.3 Intent. The purpose of this code is to establish the minimum requirements for mechanical equipment and systems in the built environment to safeguard the public safety, health and general welfare through provisions that address:

1. Design, quality of materials, construction and installation, durability, operation and maintenance;
2. Safety to life and property from fire and other hazards attributed to the built environment; and
3. Sustainable practices in building design, construction and use.

3. IFGC – Delete and substitute in its entirety as follows:

~~**101.4 Intent.** The purpose of this code is to provide minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, installation, quality of materials, location, operation and maintenance or use of fuel gas systems.~~

101.4 Intent. The purpose of this code is to establish the minimum requirements for fuel gas equipment and systems in the built environment to safeguard the public safety, health and general welfare through provisions that address:

1. Design, quality of materials, construction and installation, durability, operation and maintenance;
2. Safety to life and property from fire and other hazards attributed to the built environment; and
3. Sustainable practices in building design, construction and use.

4. IPC – Delete and substitute in its entirety as follows:

~~**101.3 Intent.** The purpose of this code is to provide minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, installation, quality of materials, location, operation and maintenance or use of plumbing equipment and systems.~~

101.3 Intent. The purpose of this code is to establish the minimum requirements for plumbing equipment and systems in the built environment to safeguard the public safety, health and general welfare through provisions that address:

1. Design, quality of materials, construction and installation, durability, operation and maintenance;
2. Safety to life and property from fire and other hazards attributed to the built environment; and
3. Sustainable practices in building design, construction and use.

5. IPSDC – Delete and substitute in its entirety as follows:

~~**101.3 Intent.** The purpose of this code is to provide minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, installation, quality of materials, location, operation and maintenance or use of private sewage disposal systems.~~

101.3 Intent. The purpose of this code is to establish the minimum requirements for private sewage disposal equipment and systems in the built environment to safeguard the public safety, health and general welfare through provisions that address:

1. Design, quality of materials, construction and installation, durability, operation and maintenance;
2. Safety to life and property from fire and other hazards attributed to the built environment; and
3. Sustainable practices in building design, construction and use.

6. IECC – Revise as follows:

101.3 Intent. This code shall regulate the design and construction of buildings through provisions that address sustainable practices for the effective use of energy. This code is intended to provide flexibility to permit the use of innovative approaches and techniques ~~to achieve the effective use of energy~~. This code is not intended to abridge, but to augment, safety, health or environmental requirements contained in other applicable codes and ordinances.

7. IFC – Revise as follows:

101.3 Intent. The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide safety to fire fighters and emergency responders during emergency operations. This code is not intended to abridge, but to augment, safety, health or environmental requirements contained in other applicable codes and ordinances.

8. IEBC – Revise as follows:

101.3 Intent. The intent of this code is to provide flexibility to permit the use of alternative approaches to achieve compliance with minimum requirements to safeguard public health, safety and general welfare insofar as they are affected by the repair, alteration, change of occupancy, addition and relocation of existing buildings. This code supports responsible alteration and reuse of buildings to enhance and protect the long term investment of materials and resources in existing structures.

9. IPMC – Revise as follows:

101.3 Intent. This code shall be construed to secure its expressed intent, which is to ensure public health, safety and general welfare in so far as they are affected by the continued occupancy and maintenance of structures and premises. This code supports the responsible performance and maintenance of buildings to protect the long term investment of materials and resources inherent in existing structures. Existing structures and premises that do not comply with these provisions shall be altered or repaired to provide a minimum level of health and safety required herein.

10. IWUIC – Revise as follows:

101.3 Objective. The objective of this code is to establish minimum regulations consistent with nationally recognized good practice for the safeguarding of life and property. Regulations in this code are intended to mitigate the risk of life and structures from intrusion of fire from wildland fire exposures and fire exposures from adjacent structures and to mitigate structure fires from spreading to wildland fuels. This code encourages the maintenance of the investment of materials and resources in buildings and structures and the preservation of surrounding wildland resources. The extent of this regulation is intended to be tiered commensurate with the relative level of hazard present.

The unrestricted use of property in wildland-urban interface areas is a potential threat to life and property from fire and resulting erosion. Safeguards to prevent the occurrence of fires and to provide adequate fire-protection facilities to control the spread of fire in wildland-urban interface areas shall be in accordance with this code.

This code shall supplement the jurisdiction's building and fire codes, if such codes have been adopted, to provide for special regulations to mitigate the fire- and life-safety hazards of the wildland-urban interface areas.

11. IZC – Revise as follows:

101.2 Intent. The purpose of this code is to safeguard the public health, property and ~~public~~ general welfare by controlling the design, location, use or occupancy of all buildings and structures through ~~regulated and~~, regulations supporting long term solutions, that result in orderly development of land and land uses within this jurisdiction that are sensitive to the environment and the community.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R101.3 Intent. The purpose of this code is to establish the minimum requirements for the built environment to safeguard the public health, safety~~, health~~ and general welfare through provisions which address:

1. Affordability, structural strength, means of egress facilities, stability, durability, sanitation, light and ventilation, and energy conservation ~~and~~;
2. Safety to life and property from fire and other hazards attributed to the built environment; ~~and to provide~~
3. Safety ~~to~~ of fire fighters and emergency responders during emergency operations; and
4. Sustainable practices in building design, construction and use.

Reason: General:
Purpose: Align the intent statements of the I-Codes for consistency, reformat the statements for improved clarity, and add a provision for sustainability to the intent statements: "Sustainable practices in building design, construction and use."

Note: This code proposal updates the Intent section of each of the I-Codes to incorporate sustainability as a core principle. The intent statements vary widely from one code to the next so the language varies accordingly but the principle is the same and this proposal strives to update some outdated language, maintain specific relevance, and improve consistency and clarity.

1. INTEGRATING PUBLIC HEALTH, SAFETY AND WELFARE AND THE ENVIRONMENT

This proposal recognizes a fundamental link between "safeguarding the public health, safety and general welfare" and preserving a safe and healthy natural environment. There is widely recognized and growing evidence that many of the immediate and cumulative negative impacts of the built environment threaten the health and viability of the natural systems underlying human health and welfare. The importance of this connection has been acknowledged in policy positions of the International Code Council and organizations including the American Institute of Architects (AIA), the American Society of Civil Engineers (ASCE), the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE), the American Planning Association (APA), the World Business Council for Sustainable Development (http://www.wbcsd.org/web/about/members.html), which includes many of the largest companies in the US and the world, and many others.

The health and welfare of humans and society depend directly on the health and viability of ecological and natural systems and on many critical non-renewable resources. Safeguarding the public from hazards attributed to the built environment necessarily includes addressing these larger hazards created by building practices. The benefits of enabling more sustainable practices extend beyond improving environmental and human health, to creating a more sustainable economy, greater social equity and more resilient communities. Improving the efficiency of resource use, reducing waste and pollution, improving indoor environmental quality, and enabling water and energy saving strategies relieve pressures on public infrastructure, reduce public expenditures, and increase health and productivity of everyone, at home, in schools and at work.

2. NOT REPLACING EXISTING PROVISIONS OR COMPROMISING SAFETY

Adding sustainability to the intent of the code does not negate any other provisions. Sustainability identifies a consideration that, in addition to existing safety goals, addresses systemic risks, providing increased safety with respect to the cumulative impacts of construction-related activities that create risks to building occupants, the general public, and future generations. Though these are hazards attributable to the built environment, and thus part of the responsibility for safeguarding the public, they have not previously been recognized or explicitly acknowledged in the codes. Adding this provision will aid code officials in interpreting the codes as supporting practices that seek to address both the current concerns and the large-scale and long-term risks that are emerging. Code enforcement during plan review and site inspections determines the fundamental safety conditions of a building that will impact the health and safety of occupants for the life of the building after the Certificate of Occupancy is issued. Consideration of more sustainable practices is important for maintaining safety both in the immediate and long term.

3. STATEMENTS ON SUSTAINABILITY

Incorporating sustainability into the intent and purpose statements of the I-Codes is parallel to commitments and statements made by several leading organizations representing regulatory bodies and the design, building and development sectors.

AIA (American Institute of Architects):

A. Excerpted from "AIA Position Statement #41 on Sustainable Built Environment," December 2008
"The AIA supports governmental and private sector policy programs, and incentives to encourage a built environment that embodies the advantages of sustainable architecture."
http://www.aia.org/aiaucmp/groups/aia/documents/pdf/aias078764.pdf

B. Excerpted from "Sustainable Architectural Practice Position Statement," 2005:
"The AIA recognizes a growing body of evidence that demonstrates current planning, design, construction, and real estate practices contribute to patterns of resource consumption that seriously jeopardize the future of the Earth's population. Architects need to accept responsibility for their role in creating the built environment and, consequently, believe we must alter our profession's actions and encourage our clients and the entire design and construction industry to join with us to change the course of the planet's future."
http://www.aia.org/aiaucmp/groups/aia/documents/pdf/aias077734.pdf

APA (American Planning Association):

Excerpted from the "Policy Guide on Planning for Sustainability" – Section I: Findings, April 2000:
"…Over the last 40 years, the increase in per capita energy and material consumption has increased even faster than the world's human population. Scientists estimate that our present consumption level is exceeding the Earth's carrying capacity by 30%. We are making up that difference by depleting "natural capital". The United States leads the world in material consumption and waste generation…"
"…Modern economies rely on a host of substances that are not part of nature's cycle of growth and decay. Because these substances are not renewable, their supplies are constantly diminishing. This causes competition for limited resources, with societal repercussions and resulting damage to the environment…"
"…The use of substances that accumulate in the ecosphere and are not part of nature's cycle causes environmental pollution in various forms. Carbon dioxide has increased 30% over its natural occurrence in our atmosphere. Poisonous elements mined from below the Earth's crust, such as cadmium and lead, are found at five and eight times, respectively, their natural rates in the ecosphere. Over 70,000 chemical compounds are now present and accumulating in the ecosphere. Many of these may be toxic to humans or other species."
http://www.planning.org/policy/guides/adopted/sustainability.htm

ASCE (American Society of Civil Engineers):

A. Excerpted from "ASCE Code of Ethics" –Fundamental Canons, July 2006, the first of which states:
"1. Engineers shall hold paramount the safety, health and welfare of the public and shall strive to comply with the principles of sustainable development in the performance of their professional duties."
http://www.asce.org/inside/codeofethics.cfm

B. Excerpted from "The Role of the Civil Engineer in Sustainable Development" – Policy Statement #418, April 2007:
"ASCE Code of Ethics requires civil engineers to strive to comply with the principles of sustainable development in the performance of their professional duties."
http://www.asce.org/pressroom/news/policy_details.cfm?hdlid=60

ASHRAE (American Society of Heating, Refrigeration and Air-conditioning Engineers):

Excerpted from "Sustainability Roadmap," January 2006
"*To achieve and maintain a position of leadership, ASHRAE will:*
- *Expand our efforts to foster sustainable buildings.*
- *Conduct our own affairs of the Society in a sustainable manner…*
- *Integrate building sustainability principles, effective practices and emerging concepts into all appropriate ASHRAE standards, guidelines, research, Handbook chapters, and other publications."*

http://www.ashrae.org/docLib/200621485921_886.pdf

ICC (International Code Council):

A. Excerpted from "Council Policy #35 - 08 – Sustainable Building Technology Committee," September 2008
"…2.1 To work for the continual improvement of ICC Codes, Standards and Guidelines in the areas of sustainability and high performance. This includes the development of proposed code changes, and analysis/response to sustainability-related changes submitted by others..."
http://www.iccsafe.org/news/about/pdf/CP35-08.pdf

B. Excerpted from "Council Policy Position on Green Buildings/Sustainable Communities" – ICC PS 1-2006
"…The Code Council must lead the building safety field: …
- *In monitoring and advocating in the legislative, regulatory and codes arena to give Code Council members the opportunity to speak for sustainable building safety;*
- *Promote the environmental features of the I-Codes and reinforce the understanding that safety and sustainability are both achievable;*
- *Promote the understanding that the I-Codes and the Code Council safety system facilitate the application of sustainable building policy…"*

http://www.iccsafe.org/news/green/Green_Building_policy.pdf

4. SOCIAL VALUE / PUBLIC GOOD
The history of building codes and standards reveals a continuous evolution in understanding and addressing risks as society recognizes them and deems them important enough to require regulation. Public health, safety, and general welfare represent evolving social values. Addressing accessibility of building facilities for users with disabilities is an example of a social issue that was at one time unaddressed by codes and now is fully addressed throughout the building code, in other codes, and as a separate ANSI standard. Affordability, a social issue, is now addressed in the intent statement of the IRC. The NAHB wrote in its supporting statement for adding affordability to the code, "inclusion of "affordability" in the IRC is needed to clarify that safeguarding the public welfare includes concerns about the affordability of housing". The same is true for sustainability. Whether it is through protecting the health of community or regional ecosystems, saving costs of operations and maintenance, reducing negative community impacts, reducing demand for electricity and water, improving occupant and employee health and productivity, or maintaining clean air, the public is demanding better buildings that address these important concerns.

5. BUILDING IMPACTS - LOCAL
Buildings never exist in isolation. They provide a visible, tangible component of the physical infrastructure of a place, town or region. And no matter where it is located, a building has impacts related to its initial construction and the resources necessary to sustain it over time. Whether it is the utility system, the traffic system, the waste stream, flows of equipment and supplies for operations, or the micro-climate impacts of shade, heat, wind or storm runoff, the permitted designs and methods of construction will affect the building occupants and the surrounding environment of the jurisdiction for its lifetime and beyond.

6. BUILDING IMPACTS - GLOBAL
There are negative impacts at every point of the lifecycle of a material or product – whether at extraction or harvest, transport or distribution, alteration or manufacture, construction, installation, use, and later deconstruction, demolition, or destruction. Given that the citizens of a jurisdiction, of a region and even citizens of the world pay the price when such impacts are unregulated and unchecked—effectively externalized to the Commons—and that those impacts are now widely recognized, the public and leading industries and businesses should address these broader impacts. Local activities have both local and global consequences, with both short- and long-term effects. This reality needs to be an inherent part of the process of designing, regulating, building and operating buildings. Incorporating sustainability into the intent provisions of the I-Codes begins the process of acknowledging this reality and its importance.

7. INDUSTRY ADVANCING
In recent years industry professionals and the public have developed a new understanding that short-term focus on first costs along with wasteful building practices can lead to long term costs and system failures. In the arena of energy efficiency, the cheapest, easiest building to construct often becomes the costliest, most maintenance-intensive building to operate. Buildings full of chemicals that retard moisture, rot, mildew, insects, or flame-spread are, in some cases, negatively impacting the health of building occupants. Industry is learning from and adapting to market demand for better buildings and emerging information from the fields of building science, biology, ecology and human health, and it is essential that knowledge be integrated into standard practice. Building regulations should support, not impede this transition to healthier, more sustainable practice.

8. NOT GREEN BUILDING CODE
This is not a green building provision. Green buildings are typically considered above-code or high performance buildings and rating systems exist to define them. New green building codes will set standards for green building designs in enforceable language. As some green building practices become commonplace they will find their way into the ICC family of codes. Having sustainability as a scoping provision will provide the vehicle for transitioning to more sustainable building construction over time. While green buildings may be more likely to be sustainable buildings, they are not necessarily sustainable just because they meet the criteria of a rating system.

9. NOT DEFINING SUSTAINABILITY
Just as the terms "health," "safety," and "welfare" are not defined in the code, we will not attempt to define Sustainability here. This will be for code officials to determine during the consideration of future code proposals one at a time – each on its own merit. The level of safety within the codes is decided by each final action proposal that is passed by ICC membership. Consideration is given to balancing the risks to public health, safety, and welfare against the costs for compliance and consequences of enforcement on building owners, occupants and safety professionals. This will not change.

10. NOT TOO EARLY
Sustainability addresses a set of issues that are increasingly recognized as urgent today, are already included in many European and other national codes, and should already be in U.S. codes. Regulations always lag behind both innovation and the emergence of new risks or new understanding about existing risks. The design, construction and development industry is already well ahead of the codes and this will only increase in coming years. As it stands, the codes affected by this proposal will not be published until 2012, and will likely not be widely adopted for several more years after publication, meaning that official recognition of the need to incorporate sustainable practices into the building regulatory system will not appear for several years. The changes proposed set the stage for more rapid acceptance and advancement of changes that are already taking place. As techniques, methods and strategies make their way into the market, they will become the norm. As they become the norm, they become candidates for code requirements. Without explicit support for such changes, the codes will be an impediment to responsible change, rather than increasing public safety and welfare. Response to water and energy shortages, climate change and other factors are already driving many jurisdictions to develop their own ordinances, codes and standards in efforts to address realities that exist on the ground today. There should be no question about the need to incorporate these changes in the 2012 family of International Codes.

Explanation of Proposed Changes to Each Code:

Section 101.3, Intent of the 2009 IBC reads as follows:

> **101.3 Intent**. The purpose of this code is to establish the minimum requirements to safeguard the public health, safety and general welfare through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation, energy conservation, and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations.

In developing the 13 proposed revisions to 12 International Codes, the existing intent statement of the IBC formed the base platform from which the proposals for all the other codes were then constructed. The existing intent of the IBC already covers many topics but it doesn't fully address the total scope of the current code. The primary intent of this proposal is to add one provision which clarifies the code's role in supporting the shift to sustainable building practices. This is principally accomplished by adding item 4 to the existing three items in the IBC intent statement but also by adding 'durability' to the first item. It became clear to us in developing this proposal that the existing intent statements would be clearer to all if reformatted. Therefore, the final piece of the proposal is a revised format. This proposal provides a clearer format for the intent statement by creating a list. The existing intent statement results in Items 1 through 3. A final change for the IBC is to add 'accessibility' into Item 1's list of broad elements of the code. The IBC is the main location of accessibility standards in the International family of codes and that should be acknowledged in the intent statement.

Intent sections of the IMC, IFGC, IPC, IPSDC and Appendix K of the IBC
These four codes and Appendix K of the IBC are similar codes to each other in that they address specific systems within and serving the building. They are also similar to the IBC and IRC in that they are primarily 'new construction codes'. As similar codes, their existing intent statements are very similar to each other, with unique text for each discipline. However these intent statements are significantly different than the IBC or IRC statements. As an example of these intent statements, the IMC Section 101.3 is shown below:

> **101.3 Intent.** The purpose of this code is provide minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, installation, quality of materials, location, operation and maintenance or use of mechanical systems.

The proposals for these 4 codes and the electrical administrative provisions of IBC Appendix K provide similar language and format to the proposals for the IBC and IRC, yet maintain the unique focus of each code's intent. Language was modernized and made consistent with the IBC and IRC in stating that the intent is to 'safeguard the public health, safety and general welfare. Because the revisions were presented in a new format, it was clearer to show these proposals as 'delete and replace' text. Existing intent provisions from these 5 documents is provided in the charging text and Items 1 and 2. Item 3 reflects the goal of sustainable practices for each system.

Section 101.3, Intent of the IECC
The IECC is already a sustainable practices code. Therefore the existing intent fairly well addresses the need for minimizing the use of energy by buildings constructed under its provisions. The proposed changes are mostly to establish similar language as provided in the other proposals. Further, we propose adding the text to clarify that the IECC doesn't supersede the safety standards of the other construction codes, but is a partner with them. The intent of the IECC does not lend itself to the same formatting as proposed for the 7 previous codes.

Intent sections of the IFC, IEBC and IPMC
These three codes do not have a primary focus of new construction as covered by codes in Parts 1 through 8, but have a primary focus on the maintenance of existing buildings in a safe and occupiable condition. (Although the IFC does contain many new construction standards.) One can say that these codes are already fully engaged in sustainability. The whole concept of taking action to maintain buildings so that they will survive and that people in them won't be harmed by what is in them is embodied in each of these codes. As such their existing intent statements already differ significantly from the 'construction' codes. However the phrasing and text in the existing intent statements was not consistent with each other, or with similar language in the construction codes.

IFC: The IFC has many of the provisions found in the IBC Intent Section 101.3 spread in two sections - 101.2 Scope and 101.3 Intent. For your convenience Section 101.2 is reproduced below: It is already in the list format we've proposed for the construction codes.

> **101.2 Scope.** This code establishes regulations affecting or relating to structures, processes, premises and safeguards regarding:
>
> 1. The hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices;
> 2. Conditions hazardous to life, property or public welfare in the occupancy of structures or premises.
> 3. Fire hazards in the structure or on the premises from occupancy or operation;
> 4. Matters related to the construction, extension, repair, alteration or removal of fire suppression or alarm systems.

Therefore the only proposed amendment is to Section 101.3. This proposal adds a sentence parallel to the sentence which is present in the IECC. That proposed sentence is: <u>This code is not intended to abridge, but to augment, safety, health or environmental requirements contained in other applicable codes and ordinances.</u>

IEBC: While the title is the Existing Building Code, its primary purpose is addressing the reuse of existing buildings as well as guiding additions and alterations. Reuse and upgrading the existing building stock is perhaps one of the most 'sustainable' practices in development. The IEBC provides alternatives for compliance that encourages use of existing materials, yet upgrading to current standards and technologies where appropriate. The proposed new sentence is intended to make plain the goal of this code and how it relates to the sustainability of development as it relates to existing buildings. The term "general' was added for consistency with other codes.

IPMC: The Property Maintenance Code only addresses maintenance of existing structures and their continued safe use. It does not address remodeling or other upgrades as addressed in the IEBC. The basic intent of the IMPC is keeping what is there in good condition so that use can be continued and is safe and healthy. In a broad sense the IPMC is a code about sustainability. The proposed new sentence is intended to make plain the goal of this code and how it relates to the sustainability of existing buildings.

Section 101.3 The "Objective" of IWUIC
The IWUIC is unique in many ways. First it doesn't have an "Intent" section, but rather it has an "Objective". It is also unique in that it provides for construction standard for buildings in fire risk areas, but also contains maintenance provisions. Perhaps the IWUIC can be viewed as ICC's first "green" code in that it addresses the need for the built environment and the natural environment to co-exist. Its goal could be summarized by saying it intends to keep the forest wildlands from burning down the built environment and to keep the built environment from burning down the neighboring wildlands**.** Similar to the proposals to the IEBC and IPMC, the proposed additional language is only to make plain this existing intent of the IWUIC

Section 101.2. Intent of the IZC.
The IZC is another unique code in the ICC galaxy of codes. While the balance of the International Codes are focused on building construction and maintenance, the IZC is focused on the rational use of land. Yet while the IZC should be more closely linked to the use of the key resource, land; its intent statement doesn't clearly address sustainability. Because of its unique role, the proposal is also unique through enhancing the codes focus on long term solutions to zoning decisions as well as the clearly needed statement of relating zoning development to the existing environment - be that the natural environment or the community environment.

Part II: Section R101.3, Intent of the 2009 IRC
The existing intent provisions of the IRC mirror the provisions of the IBC but with a slightly different listing of public health, safety and general welfare. This proposal for the IRC would make this intent statement consistent with the IBC intent statement with one key difference. The existing IRC intent section includes the word 'affordability' in its provisions. This is unique to the IRC and this proposal does nothing to change that nor to extend it to other codes. This proposal continues the parallel construction already existing between the IBC and IRC and would add the same text as proposed for the IBC as well as establishing the same format.

The Performance Code
The Performance Code was reviewed to determine if similar revisions needed to be proposed. There are already numerous, and sufficient goals statements spread throughout the Performance Code. No additional revisions are proposed.

Cost Impact: The code change proposal will not increase the cost of construction. Subsequent proposals by others addressing sustainable practices may increase initial construction costs, however, a growing body of evidence indicates that more sustainable design and building practices often have no cost implications and sometimes reduce construction costs, while typically reducing operating costs and other negative impacts, improving the long-term affordability of ownership and operation.

PART I – IBC, IMC, IFGC, IPC, IPSDC, IECC, IFC, IEBC, IPMC, IWUIC, IZC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BASORA-ADMIN1-101.3 sub only

ADM4–09/10

IBC 102.4; IEBC 102.4; IECC 106.1; IFC 102.7; IFGC 102.8; IMC 102.8; IPC 102.8; IPMC 102.7; IPSDC 102.10; IWUIC 102.4; IRC 102.4

Proponent: Jonathan Humble, Chair, ICC Referenced Standards Committee

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING AND ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC; IEBC; IECC; IFC; IFGC; IMC; IPC; IPMC; IPSDC; IWUIC; IRC

1. IBC Revise as follows:

102.4 Referenced codes and standards. The codes and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections 102.4.1 through 102.4.3.

102.4.1 Differences. Where differences occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

102.4.2 Conflicting scopes. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code or the International Codes listed in Section 101.4, the provisions of this code or the International Codes listed in Section 101.4, as applicable, shall take precedence over the provisions in the referenced code or standard.

2. IEBC Revise as follows:

102.4 Referenced codes and standards. The codes and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections 102.4.1 and 102.4.2.

Exception: Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing shall govern.

102.4.1 Differences. Where differences occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

102.4.2 Conflicting scopes. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code as applicable, shall take precedence over the provisions in the referenced code or standard.

3. IECC Revise as follows:

106.1 ~~General~~ Referenced codes and standards. The codes and standards referenced in this code shall be those listed in Chapter 6, and such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections 106.1.1 and 106.1.2.

106.1.1 Differences. Where differences occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

106.1.2 Conflicting scopes. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

4. IFC Revise as follows:

102.7 Referenced codes and standards. The codes and standards referenced in this code shall be those that are listed in Chapter 47 and such codes and standards shall be considered part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections 102.7.1 and 102.7.2.

102.7.1 Differences. Where differences occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

102.7.2 Conflicting scopes. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

5. IFGC Revise as follows:

102.8 Referenced codes and standards. The codes and standards referenced in this code shall be those that are *listed* in Chapter 8 and such codes and standards shall be considered part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections 102.8.1 and 102.8.2.

Exception: Where enforcement of a code provision would violate the conditions of the listing of the *equipment* or *appliance*, the conditions of the listing and the manufacturer's installation instructions shall apply.

102.8.1 Differences. Where differences occur between provisions of this code and the referenced standards, the provisions of this code shall apply.

102.8.2 Conflicting scopes. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

6. IMC Revise as follows:

102.8 Referenced codes and standards. The codes and standards referenced herein shall be those that are listed in Chapter 15 and such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between provisions of this code and the referenced standards, the provisions of this code shall apply and as further regulated in Sections 102.8.1 and 102.8.2.

> **Exception:** Where enforcement of a code provision would violate the conditions of the listing of the *equipment* or *appliance*, the conditions of the listing and the manufacturer's installation instructions shall apply.

102.8.1 Differences. Where differences occur between provisions of this code and the referenced standards, the provisions of this code shall apply.

102.8.2 Conflicting scopes. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

7. IPC Revise as follows:

102.8 Referenced codes and standards. The codes and standards referenced in this code shall be those that are listed in Chapter 13 and such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections 102.8.1 and 102.8.2.

102.8.1 Differences. Where differences occur between provisions of this code and the referenced standards, the provisions of this code shall apply.

102.8.2 Conflicting scopes. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

8. IPMC Revise as follows:

102.7 Referenced codes and standards. The codes and standards referenced in this code shall be those that are listed in Chapter 8 and considered part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections 102.7.1 and 102.7.2.

> **Exception:** Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing shall apply.

102.7.1 Differences. Where differences occur between provisions of this code and the referenced standards, the provisions of this code shall apply.

102.7.2 Conflicting scopes. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

9. IPSDC Revise as follows:

102.10 Referenced codes and standards. The codes and standards referenced in this code shall be those that are listed in Chapter 14 and such codes and standards shall be considered to be part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections 102.10.1 and 102.10.2.

> **Exception:** Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing and the manufacturer's installation instructions shall apply

102.10.1 Differences. Where differences occur between provisions of this code and the referenced standards, the provisions of this code shall apply.

102.10.2 Conflicting scopes. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

10. IWUIC Revise as follows:

102.4 Referenced codes and standards. The codes and standards referenced in this code shall be those that are listed in Chapter 7 and such codes and standards shall be considered as part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections 102.4.1 and 102.4.2.

102.4.1 Differences. Where differences occur between provisions of this code and the referenced standards, the provisions of this code shall govern.

102.4.2 Conflicting scopes. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R102.4 Referenced codes and standards. The codes and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections R102.4.1 and R102.4.2.

> **Exception:** Where enforcement of a code provision would violate the conditions of the *listing* of the *equipment* or *appliance*, the conditions of the *listing* and manufacturer's instructions shall apply.

R102.4.1 Differences. Where differences occur between provisions of this code and referenced codes and standards, the provisions of this code shall apply.

R102.4.2 Conflicting scopes. Where the extent of the reference to a referenced code or standard includes subject matter that is within the scope of this code, the provisions of this code, as applicable, shall take precedence over the provisions in the referenced code or standard.

Reason: The ICC Reference Standards Committee scope is to support the code development committees through the review of reference standards for the International Codes. The ICC Reference Standards Committee is bringing this proposal forward to clarify the intent of the International Codes with respect to the extent of the application of referenced standards.

The use of referenced codes and standards to cover certain aspects of various occupancies and operations rather than write parallel or competing requirements into the code is a long-standing code development principle. Often, however, questions and potential conflicts in the use of referenced codes and standards can arise which can lead to inconsistent enforcement of the code. In the IBC, several sections illustrate this concern, as follows:

> Section **[F] 415.6.4 Dry cleaning plants** states: "The construction and installation of dry cleaning plants shall be in accordance with the requirements of this code, the *International Mechanical Code*, the *International Plumbing Code* and NFPA 32. Dry cleaning solvents and systems shall be classified in accordance with the *International Fire Code*." Based on this text, NFPA 32, *Standard for Dry Cleaning Plants*, 2007 Edition, in Section 4.4.1.1 states, "General building and structure design and construction shall be in accordance with NFPA 5000, Building Construction and Safety Code, except as modified herein." Since the extent of the reference to NFPA 32 in Section 415.6.4 includes "...construction...", it has happened that designers construed this to mean that the requirements for building construction of dry cleaning plants will be required to follow NFPA 5000 instead on the IBC.
>
> Another example is in the International Mechanical Code, which references ANSI/ASHRAE 15 in sections 1101.6 and 1108.1. ANSI/ASHRAE 15 then references NFPA 54 (ANSI Z223.1) National Fuel Gas Code. This could lead code users to interpret the Mechanical Code to mean that the National Fuel Gas Code is applicable to specific situations rather than the International Fuel Gas Code.

New Section 102.4.2 expands upon the provisions of proposed numbered section 102.4.1 by making it clear that, even if a referenced standard contains requirements that parallel the IBC (or the other referenced I-Codes) in the standards own duly referenced section(s), the provisions of the IBC (or the other referenced I-Codes) will always take precedence. This proposed section does not intend to take the place of carefully scoped and written standards reference text for the I-Codes but, rather, provides the policy underpinnings upon which sound code change proposals can be based.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC; IEBC; IECC; IFC; IFGC; IMC; IPC; IPMC; IPSDC; IWUIC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HUMBLE-ADM1-102.4.DOC

ADM5–09/10
IBC 104.10.1 (New), 113.2.1 (New)

Proponent: Rebecca C. Quinn, Department of Homeland Security, Federal Emergency Management Agency

Revise as follows:

IBC 104.10 Modifications. Wherever there are practical difficulties involved in carrying out the provisions of this code, the building official shall have the authority to grant modifications for individual cases, upon application of the owner or owner's representative, provided the building official shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, accessibility, life and fire safety, or structural requirements. The details of action granting modifications shall be recorded and entered in the files of the department of building safety.

104.10.1 Flood hazard areas. The building official shall not grant modifications to any provision required in flood hazard areas as established by Section 1612.2 without the granting of a variance to such provision by the board of appeals.

SECTION 113
BOARD OF APPEALS

113.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The board shall have no authority to waive requirements of this code.

113.2.1 Criteria for issuance of a variance for flood hazard areas. If an application for a modification to a provision required in flood hazard areas is received, the board of appeals shall issue a variance only upon:

1. A showing of good and sufficient cause that the unique characteristics of the size, configuration or topography of the site render the elevation standards of Section 1612 inappropriate.
2. A determination that failure to grant the variance would result in exceptional hardship by rendering the lot undevelopable.
3. A determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, cause fraud on or victimization of the public, or conflict with existing laws or ordinances.
4. A determination that the variance is the minimum necessary to afford relief, considering the flood hazard.
5. Submission to the applicant of written notice specifying the difference between the design flood elevation and the elevation to which the building is to be built, stating that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation, and stating that construction below the design flood elevation increases risks to life and property.

Reason: To be consistent with the requirements of the National Flood Insurance Program (NFIP), any modifications requested by an applicant that would reduce the requirements related to flood resistant construction must be handled by the authority having jurisdiction by granting a variance. The NFIP requires that such modifications be carefully considered and the procedures for that consideration are set forth in federal regulations (44 C.F.R. §60.6(a)). This same limitation on the authority of the building official to grant modification is found in the *International Residential Code* at Section R104.10.1, and the same criteria for consideration of a variance are found at R112.2.2.

Cost Impact: There is no cost impact; communities that participate in the NFIP must process requests to modify or vary the minimum criteria as variances.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: QUINN-ADM1-104.10.1 COMPLETE.DOC

ADM6–09/10
IBC 105.2; IRC R105.2

Proponent: Rick Davidson, City of Maple Grove, MN

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC

Revise IBC as follows:

105.2 Work exempt from permit. Exemptions from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. *Permits* shall not be required for the following:

Building:

1. One-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11 m^2).
2. Fences not over ~~6 feet (1829 mm)~~ 7 feet (2134 mm) high.
3. Oil derricks.
4. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or impounding Class I, II or IIIA liquids.
5. Water tanks supported directly on grade if the capacity does not exceed 5,000 gallons (18 925 L) and the ratio of height to diameter or width does not exceed 2:1.
6. Sidewalks and driveways not more than 30 inches (762 mm) above adjacent grade, and not over any basement or *story* below and are not part of an *accessible route*.
7. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
8. Temporary motion picture, television and theater stage sets and scenery.
9. Prefabricated swimming pools accessory to a Group R-3 occupancy that are less than 24 inches (610 mm) deep, do not exceed 5,000 gallons (18 925 L) and are installed entirely above ground.
10. Shade cloth structures constructed for nursery or agricultural purposes, not including service systems.
11. Swings and other playground equipment accessory to detached one- and two-family *dwellings*.
12. Window *awnings* supported by an *exterior wall* that do not project more than 54 inches (1372 mm) from the *exterior wall* and do not require additional support of Groups R-3 and U occupancies.
13. Nonfixed and movable fixtures, cases, racks, counters and partitions not over 5 feet 9 inches (1753 mm) in height.

(Remainder of text unchanged)

PART II – IRC BUILDING/ENERGY

Revise as follows:

R105.2 Work exempt from permit. Permits shall not be required for the following. Exemption from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction.

Building:

1. One-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 120 square feet (11.15 m^2).
2. Fences not over ~~6 feet (1829 mm)~~ 7 feet (2134 mm) high.
3. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge.
4. Water tanks supported directly upon grade if the capacity does not exceed 5,000 gallons (18 927 L) and the ratio of height to diameter or width does not exceed 2 to 1.

5. Sidewalks and driveways.
6. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
7. Prefabricated swimming pools that are less than 24 inches (610 mm) deep.
8. Swings and other playground equipment.
9. Window awnings supported by an exterior wall which do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support.
10. Decks not exceeding 200 square feet (18.58m2) in area, that are not more than 30 inches (762 mm) above *grade* at any point, are not attached to a *dwelling* and do not serve the exit door required by Section R311.4.

(Remainder of text unchanged)

Reason: While this code change may seem petty, it does point out the reality faced by building departments on a daily basis and the conflict that occurs when the point at which fences are regulated hits smack dab in the middle of the height range of commonly constructed fences. The current language establishes the maximum height for a fence not needing a permit at 6 feet. However, fence boards are commonly sold in lengths of 6 feet to 6 feet ½ inch. Coupled with the fact that fences are almost always constructed with fence boards slightly above grade and your standard six foot fence is most often 6 feet 1 inch to 6 feet 2 inches high. Fences are often constructed because of a dispute between neighbors. Then one of those neighbors will often complain to the building department that their neighbor should have a permit to construct a fence that is only an inch or two more than six feet. This attempt to place the building department in the middle of the dispute is often successful. Raising the height when a permit is needed to seven feet will not have any significant impact on the design of fences and changes the point when a permit is required to a height that is not as likely to conflict with standard construction practices. This would be much better public policy.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:DAVIDSON-RB4-105.2.DOC

ADM7–09/10
IBC 105.2.4 (New); IEBC 105.2.4 (New); IRC 105.2.4 (New)

Proponent: Patrick Vandergriff, Vandergriff Code Consulting Services

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC/IEBC

Add new text as follows:

IBC 105.2.4 (IEBC 105.2.4) Modular buildings. Where there is no change in occupancy, alteration of floor plan, or structural alteration of a previously approved modular building it shall be deemed a legal continuation of occupancy under Section 102.6 of this code and subject to the provisions contained within that section. All site work, foundation work, electrical, mechanical and plumbing connections shall be subject to permitting and compliance with the requirements of this code.

PART II – IRC BUILDING/ENERGY

Add new text as follows:

R105.2.4 Modular buildings. Where there is no change in occupancy, alteration of floor plan, or structural alteration of a previously approved modular building it shall be deemed a legal continuation of occupancy under Section 102.6 of this code and subject to the provisions contained within that section. All site work, foundation work, electrical, mechanical and plumbing connections shall be subject to permitting and compliance with the requirements of this code.

Reason: This changes wording relative to modular buildings and provides them the same protections afforded site built structures where there is no real redesign of layout taking place within the building.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC/IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: VANDERGRIFF-ADM4-107.1 Comp

ADM8–09/10
IMC 107.2; IPC 107.2; IFGC 107.2; IBC 110.3; IRC 109.1

Proponent: Wesley R. Davis, Air Conditioning Contractors of America

THIS IS A 3 PART CODE CHANGE. PARTS I AND II WILL BE HEARD BY THE ADMINISTRATIVE COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC, IPC, IFGC

Revise as follows:

IMC 107.2 (IPC 107.2, IFGC 107.2) Required inspections and testing. The code official, upon notification from the permit holder or the permit holder's agent, shall make the following inspections and other such inspections as necessary, <u>within 15 days,</u> and shall either release that portion of the construction or shall notify the permit holder or the permit holder's agent of violations that must be corrected. The holder of the permit shall be responsible for the scheduling of such inspections.

1. Underground inspection shall be made after trenches or ditches are excavated and bedded, piping installed, and before backfill is put in place. When excavated soil contains rocks, broken concrete, frozen chunks and other rubble that would damage or break the piping or cause corrosive action, clean backfill shall be on the job site.
2. Rough-in inspection shall be made after the roof, framing, fireblocking and bracing are in place and all ducting and other components to be concealed are complete, and prior to the installation of wall or ceiling membranes.
3. Final inspection shall be made upon completion of the mechanical system.

PART II – IBC

110.3 Required inspections. The *building official*, upon notification, shall make the inspections set forth in Sections 110.3.1 through 110.3.10 <u>within 15 days of such notice</u>.

PART III – IRC BUILDING/ENERGY

IRC 109.1 Types of inspections. For onsite construction form time to time the building official, upon notification from the permit holder or his agent, shall make or cause to be made any necessary inspections and shall, <u>within 15 days,</u> either approve that portion of the construction as completed or shall notify the permit holder of his or her agent wherein the same fails to comply with this code.

Reason: Staffing requirements for code enforcement are affected by the forces of economic cycles. In order to assist with the justification for proper staffing levels, it is proposed that code enforcement officials be required to meet their inspection duties within a reasonable prescribed time limit.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC, IPC, IFGC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIS-M1-107.2

ADM9–09/10

PART I: IBC 107.2, 107.2.1 (New); IEBC 106.2.1, 106.2.2 (New); IECC 103.2, 103.2.1 (New); IFC 105.4.2, 105.4.3 (New)

PART II: IRC R106.1.1

Proponents: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone ; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC, IEBC, IECC, IFC

IBC Revise as follows:

107.2.1 Information on construction documents. *Construction documents* shall be dimensioned and drawn upon suitable material. Electronic media documents ~~are permitted to be submitted~~ shall be submitted when required or, if not required, when *approved* by the *building official*. *Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the *building official*.

107.2.2 Summary of code compliance plans provided with construction documents. Construction documents prepared in accordance with section 103.2 shall contain a summary of how the proposed building will meet all of the applicable requirements under this code on separate sheets of such documents to assist code officials in plan reviews and field inspections where required by the *code official*. The *code official* may specify a particular format for this document.

IEBC Revise as follows:

106.2.1 Construction documents. Construction documents shall be dimensioned and drawn upon suitable material. Electronic media documents ~~are permitted to be submitted~~ shall be submitted when required or, if not required, when approved by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the *code official*. The work areas shall be shown.

106.2.2 Summary of code compliance plans provided with construction documents. Construction documents prepared in accordance with section 103.2 shall contain a summary of how the proposed building will meet all of the applicable requirements under this code on separate sheets of such documents to assist code officials in plan reviews and field inspections where required by the *code official*. The *code official* may specify a particular format for this document.

IECC Revise as follows:

103.2 Information on construction documents. Construction documents shall be drawn to scale upon suitable material. Electronic media documents ~~are permitted to be submitted~~ shall be submitted when required or, if not required, when *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, as applicable, insulation materials and their *R*-values; fenestration *U*-factors and SHGCs; area-weighted *U*-factor and SHGC calculations; mechanical system design criteria; mechanical and service water heating system and equipment types, sizes and efficiencies; economizer or energy recovery ventilation system description and efficiency; equipment and systems controls description; fan motor horsepower ~~(hp)~~ and controls description; duct sealing, duct and pipe insulation R-value and location; lighting fixture schedule with wattage and control narrative; and air sealing details including blower door requirements or air barrier criteria checklist.

103.2.1 Summary of code compliance plans provided with construction documents. Construction documents prepared in accordance with section 103.2 shall contain a summary of how the proposed building will meet all of the applicable requirements under this code on separate sheets of such documents to assist code officials in plan reviews and field inspections where required by the *code official*. The *code official* may specify a particular format for this document.

IFC Revise as follows:

105.4.2 Information on construction documents. *Construction documents* shall be drawn to scale upon suitable material. Electronic media documents ~~are allowed to be submitted~~ shall be submitted when required or, if not required, when *approved* by the *fire code official*. *Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations as determined by the *fire code official*.

105.4.3 Summary of code compliance plans provided with construction documents. Construction documents prepared in accordance with Section 105.5 shall contain a summary of how the proposed building will meet all of the applicable requirements under this code on separate sheets of such documents to assist fire code officials in plan reviews and field inspections where required by the *fire code official*. The *fire code official* may specify a particular format for this document.

PART II – IRC BUILDING/ENERGY

R106.1.1 Information on construction documents. *Construction documents* shall be drawn to scale upon suitable material. Electronic media documents ~~are permitted to be submitted~~ shall be submitted when required or, if not required, when *approved* by the *building official*. *Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in sufficient detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the *building official* where required by the *building official*, all braced wall lines, shall be identified on the *construction documents* and all pertinent ~~information~~ data and features of the building, systems and equipment as herein governed. Details shall include ~~including~~, but are not limited to, as applicable, bracing methods, location and length of braced wall panels, foundation requirements of braced wall panels at top and bottom ~~shall be provided.~~ ; insulation materials and their R-values; fenestration U-factors and SHGCs; area weighted U-factor and SHGC calculations; mechanical system design criteria; mechanical and service water heating system and equipment types, sizes and efficiencies; economizer or *energy recovery ventilation system* description and efficiency; equipment and system controls description; fan motor horsepower and controls description; duct sealing, duct and pipe insulation R-value and location; lighting fixture schedule with wattage and control narrative; and air sealing details including blower door requirement or air barrier criteria checklist.

Reason: This purpose of this proposal is to update the language of this section to reflect additional requirements added since this provision was last revised and also to improve the clarity of required information on the construction documents. The information on constructions documents section has also been modified to include language that allows the code officials to require paperless document submittal.

This proposal also adds a new subsection permitting the code official to require that a separate summary of how the proposed building will meet all of the requirements under this code be provided as part of the construction documents. This provision also permits the code official to specify a particular format for this submittal. The effect of these provisions is to enhance code compliance and ease of enforcement of the energy code requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC3-103.2.DOC

ADM10–09/10
IBC 107.2.2; IFC 105.4.2.1

Proponent: Jeff Hugo, CBO, National Fire Sprinkler Association

Revise as follows:

IBC 107.2.2 (IFC 105.4.2.1) Fire protection system shop drawings. Shop drawings for the fire protection system(s) shall be submitted to indicate conformance with this code and the construction documents and shall be approved prior to the start of system installation. Shop drawings shall contain all information as required by the referenced installation standards in Chapter 9, and shall be prepared by persons who have knowledge, experience and skills necessary to layout fire protection systems and possess a technician level credential satisfactory to the building and/or fire official.

Reason: The development of shop drawings is not the practice of an engineer. The engineer is responsible to designate to the layout technician the water supply information and the specific hazard of the structure, which is typically located on the architectural plans. The fire sprinkler layout technician then takes the water supply information and hazard category and hydraulically lays out the piping and sprinkler location for the most efficient fire sprinkler system in accordance with the engineer's specifications and nationally accepted standards and the adopted code of the jurisdiction.

The role of the engineer and fire sprinkler layout technician in fire sprinkler design both have important roles, but distinct duties. The fire sprinkler layout technician more than likely consults the engineer in obtaining the water supply information and could consult on the most restrictive hazard or commodity of the structure. However, the fire sprinkler layout technician can only layout fire sprinkler system according to the engineer's information.

Frequently, code officials request that shop drawings be signed and sealed by an engineer. This practice is not only illegal to the engineer that stamps the shop drawing (unless the engineer has been certified as a layout technician), but can lead the code official in a false sense of security that the layout documents are properly designed. Layout technicians, specifically NICET Level III or IV have the years of experience and certification(s) necessary to properly layout sprinkler systems and should be required and relied upon by the code official.

Bibliography:
Society of Fire Protection Engineers (SFPE), National Society of Professional Engineers (NSPE), National Institute for Certification in Engineering Technologies (NICET). Position Statement: The Engineer and the Engineering Technician Designing Fire Protection Systems. July 28, 2008

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HUGO-ADM1-106.1.1.1

ADM11–09/10
IBC 107.2.3

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee; Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Revise as follows:

IBC 107.2.3 Means of egress. The *construction documents* shall show in sufficient detail the location, construction, size and character of all portions of the *means of egress* including the path of the *exit discharge* to the *public way* in compliance with the provisions of this code. In other than occupancies in Groups R-2, R-3, and I-1, the *construction documents* shall designate the number of occupants to be accommodated on every floor, and in all rooms and spaces.

Reason: The exit discharge path to the public way is an important component of the means of egress system for all buildings or structures. The exit discharge path needs to be delineated on the submitted and approved plans to ensure the path is reviewed for compliance with the provisions of the code. This will also provide an historical reference once the building is occupied to ensure the exit discharge path is maintained as intended for the life of the building or structure unless modifications are approved.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-ADM1-107.2.3COMPLETE.DOC

ADM12–09/10
IBC 107.2.6 (New)

Proponent: William E. Koffel, Koffel Associates, Inc., representing Firestop Contractors International Association

Add new text as follows:

IBC 107.2.6 Protection of penetrations and joints. Where fire resistance designs from approved sources for through or membrane penetration firestop, fire resistant joint systems are used, documentation acceptable to the code official shall be submitted prior to construction to indicate conformance with this code and the construction documents, and shall be approved prior to the start of system installation.

Reason: Fire resistance rated systems and their features should be given the same level of attention in the code as fire sprinklers, detection and alarm systems, as already exists currently in the building code. Recognizing that Firestop Systems are different than sprinkler systems and shop drawings are not required for this work, we changed the name of the requested information from 'shop drawings' to 'fire resistance designs from approved sources'. This language better describes information that must is vital for all parties – architects, AHJ's, contractors, maintenance personnel, during the life cycle of the building. These Through Penetration Firestop Systems and Fire Resistant Joint Systems aren't systems without this documentation. With this documentation, workers can identify systems used and repair / maintain as necessary.

If means of egress, horizontal assemblies, and other compartments are to be protected with fire resistance rated and smoke resistant construction features, then it is considered vital in importance for fire and life safety. When fire, smoke, or fire/smoke resistance rated compartmentation and with firestopping is used for safety, these submissions should be examined with the same scrutiny as other fire protection items during permit process…which then sets up a documentation stream that is used for the life cycle of the building.

Where required by code, compartmentation needs to be properly designed, installed, inspected and maintained for effectiveness when called upon to protect people in buildings. This code change addresses only firestopping, an item that is very detailed, with documentation tracking that is imperative to identifying what is in the penetration or joint firestop system for annual inspection and maintenance, as required by the International Fire Code.

Just like fire protection system shop drawings, this documentation may be submitted by the contractor after the building permit has been initially issued.

Cost Impact: The code change proposal will not increase the cost of construction, as this documentation is required…but not necessarily at this time.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KOFFELL-ADM1-107.2.6 NEW

ADM13–09/10
IBC 108.1; IEBC 107.1,

Proponent: Patrick Vandergriff, Vandergriff Code Consulting Services

Revise as follows:

108.1 (IEBC 107.1) General. The building official is authorized to issue a permit for temporary structures and temporary uses. Such permits shall be limited as to time of service, but shall not be permitted for more than ~~180 days~~ 24 months for modular buildings and similar structures. Tents and other membrane structures shall not be permitted for more than 180 days. The building official is authorized to grant extensions for demonstrated cause.

Reason: This change provides for time period for temporary structures that is more in keeping with the issue of buildings used as temporary offices and temporary use buildings during construction projects and for other purposes where the old 180 days is simply not going to cover it. It keeps the building official from having to repeatedly review and re-issue permission over and over on such uses which have become common within the industry. It also provides a vehicle for separating modular or other code constructed structures from the Tent and membrane structures.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: VANDERGRIFF-ADM5-107.1 Comp

ADM14–09/10
IBC 109.3.10.1 (New); IRC 109.1.6.1 (New)

Proponent: Rebecca C. Quinn, Department of Homeland Security, Federal Emergency Management Agency

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES

PART I – IBC

Add new text as follows:

109.3.10 Final inspection. The final inspection shall be made after all work required by the building permit is completed.

109.3.10.1 Flood hazard documentation. If located in a flood hazard area, documentation of the elevation of the lowest floor required Section 1612.5 shall be submitted to the building official prior to the final inspection.

PART II — IRC BUILDING/ENERGY

Add new text as follows:

R109.1.6 Final inspection. Final inspection shall be made after the permitted work is complete and prior to occupancy.

R109.1.6.1 Elevation documentation. If located in a flood hazard area, the documentation of elevations required Section R322.1.10 shall be submitted to the building official prior to the final inspection.

Reason: The lowest floor inspection called for in Section 109.3.3 of the IBC (Section R109.1.3 of the IRC) requires submission of documentation of elevations upon placement of the lowest floor and prior to further vertical construction. The purpose for submission at that time is to confirm compliance at a point during construction when insufficient elevation can be corrected most readily. This proposal would require submission of elevation information when construction is completed. Work that is performed subsequent to the placement of the lowest floor may alter the reference level that is deemed the lowest floor. Building owners must provide this 'as-built' documentation when they obtain federal flood insurance policies from the National Flood Insurance Program (NFIP).

Documentation of the 'as-built' lowest floor elevations is required to be obtained and maintained by communities that participate in the NFIP. A building for which the community does not have this documentation is, by federal regulation, considered to be in violation of the minimum NFIP requirements (see definition of "violation" in 44 C.F.R. §59.2). The Federal Emergency Management Agency and state agencies designated to coordinate the NFIP periodically visit communities that participate in the NFIP. The purposes of these visits are to provide technical assistance and to review the community's procedures relative to administering its codes and ordinances that address flood resistant construction and development. Failure to have a copy of the 'as-built' elevation documentation is cited as one of the more frequently observed problems with administrative procedures.

C**ost Impact:** There is no cost impact as this 'as-built' documentation is required to be obtained and maintained by communities that participate in the NFIP.

PART I – IBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: QUINN-ADM2-109.3.10.DOC

ADM15–09/10
IBC 110.6; IECC 104.2; IEBC 109.6

Proponent: John D. McGee, Binswanger Glass Training Center

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING AND ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC, IECC, IEBC

Revise as follows:

IECC 104.2, (IBC 110.6, IEBC 109.6) Required approvals. Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the *code official*. The *code official*, upon notification, shall make the requested inspections and shall either indicate the portion of the construction that is satisfactory as completed, or notify the permit holder or his or her agent wherein the same fails to comply with this code. Any portions that do not comply shall be corrected and such portion shall not be covered or concealed until authorized by the *code official*.

> **Exception:** Glass and glazing applications need not comply, provided the energy use of the building is not increased.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R109.4 Approval required. Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the *building official*. The *building official*, upon notification, shall make the requested inspections and shall either indicate the portion of the construction that is satisfactory as completed, or notify the permit holder or his or her agent wherein the same fails to comply with this code. Any portions that do not comply shall be corrected and such portion shall not be covered or concealed until authorized by the *building official*.

> **Exception:** Glass and glazing applications need not comply, provided the energy use of the building is not increased.

Reason: Under this too-rigid standard, no commercial glazing can be performed without first obtaining a permit. Because the ever-dangerous electric, gas, or water categories do not pertain to Glass and Glazing installations, and because glass is not considered a structural component of a building, requiring permits for glazing is ridiculous. Just as each floor provides the support for curtainwall systems, red iron provides the load bearing points for storefront applications. Verification that glass adds no structural value to a building can be obtained from any architectural metal manufacturer.

The only glass and glazing item an inspector should be concerned with is the solar heat gain co-efficiency (U- and R-values), but because the windows are ordered per specifications, energy rated glass should be included in the General Contractor's permit, and should not be required through the glazing firm.

Inspectors work in series, but glass and glazing does not work this way. Because the envelope of a building cannot be left exposed to the elements (and thieves) for long, in most repair or replacement operations, the glazier is done within three hours. Glaziers move much too fast to wait around for an inspector to sign off on each stage of the installation process.

Cost Impact: Undue burden is placed upon the consumer and the glazing firm.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCGEE-EC-1-104.2

ADM16–09/10

PART I: IBC 117 (New), IFC 114 (New), IMC 111(New), IPC 111 (New), IPSDC 111 (New), IFGC 111(New), IWUIC 115 (New), IECC 110 (New), IEBC 118 (New), IPMC 113 (New), IZC 112 (New).

PART II: IRC 115 (New)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE ADMINISTRATIVE COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Carl A. Blaisdell, Building Official, City of San Marcos, CA

PART I – IBC, IFC, IMC, IPC, IPSDC, IFGC, IWUIC, IECC, IEBC, IPMC, IZC

Add new section, DIMENSION CONVENTIONS as follows:

SECTION XXX
DIMENSION CONVENTIONS

xxx.1 General. For purposes of this code, the conventions for use of dimensions shall be in accordance with Sections 117.2 and 117.3.

xxx.2 Absolute measurement. Requirements stated in this code as the following (a) not less than, (b) not more than, or (c) in a range with upper and lower limits, shall mean the requirement is an absolute measurement and dimensional tolerances are not permitted.

xxx.3 Dimensional tolerances. Requirements stated in this code as the following (a) minimum dimension and (b) maximum dimension shall mean the requirements can be increased or reduced by a dimensional tolerance established by the code official or not more than one-half inch (2.54 cm).

PART II – IRC BUILDING/ENERGY

Add new Section R115 DIMENSION CONVENSIONS as follows:

SECTION R115
DIMENSION CONVENTIONS

R115.1 General. For purposes of this code, the conventions for use of dimensions shall be in accordance with Sections R115.2 and R115.3.

R115.2 Absolute measurement. Requirements stated in this code as the following (a) not less than, (b) not more than, or (c) in a range with upper and lower limits, shall mean the requirement is an absolute measurement and dimensional tolerances are not permitted.

R115.3 Dimensional tolerances. Requirements stated in this code as the following (a) minimum dimension and (b) maximum dimension shall mean the requirements can be increased or reduced by a dimensional tolerance established by the building official or not more than one-half inch (2.54 cm).

Reason: Public: employees enforcing that code are aware of the absolute and tolerances allowed, however, very few contractors and the general public has any knowledge of these unwritten rules.

Many state codes. E.g. California, mention these definitions. In their codes, for example section 1101.B.4 in the California Building Code refers to these definitions in the disabled accessibility chapter.

Many residential real estate inspectors and accessibility specialists are unaware of the dimensional tolerances and cite installations approved by the city as noncompliant because they are unaware of the allowed tolerances. These definitions will help to eliminate any confusion about what minimum and maximum mean.

Cost Impact: The code change proposal will reduce construction cost, as the installer will know beforehand what tolerances are allowed instead of reinstalling something that in-fact was allowed with a dimensional tolerance.

PART I – IBC, IFC, IMC, IPC, IPSDC, IFGC, IWUIC, IECC, IEBC, IPMC, IZC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

PART II – IRC BUILDING/ENERGY

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: BLAISDELL-ADM1-117 (NEW)

ADM17–09/10
IECC 101.5.1

Proponent: Joseph Hill, RA, New York State Department of State

Revise as follows:

101.5.1 Compliance materials. The ~~*code official*~~ applicable State Energy Regulatory authority, or *State Energy Code Authority* shall be permitted to approve specific computer software, worksheets, compliance manuals and other similar materials that meet the intent of this code. The code official shall approve above code programs (those which exceed Energy Code requirements), in accordance with Section 102.1.1 *Above Code Programs.*

Reason: For clarification. For sake of statewide energy code continuity, it would serve to require allowable methodologies for energy code *compliance* at the State level, while still allowing for the Code Official to approve methods which are *more stringent* than the Energy Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: HILL-EC-1-101.5.1

ADM18–09/10
IECC 103.1, 202

Proponent: Ronald Majette, US Department of Energy

1. Add a new definition to Section 202 as follows:

BUILDING INFORMATION MODEL. A digital file containing the building geometry, spatial relationships, geographic information, and quantities and properties of building components created using three-dimensional, real-time, dynamic building modeling software

2. Revise as follows:

103.1 General. Construction documents and other supporting data shall be submitted in one or more sets with each application for a permit. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the *code official* is authorized to require necessary construction documents to be prepared by a registered design professional. For buildings over 500,000 sq.ft. the submittal shall also include a *building information model* of the proposed design that includes all information relevant to compliance with this code as outlined in Section 103.2.

Exception: The *code official* is authorized to waive the requirements for construction documents or other supporting data if the *code official* determines they are not necessary to confirm compliance with this code.

Reason: The application and use of building information models (BIM) is becoming increasingly desired by owners, developers, designers, specifiers and contractors. Software is readily available for creation of BIMs, which are essentially a digital file with all the relevant information about a building project. Rather than providing "hard" or "electronic" data for application and use in a series of "human" actions, the availability of a BIM allows transparent and ready "communication" amongst all project team members and in so doing fosters timely collaboration. Through the application and use of BIM the cost of construction can be reduced through improved and more cost effective design solutions that concurrently can address issues such as clash detection before the building is even built. Savings associated with application and use of BIM can then be made available to support the application and use of improved energy designs and more efficient building products and systems.

Cost Impact: The code change proposal will decrease the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: MAJETTE-EC-40-103.1.DOC

ADM19–09/10
IFC 101.2

Proponent: Lynne M. Kilpatrick, Seattle Fire Department, representing Washington State Association of Fire Marshals

IFC Revise as follows:

101.2 Scope. This code establishes regulations affecting or relating to structures, processes, premises, motor vehicles, marine vessels and safeguards regarding:

1. The hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices;
2. Conditions hazardous to life, property or public welfare in the occupancy of structures or premises;
3. Fire hazards in the structure or on the premises from occupancy or operation;
4. Matters related to the construction, extension, repair, alteration or removal of fire suppression or alarm systems; and
5. Conditions affecting the safety of fire fighters and emergency responders during emergency operations.

Reason: This code change modifies the scope of the code to include vehicles and marine vessels. There are provisions in Chapter 34 and Chapter 38 that regulate tank vehicles. Also, Section 106.1 gives the fire code official specific authority to enter and examine marine vessels and vehicles for the purpose of enforcing the code. Because vehicles and marine vessels covered by this code it is appropriate to include them in the scope.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME:K ILPATRICK-ADM1-101.2 DB

ADM20–09/10
IFC 102.5

Proponent: Lawrence Brown, CBO, National Association of Home Builders (NAHB)

Delete without substitution:

~~**102.5 Application of residential code.** Where structures are designed and constructed in accordance with the *International Residential Code*, the provisions of this code shall apply as follows:~~

~~1. Construction and design provisions: Provisions of this code pertaining to the exterior of the structure shall apply including, but not limited to, premises identification, fire apparatus access, and water supplies. Where interior or exterior systems or devices are installed, construction permits required by Section 105.7 of this code shall also apply.~~
~~2. Administrative, operational, and maintenance provisions: All such provisions of this code shall apply.~~

Reason: This wording in of this provision is actually only commentary on the current provisions in the IFC with which one already is required to comply. It neither adds a new provision or modifies another provision of the IFC. It is only guidance.

Section 102.1 already states that the provisions of the IFC applies to, "structures…arising after the adoption of this code." Clearly, any one- and two-family dwelling is a "structure", and the provisions of the IFC would apply as specified in the IFC. And, since "premises identification", "fire apparatus access", and "water supplies" are provisions contained in the IFC, compliance with Section 102.1 would require those provisions to be applied to all structures, including one- and two-family dwellings, as applicable.

There is also a problem with the phase, "Provisions of this code pertaining to the 'exterior of the structure'…" The provisions cited in this provision are actually "exterior" to the structure, not the actual "exterior" of the building structure. This sentence as stated would seem to imply that the exterior surface/structure of a one- and two-family dwelling is regulated by the IFC. That would be incorrect as IFC Section 102.4 required the construction of any structure to be in compliance with the IBC.

Since this text merely gives guidance on the application the Section 102.1, this text should be deleted, and a recommendation should be forwarded to ICC staff to consider including the gist of the text in the IFC Commentary.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: BROWN-ADM1-102.5

ADM21–09/10
IFC 105.1.1

Proponent: Jon Napier, CFM, Kent Fire Department, representing the Washington State Association of Fire Marshals

Revise as follows:

IFC 105.1.1 Permits Required. Any property owner or authorized agent who intends to conduct an operation or business, or install or modify systems and equipment, which is regulated by this code, or to cause any such work to be done, shall first make application to the ~~Permits required by this code shall be obtained from the~~ *fire code official* and obtain the required permit. ~~Permit fees, if any, shall be paid prior to issuance of the permit. Issued permits shall be kept on the premises designated therein at all times and shall be readily available for inspection by the fire code official.~~

Reason: This proposal intends to remove redundant code language and add code language, similar to the IBC, which identifies that the owner or authorized agent shall make application and to obtain a permit. It is important that the owner or the authorized agent performs this function so that they are aware and give consent for the issued permits which may include hazardous materials which could pollute or contaminate the property. The last two sentences were deleted since they are covered as follows; permit fees are now covered in new Section 113.1 and issued permits being kept on the premises and available for inspection are covered in Section 105.3.5.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NAPIER-ADM 1-105.1.1 COMPLETE.DOC

ADM22–09/10
IPMC 102.3

Proponent: Bob Eugene, Underwriters Laboratories Inc.

Revise as follows:

IPMC 102.3 Application of other codes. Repairs, additions or alterations to a structure, or changes of occupancy, shall be done in accordance with the procedures and provisions of the *International Building Code, International Residential Code, International Fuel Gas Code, International Mechanical Code, International Plumbing Code,* and NFPA 70. Nothing in this code shall be construed to cancel, modify or set aside any provision of the *International Zoning Code.*

Reason: The *International Property Maintenance Code* covers installations also addressed by the International Residential Code and the International Plumbing Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-ADM1-102.3 Complete

ADM23–09/10
IBC 110.3.6; IEBC 109.3.6 (New)

Proponent: Tony Crimi, AC Consulting Solutions Inc., representing International Firestop Council

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE IBC FIRE SAFETY COMMITTEE.

PART I – IBC FIRE SAFETY

Revise as follows:

110.3.6 Fire-resistant penetrations. Protection of ~~joints and~~ penetrations in fire-resistance-rated assemblies shall not be concealed from view until inspected and approved. Where inspection of penetrations of the types specified in 713.3.1.2 and 713.4.1.2 are conducted by an approved inspection agency, they shall be conducted in accordance with ASTM E2174 or to adopt other policies and procedures in compliance with the intent and purpose of this code.

PART II – IEBC

1. Add new text as follows:

109.3.6 Fire-resistive joints. Protection of joints in fire-resistance-rated assemblies shall not be concealed from view until inspected and approved. Where inspection of joints of the types specified in 714.3 and 714.4 are conducted by an approved inspection agency, they shall be conducted in accordance with ASTM E2393 or to adopt other policies and procedures in compliance with the intent and purpose of this code.

2. Add new standards to Chapter 35 as follows:

ASTM

E2174-04	Standard Practice for On-site Inspection of Installed Fire Stops
E2393-04	Standard practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers

Reason: The Code already mandates proper installation of penetration and joint firestops to maintain the integrity of vertical and horizontal fire or smoke separations, and requires that the penetrations and joints not be concealed prior to inspection and approval. This two referenced Standards identify effective techniques for the field inspection of these systems for situations where the inspections are conducted by 3-rd party inspectors instead of the AHJ, and provide consistent procedures needed to conduct and report the on-site assessment of the installations, as well as providing conflict-of-interest guidelines to ensure that the inspections are fully independent.

The purpose of the change is to add a reference to two Consensus Standards developed at ASTM for inspection of installed penetration firestop systems, fire-resistive joints, and perimeter fire barriers.

Firestop and joint system designs and materials are increasing in number and variety. The current code relies heavily on Installers, Designers, and Code Officials to verify proper system selection and installation. In response to this reality, a standard practice was developed within the ASTM process to allow inspections of through-penetration firestops, joints, and perimeter fire barrier systems to be conducted in a thorough and consistent manner, with standardized report formats, regardless of the Trade or individual conducting the inspection. Part of the impetus for the development of that standard was the recognition that jurisdictions sometimes do not have sufficient resources themselves to ensure that all penetrations and joints are firestopped properly. In any project, the number of joints and penetrations can range from hundreds to a few thousand in a single building. The addition of these new Standards to the Code would provide and identify a means for authorities having jurisdiction to have effective tools to mandate standardized inspection thoroughness and quality when third party inspection agencies are used for verification of these important systems. The inclusion of consensus standards would ensure that required inspections are conducted consistently, fairly, and adequately, while also standardizing inspection reports, so that they will be of a uniform high quality.

The proposed code change would provide the code official the option of having a third party (e.g. approved inspection agency) to conduct the inspection of joints and penetrations in conformance with these Standards, while preserving the option to utilize other policies and procedures consistent with the intent of the Code.

The current editions of **ASTM E2174 and ASTM E2393** are dated 2004.

Referenced Standards:
ASTM E2174-04 Standard Practice for On-site Inspection of Installed Fire Stops
ASTM E2393-04, Standard practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers

Cost Impact: The code change proposal will not increase the cost of construction

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM E2174-04 and ASTM E2393-04, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: CRIMI-G1-110.3.6 COMPLETE

ADM24–09/10
IECC 101.3

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS PROPOSAL IS ON THE AGENDA OF THE IECC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IECC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

IECC 101.3 Intent. This code shall regulate the design and construction of buildings for the effective use and conservation of energy over the useful life of each building. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this objective. ~~the effective use of energy.~~ This code is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.

Reason: The purpose of this proposal is to clarify the intent of the code. As the *International Energy Conservation Code*, while we agree that the "effective use of energy" is important and should be included, we believe that "conservation" of energy is paramount and should also be spelled out as a primary objective of the code. We also believe that the intent of the code is to promote effective use and conservation of energy not just in the first year of operation, but over the life of the building. The added language clarifies this intent.

It should be noted that the IRC section R101.3 already includes Energy Conservation as part of the intent of the IRC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-1-101.3 COMPLETE.DOC

ADM25–09/10
IECC 101.4.6

Proponent: Joseph Hill, RA, New York State Department of State

THIS PROPOSAL IS ON THE AGENDA OF THE IECC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IECC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

IECC 101.4.6 Mixed occupancy. Where a building includes both *residential* and *commercial* occupancies, each occupancy shall be separately considered and meet the applicable provisions of Chapter 4 for *residential* and Chapter 5 for *commercial*. Mixed occupancy is applicable to buildings of three stories or less only. For building construction of four stories and greater, all building occupancies are considered as commercial occupancies for the purposes of the IECC.

Reason: For clarification. This section as written indicates that residential and commercial occupancies are treated as separate occupancies, regardless of number of building stories. Chapter 2- Definitions define Residential buildings of three stories or less in height for applicability of the Energy Code. The IECC is based on code provisions of ASHRAE 90.1. In accordance with reference standard ASHRAE 90.1 building of four stories and greater are considered to be **commercial occupancies.** This is further supported by the IECC Code and Commentary, which states that "a four story building containing one or more retail establishment on the First floor, and ….the remaining stories of this four story building consist entirely of dwelling units and are classified as residential. For our current example, the definition of Residential makes it clear that the entire building would be considered Commercial and be subject to the requirements of Chapter 5.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HILL-EC5-101.4.6

ADM26–09/10
IECC 101.5.2

Proponent: Michael P. Burnetter, PE, New York State Department of State, representing Division of Code Enforcement and Administration

THIS PROPOSAL IS ON THE AGENDA OF THE IECC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IECC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

IECC 101.5.2 Low energy buildings. The following buildings, or portions thereof, separated from the remainder of the building by *building thermal envelope* assemblies complying with this code shall be exempt from the *building thermal envelope* provisions of this code:

1. Those with a peak design rate of energy usage less than 3.4 Btu/h·ft^2 (10.7 W/m^2) or 1.0 watt/ft^2 (10.7 W/m^2) of floor area for space conditioning purposes <u>utilizing fossil fuel or electric power.</u>
2. Those that do not contain *conditioned space*.

Reason: The section seems intended to regulate only particular fuel types (non-renewable) since it's impossible to heat (or cool) a majority of all buildings at the typical temperature extremes that all designs are required to be based (per IECC chapter 3) if insulated to code required levels using the 3.4 Btu/h-ft sq of fossil or electric heating sources. Therefore, by specifying the low limit exemption for fossil and electric fuel only, the code will encourage making up any difference by using renewable power sources. A good example of this would be a passive solar design which would allow an affordable balance point with the only constraint being the 3.4 Btu/h-ft sq figure as opposed to all the other code limits. Then the home owner example case would not specifically need to meet code, hence encouraging renewable energy, which was likely the intent of the section as any occupied space would never comply at the 3.4 Btu/h-ft sq figure and freeze if not super insulated. This proposal will actually encourage the use of renewable fuels as it takes them out of the category of the regulated fuel type under the 3.4 Btu/h-ft sq limit which then gives an exemption where it may benefit some building owners who are mainly using renewable fuel types like a passive solar design but have a very small back-up heater for say, days when the sun doesn't shine.

The *International Energy Conservation Code*®, in this 2009 edition specifies the model code regulations that will result in the optimal utilization of fossil fuel. Therefore, for consistency, there are similar exemptions found in the other sections of the code (such as IECC Section 503.2.8) where the code intent is specified to control fossil or electric fuel use only.

Please consider this change for consistency of intent and clarity.

Cost Impact: The potential exists here to lower the cost of construction (as a building would be exempt from the code under the limit specified), the cost of operation of a building (since this will encourage the use of renewable fuels which can provide free heat like passive solar) and design (as the exemption is more clear and able to be calculated without confusion).

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BURNETTER-EC-1-101.5.2.DOC

ADM27–09/10
IECC 101.4.4

Proponent: Michael P. Burnetter, PE, New York State Department of State, representing Division of Code Enforcement and Administration

THIS PROPOSAL IS ON THE AGENDA OF THE IECC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IECC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

IECC 101.4.4 Change in occupancy ~~Spaces undergoing a change in occupancy that would result in an increase in demand for either fossil fuel or electrical energy shall comply with this code.~~ Where the use in a space changes from one use in Table 505.5.2 to another use in Table 505.5.2<u>, and the space is undergoing a lighting fixture alteration</u>, the installed lighting wattage shall comply with Section 505.5.

Reason: This extremely broad code section is not workable in the real world as this may cause substantial economic penalties in pre-existing non-conforming buildings. Especially illuminated during a recession, is the fact that when a new tenant or owner moves into a building which may have no construction taking place but, in this example, would simple employ more people, the section may fully apply. This could trigger a full blown code event since the air conditioner load may increase measurably by virtue of added staffing (a good thing in this economy) and yet this code section as written would require a full scale "gut-rehab to replace many energy systems" of a building if read as it is written and actually enforced. This example would appear to the owner as a stealth tax applied to a new business trying to employ more people into the workforce.

In this very typical example, there was no conscious construction project decided upon except for the fact that the code section would very likely "require" a full scale rebuilding of an existing building which has no construction being proposed. In fact there would be no construction permit required were it not for the fact that this code section as it stands requires a massive overhaul of the building if ever enforced.

The remaining portion of the code section is workable but may contain some of the same surprises if the owner did not decide to reconfigure the space but simply would be considered a new use. Therefore the added language involving an alteration decision (that would require a permit – by definition, of Alteration) was added.

Cost Impact: A drastic reduction in cost may take place depending on the building size, age, and enforcement on this major code section change.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BURNETTER-EC-3-101.4.5.DOC

ADM28–09/10
IECC 102.1.1

Proponent: Ronald Majette, representing US Department of Energy

THIS PROPOSAL IS ON THE AGENDA OF THE IECC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IECC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

IECC 102.1.1 Above code programs. The *code official* or other authority having jurisdiction shall be permitted to deem a national, state or local energy efficiency program ~~to exceed~~ as meeting the ~~energy efficiency required by~~ requirements of this code. Buildings *approved* in writing ~~by such an~~ as meeting such an energy efficiency program shall be considered in compliance with this code. ~~The requirements identified as "mandatory" in Chapters 4 and 5 of this code, as applicable, shall be met.~~

Reason: Clarification. The intent in the first sentence is that the program when satisfied meets the requirements of the code. Certainly it can exceed the requirements but for the purposes of code compliance the only consideration would be if the building as designed, constructed and commissioned under such a program was no less energy efficient than if it just satisfied the minimum requirements in the code. The second sentence is in error as a "program" cannot approve a building. The intent is that the code official or other authoritative agency as approved by the code official would have to approve any building in writing. The last sentence is not needed as the intent of the provision is that such programs in their entirety be evaluated against the code and if they are found acceptable then there should be no need to refer back to the code for any reason.

Cost Impact: The code change proposal will decrease the cost of construction to the degree that the acceptance of alternative programs as meeting or exceeding the code helps streamline the plan review and permitting process.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-39-102.1.1-REDONE

ADM29–09/10
IECC 102.1.2 (New), Chapter 6

Proponent: Rob Pickett, Log Homes Council of the Building Systems Councils of the National Association of Home Builders

THIS PROPOSAL IS ON THE AGENDA OF THE IECC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IECC CODE DEVELOPMENT COMMITTEE.

1. IECC Add new text as follows:

SECTION 102
ALTERNATE MATERIALS—METHOD OF CONSTRUCTION, DESIGN OR INSULATING SYSTEMS

102.1 General. This code is not intended to prevent the use of any material, method of construction, design or insulating system not specifically prescribed herein, provided that such construction, design or insulating system has been approved by the code official as meeting the intent of this code.

102.1.1 Above code programs. The code official or other authority having jurisdiction shall be permitted to deem a national, state or local energy efficiency program to exceed the energy efficiency required by this code. Buildings approved in writing by such an energy efficiency program shall be considered in compliance with this code. The requirements identified as "mandatory" in Chapters 4 and 5 of this code, as applicable, shall be met.

102.1.2 Log structures. The design and construction of log structures shall be in accordance with the provisions of ICC400.

2. Add new standard to Chapter 6 as follows:

ICC	
400-2007	Standard on Design and Construction of Log Structures

Reason: The purpose of this change is to direct users of the code who are evaluating log structures to the ICC consensus standard pertaining to this unique and traditional construction method.

Log structures employ alternative methods of construction that are fully covered by ICC400 *Standard for the Design and Construction of Log Structures.* ICC400-2007 is an ANSI-approved document that represents industry standards and guidelines for this form of construction. It gives the code official an important tool for inspection and understanding log construction, including thermal performance. Carefully written to cover all forms of log construction, the standard explains how to respond to design conditions, but it does not establish those conditions. A major reason for this change is that field interpretations of the IECC requirements for log wall performance are often incorrect. Frequently enough, the interpretation is that a log wall must meet the rated insulation R-values provided in Table 402.1.1. This is neither accurate nor intended by the code, but the industry is put in a position of debating the issue that the frame wall requirements represent the rated insulation R-value rather than the effective overall value that accounts for the lower R-value of framing members. Wall assemblies constructed of solid material (e.g., log, brick, masonry/concrete, or straw bale) do not conceal a cavity, perform altogether differently, and can only be compared on the basis of the overall *U*-Factor as provided in IECC Table 402.1.3, where the framing factor for frame walls is applied.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The standard is currently referenced in the IBC.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: PICKETT-ADM1-102.1.2 NEW

ADM30–09/10
IECC 101.5.2

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS PROPOSAL IS ON THE AGENDA OF THE IECC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IECC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

IECC 101.5.2 Low energy buildings. The following buildings or portions thereof, separated from the remainder of the building by *building thermal envelope* assemblies complying with this code shall be exempt from the *building thermal envelope* provisions of this code:

1. Those with a peak design rate of energy usage less than 3.4 2.4 Btu/h.ft^2 (10.7 7.5 W/m^2) or 1.0 0.7 watt/ft^2 (10.7 7.5 W/m^2) of floor area for space conditioning purposes.
2. Those that do not contain *conditioned space*.

Reason: The purpose of this proposal is to update the exemption for low-energy buildings in the code to reflect the goal of reducing energy use in all buildings by 30% under the code. Like buildings subject to the code, low-energy buildings exempt from the code should share in the burden to conserve energy. The current definition of a low-energy building has been the *IECC* since its inception in 1998. It is reasonable to update this requirement now. This proposal reduces the peak design rate of energy usage for these buildings by 30% and is a reasonable change.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-2-101.5.2.DOC

ADM31–09/10
IECC 102.1.1

Proponent: Ken Sagan, representing National Association of Home Builders (NAHB)

THIS PROPOSAL IS ON THE AGENDA OF THE IECC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IECC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

IECC 102.1.1 Above code programs. The code official or other authority having jurisdiction shall be permitted to deem a national, state or local energy efficiency program to exceed the energy efficiency required by this code. Buildings approved in writing by such an energy efficiency program shall be considered in compliance with this code. ~~The requirements identified as "mandatory" in Chapters 4 and 5 of this code, as applicable, shall be met.~~

Reason: Above Code Programs are available for adoption by local jurisdictions at their discretion and are by definition "Above Code". In making certain sections of Chapter 4 and 5 "mandatory", this limits energy neutral tradeoffs (e.g. R-6 ducts) or energy saving designs (e.g. passive solar using high solar heat gain windows on southern exposures) that can improve energy performance of a building when properly designed. Buildings should be allowed to exceed the requirements of this code, based on overall home performance. The addition of this proposal will bring consistency between the IRC and IECC, eliminating the confusion between the 2 codes.

EPA's Energy Star and the ICC-700 National Green Building Standard are both considered "above code" programs and they exceed the minimum requirements of the IECC by 15%. Both programs follow closely the requirements of the IECC, but allow trade-offs to achieve increased energy savings

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SAGAN-EC-05-102.1.1

ADM32–09/10
IEBC 101.5.4.2

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

IEBC 101.5.4.2 Compliance with reduced IBC level seismic forces. Where seismic evaluation and design is permitted to meet reduced *International Building Code* seismic force levels, the procedures used shall be in accordance with one of the following:

1. The *International Building Code* using 75 percent of the prescribed forces. Values of R,$\Omega 0$ and Cd used for analysis shall be as specified in Section 101.5.4.1 of this code.
2. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A as specified in Items 2.1 through 2.5 and subject to the limitations of the respective Appendix A chapters shall be deemed to comply with this section.
   - 2.1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A1.
   - 2.2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A2.
   - 2.3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Chapter A3.
   - 2.4. Seismic evaluation and design of soft, weak, or open-front wall conditions in multiunit residential buildings of wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Chapter A4.
   - 2.5. Seismic evaluation and design of concrete buildings in all occupancy categories are permitted to be based on the procedures specified in Chapter A5.

Reason: The proposed additional text in item 2 clarifies that the Appendix A chapters are acceptable options only when the building in question is explicitly within the scope of the relevant appendix chapter. The proposed revisions to Items 2.3 and 2.4 are editorial. Residential buildings, by definition, will not be in Occupancy Category I.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB33-101.5.4.2.DOC

ADM33–09/10
IEBC 101.5.4.2, Chapter A5

Proponent: Peter Somers, Magnusson Klemencic Associates, representing Structural Engineers Association of Washington, Existing Buildings Committee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

1. Revise as follows:

IEBC 101.5.4.2 Compliance with reduced IBC level seismic forces. Where seismic evaluation and design is permitted to meet reduced *International Building Code* seismic force levels, the procedures used shall be in accordance with one of the following:

1. The *International Building Code* using 75 percent of the prescribed forces. Values of R,$\Omega 0$ and Cd used for analysis shall be as specified in Section 101.5.4.1 of this code.
2. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A as specified in Items 2.1 through ~~2.5~~ 2.4 shall be deemed to comply with this section.
   - 2.1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A1.
   - 2.2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A2.
   - 2.3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Chapter A3.
   - 2.4. Seismic evaluation and design of soft, weak, or open-front wall conditions in multiunit residential buildings of wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Chapter A4.
   - ~~2.5. Seismic evaluation and design of concrete buildings in all occupancy categories are permitted to be based on the procedures specified in Chapter A5.~~

2. Delete entire chapter without substitution:

IEBC ~~CHAPTER A5 EARTHQUAKE HAZARD REDUCTION IN EXISTING CONCRETE BUILDINGS~~

Reason: The current version of this chapter in the 2009 IEBC is in most cases nothing more than a reference to the evaluation and retrofit procedures that are referenced in Section 101.5.4.2. Therefore, it represents unnecessary redundancy and duplication.

Appendix Chapter A5 specifies a three-tiered approach for concrete buildings.

- Tier 1 (Section A505) is a reference to ASCE 31.
- Tier 2 (Section A506) is a reference to 75percent of IBC (force levels based on Section A504.2) with additional modifications as discussed below.
- Tier 3 (Section A507) is a reference to ASCE 41.

Therefore, Chapter A5, which is referenced from Section 101.5.4.2 is nothing more than a reference back to the other provisions referenced in Section 101.5.4.2.

The Tier 2 procedure in Section A506 does contain additional provisions, but these provisions are either duplications of provisions in the IBC (and its reference standards) or are conflicts between A5 and the IBC. In either case, these are unnecessary or potentially confusing since the IBC without such modifications is also referenced in Section 101.5.4.2. These are discussed as follows:

Section A506.2 contains limitations on the use of the Tier 2 procedure (75% of IBC). These limitations are generally related to building configuration, and are adequately addressed in the IBC and its reference standards. A building, even with the irregularities contained in this section, but still satisfying the provisions of the IBC as referenced in Section 101.5.4.2, Item 1 should provide adequate seismic performance.

Section A506.3 covers the analysis procedure and modeling, all of which is addressed in the IBC and its reference standards.

Section A506.4 is simply a reference to the IBC.

Section A506.5 contains references to the IBC and a provision for determining shear in concrete beams and columns that is the same as what is required by ACI 318 as referenced by the IBC.

Chapter A5 may be a valuable procedure for reducing earthquake hazards in existing concrete buildings, but it does not provide any references or provisions at are not otherwise included in the IEBC (based on Section 101.5.4.2) and any differences between A5 and the other procedures referenced in Section 101.5.4.2 are either insignificant or can be circumvented by using the unmodified IBC referenced directly from Section 101.5.4.2.

Section A503.1 permits design professionals to utilize alternate methods for evaluating existing concrete buildings where approved by the code official. Whiles this is reasonable and appropriate for these types of buildings, the use of alternate methods is already contained in IEBC Section 104.11, so again, this portion of A5 is simply unnecessary duplication.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SOMERS-EB4-101.5.4.2.DOC

ADM34–09/10
IFC 105.6.27

Proponent: Lynne M. Kilpatrick, Seattle Fire Department, representing Washington State Association of Fire Marshals

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IFC CODE DEVELOPMENT COMMITTEE.

IFC Revise as follows:

105.6.27 LP-gas. An operational permit is required for:

1. Storage and use of LP-gas.

   Exceptions:

   1. A permit is not required for individual containers with a 500-gallon (1893 L) water capacity or less or multiple container systems having an aggregate quantity not exceeding 500 gallons (1893) L, serving occupancies in Group R-3.
   2. A permit is not required for LP-gas containers having a water capacity not exceeding 48 pounds [nominal 20 pounds (9 kg) LP-gas] connected to a LP-gas grill unless at a public assembly or on or serving a public way.

2. Operation of cargo tankers that transport LP-gas.

Reason: This code change modifies the existing exception to require a permit at Group R-3 occupancies where the aggregate quantity of LP-gas containers exceeds 500 gallons. It has become commonplace for LP-gas distributors to install LP-gas systems exceeding 500 gallons that consist of multiple containers in series with individual containers that do not exceed 500 gallons thereby avoiding the permit requirement. It is appropriate to require a permit at these locations given the significant hazard associated with these quantities.
This code change also adds a second exception that eliminates the need for a permit for standard consumer LP-gas barbeque containers connected for use on a grill unless the container/grill is at a public assembly or on a public way.

Cost Impact: Exception 1 may increase cost where permit fees are required. Exception 2 may decrease cost where permit fees are required.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:KILPATRICK-ADM2-105.6.27

ADM35–09/10
IFC 107.2.1 (New)

Proponent: William Winslow, CIH, CFI, CMI, Winslow Partnership, representing self

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IFC CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

IFC 107.2 Testing and operation. Equipment requiring periodic testing or operation to ensure maintenance shall be tested or operated as specified in this code.

IFC 107.2.1 Safety devices and systems. Safety interlocks, automatic emergency shutoff valves, and emergency shutoff switches shall be tested as specified in this code or as required by the fire code official, where testing requirements are not specified by this code.

Reason: Many chapters in the IFC require safety devices for equipment. A quick scan of the code revealed approximately 15 interlocks and a similar number of automatic emergency shutoff valves and switches, all of which are safety devices. Some of these devices have testing requirements but many don't. For example, Chapter 21 requires an interlock for a Class A furnace, so that conveyors of flammable materials shut down if the exhaust system stops. However, there is no testing requirement specified in Chapter 21 for this safety interlock. So, based on 107.2, it appears testing of the interlock would not be required, because it is not specified. This modification of Section 107.2 gives the FCO the authority to establish a testing requirement where such a requirement is not currently specified in the IFC. The section is limited to interlocks, automatic emergency shutoff valves and emergency shutoff switches.

Cost Impact: The code change should not increase cost of construction because testing of safety devices is already required or inferred by the code

Public Hearing: Committee:	AS	AM	D	
Assembly:	ASF	AMF	DF	

ICCFILENAME: WINSLOW-ADM1-107.2.1 (NEW)-REVISED.DOC

ADM36–09/10
IMC 102.3, IMC Chapter 15

Proponent: Steve Ferguson, American Society of Heating, Refrigerating, and Air-Conditioning Engineers

THIS PROPOSAL IS ON THE AGENDA OF THE IMC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IMC CODE DEVELOPMENT COMMITTEE.

1. Revise as follows:

IMC 102.3 Maintenance. Mechanical systems, both existing and new, and parts thereof shall be maintained in proper operating condition in accordance with the original design and in a safe and sanitary condition. The inspection for maintenance of HVAC systems shall be done in accordance with ASHRAE/ACCA/ANSI Standard 180. Devices or safeguards which are required by this code shall be maintained in compliance with the code edition under which they were installed. The owner or the owner's designated agent shall be responsible for maintenance of mechanical systems. To determine compliance with this provision, the code official shall have the authority to require a mechanical system to be reinspected.

2. Add new standard to Chapter 15 as follows:

ASHRAE

180—2008	Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems

Reason: Standard 180 was created in a collaborative effort between ASHRAE and ACCA, the Air Conditioning Contractors of America. Its intent is to address the often inconsistent practices for inspecting and maintaining HVAC systems in commercial, institutional and other buildings where the public may be exposed to the indoor environment. Current practices in such buildings vary widely today. Many facilities choose to follow rigorous policies that maintain the system in new or nearly new condition. Others either lack policy in this area or have adopted a run-to-failure approach where the system or components of the system are attended to only when there is a failure.

To provide consistency and improve energy efficiency, thermal comfort and indoor air quality provided by HVAC systems, a standard practice for the inspection and maintenance of commercial HVAC systems is needed. When there is no routine inspection and subsequent adjustment or maintenance of system components, the system is typically found operating outside its optimum performance parameters. When systems are not maintained, they do not continue to provide the level of work they were designed for.

A standard practice is also needed to guide maintenance of HVAC systems because the maintenance information often provided by manufacturers applies only to the discrete components that they provide rather than to the entire system. This document considers the integration of those components and the way they interact as well as each component separately.

For the public good, it is essential that the HVAC systems in all buildings where persons work, visit or reside support a high quality indoor environment. In addition, sustainability mandates that those conditions be maintained in as energy efficient a manner as possible.

This document describes the minimum acceptable level of maintenance for commercial building HVAC systems. Other standards or guidance documents may establish more specific or rigorous requirements that apply to certain buildings. Where applicable, those requirements should be followed or considered (if guidelines).

Much of the information that will be required to prepare the maintenance program that is mandated by this standard can most conveniently be obtained from the building commissioning (re-commissioning or retro-commissioning) documents. Although re-commissioning is not a requirement of this standard, it should be considered where the commissioning data is either unavailable or outdated.

Cost Impact: The code change proposal will not increase the cost of construction. There will be an increased cost to enforce this post-occupancy requirement similar to inspection of elevators or fire safety systems.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASHRAE 180-2008, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FERGUSON-M1-102.3.DOC

ADM37–09/10
IMC 102.4 (New), Chapter 15

Proponent: Steve Ferguson, American Society of Heating, Refrigerating, and Air-Conditioning Engineers

THIS PROPOSAL IS ON THE AGENDA OF THE IMC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IMC CODE DEVELOPMENT COMMITTEE.

1. Add new text as follows:

IMC 102.4 Operational permits for mechanical systems. Where deemed necessary by the code official, an operation permit shall be required to facilitate verification that the inspection of maintenance of HVAC systems in new and existing buildings is performed in accordance with ASHRAE/ACCA/ANSI Standard 180.

(Renumber subsequent sections)

2. Add new standard to Chapter 15 as follows:

ASHRAE
180—2008 Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems

Reason: Standard 180 was created in a collaborative effort between ASHRAE and ACCA, the Air Conditioning Contractors of America. Its intent is to address the often inconsistent practices for inspecting and maintaining HVAC systems in commercial, institutional and other buildings where the public may be exposed to the indoor environment. Current practices in such buildings vary widely today. Many facilities choose to follow rigorous policies that maintain the system in new or nearly new condition. Others either lack policy in this area or have adopted a run-to-failure approach where the system or components of the system are attended to only when there is a failure.

To provide consistency and improve energy efficiency, thermal comfort and indoor air quality provided by HVAC systems, a standard practice for the inspection and maintenance of commercial HVAC systems is needed. When there is no routine inspection and subsequent adjustment or maintenance of system components, the system is typically found operating outside its optimum performance parameters. When systems are not maintained, they do not continue to provide the level of work they were designed for.

A standard practice is also needed to guide maintenance of HVAC systems because the maintenance information often provided by manufacturers applies only to the discrete components that they provide rather than to the entire system. This document considers the integration of those components and the way they interact as well as each component separately.

For the public good, it is essential that the HVAC systems in all buildings where persons work, visit or reside support a high quality indoor environment. In addition, sustainability mandates that those conditions be maintained in as energy efficient a manner as possible.

This document describes the minimum acceptable level of maintenance for commercial building HVAC systems. Other standards or guidance documents may establish more specific or rigorous requirements that apply to certain buildings. Where applicable, those requirements should be followed or considered (if guidelines).

Much of the information that will be required to prepare the maintenance program that is mandated by this standard can most conveniently be obtained from the building commissioning (re-commissioning or retro-commissioning) documents. Although re-commissioning is not a requirement of this standard, it should be considered where the commissioning data is either unavailable or outdated.

Cost Impact: The code change proposal will not increase the cost of construction. There will be an increased cost to enforce this post-occupancy requirement similar to inspection of elevators or fire safety systems.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASHRAE 180-2008, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FERGUSON-M3-102.4.DOC

ADM38–09/10
IPMC 108.1.3, 110.1, 202

Proponent: Tom Neltner / National Center for Healthy Housing / Representing the National Center for Healthy Housing and the Alliance for Healthy Homes

THIS PROPOSAL IS ON THE AGENDA OF THE IPMC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IPMC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

IPMC 108.1.3 Structure unfit for human occupancy. A structure is unfit for human occupancy whenever the code official finds that such structure is unsafe, unlawful or, because of the degree to which the structure is in disrepair or lacks maintenance, is not ~~in~~sanitary, vermin or ~~rat~~ rodent infested, contains filth and contamination, or lacks ventilation, illumination, sanitary or heating facilities or other essential equipment required by this code, or because the location of the structure constitutes a hazard to the occupants of the structure or to the public.

IPMC 110.1 General. The code official shall order the owner of any premises upon which is located any structure, which in the code official's judgment is so old, dilapidated or has become so out of repair as to be dangerous, unsafe, not ~~in~~sanitary or otherwise unfit for human habitation or occupancy, and such that it is unreasonable to repair the structure, to demolish and remove such structure; or if such structure is capable of being made safe by repairs, to repair and make safe and sanitary or to demolish and remove at the owner's option; or where there has been a cessation of normal construction of any structure for a period of more than two years, to demolish and remove such structure.

SECTION 202
GENERAL DEFINITIONS

1. IPMC Add new definition as follows:

SANITARY. A condition that is clean and free of: infestation of rodents or insects, rodent residues such as urine, droppings, gnaw marks, grease marks, or nest debris; insect residues such as droppings, debris, or body parts; human and animal waste; mold; wastewater; sewage; and rotting material; and accumulation of rubbish or garbage. Swimming pools or food preparation areas shall meet the sanitary requirements as prescribed by local or state authorities having jurisdiction.

Exception: It does not include systems designed and properly managed to handle contained rubbish, garbage, sewage or wastewater.

2. IPMC Revise as follows:

INFESTATION. The presence, within or contiguous to, a structure or premises of insects including: cockroaches, fleas, and bedbugs; spiders; pest rodents rats; vermin; or other pests. Visible pest residues or debris constitutes an infestation unless there is clear evidence that the pest has been eliminated. The term does not include pets kept in a cage or other container.

Reason: The current definition of infestation would appear to exclude rodents other than rats. However, rodents carry disease and, in the case of mice, may trigger an asthma attack. The proposal applies the term to all rodents while creating an exception for rodents kept as pets in a cage or other container.

The proposal also would make it clear that visible evidence of pest residues is a sufficient basis for action by a code official. The code official does not have to see a live pest. Many of the pests of most concern are nocturnal.

The term "sanitary" is used in 24 times in 16 sections of the code: 108.1.3, 110.1, 301.2, 301.3, 302.1, 303.1, 304.1, 305.1, 305.3, 307.2, 307.3, 402.3, 404.7, 502.1, 503.4, and 504.1 as well as the title of Section 506. The sections are repeated below for convenience.

> **108.1.3 Structure unfit for human occupancy.** A structure is unfit for human occupancy whenever the code official finds that such structure is unsafe, unlawful or, because of the degree to which the structure is in disrepair or lacks maintenance, is not insanitary, vermin or rat rodent infested, contains filth and contamination, or lacks ventilation, illumination, sanitary or heating facilities or other essential equipment required by this code, or because the location of the structure constitutes a hazard to the occupants of the structure or to the public.
>
> **110.1 General.** The code official shall order the owner of any premises upon which is located any structure, which in the code official's judgment is so old, dilapidated or has become so out of repair as to be dangerous, unsafe, not insanitary or otherwise unfit for human habitation or occupancy, and such that it is unreasonable to repair the structure, to demolish and remove such structure; or if such structure is capable of being made safe by repairs, to repair and make safe and sanitary or to demolish and remove at the owner's option; or where there has been a cessation of normal construction of any structure for a period of more than two years, to demolish and remove such structure.

301.2 Responsibility. The owner of the premises shall maintain the structures and exterior property in compliance with these requirements, except as otherwise provided for in this code. A person shall not occupy as owner-occupant or permit another person to occupy premises which are not in a **sanitary a**nd safe condition and which do not comply with the requirements of this chapter. Occupants of a dwelling unit, rooming unit or housekeeping unit are responsible for keeping in a clean, **sanitary** and safe condition that part of the dwelling unit, rooming unit, housekeeping unit or premises which they occupy and control.

301.3 Vacant structures and land. All vacant structures and premises thereof or vacant land shall be maintained in a clean, safe, secure and **sanitary** condition as provided herein so as not to cause a blighting problem or adversely affect the public health or safety.

302.1 Sanitation. All exterior property and premises shall be maintained in a clean, safe and **sanitary** condition. The occupant shall keep that part of the exterior property which such occupant occupies or controls in a clean and **sanitary** condition.

303.1 Swimming pools. Swimming pools shall be maintained in a clean and **sanitary** condition, and in good repair.

304.1 General. The exterior of a structure shall be maintained in good repair, structurally sound and **sanitary** so as not to pose a threat to the public health, safety or welfare.

305.1 General. The interior of a structure and equipment therein shall be maintained in good repair, structurally sound and in a **sanitary** condition. Occupants shall keep that part of the structure which they occupy or control in a clean and sanitary condition. Every owner of a structure containing a rooming house, housekeeping units, a hotel, a dormitory, two or more dwelling units or two or more nonresidential occupancies, shall maintain, in a clean and **sanitary** condition, the shared or public areas of the structure and exterior property.

305.3 Interior surfaces. All interior surfaces, including windows and doors, shall be maintained in good, clean and **sanitary** condition. Peeling, chipping, flaking or abraded paint shall be repaired, removed or covered. Cracked or loose plaster, decayed wood and other defective surface conditions shall be corrected.

307.2 Disposal of rubbish. Every occupant of a structure shall dispose of all rubbish in a clean and sanitary manner by placing such rubbish in approved containers.

307.3 Disposal of garbage. Every occupant of a structure shall dispose of garbage in a clean and **sanitary** manner by placing such garbage in an approved garbage disposal facility or approved garbage containers.

402.3 Other spaces. All other spaces shall be provided with natural or artificial light sufficient to permit the maintenance of **sanitary** conditions, and the safe occupancy of the space and utilization of the appliances, equipment and fixtures.

404.7 Food preparation. All spaces to be occupied for food preparation purposes shall contain suitable space and equipment to store, prepare and serve foods in a **sanitary** manner. There shall be adequate facilities and services for the **sanitary** disposal of food wastes and refuse, including facilities for temporary storage.

502.1 Dwelling units. Every dwelling unit shall contain its own bathtub or shower, lavatory, water closet and kitchen sink which shall be maintained in a **sanitary**, safe working condition. The lavatory shall be placed in the same room as the water closet or located in close proximity to the door leading directly into the room in which such water closet is located. A kitchen sink shall not be used as a substitute for the required lavatory.

503.4 Floor surface. In other than dwelling units, every toilet room floor shall be maintained to be a smooth, hard, nonabsorbent surface to permit such floor to be easily kept in a clean and **sanitary** condition.

504.1 General. All plumbing fixtures shall be properly installed and maintained in working order, and shall be kept free from obstructions, leaks and defects and be capable of performing the function for which such plumbing fixtures are designed. All plumbing fixtures shall be maintained in a safe, **sanitary** and functional condition.

Although used extensively in the code, because “sanitary” currently lacks a definition, the varying contexts in which it appears give the word different connotations. As a result the term is ambiguous allowing for differing interpretations. The ambiguity means that the code official’s interpretation is open to challenge. As a result, code officials are often reluctant to cite for unsanitary conditions absent other violations such as active infestation.

In addition, control of an infestation does not require the removal of the residues of the infestation. These residues may carry infectious diseases and allergens that cause allergies, cause asthma or trigger an asthma attack. Accumulations of rubbish or garbage can provide harborage and a food source for rodents or insects and become the source of disease.

The definition of sanitation addresses those situations commonly understood to spread or support disease. In addition, it includes the term infestation is included in the definition of sanitary to make clear that an infestation is never sanitary. The definition accommodates situations where a state or local health department provides set more stringent standards for food preparation areas and swimming pools.

Finally, the definition makes it clear that systems designed and manage wastes are inherently not sanitary by design. These include sanitary sewage disposal systems and trash handling systems. Therefore, they are excluded from the definition.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NELTNER-ADM1-108.1.3 PM.DOC

ADM39-09/10

IBC-Chapter 35, IECC-Chapter 6, IEBC-Chapter 15, IFC-Chapter 47, IFGC-Chapter 8, IMC-Chapter 15, IPC-Chapter 13, IPMC-Chapter 8, IRC-Chapter 44

The following table provides a comprehensive list of all standards that the respective standards promulgators have indicated have been, or will be, updated from the listing in the 2009 Editions of the International Codes. According to Section 4.5 of ICC Council Policy #CP 28, Code Development Policy, the updating of standards referenced by the Codes shall be accomplished administratively by the Administrative code development committee. Therefore, referenced standards that are to be updated for the 2012 edition of any of the I-Codes are listed in this single code change proposal. This is unlike the way these standards were updated in the past code change cycles, where updates for standards were dealt with by each committee for their respective codes. Note that the table below indicates the change to the standard, and the code or codes in which each standard appears. The list includes standards that the promulgators have already updated or will have updated by December 1, 2011.

4.5 Updating Standards: The updating of standards referenced by the Codes shall be accomplished administratively by the Administrative code development committee in accordance with these full procedures except that the deadline for availability of the updated standard and receipt by the Secretariat shall be December 1, 2011. The published version of the 2012 Code which references the standard will refer to the updated edition of the standard. If the standard is not available by the deadline, the edition of the standard as referenced by the newly published Code shall revert back to the reference contained in the previous edition and an errata to the Code issued. Multiple standards to be updated may be included in a single proposal.

AA — Aluminum Association

Standard Reference Number	Title	Referenced in Code(s):							
ADM 1-20~~05~~ 2010	Aluminum Design Manual: Part ~~I-A~~ Specification for Aluminum Structures ~~- Allowable Stress Design; and Part I-B - Specification for Aluminum Structures - Load and Resistance Factor Design~~	IBC							

AAMA — American Architectural Manufacturers Association

Standard Reference Number	Title	Referenced in Code(s):							
AAMA/WDMA/CSA 101/I.S.2/A440-~~08~~ 11	North American Fenestration Standard/Specification for Windows, Doors, and Skylights	IBC	IRC	IECC					
450-~~06~~ 09	Voluntary Performance Rating Method for Mulled Fenestration Assemblies	IRC							
506-~~06~~ 08	Voluntary Specifications for Hurricane Impact and Cycle Testing of Fenestration Products	IRC							

ACCA — Air Conditioning Contractors of America

Standard Reference Number	Title	Referenced in Code(s):							
Manual D-~~95~~ 09	Residential Duct Systems	IMC	IRC						
Manual J-~~02~~ 11	Residential Load Calculation - Eighth Edition	IRC							
Manual S-~~04~~ 10	Residential Equipment Selection	IRC							

ACI	American Concrete Institute								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
318-~~08~~ 11	Building Code Requirements for Structural Concrete (Revised 2011)	IBC	IRC						
332-~~08~~ 10	Code Requirements for Residential Concrete Construction	IRC							
530-~~08~~ 11	Building Code Requirements for Masonry Structures	IBC	IRC						
530.1-~~08~~ 11	Specifications for Masonry Structures	IBC	IRC						
AF&PA	**American Forest & Paper Association**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
AF&PA-~~93~~ 2012	Span Tables for Joists and Rafters	IBC	IRC						
ANSI/AF&PA PWF-2007	Permanent Wood Foundation Design Specification	IBC	IRC						
ANSI/AF&PA SDPWS-2008	Special Design Provisions for Wind and Seismic	IBC							
NDS-~~05~~ 2012	National Design Specification (NDS) for Wood Construction - with 20~~05~~ 12 Supplement	IBC	IRC						
AF&PA WCD No. 4-~~89~~ 2003	Wood Construction Data-Plank and Beam Framing for Residential Buildings	IBC							
ANSI/AF&PA WFCM-~~01~~ 2012	Wood Frame Construction Manual for One- and Two-Family Dwellings	IBC	IRC						
AHRI	**Air Conditioning, Heating and Refrigeration Institute**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
210/240-~~03~~ 08	Unitary Air-Conditioning and Air-Source Heat Pump Equipment	IECC							
310/380-~~93~~ 04	Standard for Packaged Terminal Air-Conditioners and Heat Pumps	IECC							
340/360-20~~00~~ 07	Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment	IECC							
365-~~02~~ 09	Commercial and Industrial Unitary Air-Conditioning Condensing Units	IECC							
440-~~05~~ 08	Room Fan-Coil	IECC							
550/590-~~98~~ 03	Water-Chilling Packages Using the Vapor Compression Cycle with Addenda	IECC							
700-~~99~~ 2006	Purity Specifications for Fluorocarbon and Other Refrigerants	IMC							
1160-~~04~~ 08	Performance Rating of Heat Pump Pool Heaters	IECC							

AISC	**American Institute of Steel Construction**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
341-~~05~~ 10	Seismic Provisions for Structural Steel Buildings~~, including Supplement No.1 dated 2005~~	IBC							
360-~~05~~ 10	Specification for Structural Steel Buildings	IBC							
AISI	**American Iron and Steel Institute**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
AISI S100-07/S1-10	North American Specification for the Design of Cold Formed Steel Structural Members, with Supplement 1, dated 2010	IBC	IRC						
AISI S213-07/S1-10	North American Standard for Cold-Formed Steel Framing-Lateral Design, with Supplement 1, dated 2010	IBC							
AITC	**American Institute of Timber Construction**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
113-~~01~~ 10	Standard for Dimensions of Structural Glued Laminated Timber	IBC							
117-~~04~~ 10	Standard Specifications for Structural Glued Laminated Timber of Softwood Species	IBC							
200-~~04~~ 09	Manufacturing Quality Control System Manual for Structural Glued Laminated Timber	IBC							
ALI	**Automotive Lift Institute**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
ALI ALCTV- 2011	Standard for Automo~~bile~~ tive Lifts - Safety Requirements for Construction, Testing, and Validation (ANSI)	IBC							
AMCA	**Air Movement and Control Association International**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
500D-~~07~~ 10	Laboratory Methods for Testing Dampers for Rating	IECC							
511-~~99 (Reaffirmed 2002)~~ 09	Certified Ratings Program for Air Control Devices	IBC							

Standard Reference Number	Title	Referenced in Code(s):							
ANSI	**American National Standards Institute**								
Z 97.1~~—04~~ 09	Safety Glazing Materials Used in Buildings—Safety Performance Specifications and Methods of Test	IBC	IRC						
A208.1-~~99~~ 2009	Particleboard	IRC	**IBC**						
APA	**APA -The Engineered Wood Association**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
APA PDS Supplement 5-~~95~~ 08	Design and Fabrication of All-plywood Beams (revised ~~1995~~) 08	IBC							
APSP	**The Association of Pool & Spa Professionals**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
ANSI/~~NSPI~~ APSP-4 ~~99~~ 2007	American National Standard for Aboveground/Onground Residential Swimming Pools	IRC							
ASABE	**American Society of Agricultural & Biological Engineers**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
EP 484.2 JUN 1998 (R200~~3~~ 8)	Diaphragm Design of Metal-Clad, Wood-Frame Rectangular Buildings	IBC							
EP 486.1 DEC1999 (R200~~9~~5)	Shallow Post Foundation Design	IBC							
EP 559 ~~(~~1997~~)~~ DEC1996 (R2008)	Design Requirements and Bending Properties for Mechanically Laminated Columns	IBC							
ASCE/SEI	**American Society of Civil Engineers/Structural Engineers Institute**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
~~3-91~~	~~Structural Design of Composite Slabs~~	~~IBC~~							
~~5—08~~ 402-11	Building Code Requirements for Masonry Structures	IBC	IRC						
~~6—08~~ 602-11	Specifications for Masonry Structures	IBC	IRC						
7~~—05~~ 10	Minimum Design Loads for Buildings and Other Structures ~~including Supplement No.1 and 2 excluding Chapter 14 and Appendix 11A~~	IBC	IRC	IEBC					
19-~~96~~ 09	Structural Applications of Steel Cables for Buildings	IBC							

ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
15-~~2004~~ 2010	Safety Standard for Refrigeration Systems	IMC							
34-~~2004~~ 2010	Designation and Safety Classification of Refrigerants	IMC	IRC						
62.1-~~2004~~ 2010	Ventilation for Acceptable Indoor Air Quality	IMC	IECC	IEBC					
90.1-~~2007~~ 2010	Energy Standard for Buildings Except Low-Rise Residential Buildings including Addendum G (ANSI/ASHRAE/IESNA 90.1-2007)	IECC							
140-~~2007~~ 2010	Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs	IECC							
146-~~1998~~ 2006	Testing for Rating Pool Heaters	IECC							
ASHRAE-~~2005~~ 2009	ASHRAE Handbook Fundamentals	IMC	IECC	IRC					
ASME	**American Society of Mechanical Engineers**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
A13.1- ~~[96 (Reaffirmed 2002)]~~ 2007	Scheme for the Identification of Piping Systems	IBC	IFC	IFGC					
~~A17.1/CSA B44-2007~~ASME/A17.1-2007/CSA B44-2007	Safety Code for Elevators and Escalators - with A17.1a/CSA B44a-08 Addenda	IBC	IFC	IEBC	IRC	IPMC			
A17.3-200~~2~~ 8	Safety Code for Existing Elevators and Escalators	IFC	IEBC						
A18.1-0~~5~~ 8	Safety Standard for Platform Lifts and Stairway Chairlifts	IBC	IFC	IEBC	IRC				
A90.1-0~~3~~ 9	Safety Standard for Belt Manlifts	IBC							
A112.14.1-2003 (Reaffirmed 2008)	Backwater Valves	IPC	IRC						
A112.14.3-2000 (Reaffirmed 2004)	Grease Interceptors	IPC	IRC						
A112.18.1-2005/CSA B125.1-20~~05~~-10	Plumbing Supply Fittings	IPC	IRC						
A112.18.2-2005/CSA B125.2-05	Plumbing Waste Fittings with 2007 and 2008 Supplements	IPC	IRC						
A112.18.3M-2002 (Reaffirmed 2008)	Performance Requirements for Backflow Protection Devices and Systems in Plumbing Fixture Fittings	IPC	IRC						
A112.18.6- ~~2003~~ /CSA B125.6-2010	Flexible Water Connectors	IPC	IRC						
A112.19.1M~~-1994 (Reaffirmed 2004)~~/CSA B45.2-2008	Enameled Cast Iron and Enameled Steel Plumbing Fixtures	IPC	IRC						
A112.19.2-~~2003~~ 2008/CSA B45.1-08	~~Vitreous China Plumbing Fixtures - and Hydraulic Requirements for Water Closets and Urinals~~ Ceramic Plumbing Fixtures	IPC	IRC						

A112.19.3~~M-2000 (Reaffirmed 2007)~~ 2008/CSA B45.4-08	Stainless Steel Plumbing Fixtures ~~(Designed for Residential Use) - with 2002 Supplement~~	IPC	IRC						
ASME A112.19.5/CSA B45.X-200~~5~~ 9	Trim for Water-Closet Bowls, Tanks, and Urinals	IPC	IRC						
ASME A112.19.7/CSA B45.10~~M-2006~~ 2009	Hydromassage Bathtub Appliances	IPC	IRC						
A112.19.8~~M~~—2007	Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Whirlpool Bathtub Appliances - with A112.19.8a-2008 Addenda	IPC	IRC						
A112.36.2.M-1991(R200~~2~~ 8)	Cleanouts	IPC							
B16.9-200~~3~~ 7	Factory-Made Wrought Steel Steel Buttwelding Fittings	IPC	IRC	IMC					
B16.20-98 (Reaffirmed 2007)	Metallic Gaskets for Pipe Flanges Ring-Joint, Spiral-Wound and Jacketed	IFGC							
B16.24-200~~1~~ 6	Cast Copper Alloy Pipe Flanges and Flanged Fittings: Class 150, 300, 400, 600, 900, 1500 and 2500	IMC							
B16.29-200~~1~~ 7	Wrought Copper and Wrought Copper Allow Solder Joint Drainage Fittings - DWV	IPC	IRC	IMC					
B16.33-2002 (Reaffirmed 2007)	Manually Operated Metallic Gas Valves for Use in Gas Piping Systems up to 125 psig (Sizes ½ through 2)	IFGC	IRC						
B16.44-2002 (Reaffirmed 2007)	Manually Operated Metallic Gas Valves for Use in Above Ground Piping Systems up to 5 psi	IFGC	IRC						
B20.1-200~~6~~ 9	Safety Standard for Conveyors and Related Equipment	IBC							
B31.1-20~~04~~ 07	Power Piping with B31.1a-2008 Addenda	IFC							
B31.9-~~04~~ 08	Building Services Piping	IMC	IFC						
BPVC-20~~04~~ 07	ASME Boiler & Pressure Vessel Code (20~~04~~) 07 Edition	IMC	IFC	IFGC	IRC				
CSD-1-20~~04~~ 09	Controls and Safety Devices for Automatically Fired Boilers	IMC	IRC	IFGC					
PTC 4.1-1964 ~~(Reaffirmed 1991)~~ 2008	Fired Steam Generat~~ing~~ors ~~Units~~	IECC							
ASSE	**American Society of Sanitary Engineering**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
1001-~~02~~ 08	Performance Requirements for Atmospheric Type Vacuum Breakers	IPC	IRC						
1002-~~1999~~ 2008	Performance Requirements for Antisiphon Fill Valves ~~Ballcocks~~ for ~~Gravity~~ Water Closet Flush Tanks	IPC	IRC						
1003-~~01~~ 2009	Performance Requirements for Water Pressure Reducing Valves for Domestic Water Distribution Systems	IPC	IRC						
1004-~~1990~~ 2008	Performance Requirements for Commercial Dishwashing Machines	IPC							
1008-~~1989~~ 2006	Performance Requirements for ~~Household~~ Plumbing Aspects of Residential Food Waste Disposer Units	IPC	IRC						

1012-~~02~~ 09	Performance Requirements for Backflow Preventers with Intermediate Atmospheric Vent	IPC	IRC						
1013-~~2005~~ 2009	Performance Requirements for Reduced Pressure Principle Backflow Preventers and Reduced Pressure Principle Fire Protection ~~Principle~~ Backflow Preventers	IPC	IRC						
1015-~~2005~~ 2009	Performance Requirements for Double Check Backflow Prevention Assemblies and Double Check Fire Protection Backflow Prevention Assemblies	IPC	IRC						
1016-~~1996~~ 2010	Performance Requirements for Automatic Compensating, Valves for Individual Showers and Tub/Shower Combinations	IPC	IRC						
1017-~~2003~~ 2010	Performance Requirements for Temperature Actuated Mixing Valves for Hot Water Distribution Systems	IPC	IRC	IMC					
1018-~~2001~~ 2010	Performance Requirements for Trap Seal Primer Valves - Potable Water Supplied	IPC							
1019-~~2004~~ 2010	Performance Requirements for Freeze Resistant~~,~~ Wall Hydrant~~s~~, Vacuum Breaker, ~~Automatic~~ Draining Type	IPC	IRC						
1022-2003	Performance Requirements for Backflow Preventer for ~~Carbonated~~ Beverage Dispensing ~~Machines~~ Equipment	IPC							
1023-~~1979~~ 2010	Performance Requirements for Hot Water Dispensers - Household Storage Type - Electrical	IPC	IRC						
1035-~~02~~ 2008	Performance Requirements for Laboratory Faucet Backflow Preventers	IPC	IRC						
1037-~~1990~~ 2010	Performance Requirements for Pressurized Flushing Devices for Plumbing Fixtures	IPC	IRC						
1044-~~2001~~ 2010	Performance Requirements for Trap Seal Primer Devices - Drainage Types and Electronic Design Types	IPC							
1047-~~2005~~ 2009	Performance Requirements for Reduced Pressure Detector Fire Protection Backflow Prevention Assemblies	IPC	IRC						
1048-~~2005~~ 2009	Performance Requirements for Double Check Detector Fire Protection Backflow Prevention Assemblies	IRC	IPC						
1050-~~02~~ 2009	Performance Requirements for Stack Air Admittance Valves for Sanitary Drainage Systems	IPC	IRC						
1051-~~02~~ 2009	Performance Requirements for Individual and Branch Type Air Admittance Valves for Sanitary Drainage Systems	IRC	IPC						
1055-~~1997~~ 2009	Performance Requirements for Backflow Devices for Chemical Dispensing Systems	IPC							

1056-~~01~~ 2010	Performance Requirements for Spill Resistant Vacuum Breaker	IPC	IRC						
1060-~~1996~~ 2006	Performance Requirements for Outdoor Enclosures for ~~Backflow Prevention Assemblies~~ Fluid Conveying Components	IPC	IRC						
1061-~~06~~ 2010	Performance Requirements for Removable and Non-Removable Push Fit Fittings	IPC	IRC						
1062-~~1997~~ 2006	Performance Requirements for Temperature Actuated, Flow Reduction Valves to Individual ~~Fixture~~ Supply Fittings	IRC	IPC						
1066-~~1997~~ 2009	Performance Requirements for Individual Pressure Balancing In-Line Valves for Individual Fixture Fittings	IPC	IRC						
1079-2005	Performance Requirements for Dielectric Pipe Unions	IPC							
5013-~~1998~~ 2009	Performance Requirements for Testing Reduced Pressure Principle Backflow Preventers (RP) and Reduced Pressure Principle Fire Protection ~~Principle~~ Backflow Preventers (RFP)	IPC							
5015-~~1998~~ 2009	Performance Requirements for Testing Double Check Valve Backflow Prevention Assembly ies (DC~~VA~~) and Double Check Fire Protection Backflow Prevention Assemblies (DCF)	IPC							
5020-~~1998~~ 2009	Performance Requirements for Testing Pressure Vacuum Breaker Assembly mblies (PVB~~A~~)	IPC							
5048-~~1998~~ 2009	Performance Requirements for Testing Double Check Valve Detector Assembly (DCDA)	IPC							
5052-1998 ~~2009~~	Performance Requirements for Testing Hose Connection Backflow Preventers	IPC							
5056-1998 ~~2009~~	Performance Requirements for Testing Spill Resistant Vacuum Breaker (SRVB)	IPC							

ASTM — ASTM International

Standard Reference Number	Title	Referenced in Code(s):							
A 36/A 36M-~~05~~ 08	Specification for Carbon Structural Steel	IBC	IRC						
A 53/A 53M-~~06a~~ 07	Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless	IPC	IMC	IRC	IFGC				
A 74-~~06~~ 09	Specification for Cast Iron Soil Pipe and Fittings	IPC	IRC	IPSDC					
A 106/A 106M-~~06a~~ 08	Specification for Seamless Carbon Steel Pipe for High-Temperature Service	IMC	IRC	IFGC					
A 167-99(200~~4~~) 9	Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip	IRC							

A 240/A 240M-~~07~~ 09a	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and for General Applications	IBC	IRC						
A 252-98(20~~02~~ 07)	Specification for Welded and Seamless Steel Pipe Piles	IBC							
A 254-97(20~~02~~ 07)	Specification for Copper Brazed Steel Tubing	IMC	IRC	IFGC					
A 283/A 283M-03(2007)	Specification for Low and Intermediate Tensile Strength Carbon Steel Plates	IBC							
A 307-~~04E01~~ 07b	Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength	IBC	IRC						
A 312/A 312M-~~06~~ 08a	Specification for Seamless, ~~and~~ Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes	IPC	IRC						
A 463M/A 463M-~~05~~ 06	Specification for Steel Sheet, Aluminum-Coated, by the Hot Dip Process	IBC	IRC						
A 510-~~06~~ 08	Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel	IRC							
A 588/A 588M-05	Specification for High-Strength Low-Alloy Structural Steel with 50 ksi (345 Mpa) Minimum Yield Point, ~~to 4 Inches (100mm) Thick~~ with Atmospheric Corrosion Resistance	IBC							
A 615/A 615M-~~04a~~ 09	Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement	IBC	IRC						
A 641/A 641M-~~03~~ 09a	Specification for Zinc-Coated (Galvanized) Carbon Steel Wire	IRC							
A 653/A 653M-~~07~~ 08	Specification for Steel Sheet, Zinc-Coated Galvanized or Zinc-Iron Alloy-Coated Galvannealed by the Hot-Dip Process	IBC	IRC						
A 706/A 706M-~~05a~~ 09	Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement	IBC	IRC						
A 755/A 755M-~~07~~ 03(2008)	Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products	IBC	IRC						
A 792/A 792M-~~06a~~ 08	Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process	IBC	IRC						
A 888-~~07a~~ 09	Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Application	IPC	IPSDC	IRC					
A 913/A 913M-~~04~~ 07	Specification for High-Strength Low-Alloy Steel Shapes of Structural Quality, Produced by Quenching and Self-Tempering Process (QST)	IBC							
A 924/A 924M-~~07~~ 08a	Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot Dip Process	IBC	IRC						

A 996/A 996M-~~06a~~ 09	Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement	IRC							
A 1003/A 1003M-~~05~~ 08	Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-formed Framing Members	IRC							
B 32-~~04~~ 08	Specification for Solder Metal	IPC	IMC	IRC	IPSDC				
B 101-~~02~~ 07	Specification for Lead-Coated Copper Sheet and Strip for Building Construction	IBC	IRC						
B 135-~~02~~ 08a	Specification for Seamless Brass Tube	IMC	IRC						
B 152/B 152M-06ae1	Specification for Copper Sheet, Strip Plate and Rolled Bar	IPC							
B 209-~~06~~ 07	Specification for Aluminum and Aluminum-Alloy Steel and Plate	IBC	IRC						
B 210-~~02~~ 04	Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes	IFGC							
B 280-~~03~~ 08	Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service	IMC	IFC	IBC					
B 302-~~02~~ 07	Specification for Threadless Copper Pipe, Standard Sizes	IPC	IRC	IMC					
B 306-~~02~~ 09	Specification for Copper Drainage Tube (DWV)	IPC	IRC						
B 370-~~03~~ 09	Specification for Cold Rolled Copper Sheet and Strip for Building Construction	IBC	IRC						
B 813-00~~e01~~ (2009)	Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube	IPC	IPSDC	IRC	IMC				
C 14-07	Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe	IPC	IPSDC	IRC					
C 27-98(~~2002~~) 2008	Specification for Standard Classification of Fireclay and High-Alumina Refractory Brick	IBC	IRC						
C 31/C 31M-~~06~~ 08b	Practice for Making and Curing Concrete Test Specimens in the Field	IBC							
C 33/C33M-~~03~~ 08	Specification for Concrete Aggregates	IBC	IRC						
C 62-~~05~~ 08	Specification for Building Brick (Solid Masonry Units Made From Clay or Shale)	IBC	IRC						
C 67-~~07~~ 08	Test Methods of Sampling and Testing Brick and Structural Clay Tile	IBC							
C 76-~~07~~ 08a	Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe	IPC	IPSDC	IRC					
C 90-~~06b~~ 08	Specification for Loadbearing Concrete Masonry Units	IBC	IRC	IECC					
C 94/C 94M-~~07~~ 09	Specification for Ready-Mixed Concrete	IBC	IRC						
C 140-~~07~~ 08a	Test Method Sampling and Testing Concrete Masonry Units and Related Units	IBC							

C 143/C 143M-~~05a~~ 08	Test Method for Slump of Hydraulic Cement Concrete	IRC							
C 172-~~04~~ 08	Practice for Sampling Freshly Mixed Concrete	IBC							
C 207-06	Specification for Hydrated Lime for Masonry Purposes	IRC							
C 208-~~95 (2001)~~ 08a	Specification for Cellulosic Fiber Insulating Board	IBC	IRC						
C 216-07a	Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale)	IBC	IRC						
C 270-~~07~~ 08a	Specification for Mortar for Unit Masonry	IBC	IRC						
C 272-01(2007)	Standard Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions	IRC							
C 273/ C273M-~~00e1~~ 07a	Standard Test Method for Shear Properties of Sandwich Core Materials	IRC							
C 296-00(2004)e~~01~~	Specification for Asbestos-Cement Pressure Pipe	IPC	IRC						
C 428-~~97~~ 05(2006)	Specification for Asbestos-Cement Nonpressure Sewer Pipe	IPC	IPSDC	IRC					
C 473-~~06a~~ 07	Test Methods for Physical Testing of Gypsum Panel Products	IBC							
C 474-~~02(2007)~~ 05	Test Methods for Joint Treatment Materials for Gypsum Board Construction	IBC							
C 475/C 475M-~~05~~ 02(2007)	Specification for Joint Compound and Joint Tape for Finishing Gypsum Wallboard	IBC	IRC						
C 476-~~02~~ 08	Specification for Grout for Masonry	IRC							
C 503-~~05~~ 08a	Specification for Marble Dimension Stone (Exterior)	IBC							
C 516-~~02~~ 08a	Specification for Vermiculite Loose Fill Thermal Insulation	IBC							
C 547-~~06~~ 07e1	Specification for Mineral Fiber Pipe Insulation	IBC							
C 552-~~03~~ 07	Standard Specification for Cellular Glass Thermal Insulation	IBC	IRC						
C 564-~~03a~~ 08	Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings	IPC	IPSDC	IRC					
C 568-~~03~~ 08a	Specification for Limestone Dimension Stone	IBC							
C 578-~~07~~ 08b	Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation	IBC	IRC						
C 595-~~07~~ 08a	Specification for Blended Hydraulic Cements	IBC	IRC						
C 616-~~03~~ 08a	Specification for Quartz Dimension Stone	IBC							
C 629-~~03~~ 08	Specification for Slate Dimension Stone	IBC							
C 631-~~95a(2004)~~ 09	Specification for Bonding Compounds for Interior Gypsum Plastering	IBC	IRC						

C 635/C635M-~~04~~ 07	Specification for the Manufacturer, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings	IBC							
C 636/C636M-~~06~~ 08	Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels	IBC							
C 645-~~07~~ 08a	Specification for Nonstructural Steel Framing Members	IBC	IRC						
C 652-~~05a~~ 09	Specification for Hollow Brick (Hollow Masonry Units Made from Clay or Shale)	IBC	IRC						
C 685/C 685M-~~01~~ 07	Specification for Concrete Made by Volumetric Batching and Continuous Mixing	IRC							
C 700-07a	Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated	IPC	IPSDC	IRC					
C 744-~~05~~ 08	Specification for Prefaced Concrete and Calcium Silicate Masonry Units	IBC							
C 754-~~04~~ 08	Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products	IBC							
C 840-~~07~~ 08	Specification for Application and Finishing of Gypsum Board	IBC							
C 841-03(2008)e1	Specification for Installation of Interior Lathing and Furring	IBC							
C 847-~~06~~ 09	Specification for Metal Lath	IBC	IRC						
C 913-~~02~~ 08	Specification for Precast Concrete Water and Waste Water Structures	IPSDC	IBC						
C 920-~~05~~ 08	Standard Specification for Elastomeric Joint Sealants	IBC	IRC						
C 926-~~98a(2005)~~ 06	Specification for Application of Portland Cement-Based Plaster	IBC	IRC						
C 933-~~05~~ 07b	Specification for Welded Wire Lath	IBC	IRC						
C 954-~~04~~ 07	Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 inch (0.84 mm) to 0.112 inch (2.84 mm) in Thickness	IBC	IRC						
C 955-~~06~~ 09	Standard Specification for Load-bearing Transverse and Axial Steel Studs, Runners Tracks, and Bracing or Bridging, for Screw Application of Gypsum Panel Products and Metal Plaster Bases	IBC	IRC						
C 1002-~~04~~ 07	Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs	IBC	IRC						
C 1007-~~04~~ 08a	Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories	IBC							
C 1019-~~05~~ 09	Test Method for Sampling and Testing Grout	IBC							

C 1029-~~05a~~ 08	Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation	IBC	IRC						
C 1047-~~05~~ 09	Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base	IBC	IRC						
C 1053-00(2005)	Specification for Borosilicate Glass Pipe and Fittings for Drain, Waste, and Vent (DWV) Applications	IPC							
C 1063-~~06~~ 08	Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster	IBC	IRC						
C 1088-~~07a~~ 09	Specification for Thin Veneer Brick Units Made From Clay or Shale	IBC							
C 1107/C1107M-~~07~~ 08	Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)	IRC							
C 1116/C1116M -~~06~~ 08a	Standard Specification for Fiber - Reinforced Concrete and Shotcrete	IRC							
C 1157-~~03~~ 08a	Performance Specification for Hydraulic Cement	IRC							
C 1173-~~06~~ 08	Specification for Flexible Transition Couplings for Underground Piping Systems	IPC	IPSDC	IRC					
C 1177/C 1177M-~~06~~ 08	Specification for Glass Mat Gypsum Substrate for Use as Sheathing	IBC	IRC						
C 1178/C 1178M-~~06~~ 08	Specification for Coated Mat Water-Resistant Gypsum Backing Panel	IBC	IRC						
C 1186-~~07~~ 08	Specification for Flat ~~Nonasbestos~~ Fiber Cement Sheets	IBC	IRC						
C 1277-~~06~~ 08	Specification for Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings	IPC	IPSDC	IRC					
C 1278/C 1278M-~~06~~ 07a	Specification for Fiber-Reinforced Gypsum Panels	IBC	IRC						
C 1280-~~04~~ 09	Specification for Application of Gypsum Sheathing	IBC							
C 1283-07a	Practice for Installing Clay Flue Lining	IBC	IRC						
C 1288-99(2004)e1	Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets	IBC	IRC						
C 1289—~~07~~ 08	Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board	IBC	IRC						
C 1325-~~04~~ 08b	Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitous Backer Units ~~Interior Substrate Sheets~~	IBC	IRC						
C 1396M/ C1396M-06a	Specification for Gypsum Board	IBC	IRC						
C 1405-~~07~~ 08	Standard Specification for Glazed Brick (Single Fired, Solid Brick Units)	IBC							
C 1440-~~03~~ 08	Specification for Thermoplastic Elastomeric (TPE) Gasket Materials for Drain, Waste, and Vent (DWV), Sewer, Sanitary and Storm Plumbing Systems	IPC	IPSDC	IRC					

C 1460-~~04~~ 08	Specification for Shielded Transition Couplings for Use with Dissimilar DWV Pipe and Fittings Above Ground	IPC	IPSDC	IRC					
C 1461-~~06~~ 08	Specification for Mechanical Couplings Using Thermoplastic Elastomeric (TPE) Gaskets for Joining Drain, Waste, and Vent (DWV) Sewer, Sanitary, and Storm Plumbing Systems for Above and Below Ground Use	IPC	IPSDC	IRC					
C 1540-~~04~~ 08	Specification for Heavy Duty Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings	IPC							
C 1563-~~04~~ 08	Standard Test Method for Gaskets for Use in Connection with Hub and Spigot Cast Iron Soil Pipe and Fittings for Sanitary Drain, Waste, Vent and Storm Piping	IPC							
D 86-~~07a~~ 09	Test Method for Distillation of Petroleum Products at Atmospheric Pressure	IBC	IFC						
D 93-~~07~~ 08	Test Method for Flash Point by Pensky-Martens Closed Cup Tester	IBC	IFC	IMC					
D 225-~~04~~ 07	Specification for Asphalt Shingles (Organic Felt) Surfaced with Mineral Granules	IBC	IRC						
D 323-~~06~~ 08	Test Method for Vapor Pressure of Petroleum Products (Reid Method)	IFC							
D 422-63(200~~2~~ 7)~~E01~~	Test Method for Particle-Size Analysis of Soils	IBC	IRC						
D 448-~~03a~~ 08	Standard Classification for Sizes of Aggregate for Road and Bridge Construction	IBC							
D 449-03(2008)	Specification for Asphalt Used in Dampproofing and Waterproofing	IRC							
D 1003-~~00~~ 07e1	Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics	IECC							
D 1143/D1143M-07e1	Test Method for Piles Under Static Axil Compressive Load	IBC							
D 1557-~~02e01~~ 07	Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb/ft3(2,700kN-m/m3))	IBC							
D 1586-~~99~~ 08a	Specification for Penetration Test and Split-Barrel Sampling of Soils	IBC							
D 1622-~~03~~ 08	Standard Test Method for Apparent Density of Rigid Cellular Plastics	IRC							
D 1623-~~78(1995)~~ 03	Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics	IRC							
D 1693-~~07~~ 08	Test Method for Environmental Stress-Cracking of Ethylene Plastics	IRC	IMC						
D 1784-~~06a~~ 08	Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds	IRC							

D 1869-95 (2005)e1	Specification for Rubber Rings for Asbestos-Cement Pipe	IPC	IPSDC	IRC					
D 1970-~~01~~ 09	Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roof Underlayment for Ice Dam Protection	IBC	IRC						
D 2412-02(2008)	Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading	IMC	IRC						
D 2487-06e1	Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)	IBC							
D 2513-~~07a~~ 08b	Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings	IFGC	IMC	IRC					
D 2609-02(2008)	Specification for Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe	IPC	IRC						
D 2661-~~06~~ 08	Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings	IPC	IPSDC	IRC					
D 2665-~~07~~ 09	Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings	IPC	IPSDC	IRC					
D 2729-~~04e01~~ 03	Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings	IPC	IRC	IPSDC					
D 2822-~~(2005)~~	Specification for Asphalt Roof Cement, Asbestos Containing	IBC	IRC						
D 2823-05	Specification for Asphalt Roof Coatings, Asbestos Containing	IBC	IRC						
D 2837-~~04e01~~ 08	Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products	IMC	IRC						
D 2846/D 2846M-~~06~~ 09	Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot- and Cold-Water Distribution Systems	IPC	IRC	IMC					
D 2850-03a(2007)	Test Method for Unconsolidated, Undrained Triaxial Compression Test on Cohesive Soils	IBC							
D 2898-~~04~~ (2008e01)	Standard Test Methods for Accelerated Weathering of Fire-Retardant-treated Wood for Fire Testing	IWUIC							
D 2949 – 01~~ae01~~a(2008)	Specification for 3.25-in. Outside Diameter Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings	IPC	IPSDC	IRC					
D 3019-~~94(2007)~~ 08	Specification for Lap Cement Used with Asphalt Roll Roofing, Non-Fibered, Asbestos Fibered, and Non-Asbestos Fibered	IBC	IRC						
D 3034 - ~~06~~ 08	Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings	IPC	IPSDC	IRC					
D 3035-~~06~~ 08	Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter	IPC	IRC	IMC					

D 3161-~~06~~ 09	Test Method for a Wind Resistance of Asphalt Shingles (Fan Induced Method)	IBC	IRC						
D 3201-~~07~~ 08a	Test Method for Hygroscopic Properties of Fire-Retardant Wood and Wood-Base Products	IBC	IRC	IWUIC					
D 3212-~~96a(2003)e01~~ 07	Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals	IPC	IPSDC	IRC					
D 3261-03	~~Standard Practice~~ Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings ~~Joining of Polyolefin~~ Plastic Pipe and ~~Fittings~~ Tubing	IMC	IPC						
D 3278-~~2004e01~~ 96(2004)e~~0~~1	Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus	IBC	IFC	IMC					
D 3311-~~06a~~ 08	Specification for Drain, Waste and Vent (DWV) Plastic Fittings Patterns	IPC	IRC						
D 3350-~~06~~ 08	Specification for Polyethylene Plastics Pipe and Fittings Materials	IMC	IRC						
D 3462-~~07~~ 09	Specification for Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules	IBC	IRC						
D 3679-~~06a~~ 09	Specification for Rigid Poly (Vinyl Chloride) (PVC) Siding	IBC	IRC						
D 3689-~~90 (1995)~~ 07	~~Method for Testing Individual Piles~~ Test Methods for Deep Foundations Under Static Axial Tensile Load	IBC							
D 3737-~~07~~ 08	Practice for Establishing Allowable Properties for Structural Glued Laminated Timber (Glulam)	IBC	IRC						
D 3746-85(~~2002~~) 2008	Test Method for Impact Resistance of Bituminous Roofing Systems	IBC							
D 3909-97b(2004)e~~0~~1	Specification for Asphalt Roll Roofing (Glass Felt) Surfaced with Mineral Granules	IBC	IRC	IWUIC					
D 4272-~~03~~ 08a	Test Method for Total Energy Impact of Plastic Films by Dart Drop	IBC							
D 4434/D4434M -~~06~~ 09	Specification for Poly (Vinyl Chloride) Sheet Roofing	IBC	IRC						
D 4551-96 (200~~1~~ 8)e1	Specification for Poly (Vinyl Chloride) (PVC) Plastic Flexible Concealed Water-Containment Membrane	IPC	IRC						
D 4586-~~00~~ 07	Specification for Asphalt Roof Cement, Asbestos-Free	IBC	IRC						
D 4637-~~04~~ 08	Specification for EPDM Sheet Used in Single-Ply Roof Membrane	IBC	IRC						
D 4829-~~07~~ 08a	Test Method for Expansion Index of Soils	IBC	IRC						
D 4945-~~00~~ 08	Test Method for High-Strain Dynamic Testing of Piles	IBC							
D 5019 - 07a	Specification for Reinforced Nonvulcanized Polymeric Sheet Used in Roofing Membrane	IBC	IRC						
D 5055-~~05~~ 09	Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists	IBC	IRC						

D 5456-~~05a~~ 09	Specification for Evaluation of Structural Composite Lumber Products	IBC							
D 5664-~~02~~ 08	Test Methods for Evaluating the Effects of Fire-Retardant Treatments and Elevated Temperatures on Strength Properties of Fire-Retardant Treated Lumber	IBC	IRC						
D 6162-00a(2008)	Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements	IBC	IRC						
D 6163-00(2008)	Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements	IBC	IRC						
D 6164-05e1	Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements	IBC	IRC						
D 6221-00(2006)	Specification for Reinforced Bituminous Flashing Sheets for Roofing and Waterproofing	IRC							
D 6222-02~~e01~~ 08	Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using Polyester Reinforcements	IBC	IRC						
D 6223-02e~~01~~2	Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements	IBC	IRC						
D 6298-05e1	Specification for Fiberglass Reinforced Styrene-Butadiene-Styrene (SBS) Modified Bituminous Sheets with a Factory Applied Metal Surface	IBC	IRC						
D 6305-~~02e01~~ 08	Practice for Calculating Bending Strength Design Adjustment Factors for Fire-Retardant-Treated Plywood Roof Sheathing	IBC	IRC						
D 6380-03(2009)	Standard Specification for Asphalt Roll Roofing (Organic) Felt	IBC	IRC						
D 6509/D6509M —~~00~~ 09	Standard Specification for Atactic Polypropylene (APP) Modified Bituminous Base Sheet Materials Using Glass Fiber Reinforcements	IBC							
D 6662-~~06~~ 09	Standard Specification for Polyolefin-Based Plastic Lumber Decking Boards	IWUIC							
D 6694-~~07~~ 08	Standard Specification for Liquid-applied Silicone Coating Used In Spray Polyurethane Foam Roofing	IBC	IRC						
D 6841-~~03~~ 08	Standard Practice for Calculating Design Value Treatment Adjustment Factors for Fire-Retardant-Treated Lumber	IBC	IRC						

D 6878-~~06a~~ 08e1	Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing	IBC	IRC						
D 7032-~~07~~ 08	Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails)	IRC							
D 7158-~~07~~ 08d	Standard Test Method for Wind Resistance of Sealed Asphalt Shingles (Uplift Force/Uplift Resistance Method)	IBC	IRC						
E 84-~~07~~ 09	Test Method for Surface Burning Characteristics of Building Materials	IBC	IRC	IFC	IMC	IWUIC			
E 119-~~07~~ 08a	Test Methods for Fire Tests of Building Construction and Materials	IBC	IRC	IMC					
E 136-~~04~~ 09	Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C	IBC	IRC	IMC	IWUIC				
E 283-04	Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences Across the Specimen	IRC	IECC						
E 331-00(2009)	Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference	IBC	IRC						
E 492-~~04~~ 09	Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine	IBC	IRC						
E 814-~~06~~ 08b	Test Method of Fire Tests of Through-Penetration Firestops	IBC	IRC	IMC					
E 970-~~00~~ 08a	Test Method for Critical Radiant Flux of Exposed Attic Floor Insulation Using a Radiant Heat Energy Source	IBC	IRC						
E 1300-~~04~~ 07e01	Practice for Determining Load Resistance of Glass in Buildings	IBC							
E 1354-~~04a~~ 09	Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter	IBC	IFC						
E 1592-~~01~~ 05	Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference	IBC							
E 1886-~~06~~ 05	Test Method for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Missiles and Exposed to Cyclic Pressure Differentials	IBC	IRC						
E 1966-~~01~~ 07	Test Method for Fire Resistant Joint Systems	IBC							
E 1996-~~06~~ 09	Specification for Performance of Exterior Windows, Glazed Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes	IBC	IRC						

E 2404—~~07a~~ 08	Standard Practice for Specimen Preparation and Mounting of Textile, Paper or Vinyl Wall or Ceiling Coverings to Assess Surface Burning Characteristics	IBC	IFC						
E 2568—~~07~~ 09e1	Standard Specification of PB Exterior Insulation and Finish Systems (EIFS)	IBC	IRC						
E 2573—07a	Standard Practice for Specimen Preparation and Mounting of Site-Fabricated Stretch Systems to Assess Surface Burning Characteristics	IBC	IFC						
F 405-05	Specification for Corrugated Polyethylene (PE) Pipe ~~Tube~~ and Fittings	IPC	IPSDC	IRC					
F 409-02(2008)	Specification for Thermoplastic Accessible and Replaceable Plastic Tube and Tubular Fittings	IPC	IRC						
F 441/F 441M-02 (2008)	Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80	IPC	IRC	IMC					
F 442/F 442M-99(2005)e1	Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR)	IPC	IRC	IMC					
F 477-~~07~~ 08	Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe	IPC	IPSDC	IRC					
F 547-~~01~~ 06	Terminology of Nails for Use with Wood and Wood-based Materials	IBC							
F 628-~~06e01~~ 08	Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe with a Cellular Core	IPC	IPSDC	IRC					
F 656-~~02~~ 08	Specification for Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings	IPC	IPSDC	IRC					
F 714-~~06a~~ 08	Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter	IPC	IRC						
F 876-~~06~~ 08b	Specification for Crosslinked Polyethylene (PEX) Tubing	IPC	IRC	IMC					
F 891-~~04~~ 07	Specification for Coextruded Poly (Vinyl Chloride) (PVC) Plastic Pipe with a Cellular Core	IPC	IPSDC	IRC					
F 1055-98(2006)	Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and ~~Fittings~~ Tubing	IPC	IRC	IMC					
F 1412-01~~e01~~ 09	Specification for Polyolefin Pipe and Fittings for Corrosive Waste Drainage	IPC	IRC						
F 1476-~~**(2006)**~~ **07**	Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications	IMC							
F 1499-01(2008)	Specification for Coextruded Composite Drain, Waste, and Vent Pipe (DWV)	IPSDC							
F 1554-~~04e1~~ 07a	Specification for Anchor Bolts, Steel 36, 55 and 105 ksi Yield	IRC							

	Strength								
F 1807-~~07~~ 08	Specifications for Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing	IPC	IRC						
F 1960-~~07~~ 09	Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing	IPC	IRC						
F 1973-~~05~~ 08	Standard Specification for Factory Assembled Anodeless Risers and Transition Fittings in Polyethylene (PE) and Polyamide 11 (PA11) and Polyamide 12 (PA12) Fuel Gas Distribution Systems	IFGC	IRC						
F 1974-~~04~~ 08	Specification for Metal Insert Fittings for Polyethylene/Aluminum/Polyethylene and Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene Composite Pressure Pipe	IPC	IRC	IMC					
F 2006-~~00(2005)~~ 08	Standard/Safety Specification for Window Fall Prevention Devices for Non-Emergency Escape (Egress) and Rescue (Ingress) Windows	IBC							
F 2080-~~05~~ 08	Specification for Cold-Expansion Fittings with Metal Compression-Sleeves for Cross-linked Polyethylene (PEX) Pipe	IPC	IRC						
F 2090-~~01a(2007)~~ 08	Specification for Window Fall Prevention Devices with Emergency Escape (Egress) Release Mechanisms	IBC	IRC						
F 2098-~~04e1~~ 08	Standard Specification for Stainless Steel Clamps for Securing SDR9 Cross-linked Polyethylene (PEX) Tubing to Metal Insert and Plastic Insert Fittings	IPC	IRC						
F 2158-~~01~~ 08	Standard Specification for Residential Central-Vacuum Tubes and Fittings	IRC							
F 2306/F 2306M-~~05~~ 08	Specification for 12" to 60" in. 300 to 1500 mm annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Gravity-Flow Storm Sewer and Subsurface Drainage Applications	IPC							
F 2389-~~06~~ 07e1	Specification for Pressure-Rated Polypropylene (PP) Piping Systems	IPC	IRC	IMC					
F2434-~~05~~ 08	Standard Specification for Metal Insert Fittings Utilizing a Copper Crimp ring for SDR9 Cross-Linked Polyethylene (PEX) Tubing and SDR9 Cross-Linked Polyethylene/Aluminum/Cross-Linked Polyethylene (PEX-AL-PEX) Tubing	IPC	IRC						
F 2623-~~07~~ 08	Standard Specification for Polyethylene of Raised Temperature (PE-RT) SDR 9 Tubing	IMC	IRC						

G 154-~~05~~ 06	Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials	IBC							
AWPA	**American Wood Protection Association**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
M4-~~06~~ 08	Standard for the Care of Preservative-Treated Wood Products	IBC	IRC						
U1-~~07~~ 11	USE CATEGORY SYSTEM: User Specification for Treated Wood except Section 6, Commodity Specification H	IBC	IRC						
BHMA	**Builders Hardware Manufacturers' Association**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
A 156.10.~~06~~ 2011	Power Operated Pedestrian Doors	IBC	IFC						
A 156.19-20~~02~~ 07	Power Assist and Low Energy Power Operated Doors	IBC	IFC						
CPA	**Composite Panel Association**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
A135.6-~~1998~~ 2006	Hardboard Siding	IBC	IRC						
A208.1-~~99~~ 2009	Particleboard	IBC	IRC						
CPSC	**Consumer Product Safety Commission**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
16 CFR Part 1201(~~1977~~) 2002	Safety Standard for Architectural Glazing Material	IBC	IRC						
16 CFR Part 1209 (~~1979~~) 2002	Interim Safety Standard for Cellulose Insulation	IBC	IRC						
16 CFR Part 1404 (~~1979~~) 2002	Cellulose Insulation	IBC	IRC						
16 CFR Part 1500 (~~1991~~) 2009	Hazardous Substances and Articles; Administration and Enforcement Regulations	IBC	IFC						
16 CFR Part 1500.41 (~~1984~~) 2009	Method for Testing Primary Irritant Substances	IFC							
16 CFR Part 1500.42 (~~1994~~) 2009	Test for Eye Irritants	IFC							
16 CFR Part 1500.44 (~~2001~~) 2009	Method for Determining Extremely Flammable and Flammable Solids	IBC	IFC						
16 CFR Part 1507 (~~2001~~) 2002	Firework Devices	IBC	IFC						
16 CFR Part 1630 (2000) (2007)	Standard for the Surface Flammability of Carpets and Rugs	IBC	IFC						
CSA	**Canadian Standards Association**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
ASME A112.9.2/CSA B45.1—~~02~~ 08	Ceramic Plumbing Fixtures	IPC	IRC						

ASME A112.19.1/CSA B45.2—~~02~~ 08	Enameled Cast-iron and Enameled Steel Plumbing Fixtures	IPC	IRC						
ASME A112.19.3/CSA B45.4—~~02~~ 08	Stainless-steel Plumbing Fixtures	IPC	IRC						
B45.5—02 (R2008)	Plastic Plumbing Fixtures	IPC	IRC						
B45.9—99 (R2008)	Macerating Systems and Related Components	IPC	IRC						
B64.1.1-~~01~~ 07	Atmospheric Vacuum Breakers ~~Vacuum Breakers, Atmospheric Type~~ (AVB)	IPC	IRC						
B64.1.2—~~01~~ 07	Pressure Vacuum Breakers~~, Type~~ (PVB)	IPC	IRC						
B64.2-~~01~~-07	Hose connection vacuum breakers ~~Vacuum breakers, hose connection type~~ (HCVB)	IPC	IRC						
B64.2.1—~~01~~ 07	Hose Connection Vacuum Breakers~~, Type~~ (HCVB) with Manual Draining Feature	IPC	IRC						
B64.2.1.1—~~01~~ 07	Hose Connection Dual Check Vacuum Breakers~~,Type~~ (HCDVB)	IPC	IRC						
B64.2.2-~~01~~-07	Hose connection vacuum breakers ~~Vacuum breakers, hose connection type~~ (HCVB) with automatic draining feature	IPC	IRC						
B64.3-~~01~~-07	Dual check valve backflow preventers ~~Backflow preventers, dual check valve type~~ with atmospheric port (DCAP)	IPC	IRC						
B64.4-~~01~~-07	~~Backflow preventers,~~ Reduced pressure principle backflow preventers (RP)	IPC	IRC						
B64.4.1—~~01~~ 07	~~Backflow Preventers,~~ Reduced Pressure Principle ~~Type~~ for Fire Sprinklers (RPF)	IPC	IRC						
B64.5—~~01~~ 07	Double Check Backflow Preventers~~,Type~~ (DCVA)	IPC	IRC						
B64.5.1—~~01~~ 07	Double Check Valve Backflow Preventers~~, Type~~ for Fire Systems (DCVAF)	IPC	IRC						
B64.6—~~01~~ 07	Dual Check Backflow Preventers, Valve ~~Type~~ (DuC)	IPC							
B64.7—~~94~~ 07	Laboratory Faucet Vacuum Breakers, ~~Type~~ (LFVB)	IPC	IRC						
B64.10/~~B64.10.1—01~~ 07	Manual for the Selection and Installation of Backflow Prevention Devices~~/Manual for the Maintenance and Field Testing of Backflow Prevention Devices~~	IPC							
~~B64.10/~~B64.10.1—~~01~~ 07	~~Manual for the Selection and Installation of Backflow Prevention Devices/~~Manual for the Maintenance and Field Testing of Backflow Prevention Devices	IPC							
B79—~~94(2000)~~ 08	Commercial and residential ~~Floor, Area and Shower~~ Drains~~,~~ and Cleanouts ~~for Residential Construction~~	IPC							

ASME A112.18.1/CSA B125—01 05	Plumbing Supply Fittings	IPC	IRC						
ASME A112.18.2/CSA B125.2—2005	Plumbing Waste Fittings	IPC	IRC						
B125.3—2005	Plumbing Fittings	IPC	IRC						
B137.1—02 05	Polyethylene (PE) Pipe, Tubing and Fittings for Cold Water Pressure Services	IPC	IRC						
B137.2—02 05	Polyvinylchloride PVC Injection-moulded Gasketed Fittings for Pressure Applications	IPC	IRC						
B137.3—02 05	Rigid poly(vinylchloride) (PVC) Pipe for Pressure Applications	IPC	IRC	IPSDC					
B137.5—02 05	Cross-linked Polyethylene (PEX) Tubing Systems for Pressure Applications—with Revisions through September 1992	IPC	IRC						
B137.6—02 05	Chlorinated polyvinylchloride CPVC Pipe, Tubing and Fittings for Hot and Cold Water Distribution Systems—with Revisions through May 1986	IPC	IRC						
B137.9-02 05	Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure -Pipe Systems	IPC	IRC	IMC					
B137.10M—02 05	Cross-linked Polyethylene/Aluminum/Cross-linked Polyethylene (PEX-AL-PEX) Composite Pressure Pipe Systems	IPC	IRC	IMC					
B137.11—02 05	Polypropylene (PP-R) Pipe and Fittings for Pressure Applications	IPC	IRC						
B181.1—02 06	Acrylonitrile-butadiene-styrene (ABS) Drain, Waste and Vent Pipe and Pipe Fittings	IPC	IRC	IPSDC					
B181.2—02 06	Polyvinylchloride (PVC) and chlorinated polyvinylchloride (CPVC) Drain, Waste, and Vent Pipe and Pipe Fittings—with Revisions through December 1993	IPC	IRC	IPSDC					
B181.3—02 06	Polyolefin and polyvinylidene (PVDF) Laboratory Drainage Systems	IPC	IRC						
B182.1—02 06	Plastic Drain and Sewer Pipe and Pipe Fittings	IPC	IPSDC						
B182.2—02 06	(PSM Type) polyvinylchloride (PVC) Sewer Pipe and Fittings	IPC	IRC	IPSDC					
B182.4—02 06	Profile polyvinylchloride (PVC) Sewer Pipe and Fittings	IPC	IRC	IPSDC					
B182.6—02 06	Profile Polyethylene Sewer Pipe and Fittings for Leak-proof Sewer Applications	IPC	IRC						
B182.8—02 06	Profile Polyethylene (PE) Storm Sewer and Drainage Pipe and Fittings	IPC	IRC						
B602—02 05	Mechanical Couplings for Drain, Waste and Vent Pipe and Sewer Pipe.	IPC	IRC	IPSDC					

DOC	United States Department of Commerce								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
16 CFR Part 1632-~~1999~~ (2009)	Standard for the Flammability of Mattress and Mattress Pads (FF4-72 Amended)	IFC							
PS 1-~~07~~ 09	Structural Plywood	IBC							
PS 2-~~04~~10	Performance Standard for Wood-based Structural-use Panels	IBC							
DOL	**U.S. Department of Labor**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
29 CFR Part 1910.1000 (~~1974~~) 2009	Air Contaminants	IBC	IFC	IMC					
29 CFR Part 1910.1200 (~~1999~~) 2009	Hazard Communication	IFC							
29 CFR Part 1910-1025 (2009)	Toxic and Hazardous Substances	IMC							
DOTn	**U.S. Department of Transportation**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
49 CFR Parts 100-185-2005	Hazardous Materials Regulations	IBC	IFC						
49 CFR—1998	Specification of Transportation of Explosive and Other Dangerous Articles, UN 0335,UN 0336 Shipping Containers	IBC							
49 CFR Part 172— ~~2005~~ 2009	Hazardous Materials Tables, Special Provisions, Hazardous Materials Communications, Emergency Response Information and Training Requirements	IFC							
49 CFR Part 173—~~2005~~ 2009	Shippers—General Requirements for Shipments and Packagings	IFC							
49 CFR Parts 173.137 ~~-2005~~ (2009)	Shippers-General Requirements for Shipments and Packaging-Class 8-Assignment of Packing Group	IBC	IFC						
49 CFR, Parts 192.281(e) & 192.283 (b) - (2009)	Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards	IRC	IFGC						
FEMA	**Federal Emergency Management Agency**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
FEMA-TB-2-~~93~~ 08	Flood Damage-Resistant Materials Requirements	IRC							
FEMA ~~FIA~~-TB-11-01	Crawlspace Construction for Buildings Located in Special Flood Hazard Areas	IBC	IRC						

GA	Gypsum Association								
Standard ReferenceNumber	**Title**	**Referenced in Code(s):**							
GA 600-~~06~~ 09	Fire Resistance Design Manual, 18th Edition	IBC							
HPVA	**Hardwood Plywood and Veneer Association**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
ANSI/HP-1-20~~04~~ 09	Standard for Hardwood and Decorative Plywood	IBC	IRC						

HUD	U.S. Department of Housing and Urban Development								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
HUD 24 CFR Part 3280 (~~1994~~) 2008	Manufactured Home Construction and Safety Standards	IBC							
ICC	**International Code Council**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
ICC/ANSI A117-~~03~~ 2009	Accessible and Usable Buildings and Facilities	IBC	IFC	IZC	IEBC				
ICC 300-~~07~~ 12	ICC Standard on Bleachers, Folding and Telescopic Seating, and Grandstands	IBC	IFC						
ICC 400-~~07~~ 12	Standard for the Design and Construction of Log Structures	IRC							
ICC~~/ANSI~~ A117.1-~~03~~ 09	Accessible and Usable Buildings and Facilities	IBC	IFC	IZC	IEBC	IRC			
IBC-~~09~~ 12	International Building Code	IRC	IFC	IMC	IPC	IPSDC	IFGC	IECC	IEBC
ICCPC-~~09~~ 12	International Performance Code								
IEBC-~~09~~ 12	International Existing Building Code	IBC	IRC	IFC	IMC	IFGC	IECC	IPMC	
IECC-~~09~~ 12	International Energy Conservation Code	IBC	IRC	IMC	IPC	IFGC	IEBC		
IFC-~~09~~ 12	International Fire Code	IBC	IRC	IMC	IPC	IFGC	IECC	IEBC	IPMC
IFGC-~~09~~ 12	International Fuel Gas Code	IBC	IRC	IFC	IMC	IPC	IECC	IEBC	
IMC-~~09~~ 12	International Mechanical Code	IBC	IRC	IFC	IPC	IFGC	IECC	IEBC	IPMC
IPC-~~09~~ 12	International Plumbing Code	IBC	IRC	IFC	IMC	IPSDC	IFGC	IECC	IEBC
IPMC-~~09~~ 12	International Property Maintenance Code	IBC	IRC	IFC	IEBC				
IPSDC-~~09~~ 12	International Private Sewage Disposal Code	IBC	IRC	IPC					
IRC-~~09~~ 12	International Residential Code	IBC	IFC	IMC	IFGC	IEBC	IPC		
IWUIC-~~09~~ 12	International Wildland-Urban Interface Code	IBC	IFC						
IZC-~~09~~ 12	International Zoning Code	IPMC							

NAAMM	National Association of Architectural Metal Manufacturers								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
FP 1001-~~97~~ 07	Guide Specification for Design of Metal Flag Poles	IBC							
NAIMA	**North American Insulation Manufacturers Association**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
AH 116-~~02~~ 09	Fibrous Glass Duct Construction Standards, Fifth Edition	IMC	IRC						

NFPA	National Fire Protection Association								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
10-~~07~~ 10	Portable Fire Extinguishers	IFC	IBC						
11-~~05~~ 10	Low-, Medium-, and High-Expansion Form	IFC	IBC						
12-~~05~~ 11	Carbon Dioxide Extinguishing Systems	IFC	IBC						
12A-~~04~~ 09	Halon 1301 Fire Extinguishing Systems	IFC	IBC						
13-~~07~~ 10	Installation of Sprinkler Systems	IFC	IBC	IRC					
13D-~~07~~ 10	Installation of Sprinkler Systems in One- and Two Family Dwellings and Manufactured Homes	IFC	IRC	IBC					
13R-~~07~~ 10	Installation of Sprinkler Systems in Residential Occupancies Up to and Including Four Stories in Height	IFC	IBC	IEBC					
14-~~07~~ 10	Installation of Standpipe and Hose Systems	IFC	IBC						
15-~~07~~ 12	Water Spray Fixed Systems for Fire Protection	IFC							
16 - ~~07~~ 11	Installation of Foam-Water Sprinkler and Foam-Water Spray Systems	IFC	IBC						
17-~~02~~ 09	Dry Chemical Extinguishing Systems	IFC	IBC						
17A-~~02~~ 09	Wet Chemical Extinguishing Systems	IFC	IBC						
20-~~07~~ 10	Installation of Stationary Pumps for Fire Protection	IFC	IBC						
22-~~03~~ 08	Water Tanks for Private Fire Protection	IFC							
24-~~07~~ 10	Installation of Private Fire Service Mains and Their Appurtenances	IFC							
25-~~08~~ 11	Inspection, Testing and Maintenance of Water-Based Fire Protection Systems	IFC	IPMC						

30-~~08~~ 12	Flammable and Combustible Liquids Code	IFC	IBC						
30A-~~08~~ 12	Code for Motor Fuel Dispensing Facilities and Repair Garages	IFC	IMC	IFGC					
30B-~~07~~ 11	Manufacture and Storage of Aerosol Products	IFC							
31-~~06~~ 11	Installation of Oil-Burning Equipment	IFC	IRC	IMC					
32-~~07~~ 11	Drycleaning Plants	IFC	IBC						
33-~~07~~ 11	Spray Application Using Flammable or Combustible Materials	IFC							
34-~~07~~ 11	Dipping and Coating Processes Using Flammable or Combustible Liquids	IFC							
35-~~05~~ 11	Manufacture of Organic Coatings	IFC							
37-~~06~~ 10	Installation and Use of Stationary Combustion Engines and Gas Turbines	IMC	IFGC	IBC					
40-~~07~~ 11	Storage and Handling of Cellulose Nitrate Film	IFC	IBC						
45-~~04~~ 10	Standard on Fire Protection for Laboratories Using Chemicals	IBC							
51A-~~06~~ 11	Acetylene Cylinder Charging Plants	IFC							
52-~~06~~ 10	Vehicular Fuel System Code	IFC							
55-~~05~~ 10	Standard for the Storage, Use and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationery Containers Cylinders and Tanks	IFC							
58-~~08~~ 11	Liquefied Petroleum Gas Code	IFC	IBC	IRC	IMC	IFGC			
59A-~~06~~ 09	Production, Storage and Handling of Liquefied Natural Gas (LNG)	IFC							
70-~~08~~ 11	National Electrical Code	IFGC	IPC	IEBC	IBC	IWUIC	IFC	IRC	IMC
72-~~07~~ 10	National Fire Alarm Code	IFC	IBC	IRC	IMC	IEBC			
80-~~07~~ 10	Fire Doors and Other Opening Protectives	IFC	IBC						
82-~~04~~ 09	Incinerators, Waste and Linen Handling Systems and Equipment	IMC	IFGC						
85-~~07~~ 11	Boiler and Construction Systems Hazards Code	IFC	IBC	IRC	IFGC				
86-~~07~~ 11	Ovens and Furnaces	IFC							
88A-~~02~~ 11	Parking Structures	IFGC							
91-~~04~~ 10	Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Noncombustible Particulate Solids	IMC							
92B-~~05~~ 09	Smoke Management Systems in Malls, Atria, and Large Spaces	IFC	IBC	IMC					
99-~~05~~ 10	Health Care Facilities	IBC	IFC	IEBC					
101-~~06~~ 12	Life Safety Code	IBC	IFC	IEBC					
105-~~0~~7 10	Installation of Smoke Door Assemblies and Other Opening Protectives	IBC	IFC						
110-~~05~~ 10	Emergency and Standby Power Systems	IFC	IBC						
111-~~05~~ 10	Stored Electrical Energy Emergency and Standby Power Systems	IFC	IBC						
120-~~04~~ 10	Fire Prevention and Control in Coal Mines	IFC	IBC						

160-~~06~~ 11	Flame Effects Before an Audience	IFC							
170-~~06~~ 09	Standard for Fire Safety and Emergency Symbols	IFC	IBC						
211-~~06~~ 10	Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances	IMC	IBC	IRC	IFC	IFGC			
241-~~04~~ 09	Safeguarding Construction, Alteration, and Demolition Operations	IFC							
252-~~03~~ 12	Standard Methods of Fire Tests of Door Assemblies	IBC							
253-~~06~~ 11	Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source	IBC							
257-~~07~~ 12	Standard on Fire Test for Window and Glass Block Assemblies	IBC							
259-~~03~~ 08	Test Method for Potential Heat of Building Materials	IBC	IRC						
260-~~03~~ 09	Methods of Tests and Classification System for Cigarette Ignition Resistance of Components of Upholstered Furniture	IFC							
261-~~03~~ 09	Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes	IFC							
262-~~07~~ 11	Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces	IMC	IBC						
265-~~07~~ 11	Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Coverings on Full Height Panels and Walls	IBC	IFC						
268-~~07~~ 12	Standard Test Method for Determining Ignitibility of Exterior Wall Assemblies Using a Radiant Heat Energy Source	IBC							
285-~~06~~ 11	Method of Test for the Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components	IBC							
286-~~06~~ 11	Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth	IFC	IBC	IRC					
288-~~07~~ 12	Standard Methods of Fire Tests of Floor Fire Door Assemblies Installed Horizontally Fire-Resistance-Rated Floor Systems	IBC							
303-~~06~~ 11	Fire Protection Standards for Marinas and Boatyards	IFC	IBC						
407-~~07~~ 12	Aircraft Fuel Servicing	IFC							
409-~~04~~ 10	Aircraft Hangers	IFC	IBC						
418-~~06~~ 11	Heliports	IBC							
430-~~04~~ 10	Storage of Liquid and Solid Oxidizers	IFC							
484-~~06~~ 12	Combustible Metals	IFC							
490-~~02~~ 10	Storage of Ammonium Nitrate	IFC							
495-~~06~~ 10	Explosive Materials Code	IFC							

498-~~06~~ 10	Safe Havens and Interchange Lots for Vehicles Transporting Explosives	IFC							
501-~~05~~ 10	Manufactured Housing	IRC							
505-~~06~~ 10	Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance, and Operations	IFC							
654-~~06~~ 11	Prevention of Fire & Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids	IBC	IFC						
655-~~07~~ 12	Prevention of Sulfur Fires and Explosions	IBC	IFC						
664-~~07~~ 12	Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities	IBC	IFC						
701-~~04~~ 10	Methods of Fire Tests for Flame-Propagation of Textiles and Films	IFC	IBC						
703-~~06~~ 12	Fire Retardant Treated Wood and Fire Retardant Coatings for Building Materials	IFC							
704-~~07~~ 12	System for the Identification of the Hazards of Materials for Emergency Response	IFC	IMC	IBC					
750-~~06~~ 10	Water Mist Fire Protection Systems	IFC							
853-~~07~~ 10	Installation of Stationary Fuel Cell Power Systems	IMC	IBC	IFGC	IRC				
1123-~~06~~ 10	Fireworks Display	IFC							
1124-~~06~~ 12	Manufacture, Transportation, Storage and Retail Sales of Fireworks and Pyrotechnic Articles	IFC	IBC						
1125-~~07~~ 12	Manufacture of Model Rocket and High Power Rocket Motors	IFC							
1126-~~06~~ 11	Use of Pyrotechnics Before a Proximate Audience	IFC							
1142-~~07~~ 12	Water Supply for Suburban and Rural Fire Fighting	IFC							
1620-~~03~~ 10	Recommended Practice for Pre-Incident Planning	IBC							
2001-~~08~~ 11	Clean Agent Fire Extinguishing Systems	IFC	IBC						
NFRC	**National Fenestration Rating Council Inc.**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
100-~~2004~~ 2009	Procedure for Determining Fenestration Product U-factors	IRC	IECC						
200-~~2004~~ 2009	Procedure for Determining Fenestration Product Solar Heat Gain Coefficients and Visible Transmittance at Normal Incidence	IRC	IECC						
400-~~2004~~ 2009	Procedure for Determining Fenestration Product Air Leakage - Second Edition	IRC	IECC						

NSF	NSF International								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
3—~~2007~~ 2008	Commercial Warewashing Equipment	IPC							
14—~~2007~~ 2008e	Plastics Piping System Components and Related Materials	IPC	IRC						
40-~~2000~~2005	Residential Wastewater Treatment Systems	IPSDC							
41-~~1999~~2005	Non-Liquid Treatment Systems (Composting Toilets)	IPSDC							
42—2007a~~e~~	Drinking Water Treatment Units—Aesthetic Effects	IPC							
44—~~2000~~2007	Residential Cation Exchange Water Softeners	IPC	IRC						
53—2007a	Drinking Water Treatment Units—Health Effects	IPC	IRC						
58—~~2006~~2007	Reverse Osmosis Drinking Water Treatment Systems	IPC	IRC						
61—~~2007e~~2008	Drinking Water System Components—Health Effects	IPC	IRC						
62—~~2004~~2007	Drinking Water Distillation Systems	IPC							
PCA	**Portland Cement Association**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
100-~~07~~ 10	Prescriptive Design of Exterior Concrete Walls for One- And Two- Family Dwellings (Pub. No. EB241)	IRC							
SDI	**Steel Deck Institute**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
NC~~1.0-06~~ 10	Standard for Non-Composite Steel Floor Deck	IBC							
RD~~1.0-06~~ 10	Standard for Steel Roof Deck	IBC							
SJI	**Steel Joist Institute**								
Standard ReferenceNumber	**Title**	**Referenced in Code(s):**							
~~CJ-1.0-06~~ CJ-10	Standard Specification for Composite Steel Joists, CJ-Series	IBC							
~~JG-1.1 (2005)~~ JG-10	Standard Specification for Joist Girders	IBC							
~~K-1.1 (2005)~~ K-10	Standard Specification for Open Web Steel Joists, K-Series	IBC							
~~LH/DLH-1.1 (2005)~~ LH/DLH-10	Standard Specification for Longspan Steel Joists, LH Series and Deep Longspan Steel Joists, DLH Series	IBC							

SMACNA	Sheet Metal & Air Conditioning Contractors National Assoc. Inc.								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
SMACNA-~~85~~ 10	HVAC Air Duct Leakage Test Standard 2010	IECC							
SPRI	**Single-Ply Roofing Institute**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
ANSI/SPRI/FM4435-ES-1	Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems	IBC							
ANSI/SPRI RP-4-~~02~~ 08	Wind Design Guide for Ballasted Single-ply Roofing Systems	IBC							
TIA	**Telecommunications Industry Association**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
222-G-2005	Structural Standards for Antenna Supporting Structures and Antennas, including - Addendum 1, 222-G-1 Dated 2007 and Addendum 2, 222-G-2 Dated 2009	IBC							
TMS	**The Masonry Society**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
402-~~08~~ 11	Building Code for Masonry Structures	IBC	IRC						
602-~~08~~ 11	Specification for Masonry Structures	IBC	IRC						
UL	**Underwriters Laboratories**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
10A-~~1998~~ 2009	Tin Clad Fire Doors ~~– with Revisions through March 2003~~	IBC							
10B-~~1997~~ 2008	Fire Tests of Door Assemblies - with Revisions through ~~October 2001~~ April 2009	IBC							
10C-~~1998~~ 2009	Positive Pressure Fire Tests of Door Assemblies ~~– with Revisions through November 2001~~	IBC							
14B-~~1998~~ 2008	Sliding Hardware for Standard Horizontally Mounted Tin Clad Fire Doors ~~– with Revisions through July 2000~~	IBC							
14C-2006	Swinging Hardware for Standard Tin Clad Fire Doors Mounted Singly and in Pairs - with revisions through December 2008	IBC							

17-1994	Vent or Chimney Connector Dampers for Oil-Fired Appliances ~~- with Revisions through September 1999~~	IMC	IRC						
30-~~04~~ 95	Metal Safety Cans - with Revisions through December 2004	IFC							
80-20~~04~~ 07	Steel Tanks for Oil-Burner Fuel	IRC							
127-~~96~~ 08	Factory-Built Fireplaces ~~- with Revisions through November 2006~~	IMC	IRC	IBC	IFGC				
174-04	Household Electric Storage Tank Water Heaters - with Revisions through ~~November 2005~~ April 2009	IMC	IRC						
181-2005	Factory-Made Air Ducts and Connectors - with revisions through October 2008	IMC	IRC						
181A-2005	Closure Systems for Use with Rigid Air Ducts - with revisions through February 2008	IMC	IRC						
181B-2005	Closure Systems for Use with Flexible Air Ducts and Air Connectors - with revisions through February 2008	IMC	IRC						
207-~~2001~~ 2009	Refrigerant-Containing Components and Accessories, Nonelectrical-~~with Revisions through November 2004~~	IMC							
217–2006	Single and Multiple Stations Smoke Alarms - with revisions through ~~May 2007~~ October 2008	IBC	IRC	IFC					
263–2003	Standard for Fire Tests of Building Construction and Materials	IBC	IRC	IMC					
268A-~~1998~~ 2008	Smoke Detectors for Duct Application - ~~with Revisions through April 2006~~	IMC							
300-2005	Fire Testing of Fire Extinguishing Systems for Protection of ~~Restaurant~~ Commercial Cooking Equipment	IBC	IFC						
305-~~07~~ 97	Panic Hardware - with revisions through January 2007	IBC							
325-2002	Door, Drapery, Gate, Louver and Window Operators and Systems - with Revisions through ~~February 2006~~ January 2009	IRC	IFC	IBC					
343-~~1997~~ 2008	Pumps for Oil-Burning Appliances~~- with Revisions through May 2006~~	IMC	IRC						
412-2004	Refrigeration Unit Coolers - with Revisions through ~~February 2007~~ January 2009	IMC							
471-2006	Commercial Refrigerators and Freezers - with Revisions through ~~March 2006~~ October 2008	IMC							
508—99	Industrial Control Equipment - with Revisions through ~~July 2005~~ September 2008	IMC	IPC	IRC					
555–2006	Fire Dampers - with revisions through February 2009	IBC	IMC						
555C–2006	Ceiling Dampers - with revisions through March 2009	IBC	IMC						
555S–1999	Smoke Dampers - with Revisions through ~~July 2006~~ March 2009	IBC	IMC						

586–1996	High-Efficiency, Particulate, Air Filter Units - with Revisions through August ~~2004~~ 2008	IMC							
651–05	Schedule 40 and 80 Rigid PVC Conduit and Fittings - with revisions through July 2008	IFGC	IRC						
710B-2004	Recirculating Systems with Revisions through April 2006	IMC	IFC	IBC					
723—~~03~~ 2008	Standard for Test for Surface Burning Characteristics of Building Materials, ~~with Revisions through May 2005~~	IBC	IFC	IWUIC	IRC	IMC			
729-03	Oil-Fired Floor Furnaces – with revisions through ~~January 1999~~ October 2008	IMC	IRC						
730-03	Oil-Fired Wall Furnaces-with revisions through ~~January 1999~~ October 2008	IMC	IRC						
731-1995	Oil-Fired Unit Heaters with Revisions ~~through February 2006~~ December 2008	IMC	IECC						
737-~~1996~~ 2007	Fireplaces Stoves ~~- with Revisions through January 2000~~	IMC	IRC						
790-04	Standard Test~~s~~ Methods for Fire Tests ~~Resistance~~ of Roof Coverings ~~Materials~~ - with revisions through October 2008	IBC	IRC						
793-~~03~~ 08	Automatically Operated Roof Vents For Smoke and Heat ~~with Revisions through April 2004~~	IBC	IFC						
834-04	Heating, Water Supply, and Power Boilers - Electric with Revisions through ~~March 2006~~ April 2009	IRC	IMC						
858-05	Household Electric Ranges - with Revisions through ~~April 2006~~ November 2007	IMC							
864-03	Standard for Control Units and Accessories for Fire Alarm Systems-with Revisions through ~~March 2006~~ May 2007	IBC	IFC						
867-00	Electrostatic Air Cleaners-with Revisions through ~~February 2004~~ December 2007	IMC							
875-~~04~~ 09	Electric Day Bath Heaters - with ~~Revisions through March 2006~~	IMC	IRC						
896-1993	Oil-Burning Stoves - with Revisions through ~~May 2004~~ December 2008	IMC	IRC						
900-04	Air Filter Units - with revisions through November 2007	IMC	IFC						
923-~~2002~~ 2008	Microwave Cooking Appliances ~~- with Revisions through February 2006~~	IMC	IRC						
924-06	Emergency Lighting and Power Equipment - with revisions through January 2009	IBC	IFC						

1040-1996	Fire Test of Insulated Wall Construction - with Revisions through ~~June 2001~~ September 2007	IBC	IRC						
1240-2005	Electric Commercial Clothes~~-~~ ~~Drying Equipment~~	IMC							
1261-2001	Electric Water Heaters for Pools and Tubs - with Revisions through ~~April 2006~~ May 2008	IMC	IRC						
1313-93	Standard for Nonmetallic Safety Cans for Petroleum Products- with Revisions through ~~May 2003~~ August 2007	IFC							
1315-95	Standard for Safety for Metal Waste Paper containers-with Revisions through ~~December 2003~~ August 2007	IFC							
1363-2007	Relocatable Power Taps - with revisions through August 2008	IFC							
1453-04	Electric Booster and Commercial Storage Tank Water Heaters - with Revisions through ~~May 2006~~ April 2009	IMC	IRC						
1479-03	Fire Tests of Through-Penetration Firestops with Revisions through ~~April 2007~~ December 2008	IBC	IRC						
1715-1997	Fire Test of Interior Finish Material - with Revisions through ~~March 2004~~ April 2008	IBC	IRC						
1738-~~06~~ 1993	Venting Systems for Gas-Burning Appliances, Categories II, III and IV - with revisions through October 2006	IRC	IFGC						
1777-~~04~~ 2007	Chimney Liners	IMC	IRC	IBC	IFGC				
1812-~~05~~ 1995	Standard for Ducted Heat Recovery Ventilators - with revisions through ~~January 2006~~ March 2009	IMC							
1820-2004	Fire Test of Pneumatic Tubing for Flame and Smoke Characteristics - with revisions through February 2009	IMC							
1887-2004	Fire Tests of Plastic Sprinkler Pipe for Visible Flame and Smoke Characteristics~~-~~ - with revisions through February 2009	IMC							
1897-2004	Uplift Tests for Roof Covering Systems - with revisions through May 2008	IBC							
1978-~~95~~ 05	Grease Ducts	IMC							
2017-~~2000~~ 2008	Standards for General-Purpose Signaling Devices and Systems~~-~~ ~~with Revisions through August 2005~~	IBC	IRC						
2034-2008	Standard for Single and Multiple Station Carbon Monoxide Alarms~~-~~ - with revisions through February 2009	IRC							

2043-~~1996~~ 2008	Fire Test for Heat and Visible Smoke Release for Discrete Products and their Accessories Installed in Air-Handling Spaces ~~- with Revisions through June 2001~~	IBC	IMC						
2075-~~2007~~ 2004	Standard for Gas and Vapor Detectors and Sensors - with revisions through September 2007	IFC							
2079-2004	Tests for Fire Resistance of Building Joint Systems with Revisions through ~~March 2006~~ June 2008	IBC	IFC						
2158-1997	For Electric Clothes Dryer**s** - with Revisions through ~~May 2004~~ March 2009	IMC							
2200-~~04~~ 98	Stationary Engine Generator Assemblies with Revisions through July 2004	IBC	IFC	IMC	IFGC				
WDMA	**Window and Door Manufacturers Association**								
Standard Reference Number	**Title**	**Referenced in Code(s):**							
AAMA/WDMA/CSA 101/i.S.2/A440-~~08~~ 11	North American Fenestration	IBC	IRC	IECC					

Reason: *The CP 28 Code Development Policy, Section 4.5.1 requires the updating of referenced standards to be accomplished administratively, and be processed as a Code Change Proposal for consideration by the Administrative Code Change Committee. In May 2009, a letter was sent to each developer of standards that is referenced in the International Codes, asking them to provide ICC with a list of their standards in order to update to the current edition. Above is the list of the referenced standards that are to be updated based upon responses from standards developer*

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE-FIRE SAFETY COMMITTEE

FIRE SAFETY CODE COMMITTEE

Daniel Nichols, PE - *Chair*
Fire Protection Engineer
State of New York Division of Code Enforcement
Albany, NY

Gene Boecker, AIA – *Vice Chair*
Project Manager
Code Consultants Inc.
St. Louis, MO

Anthony Apfelbeck, CBO
Rep: International Association of Fire Chiefs
Fire Marshal/Building Official
City of Altamonte Springs Florida
Altamonte Springs, FL

Kenneth Bush
Rep: National Association of State Fire Marshals
Senior Fire Protection Engineer
Maryland Office of State Fire Marshal
Easton, MD

Douglas Evans, PE
Fire Protection Engineer
Clark County Dept. of Dev. Services
- Bldg Div.
Las Vegas, NV

W. Jay Hall, CBO
Codes Specialist
Virginia Masonry Association
Mechanicsville, VA

Marcelo Hirschler
GBH International
Mill Valley, CA

Howard Hopper, PE
Manager, Regulatory Services
Underwriters Laboratories
San Jose, CA

Steve Mills, CBO
Director of Building and Codes
City of Hendersonville
Hendersonville, TN

Lorin Neyer
Regional Compliance Officer
California Office of Statewide Health
Planning & Dev. - CA
Manteca, CA

Tim Pate, CBO
Senior Plans Analyst
City and County of Broomfield Building
Department
Broomfield, CO

Michael Pokorny, PE
Fire Protection Engineer
Montgomery County Department of Permitting
Service
Rockville, MD

Michael Shannon, PE, CBO
Development Services Engineer
City of San Antonio, Development
Services Department
San Antonio, TX

Jerry Tepe, FAIA
Architect
JRT-AIA-Architect
Hopkinton, NH

Michael Whalen
Code Specialist
New Jersey Department of Community Affairs
Trenton, NJ

Staff Secretariat:
Ed Wirtschoreck, LA
Manager, Standards
International Code Council

TENTATIVE ORDER OF DISCUSSION

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE

FIRE SAFETY

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does **not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair.

FS1-09/10
FS2-09/10
FS3-09/10
FS4-09/10
FS5-09/10
FS6-09/10
FS7-09/10
FS8-09/10
FS9-09/10
FS10-09/10
    G42-09/10
    G41-09/10
FS11-09/10
FS12-09/10
FS13-09/10
FS14-09/10
FS15-09/10
FS16-09/10
FS17-09/10
FS18-09/10
FS19-09/10
FS20-09/10
FS21-09/10
FS22-09/10
FS23-09/10
FS24-09/10
FS25-09/10
FS26-09/10
FS27-09/10
FS28-09/10
FS29-09/10, Part I
FS29-09/10, Part II
FS30-09/10
FS31-09/10
FS32-09/10
FS33-09/10
FS34-09/10
FS35-09/10
FS36-09/10
FS37-09/10
FS38-09/10
FS39-09/10
FS40-09/10
FS41-09/10
FS42-09/10
FS43-09/10
FS44-09/10
FS45-09/10
FS46-09/10
FS47-09/10
FS48-09/10
FS49-09/10
FS50-09/10
FS51-09/10
FS52-09/10
FS53-09/10
FS54-09/10
FS55-09/10
FS56-09/10
FS57-09/10
FS58-09/10
FS59-09/10
FS60-09/10
FS61-09/10
FS62-09/10
FS63-09/10
FS64-09/10
FS65-09/10
FS66-09/10
FS67-09/10
FS68-09/10
FS69-09/10
FS70-09/10
FS71-09/10
FS72-09/10
FS73-09/10
FS74-09/10
FS75-09/10
FS76-09/10
FS77-09/10
FS78-09/10
FS79-09/10
FS80-09/10
FS81-09/10
FS82-09/10
FS83-09/10
FS84-09/10
FS85-09/10
FS86-09/10
FS87-09/10
FS88-09/10
FS89-09/10
FS90-09/10
FS91-09/10
FS92-09/10
FS93-09/10
FS94-09/10
FS95-09/10
FS96-09/10
FS97-09/10
FS98-09/10
FS99-09/10
FS100-09/10
FS101-09/10, Part I
FS101-09/10, Part II
FS102-09/10
FS103-09/10
FS104-09/10
FS105-09/10
FS106-09/10
FS107-09/10
FS108-09/10
FS109-09/10
FS110-09/10
FS111-09/10
FS112-09/10
FS113-09/10
FS114-09/10
FS115-09/10
FS116-09/10
FS117-09/10
FS118-09/10, Part I
FS119-09/10
FS120-09/10
FS121-09/10
FS122-09/10
FS123-09/10
FS124-09/10, Part I
FS124-09/10, Part II
FS125-09/10
FS126-09/10
FS127-09/10
FS128-09/10
FS129-09/10
FS130-09/10
FS131-09/10
FS132-09/10
FS133-09/10, Part I
FS133-09/10, Part II
FS134-09/10
FS135-09/10
FS136-09/10, Part I
FS136-09/10, Part II
FS137-09/10
FS138-09/10
FS139-09/10
FS140-09/10, Part I
FS141-09/10
FS142-09/10
FS143-09/10
FS144-09/10, Part I
FS145-09/10
FS146-09/10
    RB169-09/10, Part II
FS147-09/10, Part I
FS150-09/10, Part I
FS151-09/10, Part I
    RB122-09/10, Part II
FS152-09/10
    RB123-09/10, Part II
    RB126-09/10, Part II
FS153-09/10
FS154-09/10
    RB120-09/10, Part II
    RB125-09/10, Part II
FS155-09/10, Part I
FS157-09/10
FS158-09/10

FS159-09/10
FS160-09/10, Part I
FS161-09/10
FS162-09/10
FS163-09/10
FS164-09/10
- S10-09/10
- S11-09/10
- S12-09/10
- S13-09/10
- S24-09/10
- S25-09/10
- S126-0910
- ADM23-09/10
- S127-09/10
- S128-09/10

FS165-09/10
FS166-09/10
FS167-09/10
FS168-09/10, Part I
FS169-09/10, Part I
FS170-09/10
FS171-09/10, Part I
FS172-09/10
FS173-09/10
FS174-09/10
FS175-09/10
FS176-09/10, Part I
FS177-09/10
FS178-09/10
FS179-09/10
FS181-09/10
FS182-09/10
FS183-09/10
FS184-09/10
FS185-09/10
FS186-09/10
FS187-09/10
FS188-09/10
FS190-09/10

FS1–09/10
701.1

Proponent: Sarah A. Rice, CBO, representing self

1. Revise as follows:

CHAPTER 7

CONSTRUCTION OF HORIZONTAL AND VERTICAL ASSEMBLIES
~~**FIRE AND SMOKE PROTECTION FEATURES**~~

2. Revise as follows:

SECTION 701 GENERAL

701.1 Scope. The provisions of this chapter shall govern the materials, systems and assemblies used in the construction of horizontal and vertical assemblies used to separate adjacent buildings, stories, rooms or spaces ~~for structural *fire resistance* and fire-resistance-rated construction separation of adjacent spaces to safeguard against the spread of fire and smoke within a building and the spread of fire to or from buildings~~.

Reason: This code change is one in a series of code changes intended to add clarity to the provisions of Chapter 7. Unless otherwise specifically stated, each code change can be accepted on its own merits.
Chapter 7 is currently titled "Fire and Smoke Protection Features" and yet it contains provisions for nonfire- and nonsmoke-resistance rated assemblies. Through a series of code changes, including this one, it is hoped that it becomes clear that Chapter 7 regulates both fire/smoke and nonfire/nonsmoker-resistance rated vertical and horizontal (floors, roofs and walls) assemblies.

This code change addresses the title of Chapter 7 and Sections 701 (General).

The changes to the title and to Section 701 is made to make it clear that the provisions found in Chapter 7 are not just fire resistance rated or smoke protected assemblies but to all Vertical and Horizontal assemblies regardless of their rating.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-FS1a-701.1

FS2–09/10
701.2 (New)

Proponent: Stephen Thomas, Colorado Code Consulting, LLC, representing the Colorado Chapter

Add new text as follows:

701.2 Multiple use fire assemblies. Fire assemblies that serve multiple purposes in a building shall comply with all of the requirements that are applicable for each of the individual fire assemblies.

Reason: A single fire assembly can serve multiple purposes in a structure. For example, a fire barrier along a fire-resistant rated corridor would also serve as a fire partition. The current code does not provide any direction on what requirements apply to that assembly. The intent of this proposal is to clarify that the requirements for each of the different assemblies must be met. In the example above, an opening protective would need to comply with the not only the fire-resistance rating for a fire barrier, but also the smoke and draft control requirements for an opening in a fire partition.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THOMAS-FS1-701.2 (New)

FS3–09/10
702.1

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., representing International Firestop Council

Revise as follows:

JOINT. The ~~linear opening~~ void created at the interface in or between adjacent fire-resistance-rated ~~assemblies~~ building elements that is created due to building tolerances, or is designed to allow independent movement of the building in any plane caused by thermal, seismic, wind or any other loading.

Reason: The purpose of this proposal is to clarify that a "Joint", as defined in the IBC, may or may not be linear, and that the Joint is not the "opening" between fire resistance rated assemblies, but rather the materials or methods used to treat these openings

Justification: "Joints" are interfaces created in or between building elements such as walls, floors, columns or other building items. A joint typically involves a continuous void at the interface of two or more distinct components. When joints are designed into a structure, they are intended to allow independent movement of the building in any plane caused by thermal, seismic, wind or any other loading. However, joints are sometimes created as a result of building construction tolerances.

In fact, a Joint is never an "opening" as the current definition suggests, but instead they are the closures that go into the opening to provide continuity. The existing language in the definition already clarifies that the definition applies to both locations that are "… designed to allow independent movement" and also those created due to construction tolerances, and need to be treated. Consequently, the additional language addresses' that portion of the scope of the definition.

.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRIMI-FS6-702.1

FS4–09/10
703.4 (New)

Proponent: Tony Crimi, AC Consulting Solutions Inc., representing International Firestop Council

Add new text as follows:

703.4 Automatic sprinklers. The fire resistance rating of a building element, component or assembly shall be established without the use of automatic sprinklers or any other fire suppression system being incorporated as part of the assembly tested in accordance with the fire exposure, procedures, and acceptance criteria specified in ASTM E119 or UL 263.

(Renumber subsequent sections)

Reason: There is a potential for misuse of established fire-resistance test Standards relied upon in the Code to determine performance of elements and assemblies, wherein the established consensus test method are modified outside the scope of the test standard to include a flow of cooling water during the fire exposure portion of the test.

Since some material manufacturers have begun to submit test reports to Authorities Having Jurisdiction with fire-resistance ratings obtained using a flow of cooling water during the fire test, it now becomes important to clarify that the code-required fire resistance rating is in fact a property that is meant to represent the inherent resistance to fire without the assistance of cooling flows. In countless instances, the code already incorporates the risk-reducing effect of a cooling flow from an extinguishing system by reducing the fire-resistance requirements, or by reducing other required safety measures.

The possibility of reducing some code requirements based on the improved behavior of an assembly when subjected to a cooling water flow can already be done via Alternative protection methods as allowed by Section 104.11, or by evaluation as a performance-based option. Thus, the only impact of this code change is to prevent a manufacturer of products from claiming an inflated fire resistance rating. The code change would not restrict anyone from proving that the addition of a cooling and/or extinguishing water flow can reduce some other requirement in the code.

It has never been the intent of either the Codes or the fire resistance testing Standards to incorporate the fire suppression system as part of the fire resistance rating of a building element, component or assembly. It would not be acceptable to have a fire-resistance rating that is determined during a test using a cooling flow, since the need for a fire resistive assembly is usually required by the Code in order to provide a an inherent passive level of fire protection. The notion of multiple safeguards and "Balanced Fire Protection" is not new to the Codes. It has long been a basic tenet that the design of every building or structure intended for human occupancy shall be such that reliance for safety to life does not depend solely on any single safeguard. Additional safeguards are provided for life safety in case any single safeguard is ineffective due to inappropriate human actions or system failure.

The resulting cooling-enhanced fire resistance rating then provides a result that would be incompatible with the required fire resistance ratings specified throughout the I-Codes. The various fire resistance ratings mandated throughout dozens of articles in the Code have been established based on an assumption of the type of construction that would pass the standardized tests without the aid of water cooling during fire exposure. For example, a relatively thin and un-insulated metal panel wall with suitable water cooling could potentially be arranged to pass a 1-hour standardized fire-resistance test, and possibly even longer duration fire-resistance tests. However, where the Code specifies the need for a 1-hour assembly, the intent in the development of that code provision would have clearly been to have an assembly that could survive a fire without being breached and

without losing any load-bearing capabilities all by itself, without relying on an external water source for continued cooling. If sprinkler protection was also required for such an occupancy, then the overall intent of the Code is to have these two systems act independently, but in concert with each other.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Standards ASTM E119 and UL 263 are currently referenced in the I-codes.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRIMI-FS3-703.4

FS5–09/10
703.4.1

Proponent: Richard Porter and Robert Sullivan, cfiFOAM, Inc., representing themselves

Revise as follows:

703.4.1 Elementary materials. Materials required to be noncombustible shall be tested in accordance with ASTM E 136.

Exception: Where foam plastic insulation is encased within either the core cells of concrete masonry wall assemblies or within the core spaces of precast hollow core concrete panel wall assemblies, the potential heat of the foam plastic insulation shall be determined in accordance with NFPA 259 and the results shall be expressed in Btu per square feet (MJ/m^2).

Reason: Section 2603 FOAM PLASTIC INSULATION makes no reference to ASTM E 136 but instead points to the significance of testing in accordance with NFPA 259 to measure the potential heat contribution of the foam plastic insulation incorporated into a wall or panel.

On one hand, NFPA 259 data shows that foam plastic insulation contributes very little fuel per square foot (MJ/W) of wall or panel area by virtue of its very low density; therefore, the presence of foam plastic insulation has little or no impact upon the fire resistance performance of a wall or panel assembly.

In measuring fuel contribution per wall or panel area, NFPA 259 data provides superior information vs. ASTM E 136 which provides only pass/fail criteria having to do with temperature rise and the fragility of foam plastic insulation.

On the other hand, foam plastic insulation offers resistance to heat flow as does any insulating material. By virtue of its encased presence within concrete masonry wall and precast concrete panel assemblies, the initial heat-up of assemblies exposed to fire is slightly retarded up to or until the point where the foam plastic insulation thermally degrades. This slight heat flow delay contributes slightly to the fire-rating of the wall assembly.

The positive contribution on the one hand is off-set by the negative contribution on the other hand.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Standard NFPA 259 is currently referenced in the I-codes.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PORTER-SULLIVAN-FS1-703.4.1

FS6–09/10
703.5.1 (New)

Proponent: Lynn Warren Manley, Staff Architect State of Illinois Department of Public Health/Health Care Facilities and Programs, representing self

Add new text as follows:

703.5 Fire-resistance-rated glazing. Fire-resistance-rated glazing, when tested in accordance with ASTM E 119 or UL 263 and complying with the requirements of Section 707, shall be permitted. Fire-resistance-rated glazing shall bear a *label* or other identification showing the name of the manufacturer, the test standard and the identifier "W-XXX," where the "XXX" is the *fire-resistance rating* in minutes. Such *label* or identification shall be issued by an agency and shall be permanently affixed to the glazing.

703.5.1 Testing. Glazing shall be considered to comply with this section only if it has been tested in accordance with ASTM E 119 or U L 723 without use or consideration of a fire suppression system.

1. Opening protection used in exterior walls in accordance with 705.8.2.
2. Glazing wall systems or window openings used in atriums as permitted under 404.6

Reason: NER-516 was originally approved by the ES Committee under BOCA and was reissued by the ICC ES Committee in Reno in 2007. According to the proponents and with supporting agreement from ES staff members. This glazing system may be used as an equivalent system in any fire barrier, with almost no limitations.

The glazing system is tempered glass, it can be no higher than 13'0" and it cannot be used for hazardous areas. However, according to ES Staff and according to the report (NER-516) there are no limitations for its use as a glazing system in any fire barriers, Including but not limited to: exit enclosures, shaft enclosures, occupancy separations, horizontal exits, etc.

The test that this system passed was a simulated E 119 test that was terminated when the sprinkler system activated. No testing was conducted that simulated total or partial failure of the sprinkler system. Thls system did not pass E 119, but the ES Committee accepts the test as equivalent.

NER-516 amounts to a sprinkler trade off, eliminating all of the requirements for fire ratings where a sprinkler system is provided and installed as proposed in the ES Report.

The proponent of the above changes suggests that NER-516 is not a demonstration of equivalency but rather a code change that has not been considered or voted on by the ICC voting members.

Cost Impact: The cost impact is negligible and not relevant when compared to the loss from fire and loss of life if NER-516 becomes widely used without limitations.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MANLEY-FS2-703.5.1 NEW

FS7–09/10
703.6

Proponent: Valarie Loper, City of North Las Vegas Building Safety

Revise as follows:

703.6 Marking and identification. Fire walls, fire barriers, fire partitions, smoke barriers, and smoke partitions or any other wall required to have protected openings or penetrations shall be effectively and permanently identified with signs or stenciling. Such identification shall:

1. Be located in accessible concealed floor floor-ceiling or attic spaces;
2. Be ~~repeated~~ located with in 15 feet (4572 mm) of the end of each wall and at intervals not exceeding 30 feet (9144mm) measured horizontally along the wall or partition; and
3. Included lettering not less than 3 inches (76 mm) ~~0.5 inch (12.7mm)~~ in height in a contrasting color incorporating the suggested wording. “FIRE AND/OR SMOKE BARRIER—PROTECT ALL OPENINGS” or other wording.

> **Exception:** Walls in Group R-2 occupancies that do not have a removable decorative ceiling allowing access to the concealed space.

Reason: I believe this is a needed code to assist in maintaining the integrity of fire resistive construction. The change to a larger size of3 Inches will better ensure that the lettering will be seen by the contractors and subcontractors that will be creating unprotected openings in protected assemblies. The contrasting color will regulate that the lettering be installed in a color that will contrast the base color of the assembly also ensuring a better chance of this identification being achieved. To install this lettering within 15 feet of the end of each wall will also aid in the ability of the persons remodeling the existing wall to be informed of the need to protect any openings made. The maintaining of a fire resistive assembly is as important as the creating of the assembly was to begin with.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LOPER-FS1-703.6.doc

FS8–09/10
704.1, 704.9 (New)

Proponent: Sarah A. Rice, CBO, representing self

1. Revise as follows:

SECTION 704
FIRE-RESISTANCE RATING OF STRUCTURAL MEMBERS

704.1 Requirements. ~~The *fire-resistance ratings* of~~ Structural members and assemblies required by Table 601 or other sections of this code to have a fire resistance rating shall comply with this section ~~and the requirements for the type of construction as specified in Table 601.~~

704.1.1 Assemblies supported by structural members. The *fire-resistance ratings* of the structural member shall not be less than the ratings required for the fire-resistance-rated assemblies supported by the structural members.

Exception: *Fire barriers*, *fire partitions*, *smoke barriers* and *horizontal assemblies* as provided in Sections 707.5, 709.4, 710.4 and 712.4, respectively.

2. Add new text as follows:

704.9 Interior walls - openings, penetrations, joints, air-transfer openings and duct openings. Openings, penetrations, joints, air-transfer openings and duct openings into and through interior walls required to be fire-resistance rated by only Table 601 are not required to be protected.

(Renumber subsequent sections)

Reason: This code change is one in a series of code changes intended to add clarity to the provisions of Chapter 7. Unless otherwise specifically stated, each code change can be accepted on its own merits.

Chapter 7 is currently titled “Fire and Smoke Protection Features” and yet it contains provisions for nonfire- and nonsmoke-resistance rated assemblies. Through a series of code changes, including this one, it is hoped that it becomes clear that Chapter 7 regulates both fire/smoke and nonfire/nonsmoker-resistance rated vertical and horizontal (floors, roofs and walls) assemblies.

This code change addresses Section and 704 (Fire-Resistance Rating of Structural Members).

The changes to Section 704 are intended to clarify how “holes” are to be regulated in interior wall assemblies that are only required to be fire resistance rated by Table 601 and by no other section in the code. Interior loadbearing walls rated by only Table 601 are not fire barriers, fire partitions, smoke partitions or smoke barriers UNLESS some other section of the code says they need to be. The proposed language makes it clear how “holes” in those walls are to be regulated .

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-FS1g-704.1

FS9–09/10
704.2, 704.3, 704.4

Proponent: Sam Francis representing American Forest & Paper Association

Revise as follows:

704.2 Column protection. Where columns are required to be fire-resistance rated, the entire column shall be provided individual encasement protection by protecting it on all sides for the full column length, including connections to other structural members, with materials having the required fire-resistance rating. Where the column extends through a ceiling, the encasement protection shall be continuous from the top of the foundation or floor/ceiling assembly below through the ceiling space to the top of the column.

Exception: Columns complying with Section 602.4, 721.1 or 721.6.3

704.3 Protection of the primary structural frame other than columns. Members of the primary structural frame other than columns that are required to have a fire-resistance rating and support more than two floors or one floor and

roof, or support a load-bearing wall or a nonload-bearing wall more than two stories high, shall be provided individual encasement protection by protecting them on all sides for the full length, including connections to other structural members, with materials having the required fire-resistance rating.

Exceptions:

1. Individual encasement protection on all sides shall be permitted on all exposed sides provided the extent of protection is in accordance with the required fire-resistance rating, as determined in Section 703.
2. Members complying with Section 602.4, 721.1 or 721.6.3

704.4 Protection of secondary members. Secondary members that are required to have a fire-resistance rating shall be protected by individual encasement protection, by the membrane or ceiling of a horizontal assembly in accordance with 712, or by a combination of both

704.4.1 Light-frame protection. King studs and boundary elements that are integral elements in load- bearing walls of light-framed construction shall be permitted to have required fire-resistance ratings provided by the membrane protection provided for the load-bearing wall.

704.4.2 Alternative protection. Structural elements complying with Section 602.4, 721.1 or 721.6.3 shall not be required to comply with Section 704.4.

Reason: Wood members of sufficiently large section to be considered heavy timber have never been required to be protected with a membrane in order to be considered heavy timber. There has been some confusion about the fire resistive properties of heavy timber as compared to the fire resistance of large members determined by the calculation methodology in Section 721. This confusion has led to a misapplication of Section 714 and its provision for protecting the member on all sides by materials having the required fire resistance. In the case of large wood members used in Type IV Construction as defined in Section 602.4, there is an inherent protection afforded the member by the char layer that forms as the timber is pyrolized. Table 601 recognizes this unique characteristic and distinguishes it from a fire resistance by utilizing the term “heavy timber” to describe this type of construction.

Moreover, the calculation methodology in Section 721 also relies on the insulating qualities of the char layer in order to calculate the size of member which will afford a sufficient sacrificial layer and still have adequate section to resist 100% of the required loads imposed on it. Accordingly, neither members complying with Section 602 nor members complying with Section 721 require further protection as required in Section 704. This code change is intended to make it clear that large wood members conforming to 602 or to 721 are not required to have this additional and redundant layer of protection.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FRANCIS-FS2-704.2

FS10–09/10
704.11

Proponent: Randy B. Maurer, Associated Building Inspections Inc., representing Pennsylvania Association of Building Code Officials, Inc.

Revise as follows:

704.11 Bottom flange protection. Fire protection is not required at the bottom flange of lintels, shelf angles and plates, spanning not more than ~~6 feet (1829mm)~~ 6 feet 4 inches (1931mm) whether part of the primary structural frame or not, and from the bottom flange of lintels, shelf angles and plates not part of the structural frame, regardless of span.

Reason: This change will accommodate the 6’-4” width of a pair of 36” doors in a hollow metal frame, which is common now due to accessibility requirements. It should not affect the safety inherent in the requirement.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Maurer-FS1-704.11

FS11–09/10
705.2, TABLE 705.2 (New)

Proponent: Gary Lampella, City of Redmond, OR, representing Oregon Building Officials Association

1. Revise as follows:

SECTION 705
EXTERIOR WALLS

705.2. Projections. Cornices, eave overhangs, exterior balconies and similar projections extending beyond the exterior wall shall conform to the requirements of this section and Section 1406. Exterior egress balconies and exterior exit stairways shall also comply with Sections 1019 and 1026, respectively. Projections shall not extend beyond the distance determined by the following ~~three~~ two methods, whichever results in the lesser projection:

1. A point one-third the distance ~~from the exterior face of the wall~~ to the lot line ~~where protected openings or a combination of protected and unprotected openings are required in the exterior wall~~ from an assumed vertical plane in accordance with Table 705.2.
2. ~~A point one-half the distance from the exterior face of the wall to the lot line where all openings in the exterior wall are permitted to be unprotected or the building is equipped throughout with an automatic sprinkler system installed under the provisions of Section 705.8.2.~~

2 ~~3~~. More than 12 inches (305 mm) into areas where openings are prohibited.

3. For the purposes of determining allowable projections from buildings, the assumed vertical plane shall be measured at right angles from the lot line or, for buildings on the same lot, an imaginary line in accordance with Section 705.3. Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with this Section. The assumed vertical plane shall be parallel with the lot line or imaginary line.

2. Add new table as follows:

TABLE 705.2
ASSUMED VERTICAL PLANE (feet)

GROUP	TYPE I, II[a]	TYPE III, IV, V[a]
A, B, E, F-2, I, R, S-2, U	3	5[b]
M, S-1, F-1	5	10
H	15	20[c]

a. Based on type of construction in Chapter 6
b. I-2 occupancies are not permitted in Type VB construction
c. H-1 occupancies are not permitted in Type VB construction

3. Revise as follows:

705.2.3 Combustible projections. Combustible projections located ~~where openings are not permitted or where protection of openings is required~~ within 5 feet (1524 mm) of a lot line or imaginary line shall be of at least 1-hour fire-resistance-rated construction, Type IV construction, fire-retardant-treated wood or as required by Section 1406.3.

Exception: Type V construction shall be allowed for R-3 occupancies.

Reason: This code change is necessary to clarify how far projections from a building can extend into the fire separation distance. The purpose is to completely disassociate this section from Table 705.8. The proposal returns this section to its original intent to regulate projections based on occupancy and construction type that was a provision of a legacy code. This is recognizing that different occupancies of differing construction types present different levels of hazards. For instance, projections from an H-2 occupancy present a higher risk than projections from an S-1 occupancy and should be regulated as such. This section has been widely interpreted and misapplied.

The provision for projections in Section 705.2 is language from a legacy code that had definite measurements for when openings were required to be protected and when they were prohibited based on occupancy and construction type. With Section 705.8 and Table 705.8, the absolute measurement that was used in the previous legacy code is no longer present. This makes it very difficult to apply and has created inconsistency in application. There is different terminology between the IBC and the legacy code that does not allow the user to adequately apply this section.

The legacy code also stated that the assumed vertical plane for protection of openings was when they were “first” required to be protected. IBC Table 704.8 does not have a provision where you can definitely apply this assumed vertical plane. Utilizing the provisions of Equation 7-2 in Section 704.8.4 for a non-sprinklered M occupancy of IIIB construction 7 feet from the lot line if the combination of protected and unprotected was less than or equal to 1, there would be some required protected openings in the wall. But looking at the Table 704.8, protected openings could be required at

10 feet from the lot line using the same equation. Does one measure the distance from wall and its location in relation to the lot line or from the point at 10 feet where openings would have been required if they would have used the same equation? Or from some other assumed vertical plane?

The philosophy of this code change is to line up with the recent code changes that have occurred with the Table 508.4, Table 602 and other sections of the code that have based their merit on similar and dissimilar risks as well as similar fuel loads of occupancies. We have taken the approach of using Table 508.4, Table 602 and Table 706.4 to develop this language. As you can see, we tried to fit the occupancies and their exterior wall fire rating from Table 602 into this new table.

By putting some actual measurements into the code, we believe that this will vastly improve the application and consistency in which projections are regulated.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LAMPELLA-FS1-705.2

FS12–09/10
705.2, Table 705.2 (New), 705.2.3

Proponent: Stephen Thomas, Colorado Code Consulting, LLC representing the Colorado Chapter ICC

1. Revise as follows:

705.2 Projections. Cornices, eave overhangs, exterior balconies and similar projections extending beyond the exterior wall shall conform to the requirements of this section and Section 1406. Exterior egress balconies and exterior exit stairways shall also comply with Sections 1019 and 1026, respectively. ~~Projections shall not extend beyond the distance determined by the following three methods, whichever results in the lesser projection:~~ Projections shall not extend any closer to a lot line than permitted in Table 705.2.

Exception: Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with this section.

~~1. A point one-third the distance from the exterior face of the wall to the *lot line* where protected openings or a combination of protected and unprotected openings are required in the *exterior wall*.~~
~~2. A point one-half the distance from the exterior face of the wall to the *lot line* where all openings in the *exterior wall* are permitted to be unprotected or the building is equipped throughout with an *automatic sprinkler system* installed under the provisions of Section 705.8.2.~~
~~3. More than 12 inches (305 mm) into areas where openings are prohibited. Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with this section.~~

2. Add new Table as follows:

Table 705.2
Minimum Distance of Projection from Lot Lines

Fire Separation Distance	Minimum distance from lot line
0 feet to less than 2 feet	Not Permitted
2 feet to less than 5 feet	24 inches
5 feet or greater	40 inches

3. Revise as follows:

705.2.3 Combustible projections. Combustible projections ~~located where openings are not permitted or where protection of openings is required~~ extending to within 5 feet of the lot line shall be of at least 1-hour fire-resistance-rated construction, Type IV construction, fire-retardant-treated wood or as required by Section 1406.3.

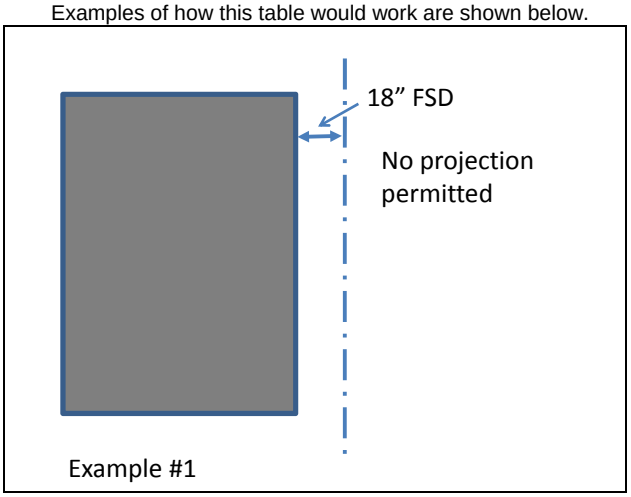
Exception: Type V construction shall be allowed for R-3 occupancies.

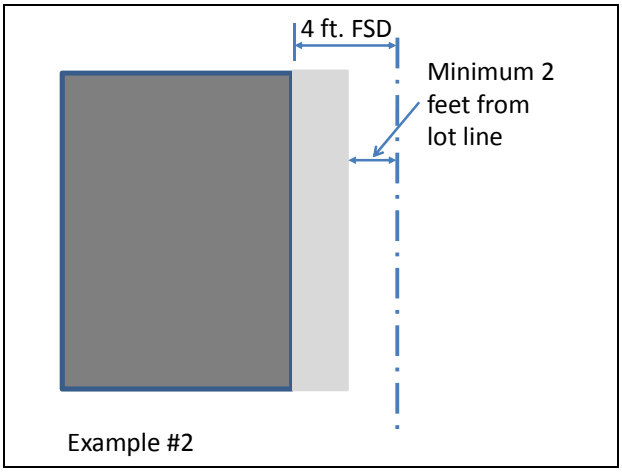
Reason: The current language outlining the requirements for projections is very confusing . Table 704.8 appears to have different distances where openings are required to be protected. However, when you really evaluate the table, the first option in Section 704.2 would occur at 5 feet (where openings are required to be protected) and the third option occurs at 3 feet (where openings are not permitted). The intent of this proposal is to simplify the requirement for determining the location of projections and when combustible projections are required to be protected. The proposal takes the language of the current first and third items and specifies the distance in a table format. The extent of the projection is now related to the

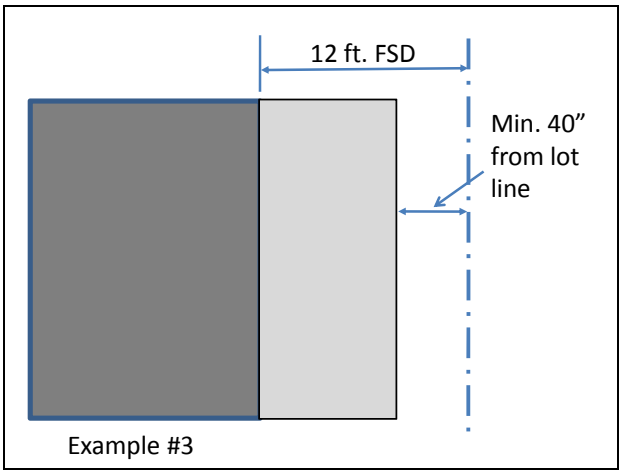
fire separation distance. The 24-inch requirement is based on item 3 of the current language and the 40-inch requirement is based on option 1 of the current requirement.

Item 2 in the current language is confusing and actually makes the code more restrictive than the language in the 2006 IBC. For example if a building is located 22 feet from the lot line, the projection would only be allowed to extend to within 11 feet from the lot line. The 2006 IBC and this proposal would allow the projection to extend to a point no closer than 40 inches from the lot line. Therefore, the item has been deleted and not addressed in the table.

Examples of how this table would work are shown below.







Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposals FS12, FS13 and FS14 propose revisions to Section 705.2.3. The committee needs to make its intent clear with respect to these revisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THOMAS-FS2-705.2

FS13–09/10
705.2.3

Proponent: Ali M. Fattah, City of San Diego, representing SD Area Chapter ICC Code Committee

Revise as follows:

705.2.3 Combustible projections. Combustible projections located where openings are not permitted, or where protection of openings is required or where a combination of protected and unprotected openings are required shall be of at least 1-hour fire-resistance-rated construction, Type IV construction, fire-retardant-treated wood or as required by Section 1406.3.

Exception: Type VB construction shall be allowed for combustible projections in R-3 occupancies with a fire separation distance greater than or equal to 5 ft (1524 mm).

Reason: The proposed change adds clarity to the IBC. Code change FS14-07/08 amended Section 704.2 to improve the code section to make clear when the length of projections is to be limited due to fire separation; the section was brought to the IBC from a legacy Code that did not include table like Table 704.8 where the area of openings is limited and protected openings are an option to include more openings in a an exterior wall based on fire separation distance within ranges of distance. The initial portion of the code change merely continues the effort that was started in the prior code change cycle and extends the same logic to this Section. Using the word "location" makes clear that if the projection falls within the distance range it is subject to the requirement.

ICC has indicated that they believe that Code intends only portions of the eave extending into the regulated area to be protected since the protection is intended to prevent ignition; additionally the IBC in Table 602 requires measurement of fire separation perpendicular to the face of a wall so it is possible for portions of a wall at an angle to be connected to portions of a wall that are not protected. The proposed code change does not seek to make a change to current practice insofar as the extent of the protection along the projection is concerned.

The exception has been amended to require the same level of protection as the IRC and eliminates ambiguity as to whether rated or non rated projections are required. Table R302.1 of the 2009 IRC requires eaves located at a fire separation distance less than 5 ft to be protected with one-hour construction on the underside. Both the 2009 IRC ad 2009 IBC require sprinkler protection in R-3 occupancies so the codes should be comparable.

Without changing the exception, the code user could conclude that an exposed 12 inch long wood eave located within 24 inches from a lot line and supported on an exterior one hour rated wall located 3 ft from a lot line is permissible which makes no sense. The IBC and IRC have increased the level of exterior fire protection due to fire separation distance recognizing the vulnerability of least protected occupancies such R-3 from conflagration hazards.

Cost Impact: This proposal will minimally impact the cost of construction.

Analysis: Code change proposals FS12, FS13 and FS14 propose revisions to Section 705.2.3. The committee needs to make its intent clear with respect to these revisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FATTAH-FS1-705.2.3

FS14–09/10
705.2.3

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter Peninsula, East Bay, Monterey Bay

Revise as follows:

705.2.3 Combustible projections. Combustible projections located where openings are not permitted or where protection of openings is required shall be of at least 1-hour fire-resistance-rated construction, Type IV construction, fire-retardant-treated wood or as required by Section 1406.3.

~~**Exception**: Type V construction shall be allowed for R-3 occupancies~~.

Reason: In Table R302.1 of IRC, projections are allowed to be rated 1 hour construction when minimum fire separation distance is 2 feet to 5 feet (less than 2 feet no protection is allowed). IBC Table 705.8 indicates that protection of the openings are required from 3 feet to less than 5 feet. The exception in Section 705.2.3 is in conflict with IRC. Therefore, it is only prudent to delete this exception.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposals FS12, FS13 and FS14 propose revisions to Section 705.2.3. The committee needs to make its intent clear with respect to these revisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAIEL-FS2-705.2.3.doc

FS15–09/10
705.3

Proponent: Gary Lampella, City of Redmond, OR, representing Oregon Building Officials Association

Revise as follows:

705.3 Buildings on the same lot. For the purposes of determining the required wall and opening protection, projections and roof-covering requirements, buildings on the same lot shall be assumed to have an imaginary line between them.

Where a new building is to be erected on the same lot as an existing building, the location of the assumed imaginary line with relation to the existing building shall be such that the *exterior wall* and opening protection of the existing building meet the criteria as set forth in Sections 705.5 and 705.8.

Exception: Two or more buildings on the same lot shall either be regulated as separate buildings or shall be considered as portions of one building if the aggregate area of such buildings is within the limits specified in Chapter 5 for a single building. Where the buildings contain different occupancy groups or are of different types of construction, the area shall be that allowed for the most restrictive occupancy or construction.

Reason: This code change is to clarify that buildings on the same lot that are not considered one building. If one is concerned about wall and opening protection it stands to reason that projections also should be considered.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LAMPELLA-FS3-705.3

FS16–09/10
705.5, 705.5.1 (New)

Proponent: Katherine Bang representing the City of Portland, Bureau of Development Services

Revise as follows:

705.5 Fire-resistance ratings. Exterior walls shall be fire-resistance rated in accordance with Tables 601 and 602 and this section. Where exterior walls are required to be fire-resistive, the fire rating shall be continuous from the foundation, through concealed spaces, to the top of the parapet or the underside of the roof sheathing or decking if no parapet is provided.

Exception: In the concealed space between the ceiling and the underside of the sheathing above, each layer of gypsum board on the interior side, is permitted to be substituted by an equivalent amount of fire blocking in accordance with Section 717.2.

705.5.1 Fire rating exposure. The required fire-resistance rating of exterior walls with a fire separation distance of greater than 10 feet (3048 mm) shall be rated for exposure to fire from the inside. The required fire-resistance rating of exterior walls with a fire separation distance of less than or equal to 10 feet (3048 mm) shall be rated for exposure to fire from both sides.

Reason: The model code does not address continuity at exterior walls. Because continuity is noted at all other fire resistive walls, there is the suggestion that continuity is not required. With platform framing it is easy to lose the fire resistive rating at the intersection of the horizontal assemblies and the exterior wall. This revision seeks to remedy that misunderstanding.

This revision clarifies the intent of the code and also provides an alternative solution for maintaining continuity at the intersection of the horizontal assembly and the exterior wall.

Cost Impact: None - this is a clarification of code intent.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BANG-FS1-705.5

FS17–09/10
705.6

Proponent: Sam Francis representing American Forest & Paper Association

Revise as follows:

705.6 Structural stability. The wall shall extend to the height required by Section 705.11 and shall have sufficient structural stability such that it will remain in place for the duration of time indicated by the required fire-resistance rating. Interior structural elements which brace the exterior wall but are not within the plane of the exterior wall nor on the outside of it shall have the fire resistance rating required by Table 601.

Reason: This section of the code is a direct descendent of the following section of the BOCA National Building Code which read in part:
Section 302.2.3 Method 3: The fire resistance rated wall shall be so constructed that it will remain structurally in place against an exterior exposing fire, for the duration of time indicated by the required fire resistance rating.

The 2006 IBC, Section 714.5, required all load-bearing structural members located within an exterior wall or exterior to it (outside of the exterior wall meaning outdoor side, not the enclosed side) to have the higher of the fire resistance ratings required for that element in:

(1) Table 601;
(2) Table 601 for the exterior bearing wall; or,
(3) Table 602 based upon fire separation distance.

It may be inferred from this requirement that load-bearing structural members located internally within the building need only have the fire resistance rating required of them in Table 601. The fire resistance ratings for exterior walls are based upon exterior exposure or conflagration. Thus, it is not reasonable to assume that because an interior element braces, to any extent, an exterior wall that it follows that the bracing element interior to that exterior wall must then have the same fire resistance rating as the exterior wall. The 2009 IBC has this requirement relocated to 705.6 and the base fire resistance requirements were "mixed with fire separation distance requirements" so the base requirement is not so readily discernable.

This proposal would clarify the intent of Section 705.6. It is clear that the code has a long standing provision which permits the various elements of a building for a given construction type to have differing fire resistance ratings based upon the function of the individual element and the duration of time deemed necessary for that element to continue to perform that function.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FRANCIS-FS1-705.6

FS18–09/10
705.6

Proponent: Dennis Richardson PE, dbr group inc. representing self

Revise as follows:

705.6 Structural stability. The wall shall extend to the height required by Section 705.11 and shall have sufficient structural stability such that it will remain in place for the duration of time indicated by the required *fire-resistance rating*.

Exceptions:

1. Building elements providing out of plane structural stability for fire-resistance rated exterior walls shall be considered to remain in place for 2 hours if they are one hour fire resistance rated or heavy timber construction and the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Building elements providing out of plane structural stability for fire-resistance rated exterior walls shall be considered to remain in place for 2 hours if they are one hour fire resistance rated or heavy timber construction and the building is equipped with an automatic sprinkler system in accordance with Section 903.3.1.2 or 903.3.1.3 and the fire-resistance rated exterior wall conforms with any of the conditions listed in the exception to Section 705.11 for parapets.
3. Building elements providing out of plane structural stability for fire-resistance rated exterior walls shall be considered to remain in place for 1 hour in construction that is not otherwise fire-resistance rated if the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
4. Building elements providing out of plane structural stability for fire-resistance rated exterior walls shall be considered to remain in place for 1 hour in construction that is not otherwise fire-resistance rated if the

building equipped with an automatic sprinkler system in accordance with Section 903.3.1.2 or 903.3.1.3 and the fire-resistance rated exterior wall conforms with any of the conditions listed in the exception to Section 705.11 for parapets.

Reason: Section 705.6 which requires structural stability of exterior fire resistance rated walls is rarely, if ever, enforced because it provides no criteria for "sufficient structural stability" and does not consider protection to supporting elements provided in part by automatic sprinkler systems and partially by passive fire resistance. An informal phone survey of a number of building officials and code consultants including review of numerous interpretation manuals did little to shed light on the application of this section. Lack of enforcement and a wide range of interpretations justifies this section needs to be clarified or removed from the code.

The proposed exceptions are superior to the existing code language because they provide a prescriptive way to address the intent of this code section giving credit to the combination of fire sprinklers and passive fire resistance of one hour fire restive or heavy timber construction. Credit is given for NFPA 13 systems referenced in 903.3.1.1 and NFPA 13R or 13D systems referenced in 903.3.1.2 or 903.3.1.3 of the IBC.

Footnote c. of Table 601 refers to heavy timber construction as an equivalent to one hour fire resistance rated construction.

Footnote d. of table 601 allows non rated construction with a NFPA 13 sprinkler system throughout to be substituted for 1-hour fire-resistance rated construction provided the system is not otherwise required by the other provisions of the code or used for an allowable area increase in accordance with Section 506.3 or an allowable height increase in accordance with Section 504.2. Footnote c. goes on to state the 1-hour substitution for the fire resistance of exterior walls is not permitted.

This proposed code change does not provide an exception to the fire resistance rating for the exterior wall itself or for the elements providing vertical support of the wall. The code proposal only clarifies the anticipated effectiveness and required protection of secondary structural elements providing out of plane stability for the fire resistance rated exterior wall. As such the proposed use of the proposed exceptions would not disqualify the use of sprinklers for allowable area or height increases.

This proposed code change relies on NFPA 13R and 13D sprinkler systems when used for residential construction. It is acknowledged these systems are based on lower water flow than a NFPA 13 system and do not require sprinkler heads in attic areas. However residential construction typically is highly compartmentalized typically with one hour construction between multi-family units and noncombustible interior finish materials and a great deal of structural redundancy. Because of the lack of sprinkler heads in attic areas, the proposed exceptions as written for 13R and 13D systems only apply if the fire-resistance rated exterior wall conforms with any of the conditions listed in the exception to Section 705.11 for elimination of parapets. These exceptions for parapets either rely on additional passive fire resistance in lieu of a parapet or are limited by size or location of the structure.

In addition to this change, a proposal is also being submitted to add Section 1604.14 to establish out of plane structural design criteria for the instances where these exceptions would not apply.

The author of this proposed code change acknowledges there is little data or full scale research to specifically address this issue however the current code language provides absolutely no basis or guidance whatsoever as to the intent or application of this code section. Because of the wide variety of configurations materials and conditions and the need to show performance of structural stability during a wide variety of fire conditions, it is not clear how a structural engineer would provide a rational analysis if requested under the present code language.

Because of this Section 705.6 appears to be almost universally ignored by designers and code officials alike. At a minimum, this code change proposal is intended to provide a reasonable basis (or at minimum a starting point for a healthy discussion) for consistent application and enforcement acknowledging the contributions of both active systems and passive fire-resistance construction.

Cost Impact: Since the proposed code change incorporates exceptions to be utilized if desired by the designer, it is anticipated this change would result in a cost savings.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICHARDSON-FS1-705.6

FS19–09/10
705.8.1

Proponent: Catherine Heeb, City of Portland Bureau of Development Services

Revise as follows:

705.8.1 Allowable area of Openings. The maximum area of unprotected or protected openings permitted in an exterior wall in any story of a building shall not exceed the percentages specified in Table 705.8. Openings shall be proportionally spaced along the length of the story.

Exceptions:

(Exceptions remain unchanged)

Reason: The additional text clarifies the intent of the model code language. Without this clarification, openings in a story may be concentrated in one area, leading to a higher percentage of opening in one area than would otherwise be allowed.

The added text codifies the assumption that is explained in the ICC publication 2006 International Building Code - Code and Commentary, which states, "The table is based on a formula that was developed under the following assumptions: …3. the exterior openings are equally spaced and distributed in the wall."

The even spread of openings in a story ensures that all portions of the building will be adequately protected and improves the safety of the occupants.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Heeb-FS1-705.8

FS20–09/10
705.8.6

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

705.8.6 Vertical exposure. Opening protectives of buildings shall comply with this section.

705.8.6.1 Vertical exposure for buildings on the same lot. For buildings on the same lot, opening protectives having a *fire protection rating* of not less than 3/4 hour shall be provided in every opening that is less than 15 feet (4572 mm) vertically above the roof of an adjacent building or structure based on assuming an imaginary line between them. The opening protectives are required where the *fire separation distance* between the imaginary line and the adjacent building or structure is less than 15 feet (4572 mm).

Exceptions:

1. Opening protectives are not required where the roof assembly of the adjacent building or structure has a fire-resistance rating of not less than 1 hour for a minimum distance of 10 feet (3048 mm) from the exterior wall facing the imaginary line and the entire length and span of the supporting elements for the fire-resistance-rated roof assembly has a fire-resistance rating of not less than 1 hour.
2. Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with Section 705.8.6.1.

705.8.6.2 Vertical exposure for buildings on separate lots. When a new building or an addition is to be erected adjacent to an existing building, all openings in the exterior wall of the new building or addition are required to be not less than ¾ hour protectives when these openings are less than 15' vertically above the roof of the existing building or structure. The opening protectives are required where the distance between buildings or structures is less than 15' feet. When the roof of the new building or an addition is at lower elevation from the existing building, the roof construction of the new building or the addition shall have fire-resistance rating of not less than 1 hour for a minimum distance of 10 feet (3048 mm) from the exterior wall facing the existing building and the entire length and span of the supporting elements for the fire-resistance-rated roof assembly shall have a fire-resistance rating of not less than 1 hour. The roof protections are required where the distance between the buildings or structures is less than 15' feet.

Reason: A fire in a lower building that is adjacent to a taller building can be a source of fire exposure to openings in the taller building. Since fire does not differentiate between buildings on same lot or separate adjacent lots, the existing provisions for buildings on the same lot need to be expanded to cover buildings on separate lots too. The requirements for the buildings on the separate lots should not be different from those on the same lot. The buildings on the same lots are under one ownership and the imaginary property lines can be moved so that it will serve all buildings in the most efficient way.

On the other hand, the buildings on separate lots are under different ownerships. The property lines are legal property lines and can not be moved around. An existing building on one site should not dictate the design and construction of the future building nor a future building should not alter the design and construction of an existing building. In other words, between two neighboring buildings, whichever is built last will need to comply with requirements of this section. The 15-foot separation requirement between buildings on the separate lots, is consistent with the same requirement for buildings on the same lot.

Also not to leave out the additions to existing buildings, additions are also included in these requirements. So for the sake of argument, imagine that there are two existing buildings, with same height, on separate lots. If one building is adding more stories, then these requirements could apply to the windows of new stories.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposals FS20 and FS21 propose similar requirements for vertical exposure for buildings on separate lots. The committee needs to make its intent clear with respect to these revisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAIEL-FS3-705.8.6.doc

FS21–09/10
705.8.6, 705.8.6.1 (New), 705.8.6.2 (New)

Proponent: Gary Lampella, City of Redmond, Oregon, representing: Oregon Building Officials Association

Revise as follows:

705.8.6 Vertical exposure. Opening protectives of buildings shall comply with this section.

705.8.6.1 Vertical exposure for buildings on the same lot. For buildings on the same lot, opening protectives having a fire protection rating of not less than 3/4 hour shall be provided in every opening that is less than 15 feet (4572 mm) vertically above the roof of an adjacent building or structure based on assuming an imaginary line between them. The opening protectives are required where the ~~fire separation~~ distance between the ~~imaginary line and the adjacent~~ building**s** or structure**s** is less than 15 feet (4572 mm).

Exceptions:

1. Opening protectives are not required where the lower roof assembly of the adjacent building or structure has a fire-resistance rating of not less than 1 hour for a minimum distance of 10 feet (3048 mm) from the exterior wall facing the imaginary line and the entire length and span of the supporting elements for the fire-resistance-rated roof assembly has a fire-resistance rating of not less than 1 hour.
2. Buildings on the same lot and considered as portions of one building in accordance with Section 704.3 are not required to comply with Section 704.8.6.

705.8.6.2 Vertical exposure for buildings on separate lots. When a new building is to be erected adjacent to an existing building, all openings in the exterior wall of the new building are required to be not less than ¾ hour when these openings are less than 15 feet (4572 mm) vertically above the roof of existing building or structure. The opening protectives are required where the distance between the buildings or structures is less than 15 (4572 mm) feet. When the roof of the new building is at lower elevation from the existing building, the roof construction of the new building shall have fire-resistance rating of not less than 1 hour for a minimum distance of 10 feet (3048 mm) from the exterior wall facing the new building and the entire length and span of the supporting elements for the fire-resistance-rated roof assembly shall have a fire-resistance rating of not less than 1 hour. The roof protections are required where the distance between the buildings or structures is less than 15 feet (4572 mm).

Reason: I was the original proponent in Palm Springs of a similar proposal that was approved by the Fire Safety Committee. The Committee agreed that buildings with a real property line should be treated the same as two buildings on the same lot in regards to vertical fire exposure. In Minneapolis there was a Public Comment submitted pointing out some flaws in the code change. Rather than attempt to keep it in the code I opted to ask ICC staff to simply withdraw it and I would work with the author of the Public Comment and come back with a new proposal in Baltimore.

The purpose of this submittal is clean up inconsistent provisions between buildings on the same lot with an imaginary line for fire separation distance and the lack of the same provision for buildings on adjacent lots with real property lines. The purpose of assuming an imaginary line between buildings on the same lot is to mirror the fire separation distance of those buildings with actual property lines and determining opening and wall protection. Currently, the provisions of buildings on the same lot with an imaginary line have more restrictive requirements than those buildings with a real line.

If one is concerned about fire spread from one building to another, should the provisions be the same for a real lot line as opposed to an imaginary one? Yes, we believe so. The probability of a fire spreading from one building to another via openings and fire separation distance to other buildings is the same regardless of real or imaginary lines. Based on the current code language, we can only assume that a recorded property line somehow adds an additional level of protection over and above an imaginary one.

We have divided this Section into three parts now. We are proposing to delete the language “imaginary line and the adjacent” in the Section 704.8.6.1 because it only addresses the fire separation for one building and ignores the other. There are many reasons to have fire separation from an imaginary line at different place and one building may have less than 15 feet of fire separation distance and the other may have 20. In this case the lower roof would be required to have a 1 hour roof assembly, which doesn’t make sense. The reference to “fire separation” is being deleted because we believe the crucial distance is the true distance between the buildings, which clears up the confusion over where the measurement is taken. We have also added the word “lower” in the first exception to make it clear that it is the lower roof that is required to be of 1 hour fire-resistive construction. Lastly, we have created a new Subsection 704.8.6.2 to address buildings and structures with real property lines.

Cost Impact: The code change proposal will not increase the cost of construction. There could be some minimal costs in providing the 1 hour roof assemblies.

Analysis: Code change proposals FS20 and FS21 propose similar requirements for vertical exposure for buildings on separate lots. The committee needs to make its intent clear with respect to these revisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LAMPELLA-FS2-704.8.6

FS22–09/10
705

Proponent: Sarah A. Rice, CBO, representing self

Revise as follows:

SECTION 705 EXTERIOR WALLS

705.1 General. All e*xterior walls* shall comply with this section.

(Section 705.2 relocated to Section 705.9)

(Section 705.3 relocated to Section 705.4.1)

705.2 ~~705.4~~ Materials. *Exterior walls* shall be of materials permitted by the building type of construction.

705.3 ~~705.6~~ Structural stability. The wall shall extend to the height required by Section 705.11 and shall have sufficient structural stability such that it will remain in place for the duration of time indicated by the required *fire-resistance rating*.

705.4 Fire-resistance ratings – where required. *Exterior walls* shall be fire-resistance rated in accordance with Tables 601 and 602.

705.4.1 ~~705.3~~ Buildings on the same lot. For the purposes of determining the required wall and opening protection and roof-covering requirements, buildings on the same lot shall be assumed to have an imaginary line between them. Where a new building is to be erected on the same lot as an existing building, the location of the assumed imaginary line with relation to the existing building shall be such that the *exterior wall* and opening protection of the existing building meet the criteria as set forth in Sections 705.5 and 705.8.

> **Exception:** Two or more buildings on the same lot shall either be regulated as separate buildings or shall be considered as portions of one building if the aggregate area of such buildings is within the limits specified in Chapter 5 for a single building. Where the buildings contain different occupancy groups or are of different types of construction, the area shall be that allowed for the most restrictive occupancy or construction.

705.5 Fire-resistance rated exterior walls. Exterior walls required to have a fire resistance rating shall comply with this Sections 705.5.1 through 705.5.4.

705.5.1 ~~705.5~~ Fire-resistance ratings. ~~*Exterior walls* shall be fire-resistance rated in accordance with Tables 601 and 602 and this section.~~ The required *fire-resistance rating* of *exterior walls* with a *fire separation distance* of greater than 10 feet (3048 mm) shall be rated for exposure to fire from the inside. The required *fire-resistance rating* of *exterior walls* with a *fire separation distance* of less than or equal to 10 feet (3048 mm) shall be rated for exposure to fire from both sides.

705.5.2 ~~705.7~~ Unexposed surface temperature. *(No change to text)*

FIGURE 705.5.2 ~~705.7~~
EQUIVALENT OPENING FACTOR
(No change to Figure)

705.5.3 ~~705.9~~ Joints. *(No change to text)*

705.5.3.1 ~~705.9.1~~ Voids. *(No change to text)*

705.5.4 ~~705.10~~ Ducts and air transfer openings. *(No change to text)*

705.5.5 Penetrations. Penetrations of fire-resistance rated exterior walls shall comply with Section 713

705.5.6 Openings. Openings in fire-resistance rated exterior walls shall comply with Section 705.7

705.6 Nonfire-resistance rated exterior walls. Exterior walls not required to have a fire resistance rating shall comply with this Sections 705.6.1 through 705.6.3.

705.6.1 Joints. Joints made in or between nonfire-resistance rated exterior walls are not required to be protected.

705.6.2 Ducts and air transfer openings. Penetrations by air ducts and air transfer openings in nonfire-resistance-rated exterior walls are not required to have protected openings

705.5.5 Penetrations. Penetrations of nonfire-resistance rated exterior walls shall comply with Section 713

705.5.6 Openings. Openings in nonfire-resistance rated exterior walls shall comply with Section 705.7

705.7 ~~705.8~~ Openings. Openings in fire-resistance rated and nonfire-resistance rated *exterior walls* shall comply with Sections 705.8.1 through 705.8.6.

705.7.1 ~~705.8.1~~ Allowable area of openings. *(No change to text)*

705.7.2 ~~705.8.2~~ Protected openings. *(No change to text)*

705.7.3 ~~705.8.3~~ Unprotected openings. *(No change to text)*

TABLE 705.7 ~~705.8~~
MAXIMUM AREA OF EXTERIOR WALL OPENINGS BASED ON FIRE SEPARATION DISTANCE AND DEGREE OF OPENING PROTECTION
(No change to Table)

705.7.4 ~~705.8.4~~ Mixed openings. *(No change to text)*

705.7.5 ~~705.8.5~~Vertical separation of openings. *(No change to text)*

705.7.6 ~~705.8.6~~ Vertical exposure. *(No change to text)*

705.8 ~~705.11~~ Parapets. . *(No change to text)*

705.8.1 ~~705.11.1~~ Parapet construction. *(No change to text)*

705.9 ~~705.2~~ Projections. Cornices, eave overhangs, exterior balconies and similar projections extending beyond the *exterior wall* shall conform to the requirements of this section and Section 1406. Exterior egress balconies and *exterior exit stairways* shall also comply with Sections 1019 and 1026, respectively. Projections shall not extend beyond the distance determined by the following three methods, whichever results in the lesser projection:

1. A point one-third the distance from the exterior face of the wall to the *lot line* where protected openings or a combination of protected and unprotected openings are required in the *exterior wall*.
2. A point one-half the distance from the exterior face of the wall to the *lot line* where all openings in the *exterior wall* are permitted to be unprotected or the building is equipped throughout with an *automatic sprinkler system* installed under the provisions of Section 705.8.2.
3. More than 12 inches (305 mm) into areas where openings are prohibited. Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with this section.

705.9.1 ~~705.2.1~~ Type I and II construction. Projections from walls of Type I or II construction shall be of noncombustible materials or combustible materials as allowed by Sections 1406.3 and 1406.4.

705.9.2 ~~705.2.2~~ Type III, IV or V construction. Projections from walls of Type III, IV or V construction shall be of any *approved* material.

705.9.3 ~~705.2.3~~ Combustible projections. Combustible projections located where openings are not permitted or where protection of openings is required shall be of at least 1-hour fire-resistance-rated construction, Type IV construction, *fire-retardant-treated wood* or as required by Section 1406.3.

Exception: TypeV construction shall be allowed for R-3 occupancies.

Reason: This code change is one in a series of code changes intended to add clarity to the provisions of Chapter 7. Unless otherwise specifically stated, each code change can be accepted on its own merits.

Chapter 7 is currently titled "Fire and Smoke Protection Features" and yet it contains provisions for nonfire- and nonsmoke-resistance rated assemblies.

Through a series of code changes, including tone, it is hoped that it becomes clear that Chapter 7 regulates both fire/smoke and nonfire/nonsmoker-resistance rated vertical and horizontal (floors, roofs and walls) assemblies.

This code change address Section 705 Exterior Walls. While currently the provisions contained in Section 705 seem to only apply to fire-resistance rated exterior wall assemblies, the general statement in 705.1 says "Exterior walls shall comply…" not just "Fire resistance rated exterior walls shall comply…" and upon closer look at the opening protective requirements, and how the user is directed to use Table 705.8 elsewhere in the code, it can be seen that the table regulates openings in both fire-resistance rated and nonfire-resistance rated exterior walls. This proposal just makes it clear that the entire section applies to both fire-resistance rated and non -resistance rated exterior walls.

The majority of technical provisions are unchanged, and are noted as such. The following outlines the major changes to Section 705:

Re-arrangement of sections to present order consistent with other "wall" sections in Chapter 7

Move Section 705.2 towards end of section

Bring provisions applicable to all exterior walls to the beginning of the section.

Correlation of terminology to acknowledge that there are now 5 types of "holes" addressed by the code – openings, penetrations, joints, air-transfer openings and duct openings.

Addition of new sections for penetrations and openings in fire rated and nonfire- rated exterior walls are to be addressed.

References within sections have not been correlated. ICC Staff has indicated that if accepted this would be done editorially.

For clarity the entire text of Section 705 is shown below.

SECTION 705 EXTERIOR WALLS

705.1 General. All *exterior walls* shall comply with this section.

705.2 Projections. Cornices, eave overhangs, exterior balconies and similar projections extending beyond the *exterior wall* shall conform to the requirements of this section and Section 1406. Exterior egress balconies and *exterior exit stairways* shall also comply with Sections 1019 and 1026, respectively. Projections shall not extend beyond the distance determined by the following three methods, whichever results in the lesser projection:

1. A point one-third the distance from the exterior face of the wall to the *lot line* where protected openings or a combination of protected and unprotected openings are required in the *exterior wall*.
2. Apoint one-half the distance from the exterior face of the wall to the *lot line* where all openings in the *exterior wall* are permitted to be unprotected or the building is equipped throughout with an *automatic sprinkler system* installed under the provisions of Section 705.8.2.
3. More than 12 inches (305 mm) into areas where openings are prohibited. Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with this section.

705.2.1 Type I and II construction. Projections from walls of Type I or II construction shall be of noncombustible materials or combustible materials as allowed by Sections 1406.3 and 1406.4.

705.2.2 Type III, IV or V construction. Projections from walls of Type III, IV or V construction shall be of any *approved* material.

705.2.3 Combustible projections. Combustible projections located where openings are not permitted or where protection of openings is required shall be of at least 1-hour fire-resistance-rated construction, Type IV construction, *fire-retardant-treated wood* or as required by Section 1406.3.

Exception: TypeV construction shall be allowed for R-3 occupancies.

705.3 Buildings on the same lot. For the purposes of determining the required wall and opening protection and roof-covering requirements, buildings on the same lot shall be assumed to have an imaginary line between them. Where a new building is to be erected on the same lot as an existing building, the location of the assumed imaginary line with relation to the existing building shall be such that the *exterior wall* and opening protection of the existing building meet the criteria as set forth in Sections 705.5 and 705.8.

Exception: Two or more buildings on the same lot shall either be regulated as separate buildings or shall be considered as portions of one building if the aggregate area of such buildings is within the limits specified in Chapter 5 for a single building. Where the buildings contain different occupancy groups or are of different types of construction, the area shall be that allowed for the most restrictive occupancy or construction.

705.2 705.4 Materials. *Exterior walls* shall be of materials permitted by the building type of construction.

705.3 (IBC 2009 705.6) Structural stability. The wall shall extend to the height required by Section 705.11 and shall have sufficient structural stability such that it will remain in place for the duration of time indicated by the required *fire-resistance rating*.

705.4 Fire-resistance ratings – where required. *Exterior walls* shall be fire-resistance rated in accordance with Tables 601 and 602.

705.4.1 (IBC 2009 705.3) Buildings on the same lot. For the purposes of determining the required wall and opening protection and roof-covering requirements, buildings on the same lot shall be assumed to have an imaginary line between them. Where a new building is to be erected on the same lot as an existing building, the location of the assumed imaginary line with relation to the existing building shall be such that the *exterior wall* and opening protection of the existing building meet the criteria as set forth in Sections 705.5 and 705.8.

Exception: Two or more buildings on the same lot shall either be regulated as separate buildings or shall be considered as portions of one building if the aggregate area of such buildings is within the limits specified in Chapter 5 for a single building. Where the buildings contain different occupancy groups or are of different types of construction, the area shall be that allowed for the most restrictive occupancy or construction.

705.5 Fire-resistance rated exterior walls. Exterior walls required to have a fire resistance rating shall comply with this Sections 705.5.XX through 705.5.XX

705.5.1 Fire-resistance ratings. *Exterior walls* shall be fire-resistance rated in accordance with Tables 601 and 602 and this section. The required *fire-resistance rating* of *exterior walls* with a *fire separation distance* of greater than 10 feet (3048 mm) shall be rated for exposure to fire from the inside. The required *fire-resistance rating* of *exterior walls* with a *fire separation distance* of less than or equal to 10 feet (3048 mm) shall be rated for exposure to fire from both sides.

705.6 Structural stability. The wall shall extend to the height required by Section 705.11 and shall have sufficient structural stability such that it will remain in place for the duration of time indicated by the required *fire-resistance rating*.

705.5.2 705.7 Unexposed surface temperature. Where protected openings are not limited by Section 705.8, the limitation on the rise of temperature on the unexposed surface of *exterior walls* as required by ASTM E 119 or UL 263 shall not apply. Where protected openings are limited by Section 705.8, the limitation on the rise of temperature on the unexposed surface of *exterior walls* as required by ASTM E 119 or UL 263 shall not apply provided that a correction is made for radiation from the unexposed *exterior wall* surface in accordance with the following formula:

$Ae = A + (Af \cdot Feo)$ **(Equation 7-1)**

where:

Ae = Equivalent area of protected openings.

A = Actual area of protected openings.
Af = Area of *exterior wall* surface in the *story* under consideration exclusive of openings, on which the temperature limitations of ASTME 119 or UL 263 for walls are exceeded.
Feo = An "equivalent opening factor" derived from Figure 705.7 based on the average temperature of the unexposed wall surface and the *fire-resistance rating* of the wall.

FIGURE 705.3.3 705.7 - [Unchanged]
705.5.3 705.9 Joints. Joints made in or between *exterior walls* required by this section to have a *fire-resistance rating* shall comply with Section 714.
Exception: Joints in *exterior walls* that are permitted to have unprotected openings.
705.5.3 705.9.1 Voids. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 714.4.
705.5.4 705.10 Ducts and air transfer openings. Penetrations by air ducts and air transfer openings in fire-resistance-rated *exterior walls* required to have protected openings shall comply with Section 716.
Exception: Foundation vents installed in accordance with this code are permitted.
705.5.5 Penetrations other than joints, ducts and air-transfer openings. Penetrations made into or thorugh fire-resistance rated exterior walls shall comply with Section 705.XXXX
705.6 Nonfire-resistance rated exterior walls. Exterior walls not required to have a fire resistance rating shall comply with this Sections 705.6.XX through 705.6.XX
705.6.1 Joints. Joints made in or between nonfire-resistance rated exterior walls are not required to be protected.
705.6.2 Ducts and air transfer openings. Penetrations by air ducts and air transfer openings in nonfire-resistance-rated exterior walls are not required to have protected openings
705.6.3 Penetrations other than joints, ducts and air-transfer openings. Penetrations made into or thorugh nonfire-resistance rated exterior walls shall comply with Section 705.XXXX
705.7 705.8 Openings. Openings in fire-resistance rated and nonfire-resistance rated *exterior walls* shall comply with Sections 705.8.1 through 705.8.6.
705.7.1 705.8.1 Allowable area of openings. The maximum area of unprotected and protected openings permitted in an *exterior wall* in any *story* of a building shall not exceed the percentages specified in Table 705.8.
Exceptions:
1. In other than Group H occupancies, unlimited unprotected openings are permitted in the first *story* above grade either:
1.1. Where the wall faces a street and has a *fire separation distance* of more than 15 feet (4572 mm); or
1.2. Where the wall faces an unoccupied space. The unoccupied space shall be on the same lot or dedicated for public use, shall not be less than 30 feet (9144 mm) in width and shall have access from a street by a posted fire lane in accordance with the *International Fire Code*.
2. Buildings whose exterior bearing walls, exterior nonbearing walls and exterior primary structural frame are not required to be fire-resistance rated shall be permitted to have unlimited unprotected openings.
705.7.2 705.8.2 Protected openings. Where openings are required to be protected, *fire doors* and fire shutters shall comply with Section 715.4 and *fire window assemblies* shall comply with Section 715.5.
Exception: Opening protectives are not required where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 and the exterior openings are protected by awater curtain using automatic sprinklers *approved* for that use.
705.7.3 705.8.3 Unprotected openings. Where unprotected openings are permitted, windows and doors shall be constructed of any *approved* materials. Glazing shall conform to the requirements of Chapters 24 and 26.
TABLE 705.7 705.8 - [Unchanged]
705.7.4 705.8.4 Mixed openings. Where both unprotected and protected openings are located in the *exterior wall* in any *story* of a building, the total area of openings shall be determined in accordance with the following:
(*Ap*/ *ap*) + (*Au*/*au*) ≤ 1 **(Equation 7-2)**
where:
Ap = Actual area of protected openings, or the equivalent area of protected openings, *Ae* (see Section 705.7).
ap = Allowable area of protected openings.
Au = Actual area of unprotected openings.
au = Allowable area of unprotected openings.
705.7.5 705.8.5Vertical separation of openings. Openings in *exterior walls* in adjacent *stories* shall be separated vertically to protect against fire spread on the exterior of the buildings where the openings are within 5 feet (1524 mm) of each other horizontally and the opening in the lower *story* is not a protected opening with a *fire protection rating* of not less than 3/4 hour. Such openings shall be separated vertically at least 3 feet (914 mm) by spandrel girders, *exterior walls* or other similar assemblies that have a *fire-resistance rating* of at least 1 hour or by flame barriers that extend horizontally at least 30 inches (762 mm) beyond the *exterior wall*. Flame barriers shall also have a *fire-resistance rating* of at least 1 hour. The unexposed surface temperature limitations specified in ASTM E 119 or UL 263 shall not apply to the flame barriers or vertical separation unless otherwise required by the provisions of this code.
Exceptions:
1. This section shall not apply to buildings that are three *stories* or less above *grade plane*.
2. This section shall not apply to buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Open parking garages.
705.7.6 705.8.6 Vertical exposure. For buildings on the same lot, opening protectives having a *fire protection rating* of not less than 3/4 hour shall be provided in every opening that is less than 15 feet (4572 mm) vertically above the roof of an adjacent building or structure based on assuming an imaginary line between them. The opening protectives are required where the *fire separation distance* between the imaginary line and the adjacent building or structure is less than 15 feet (4572 mm).
Exceptions:
1. Opening protectives are not required where the roof assembly of the adjacent building or structure has a *fire-resistance rating* of not less than 1 hour for a minimum distance of 10 feet (3048 mm) from the *exterior wall* facing the imaginary line and the entire length and span of the supporting elements for the fire-resistance-rated roof assembly has a *fire-resistance rating* of not less than 1 hour.
2. Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with Section 705.8.6.
705.9 Joints. Joints made in or between *exterior walls* required by this section to have a *fire-resistance rating* shall comply with Section 714.
Exception: Joints in *exterior walls* that are permitted to have unprotected openings.
705.9.1 Voids. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 714.4.

705.10 Ducts and air transfer openings. Penetrations by air ducts and air transfer openings in fire-resistance-rated *exterior walls* required to have protected openings shall comply with Section 716.
Exception: Foundation vents installed in accordance with this code are permitted.
705.8 705.11 Parapets. Parapets shall be provided on *exterior walls* of buildings.
Exceptions: A parapet need not be provided on an *exterior wall* where any of the following conditions exist:
1. The wall is not required to be fire-resistance rated in accordance with Table 602 because of *fire separation distance*.
2. The building has an area of not more than 1,000 square feet (93 m2) on any floor.
3. Walls that terminate at roofs of not less than 2-hour fire-resistance-rated construction or where the roof, including the deck or slab and supporting construction, is constructed entirely of noncombustible materials.
4. One-hour fire-resistance-rated *exterior walls* that terminate at the underside of the roof sheathing, deck or slab, provided:
4.1. Where the roof/ceiling framing elements are parallel to the walls, such framing and elements supporting such framing shall not be of less than 1-hour fire-resistance-rated construction for a width of 4 feet (1220 mm) for Groups R and U and 10 feet (3048 mm) for other occupancies, measured from the interior side of the wall.
4.2. Where roof/ceiling framing elements are not parallel to the wall, the entire span of such framing and elements supporting such framing shall not be of less than 1-hour fire-resistance-rated construction.
4.3. Openings in the roof shall not be located within 5 feet (1524 mm) of the 1-hour fire-resistance-rated *exterior wall* for Groups R and U and 10 feet (3048 mm) for other occupancies, measured from the interior side of the wall.
4.4. The entire building shall be provided with not less than a Class B roof covering.
5. In Groups R-2 and R-3 where the entire building is provided with a Class C roof covering, the *exterior wall* shall be permitted to terminate at the underside of the roof sheathing or deck in Type III, IV and V construction, provided:
5.1. The roof sheathing or deck is constructed of *approved* noncombustible materials or of *fire-retardant-treated wood* for a distance of 4 feet (1220 mm); or
5.2. The roof is protected with 0.625-inch (16 mm) Type X gypsum board directly beneath the underside of the roof sheathing or deck, supported by a minimum of nominal 2-inch (51 mm) ledgers attached to the sides of the roof framing members for a minimum distance of 4 feet (1220 mm).
6. Where the wall is permitted to have at least 25 percent of the *exterior wall* areas containing unprotected openings based on *fire separation distance* as determined in accordance with Section 705.8.
705.8.1 705.11.1 Parapet construction. Parapets shall have the same *fire-resistance rating* as that required for the supporting wall, and on any side adjacent to a roof surface, shall have noncombustible faces for the uppermost 18 inches (457 mm), including counterflashing and coping materials.
The height of the parapet shall not be less than 30 inches (762 mm) above the point where the roof surface and the wall intersect. Where the roof slopes toward a parapet at a slope greater than two units vertical in 12 units horizontal (16.7-percent slope), the parapet shall extend to the same height as any portion of the roof within a *fire separation distance* where protection of wall openings is required, but in no case shall the height be less than 30 inches (762 mm).
705.9 (2009 IBC 705.2) Projections. Cornices, eave overhangs, exterior balconies and similar projections extending beyond the *exterior wall* shall conform to the requirements of this section and Section 1406. Exterior egress balconies and *exterior exit stairways* shall also comply with Sections 1019 and 1026, respectively. Projections shall not extend beyond the distance determined by the following three methods, whichever results in the lesser projection:
1. A point one-third the distance from the exterior face of the wall to the *lot line* where protected openings or a combination of protected and unprotected openings are required in the *exterior wall*.
2. Apoint one-half the distance from the exterior face of the wall to the *lot line* where all openings in the *exterior wall* are permitted to be unprotected or the building is equipped throughout with an *automatic sprinkler system* installed under the provisions of Section 705.8.2.
3. More than 12 inches (305 mm) into areas where openings are prohibited. Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with this section.
705.9.1 Type I and II construction. Projections from walls of Type I or II construction shall be of noncombustible materials or combustible materials as allowed by Sections 1406.3 and 1406.4.
705.9.2 Type III, IV or V construction. Projections from walls of Type III, IV or V construction shall be of any *approved* material.
705.9.3 Combustible projections. Combustible projections located where openings are not permitted or where protection of openings is required shall be of at least 1-hour fire-resistance-rated construction, Type IV construction, *fire-retardant-treated wood* or as required by Section 1406.3.
Exception: TypeV construction shall be allowed for R-3 occupancies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-FS1b-705

FS23–09/10
706.2, Chapter 35

Proponent: Sarah A. Rice, CBO, representing self

1. Revise as follows:

706.2 Structural stability. Fire walls shall have sufficient structural stability under fire conditions to allow collapse of construction on either side without collapse of the wall for the duration of time indicated by the required fire-resistance rating or shall be double fire walls constructed in accordance with NFPA 221.

2. Add new standard to Chapter 35 as follows:

NFPA	
221-09	Standard for High Challenge Fire Walls, Fire Walls, and Fire Barrier Walls, 2009 Edition

Reason: To allow what today would be considered a design using 2 exterior walls to be classified as a fire wall and thus also allowed to have openings when the wall is not located on a lot line (party wall).

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, NFPA 221-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-FS4-706.2

FS24–09/10

702.1, 705.6, 706.2, 706.2.1 (New), 706.2.2 (New), 706.2.3 (New), 706.4, Table 706.X (New)

Proponent: Marshall P. Carman, Structural Engineers Association of Ohio

Revise as follows:

702.1 Definitions

FIRE WALL. A fire-resistance rated wall having protected openings, which restricts the spread of fire and extends continuously from the foundation to or through the roof ~~with sufficient structural stability under fire conditions to allow.~~ designed to safely support loads as required by Chapter 16 following collapse of construction on either side. ~~without collapse of the wall.~~

Fire wall, cantilevered. Self supporting fire wall which is independent from construction on either side of the fire wall.

Fire wall, double. Two independent parallel walls meeting the exterior wall requirements of section 705 and having an equivalent combined assembly fire-resistance rating equal to the required fire-resistance rating.

Fire wall, tied. Fire wall connected to a diaphragm on both sides of the wall, with the fire wall relying on the diaphragm on either side for structural support, but not at the same time.

705.6 Structural ~~stability~~ requirements. The wall shall extend to the height required by Section 705.11 and shall ~~have sufficient structural stability such that it will remain in place for~~ be designed to safely support loads as required by Chapter 16 for the duration of time indicated by the required fire-resistance rating

706.2 Structural ~~stability~~ requirements. ~~Fire walls shall have sufficient structural stability under fire conditions to allow collapse of construction on either side without collapse of the wall for the duration of time indicated by the required fire-resistance rating.~~ *Fire walls* shall be designed to safely support loads as required by Chapter 16 for the duration of time indicated by the required fire-resistance rating, assuming collapse of construction due to fire on either side of the wall. For application of wind loads and lateral live loads, it is permitted to consider the portions of the fire wall that are interior prior to assumed collapse as interior walls after assumed collapse. Load combinations with earthquake loading need not be considered after assumed collapse. Fire walls shall meet the additional requirements of 706.2.1, 706.2.2, or 706.2.3.

706.2.1 Tied fire walls. Tied fire walls and supporting structure opposite of the assumed collapse of construction, shall resist an applied lateral load induced by collapse of construction on either side of the wall. Lateral loads applied to the wall and supporting structure due to collapse are permitted to be determined in accordance with equation 7-2 provided both of the following conditions are met.

1. Framing supported by the fire wall is detailed to permit rotation of the framing element at the fire wall support.
2. Framing, other than tension ties, is not continuous through the fire wall

$$h_f = 1.5 a l \qquad \textbf{(Equation 7-2)}$$

Where:

h_f = lateral load applied at framing support

l = span of framing perpendicular to fire wall
ω = equivalent uniform applied gravity load to framing member

The applied lateral load due to collapse need not exceed the maximum force that can be developed in the system.

Construction on both sides of the fire wall shall be considered a single structure for structural design and analysis.
(Renumber subsequent equations)

706.2.2 Cantilevered fire walls. Separation between a cantilevered fire wall and building elements on all sides shall meet the requirements of 1613.6.7.

706.2.3 Double fire walls. Each wall of a double fire wall shall be considered an exterior wall as required by section 705. Construction on either side of the fire wall shall be considered separate structures and shall meet the building separation requirements of 1613.6.7.

706.4 Fire-resistance rating. *Fire walls* shall have a fire-resistance rating of not less than that required by table 706.4(1). Double fire walls shall be considered to have an equivalent combined fire resistance rating as specified in table 706.4(2).

TABLE 706.4(1)
FIRE WALL FIRE-RESISTANCE RATINGS

GROUP	FIRE-RESISTANCE RATING (hours)
A, B,E, H-4, I, R-1, R-2, U	3[a]
F-1, H-3[b], H-5, M, S-1	3
H-1, H-2	4[b]
F-2, S-2, R-3, R-4	2

a. In Type II or V construction, walls shall be permitted to have a 2-hour fire–resistance rating
b. For Group H-1, H-2 or H-3 buildings, also see Sections 415.4 and 415.5

Add new Table as follows:

TABLE 706.4(2)
EQUIVALENT COMBINED FIRE-RESISTANCE RATING FOR DOUBLE FIRE WALLS.

Required fire-resistance rating for each wall of a double fire wall (hours)	Equivalent single wall fire-resistance rating (hours)
3	4
2	3
1	2

Reason: The language of Section 706.2 requires that fire walls have sufficient structural stability to prevent collapse of the fire wall under fire conditions. However, there is no definition of *sufficient structural stability* or design loads provided for fire conditions. While this provides a legitimate performance goal, it is inconsistent with typical structural code requirements which require specific resistance against defined loading.

This code change proposal attempts to clearly define loading and resistance requirements for fire walls, reference already defined strength and stability requirements in chapter 16, as well as clarify / define types of firewalls.

A provision has been added permitting the application of interior lateral live loads on fire walls based upon their condition prior to collapsed construction on either side of the wall. NFPA 221 applies 5psf for the lateral design load on fire walls, which is also the typical lateral live load applied to interior walls per 1607.13.

The types of fire walls are typical walls defined in NFPA 221. NFPA 221 provides an equation for determining the lateral load applied to a tied fire wall, which is based upon a catenary action due to sagging of the member. The equation provided in this proposal is based upon the horizontal reaction due the centripetal force of a swinging member that lost support at the far end. While lateral loads due to catenary action are possible, the horizontal reaction due to centripetal force provides a larger horizontal load than the catenary action equation provided in NFPA 221.

Reference:
NFPA 221, Standard for High Challenge Fire Walls, Fire Walls and Fire Barrier Walls (2009 Edition). National Fire Protection Association (NFPA)

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CARMAN-FS1-702.1

FS25–09/10
706.3.1 (New)

Proponent: Jason Thompson, National Concrete Masonry Association, representing the Masonry Alliance for Codes and Standards

Add new text as follows:

706.3 Materials. *Fire walls* shall be of any *approved* noncombustible materials.

Exception: Buildings of Type V construction.

706.3.1 Sources of ignition. Where fire walls are constructed of combustible structural elements in buildings of Type V construction, potential sources of ignition of the combustible structural elements shall not be permitted within the interior of the fire wall assembly.

Reason: Combustible fire walls may be fire tested in accordance with ASTM E119 to achieve the minimum required fire resistance rating specified in Table 706.4 for the appropriate application. However, the combustible framing elements and combustible materials used to construct the fire wall would still be subjected to burning if they become ignited by an ignition source located within the fire wall cavity. Typical examples of ignition sources include gas vents, dryer vents, hot water piping, electrical wiring, electrical receptacles, switches, equipment and other electrical components. The purpose of this code change proposal is to prohibit the installation of potential ignition sources within the wall cavities of fire walls constructed of combustible structural elements where allowed by the Exception to Section 706.3. The same risk of fire from these sources is not inherent in fire walls constructed of noncombustible materials since there are no combustible materials to ignite even though the wall cavities of such fire walls may contain potential ignition sources.

Another reason for this change is to strengthen the level of performance for fire walls constructed using combustible materials. Fire walls are intended to create separate buildings. Because they are required to be structurally stable and remain in place if the building on either side of the fire wall should collapse due to a fire, it follows that they should not be subject to burning and subsequent collapse caused by a fire originating within the cavity of the fire wall. Therefore, wherever combustible structural elements are used to construct a fire wall, ignition sources should be prohibited so that the structural integrity and fire resistance rating of the fire wall will not be compromised.

Finally, the ASTM E119 test procedure does not have an ignition resistance component in the cavities of fire rated walls constructed of combustible materials. To address the structural reliability of fire walls constructed of combustible structural materials the building code needs to set limits on the potential for the internal ignition of those combustible components and the subsequent degradation of the fire wall. If a fire occurs within the fire wall, it needs to be able to perform its intended function. Limiting potential sources of ignition should be required to achieve this goal.
Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Thompson-FS1-706.3.1

FS26–09/10
706.5

Proponent: Rick Lupton, City of Seattle, representing Seattle Dept of Planning & Development

Revise as follows:

706.5 Horizontal continuity. *Fire walls* shall be continuous from *exterior wall* to *exterior wall* and shall extend at least ~~18 inches (457 mm) beyond the exterior surface of *exterior walls*~~ to the interior surface of exterior sheathing or siding.

~~**Exceptions:**~~

1. ~~*Fire walls* shall be permitted to terminate at the interior surface of combustible exterior sheathing or siding provided the *exterior wall* has a *fire-resistance rating* of at least 1 hour for a horizontal distance of at least 4 feet (1220 mm) on both sides of the *fire wall*. Openings within such *exterior walls* shall be protected by opening protectives having a *fire protection rating* of not less than 3/4 hour.~~
2. ~~*Fire walls* shall be permitted to terminate at the interior surface of noncombustible exterior sheathing, exterior siding or other noncombustible exterior finishes provided the sheathing, siding, or other exterior noncombustible finish extends a horizontal distance of at least 4 feet (1220 mm) on both sides of the *fire wall*.~~
3. ~~*Fire walls* shall be permitted to terminate at the interior surface of noncombustible exterior sheathing where the building on each side of the *fire wall* is protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.~~

~~**706.5.1 Exterior walls.**~~ Where the *fire wall* intersects *exterior walls*, the *fire-resistance rating* and opening protection of the *exterior walls* shall comply with one of the following:

1. The *exterior walls* on both sides of the *fire wall* shall have a 1-hour *fire-resistance rating* with ~~3/4-~~hourprotection ~~where opening protection is required by Section 705.8~~. The *fire-resistance rating* of the *exterior wall* shall extend a minimum of 4 feet (1220 mm) on each side of the intersection of the *fire wall* ~~to~~ with the *exterior wall*. ~~*Exterior wall* intersections at *fire walls* that form an angle equal to or greater than 180 degrees (3.14 rad) do not need *exterior wall* protection.~~
2. Buildings or spaces on both sides of the intersecting *fire wall* shall be assumed to have an imaginary *lot line* at the *fire wall* and extending beyond the exterior of the *fire wall*. The location of the assumed line in relation to the *exterior walls* and the *fire wall* shall be such that the *exterior wall* and opening protection meet the requirements set forth in Sections 705.5 and 705.8. ~~Such protection is not required for *exterior walls* terminating at *fire walls* that form an angle equal to or greater than 180 degrees (3.14 rad).~~

   Exception: Exterior wall and opening protection is not required on each side of the intersection where any of the following apply:

   1. Where exterior wall intersections at fire walls form an angle equal to or greater than 180 degrees (3.14 rad).
   2. Where the fire wall extends at least 18 inches (457 mm) beyond the exterior surface of exterior walls.
   3 Where noncombustible exterior sheathing, exterior siding or other noncombustible exterior finish extends a horizontal distance of at least 4 feet (1220 mm) on both sides of the *fire wall*.
   4. Where noncombustible exterior sheathing, exterior siding or other noncombustible exterior finish is provided and the building on each side of the *fire wall* is protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2.

~~**706.5.2**~~ **706.5.1 Horizontal projecting elements.** *(No change to text)*

Reason: This proposal is intended to be editorial only, with no substantive technical changes. The existing code language is confusing because the exceptions to Sec. 706.5 and Sec. 706.5.1 both regard the intersection of a fire wall with an exterior wall and as a result appear to have conflicting requirements rather than the conditional requirements intended. Additionally, the 18-inch fire wall extension at exterior walls is generally avoided and should be an alternative option instead.

The proposal combines continuity and exterior wall intersections, the exceptions related solely to omission of wall protectives

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LUPTON-FS1-706.5

FS27–09/10
706.6, 706.6.2 (New)

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

706.6 Vertical continuity. Fire walls shall extend from the foundation to a termination point at least 30 inches (762 mm) above both adjacent roofs**.**

Exceptions:

(Exceptions 1 through 5 remain unchanged)

6. Buildings with sloped roof in accordance with Section 706.6.2

Add new text as follows:

706.6.2 Buildings with sloped roofs. Where a fire wall serves as an interior wall for a building, and the roof on one side or both sides of the fire wall, slopes toward the fire wall at a slope greater than two units vertical in 12 units horizontal (2:12), the fire wall shall extend to a height equal to the height of the roof located 4 feet from the fire wall plus 30 inches. In no case shall the extension of the fire wall be less than 30 inches.

Reason: The Code fails to address the vertical continuity of fire walls at sloped roofs when fire wall serves as an interior wall. Since the parapet construction at the exterior walls (Section 705.11.1) is dependent on fire separation and protection of wall openings, this new Section (706.6.2) is needed to be structured differently. To achieve this, parts of Section 705.11.1 and Section 705.11, Exception 4 have been combined. By implementing this code proposal the height of the parapet could vary from 42" (for roofs with slopes of 3:12) to 6'-6" (for roofs with slope of 12:12). This is comparable with parapet heights that would be obtained from Section 705.11.1

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAIEL-FS4-706.6.doc

FS28–09/10
706.8

Proponent: Randy B. Maurer, Associated Building Inspections, Inc., representing Pennsylvania Association of Building Code Officials, Inc.

Revise as follows:

706.8 Openings. Each opening through a *fire wall* shall be protected in accordance with Section 715.4 and shall not exceed 156 square feet (15 m^2). The aggregate width of openings at any floor level <u>of a wall over 20 feet long</u> shall not exceed 25 percent of the length of the wall.

(Exception 1 and 2 remain unchanged)

Reason: Occasionally, a small fire wall is needed to divide a wide circulation space connecting two buildings. For example, two large unsprinklered warehouse structures may be connected by a 12' corridor for forklift traffic. The 25% rule would limited the opening in that wall to 3' wide. The proposed change would allow that opening to be at least 8' to accommodate the forklifts. The 20' limit is based on a 16' wide door for moving materials, assuming 2' of wall on either side.
Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Maurer-FS2-706.8

FS29–09/10
707.3.8, 901.7; 901.4.3

Proponent: Marshall Klein PE, Marshall A. Klein & Associates Inc., representing Marshall A. Klein & Associates, Inc.

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THE FIRE SAFETY COMMITTEE.

PART I – IBC FIRE SAFETY

Revise as follows:

707.3.8 Separation of mixed occupancies. Where the provisions of Section 508.4 are applicable, the fire barrier <u>or horizontal assembly</u> separating mixed occupancies shall have a fire-resistance rating of not less than that indicated in Section 508.4 based on the occupancies being separated <u>to comply with the allowable area requirement of Section 508.4</u>. <u>For purposes of determining the size of fire areas for requiring a fire protection system in accordance with Chapter 9, such fire areas shall be separated by fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both, having a fire-resistance rating of not less than that determined in accordance with Table 707.3.9.</u>

901.7 Fire areas. <u>For purposes of determining fire protection system requirements in accordance with this chapter,</u> where buildings, or portions thereof, are divided into fire areas so as not to exceed the limits established for requiring a fire protection system in accordance with this chapter, such fire areas shall be separated by fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both, having a fire-resistance rating of not less than that determined in accordance with Section <u>707.3.8 or Section</u> 707.3.9<u>, as applicable</u>.

PART II – IFC

Add new text as follows:

901.4.3 Fire areas. For purposes of determining fire protection system requirements in accordance with this chapter, buildings, or portions thereof, divided into fire areas shall be separated by fire barriers constructed in accordance with the International Building Code and having a fire-resistance rating of not less than that determined in accordance with the International Building Code Section 707.3.8 or Section 707.3.9, as applicable.

Reason: This code proposal is strictly editorial and for correlation of requirements between the IBC and IFC with no intent to change the requirements under the Codes.

In the July-August 2008 Building Safety Journal there was an article entitled "Fire Barrier Ratings in Separated Mixed Occupancies", by Kevin Scott, ICC Senior Regional Manager of Fire Services Activities. That article explained the application of the code requirements that were unclear to many users of the Code on this subject. FS34-07/08 was a good start on clarifying IBC Section 707.3.9 last code cycle on this issue. This code proposal is attempting to further help clarify this issue in the other relevant sections of the I Codes by adding the appropriate text into the IBC and IFC Codes to properly state what Mr. Scott noted in his article was the intent of the Code.

Part I of this code proposal adds to the IFC Code new Section 901.4.3, "Fire areas", to correlate with the identical existing IBC Section 901.7, "Fire areas".

Part II of this code proposal adds to IBC Section 707.3.8, "Separation of mixed occupancies", the clarification that the provisions of Section 508.4, "Separated occupancies", also apply to horizontal assemblies as well as to the vertical fire barriers. This section will now correlate with Section 707.3.9, "Fire areas" that also applies to both fire barriers and horizontal assemblies.

In summary, this code proposal provides the code text language clarifications that follow the explanation of the code's intent based on the article in the July-August 2008 Building Safety Journal, by Kevin Scot, ICC Senior Regional Manager of Fire Services Activities.

Cost Impact: This code change proposal will not increase the cost of construction.

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KLEIN-FS1-707.3.8

FS30–09/10
707.3.9

Proponent: David S. Collins, FAIA, The Preview Group, Inc., representing The American Institute of Architects

Revise as follows:

707.3.9 Fire areas. Where required by Section 903, 905 or 907, ~~T~~the fire barriers or horizontal assemblies, or both, separating a single occupancy into different fire areas shall have a fire-resistance rating of not less than that indicated in Table 707.3.9. The fire barriers or horizontal assemblies, or both, separating fire areas of mixed occupancies shall have a fire-resistance rating of not less than the highest value indicated in Table 707.3.9 for the occupancies under consideration.

Reason: The creation of single-occupancy fire areas is only required when determining if the fire area exceeds the limits in Sections 903, 905 or 907.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Collins-FS1-707.3.9

FS31–09/10
TABLE 707.3.9

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing self

Revise as follows:

TABLE 707.3.9
FIRE-RESISTANCE RATING REQUIREMENTS FOR FIRE BARRIER ASSEMBLIES OR HORIZONTAL ASSEMBLIES BETWEEN FIRE AREAS

OCCUPANCY GROUP	FIRE-RESISTANCE RATING (hours)
H-1, H-2	4
F-1, H-3, S-1	3
A, B, E, F-2, H-4, H-5, I, M[a], R, S-2	2
U	1

a. For Group M occupancies containing display shelves or storage racks where the top of the merchandise is greater than 12 feet (3658 mm) in height above the floor, the minimum fire-resistance rating shall be 3 hours.

Reason: The purpose of this proposed code change is to increase the required fire-resistance rating from 2-hours to 3-hours for fire barriers and horizontal assemblies used to separate fire areas of Group M occupancies where the Group M occupancy contains display shelves and/or storage racks where the top of the merchandise is greater than 12 ft in height. This is intended to recognize the fact that the fire load will be significantly greater in those Group M occupancies where the heights of the merchandise on display or on storage racks in the retail sales area exceed 12 ft. For the most part where Group M occupancies have display racks less than 8 ft in height, the fire load will generally not exceed 20 pounds per sq ft which is roughly equivalent to a 2-hour fire duration. However, for those stores where the display shelving and storage racks allow for merchandise to be placed greater than 12 ft above the floor such as in the typical "big box" stores where the fire load is significantly greater, the fire load can greatly exceed 20 pounds per sq ft and can be as high as 30 to 40 pounds per sq ft. A 30 pound per sq ft fire load is roughly equivalent to a 3-hour fire duration.

We believe this is especially important since fire areas are used to avoid the requirements triggering automatic sprinkler system protection in accordance with Section 903.2.7 for Group M occupancies. If a Group M occupancy building is separated into fire areas of 12,000 sq ft or less, then the building is not required to be sprinklered unless the combined fire areas exceed 24,000 sq ft. In reality, this means that a 1-story building could be divided into two 12,000 sq ft fire areas without having to provide for automatic sprinkler protection. Similarly, a 3-story Group M occupancy limited to 8,000 sq ft per story with the floors (horizontal assemblies) having the required fire-resistance rating to create the fire area separations would also not be required to be sprinklered. In those nonsprinklered cases, it is very important to limit the fire load for the Group M occupancies based on the height of the merchandise displayed and stored in the building. So for those cases which generally encompass most retail sales situations, the 2-hour fire-resistance rating would be suitable. But for those cases such as the "big box" stores where the display shelves and storage racks are greater than 12 ft in height, the fire-resistance rating of the fire barriers and horizontal assemblies should be increased to a minimum of 3-hours.

The proposed 12 ft height limit is also consistent with Chapter 23 of the International Fire Code for high-piled combustible storage which is defined as "storage of combustible materials in closely packed piles or combustible materials on pallets, in racks or on shelves where the top of the storage is greater than 12 ft (3658 mm) in height…" Chapter 23 recognizes that high-piled combustible storage creates a much greater fire hazard than storage of lesser heights. Thus, there are more restrictive fire safety requirements incorporated into Chapter 23 as enumerated in Table 2306.2 General Fire Protection and Life Safety Requirements. This recognizes the fact that the fire load is significantly greater in these types of storage occupancies.

Increasing the minimum fire-resistance rating from 2-hours to 3-hours for these Group M occupancies would also be consistent with the minimum 3-hour fire-resistance rating specified for Group F-1, H-3, and S-1 occupancies in the table based on the relative fire load and fire hazard. And it is also consistent with Table 706.4 Fire Wall Fire-Resistance Ratings.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Thornberry-FS3-707.3.9

FS32–09/10
707.7

Proponent: Sarah A. Rice, CBO, representing self

Revise as follows:

707.7 Penetrations. Penetrations of *fire barriers* shall comply with Section 713.

707.7.1 Prohibited penetrations. Penetrations of fire barriers used to construct ~~into~~ an *exit* enclosure or enclose an *exit* passageway shall be allowed only when permitted by Section 1022.4 or 1023.6, respectively.

Reason: The proposed revision makes it clear that it is "fire barriers" that are being penetrated. It make the language consistent with that for the sections on openings, joints and ducts and air-transfer openings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-FS1c-707-7

FS33–09/10
707.8

Proponent: William E. Koffel, Koffel Associates, Inc, representing Firestop Contractors International Association

Revise as follows:

707.8 Joints. Joints made in or between fire barriers, and joints made at the intersection of fire barriers with underside of the floor or roof sheathing, slab, or deck above, and the exterior vertical wall intersection shall comply with Section 714.

Reason: The proposed language clarifies that the same requirement to protect the joint of a fire barrier and the underside of the floor also applies to the joint of a fire barrier and an exterior wall.

Cost Impact: The code change proposal will increase the costs of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KOFFELL-FS1-707.8.doc

FS34–09/10
708

Proponent: Sarah A. Rice, CBO, representing self

Revise as follows:

(Relocate Section 708 in its entirety to become NEW Section 714)

Section 714 ~~708~~ Shaft Enclosures

(Renumber applicable section numbers)

Reason: This proposal seeks to relocate Section 708 to become New Section 714, appearing behind the Section 713 Penetrations. This is done because the only way to get to the shaft section is through Section 713 and because a shaft is only one of several ways that a penetration in a horizontal assembly can be protected.

References within sections have not been correlated. ICC Staff has indicated that if accepted this would be done editorially.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-FS1d-708

FS35–09/10
708.5

Proponent: Sharon Halpert, representing self

Revise as follows:

708.5 Continuity. Shaft enclosures shall be constructed as *fire barriers* in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 712, or both, and shall have continuity in accordance with Section 707.5 for *fire barriers* or Section 712.4 for *horizontal assemblies* as applicable. Joints created at every intersection between the bottom of a shaft wall assembly and the top of the floor or slab shall also comply with Section 714

Reason: Where used, shafts are critical building elements in preventing the passage of heat, flame and toxic gases to stories beyond the floor of fire origin. While the requirements for continuity of vertical and horizontal shafts through floors and walls are quite detailed, there is a lack of specific information for the construction detail required when the shaft wall is not a continuous membrane, but rather is interrupted at one or more floors by the floor slab.

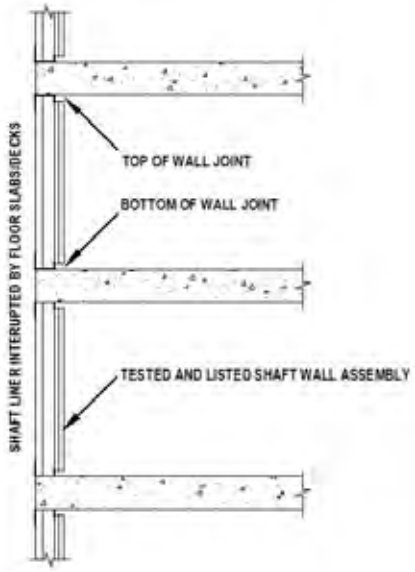
Substantiation: A shaft is intended to be a continuous assembly (fire barrier) from its lowest point to its highest point, with all openings, joints and penetrations suitably protected or sealed. This revision serves simply to clarify the intent of how this protection will be maintained.

When a shaft is hung entirely from the floors it traverses and is constructed of wall materials (e.g. gypsum boards, concrete masonry units) that are joined one to another from top to bottom, there would normally not be any intermediate floor slabs that would bisect the shaft wall, and therefore no fire resistive joint systems within the wall.

On the other hand, when a shaft enclosure is constructed of independent wall segments that rest on top of each floor slab/deck that the shaft traverses, there will be a joint between the wall segments and the floor slab/deck above, as well as between the wall and the floor slab/deck below it. Clearly both types of joints will occur at each level this shaft wall assembly is intended to protect. Shaft construction is unique in that the joint at the top of the wall and at the bottom of wall are equally important in maintaining the anticipated protection.

Since the code already maintains provisions for the continuity of shaft wall construction, this proposed clarification will simply serve to enhance this intent. Smoke and fire inside a shaft, in a multi-story building, will not delineate between the head of wall joint on the underside of a deck and the bottom of wall joint on the top side of this same deck. Once the pressure builds and the temperatures rise, fire and smoke will find its way through any unprotected areas. An illustration of this condition is enclosed.

There are dozens of bottom-of-wall fire resistance rated joint systems that have been tested by nationally recognized testing organizations and have been listed in their directories. Information concerning these details is described in the individual systems. Bottom-of-wall joint systems have been investigated using the general methods and conditions of acceptance specified for the four defined types of joint systems in ANSI/UL 2079 and ASTM E1966.



Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: HALPERT-FS1-708.5

FS36–09/10
708.8

Proponent: David S. Collins, FAIA, The Preview Group, Inc. representing The American Institute of Architects

Revise as follows:

708.8 Penetrations. Penetrations in a shaft enclosure shall be protected in accordance with Section 713 as required for fire barriers. Structural elements, such as beams or joists, where they and their supporting construction are protected in accordance with Section 713 shall be permitted to penetrate a shaft enclosure.

Reason: It is virtually impossible to design a shaft enclosure over a few stories tall without some support from adjoining structural elements. This change will allow a beam or other structural member to penetrate a shaft as long as it is also protected as required.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Collins-FS2-708.8

FS37–09/10
708.13, Chapter 35

Proponent: Christine Reed and Stuart Tom, PE, CBO, representing the California Fire Chiefs Association

1. Revise as follows:

708.13 Refuse and Laundry Chutes. In other than Group I-2, refuse and laundry chutes, access and termination rooms and incinerator rooms shall meet the requirements of sections 708.13.1 through 708.13.6.

Exceptions:

1. Chutes serving and contained within a single dwelling unit
2. Refuse and laundry chutes in Group I-2 shall comply with the provisions of NFPA 82, Chapter 5.

2. Add new standard to Chapter 35 as follows:

NFPA	
82-09	Standard on Incinerators and Waste and Linen Handling Systems and Equipment, 2009 Edition

Reason: Please note that 2 copies of the new referenced standard will be provided via United States Postal Service for this proposal.

Hospitals that are accredited by the Joint Commission must follow not only the rules of the International Code when being constructed, but must also follow the Life Safety Code (NFPA 101). Within that code, linen and rubbish chutes must conform to a set of rules that are in not only NFPA 101, but also NFPA 82. The rules in both documents are largely consistent with the current IBC. One area of concern in which there is an inconsistency is that NFPA 82 requires that the top of the chute must be vented to the outside (NFPA 82, 5.2.2.4). Because this provision is not in the IBC, it creates a problem when the hospital tries to get its accreditation. Rectifying this problem after construction is completed can create a problem since it involves altering the roof, and demolishing that which has already been constructed. It would be less expensive to build the chute with the vent from the outset.

Having refuse and linen chutes follow the provisions of NFPA 82 ensures that the International code stays current with Joint Commission rules without having to go through a code change proposal each time the NFPA standard changes.

This proposal does not include adopting any portion of NFPA 101.

Referenced Standards: NFPA 82, 2004 edition

Cost Impact: The code change proposal will increase the cost of construction.
Analysis: A review of the standard(s) proposed for inclusion in the code, NFPA 82-09 for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: REED-TOM-FS1-707.13

FS38–09/10
708.13.4

Proponent: Larry Lincoln, representing Utah Chapter of ICC

Revise as follows:

708.13.4 Termination room. Refuse and laundry chutes shall discharge into an enclosed room separated from the remainder of the building by ~~not less than 1-hour~~ *fire barriers* constructed in accordance with Section 707.3 or *horizontal assemblies* constructed in accordance with Section 712.3, or both. Openings into the termination room shall be protected by opening protectives having a *fire protection rating* ~~of not less than 3/4 hour~~ equal to the protection required for the shaft enclosure. Doors shall be self- or automatic- closing upon the detection of smoke in accordance with Section 715.4.8.3. Refuse chutes shall not terminate in an incinerator room. Refuse and laundry rooms that are not provided with chutes need only comply with Table 508.2.5.

Reason: The current wording in the code creates some confusion as to when a refuse and laundry chute termination room should have a fire-resistance rating greater than 1 hour. The hourly rating of the termination room and opening protectives need to reflect language similar to that found in Section 708.11 (Enclosure at the bottom) of which this proposed change now does reflect.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Lincoln-FS1-708.13.4

FS39–09/10
708.3.1 (New), 708.13.1, 708.13.3, 715.4.1, 715.4.2, 715.4.8

Proponent: Edward L. Repic, Architectural Refuse Solutions, LLC, representing self

1. Add new text as follows:

708.3 Materials. The shaft enclosure shall be of materials permitted by the building type of construction.

708.3.1 Shaft enclosure at rubbish and laundry chutes. The shaft enclosure containing a rubbish or laundry chute shall include the following provisions:

708.3.1.1 Single sided construction. The chute shaft enclosure shall be of a listed construction that can be fully assembled in accordance with its approved design, including all required drywall taping when required by the design, from one side after the chute has been installed, regardless of the presence of bearing walls supporting floor framing.

708.3.1.2 Identical floor and wall ratings. A chute shaft enclosure shall provide the required fire protection rating over its entire length. Fire ratings shall not be lower at floor, ceiling or roof framing intersections.

708.3.1.3 Extend shaft enclosure to roof. The shaft enclosure shall extend to the underside of the roof. Structural framing members supporting the roof shall be outside of the chute shaft enclosure and shall not be permitted inside the shaft enclosure.

2. Revise as follows:

708.13.1 Rubbish and laundry chute enclosures. A shaft enclosure containing a rubbish or laundry chute shall not be used for any other purpose and shall be enclosed in accordance with Section 708.3.1 and 708.4. ~~Openings into the shaft~~, Fire-rated chute intake door assemblies as well as openings ~~including those~~ from access rooms and termination rooms, shall be protected in accordance with this section and Section 715. Openings into chutes shall not be located in *corridors*. ~~Doors~~ Fire-rated chute intake door assemblies shall be self- or automatic-closing upon the actuation of a smoke detector in accordance with Section 715.4.8.3, except that heat-activated closing devices shall be permitted between the shaft and the termination room. Fire-rated chute intake door assemblies shall additionally comply with Sections 715.4.8 and 715.4.8.1.1.

708.13.3 Rubbish and laundry chute access rooms. ~~Access openings~~ Openings into access rooms for rubbish and laundry chutes shall be located in rooms or compartments enclosed by not less than 1-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 712, or both. Openings into the access rooms shall be protected by opening protectives having a *fire protection rating* of not less than 3/4 hour. Doors shall be self- or automatic-closing upon the detection of smoke in accordance with Section 715.4.8.3.

715.4.1 Side-hinged or pivoted swinging doors. *Fire door* assemblies with side-hinged and pivoted swinging doors shall be tested in accordance with NFPA 252 or UL 10C. After 5 minutes into the NFPA 252 test, the neutral pressure level in the furnace shall be established at 40 inches (1016mm) or less above the sill.

> **Exception:** Side-hinged rubbish and laundry chute intake doors shall be tested to UL-10B and shall otherwise comply with the provisions of Section 715.4.8 and 715.4.8.1.1.

715.4.2 Other types of assemblies. *Fire door* assemblies with other types of doors, including swinging elevator doors and fire shutter assemblies, bottom and side-hinged chute intake doors, and top hinged chute discharge doors, shall be tested in accordance with NFPA252 or UL10B. The pressure in the furnace shall be maintained as nearly equal to the atmospheric pressure as possible. Once established, the pressure shall be maintained during the entire test period.

715.4.8 Door closing. *Fire doors* shall be self- or automatic-closing in accordance with this section. Self-closing chute intake doors shall not fail in a “door open” position in the event of a closer failure.

3. Add new text as follows:

715.4.8.1 Latch required. Unless otherwise specifically permitted, single *fire doors* and both leaves of pairs of side-hinged swinging *fire doors* shall be provided with an active latch bolt that will secure the door when it is closed.

715**.4.8.1.1 Chute intake door latching**. Chute intake doors shall be positive latching, remaining latched and closed in the event of latch spring failure during a fire emergency.

4. Revise as follows:

715.4.8.3 Smoke-activated doors. Automatic-closing doors installed in the following locations shall be automatic-closing by the actuation of smoke detectors installed in accordance with Section 907.3 or by loss of power to the smoke detector or hold-open device. Doors that are automatic-closing by smoke detection shall not have more than a 10-second delay before the door starts to close after the smoke detector is actuated:

1. Doors installed across a *corridor*.
2. Doors that protect openings in *exits* or *corridors* required to be of fire-resistance-rated construction.
3. Doors that protect openings in walls that are capable of resisting the passage of smoke in accordance with Section 508.2.5.2.
4. Doors installed in *smoke barriers* in accordance with Section 710.5.
5. Doors installed in *fire partitions* in accordance with Section 709.6.
6. Doors installed in a *fire wall* in accordance with Section 706.8.
7. Doors installed in shaft enclosures in accordance with Section 708.7.
8. Doors installed in rubbish and laundry chutes and access and termination rooms in accordance with Section 708.13. Automatic-closing chute intake doors installed in rubbish and laundry chutes shall also meet the requirements of Sections 715.4.8 and 715.4.8.1.1.
9. Doors installed in the walls for compartmentation of underground buildings in accordance with Section 405.4.2.
10. Doors installed in the elevator lobby walls of underground buildings in accordance with Section 405.4.3.
11. Doors installed in smoke partitions in accordance with Section 711.5.3.

Reason: This submittal is part of four such proposals submitted as independent documents with the intent of adequately addressing Rubbish Chutes (which can include "recycling" chutes that simply redirect parts of the rubbish waste stream to locations other than a landfill) and Laundry (or Laundry) Chutes. These proposals individually address Life Safety, Sprinkler Placement, Accessibility in new and existing facilities, and actual Chute Construction and a related component to Rubbish Chutes: Compactors (codes generally address the shaft enclosure but ignore the actual chute being enclosed or the compactor it is feeding).

Reason with regard to 708.3.1: The proposed additions are designed to overcome common mistakes that most commonly, but not exclusively, occur in wood frame structures. The single side construction concept is crucial as most fire wall designs require full fire taping on both sides of the wall. It is impossible to all required fire taping on the inside surface of a chute enclosure because the chute is in place, as is the chute intake door. Wood framing also commonly creates problems with fire ratings at wall and floor intersection as well as roof framing interferences.
Reason with regard to 708.13.1: The first addition of text simply coordinates information between sections. The next two additions, calling out "fire-rated chute intake door assemblies", permit differentiation between man doors and intake doors specifically accessing the chute by penetration of the enclosure. The final text addition again provides coordination between sections and additionally introduces differentiation between side-hinged and bottom-hinged doors.
Reason with regard to 708.13.3: This "deletion and substitution" continues the theme of providing differentiation between man doors and intake doors specifically accessing the chute by penetration of the shaft enclosure.
Reason with regard to 715.4.1 Exception (new): This additional text is an occurrence of the need for differentiation between man doors and fire doors that perform as chute intake doors. Chute intake doors do not exist as UL-10C doors. They are always UL-10B doors regardless of whether they are side-hinged (almost exclusively used on laundry chutes) or bottom hinged (most often used on rubbish chutes and occasionally on linen chutes).
Reason with regard to 715.4.2: The additional text coordinates information with other sections for clarity.
Reason with regard to 715.4.8, 715.4.8.1, and 715.4.8.3: Rubbish and Laundry Chute intake doors, as listed fire doors are required to be self-closing and positive latching to maintain constant protection of the fire wall penetrations that are the chute access (intake) points on specific floors of the buildings they serve: Apartments & Condominiums, Medical & Nursing Facilities, and Hotels...places where people sleep. Because of their mundane nature, they are typically used daily by every resident or maintenance staff member. Resultantly, they are used much more frequently than most fire doors because they are logically not equipped with hold-open devices. These intake doors have two short-comings as fire protection devices.

First, in a pre-fire condition, the industry-wide recognized symptom that an intake is in need of a closer replacement is an open chute intake door. This creates a major fire hazard in that the now-unprotected opening exposes other floors of the building serviced by the chute, which extends to and penetrates the roof, to fire damage to life and property. Unfortunately, most maintenance personnel and, worse, most fire inspectors, do not recognize the inherent danger and simply don't facilitate/require repair of the failed closer. This proposal is based, in part, upon the idea that a self-closing fire door used for a chute intake should REMAIN closed, even in the event of a closer failure. Simple technology exists that can insure closer operation in the event of a failure of normal closer function.

Secondly, in an actual fire emergency which involves a chute door from either, or even *both* sides, two things happen: A) the closer experiences hydraulic seal failure, permitting the hydraulic fluid to burn away. Even more destructive is the fact that the aluminum closer cylinder housing melts away. Both of these occur significantly before the required 90-minute door life. And B) the vertically-installed latch bolt on bottom-hinged, rubbish chute doors (as opposed to the horizontally positioned latch on side-hinged laundry chute doors) can be heated to the point where the spring holding the latch bolt in an extended position fails, thereby losing tension (spring manufacturers peg the maximum temperature limit for *any* spring at about 600°F. to 700°F). Without spring tension, the latch bolt can compress the spring, allowing the intake door to fall open DURING the fire emergency. This failure then promotes the possible spread of the fire to uninvolved areas of the building in every smoke compartment through which the chute passes. This proposal is based, in part, upon the idea that a positive latching fire door used for a chute intake should REMAIN latched, even in the event of a tension spring failure. Simple technology exists that can insure latch bolt operation in the event of such a tension spring failure.

Cost Impact: For closer and latch modifications: Less than $75, installed

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: REPIC-FS1-708.3.1 New

FS40–09/10
708.14.1

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing self

Revise as follows:

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than ~~three~~ two stories. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition to the requirements in Section 709 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for corridor walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

(Exceptions to remain unchanged)

Reason: This proposed code change is a follow up to Code Change FS46-07/08 which was submitted by Cal Chiefs. During the public hearings in Palm Springs, the Cal Chiefs representative at the hearings requested that the Fire Safety Committee disapprove the code change since it needed further development. No other testimony was offered on that code change proposal. It is not clear as to why this position was taken, especially since a Public Comment was never developed to follow up. At any rate, the following text in the remainder of this supporting statement is taken from that original code change submittal.

Currently, this Section triggers the requirement for enclosed elevator lobbies when the elevator shaft enclosure connects more than three stories. The purpose of this code change proposal is to reduce that threshold to where the elevator shaft enclosure connects more than two stories.

This is generally consistent with Section 708 Shaft Enclosures which requires shaft enclosures for openings that pass through floor/ceiling assemblies but allows specific exceptions for two consecutive stories to be interconnected with floor openings without a shaft enclosure. Refer to Exceptions 7 and 11 to Section 708.2. Thus, for those cases smoke will be able to readily migrate from one story to the next through the unenclosed floor openings. In that case it seems reasonable that it would not be critical to require the elevator lobby to protect elevator hoistway enclosures from smoke migration. However, we believe that once the elevator shaft interconnects three or more stories, it should be protected against smoke movement through the shaft so as to prevent smoke spread from floor to floor.

It has been well documented that smoke spreads readily throughout the building via the elevator shafts even though the elevator hoistway doors are protected with fire protection rated fire doors. The fact is that such doors are very loose fitting. Even though they pass the fire door test, they will still allow significant quantities of smoke to pass around the edges of the door. Since stack effect occurs in multi-story buildings, the natural tendency for smoke is to migrate toward the elevator shafts. Then the smoke will move either upward or downward, depending upon where the origin of smoke is in relationship to the neutral pressure plane within the building. And then the smoke will leak out of the elevator shafts and spread onto floors remote from the fire floor.

Therefore, we believe that it is important to provide protection for the elevator shaft hoistway doors against the movement of smoke from floor to floor once the elevator intercommunicates more than two stories.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Thornberry-FS2-708.14.1

FS41–09/10
708.14.1

Proponent: Larry Lincoln representing Utah Chapter of ICC

Revise as follows:

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories* including any basements but not any mezzanines. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 709 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

Exceptions:

(Exceptions to remain unchanged)

Reason: In many parts of the country basements are common and should be included in determining the number of floors where these requirements become effective. The new wording is taken almost word for word from I.B.C. Section 708.4 where the fire-resistance requirements for shafts are required. Since the elevator is in a shaft whose fire-resistance is determined from section 708.4 then it is logical that the threshold for the requirements of 708.14.1 parallel the shaft requirements. In our jurisdiction we have a project where there are four levels of parking under three levels of retail above so the elevators serve seven levels. Under the current code the elevators only serve three stories and none of the safeguards in 708.14.1 would apply.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Lincoln-FS2-708.14.1

FS42–09/10
708.14.1

Proponent: Sarah A. Rice, representing herself.

Revise as follows:

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition, to the requirements In Section 709 for fire partitions, doors protecting openings in the elevator lobby enclosure walls, <u>other than the elevator shaft doors,</u> shall also comply with Section 715.4.3 as required for corridor walls and penetrations of the elevator lobby enclosure y ducts and air transfer openings shall be protected as required for corridors in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exceptions:

(Exceptions to remain unchanged)

Reason: The proposed language makes it clear that when an elevator lobby is required by 708.14 or by the area of refuge requirements the doors of the elevator are not required to have the additional smoke protection. As the lobby enclosure requirements were put in place to address smoke that may migrate up through the elevator shaft and spread to other parts of a floor, mandating that the doors have smoke protection is redundant. Therefore the elevator shaft is actually part of the lobby enclosure and does not need to be separated from the elevator lobby as other parts of the floor onto which it opens.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-FS2-708.14.1

FS43–09/10
708.14.1

Proponent: Gregory J. Cahanin, Cahanin Fire & Code Consulting representing the Smoke Safety Council

Revise as follows:

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 709 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 716.5.4.1. <u>Elevator lobby fire door assemblies in accordance with Section 715 shall be tested in accordance with UL 1784 without an artificial bottom seal.</u> Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

Exceptions:

(Exceptions to remain unchanged)

Reason: UL 1784 for the testing of fire door assemblies is well referenced in Section 715 for smoke and draft control fire door assemblies. The test records the data from the testing and doors assemblies may be tested by the manufacturer with or without an artificial bottom seal- most commonly a layer of duct tape is used for the undercut. Those results are published by UL. The responsibility for the referencing of design or result data from testing is with the Code that references UL 1784. If it simply states testing according to UL 1784, then any door tested with or without an artificial bottom seal can be utilized. Listed fire doors can have as much as ¾ inch undercut to allow for door swing and uneven floors. Heat and smoke flow from the underside of the door can be significant.

In the case of elevator lobbies, the fire rated elevator shaft protected by fire rated doors in 708.14.1 requires an additional box or lobby in front of it to stall the impact of heat or smoke upon the elevator shaft or in certain cases the movement of heat and smoke from the elevator shaft to upper floors based upon the heat stratification. Pressure differentials between the fire floor, non-fire floors, elevator shafts, interior HVAC operation, and wind loads upon the exterior of the building can all contribute to pressure differences at the elevator lobby. The lobby doors logically should be able to restrict the passage of smoke on all four sides of the door opening- to include the undercut.

Cost Impact: Minimal.

Analysis: Code change proposals FS43 and FS44 address lobby fire door testing without an artificial bottom seal. The committee needs to make its intent clear with respect to these provisions. Standard UL 1784 is currently referenced in the I-codes.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Cahanin-FS2-708.14.1-2

FS44–09/10
708.14.1

Proponent: Bob Eugene, representing Underwriters Laboratories Inc

Revise as follows:

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 709 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall be also comply with Section 715.4.3 as required for *corridor* walls <u>with the UL 1784 test conducted without an artificial bottom seal.</u> ~~and p~~Penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

Exceptions:

(Exceptions to remain unchanged)

Reason: This proposal clarifies that the air leakage rating of smoke and draft control doors protecting openings in elevator lobby enclosure walls shall be determined without an artificial bottom seal in order to replicate the stack effect present in an elevator shaft and hence the elevator lobby. This proposal is consistent with the artificial bottom seal requirements for smoke and draft control doors protecting the lobby of the new Fire Services Access Elevator found in Section 3007.4.3.
Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposals FS43 and FS44 address lobby fire door testing without an artificial bottom seal. The committee needs to make its intent clear with respect to these provisions. Standard UL 1784 is currently referenced in the I-codes.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-FS1-708.14.1

FS45–09/10
708.14.1

Proponent: Bill Ziegert, representing Smoke Guard, Inc.

Revise as follows:

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 709 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code. Access to an exit through an elevator lobby shall be permitted provided that access to at least one other required exit does not require passing through the elevator lobby.

Exceptions:

(Exceptions to remain unchanged)

Reason: Currently there is no prohibition in the code for occupied spaces exiting directly into an elevator lobby. Irrespective of whether the corridors leading to the elevator lobby are rated or not, the elevator lobby is a potentially hazardous area that can be filled with smoke. This change would insure that building occupants would have access to at least one exit without being forced to pass through the elevator lobby. Note that this language is already part of the current New York City Building Code which is based upon the IBC.

Cost Impact: No additional costs, since it is possible with the beginning design to structure the corridor system to provide direct access to at least one exit.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ZIEGERT-FS3-708.14.1

FS46–09/10
708.14.1

Proponent: Dave Frable, U.S. General Services Administration, representing the U.S. General Services Administration

Revise as follows:

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 709 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the level(s) of *exit discharge* ~~street floor~~, provided the level(s) of *exit discharge* ~~entire street floor~~ is equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

(Exceptions not shown, remain unchanged)

Reason: The intent of this code change is to only replace the undefined term “street floor” with the defined term “level of exit discharge”.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Frable-FS2-708.14.1

FS47–09/10
708.14.1

Proponent: Bob Eugene, Underwriters Laboratories Inc, representing Underwriters Laboratories Inc

Revise as follows:

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition to the requirements in Section 709 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall be also comply with Section 715.4.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

Exceptions:

(Exception 1 and 2 remain unchanged)

3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall ~~be~~ comply with the smoke and draft control door assembly requirements in Section 715.4.3.1 when tested in accordance with UL 1784 without an artificial bottom seal.

(Exception 4 through 7 remain unchanged)

Reason: As written, Exception 3 does not contain requirements for the allowable air leakage for this additional door, it just describes the test method to be used to measure the leakage. The proposed language fixes this hole in the code by referencing the maximum air leakage requirements in Section 715.4.3.1. A similar reference to 715.4.3.1 is used for smoke and draft control doors protecting the lobby of the new Fire Services Access Elevator in Section 3007.4.3.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-FS2-708.14.1Exc3

FS48–09/10
708.14.1

Proponent: Gregory J. Cahanin, Cahanin Fire & Code Consulting representing the Smoke Safety Council

Revise as follows:

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 709 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 708.2 are not required to have enclosed elevator lobbies.
3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial ~~bottom~~ horizontal or vertical seal.

4. Enclosed elevator lobbies are not required where the building is protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
   4.1. Group I-2 occupancies,
   4.2. Group I-3 occupancies, and
   4.3. High-rise buildings.
5. Smoke partitions shall be permitted in lieu of *fire partitions* to separate the elevator lobby at each floor where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 711 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 711.5.2, 711.5.3, and 715.4.8 and duct penetrations of the smoke partitions shall be protected as required for *corridors* in accordance with Section 716.5.4.1.
6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 708.14.2.
7. Enclosed elevator lobbies are not required where the elevator serves only *open parking garages* in accordance with Section 406.3.

Reason: UL 1784 for the testing of fire door assemblies is well referenced in Section 715 for smoke and draft control fire door assemblies. Newer applications of in-the-field or aftermarket seals may not have been tested in the orientation utilized on elevator doors they are being installed upon. This change by its simple removal or either artificial horizontal or vertical bottom seals (duct tape) from material tested will insure that the as-installed assembly is an as-tested assembly consistent with IBC Section 715.4.3.1 intent.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Cahanin-FS1-708.14.1

FS49–09/10
708.14.1

Proponent: Michael Perrino, Code Consultants, Inc., representing Code Consultants, Inc.

Revise as follows:

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 709 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 708.2 are not required to have enclosed elevator lobbies.
3. Where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.
4. Enclosed elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
   4.1. Group I-2 occupancies;
   4.2. Group I-3 occupancies, and;
   4.3. Elevators serving floor levels over 75 feet above the lowest level of fire department vehicle access in ~~H~~ high-rise buildings.
5. Smoke partitions shall be permitted in lieu of *fire partitions* to separate the elevator lobby at each floor where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 711 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 711.5.2, 711.5.3, and 715.4.8

and duct penetrations of the smoke partitions shall be protected as required for *corridors* in accordance with Section 716.5.4.1.

6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 708.14.2.
7. Enclosed elevator lobbies are not required where the elevator serves only *open parking garages* in accordance with Section 406.3.

Reason: Current language requires all elevators in a high rise to be provided with lobbies, regardless of number of stories or height of the stories served. The reason that the code requires lobbies is to ameliorate the potential problems associated with stack effect. However, as with smoke proof enclosures, stack effect does not become an issue until the shaft (or in the case of elevators, the hoistway) serves floors over 75 feet above the lowest level of fire department vehicle access.

Many high-rise buildings have numerous elevators that serve only the lower floors of the building. This proposal brings the requirements for addressing the potential issues associated with stack effect in elevator hoistways serving high rise buildings into line with those for stairs.

Cost Impact: The code change proposal will not increase the cost of construction. The proposal will decrease the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PERRINO-FS1-708.14.1

FS50–09/10
708.14.1

Proponent: Bill Ziegert, representing Smoke Guard, Inc.

Revise as follows:

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 709 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

Exceptions:

(Exceptions 1 through 4 remain unchanged)

5. Smoke partitions shall be permitted in lieu of *fire partitions* to separate the elevator lobby at each floor where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 711 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 711.5.2, 711.5.3, and 715.4.8 and duct penetrations of the smoke partitions shall be protected as required for *corridors* in accordance with Section 716.5.4.1. <u>When egress to any exit on a floor requires occupants to pass through an enclosed elevator lobby constructed as a smoke partition, the elevator hoistway doors opening into the lobby shall also meet the requirements for smoke and draft control door assemblies in Section 715.4.3.1.</u>

(Exceptions 6 and 7 remain unchanged)

Reason: When the building floor plan allows occupants to pass through an enclosed elevator lobby constructed as a smoke partition to reach the exits, the elevator hoistway doors within the lobby do not meet the opening protective requirements of Section 715.4.3.1 for Smoke and Draft Control. If all other openings in the perimeter must meet quantifiable smoke / air leakage requirements, the elevator hoistway doors, which often have effective leakage openings of a hole greater than eight inches in diameter, should also meet the similar performance standards. To not require this would be to allow a breach in the Smoke Partition construction.

Cost Impact: Some additional costs to provide smoke gasketing at the elevator hoistway doors.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ZIEGERT-FS1-708.14.1

FS51–09/10
708.14.1-708.14.2.11

Proponent: Mike Ashley, CBO, representing Alliance for Fire & Smoke Containment & Control, Inc.

Revise as follows:

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 709 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 708.2 are not required to have enclosed elevator lobbies.
3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.
4. Enclosed elevator lobbies are not required where the building is protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
   4.1. Group I-2 occupancies;
   4.2. Group I-3 occupancies; and
   4.3. High-rise buildings.
5. Smoke partitions shall be permitted in lieu of *fire partitions* to separate the elevator lobby at each floor where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 711 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 711.5.2, 711.5.3, and 715.4.8 and duct penetrations of the smoke partitions shall be protected as required for *corridors* in accordance with Section 716.5.4.1.
6. ~~Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 708.14.2.~~
~~7~~ 6. Enclosed elevator lobbies are not required where the elevator serves only *open parking garages* in accordance with Section 406.3.

Delete without substitution:

~~**708.14.2 Enclosed elevator lobby.** Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies, the pressurization system shall comply with this section.~~

~~**708.14.2.1 Pressurization requirements.** Elevator hoistways shall be pressurized to maintain a minimum positive pressure of 0.10 inches of water (25 Pa) and a maximum positive pressure of 0.25 inches of water (67 Pa) with respect to adjacent occupied space on all floors. This pressure shall be measured at the midpoint of each hoistway door, with all elevator cars at the floor of recall and all hoistway doors on the floor of recall open and all other hoistway doors closed. The opening and closing of hoistway doors at each level must be demonstrated during this test. The supply air intake shall be from an outside, uncontaminated source located a minimum distance of 20 feet (6096 mm) from any air exhaust system or outlet.~~

~~**708.14.2.2 Rational analysis.** A rational analysis complying with Section 909.4 shall be submitted with the *construction documents*.~~

~~**708.14.2.3 Ducts for system.** Any duct system that is part of the pressurization system shall be protected with the same *fire-resistance rating* as required for the elevator shaft enclosure.~~

~~**708.14.2.4 Fan system.** The fan system provided for the pressurization system shall be as required by this section.~~

~~**708.14.2.4.1 Fire resistance.** When located within the building, the fan system that provides the pressurization shall be protected with the same *fire-resistance rating* required for the elevator shaft enclosure.~~

~~**708.14.2.4.2 Smoke detection.** The fan system shall be equipped with a smoke detector that will automatically shut down the fan system when smoke is detected within the system.~~

~~**708.14.2.4.3 Separate systems.** A separate fan system shall be used for each elevator hoistway.~~

~~**708.14.2.4.4 Fan capacity.** The supply fan shall either be adjustable with a capacity of at least 1,000 cfm (.4719 m3/s) per door, or that specified by a *registered design professional* to meet the requirements of a designed pressurization system.~~

~~**708.14.2.5 Standby power.** The pressurization system shall be provided with standby power from the same source as other required emergency systems for the building.~~

~~**708.14.2.6 Activation of pressurization system.** The elevator pressurization system shall be activated upon activation of the building fire alarm system or upon activation of the elevator lobby smoke detectors. Where both a building fire alarm system and elevator lobby smoke detectors are present, each shall be independently capable of activating the pressurization system.~~

~~**708.14.2.7 Special inspection.** *Special inspection* for performance shall be required in accordance with Section 909.18.8. System acceptance shall be in accordance with Section 909.19.~~

~~**708.14.2.8 Marking and identification.** Detection and control systems shall be marked in accordance with Section 909.14.~~

~~**708.14.2.9 Control diagrams.** Control diagrams shall be provided in accordance with Section 909.15.~~

~~**708.14.2.10 Control panel.** A control panel complying with Section 909.16 shall be provided.~~

~~**708.14.2.11 System response time.** Hoistway pressurization systems shall comply with the requirements for smoke control system response time in Section 909.17.~~

Reason: This proposed change deletes the option to provide for pressurization of the elevator shaft as an equivalent solution to the use of the enclosed elevator lobby and other alternatives described in Section 708.14.1. The intent of this section is to define compliance alternatives that provide equivalent protection of the elevator shaft from vertical smoke migration. In the case of the elevator shaft pressurization option defined in Section 708.14.2, questions have been raised as to the effective equivalency of this option with the others. If elevator shaft pressurization is chosen as an alternative solution, it must work effectively in conjunction with other building systems, and particularly with stair shaft pressurization which is a requirement for buildings as required in Sections 403.5, 1022.9 and 909.20.5. Stair shaft pressurization must maintain a minimum pressure differential of 0.10 inches of water (25 Pa) (Section 909.20.5) and a maximum pressure differential of 0.35 inches of water (87 Pa). Section 708.14.2.1 requires a pressurization differential of between 0.10 (minimum) and 0.25 (maximum) inch water gauge. This can cause interference between the two pressurization systems as the two systems must be balanced so that they can operate simultaneously. This balance is difficult to attain as the stair shaft pressurization system operates with only one leakage point per floor at the egress door into the stair shaft. The elevator shaft pressurization system must maintain the designated pressure differential across a much larger leakage area, usually multiple elevator door and frame systems at each floor. The leakage at the stair shaft at the door will typically be 200 cfm or less, while the leakage across a standard two leaf 3.5 ft by 7 ft elevator door and frame will be 600 – 900 cfm. Most floors will have two to three openings per floor, providing for a much larger leakage area to be overcome by the elevator shaft pressurization system.

A recent study published in *Building and Environment Journal* raised this question of competing pressurization systems. The study, "On stairwell and elevator shaft pressurization for smoke control in tall buildings", by Dr. Richard S. Miller and Dr. Don Beasley, with the Department of Mechanical Engineering at Clemson University, studied three scenarios: operation of the stair shaft pressurization system alone, operation of the elevator shaft pressurization system alone, and operation of the two systems simultaneously. They used the CONTAM simulation software to model these three scenarios in both a residential and commercial building thirty stories in height. The two occupancy types selected used data driven exterior leakage rates from documented sources. CONTAM is one of the key tools developed and used by NIST in modeling computational fluid dynamics scenarios for smoke travel in building fires.

The study found that stair shaft pressurization was feasible because the stair shaft has only one entry point per floor, and the single gasketed swing door at that point of entry represents a relatively small leakage area. When elevator shaft pressurization air flow was analyzed, the study found that (quoting for the abstract section) "…elevator shaft pressurization systems are found to produce prohibitively large pressure differences across both the elevator and stairwell doors if (1) minimum pressure differences must be maintained at both open and closed elevator doors, and (2) if the system must function properly when the ground floor exterior building doors are closed." This was found to be true even with the revised positive pressure limits provided in Section 708.14.2.1 (minimum positive pressure of 0.10 inches of water (25 Pa) and a maximum positive pressure of 0.25 inches of water (67 Pa) with respect to adjacent occupied space on all floors.

The study concluded that this was due primarily to the much larger leakage rates at the elevator door and frame, and the substantially added leakage that occurs on the Phase I recall floor where the doors are parked in the open position. Because the ground floor exterior doors (typically the Phase I recall floor) are normally closed, this results in over pressurization of this floor. The effect is that "the across elevator door pressure difference is increased substantially on the second floor (as well as on all the remaining floors). The elevator shaft pressurization system also

interfered with the stair shaft pressurization system in the modeling scenarios due to the high pressures that were needed to provide positive pressure in the elevator shaft. The study also found that "fan location, vents, and louvers were all found to be ineffective as means of controlling the shaft pressures." In addition, the study found that "…substantially different fan flow rates are required based on the exterior temperature (Table 3). Therefore, a system calibrated and tested during one season may have significantly different behavior during other seasons."

The data generated by this study raises the question as to whether or not elevator shaft pressurization should be considered as a functionally equivalent solution to the other code compliant solutions defined in Section 707.18.1 for protecting the elevator shaft from vertical smoke migration. It is also generally known that testing and commissioning elevator shaft pressurization systems is difficult and susceptible to daily variations in atmospheric temperature.

For these reasons, we urge the membership to approve this code change as submitted.

References:

Miller, Richard S. and Beasley, D. On stairwell and elevator shaft pressurization for smoke control in tall buildings, Building and Environment (2008), doi:10.1016/j.buildenv.2008.09.015

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposals FS51, FS52 and FS53 address elevator lobby pressurization requirements. FS51 deletes the requirements and FS52 and FS53 revise the requirements. The committee needs to make its intent clear with respect to these provisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ASHLEY-FS1-708.14.1.doc

FS52–09/10
708.14.2

Proponent: Bill Ziegert, representing Smoke Guard, Inc.

Revise as follows:

708.14.2 Enclosed elevator lobby. Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies, the pressurization system shall comply with this section. <u>When elevator hoistway pressurization is provided, the pressurization of exit stair enclosures under Section 1022.9 is not permitted.</u>

Reason: Recent computer modeling by experts has called into question the ability of an elevator pressurization system to meet the differential pressure requirements of Section 708.14.2.1 across the hoistway doors. In addition this same modeling has determined that while it is relatively easy to design a stand alone exit stair pressurization system that can meet all the requirements of the code, the simultaneous operation of an elevator hoistway pressurization system and exit stair pressurization system causes the two systems to be negatively impacted and the most serious negative impact is to the exit stair pressurization system. The authors have concluded that an elevator hoistway pressurization system operated in conjunction with stair pressurization would result in door opening forces for the exit stair doors substantially above the allowable limits. For additional information see http://www.ces.clemson.edu/~rm/PDF/BandE.pdf

Cost Impact: Moderate cost increase as vestibules would be required in lieu of stair pressurization equipment.

Analysis: Code change proposals FS51, FS52 and FS53 address elevator lobby pressurization requirements. FS51 deletes the requirements and FS52 and FS53 revise the requirements. The committee needs to make its intent clear with respect to these provisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ZIEGERT-FS4-708.14.2

FS53–09/10
708.14.2.3 (New)

Proponent: Bill Ziegert, representing Smoke Guard, Inc.

Add new text as follows:

<u>**708.14.2.3. Exit Discharge door position**. When elevator hoistway pressurization is activated at least two exit discharge doors to the outside of the building shall be automatically opened and shall remain open for the duration of the operation of the pressurization system. The open exit discharge doors shall be in addition to other doors required to be open for atrium air flow or smoke control systems.</u>

(Renumber subsequent sections)

Reason: Recent computer modeling by experts has called into question the ability of an elevator pressurization system to meet the differential pressure requirements of Section 708.14.2.1 across the hoistway doors. The difficulty is caused by the necessity to design the system to work

properly during Elevator Phase 1 Recall where the elevators return to the recall floor and park with the hoistway doors open for the duration of the emergency or until the Fire Service commandeers them under Phase 2.

Unless other precautions are undertaken, the models suggest that if the minimum differential pressure is achieved across the hoistway door openings on the recall floor, all other floors above this will see excessive pressures beyond the code limits and beyond the ability of the elevator doors to operate properly.

Two solutions were proposed including a) opening doors to the outside, or alternately b) providing an enclosed elevator lobby at the recall floor. Only the option of opening doors to the outside is viable however since elevator lobbies at the recall floor would serve minimal benefit as occupants would continually be opening the lobby doors during evacuation thereby defeating the intended purpose.

For additional information see http://www.ces.clemson.edu/~rm/PDF/BandE.pdf

Cost Impact: Minimal cost impact for automatic door opener systems

Analysis: Code change proposals FS51, FS52 and FS53 address elevator lobby pressurization requirements. FS51 deletes the requirements and FS52 and FS53 revise the requirements. The committee needs to make its intent clear with respect to these provisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ZIEGERT-FS5-708.14.2.3

FS54–09/10
708.14.1

Proponent: Dave Frable, U.S. General Services Administration, representing the U.S. General Services Administration

Revise as follows:

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three *stories*. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by *fire partitions*. In addition to the requirements in Section 709 for *fire partitions*, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for *corridor* walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for *corridors* in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one *means of egress* complying with Chapter 10 and other provisions within this code.

Exceptions:

1. Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. Elevators not required to be located in a shaft in accordance with Section 708.2 are not required to have enclosed elevator lobbies.
3. Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.
4. Enclosed elevator lobbies are not required where the building is protected by an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
   4.1. Group I-2 occupancies;
   4.2. Group I-3 occupancies; and
   4.3. High-rise buildings, except as permitted in exception 5.
5. Enclosed elevator lobbies are not required in Group B occupancies with an occupied floor not greater than 420 feet in height above the lowest level of fire department vehicle access that are protected throughout by an automatic fire sprinkler system designed and installed in accordance with Section 903.3.1.1 and maintained in accordance with Section 903.5.

6 ~~5.~~ Smoke partitions shall be permitted in lieu of *fire partitions* to separate the elevator lobby at each floor where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 711 for smoke partitions, doors protecting openings in the smoke partitions shall also comply with Sections 711.5.2, 711.5.3, and 715.4.8 and duct penetrations of the smoke partitions shall be protected as required for *corridors* in accordance with Section 716.5.4.1.

7.~~6.~~ Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 708.14.2.

8.~~7.~~ Enclosed elevator lobbies are not required where the elevator serves only *open parking garages* in accordance with Section 406.3.

Reason: The intent of this code change is to acknowledge that Group B occupancies with an occupied floor not greater than 420 feet in height above the lowest level of fire department vehicle access that are protected by an operational automatic fire sprinkler system provide an acceptable level of safety for building occupants and therefore do not warrant the need for enclosed elevator lobbies.

During the 2006/2007 ICC Code Development Hearings in Orlando, the Fire Safety Code Committee approved a similar code change proposal (FS54-06/07) that acknowledged that Group B occupancies of any height that are protected by an operational automatic fire sprinkler system provided an acceptable level of safety for building occupants and therefore did not warrant the need for enclosed elevator lobbies for the following reasons:

1. The proposal ties the exception to a specific occupancy which has a good fire record.
2. The NIST analysis is new technical data that shows a justification for this proposal.
3. The NIST study did address smoke flow in both winter and summer for this low hazard occupancy. When combined with the excellent fire safety record for high-rise buildings, both sprinklered and unsprinklered, this exception appears justified and will help to eliminate this contentious issue which has come before the committee for several years.

However, at the Final Action Hearings of the ICC in May 2007, the ICC membership voted to overturn the Fire Safety Code Committee's recommendation and disapproved the subject code change. At the Hearings, no new technical information was provided to discount any of the Fire Safety Committee's aforementioned rationale for approval as submitted other than several opponents were concerned that it would apply to high-rise office buildings of any height; even those super high-rise office buildings greater than 420 feet in height, where the potential for stack effect in certain areas of the country may be greater and result in the vertical smoke migration through the elevator hoistways.

Therefore, to address this concern, we have limited exception 5 to only apply to Group B occupancies with an occupied floor not more than 420 feet in height above the lowest level of fire department vehicle access.

In addition, the previous research conducted by the National Institute of Standards and Technology (NIST) has shown that sprinklered fires do not represent a significant hazard to the building occupants because the automatic sprinklers activated and extinguished the fire prior to releasing a significant energy or mass. Little or no smoke or gases entered the hoistways, and none reached remote locations in any building regardless of height or other conditions examined[1]. Therefore, it can be concluded that smoke spread in shafts and elevator hoistways is not a problem in Group B occupancies protected throughout with an operational fire sprinkler system since the fire sprinklers both control the burning rate (and thus limit smoke production) and maintain near ambient temperature which limits the buoyancy forces that drive smoke to the shafts where stack affect may cause smoke spread to other floors. It is also widely accepted that operating fire sprinklers will prevent room flashover and full floor fires, and will limit the size of room fires[2]. This conclusion can also be substantiated from a paper presented by Dr. John Klote at the Elevator Symposium on Emergency Use of Elevators in March 2004 and in an article titled "Is There A Need to Enclose Elevator Lobbies In Tall Buildings?", written by Richard Bukowski in the August 2005 *Building Safety Journal*.

In addition, all high-rise fires where smoke spread has been a problem have either been in unsprinklered buildings or partially sprinklered buildings. A recent comprehensive analysis in 2005 of high-rise fires by NFPA identified that no fatalities had occurred for more than a decade in any U.S. high-rise occupancy (> 10 story) other than the 6 fatalities in the unsprinklered Cook County Office Building (2003); the 1 fatality in the unsprinklered First Interstate Bank Building (1991); and 3 firefighter fatalities in the partially sprinklered (unsprinklered on floor of fire origin and several floors above) Meridan Plaza Building (1991). The Murrah Federal Building (1995) and the World Trade Center (1993 & 2001) bombings were excluded from this analysis.

Fire sprinklers control the burning rate (and thus limit smoke production) and maintain near ambient temperature which limits the buoyancy forces that drive smoke to the shafts where stack affect may cause smoke spread to other floors. It is also widely accepted that operating fire sprinklers will prevent room flashover and full floor fires, and will limit the size of room fires. The reliability of sprinklers should not be called into question as an NFPA report issued in 2005 indicated that automatic fire sprinklers successfully operating in reported structural fires was an exemplary 93%. This same report indicated that two-thirds of the automatic fire sprinkler system failures were because the automatic fire sprinkler systems were shut off, an unlikely scenario where jurisdictions adopt the IBC since the IBC requires the supervision of the automatic fire sprinkler system. Hence, the successful operation of an automatic fire sprinkler system designed and installed in compliance with the IBC requirements could be reasonably estimated at 98% (or better, since NFPA indicated that a number of fire incidents extinguished by sprinklers may not even be reported).

In addition to fire sprinklers in these buildings, the 2009 edition of the IBC now requires a number of additional safety enhancements such as: enclosed elevator lobbies for fire service access elevators in buildings greater than 120 feet; enclosed elevator lobbies for occupant evacuation elevators where utilized; two way communication at all elevator landings; an increase of 50% in egress capacity for exit stairs in all buildings; increased cohesive/adhesive bond strength for sprayed fire resistive materials; exit stair path markings in all high rise buildings; etc.

Given the aforementioned protection coupled with the excellent track record for sprinklered B occupancies, and keeping in mind that the purpose of the IBC is to provide minimum requirements to safeguard occupants of buildings from fire and other hazards attributed to the built environment based on sound technical documentation. Also keep in mind that fatalities are very rare in office buildings, even rarer in high-rise office buildings, and surpassingly rare in high-rise office buildings protected with an operational fire sprinkler system.

Last but not least, it should be noted that a similar proposal regarding the enclosure of elevator lobbies was also addressed by the National Fire Protection Association (NFPA) 101 Technical Committee on Industrial, Storage, and Miscellaneous (e.g., High-rise) Occupancies. The NFPA Technical Committee did not approve the proposal to separate elevator hoistways with smoke barriers in sprinkler high-rise buildings based on a lack of technical substantiation. In addition, on June 9, 2005 the NFPA membership approved the 2006 edition of NFPA 101 and supported the Technical Committee's decision to not include a requirement to separate elevator hoistways with smoke barriers in sprinkler high-rise buildings.

Based on all these points stated above, we strongly believe that it is reasonable to state that Group B occupancies that are not more than 420 feet in height, and protected throughout with automatic fire sprinkler system is not a rationale alternative to enclosed elevator lobbies and that automatic fire sprinklers are not an effective method for slowing or stopping the spread of smoke throughout a building protected throughout with an operational automatic fire sprinkler system. In addition, we believe the current requirement for enclosing elevator lobbies in Group B occupancies not more than 420 feet in height, protected throughout by an operational automatic fire sprinkler system has not been based on sound technical documentation and will significantly increase building construction and maintenance costs without increasing the overall safety to the building occupants.

References:

Klote, J.H., Analysis of the Consequences of Smoke Migration through Elevator Shafts, Use of Elevators in Fires and Other Emergencies Workshop. Proceedings. Co-Sponsored by American Society of Mechanical Engineers (ASME International); National Institute of Standards and Technology (NIST); International Code Council (ICC); National Fire Protection Association (NFPA); U.S. Access Board and International Association of Fire Fighters (IAFF). March 2-4, 2004, Atlanta, GA, Guide on Methods for Evaluating Potential for Room Flashover, NFPA 555 2000 ed., Nat Fire Prot Assn, Quincy, MA.

Bukowski, R. W., Is There A Need to Enclose Elevator Lobbies In Tall Buildings?, Building Safety Journal, 26-31 pp, August 2005.

Rohr, K.D and Hall, J.R., Jr., U.S. Experience With Sprinklers and Other Fire Extinguishing Equipment, August 2005.

Cost Impact: The code change proposal will not increase the cost of construction.

FS55–09/10
708.14

Proponent: Gene Boecker, Code Consultants, Inc., representing self

Revise as follows:

708.14 Elevator, dumbwaiter and other hoistways. Elevator, dumbwaiter and other hoistway enclosures shall be constructed in accordance with Section 708 and Chapter 30. Where an elevator shaft enclosure connects more than three stories, the elevator enclosure opening protection shall comply with either Section 708.14.1 or Section ~~714.8.2~~ 708.14.2.

Exceptions:

1. At the street floor, provided the entire street floor is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Where elevators are not required to be located in a shaft in accordance with Section 708.2 are not required to have enclosed elevator lobbies.
3. Where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.
4. Where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:
   4.1 Group I-2 occupancies;
   4.2 Group I-3 occupancies; and
   4.3 High-rise buildings.
5. Where the elevator hoistway is pressurized in accordance with Section ~~708.14.2~~ 708.14.3.
6. Where the elevator serves only open parking garages in accordance with Section 406.3.

708.14.1 Smoke and draft control doors. The elevator shaft enclosure doors shall comply with Section 715.4.3 and shall be labeled as smoke and draft control doors in accordance with Section 715.4.6.3.

708.14.1 708.14.2 Elevator lobby. ~~An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories.~~ The elevator lobby enclosure shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition to the requirements in Section 709 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for corridor walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code.

Exception~~s~~:

1. ~~Enclosed elevator lobbies are not required at the street floor, provided the entire street floor is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.~~
2. ~~Elevators not required to be located in a shaft in accordance with Section 708.2 are not required to have enclosed elevator lobbies.~~
3. ~~Enclosed elevator lobbies are not required where additional doors are provided at the hoistway opening in accordance with Section 3002.6. Such doors shall be tested in accordance with UL 1784 without an artificial bottom seal.~~
4. ~~Elevator lobbies are not required where the building is protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. This exception shall not apply to the following:~~
   ~~4.1 Group I-2 occupancies;~~
   ~~4.2 Group I-3 occupancies; and~~
   ~~4.3 High-rise buildings.~~
5. ~~Smoke~~ Smoke partitions shall be permitted in lieu of fire partitions to separate the elevator lobby at each floor where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. In addition to the requirements in Section 711 for smoke partitions, doors protecting

openings in the smoke partitions shall also comply with Sections 711.5.2, 711.5.3, and 715.4.8 and duct penetrations of smoke partitions shall be protected as required for corridors in accordance with Section 716.5.4.1.

~~6. Enclosed elevator lobbies are not required where the elevator hoistway is pressurized in accordance with Section 708.14.2.~~

~~7. Enclosed elevator lobbies are not required where the elevator serves only open parking garages in accordance with Section 406.3.~~

~~708.14.1.1~~ 708.14.2.1 Areas of refuge. Areas of refuge shall be provided as required by Section 1007.

(Renumber subsequent sections)

Reason: The whole reason why we have the requirements for the elevator lobby is due to the absence of a smoke tested opening protective. This small fact, however, is never stated anywhere in the code. The proposal restructures the language without changing the intent or application but makes it clear that if such a smoke tested door can be provided, then the elevator lobby would not be required. A decision is placed in the main Section consistent with the threshold for elevator lobbies in new buildings. The text is relocated from existing Section 708.14.1.

The majority of the exceptions relocated to the main section (708.14) are applicable regardless of the decision to install a smoke tested opening protective or to us the elevator lobby exceptions as they currently apply. Only exception #5 remains associated with the elevator lobby section since it applies to the alternative design for the elevator lobby enclosure walls where the building is protected throughout with sprinklers.

The intent is not to change the lobby provisions elsewhere in the code for Areas of refuge (1007.6) or for Occupant evacuation elevators (3008.11) or to change the overall provisions as they currently appear. It just seems logical that we identify what the issue is with the code requirement. As the code is written now, even if the technology existed to provide a tight smoke seal on the elevator doors, an elevator lobby would still be required. The code change clarifies the intent and opens the way to technological innovation to address the underlying reason for the elevator lobby.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOECKER-FS1-708.14

FS56–09/10

702.1, 708, 708.1, 708.2, 712.4, 711.4.1 (NEW), 715.5,712.1.1 (NEW), 712.1.4, through 712.1.18, 713 (New), 713.1 (NEW), 713.3, 713.4, 713.4.1, 713.4.1.2,713.4.1.3,713.4.1.4, 713.4.2, 713.4.2.1, 713.4.2.2, 713.5, 714.6

Proponent: Paul K. Heilstedt, PE,FAIA, Chair, representing ICC Code Technology Committee (CTC)

Revise as follows:

SECTION 702
DEFINITIONS

702.1 Definitions. The following words and terms shall, for the purposes of this chapter, and as used elsewhere in this code, have the meanings shown herein.

JOINT. The linear opening in or between adjacent ~~fire resistance rated~~ assemblies that is designed to allow independent movement of the building in any plane caused by thermal, seismic, wind or any other loading.

L RATING. The air leakage rating of a through penetration firestop system or a fire-resistant joint system when tested in accordance with UL 1479 or UL 2079, respectively.

MEMBRANE PENETRATION. ~~An opening made through one side (wall, floor or ceiling membrane) of an assembly.~~ . A breach in one side of a floor-ceiling, roof-ceiling or wall assembly to accommodate an item installed into or passing through the breach.

MEMBRANE-PENETRATION FIRESTOP. A material, device or construction installed to resist for a prescribed time period the passage of flame and heat through openings in a protective membrane in order to accommodate cables, cable trays, conduit, tubing, pipes or similar items.

MEMBRANE-PENETRATION FIRESTOP SYSTEM. An assemblage consisting of a fire-resistance-rated floor-ceiling, roof-ceiling or wall assembly, one or more penetrating items installed into or passing through the breach in one side of

the assembly and the materials or devices, or both, installed to resist the spread of fire into the assembly for a prescribed period of time.

PENETRATION FIRESTOP. A through-penetration firestop or a membrane-penetration firestop.
THROUGH PENETRATION. ~~An opening that passes through an entire assembly.~~ A breach in both sides of a floor, floor-ceiling or wall assembly to accommodate an item passing through the breaches.

THROUGH-PENETRATION FIRESTOP SYSTEM. ~~An assemblage of specific materials or products that are designed, tested and fire-resistance rated to resist for a prescribed period of time the spread of fire through penetrations. The F and T rating criteria for penetration fire stop systems shall be in accordance with ASTM E814 or UL 1479. See definition of "F" rating and "T" rating".~~ An assemblage consisting of a fire-resistance-rated floor, floor-ceiling, or wall assembly, one or more penetrating items passing through the breaches in both sides of the assembly and the materials or devices, or both, installed to resist the spread of fire through the assembly for a prescribed period of time.

(Relocate Section 708 to Section 712 and 713. Renumber subsequent sections)

SECTION ~~709~~ 708
FIRE PARTITIONS

SECTION ~~710~~ 709
SMOKE BARRIERS

SECTION ~~711~~ 710
SMOKE PARTITIONS

SECTION ~~712~~ 711
HORIZONTAL ASSEMBLIES

~~712.4~~ 711.4 Continuity. Assemblies shall be continuous without openings, penetrations or joints except as permitted by this section and Sections ~~708.2~~ 712.1, ~~713.4~~ 714.4, ~~714~~ 715 and 1022.1. Skylights and other penetrations through a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated roof construction is maintained. Unprotected skylights shall not be permitted in roof assemblies required to be fire-resistance rated in accordance with Section 704.10. The supporting construction shall be protected to afford the required fire-resistance rating of the horizontal assembly supported.

Exception: In buildings of Type IIB, IIIB or VB construction, the construction supporting the *horizontal assembly* is not required to be fire-resistance-rated at the following:

1. Horizontal assemblies at the separations of incidental uses as specified by Table 508.2.5, provided the required *fire-resistance rating* does not exceed 1 hour.
2. Horizontal assemblies at the separations of *dwelling units* and *sleeping units* as required by Section 420.3.
3. Horizontal assemblies at *smoke barriers* constructed in accordance with Section ~~710~~ 709.

711.4.1 Nonfire-resistance-rated assemblies. ~~Linear openings~~ Joints in or between floors assemblies without a required fire-resistance rating shall comply with one of the following:

1. The linear opening shall be concealed within the cavity of a wall.
2. The linear opening shall be located above a ceiling.
3. The linear opening shall be sealed, treated or covered with an approved material or system to resist the free passage of flame and the products of combustion.

Exception: Joints meeting one of the joint exceptions listed in 715.1

~~712.5~~ 711.5 Penetrations. Penetrations of horizontal assemblies, whether concealed or unconcealed, shall comply with Section ~~713~~ 714.

SECTION ~~708~~ 712
~~SHAFT ENCLOSURES~~ VERTICAL OPENINGS

~~708.1~~ 712.1 General. The provisions of this section shall apply to the vertical opening applications listed in Sections 712.1.1 through 712.1.18. ~~shafts required to protect openings and penetrations through floor/ceiling and roof/ceiling~~

~~assemblies. Shaft enclosures shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies in accordance with Section 712, or both.~~

~~**708.2 Shaft enclosure required.** Openings through a floor/ceiling assembly shall be protected by a shaft enclosure complying with this Section.~~

~~**Exceptions:**~~

712.1.1 Smoke compartments. Vertical openings contained entirely within a shaft enclosure complying with Section 709 shall be permitted.

~~**1.**~~ **712.1.2 Individual dwelling unit.** ~~A shaft enclosure is not required for~~ Unconcealed vertical openings totally within an individual residential dwelling unit and connecting four stories or less shall be permitted.

~~**2.**~~ **712.1.3 Escalator and Stairway Openings.** ~~A shaft enclosure is not required in~~ Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, ~~for~~ an escalator opening or stairway that is not a portion of the means of egress shall be protected according to Item ~~2.1 or 2.2~~ 712.1.3.1 or 712.1.3.2:

~~**2.1**~~ **712.1.3.1 Opening size.** Where the area of the ~~floor~~ vertical opening between stories does not exceed twice the horizontal projected area of the escalator or stairway and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Groups B and M, this application is limited to openings that do not connect more than four stories.

~~**2.2**~~ **712.1.3.2 Automatic shutters**. Where the vertical opening is protected by approved power-operated automatic shutters at every penetrated floor. The shutters shall be of noncombustible construction and have a fire-resistance rating of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.11 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release there from.

~~**3.**~~ **712.1.4 Penetrations.** ~~A shaft enclosure is not required for~~ Penetrations by pipe, tube, conduit, wire, cable and vents shall be protected in accordance with Section ~~713.4~~ 712.4.

~~**4.**~~ **712.1.5 Ducts.** ~~A shaft enclosure is not required for~~ Penetrations by ducts shall be protected in accordance with Section 716.6. Grease ducts shall be protected in accordance with the *International Mechanical Code*.

~~**5.**~~ **712.1.6 Atriums.** In other than Group H occupancies, ~~a shaft enclosure is not required for floor openings complying with the provisions for~~ atriums ~~in~~ complying with Section 404 shall be permitted.

~~**6.**~~ **712.1.7 Masonry chimney.** ~~A shaft enclosure is not required for~~ Approved masonry chimneys shall be permitted where the annular space is fireblocked at each floor level in accordance with Section 717.2.5.

~~**7.**~~ **712.1.8 Two story openings**. In other than Groups I-2 and I-3~~, a shaft enclosure is not required for~~ a floor opening that is not used as one of the applications listed in this section shall be permitted if it complies with all the items below ~~or an air transfer opening that complies with the following:~~

~~7.1~~ 1. Does not connect more than two stories.
~~7.2~~ 2. Does not contain a stairway or ramp required by Chapter 10. ~~Is not part of the required means of egress system~~.
3. Does not penetrate a horizontal assembly that separates fire areas or smoke barriers that separate smoke compartments.
~~7.3~~ 4. Is not concealed within the construction of a wall or a floor/ceiling assembly.
~~7.4~~ 5. Is not open to a corridor in Group I and R occupancies.
~~7.5~~ 6. Is not open to a corridor on nonsprinklered floors ~~in any occupancy~~.
~~7.6~~ 7. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.
~~7.7. Is limited to the same smoke compartment~~.

~~8.~~ **712.1.9 Parking garages**. ~~A shaft enclosure is not required for~~ Automobile ramps in open and enclosed parking garages shall be permitted where constructed in accordance with Sections 406.3 and 406.4, respectively.

~~9.~~ **712.1.10 Mezzanine.** ~~A shaft enclosure is not required for~~ Vertical ~~floor~~ openings between a mezzanine complying with Section 505 and the floor below shall be permitted. ~~and the floor below.~~

~~10.~~ **712.1.11 Joints.** ~~A shaft enclosure is not required for~~ Joints shall be permitted where complying ~~protected by a fire-resistant joint system in accordance~~ with Section ~~714~~ 715.

~~11.~~ **712.1.12 Unenclosed stairs and ramps.** A ~~shaft enclosure shall not be required for~~ vertical floor openings created by unenclosed stairs or ramps in accordance with Exception 3 or 4 in Section 1016.1 shall be permitted.

~~12.~~ **712.1.13 Floor Fire Doors.** ~~Floor~~ Vertical openings shall be permitted where protected by floor fire doors in accordance with Section ~~712.8~~ 711.8.

~~13.~~ **712. 1.14. Group I-3.** In Group I-3 occupancies, ~~a shaft enclosure is not required for floor~~ vertical openings shall be permitted in accordance with Section 408.5.

~~14.~~ **712.1.15 Elevators in parking garages.** ~~A shaft enclosure is not required for e~~ vertical openings for elevator hoistways in open or enclosed parking garages that serve only the parking garage, and complying with 406.3 and 406.4 respectively, shall be permitted..

~~15.~~ **712.1.16 Duct systems in parking garages.** Vertical openings for mechanical exhaust or supply duct systems in open or enclosed parking garages ~~a shaft enclosure is not required to enclose mechanical exhaust or supply duct systems~~ complying with 406.3 and 406.4 respectively, shall be permitted to be unenclosed where ~~when~~ such duct system is contained within and serves only the parking garage.

712.1.17 Nonfire-resistance-rated joints. Joints in or between floors without a required fire-resistance rating shall be permitted in accordance with section 711.4.1.

~~16.~~ **712.1.18 Openings otherwise permitted.** Vertical openings shall be ~~Where~~ permitted where allowed by other sections of this code.

SECTION 713
SHAFT ENCLOSURES

713.1 General. The provisions of this section shall apply to shafts required to protect openings and penetrations through floor/ceiling and roof/ceiling assemblies. Shaft enclosures shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies in accordance with Section 711, or both.

~~708.3~~ **713.2 Materials.** *(No change to text)*

~~708.4~~ **713.3 Fire-resistance rating.** *(No change to text)*

~~708.5~~ **713.4 Continuity.** *(No change to text)*

~~708.6~~ **713.5 Exterior Walls.** *(No change to text)*

~~708.7~~ **713.6 Openings.** *(No change to text)*

~~708.7.1~~ **713.6.1 Prohibited openings.** *(No change to text)*

~~708.8~~ **713.7 Penetrations.** *(No change to text)*

~~708.8.1~~ **713.7.1 Prohibited penetrations.** *(No change to text)*

~~708.9~~ **713.8 Joints.** *(No change to text)*

~~708.10~~ **713.9 Duct and air transfer openings.** *(No change to text)*

~~708.11~~ **713.10 Enclosure at the bottom.** *(No change to text)*

~~708.12~~ 713.11 **Enclosure at top.** *(No change to text)*

~~708.13~~ 713.12 **Refuse and laundry chutes.** *(No change to text)*

~~708.13.1~~ 713.12.1**Refuse and laundry chute enclosures.** *(No change to text)*

~~708.13.2~~ 713.12.2 **Materials.** *(No change to text)*

~~708.13.3~~ 713.12.3 **Refuse and laundry chute access rooms.** *(No change to text)*

~~708.13.4~~ 713.12.4 **Termination room.** *(No change to text)*

~~708.13.5~~ 713.12.5 **Incinerator room.** *(No change to text)*

~~708.13.6~~ 713.12.6 **Automatic sprinkler system.** *(No change to text)*

~~708.14~~ 713.13 **Elevator, dumbwaiter and other hoistways.** *(No change to text)*

~~708.14.1~~ 713.13.1 **Elevator lobby.** *(No change to text)*

~~708.14.1.1~~ 713.13.1.1 **Areas of refuge.** *(No change to text)*

~~708.14.2~~ 713.13.2 **Enclosed elevator lobby.** *(No change to text)*

~~708.14.2.1~~ 713.13.2.1 **Pressurization requirements.** *(No change to text)*

~~708.14.2.2~~ 713.13.2.2 **Rational analysis.** *(No change to text)*

~~708.14.2.3~~ 713.13.2.3 **Ducts for system.** *(No change to text)*

~~708.14.2.4~~ 713.13.2.4 **Fan system.** *(No change to text)*

~~708.14.2.4.1~~ 713.13.2.4.1 **Fire resistance.** *(No change to text)*

~~708.14.2.4.2~~ 713.13.2.4.2 **Smoke detection.** *(No change to text)*

~~708.14.2.4.3~~ 713.13.2.4.3 **Separate systems.** *(No change to text)*

.

~~708.14.2.4.4~~ 713.13.2.4.4 **Fan capacity.** *(No change to text)*

~~708.14.2.5~~ 713.13.2.5 **Standby power.** *(No change to text)*

~~708.14.2.6~~ 713.13.2.6 **Activation of pressurization system.** *(No change to text)*

~~708.14.2.7~~ 713.13.2.7 **Special inspection.** *(No change to text)*

~~708.14.2.8~~ 713.13.2.8 **Marking and identification.** *(No change to text)*

~~708.14.2.9~~ 713.13.2.9 **Control diagrams.** *(No change to text)*

~~708.14.2.10~~ 713.13.2.10 **Control panel.** *(No change to text)*

~~708.14.2.11~~ 713.13.2.11 **System response time.** *(No change to text)*

SECTION ~~713~~ 714
PENETRATIONS

~~713.3~~ 714.3 **Fire-resistance-rated walls.** Penetrations into or through fire walls, fire-barrier walls, smoke-barrier walls and fire partitions shall comply with Sections ~~713.3.1~~ 714.3.1 through ~~713.3.4~~ 714.3.4. Penetrations in smoke barrier walls shall also comply with Section ~~713.5~~ 714.5.

~~713.3.1~~ 714.3.1 **Through penetrations.** *(No change to text)*

~~713.3.1.1~~ 714.3.1.1 **Fire resistance rated assemblies.** *(No change to text)*

~~713.3.1.2~~ 714.3.1.2 **Through penetration firestop system.** *(No change to text)*

~~713.3.2~~ 714.3.2 **Membrane penetrations.** *(No change to text)*

~~713.3.3~~ 714.3.3 **Dissimilar materials.** *(No change to text)*

~~713.4~~ 714.4 **Horizontal assemblies.** Penetrations of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly not required to be enclosed in a shaft by Section 708.2 shall be protected in accordance with Sections ~~713.4.1~~ 714.4.1 through ~~713.4.2.2~~ 714.4.2.2.

~~713.4.1~~ 714.4.1 **Fire-resistance rated assemblies.** Penetrations of the fire-resistance rated floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly shall comply with Sections ~~714.4.1.1~~ 713.4.1.1 through ~~713.4.1.4~~ 714.4.1.4. Penetrations in horizontal smoke barriers shall also comply with ~~713.5~~ 714.5.

~~713.4.1.1~~ 714.4.1.1 **Through penetrations.** *(No change to text)*

~~713.4.1.1.1~~ 714.4.1.1.1 **Installation.** *(No change to text)*

~~713.4.1.1.2~~ 714.4.1.1.2 **Through penetration firestop system.** *(No change to text)*

~~713.4.1.2~~ 714.4.1.2 **Membrane penetrations.** Penetrations of membranes that are part of a horizontal assembly shall comply with Section ~~713.4.1.1.1~~ 714.4.1.1.1 or ~~713.4.1.1.2~~ 714.4.1.1.2. Where floor/ceiling assemblies are required to have a fire-resistance rating, recessed fixtures shall be installed such that the required fire resistance will not be reduced.

Exceptions:

1. *Membrane penetrations* by steel, ferrous or copper conduits, pipes, tubes or vents, or concrete or masonry items where the *annular space* is protected either in accordance with Section 713.4.1.1 or to prevent the free passage of flame and the products of combustion. The aggregate area of the openings through the membrane shall not exceed 100 square inches (64 500 mm2) in any 100 square feet (9.3 m2) of ceiling area in assemblies tested without penetrations.
2. Ceiling membrane penetrations of maximum 2-hour *horizontal assemblies* by steel electrical boxes that do not exceed 16 square inches (10 323 mm2) in area, provided the aggregate area of such penetrations does not exceed 100 square inches (44 500 mm2) in any 100 square feet (9.29 m2) of ceiling area, and the annular space between the ceiling membrane and the box does not exceed 1/8 inch (3.2 mm).
3. Membrane penetrations by electrical boxes of any size or type, which have been *listed* as part of an opening protective material system for use in *horizontal assemblies* and are installed in accordance with the instructions included in the listing.
4. *Membrane penetrations* by *listed* electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The *annular space* between the ceiling membrane and the box shall not exceed 1/8 inch (3.2 mm) unless *listed* otherwise.
5. The *annular space* created by the penetration of a fire sprinkler, provided it is covered by a metal eschutcheon plate.
6. Noncombustible items that are cast into concrete building elements and that do not penetrate both top and bottom surfaces of the element.

~~**713.4.1.3 Ducts and air transfer openings.** Penetrations of horizontal assemblies by ducts and air transfer openings shall comply with Section 716.~~

~~713.4.1.4~~ 714.4.1.4 **Disimilar materials.** *(No change to text)*

~~713.4.2~~ 714.4.2 **Nonfire-resistance-rated assemblies.** Penetrations of nonfire-resistance rated floor or floor/ceiling assemblies or the ceiling membrane of a nonfire-resistance rated roof/ceiling assembly shall meet the requirements of Section 708 or shall comply with Section ~~713.4.2.1~~ 714.4.2.1 or ~~713.4.2.2~~. 714.4.2.2

~~713.4.2.1~~ **714.4.2.1 Noncombustible penetrating items.** Noncombustible penetrating items that connect not more than ~~three~~ five stories are permitted, provided that the annular space is filled to resist the free passage of flame and the products of combustion with an approved noncombustible material or with a fill, void or cavity material that is tested and classified for use in through-penetration firestop systems.

~~713.4.2.2~~ **714.4.2.2 Penetrating items.** Penetrating items that connect not more than two stories are permitted, provided that the annular space is filled with an approved material to resist the free passage of flame and the products of combustion.

~~713.5~~ **714.5 Penetrations in smoke barriers.** Through-penetration firestop systems in *smoke barriers* shall be tested in accordance with the requirements of UL 1479 for air leakage. The ~~air leakage rate~~ L rating of the system measured at 0.30 inch (7.47 Pa) of water in both the ambient temperature and elevated temperature tests, shall not exceed:
5.0 cfm per square foot ($0.025 m^3/ s\ m^2$) of penetration opening for each *through-penetration firestop system*; or
A total cumulative leakage of 50 cfm ($0.024 m^3/s$) for any 100 square feet ($9.3\ m^2$) of wall area, or floor area.

Section ~~714~~ 715
FIRE RESISTANT JOINT SYSTEMS

~~714.6~~ **715.6 Fire-resistant joint systems in smoke barriers.** Fire-resistant joint systems in smoke barriers, and joints at the intersection of a horizontal *smoke barrier* and an exterior curtainwall, shall be tested in accordance with the requirements of UL 2079 for air leakage. The ~~air leakage rate~~ L rating of the joint system shall not exceed 5 cfm per lineal foot ($0.00775\ m^3/s\ m$) of joint at 0.30 inch (7.47 Pa) of water for both the ambient temperature and elevated temperature test.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html <http://www.iccsafe.org/cs/cc/ctc/index.html> . Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC's investigation of vertical openings through the Vertical Opening Study Group, which is part of the area of study, entitled "Balanced Fire Protection." The scope of the activity is noted as:

"To investigate what constitutes an acceptable balance between active fire protection and passive fire protection measures with respect to meeting the fire and life safety objectives of the IBC."

The ICC Vertical Opening Study Group re-grouped after the last ICC code development cycle and again looked at the problems and inconsistencies with Chapter 7 of the 2009 IBC. This statement provides a comprehensive explanation of the code proposals drafted and supported by the study group.

Rather than scrap the affected sections and re-write new text, the study group approached this task using mainly surgical fixes. After careful review we felt that the current content in Chapter 7 is fundamentally sound and familiar to all. We believe the inconsistencies that have developed in Chapter 7are mainly due to the initial drafting of the IBC, where language from each of the three legacy code was used, as is. As concepts in the IBC changed, some of these sections became in conflict with one another, obsolete or created "do loops" where the user never finds the correct requirement.

Most of the changes proposed by the study group are editorial in nature and will not change how the code is applied or used. However, as you will see, the study group has also proposed changes separately that are technical in nature. During the review, we felt there are areas in code that, based on fire statistics, should be improved. The study group was very focused on getting a basic proposal in front of the committee and membership that fixes the code editorially. Our main proposal includes only amendments that this group feels are editorial or very minor changes. In addition to the main proposal, we are also proposing technical changes. The study group is in support of both of these; however we did not want to jeopardize the entire effort because of the technical change debate.

Several of the definitions in Section 702 containing specific terms used in Chapter 7 were modified. Mainly the group wanted to emphasize the difference between openings, penetrations and membrane penetrations, although they are all defined globally as vertical openings. The definitions include the term breach to describe the entry into an assembly. This term was currently used in one of the existing definitions and we expanded its use. Our focus was to properly define the terms so that they can be dealt with in a prescriptive manner regarding vertical openings. In addition, the definition of joints was expanded to include linear openings in both rated or non-rated horizontal assemblies. This amendment was needed to be able to guide the code user to what is needed for non-rated assemblies. Other terms were discussed but the term "joint" was already defined in a way that familiar to all. The term L rating was also defined in a manner consistent with the existing standards and listings.

Section 711.4.1 was added to provide the user with guidance for non-rated assemblies in terms of what to do with open joints between the floor assemblies that allow for independent movement of the building in any plane caused by thermal, seismic, wind or any other loading. Basically, if the joint is not concealed within a cavity of a wall or not covered by a floor topping, then it must be sealed or treated with an approved material. Typically, they are covered by a decorative metal or something similar. This proposal will still allow for that method plus many other methods of sealing the vertical opening that this creates.

Section 711.5 was amended to clarify it applies to concealed and unconcealed penetrations. The study group felt that all penetrations needed to be sealed in some fashion, to reduce accelerated structural damage due to a breach in the assembly. Vertical openings should be protected in some way, whether the assembly is rated or non-rated. The added exception provides for joints that meet the exceptions in 715.1 and do not required additional measures.

Section 708 was changed to Section 712 to come after Horizontal Assemblies. The 2009 currently states that all vertical openings require a shaft and then give 17 exceptions to providing that shaft. Realizing that in today's built environment a shaft enclosure is only one of many ways to deal with a vertical opening, we re-named Section 712 (previously Section 708) to Vertical Openings and re-wrote the exceptions to become

available options for dealing with the multitude of various vertical openings encountered within a building. Additionally, we felt that the code should be specific on where to go to find the requirements for each application. And finally we felt users should not be able to use sections that are out of context, such as the example of using current Exception 7 for penetrations.

Section 712.1.8 was further modified to clarify the meaning "required means of egress" and to remind the user that smoke and fire barriers cannot be penetrated with an unprotected vertical opening. Additionally "limited to the same smoke compartment" was removed because the charging statement eliminates I-2 and I-3 occupancies from consideration.

A new sections were added under Section 712.1.17 that provides guidance for joints in non-rated assemblies, previously discussed.
The term "vertical" was added where the current 2009 Code section 708 used just the term "opening". We felt this clarification is consistent with our overall goal to emphasize the difference between vertical openings used for convenience and those vertical openings which are used as penetrations, joint and other applications where the vertical opening is breached by an object and intended to be sealed.

An exception was added to Section 714.4.1.2 Membrane Penetrations that exempts membrane penetrations by non-combustible items in concrete floors. Membrane penetration requirements were not intended to address embedded or cast non-combustible items within concrete floors. This condition has never been shown to be a problem. Reports from fires show that this application performs very well in real fire conditions without compromising the integrity of the structure or allowing fire spread.

The study group believes that these amendments, explained so far are all very minor or editorial in nature and do reflect any new technical requirements.

Definitions: Reason for change

These terms were either added or modified based on previous and current VO study group work.

711.4.1: Reason for change

This section was proposed to address holes in unrated floor ceiling assemblies. After a conference call on 3/31, it was determined that the term "linear opening" needed a definition or change the term.
Further work to address the term is needed. To be completed by the CTC meeting.

712:Reason for changes

Section 708 was identified as being a problem.
This proposal removes the exceptions to providing a shaft a makes them options for vertical openings. No technical changes occurred.
Alternate code change 708.1.8 is a technical change that is being proposed for discussion.

714: Reason for change.

Indentified as a problem at the Balt. MD CTC meeting.
No guidance was given as to how the measurement is to be taken.
This proposal mandates the full height of the wall as one dimension when calculating the 100 sq. ft. This was determined to be the area most affected

A 10 ft. x 10 ft. square was chosen as an easy visual reference for inspectors in the field. This was determined to be area most affected.
An exception was added to stipulate that penetrations (membrane) in solid concrete floors was not considered a membrane penetration.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HEILSTEDT-FS1-702.1

FS57–09/10
709.4

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing self

Revise as follows:

709.4 Continuity. Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above or to the fire-resistance-rated floor/ceiling or roof/ceiling assembly above, and shall be securely attached thereto. ~~If~~ In combustible construction where the fire partitions are not required to be continuous to the sheathing, deck or slab, ~~and where constructed of combustible construction,~~ the space between the ceiling and the sheathing, deck or slab above shall be fireblocked or draftstopped in accordance with Sections 717.2 and 717.3 at the partition line. The supporting construction shall be protected to afford the required fire-resistance rating of the wall supported, except for walls separating tenant spaces in covered mall buildings, walls separating dwelling units, walls separating sleeping units and corridor walls in buildings of Type IIB, IIIB and VB construction.

Exceptions:

(*Exceptions to remain unchanged)*

Reason: This code change simply clarifies the requirement for fireblocking or draftstopping the combustible concealed space between the ceiling and the underside of the deck above in those cases where the fire partitions are not required to be continuous to the underside of the sheathing, deck, or slab above. That condition may occur when the ceiling is part of a fire-resistance-rated floor/ceiling or roof/ceiling assembly or where

allowed by one of the Exceptions. Presently, this section can be misconstrued by implication to allow fire partitions in combustible construction to not be continuous through the ceiling space to the underside of the sheathing, deck, or slab in any situation if they simply stop at the ceiling, because the sentence being revised starts with "If". We believe the proposed revision clarifies this sentence so that its intent is straightforward. In other words, this sentence would only apply where the fire partitions were not required to be continuous through the ceiling space rather than if the builder decided to construct the partitions so that they stopped at the ceiling, even though this section would otherwise require them to be constructed continuous through the ceiling space.

In a previous code development cycle a code change proposal was submitted by a different proponent in an attempt to clarify this issue but it created unintended consequences by the way it was worded. We believe that this code change proposal will accomplish the intent of the previous proponent's code change and make this section easier to interpret and enforce.

.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Thornberry-FS1-709.4

FS58–09/10
710.4

Proponent: Gaius G. Nelson, Architect, Nelson•Tremain Partnership, representing self

Revise as follows:

710.4 Continuity. *Smoke barriers* shall form an effective membrane continuous from outside wall to outside wall and from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceilings, and interstitial structural and mechanical spaces. The supporting construction shall be protected to afford the required *fire-resistance rating* of the wall or floor supported in buildings of other than Type IIB, IIIB or VB construction.

Exception: Smoke-barrier walls are not required in interstitial spaces where such spaces are ~~designed and constructed with ceilings~~ part of a fire rated assembly that provides resistance to the passage of fire and smoke equivalent to that provided by the smoke barrier walls.

Reason: The current exception as written is not clear because the words "interstitial space" lack definition and lack identification with other code defined terminology. By associating interstitial space as a component of a rated assembly, the intent of the exception is clarified.
As an example, when a smoke barrier wall meets an exterior wall, the smoke barrier ends at the inside face of the exterior wall and does not continue to the exterior face.

Cost Impact: The code change proposal will reduce the cost of construction in situations where the affected parties are unsure about the need to extend smoke barrier walls through interstitial spaces.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Nelson-FS1-709.4

FS59–09/10
710.4

Proponent: Sarah A. Rice, CBO, representing self

Revise as follows:

710.4 Continuity. Smoke barriers shall form an effective membrane continuous from outside wall to outside wall and from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceilings, and interstitial structural and mechanical spaces. The supporting construction shall be protected to afford the required fire-resistance rating of the wall or floor supported in buildings of other than Type IIB, IIIB or VB construction.

Exceptions:

1. Smoke-barrier walls are not required in interstitial spaces where such spaces are designed and constructed with ceilings that provide resistance to the passage of fire and smoke equivalent to that provided by the smoke-barrier walls.
2. Smoke barrier walls enclosing areas of refuge shall not be required to be continuous from outside wall to outside wall.

Reason: Areas of refuge are typically interior rooms. Researching the history of the requirement in Section 1007.6 for areas of refuge to be enclosed in smoke barriers indicates that the proponent and memberships intent was to enclose these rooms in wall assemblies that had both fire resistive and smoke-resistive characteristics and that it was NOT the intent to impose the provision in Section 710.4 for a smoke barrier to extend from outside wall to outside wall.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposals FS59 through FS62 address smoke barrier continuity requirements related to areas of refuge or elevator lobbies, or both. The committee needs to make its intent clear with respect to these provisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-FS3-710.4

FS60–09/10
710.4

Proponent: Dave Frable, US General Services Administration, representing the US General Services Administration

Revise as follows:

710.4 Continuity. *Smoke barriers* shall form an effective membrane continuous from outside wall to outside wall and from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceilings, and interstitial structural and mechanical spaces. The supporting construction shall be protected to afford the required *fire-resistance rating* of the wall or floor supported in buildings of other than Type IIB, IIIB or VB construction.

Exceptions

1. Smoke-barrier walls are not required in interstitial spaces where such spaces are designed and constructed with ceilings that provide resistance to the passage of fire and smoke equivalent to that provided by the smoke-barrier walls.
2. Smoke barriers enclosing fire service access elevator lobbies, as required by Section 3007.4.2, and occupant evacuation elevator lobbies, as required by Section 3008.11.2, are not required to extend from outside wall to outside wall.

Reason: The original intent of requiring a smoke barrier to enclose the subject elevator lobbies was to provide a construction assemblage that provided a resistance to the passage of smoke into the subject lobby. It was not the intent of the original proposal to require the subject smoke barrier to extend from outside wall to outside wall of the building. Without this exception, the design and construction of the elevator enclosures for fire service access elevators and occupant evacuation elevators will lead to misinterpretations of the original intent of the proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposals FS59 through FS62 address smoke barrier continuity requirements related to areas of refuge or elevator lobbies, or both. The committee needs to make its intent clear with respect to these provisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Frable-FS4-710.4

FS61–09/10
710.4

Proponent: Maureen Traxler representing City of Seattle, Seattle Dept of Planning & Development

Revise as follows:

710.4 Continuity. *Smoke barriers* shall form an effective membrane continuous from outside wall to outside wall and from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceilings, and interstitial structural and mechanical spaces. The supporting construction shall be protected to afford the required *fire-resistance rating* of the wall or floor supported in buildings of other than Type IIB, IIIB or VB construction.

Exceptions:

1. Smoke-barrier walls are not required in interstitial spaces where such spaces are designed and constructed with ceilings that provide resistance to the passage of fire and smoke equivalent to that provided by the smoke-barrier walls.
2. Smoke barriers used for elevator lobbies in accordance with Section 405.4.3, 3007.4.2 or 3008.11.2 need not extend from outside wall to outside wall.
3. Smoke barriers used for areas of refuge in accordance with Section 1007.6.2 need not extend from outside wall to outside wall.

Reason: Sections 405.4, 3007.4.2 and 3008.11.2 require that lobbies for underground building elevators, fire service access elevators and occupant evacuation elevators be enclosed with smoke barriers. Section 1007.6.2 requires that each area of refuge be separated from the remainder of the story by a smoke barrier. However, the continuity requirements of 710.4 are not practical for areas of refuge and elevator lobbies due to typical floor plan layout, and don't provide additional safety. As long as each area of refuge or elevator lobby is separated from other areas by smoke barriers, the intent of the code is met. Other code sections require separation by smoke barriers as well, but continuity requirements are appropriate in those cases: Sections 407.4 & 408.6 for sleeping and treatment rooms for patients or residents in I-2 & I-3 occupancies and Section 422.2 for ambulatory health care facilities.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposals FS59 through FS62 address smoke barrier continuity requirements related to areas of refuge or elevator lobbies, or both. The committee needs to make its intent clear with respect to these provisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TRAXLER-FS2-710.4

FS62–09/10
710.4, 710.5

Proponent: Dominic Marinelli, United Spinal Assoc, representing self

Revise as follows:

710.4 Continuity. *Smoke barriers* shall form an effective membrane continuous from outside wall to outside wall and from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, deck or slab above, including continuity through concealed spaces, such as those found above suspended ceilings, and interstitial structural and mechanical spaces. The supporting construction shall be protected to afford the required *fire-resistance rating* of the wall or floor supported in buildings of other than Type IIB, IIIB or VB construction.

Exceptions:

1. Smoke-barrier walls are not required in interstitial spaces where such spaces are designed and constructed with ceilings that provide resistance to the passage of fire and smoke equivalent to that provided by the smoke-barrier walls.
2. Smoke barriers that form an area of refuge in accordance with Section 1007 shall be permitted to extend to the fire-resistance-rated stairway or elevator shaft enclosure or to another smoke barrier wall.
3. Smoke barriers that form an elevator lobby in accordance with Sections 405.4.3, 3007.4.2 and 3008.11.2 shall be permitted to extend to the fire-resistance rated elevator shaft enclosure.

710.5 Openings. Openings in a *smoke barrier* shall be protected in accordance with Section 715.

Exceptions:

1. In Group I-2, where doors are installed across *corridors*, a pair of opposite-swinging doors without a center mullion shall be installed having vision panels with fire-protection-rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested. The doors shall be close fitting within operational tolerances, and shall not have undercuts in excess of 3/4-inch, louvers or grilles. The doors shall have head and jamb stops, astragals or rabbets at meeting edges and shall be automatic closing by smoke detection in accordance with Section 715.4.8.3. Where permitted by the door manufacturer's listing, positive-latching devices are not required.
2. In Group I-2, horizontal sliding doors installed in accordance with Section 1008.1.4.3 and protected in accordance with Section 715.

3. Where smoke barriers form an area of refuge in accordance with Section 1007, the elevator doors or stairway doors are not required to meet the opening protectives for smoke barriers
4. Where smoke barriers form an elevator lobby in accordance with Sections 405.4.3, 3007.4.2 and 3008.11.2 the elevator doors are not required to meet the opening protectives for smoke barriers.

Reason: Smoke barriers are used to form areas of refuge and elevator lobbies in addition to there application for forming smoke compartments. The intent of this proposal is to clarify the requirements when this situation occurs,

When a smoke barrier forms an area of refuge immediately in front of an elevator with stand-by power or an enclosed exit stairway, the intent is that the smoke enclosure form a protected area. The shaft enclosure requirements for the walls exceed smoke barrier provisions, and therefore provide a higher level of protection. With an area of refuge in place at each story, the smoke will be kept out of the shaft by the area of refuge, therefore, the danger of smoke coming up the shaft and into the area of refuge is minimal. If the elevator doors are required to meet smoke barrier protection requirements, there can be technical issues that will impair using the elevator for assisted rescue. The elevator and stair doors will still be required to meet the fire resistance rating required for the shaft.

In rare cases, the area of refuge can be located in front of an open elevator (i.e., elevator in an atrium) or at an open stairway. In these situations, the smoke barrier must form a room, and the continuity requirements should allow for this situation.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposals FS59 through FS62 address smoke barrier continuity requirements related to areas of refuge or elevator lobbies, or both. The committee needs to make its intent clear with respect to these provisions.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Marinelli-FS1-710.4

FS63–09/10
711.5, 711.6, 711.7

Proponent: Sarah A. Rice, CBO, representing self

Add new text as follows:

711.5 Openings. Openings in smoke partitions shall comply with Sections 711.5.1 and 711.5.2.

711.5.1 Windows. Windows in smoke partitions shall be sealed to resist the free passage of smoke or be automatic-closing upon detection of smoke. ~~Doors in smoke partitions shall comply with this section.~~

711.5.2 Doors. Doors in smoke partitions shall comply with Sections 711.5.2.1 through 711.5.2.3.

711.5.2.1 ~~711.5.1~~ Louvers. Doors in smoke partitions shall not include louvers.

711.5.2.2 ~~711.5.2~~ Smoke and draft control doors. Where required elsewhere in the code, doors in smoke partitions shall meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot (0.015424m3/(s m2)) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature test and the elevated temperature exposure test. Installation of smoke doors shall be in accordance with NFPA 105.

711.5.2.3 ~~711.5.3~~ Self- or automatic-closing doors. Where required elsewhere in the code, doors in smoke partitions shall be self- or automatic-closing by smoke detection in accordance with Section 715.4.8.3.

711.6 Penetrations ~~and joints~~. The space around penetrating items ~~and in joints~~ shall be filled with an *approved* material to limit the free passage of smoke.

711.7 Joints. Joints shall be filled with an *approved* material to limit the free passage of smoke.

~~711.7~~ 711.8 Ducts and air transfer openings. *(No change to text)*

Reason: The proposed changes create uniformity with how openings, joints, penetrations and air-transfer and duct openings are addressed in other sections.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: RICE-FS1F-711

FS64–09/10
712 (New)

Proponent: Sarah A. Rice, CBO, representing self

Add new text as follows:

Section 712
NONFIRE-RESISTANCE RATED INTERIOR PARTITIONS AND BARRIERS

712.1 General. Nonfire-resistance rated interior partitions shall comply with this section.

712.2 Materials. The walls shall be of materials permitted by the building type of construction.

712.3 Openings. Unless serving as a smoke partition or required by other sections of this code, openings in nonfire-resistance rated interior partitions shall be not be required to be protected.

712.4 Penetrations. Unless serving as a smoke partition or required by other sections of this code, penetrations into or through a nonfire-resistance rated interior partitions shall be not be required to be protected.
712.5 Joints. Unless serving as a smoke partition or required by other sections of this code, joints between nonfire-resistance rated interior partitions shall be not be required to be protected.

712.6 Ducts and air transfer openings. Unless serving as a smoke partition or required by other sections of this code, ducts and air-transfer openings in nonfire-resistance rated interior partitions shall be not be required to be protected.

(Renumber subsequent sections)

Reason: This proposal introduces a new section on nonfire-resistance rated interior partitions. Often questions regarding construction and levels of protection arise when the wall of a corridor is allowed to not be fire rated because the building is spinklered. When the wall is fire rated it is considered to be a fire partition and has to be constructed as such, but how are the walls that are not fire rated to be constructed? And when an exit stairway is allowed to unenclosed, such as in an open parking garage, but the designer chooses to enclose the stair (maybe for weather purposes) what now are the requirements for the walls around that stair?

This proposal seeks to provide the answer to these questions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE FS1e NEW 712

FS65–09/10
712.3

Proponent: Lee Kranz representing Washington Association of Building Officials (WABO), Technical Code Development Committee

Revise as follows:

SECTION 712
FIRE-RESISTANCE RATED HORIZONTAL ASSEMBLIES

712.1 General. Floor and roof assemblies required to have a fire-resistance rating shall comply with this section. Nonfire-resistance-rated floor and roof assemblies shall comply with Section 713.4.2

712.2 Materials. The floor and roof assemblies shall be of materials permitted by the building type of construction.

712.3 Fire-resistive rating. The fire-resistance rating of floor and roof assemblies shall be a minimum of 1-hour fire-resistance rated construction but not be less than that required by the building type of construction. Where the floor assembly separates mixed occupancies, the assembly shall have a fire-resistance rating of not less than that required by Section 508.3.3 based on the occupancies being separated. Where the floor assembly separates a single occupancy into different fire areas, the assembly shall have a fire-resistance rating of not less than that required by

Section 707.3.9. ~~Horizontal assemblies separating dwelling units in the same building and horizontal assemblies separating sleeping units in the same building shall be a minimum of 1-hour fire-resistance-rated construction.~~

Exception: Dwelling unit and sleeping unit separations in buildings of Type IIB, IIIB and VB construction shall have fire-resistance ratings of not less than ½ hour in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

Reason: Adding "Fire Resistance Rated" to the title clarifies that this section only applies to rated horizontal assemblies. The changes in 712.3 are needed to provide coordination with Section 420.3. Currently, Section 420.3 refers to Section 712 for horizontal assemblies but Section 712 does not include scoping for "floor assemblies separating dwelling or sleeping units from other occupancies contiguous to them in the same building" but does include the scoping for "horizontal assemblies separating dwelling units in the same building and horizontal assemblies separating sleeping units in the same building". Deleting the scoping text from 712.3 eliminates the redundancy with Section 420.3. Adding the minimum 1-hour fire-resistance rated construction to Section 712.3 provides clarity similar to that provided in Section 709.3 for Fire Partitions which is also referenced in Section 420.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KRANZ-FS1-712.3

FS66 –09/10
712

Proponent: Sarah A. Rice, CBO, representing self

1. Revise as follows:

SECTION 712
FLOOR AND ROOF ~~HORIZONTAL~~ ASSEMBLIES

712.1 General. Floor and roof assemblies ~~required to have a *fire-resistance rating*~~ shall comply with this section. ~~Nonfire-resistance-rated floor and roof assemblies shall comply with Section 713.4.2~~.

712.2 Materials. The floor and roof assemblies shall be of materials permitted by the building type of construction.

(Section 712.3 relocated to Section 715.5.1 and 715.5.2)

(Sections 712.3.1, 702.3.2, and 712.3.3 relocated to Sections 715.5.3, 715.5.4, and 715.5.5 respectively)

~~**712.4**~~ **712.3 Continuity.** Floor and roof assemblies shall be continuous without openings, penetrations or joints except as permitted by this section and Sections 708.2, 713.4, 714 and 1022.1. ~~Skylights and other penetrations through a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated roof assembly is maintained. Unprotected skylights shall not be permitted in roof assemblies required to be fire-resistance rated in accordance with Section 704.10. The supporting construction shall be protected to afford the required *fire-resistance rating* of the *horizontal assembly* supported.~~

Exception: In buildings of Type IIB, IIIB or VB construction, the construction supporting the ~~*horizontal*~~ fire-resistance rated floor and roof *assembly* is not required to be fire-resistance-rated at the following:

1. ~~Horizontal~~ fire-resistance rated floor and roof assemblies at the separations of incidental uses as specified by Table 508.2.5, provided the required *fire-resistance rating* does not exceed 1 hour.
2. ~~Horizontal~~ fire-resistance rated floor and roof assemblies at the separations of *dwelling units* and *sleeping units* as required by Section 420.3.
3. ~~Horizontal~~ fire-resistance rated floor and roof assemblies at *smoke barriers* constructed in accordance with Section 710.

712.4 Nonfire-resistance rated floor and roof horizontal assemblies. Nonfire-resistance rated floor and roof assemblies shall comply with Sections 712.4.1 through 712.4.4.

712.4.1 Openings. Openings in nonfire-resistance rated floor and roof assemblies shall comply with Section 708.

712.4.2 Penetrations. Penetrations in or through nonfire-resistance rated *floor and roof assemblies* shall comply with Section 713.4.2.

712.4.3 Joints. Joints made in or between in nonfire-resistance rated *floor and roof* shall comply with Section 708.

712.4.4 Ducts and air transfer openings. Penetrations in nonfire-resistance rated floor and roof *assemblies* by ducts and air transfer openings shall comply with Section 708.

712.5 Fire-resistance rated floor and roof assemblies. Floor and roof assemblies required to have a fire-resistance rating shall comply with Sections 712.5.1 through 712.5.9.

712.5.1 ~~712.3~~ Fire-resistance rating. The *fire-resistance rating* of floor and roof assemblies shall not be less than that required by the building type of construction.

712.5.2 Floor assemblies. Where the floor assembly separates mixed occupancies, the assembly shall have a *fire-resistance rating* of not less than that required by Section 508.4 based on the occupancies being separated. Where the floor assembly separates a single occupancy into different *fire areas*, the assembly shall have a *fire-resistance rating* of not less than that required by Section 707.3.9.

Where the floor assembly ~~*Horizontal assemblies* separating~~ separates *dwelling units* in the same building ~~and *horizontal assemblies* separating~~ or *sleeping units* in the same building, the assembly shall have a minimum fire resistance rating of 1-hour ~~fire-resistance-rated construction~~.

> **Exception:** *Dwelling unit* and *sleeping unit* separations in buildings of Type IIB, IIIB and VB construction shall have *fire-resistance ratings* of not less than 1/2 hour in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

~~712.3.1~~ 712.5.3 Ceiling panels. Where the weight of lay-in ceiling panels, used as part of fire-resistance-rated floor/ceiling or roof/ceiling assemblies, is not adequate to resist an upward force of 1 pound per square foot (48 Pa), wire or other *approved* devices shall be installed above the panels to prevent vertical displacement under such upward force.

~~712.3.2~~ 712.5.4 Access doors. Access doors shall be permitted in ceilings of fire-resistance-rated floor/ceiling and roof/ceiling assemblies provided such doors are tested in accordance with ASTM E 119 or UL 263 as horizontal assemblies and labeled by an *approved agency* for such purpose

~~712.3.3~~ 712.5.5 Unusable space. In 1-hour fire-resistance-rated floor assemblies, the ceiling membrane is not required to be installed over unusable crawl spaces. In 1-hour fire-resistance-rated roof assemblies, the floor membrane is not required to be installed where unusable *attic* space occurs above.

712.5.6 Openings. Openings in fire-resistance rated floor and roof *assemblies* shall comply with Section 708 or 712.5.6.1.

> **Exception.** Skylights in a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated roof assembly is maintained. Unprotected skylights shall not be permitted in roof assemblies required to be fire-resistance rated in accordance with Section 704.10. The supporting construction shall be protected to afford the required *fire-resistance rating* of the *horizontal assembly* supported.

~~712.8~~ 712.5.6.1 Floor fire door assemblies. Floor *fire door* assemblies used to protect openings in fire-resistance-rated floors shall be tested in accordance with NFPA 288, and shall achieve a *fire-resistance rating* not less than the assembly being penetrated. Floor *fire door* assemblies shall be labeled by an *approved agency*. The *label* shall be permanently affixed and shall specify the manufacturer, the test standard and the *fire-resistance rating*.

~~712.5~~ 712.5.7 Penetrations. Penetrations of ~~*horizontal*~~ fire-resistance rated floor and roof *assemblies* shall comply with Section 713.

> **Exception.** Penetrations through a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated roof assembly is maintained. The supporting construction shall be protected to afford the required *fire-resistance rating* of the floor and roof *assembly* supported.

~~712.6~~ **712.5.8 Joints.** Joints made in or between ~~*horizontal*~~ fire-resistance rated floor and roof *assemblies* shall comply with Section 714. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 714.4.

~~712.7~~ **712.5.9 Ducts and air transfer openings.** Penetrations in ~~*horizontal*~~ fire-resistance rated floor *assemblies* by ducts and air transfer openings shall comply with Section 716.

(Section 712.8 relocated to Section 712.5.6.1)

~~712.9~~ **712.6 Smoke barrier.** Where ~~*horizontal*~~ fire-resistance rated floor or roof *assemblies* are required to resist the movement of smoke by other sections of this code in accordance with the definition of *smoke barrier*, the ~~horizontal~~ fire-resistance rated floor or roof assembly shall comply with 712.6.1 through 712.X.

712.6.1 Penetrations and joints. Penetrations and joints in such ~~*horizontal*~~ fire-resistance rated floor or roof *assemblies* required to resist the movement of smoke shall be protected as required for *smoke barriers* in accordance with Sections 713.5 and 714.6.

712.6.2 Elevator shafts. Regardless of the number of *stories* connected by elevator shaft enclosures, doors located in elevator shaft enclosures that penetrate the a ~~*horizontal*~~ fire-resistance rated floor or roof *assembly* required to resist the movement of smoke shall be protected by enclosed elevator lobbies complying with Section 708.14.1.

712.6.3 Openings. Openings through ~~*horizontal*~~ fire-resistance rated floor or roof *assemblies* shall be protected by shaft enclosures complying with Section 708. ~~*Horizontal*~~ Fire-resistance rated floor or roof *assemblies* shall not be allowed to have unprotected vertical openings.

Reason: This code change is one in a series of code changes intended to add clarity to the provisions of Chapter 7. Unless otherwise specifically stated, each code change can be accepted on its own merits.

Chapter 7 is currently titled "Fire and Smoke Protection Features" and yet it contains provisions for nonfire- and nonsmoke-resistance rated assemblies. Through a series of code changes, including tone, it is hoped that it becomes clear that Chapter 7 regulates both fire/smoke and nonfire/nonsmoker-resistance rated vertical and horizontal (floors, roofs and walls) assemblies.

This code change addresses Section 712 Horizontal Assemblies. Currently the provisions contained in Section 712 only apply to "horizontal" assemblies (which are defined in Section 702 as "fire-resistance rated floor and roof assemblies), the only help the user gets in addressing nonfire-resistance rated floor and roof assemblies is a single sentence in 712.1 that says – "Nonfire-resistance-rated floor and roof assemblies shall comply with Section 713.4.2." Which only tells the user how to address penetrations in the nonfire-resistance rated floor and roof assemblies – how about materials and continuity?

This proposal is intended to expand on the application of the section making it applicable to both fire-resistance rated and non -resistance rated floor and roof assemblies. The majority of technical provisions are unchanged, and are noted as such. The following outlines the major changes to Section 712:

Change the title to Floor and Roof Assemblies – because
Revisions to make the section applicable to both fire rated and nonfire rated floor and roof assemblies.
Create new section Introduce new language to address nonfire-resistance rated floor and roof assemblies.
Create new section that contains the provisions unique to fire resistance rated floor and roof assemblies (most provisions are currently in the 2009 IBC).
Replace the term "horizontal" with "floor and roof assembly" as the section now contains provisions for both non-fire resisance rated and fire-resistance rated floor and roof assemblies., While the term "horizontal assembly" is defined as being a fire-resistance rated assembly, with the proposed expanded scope of the section, using the terms "nonfire-resistance rated floor and roof assemblies" and "fire-resistance rated floor and roof assemblies" would seem to makes it easier for the user to see which provisions apply to which types of assemblies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-FS1h-712

FS67–09/10
713 (New)

Proponent: Sarah A. Rice, CBO, representing self

Add new text as follows:

SECTION 713
PENETRATIONS OF FIRE RESISTANCE RATED INTERIOR VERTICAL ASSEMBLIES

713.1 Scope. The provisions of this section shall govern the materials and methods of construction used to protect penetrations of and through fire-resistance-rated interior vertical assemblies.

713.2 Installation details. Where sleeves are used, they shall be securely fastened to the assembly penetrated. The space between the item contained in the sleeve and the sleeve itself and any space between the sleeve and the assembly penetrated shall be protected in accordance with this section. Insulation and coverings on or in the penetrating item shall not penetrate the assembly unless the specific material used has been tested as part of the assembly in accordance with this section.

713.3 Dissimilar materials. Noncombustible penetrating items shall not connect to combustible items beyond the point of firestopping unless it can be demonstrated that the fire-resistance integrity of the wall is maintained.

713.4 Fire-resistance-rated walls. Through penetrations of fire walls, fire-barriers, fire partitions and smoke barriers required to have a fire-resistance rating shall comply with Sections 713.4.1. Membrane penetrations of fire walls, fire-barriers, and fire partitions required to have a fire-resistance rating shall comply with Sections 713.4.2.

714.3.1 Through penetrations of fire-resistance rated walls. Through penetrations of fire-resistance-rated walls shall comply with Section 713.3.1.1 or 713.3.1.2.

Exception: Where the penetrating items are steel, ferrous or copper pipes, tubes or conduits, the *annular space* between the penetrating item and the fire-resistance- rated wall is permitted to be protected as follows:

1. In concrete or masonry walls where the penetrating item is a maximum 6-inch (152 mm) nominal diameter and the area of the opening through the wall does not exceed 144 square inches (0.0929 m_2), concrete, grout or mortar is permitted where it is installed the full thickness of the wall or the thickness required to maintain the *fire-resistance rating*; or
2. The material used to fill the annular space shall prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected to ASTM E 119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the *fire-resistance rating* of the construction penetrated.

714.3.1.1 Testing. Through penetrations of fire-resistance-rated fire walls, fire-barriers and fire partitions and smoke barriers shall be installed as tested in an approved fire-resistance-rated assembly.

714.3.1.1.1 Smoke barriers. Penetrations in *smoke barriers* shall be tested in accordance with the requirements of UL 1479 for air leakage. The air leakage rate of the penetration assemblies measured at 0.30 inch (7.47 Pa) of water in both the ambient temperature and elevated temperature tests, shall not exceed:

1. 5.0 cfm per square foot (0.025m_3 / s ¸ m_2) of penetration opening for each *through-penetration firestop system*; or
2. A total cumulative leakage of 50 cfm (0.024m_3/s) for any 100 square feet (9.3 m_2) of wall area, or floor area.

714.3.1.2 Through-penetration firestop system. *Through penetrations* shall be protected by an *approved* penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water and shall have an F rating of not less than the required *fire-resistance rating* of the wall penetrated.

713.3.2 Membrane penetrations fire-resistance-rated walls. Membrane penetrations of fire-resistance-rated fire walls, fire-barriers, fire partitions and smoke barriers shall comply with 713.3.1. Where walls or partitions are required to have a fire resistance rating recessed fixtures shall be installed such that the required fire resistance will not be reduced.

Exceptions:

1. Membrane penetrations of maximum 2-hour fire-resistance-rated walls and partitions by steel electrical boxes that do not exceed 16 square inches (0.0103 m2) in area, provided the aggregate area of the openings through the membrane does not exceed 100 square inches (0.0645 m2) in any 100 square feet (9.29m2) of wall area. The *annular space* between the wall membrane and the box shall not exceed 1/8 inch (3.1 mm). Such boxes on opposite sides of the wall or partition shall be separated by one of the following:

1.1. By a horizontal distance of not less than 24 inches (610 mm) where the wall or partition is constructed with individual noncommunicating stud cavities;
1.2. By a horizontal distance of not less than the depth of the wall cavity where the wall cavity is filled with cellulose loose-fill, rockwool or slag mineral wool insulation;
1.3. By solid fireblocking in accordance with Section 717.2.1;
1.4. By protecting both outlet boxes with *listed* putty pads; or
1.5. By other *listed* materials and methods.

2. Membrane penetrations by *listed* electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The *annular space* between the wall membrane and the box shall not exceed 1/8 inch (3.1 mm) unless *listed* otherwise. Such boxes on opposite sides of the wall or partition shall be separated by one of the following:
2.1. By the horizontal distance specified in the listing of the electrical boxes;
2.2. By solid fireblocking in accordance with Section 717.2.1;
2.3. By protecting both boxes with *listed* putty pads; or
2.4. By other *listed* materials and methods.
3. Membrane penetrations by electrical boxes of any size or type, which have been *listed* as part of a wall pening protective material system for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.
4. Membrane penetrations by boxes other than electrical boxes, provided such penetrating items and the *annular space* between the wall membrane and the box, are protected by an *approved membrane penetration* firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water, and shall have an F and T rating of not less than the required *fire-resistance rating* of the wall penetrated and be installed in accordance with their listing.
5. The *annular space* created by the penetration of an automatic sprinkler, provided it is covered by a metal escutcheon plate

(Renumber subsequent sections)

Reason: This code change is one in a series of code changes intended to add clarity to the provisions of Chapter 7. Unless otherwise specifically stated, each code change can be accepted on its own merits. The acceptance of only this code change will result in redundancy in the code at worst. Chapter 7 is currently titled “Fire and Smoke Protection Features” and yet it contains provisions for nonfire- and nonsmoke-resistance rated assemblies. Through a series of code changes, including tone, it is hoped that it becomes clear that Chapter 7 regulates both fire/smoke and nonfire/nonsmoker-resistance rated vertical and horizontal (floors, roofs and walls) assemblies.

This code change introduces a new section - Section 713 Penetrations of Fire Resistance Rated Interior Vertical Assemblies. Currently the regulations for penetrations in ALL types of assemblies are contained in a single section in the 2009 IBC – Section 713 Penetrations. It is often difficult to find exactly which penetration provisions apply to which type of assembly in the current Section 713. By extracting the provisions that only apply to fire rated vertical assemblies (walls) and putting them in their own section, confusion should be minimized.

The majority of technical provisions contained in new Section 713 are taken verbatim from current Section 713. The difference is that this section is ONLY intended to contain the regulations for vertical assemblies that are fire-resistance rated.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-FS 1i-713

FS68–09/10
713.4.1.1.2

Proponent: John Valiulis, representing Hilti, Inc.

Revise as follows:

713.4.1.1.2 Through-penetration firestop system. *Through penetrations* shall be protected by an *approved through-penetration firestop system* installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa). The system shall have an F rating/T rating of not less than 1 hour but not less than the required rating of the floor penetrated.

Exceptions:

1. Floor penetrations contained and located within the cavity of a wall above the floor or below the floor do not require a T rating.
2. Floor penetrations consisting of power cables or busbars do not require a T-rating.

Reason: To add an additional exception to the T-rating requirements for power-carrying penetrating items that cannot freely be insulated, and thus cannot practically achive a T-rating.

Justification: For a floor though-penetration to obtain a T-rating equivalent to the F-rating, as required by article 713.4.1.1.2, its temperature on the non-fire side (unexposed side) of the test assembly must have a temperature rise of no more than 325 degrees F above the ambient temperature. With a typical ambient temperature of 75F, this means that the penetrating item must maintain a temperature below 400F throughout the fire test, even with fire-side temperatures of 1700F after 1-hour of fire test duration, and 1850F after 2-hours of fire test duration. The method by which the T-rating objective is normally accomplished for anything but very small cross-section through-penetrating items is by providing sufficient thermal insulation on the penetrating item above the floor, or below the floor, or often both when the penetrating item is a good conductor of heat.

What makes power cables and busbars accomplish their intended function of conducting significant electrical currents is that they are made of a large enough cross section of a good conducting metal such as copper or aluminum. The property that makes the power cables and busbars good conductors of large amounts of electrical power also make them equally good conductors of heat. For this reason, busbars and power cables typically exceed the allowable temperature limit needed to achieve a T-rating within a ¼ hour or less in an ASTM E814/UL1479 fire test, as can easily be seen by perusing the through-penetration firestop system listings within the UL Fire Resistance Directory.

To try to achieve a T-rating equivalent to the F-rating, power cables and busbars could theoretically be covered with sufficient thermal insulation above and/or below the floor to prevent heat from being transferred from the environment to and from the conductor. But this would contradict numerous provisions of the National Electrical Code, which prohibits these power-conducting elements from being encapsulated within thermal insulation. Heat generated by the conduction of power must be free to be released to the surrounding environment. For power cables, one could theoretically use de-rating factors to compensate for the added thermal insulation by significantly reducing the power carried by the cable as compared to its design rating. However, this could add substantial cost due to the need for larger or more numerous cables to compensate for the de-rating. For busbars, the option of wrapping in thermal insulation does not exist.

The reality is that the need for the T-rating to equal the F-rating for power cables and busbars is not really being enforced throughout the country. Firestop system manufacturers have not had any such thermally-insulated power conductors tested to see if any could achieve the F=T rating, since there is a good awareness that such systems would never be used and the testing cost would be wasted. Code inspectors seem to be similarly aware of the electrical hazards that could be created by wrapping power conductors with thermal insulation, and are therefore not demanding the F=T rating for the power conductors.

This proposed code change would allow the code to recognize a valid exception which is already being allowed by code inspectors nationwide.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: VALIULIS-FS2-713.4.1.1.2

FS69–09/10
713.4.1.1.2

Proponent: John Valiulis, representing Hilti, Inc.

Revise as follows:

713.4.1.1.2 Through-penetration firestop system. *Through penetrations* shall be protected by an *approved through-penetration firestop system* installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch ofwater (2.49 Pa). The system shall have an F rating/T rating of not less than 1 hour but not less than the required rating of the floor penetrated.

Exceptions:

1. Floor penetrations contained and located within the cavity of a wall above the floor or below the floor do not require a T rating.
2. Floor penetrations by floor drains, tub drains or shower drains contained and located within the concealed space of a horizontal assembly do not require a T rating

Reason: To clarify that when a floor or tub drain is contained within the horizontal concealed space of a floor/ceiling assembly, the T rating required as part of the listed fire stop system can be omitted.

Purpose: To add an additional exception to the T-rating requirements for floor and tub drains through floors.

Justification: The horizontal concealed space of a *Horizontal Assembly* (i.e. a floor/ceiling assembly with a membrane) is comparable in construction and protection, to that of a wall cavity in the current exception for floor penetrations contained and located within the cavity of a wall above the floor or below the floor. Thus, the level of protection proposed here is comparable to that provided in the current exception to 713.4.1.1.2.

Floor drains, tub drains and shower drains would never be located such that the pipe penetrating the floor would be within the cavity of a wall. Thus, those drains would not be able to use the existing T-rating exception. Some jurisdictions are already applying the logic of the existing exception to include the situation of penetrating items concealed above the membrane of a floor/ceiling assembly, as there is some intuitive recognition that the situations really are analogous.

The alternative to allowing the additional exception proposed here is to remain with the status quo, and thus require the T-rating (thermal insulation) to be provided from insulation applied on the penetrating item below the floor. With a floor drain or shower drain application, there is no way to provide any insulation on the penetrating item above the floor. Thus, the amount of insulation required on the drain pipe below the floor is substantial. The attached photo shows such a code-compliant installation.

Given that the risk of igniting combustibles above the floor from contact with a floor drain or tub/shower drain is minutely small, and that the tested and listed solutions for providing a T-rating for these drain pipes is an obvious case of overkill in situations where the penetrating item would not see the full heat of a fire anyway, the committee is urged to accept this reasonable exception.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: VALIULIS-FS3-713.4.1.1.2

FS70–09/10

713.3.1.1, 713.4.1.1.2, 716.3.1 (IMC 607.3.1)

Proponent: Julius Ballanco, PE, JB Engineering and Code Consulting, PC, representing In-O-Vate Technologies, Inc.

Revise as follows:

713.3.1.2 Through-penetration firestop system. Through penetrations shall be protected by an approved penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water and shall have an F and T rating of not less than the required fire-resistance rating of the wall penetrated.

713.4.1.1.2 Through-penetration firestop system. Through penetrations shall be protected by an approved through-penetration firestop system installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa). The system shall have an F-rating and a T-rating of not less than 1 hour but not less than the required rating of the floor penetrated.

~~**Exception:** Floor penetrations contained and located within the cavity of a wall do not require a T- rating.~~

716.3.1 (IMC 607.3.1) Damper testing. Dampers shall be listed and bear the label of an approved testing agency indicating compliance with the standards in this section. Fire dampers shall comply with the requirements ofUL555. In addition, fire dampers shall be tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch of water (2.49 Pa). The system shall have a T-rating of not less than rating of the penetrating assembly. Only fire dampers labeled for use in dynamic systems shall be installed in heating, ventilation and air-conditioning systems designed to operate with fans on during a fire. Smoke dampers shall comply with the

requirements of UL 555S. Combination fire/smoke dampers shall comply with the requirements of both UL 555 and UL 555S. Ceiling radiation dampers shall comply with the requirements of UL 555C.

Reason: During the last code change cycle, I attempted to remove the requirement for a "T rating" on a horizontal penetration of a membrane by a box. The opposition provided a compelling argument supporting the inclusion of a "T rating" that the membership supported.

While I did not agree with the testimony supporting a "T rating," I do support consistency in the code. If the arguments for "T ratings" are compelling for a box membrane penetration, then the same argument would support a "T rating" for a full horizontal penetration and a duct penetration.

If a duct penetrated a membrane, there is currently no requirement for a "T rating." How can this be allowed in the code when a smaller box penetration of a membrane must have a "T rating?" This does not make sense. Both membrane penetrations present the same hazard.

The same can be said for any full penetration. How can we ignore the "T rating?" Clearly, without a "T rating" the penetration is not equivalent to an ASTM E119 assembly. Again, this was the argument used during the last code change cycle.

There needs to be consistency in the Building Code. I have an alternative change to Section 713.3.2 that removes the "T rating" for horizontal penetration of a membrane by a box. Either this change or that change must be accepted for the code to be consistent.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BALLANCO-FS1-713.3.1.2

FS71–09/10
713.3.2

Proponent: Julius Ballanco, PE, JB Engineering and Code Consulting, PC, representing In-O-Vate Technologies, Inc.

Revise as follows:

713.3.2 Membrane penetrations. Membrane penetrations shall comply with Section 713.3.1. Where walls or partitions are required to have a fire-resistance rating, recessed fixtures shall be installed such that the required fire-resistance will not be reduced.

Exceptions:

(Exceptions not shown remain unchanged)

4. Membrane penetrations by boxes, other than electrical boxes, provided such penetrating items and the annular space between the wall membrane and the box, are protected by an approved membrane penetration firestop system installed as tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water, and shall have an F ~~and T~~ rating of not less than the required fire-resistance rating of the wall penetrated and be installed in accordance with their listing.

Reason: I submitted this change to the last cycle when the "T rating" was added to the membrane box penetration. This was not a requirement in the 2006 edition of the IBC. Traditionally, the IBC has never required a "T rating" for horizontal penetrations. This is the first requirement for such a rating.

It is my opinion that the code should be consistent. I have submitted another change that adds the "T rating" for all horizontal penetrations. Either all horizontal penetrations or no horizontal penetrations should be required to have a "T rating." The code cannot be inconsistent.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BALLANCO-FS2-713.3.2.doc

FS72–09/10
713.2 (New)

Proponent: William E. Koffel, Koffel Associates, Inc, representing Firestop Contractors International Association

Add new text as follows:

713.2 Contractor Qualifications. In buildings having occupied floors located more than 75 feet (22860 mm) above the lowest level of fire department vehicle access, through-penetration firestop systems shall be installed by contractors that are approved or qualified for such installations under programs administered by approved agencies, such as FM Approvals or Underwriters Laboratories.

(Renumber subsequent sections)

Reason: Proper Design, Installation, Inspection and Maintenance of Firestop Systems is critical to fire and life safety in buildings because firestopping is used in everything from egress corridors to separation of spaces. Firestopping is a highly technical industry, requiring specialized knowledge at the firestop contracting firm in the office and field to analyze conditions on construction documents and / or on-site, select the appropriate firestop system(s) from UL, FM, Intertek and other directories, then match the systems to penetrating items and annular spaces as they exist in the field, with no variances from the systems allowed. If the system is not installed to the parameters in the design, the 'system' may or may not work when called upon by fire. This code change proposal addresses installation of through penetration and membrane firestop systems to zero-tolerance parameters of the classified and listed firestop design. The concept has been proposed in the past and some felt the scope was too broad. Therefore, the scope of the proposed requirement has been limited to high-rise buildings.

There are approval or qualification programs administered by approved agencies such as FM Approvals and Underwriters Laboratories for contractors who install materials that become firestop systems. Any contractor (trade or specialty firestop contractor) installing firestop systems can be approved or qualified to the programs administered by these agencies. The programs are similar to ISO 9000 that is used for the manufacturing environment, but adjusted for the construction environment. Successful completion means that the company has policies and procedures in place sufficient to control operations resulting in installations conforming to the listed firestop system.

Any firm is eligible to obtain FM Approval and or UL Qualification. With costs ranging from $6000 to $10000 for the initial audit and about $3000 annually for ongoing audits by UL & FM, the cost is less than many contractors would spend on advertising in the "Blue Book" or in entertainment. Experience shows that the cost can be recovered through the benefits of improved processes and reduced errors on firestopping projects.

Firestopping by a contractor firm who has been approved or qualified means that the firm has the processes in place in the company culture to handle the zero tolerance installation program needed for firestop systems for fire and life safety. The audits by FM & UL test the company's ability to install fire and life safety through penetration firestop systems to these requirements, through extensive review of the company procedures.

Below is a summary of what it takes for a contractor company to become FM 4991 Approved and / or UL Qualified:

-Designated Responsible Individual (DRI) – Each firm employs a DRI who has passed an industry exam based on the Firestop Contractors International Association's Firestop Industry Manual of Practice, FM Standard FM 4991, Standard for the Approval of Firestop Contractors, and - or the UL Qualified Firestop Contractor Program requirements, as well as selection of firestop systems from directories matched to field conditions.

-Quality Audits – FM & UL then audit the firestop processes of the company:

--Initial Audit - The process to install firestopping is very technical, and needs attention to detail. The specialty firestop contractor firm or trade contractor firm has their company quality manual audited and approved or qualified by an auditor from either FM Approvals or Underwriters Laboratories to be recognized by the approved agency as a 'certified contractor'. This is a very robust, truly independent inspection of the contractors' firestop systems selection, submittal, and installation and inspection processes by FM & UL Auditors. Auditors also visit a project site to verify that the procedures are actually in place throughout the company. Audits of the company include every discipline from training of employees, systems selection and communications to – from the field.

--Annual Audit – FM and or UL visit the firm to review the company's procedures annually to verify continued compliance to the FM 4991 Standard or UL Qualified Firestop Contractor Program. These visits are key to continued success of the firm's quality management system.

Firestopping is a vital part of effective compartmentation. When installation is not performed correctly, it can cause delays of certificate of occupancy, reducing building owners' revenue streams and create a fire and life safety risk. FM Approved and UL Qualified Firestop Contractors can lower the risk of non compliant firestopping through a company culture that has embraced the quality management system approach through their company culture.

Firestopping installation is a process that is knowledge sensitive, and requires a company (not just a worker) that has the quality management systems culture ingrained in it's operations and, more importantly, it's people. Plus, the production of the quality assurance manual at the company helps them gather important insight into company operations through self assessment followed up by a full audit by a credible, independent organization, FM & UL

There are many contractor firms who have been approved or qualified, that cover most of the US, Dubai, with many more in process of becoming approved or qualified throughout the world. Since firestopping is lightweight, and knowledge travels, so too can FM Approved and UL Qualified Firestop Contractor Firms travel to serve local needs competitively, throughout North America. Contractors have even exported the process know how to the Middle East including the United Arab Emirates, and beyond. For more information, visit http://www.fcia.org to view Specialty Firestop Contractor Firms who have become FM 4991 Approved or UL Qualified, and see the approval and qualification documents to understand how the contractor company can get involved in the programs.

Cost Impact: The code change proposal will not increase the costs of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KOFFELL-FS5-713.2 NEW

FS73–09/10
713.2 (New)

Proponent: William E. Koffel, Koffel Associates, Inc, representing Firestop Contractors International Association

Add new text as follows:

713.2 Contractor Qualifications. In buildings assigned an Occupancy Category of III or IV in accordance with Table 1604.5,, through-penetration firestop systems shall be installed by contractors that are approved or qualified for such installations under programs administered by approved agencies, such as FM Approvals or Underwriters Laboratories.

(Renumber subsequent sections)

Reason: Proper Design, Installation, Inspection and Maintenance of Firestop Systems is critical to fire and life safety in buildings because firestopping is used in everything from egress corridors to separation of spaces. Firestopping is a highly technical industry, requiring specialized knowledge at the firestop contracting firm in the office and field to analyze conditions on construction documents and / or on-site, select the

appropriate firestop system(s) from UL, FM, Intertek and other directories, then match the systems to penetrating items and annular spaces as they exist in the field, with no variances from the systems allowed. If the system is not installed to the parameters in the design, the 'system' may or may not work when called upon by fire. This code change proposal addresses installation of through penetration and membrane firestop systems to zero-tolerance parameters of the classified and listed firestop design. The concept has been proposed in the past and some felt the scope was too broad. Therefore, the scope of the proposed requirement has been limited to those buildings that represent a substantial hazard to human life in the event of a system failure or that are considered to be essential facilities in accordance with Table 1604.5.

There are approval or qualification programs administered by approved agencies such as FM Approvals and Underwriters Laboratories for contractors who install materials that become firestop systems. Any contractor (trade or specialty firestop contractor) installing firestop systems can be approved or qualified to the programs administered by these agencies. The programs are similar to ISO 9000 that is used for the manufacturing environment, but adjusted for the construction environment. Successful completion means that the company has policies and procedures in place sufficient to control operations resulting in installations conforming to the listed firestop system.

Any firm is eligible to obtain FM Approval and or UL Qualification. With costs ranging from $6000 to $10000 for the initial audit and about $3000 annually for ongoing audits by UL & FM, the cost is less than many contractors would spend on advertising in the "Blue Book" or in entertainment. Experience shows that the cost can be recovered through the benefits of improved processes and reduced errors on firestopping projects.

Firestopping by a contractor firm who has been approved or qualified means that the firm has the processes in place in the company culture to handle the zero tolerance installation program needed for firestop systems for fire and life safety. The audits by FM & UL test the company's ability to install fire and life safety through penetration firestop systems to these requirements, through extensive review of the company procedures.

Below is a summary of what it takes for a contractor company to become FM 4991 Approved and / or UL Qualified:

-Designated Responsible Individual (DRI) – Each firm employs a DRI who has passed an industry exam based on the Firestop Contractors International Association's Firestop Industry Manual of Practice, FM Standard FM 4991, Standard for the Approval of Firestop Contractors, and - or the UL Qualified Firestop Contractor Program requirements, as well as selection of firestop systems from directories matched to field conditions.

-Quality Audits – FM & UL then audit the firestop processes of the company:

--Initial Audit - The process to install firestopping is very technical, and needs attention to detail. The specialty firestop contractor firm or trade contractor firm has their company quality manual audited and approved or qualified by an auditor from either FM Approvals or Underwriters Laboratories to be recognized by the approved agency as a 'certified contractor'. This is a very robust, truly independent inspection of the contractors' firestop systems selection, submittal, and installation and inspection processes by FM & UL Auditors. Auditors also visit a project site to verify that the procedures are actually in place throughout the company. Audits of the company include every discipline from training of employees, systems selection and communications to – from the field.

--Annual Audit – FM and or UL visit the firm to review the company's procedures annually to verify continued compliance to the FM 4991 Standard or UL Qualified Firestop Contractor Program. These visits are key to continued success of the firm's quality management system.

Firestopping is a vital part of effective compartmentation. When installation is not performed correctly, it can cause delays of certificate of occupancy, reducing building owners' revenue streams and create a fire and life safety risk. FM Approved and UL Qualified Firestop Contractors can lower the risk of non compliant firestopping through a company culture that has embraced the quality management system approach through their company culture.

Firestopping installation is a process that is knowledge sensitive, and requires a company (not just a worker) that has the quality management systems culture ingrained in it's operations and, more importantly, it's people. Plus, the production of the quality assurance manual at the company helps them gather important insight into company operations through self assessment followed up by a full audit by a credible, independent organization, FM & UL

There are many contractor firms who have been approved or qualified, that cover most of the US, Dubai, with many more in process of becoming approved or qualified throughout the world. Since firestopping is lightweight, and knowledge travels, so too can FM Approved and UL Qualified Firestop Contractor Firms travel to serve local needs competitively, throughout North America. Contractors have even exported the process know how to the Middle East including the United Arab Emirates, and beyond. For more information, visit http://www.fcia.org to view Specialty Firestop Contractor Firms who have become FM 4991 Approved or UL Qualified, and see the approval and qualification documents to understand how the contractor company can get involved in the programs.

Cost Impact: The code change proposal will not increase the costs of construction.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KOFFELL-FS6-713.2 NEW

FS74–09/10
713.2.1 (New)

Proponent: William E. Koffel, Koffel Associates, Inc, representing Firestop Contractors International Association

Add new text as follows:

713.2 Installation details. Where sleeves are used, they shall be securely fastened to the assembly penetrated. The space between the item contained in the sleeve and the sleeve itself and any space between the sleeve and the assembly penetrated shall be protected in accordance with this section. Insulation and coverings on or in the penetrating item shall not penetrate the assembly unless the specific material used has been tested as part of the assembly in accordance with this section.

713.2.1 Alternative Methods. Where the configuration of a penetrating item or group of items is such that listed penetration firestop system tested in accordance with ASTM E 814 or UL 1479 is determined to be non-existent and reconfiguration of the penetrations or fire resistance rated assembly is determined to be impractical or impossible, alternative methods for maintaining the integrity of the required fire–resistance rating of the assembly shall be permitted to be established by any of the following methods or procedures.

1. Designs documented in approved sources but not in public directories.
2. Calculations performed in an approved manner.
3. Engineering analysis based on a comparison of approved penetration firestop systems tested in accordance with ASTM E 814 or UL 1479 that extrapolate specific similar features from these systems and combine them to formulate an equivalent fire resistant rated assembly as specifically designated by the manufacturer's technical representative of the systems specified within the referenced approved penetration firestop system.
4. Alternative protection methods as allowed by Section 104.11

Reason: The purpose of this code change proposal is to clarify a part of the code that is confusing in the field to enforce. Although there are over 8000 classified systems in the Underwriters Laboratories Fire Resistance Directory and thousands more in Intertek, FM Approvals and other laboratories listings, there are still configurations that appear at project sites that have no qualified system listed in a directory. This is when our firestop contracting industry searches for advice from the manufacturers headquarters technical personnel to seek a determination that a combination of systems that closely resembles the situation be suggested for approval from the manufacturer, that is documented by the manufacturer for submittal.

This service is performed by manufacturer's qualified technical personnel who understand the fire performance of these products in systems, and use characteristics found in similar systems to make a determination about suitability for use of the products in the specific application. These suggestions are submitted by firestop manufacturer's technical staff through the contractor for approval. Using knowledge from those who fire test the products frequently and understand their limitations, these manufacturer's technical personnel reference the closest possible tested system(s) to determine an appropriate method that provides a system closest to the field condition.

This code language is needed to set minimum requirements for how these determinations, (also known as Engineering Judgments, or Equivalent Fire Resistance Rated Assemblies) are created, and who at the company should be responsible for writing these determinations of suitability for use in specific applications.

Companies are structured different ways, with many titles for field sales people. Those with the most experience with fire testing products at companies, and the most removed from the sales process seems to be the manufacturer's technical personnel at headquarters locations. This code language is needed to provide the building official transparency in the process when presented engineering judgments from the industry…only if a listed system cannot be found in the directories from any manufacturer…even if it means switching manufacturers for a few applications.

Cost Impact: The code change proposal will not increase the costs of construction.

Analysis: Standards ASTM E814 and UL 1479 are currently referenced in the I-codes.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KOFFELL-FS2-713.2.1 NEW

FS75–09/10
713.4.1.2

Proponent: Tim Pate, City and County of Broomfield, representing the Colorado Chapter ICC Code Change Committee

Revise as follows:

713.4.1.2 Membrane penetrations. Penetrations of membranes that are part of a horizontal assembly shall comply with Sections 713.4.1.1.1 or 713.4.1.1.2. Where floor/ceiling assemblies are required to have a fire resistance rating, recessed fixtures shall be installed such that the required fire resistance will not be reduced.

Exceptions:

(Exceptions 1-5 remain unchanged)

6. The ceiling membrane of 1 and 2 hour fire resistance rated horizontal assemblies is permitted to be interrupted with the double wood top plate of a fire resistance wall assembly provided that all penetrating items through the double top plates are protected in accordance with Section 713.4.1.1.1 or 713.4.1.1.2.

Reason: This code change will add a new exception to section 712.4.1.2 which will allow the ceiling membrane of a 1 or 2 hour fire rated floor/ceiling or roof/ceiling assembly to be interrupted by a double wood top plate of a fire rated wall. All penetrations of the top plates would have to be protected by approved through penetration firestop systems. This would codify the typical construction that we see with Type VA construction where the wood framed walls extend up and attach directly to the underside of wood floor joists/trusses or roof joists/trusses for structural requirements. Non fire rated wall top plates would not be allowed to interrupt the drywall membrane of the floor/ceiling or roof/ceiling.
Section 711.4 would technically require this ceiling membrane to be continuous in these areas but it would be impossible to install this drywall on top of load bearing walls since the drywall would end up being crushed when building is fully loaded. This code change would get the IBC in line with the UL testing criteria and general notes. This code change would allow what we already see on every Type VA building.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PATE-FS1-713.4.1.2

FS76–09/10
713.4.2.3 (New)

Proponent: William E. Koffel, Koffel Associates, Inc, representing Firestop Contractors International Association

1. Revise as follows:

713.4.2 Nonfire-resistance-rated assemblies. Penetrations of nonfire-resistance-rated floor or floor/ceiling assemblies or the ceiling membrane of a nonfire-resistance-rated roof/ceiling assembly shall meet the requirements of Section 708 or shall comply with Section 713.4.2.1 ~~or~~ , 713.4.2.2., or 713.4.2.3.

713.4.2.1 Noncombustible penetrating items. Noncombustible penetrating items that connect not more than three *stories* are permitted, provided that the *annular space* is filled to resist the free passage of flame and the products of combustion with an *approved* noncombustible material or with a fill, void or cavity material that is tested and classified for use in through-penetration firestop systems.

712.4.2.2 Penetrating items. Penetrating items that connect not more than two stories are permitted, provided that the annular space is filled with an approved material to resist the free passage of flame and the products of combustion.

2. Add new text as follows:

713.4.2.3 Unlimited stories. Penetrating items shall be permitted provided the annular space is filled with a fill, void, cavity material, or device that is tested and classified for use in through-penetration firestop systems.

Reason: Currently the Code limits the number of stories connected without a shaft when the floor is not required to have a fire resistance rating. The Code currently permits the use of approved materials. While fill, void, or cavity materials and devices tested for use in through penetration firestop systems would likely be approved materials, the proposed language clearly states that such materials shall be permitted without specific approval. The proposed language will also allow such materials without a height restriction. However, Table 503 limits most buildings with non-rated floor assemblies to heights less than three stories unless an automatic sprinkler system is provided.

A void or cavity material that is tested and classified for use in through penetration firestop systems is an effective method for preventing the passage of fire and toxic gas. Very often this limitation in the code relating to the number of stories of penetrating items is overlooked because the floor is not required to be fire resistant and as a result penetrations are left inadequately protected.

To require a shaft enclosure for what could be a very limited quantify of penetrations of a non-rated floor assembly is excessive when other acceptable means to protect the penetrations are available.

Cost Impact: Much more cost effective methodology.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KOFFELL-FS8-713.4.2 NEW

FS77–09/10
702.1, 713.5

Proponent: Bob Eugene, representing Underwriters Laboratories Inc

1. Add new definition as follows:

702.1 Definitions. The following words and terms shall, for the purposes of this chapter, and as used elsewhere in this code, have the meanings shown herein**.**

L RATING. The air leakage rate of a through-penetration firestop system when tested in accordance with UL 1479, or a fire-resistant joint system when tested in accordance with UL 2079.

2. Revise as follows:

713.5 Penetrations in smoke barriers. Penetrations in *smoke barriers* shall be protected by an approved through-penetration firestop systems installed and tested in accordance with the requirements of UL 1479 for air leakage. The ~~air leakage rate~~ L rating of the ~~penetration assemblies~~ system measured at 0.30 inch (7.47 Pa) of water in both the ambient temperature and elevated temperature tests, shall not exceed:

1. 5.0 cfm per square foot (0.025 $m^3/s\ m^2$) of penetration opening for each *through-penetration firestop system*; or
2. A total cumulative leakage of 50 cfm (0.024 m^3/s) for any 100 square feet (9.3 m^2) of wall area, or floor area.

714.6 Fire-resistant joint systems in smoke barriers. Fire-resistant joint systems in smoke barriers, and joints at the intersection of a horizontal *smoke barrier* and an exterior curtainwall, shall be tested in accordance with the requirements of UL 2079 for air leakage. The ~~air leakage rate~~ L rating of the joint system shall not exceed 5 cfm per lineal foot (0.00775 m^3/s m) of joint at 0.30 inch (7.47 Pa) of water for both the ambient temperature and elevated temperature tests.~~.~~

Reason: This proposal accomplishes three things. First, it introduces a definition for L rating that matches the format used for the definitions of F rating and T rating. L rating is a common industry term, and is referenced in approximately 1500 UL systems. Second, Section 713.5 is being revised to clarify that the through-penetration firestop system includes the leakage rating, not the penetration itself. The proposed wording is similar to that included in Section 713.4.1.1.2. A reference to the L rating is also provided. Similarly Section 714.6 is being revised to indicate the joint system, not the joint itself, must comply with the specified air leakage ratings, and the reference to the L rating is also provided.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-FS4-713.5

FS78–09/10
714 (New)

Proponent: Sarah A. Rice, CBO, representing self

Add new text as follows:

SECTION 714
PENETRATIONS OF HORIZONTAL ASSEMBLIES

714.1 Scope. The provisions of this section shall govern the materials and methods of construction used to protect penetrations of and through horizontal assemblies.

714.2 Installation details. Where sleeves are used, they shall be securely fastened to the assembly penetrated. The space between the item contained in the sleeve and the sleeve itself and any space between the sleeve and the assembly penetrated shall be protected in accordance with this section. Insulation and coverings on or in the penetrating item shall not penetrate the assembly unless the specific material used has been tested as part of the assembly in accordance with this section.

714.3 Dissimilar materials. Noncombustible penetrating items shall not connect to combustible items beyond the point of firestopping unless it can be demonstrated that the fire-resistance integrity of the wall is maintained.

714.4 Fire-resistance-rated horizontal assemblies. Through penetrations of fire-resistance-rated horizontal assemblies shall be protected with a shaft enclosure constructed in accordance with Sections 715 or in accordance with 714.4.1. Membrane penetrations of fire-resistance-rated horizontal assemblies shall be protected in accordance with Section 714.4.2. Penetrations into or through horizontal assemblies that also serve as smoke barriers shall comply with 714.4.3.

Exceptions:

1. Through penetrations by steel, ferrous or copper conduits, pipes, tubes or vents or concrete or masonry items through a single fire-resistancerated floor assembly where the *annular space* is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste when subjected toASTME 119 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the *fire-resistance rating* of the construction penetrated. Penetrating items with a maximum 6-inch (152 mm) nominal diameter shall not be limited to the penetration of a single fire-resistance-rated floor assembly, provided the aggregate area of the openings through the assembly does not exceed 144 square inches (92 900 mm2) in any 100 square feet (9.3 m2) of floor area.

2. Through penetrations in a single concrete floor by steel, ferrous or copper conduits, pipes, tubes or vents with a maximum 6-inch (152 mm) nominal diameter, provided the concrete, grout or mortar is installed the full thickness of the floor or the thickness required to maintain the *fire-resistance rating*. The penetrating items shall not be limited to the penetration of a single concrete floor, provided the area of the opening through each floor does not exceed 144 square inches (92 900 mm2).
3. Through penetrations by *listed* electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and installed in accordance with the instructions included in the listing.
4. A shaft enclosure is not required for openings totally within an individual residential *dwelling unit* and connecting four *stories* or less.
5. A shaft enclosure is not required in a building equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 for an escalator opening or *stairway* that is not a portion of the *means of egress* protected according to Item 5.1 or 5.2.
    5.1. Where the area of the floor opening between *stories* does not exceed twice the horizontal projected area of the escalator or *stairway* and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Groups B and M, this application is limited to openings that do not connect more than four *stories*.
    5.2. Where the opening is protected by *approved* power-operated automatic shutters at every penetrated floor. The shutters shall be of noncombustible construction and have a *fire-resistance rating* of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.3 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release there from.
6. A shaft enclosure is not required for penetrations by pipe, tube, conduit, wire, cable and vents protected in accordance with Section 713.4.
7. A shaft enclosure is not required for penetrations by ducts protected in accordance with Section 716.6. Grease ducts shall be protected in accordance with the *International Mechanical Code*.
8. In other than Group H occupancies, a shaft enclosure is not required for floor openings complying with the provisions for atriums in Section 404.
9. A shaft enclosure is not required for *approved* masonry chimneys where *annular space* is fireblocked at each floor level in accordance with Section 717.2.5.
10. In other than Groups I-2 and I-3, a shaft enclosure is not required for a floor opening or an air transfer opening that complies with the following:
    10.1. Does not connect more than two *stories*.
    10.2. Is not part of the required *means of egress* system.
    10.3. Is not concealed within the construction of a wall or a floor/ceiling assembly.
    10.4. Is not open to a *corridor* in Group I and R occupancies.
    10.5. Is not open to a *corridor* on nonsprinklered floors in any occupancy.
    10.6. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.
    10.7. Is limited to the same smoke compartment.
11. A shaft enclosure is not required for automobile ramps in open and enclosed parking garages constructed in accordance with Sections 406.3 and 406.4, respectively.
12. A shaft enclosure is not required for floor openings between a *mezzanine* and the floor below.
13. A shaft enclosure is not required for joints protected by a *fire-resistant joint system* in accordance with Section 714.
14. A shaft enclosure shall not be required for floor openings created by unenclosed *stairs* or ramps in accordance with Exception 3 or 4 in Section 1016.1.
15. Floor openings protected by floor *fire doors* in accordance with Section 712.8.
16. In Group I-3 occupancies, a shaft enclosure is not required for floor openings in accordance with Section 408.5.
17. A shaft enclosure is not required for elevator hoistways in open or enclosed parking garages that serve only the parking garage.
18. In open or enclosed parking garages a shaft enclosure is not required to enclose mechanical exhaust or supply duct systems when such duct system is contained within and serves only the parking garage.
19. Where permitted by other sections of this code.

714.4.1 Through penetrations. Through penetrations of fire-resistance-rated *horizontal assemblies* shall comply with Section 71.4.1.1 or 714.4.1.2.

713.4.1.1. Installation. *Through penetrations* shall be installed as tested in the *approved* fire-resistance-rated assembly.

713.4.1.1.2 Through-penetration firestop system. *Through penetrations* shall be protected by an *approved through-penetration firestop system* installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch ofwater (2.49 Pa). The system shall have an F rating/T rating of not less than 1 hour but not less than the required rating of the floor penetrated.

Exception: Floor penetrations contained and located within the cavity of a wall above the floor or below the floor do not require a T rating.

714.4.2 Membrane penetrations. Penetrations of membranes that are part of a *horizontal assembly* shall comply with Section 714.4.2.1 or 714.4.2.2. Where floor/ceiling assemblies are required to have a *fire-resistance rating*, recessed fixtures shall be installed such that the required *fire resistance* will not be reduced.

Exceptions:

1. *Membrane penetrations* by steel, ferrous or copper conduits, pipes, tubes or vents, or concrete or masonry items where the *annular space* is protected either in accordance with Section 713.4.1.1 or to prevent the free passage of flame and the products of combustion. The aggregate area of the openings through the membrane shall not exceed 100 square inches (64 500 mm2) in any 100 square feet (9.3 m2) of ceiling area in assemblies tested without penetrations.
2. Ceiling membrane penetrations of maximum 2-hour *horizontal assemblies* by steel electrical boxes that do not exceed 16 square inches (10 323 mm2) in area, provided the aggregate area of such penetrations does not exceed 100 square inches (44 500 mm2) in any 100 square feet (9.29 m2) of ceiling area, and the annular space between the ceiling membrane and the box does not exceed 1/8 inch (3.2 mm).
3. Membrane penetrations by electrical boxes of any size or type, which have been *listed* as part of an opening protective material system for use in *horizontal assemblies* and are installed in accordance with the instructions included in the listing.
4. *Membrane penetrations* by *listed* electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The *annular space* between the ceiling membrane and the box shall not exceed 1/8 inch (3.2 mm) unless *listed* otherwise.
5. The *annular space* created by the penetration of a fire sprinkler, provided it is covered by a metal eschutcheon plate.

713.4.2.1. Installation. Membrane *penetrations* shall be installed as tested in the *approved* fire-resistance-rated assembly.

713.4.2.2 Membrane penetrations protected with through-penetration firestop systems. Membrane *penetrations* shall be protected by an *approved through-penetration firestop system* installed and tested in accordance with ASTM E 814 or UL 1479, with a minimum positive pressure differential of 0.01 inch ofwater (2.49 Pa). The system shall have an F rating/T rating of not less than 1 hour but not less than the required rating of the floor penetrated.

Exception: Floor penetrations contained and located within the cavity of a wall above the floor or below the floor do not require a T rating.

714.4.3 Penetrations in smoke barriers. In addition to the requirements of Section 714.4.1 through 714.4.2, penetrations in *smoke barriers* shall be tested in accordance with the requirements of UL 1479 for air leakage. The air leakage rate of the penetration assemblies measured at 0.30 inch (7.47 Pa) of water in both the ambient temperature and elevated temperature tests, shall not exceed:

1. 5.0 cfm per square foot (0.025m3 / s ¸ m2) of penetration opening for each *through-penetration firestop system*; or
2. A total cumulative leakage of 50 cfm (0.024m3/s) for any 100 square feet (9.3 m2) of wall area, or floor area.

714.5 Nonfire-resistance-rated horizontal assemblies Penetrations of nonfire-resistance-rated floor or floor/ceiling assemblies or the ceiling membrane of a nonfire-resistance rated roof/ceiling assembly shall be protected with a shaft enclosure constructed in accordance with Sections 715, or be protected in accordance with Section 714.5.1 or Section 714.5.2.

Exceptions:

1. A shaft enclosure is not required for openings totally within an individual residential *dwelling unit* and connecting four *stories* or less.
2. A shaft enclosure is not required in a building equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 for an escalator opening or *stairway* that is not a portion of the *means of egress* protected according to Item 5.1 or 5.2.
   2.1. Where the area of the floor opening between *stories* does not exceed twice the horizontal projected area of the escalator or *stairway* and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Groups B and M, this application is limited to openings that do not connect more than four *stories*.
   2.2. Where the opening is protected by *approved* power-operated automatic shutters at every penetrated floor. The shutters shall be of noncombustible construction and have a *fire-resistance rating* of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.3 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release therefrom.
3. A shaft enclosure is not required for penetrations by pipe, tube, conduit, wire, cable and vents protected in accordance with Section 713.4.
4. A shaft enclosure is not required for penetrations by ducts protected in accordance with Section 716.6. Grease ducts shall be protected in accordance with the *International Mechanical Code*.
5. In other than Group H occupancies, a shaft enclosure is not required for floor openings complying with the provisions for atriums in Section 404.
6. A shaft enclosure is not required for *approved* masonry chimneys where *annular space* is fireblocked at each floor level in accordance with Section 717.2.5.
7. In other than Groups I-2 and I-3, a shaft enclosure is not required for a floor opening or an air transfer opening that complies with the following:
   7.1. Does not connect more than two *stories*.
   7.2. Is not part of the required *means of egress* system.
   7.3. Is not concealed within the construction of a wall or a floor/ceiling assembly.
   7.4. Is not open to a *corridor* in Group I and R occupancies.
   7.5. Is not open to a *corridor* on nonsprinklered floors in any occupancy.
   7.6. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.
   7.7. Is limited to the same smoke compartment.
8. A shaft enclosure is not required for automobile ramps in open and enclosed parking garages constructed in accordance with Sections 406.3 and 406.4, respectively.
9. A shaft enclosure is not required for floor openings between a *mezzanine* and the floor below.
10. A shaft enclosure is not required for joints protected by a *fire-resistant joint system* in accordance with Section 714.
11. A shaft enclosure shall not be required for floor openings created by unenclosed *stairs* or ramps in accordance with Exception 3 or 4 in Section 1016.1.
12. Floor openings protected by floor *fire doors* in accordance with Section 712.8.
13. In Group I-3 occupancies, a shaft enclosure is not required for floor openings in accordance with Section 408.5.
14. A shaft enclosure is not required for elevator hoistways in open or enclosed parking garages that serve only the parking garage.
15. In open or enclosed parking garages a shaft enclosure is not required to enclose mechanical exhaust or supply duct systems when such duct system is contained within and serves only the parking garage.
16. Where permitted by other sections of this code.

714.5.1 Noncombustible penetrating items. Noncombustible penetrating items that connect not more than three *stories* are permitted, provided that the *annular space* is filled to resist the free passage of flame and the products of combustion with an *approved* noncombustible material or with a fill, void or cavity material that is tested and classified for use in through-penetration firestop systems.

714.5.2 Penetrating items. Penetrating items that connect not more than two *stories* are permitted, provided that the *annular space* is filled with an *approved* material to resist the free passage of flame and the products of combustion.

(Renumber subsequent sections)

Reason. This code change is one in a series of code changes intended to add clarity to the provisions of Chapter 7. Unless otherwise specifically stated, each code change can be accepted on its own merits. The acceptance of only this code change will result in redundancy in the code at worst. Chapter 7 is currently titled "Fire and Smoke Protection Features" and yet it contains provisions for nonfire- and nonsmoke-resistance rated assemblies. Through a series of code changes, including tone, it is hoped that it becomes clear that Chapter 7 regulates both fire/smoke and nonfire/nonsmoker-resistance rated vertical and horizontal (floors, roofs and walls) assemblies.

This code change introduces a new section - Section 714 Penetrations of Horizontal Assemblies. Currently the regulations for penetrations in horizontal assemblies are contained in a single section in the 2009 IBC – Section 713 Penetrations. It is often difficult to find exactly which penetration provisions apply to which type of assembly in the current Section 713. By extracting the provisions that only apply to horizontal assemblies (floors and roofs) and putting them in their own section, confusion should be minimized. In addition the section is further broken down into regulations for fire-resistance rated horizontal assemblies and nonfire-resistance rated assemblies.

Also it should be noted that the exceptions to protect a "hole' in a floor or roof which are currently found in Section 708.2 have been brought into this new section. This is the parent section and that is where any generic exceptions should occur.

The majority of technical provisions contained in new Section 714 are taken verbatim from current Section 713 (and some from 708.2). The difference is that this section is ONLY intended to contain the regulations for horizontal assemblies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-FS1j-714

FS79–09/10
708.1, 708.2, 708.3, 708.4

Proponent: Sarah A. Rice, CBO, representing self

Revise as follows:

708.1 General. The provisions of this section shall apply to shafts required to protect openings and penetrations through floor/ceiling and roof/ceiling assemblies. ~~Shaft enclosures shall be constructed as *fire barriers* in accordance with Section 707 or *horizontal assemblies* in accordance with Section 712, or both~~.

~~**708.2 Shaft enclosure required.** Openings through a floor/ceiling assembly shall be protected by a shaft enclosure complying with this section.~~

~~**Exceptions:**~~

1. ~~A shaft enclosure is not required for openings totally within an individual residential *dwelling unit* and connecting four *stories* or less.~~
2. ~~A shaft enclosure is not required in a building equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 for an escalator opening or *stairway* that is not a portion of the *means of egress* protected according to Item 2.1 or 2.2.~~
   - 2.1. ~~Where the area of the floor opening between *stories* does not exceed twice the horizontal projected area of the escalator or *stairway* and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Groups B and M, this application is limited to openings that do not connect more than four *stories*.~~
   - 2.2. ~~Where the opening is protected by *approved* power-operated automatic shutters at every penetrated floor. The shutters shall be of noncombustible construction and have a *fire-resistance rating* of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.3 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release therefrom.~~
3. ~~A shaft enclosure is not required for penetrations by pipe, tube, conduit, wire, cable and vents protected in accordance with Section 713.4.~~
4. ~~A shaft enclosure is not required for penetrations by ducts protected in accordance with Section 716.6. Grease ducts shall be protected in accordance with the *International Mechanical Code*.~~
5. ~~In other than Group H occupancies, a shaft enclosure is not required for floor openings complying with the provisions for atriums in Section 404.~~
6. ~~A shaft enclosure is not required for *approved* masonry chimneys where *annular space* is fireblocked at each floor level in accordance with Section 717.2.5.~~

~~7. In other than Groups I-2 and I-3, a shaft enclosure is not required for a floor opening or an air transfer opening that complies with the following:~~
~~7.1. Does not connect more than two *stories*.~~
~~7.2. Is not part of the required *means of egress* system.~~
~~7.3. Is not concealed within the construction of a wall or a floor/ceiling assembly.~~
~~7.4. Is not open to a *corridor* in Group I and R occupancies.~~
~~7.5. Is not open to a *corridor* on nonsprinklered floors in any occupancy.~~
~~7.6. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.~~
~~7.7. Is limited to the same smoke compartment.~~
~~8. A shaft enclosure is not required for automobile ramps in open and enclosed parking garages constructed in accordance with Sections 406.3 and 406.4, respectively.~~
~~9. A shaft enclosure is not required for floor openings between a *mezzanine* and the floor below.~~
~~10. A shaft enclosure is not required for joints protected by a *fire-resistant joint system* in accordance with Section 714.~~
~~11. A shaft enclosure shall not be required for floor openings created by unenclosed *stairs* or ramps in accordance with Exception 3 or 4 in Section 1016.1.~~
~~12. Floor openings protected by floor *fire doors* in accordance with Section 712.8.~~
~~13. In Group I-3 occupancies, a shaft enclosure is not required for floor openings in accordance with Section 408.5.~~
~~14. A shaft enclosure is not required for elevator hoistways in open or enclosed parking garages that serve only the parking garage.~~
~~15. In open or enclosed parking garages a shaft enclosure is not required to enclose mechanical exhaust or supply duct systems when such duct system is contained within and serves only the parking garage.~~
~~16. Where permitted by other sections of this code.~~

708.2 ~~708.3~~ Materials. The shaft enclosure shall be of materials permitted by the building type of construction. [Contents unchanged]

708.3 ~~708.4~~ Fire-resistance rating. Shaft enclosures shall have a *fire-resistance rating* of not less than 2 hours where connecting four *stories* or more, and not less than 1 hour where connecting less than four *stories*. The number of *stories* connected by the shaft enclosure shall include any basements but not any *mezzanines*. Shaft enclosures shall have a *fire-resistance rating* not less than the floor assembly penetrated, but need not exceed 2 hours. Shaft enclosures shall meet the requirements of Section 703.2.1. [Contents unchanged]

(Renumber subsequent sections)

Reason. This code change is one in a series of code changes intended to add clarity to the provisions of Chapter 7. Unless otherwise specifically stated, each code change can be accepted on its own merits.

Chapter 7 is currently titled “Fire and Smoke Protection Features” and yet it contains provisions for nonfire- and nonsmoke-resistance rated assemblies. Through a series of code changes, including this one, it is hoped that it becomes clear that Chapter 7 regulates both fire/smoke and nonfire/nonsmoker-resistance rated vertical and horizontal (floors, roofs and walls) assemblies.

This code change addresses Sections 708 (Shaft Enclosures) and is a companion change to the new Section being proposed for *Penetrations of Horizontal Assemblies*.

Enclosing an opening or penetration in a floor is only one of the ways a designer may choose to protect that “hole.” The 2nd sentence in Section 708.1 is redundant as it is stated again in the section and the exceptions in Section 708.2 are not needed as they have been moved to the parent new section. The scoping provisions for when a shaft is required is now in the new section on Penetrations of Horizontal Assemblies. This section will now only have the provisions for construction of shafts.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-FS1k-708.1

FS80–09/10
714.1

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., representing International Firestop Council

Revise as follows:

714.1 General. Joints installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved fire-resistant joint system designed to resist the passage of fire for a time period not less than the required fire-resistance rating of the wall, floor or roof in or between which it is installed. Fire-resistant joint systems shall be tested in accordance with Section 714.3. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 714.4.

Exception: Fire-resistant joint systems shall not be required for joints in all of the following locations:

1. Floors within a single dwelling unit.
2. Floors where the joint is protected by a shaft enclosure in accordance with Section 708.
3. Floors within atriums where the space adjacent to the atrium is included in the volume of the atrium for smoke control purposes.
4. Floors within malls.
5. Floors and ramps within open and enclosed parking garages or structures constructed in accordance with Sections 406.3 and 406.4, respectively
6. Mezzanine floors.
7. Interior ~~W~~walls that are permitted to have unprotected openings.
8. Roofs where openings are permitted.
9. Control joints not exceeding a maximum width of 0.625 inch (15.9 mm) and tested in accordance with ASTM E 119 or UL 263.

Reason:
Purpose: Although the existing language addresses' "Fire-resistant joint systems shall not be required for joints **in** all of the following locations", as currently written, the existing exception has sometimes been misinterpreted to apply to joints located **between** a rated floor slab and an exterior wall assembly, whether the exterior wall is fire resistance rated or not. This exception needs to clarify that item 7 of this article applies to interior wall.

Justification: The current language creates some conflict with the requirements in 714.4 for Exterior curtain wall/floor intersection. Perimeter fire barrier systems described in 714.4 are a unique item, distinct from conventional fire resistant joints in that they have a separate test methodology that applies to them. The existing exceptions were intended to address interior walls permitted to have unprotected openings. Exterior walls have unique requirements associated with them, and are often permitted to have unprotected openings not as a result of the presence or absence of a fire resistance rating, but because of their location on the exterior of a building. The charging language for the Exception clearly indicates it is addressing fire resistant joint **"in"** these types of assemblies. While the perimeter joints are "**between"** a horizontal and vertical assembly, there has been some confusion that needs clarification.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRIMI-FS5-714.1

FS81–09/10
714.1

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing Metal Building Manufacturers Association

Revise as follows:

714.1 General. Joints installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an *approved fire-resistant joint system* designed to resist the passage of fire for a time period not less than the required *fire-resistance rating* of the wall, floor or roof in or between which it is installed. *Fire-resistant joint systems* shall be tested in accordance with Section 714.3. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 714.4.

Exceptions:

1. *Fire-resistant joint systems* shall not be required for joints in all of the following locations:
   1.1. Floors within a single *dwelling unit*.
   1.2. Floors where the joint is protected by a shaft enclosure in accordance with Section 708.
   1.3. Floors within atriums where the space adjacent to the atrium is included in the volume of the atrium for smoke control purposes.
   1.4. Floors within malls.
   1.5. Floors and ramps within open and enclosed parking garages or structures constructed in accordance with Sections 406.3 and 406.4, respectively.
   1.6. *Mezzanine* floors.
   1.7. Walls that are permitted to have unprotected openings.
   1.8. Roofs where openings are permitted.
   1.9. Control joints not exceeding a maximum width of 0.625 inch (15.9 mm) and tested in accordance with ASTM E 119 or UL 263.
2. The voids created at the intersection of a fire-resistance-rated wall assembly and a non-fire-resistance-rated roof assembly shall be filled, but are not required to comply with the requirements of this section. The material or system used to fill the void shall be securely installed in or on the intersection for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to retard the passage of fire and hot gases.

Reason: The IBC defines joints as being an opening that occurs between two fire-resistance rated assemblies. However, in many instances there are openings/void spaces that occur between a fire-resistance rated assembly and a non-fire resistance rated assembly. One very common type of this situation occurs when a fire-resistance rated wall assembly terminates at the underside of a non-fire-resistance rated roof assembly in a low-rise metal building. This code change proposal has been submitted so as to clarify the requirements for these types of situations.

The Metal Building Manufacturers Association requested a formal interpretation on this matter. Interpretation 34-08 dated February 20, 2009 states that Section 713.1 (2006 edition) did not apply to these intersections. Thus, this Code proposal is just adding new language to address the findings of the Code interpretation and therefore enhance the code.

It is understood that this new Exception does not remove the continuity requirements for these types of assemblies as specified in the appropriate Sections of the Code.

Also, the industry has specifically inserted the requirements for installation so as to address the proper installation of the materials and systems used in this application.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEITEL-FS3-714.1.doc

FS82–09/10
714.1, 714.1.1 (New)

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., representing North American Insulation Manufacturers' Association (NAIMA)

Revise as follows:

714.1 General. Joints installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved fire-resistant joint system designed to resist the passage of fire for a time period not less than the required fire-resistance rating of the wall, floor or roof in or between which it is installed. Fire-resistant joint systems shall be tested in accordance with Section 714.3. ~~The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 714.4.~~

Exception: Fire-resistant joint systems shall not be required for joints in all of the following locations:

1. Floors within a single dwelling unit.
2. Floors where the joint is protected by a shaft enclosure in accordance with Section 708.
3. Floors within atriums where the space adjacent to the atrium is included in the volume of the atrium for smoke control purposes.
4. Floors within malls.
5. Floors and ramps within open and enclosed parking garages or structures constructed in accordance with Sections 406.3 and 406.4, respectively

6. Mezzanine floors.
7. Walls that are permitted to have unprotected openings.
8. Roofs where openings are permitted.
9. Control joints not exceeding a maximum width of 0.625 inch (15.9 mm) and tested in accordance with ASTM E 119 or UL 263

714.1.1 Curtain wall assembly. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 714.4.

714.4 Exterior curtain wall/floor intersection. Where fire resistance-rated floor or floor/ceiling assemblies are required, voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies shall be sealed with an *approved* system to prevent the interior spread of fire. Such systems shall be securely installed and tested in accordance with ASTM E 2307 to prevent the passage of flame for the time period at least equal to the *fire-resistance rating* of the floor assembly and prevent the passage of heat and hot gases sufficient to ignite cotton waste. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 705.8.5.

714.4.1 Exterior curtain wall/nonfire-resistance-rated floor assembly intersections. Voids created at the intersection of exterior curtain wall assemblies and nonfire-resistance- rated floor or floor/ceiling assemblies shall be sealed with an *approved* material or system to retard the interior spread of fire and hot gases between *stories*.

Reason: Although the existing language addresses' "Fire-resistant joint systems shall not be required for joints in all of the following locations", as currently written, the existing exception has sometimes been misinterpreted to apply to joints located **between** a rated floor slab and an exterior wall assembly, whether the exterior wall is fire resistance rated or not. This exception needs to clarify that item 7 of this article applies to interior wall.

The current language creates some conflict with the requirements in 714.4 for Exterior curtain wall/floor intersection. Perimeter fire barrier systems described in 714.4 are a unique item, distinct from conventional fire resistant joints in that they have a separate test methodology that applies to them. The existing exceptions were intended to address interior walls permitted to have unprotected openings. Exterior walls have unique requirements associated with them, and are often permitted to have unprotected openings not as a result of the presence or absence of a fire resistance rating, but because of their location on the exterior of a building. The charging language for the Exception clearly indicates it is addressing fire resistant joint "in" these types of assemblies. While the perimeter joints are "between" a horizontal and vertical assembly, there has been some confusion that needs clarification.

Cost Impact: The proposal does not increase the cost of construction beyond that intended by the Code.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRIMI-FS7-714.1

FS83–09/10
714.1.1 (New)

Proponent: William E. Koffel, Koffel Associates, Inc, representing Firestop Contractors International Association

Add new text as follows:

714.1 General. Joints installed in or between fire-resistance- rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an *approved fire-resistant joint system* designed to resist the passage of fire for a time period not less than the required *fire-resistance rating* of the wall, floor or roof in or between which it is installed. *Fire-resistant joint systems* shall be tested in accordance with Section 714.3. The void created at the intersection of a floor/ceiling assembly and an exterior curtain wall assembly shall be protected in accordance with Section 714.4.

Exception: *Fire-resistant joint systems* shall not be required for joints in all of the following locations:

1. Floors within a single *dwelling unit*.
2. Floors where the joint is protected by a shaft enclosure in accordance with Section 708.
3. Floors within atriums where the space adjacent to the atrium is included in the volume of the atrium for smoke control purposes.
4. Floors within malls.
5. Floors and ramps within open and enclosed parking garages or structures constructed in accordance with Sections 406.3 and 406.4, respectively.
6. *Mezzanine* floors.
7. Walls that are permitted to have unprotected openings.
8. Roofs where openings are permitted.

9. Control joints not exceeding a maximum width of 0.625 inch (15.9 mm) and tested in accordance with ASTM E 119 or UL 263.

714.1.1 Alternative Methods. Where the configuration of a joint is such that a listed joint firestop system or perimeter fire containment system tested in accordance with ASTM E 1966 or UL 2079 or ASTM E 2307, is determined to be non-existent alternative methods for maintaining the integrity of the required fire–resistance rating of the assembly shall be permitted to be established by any of the following methods or procedures.

1. Designs documented in approved sources but not in public directories.
2. Calculations performed in an approved manner.
3. Engineering analysis based on a comparison of approved penetration firestop systems tested in accordance with ASTM E 1966 or UL 2079 and or ASTM E 2307 that extrapolate specific similar features from these systems and combine them to formulate an equivalent fire resistant rated assembly as specifically designated by the manufacturer's technical representative of the systems specified within a referenced approved penetration firestop system
4. Alternative protection methods as allowed by Section 104.11

Reason: The purpose of this code change proposal is to clarify a part of the code that is confusing in the field to enforce. Although there are over 8000 classified systems in the Underwriters Laboratories Fire Resistance Directory and thousands more in Intertek, FM Approvals and other laboratories listings, there are still configurations that appear at project sites that have no qualified system listed in a directory. This is when the firestop contracting industry searches for advice from the manufacturer's technical personnel to seek a determination that a combination of systems that closely resembles the situation be suggested for approval based upon documentation from the manufacturer.

This service is performed by manufacturer's qualified technical personnel who understand the fire performance of these products in systems, and use characteristics found in similar systems to make a determination about suitability for use of the products in the specific application. These suggestions are submitted by firestop manufacturer's technical staff through the contractor for approval. Using knowledge from those who fire test the products frequently and understand their limitations, these manufacturers technical personnel reference the closest possible tested system(s) to determine an appropriate method that provides a system closest to the field condition.

This code language is needed to set minimum requirements for how these determinations, (also known as Engineering Judgments, or Equivalent Fire Resistance Rated Assemblies) are created, and who at the company should be responsible for writing these determinations of suitability for use in specific applications.

Companies are structured different ways, with many titles for field sales people. Those with the most experience with fire testing products at companies, and the most removed from the sales process seem to be the manufacturers technical personnel often located at headquarter locations. This code language is needed to provide the building official transparency in the process when presented engineering judgments from the industry…only if a listed system cannot be found in the directories from any manufacturer…even if it means switching manufacturers for a few applications.

Cost Impact: The code change proposal will not increase the costs of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KOFFELL-FS3-714.1.1 NEW

FS84–09/10
714.2 (New)

Proponent: William E. Koffel, Koffel Associates, Inc, representing Firestop Contractors International Association

Revise as follows:

714.2 Installation. Fire-Resistant Joint Systems shall be securely installed in accordance with the listing criteria in or on the joint for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases.

Reason: In 714.2, a very important section on installation, there is no real statement that communicates the objective of joint systems. Joint systems are not systems until they've been installed in accordance with the listed joint system from an approved source such as Underwriter's Laboratories, FM Approvals, Intertek and others. Similar language already exists in the Code fore through penetration firestop systems.

Cost Impact: The code change proposal will not increase the costs of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KOFFELL-FS4-714.2 NEW

FS85–09/10
714.2.1 (New)

Proponent: William E. Koffel, Koffel Associates, Inc., representing Firestop Contractors International Association

Add new text as follows:

714.2 Installation. *Fire-resistant joint systems* shall be securely installed in or on the joint for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases.

714.2.1 Installation details, field installation. In buildings assigned an Occupancy Category of III or IV in accordance with Table 1604.5, fire-resistant joint systems shall be installed by contractors that are approved or qualified for such installations under programs administered by approved agencies, such as FM Approvals or Underwriters Laboratories.

Reason: Proper Design, Installation, Inspection and Maintenance of Joint Systems is critical to fire and life safety in building. This is a highly technical industry, requiring specialized knowledge at the firestop contracting firm in the office and field to analyze conditions on construction documents and / or on-site, select the appropriate firestop system(s) from UL, FM, Intertek and other directories, then match the systems to penetrating items and annular spaces as they exist in the field, with no variances from the systems allowed. If the system is not installed to the parameters in the design, the 'system' may or may not work when called upon by fire. This code change proposal addresses installation of joint systems to zero-tolerance parameters of the classified and listed design. And, *fire-resistant joint systems* are very complicated systems, where the contractor firm installing must have special qualifications to accomplish the goal of limiting fire and smoke spread from the compartment of origin. The concept has been proposed in the past and some felt the scope was too broad. Therefore, the scope of the proposed requirement has been limited to those buildings that represent a substantial hazard to human life in the event of a system failure or that are considered to be essential facilities in accordance with Table 1604.5.

There are approval or qualification programs administered by approved agencies such as FM Approvals and Underwriters Laboratories for contractors who install materials that become firestop systems. Any contractor (trade or specialty firestop contractor) installing firestop systems can be approved or qualified to the programs administered by these agencies. The programs are similar to ISO 9000 that is used for the manufacturing environment, but adjusted for the construction environment. Successful completion means that the company has policies and procedures in place sufficient to control operations resulting in installations conforming to the listed firestop system.

Any firm is eligible to obtain FM Approval and or UL Qualification. With costs ranging from $6000 to $10000 for the initial audit and about $3000 annually for ongoing audits by UL & FM, the cost is less than many contractors would spend on advertising in the "Blue Book" or in entertainment. Experience shows that the cost can be recovered through the benefits of improved processes and reduced errors on firestopping projects.

Firestopping by a contractor firm who has been approved or qualified means that the firm has the processes in place in the company culture to handle the zero tolerance installation program needed for firestop systems for fire and life safety. The audits by FM & UL test the company's ability to install fire and life safety through penetration firestop systems to these requirements, through extensive review of the company procedures.

Below is a summary of what it takes for a contractor company to become FM 4991 Approved and / or UL Qualified:

-Designated Responsible Individual (DRI) – Each firm employs a DRI who has passed an industry exam based on the Firestop Contractors International Association's Firestop Industry Manual of Practice, FM Standard FM 4991, Standard for the Approval of Firestop Contractors, and - or the UL Qualified Firestop Contractor Program requirements, as well as selection of firestop systems from directories matched to field conditions.

-Quality Audits – FM & UL then audit the firestop processes of the company:

--Initial Audit - The process to install firestopping is very technical, and needs attention to detail. The specialty firestop contractor firm or trade contractor firm has their company quality manual audited and approved or qualified by an auditor from either FM Approvals or Underwriters Laboratories to be recognized by the approved agency as a 'certified contractor'. This is a very robust, truly independent inspection of the contractors' firestop systems selection, submittal, and installation and inspection processes by FM & UL Auditors. Auditors also visit a project site to verify that the procedures are actually in place throughout the company. Audits of the company include every discipline from training of employees, systems selection and communications to – from the field.

--Annual Audit – FM and or UL visit the firm to review the company's procedures annually to verify continued compliance to the FM 4991 Standard or UL Qualified Firestop Contractor Program. These visits are key to continued success of the firm's quality management system.

Firestopping is a vital part of effective compartmentation. When installation is not performed correctly, it can cause delays of certificate of occupancy, reducing building owners' revenue streams and create a fire and life safety risk. FM Approved and UL Qualified Firestop Contractors can lower the risk of non compliant firestopping through a company culture that has embraced the quality management system approach through their company culture.

Firestopping installation is a process that is knowledge sensitive, and requires a company (not just a worker) that has the quality management systems culture ingrained in it's operations and, more importantly, it's people. Plus, the production of the quality assurance manual at the company helps them gather important insight into company operations through self assessment followed up by a full audit by a credible, independent organization, FM & UL

There are many contractor firms who have been approved or qualified, that cover most of the US, Dubai, with many more in process of becoming approved or qualified throughout the world. Since firestopping is lightweight, and knowledge travels, so too can FM Approved and UL Qualified Firestop Contractor Firms travel to serve local needs competitively, throughout North America. Contractors have even exported the process know how to the Middle East including the United Arab Emirates, and beyond. For more information, visit http://www.fcia.org to view Specialty Firestop Contractor Firms who have become FM 4991 Approved or UL Qualified, and see the approval and qualification documents to understand how the contractor company can get involved in the programs.

Cost Impact: There is no cost impact to this code change proposal. Approved or qualified firms assign the correct value to firestopping systems installed to the listed system.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KOFFELL-FS7-714.1

FS86–09/10
714.2.1 (New)

Proponent: William E. Koffel, Koffel Associates, Inc., representing Firestop Contractors International Association

Add new text as follows:

714.2 Installation. *Fire-resistant joint systems* shall be securely installed in or on the joint for its entire length so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases.

714.2.1 Installation details, field installation. In buildings having occupied floors located more than 75 feet (22860 mm) above the lowest level of fire department vehicle access, fire-resistant joint systems shall be installed by contractors that are approved or qualified for such installations under programs administered by approved agencies, such as FM Approvals or Underwriters Laboratories.

Reason: Proper Design, Installation, Inspection and Maintenance of Joint Systems is critical to fire and life safety in building. This is a highly technical industry, requiring specialized knowledge at the firestop contracting firm in the office and field to analyze conditions on construction documents and / or on-site, select the appropriate firestop system(s) from UL, FM, Intertek and other directories, then match the systems to penetrating items and annular spaces as they exist in the field, with no variances from the systems allowed. If the system is not installed to the parameters in the design, the 'system' may or may not work when called upon by fire. This code change proposal addresses installation of joint systems to zero-tolerance parameters of the classified and listed design. And, *fire-resistant joint systems* are very complicated systems, where the contractor firm installing must have special qualifications to accomplish the goal of limiting fire and smoke spread from the compartment of origin. The concept has been proposed in the past and some felt the scope was too broad. Therefore, the scope of the proposed requirement has been limited to high-rise buildings.

There are approval or qualification programs administered by approved agencies such as FM Approvals and Underwriters Laboratories for contractors who install materials that become firestop systems. Any contractor (trade or specialty firestop contractor) installing firestop systems can be approved or qualified to the programs administered by these agencies. The programs are similar to ISO 9000 that is used for the manufacturing environment, but adjusted for the construction environment. Successful completion means that the company has policies and procedures in place sufficient to control operations resulting in installations conforming to the listed firestop system.

Any firm is eligible to obtain FM Approval and or UL Qualification. With costs ranging from $6000 to $10000 for the initial audit and about $3000 annually for ongoing audits by UL & FM, the cost is less than many contractors would spend on advertising in the "Blue Book" or in entertainment. Experience shows that the cost can be recovered through the benefits of improved processes and reduced errors on firestopping projects.

Firestopping by a contractor firm who has been approved or qualified means that the firm has the processes in place in the company culture to handle the zero tolerance installation program needed for firestop systems for fire and life safety. The audits by FM & UL test the company's ability to install fire and life safety through penetration firestop systems to these requirements, through extensive review of the company procedures.

Below is a summary of what it takes for a contractor company to become FM 4991 Approved and / or UL Qualified:

-Designated Responsible Individual (DRI) – Each firm employs a DRI who has passed an industry exam based on the Firestop Contractors International Association's Firestop Industry Manual of Practice, FM Standard FM 4991, Standard for the Approval of Firestop Contractors, and - or the UL Qualified Firestop Contractor Program requirements, as well as selection of firestop systems from directories matched to field conditions.

-Quality Audits – FM & UL then audit the firestop processes of the company:

--Initial Audit - The process to install firestopping is very technical, and needs attention to detail.The specialty firestop contractor firm or trade contractor firm has their company quality manual audited and approved or qualified by an auditor from either FM Approvals or Underwriters Laboratories to be recognized by the approved agency as a 'certified contractor'. This is a very robust, truly independent inspection of the contractors' firestop systems selection, submittal, and installation and inspection processes by FM & UL Auditors. Auditors also visit a project site to verify that the procedures are actually in place throughout the company. Audits of the company include every discipline from training of employees, systems selection and communications to – from the field.

--Annual Audit – FM and or UL visit the firm to review the company's procedures annually to verify continued compliance to the FM 4991 Standard or UL Qualified Firestop Contractor Program These visits are key to continued success of the firm's quality management system.

Firestopping is a vital part of effective compartmentation. When installation is not performed correctly, it can cause delays of certificate of occupancy, reducing building owners' revenue streams and create a fire and life safety risk. FM Approved and UL Qualified Firestop Contractors can lower the risk of non compliant firestopping through a company culture that has embraced the quality management system approach through their company culture.

Firestopping installation is a process that is knowledge sensitive, and requires a company (not just a worker) that has the quality management systems culture ingrained in it's operations and, more importantly, it's people. Plus, the production of the quality assurance manual at the company helps them gather important insight into company operations through self assessment followed up by a full audit by a credible, independent organization, FM & UL

There are many contractor firms who have been approved or qualified, that cover most of the US, Dubai, with many more in process of becoming approved or qualified throughout the world. Since firestopping is lightweight, and knowledge travels, so too can FM Approved and UL Qualified Firestop Contractor Firms travel to serve local needs competitively, throughout North America. Contractors have even exported the process know how to the Middle East including the United Arab Emirates, and beyond. For more information, visit http://www.fcia.org to view Specialty Firestop Contractor Firms who have become FM 4991 Approved or UL Qualified, and see the approval and qualification documents to understand how the contractor company can get involved in the programs.

Cost Impact: There is no cost impact to this code change proposal. Approved or qualified firms assign the correct value to firestopping systems installed to the listed system.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KOFFELL-FS9-714.1

FS87–09/10
714.4

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing self

Revise as follows:

714.4 Exterior curtain wall/floor intersection. Where fire resistance-rated floor or floor/ceiling assemblies are required, voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies shall be sealed with an *approved* system to prevent the interior spread of fire. Such systems shall be securely installed and tested in accordance with ASTM E 2307 to provide an F rating ~~prevent the passage of flame~~ for ~~the~~ a time period at least equal to the *fire-resistance rating* of the floor assembly ~~and prevent the passage of heat and hot gases sufficient to ignite cotton waste~~. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 705.8.5.

Reason: This Code change provides a better clarification of the requirements for the materials. The "F" rating as determined in ASTM E 2307 evaluates the material or assembly for passage of flame and passage of heat and hot gases sufficient to ignite cotton waste.
This change just clarifies that the requirements are only for an "F" rating and a "T" rating is not required.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEITEL-FS2-714.4.doc

FS88–09/10
714.4

Proponent: James P. Stahl Jr., representing Specified Technologies, Inc.

Revise as follows:

714.4 Exterior curtain wall/floor intersection. Where fire resistance-rated floor or floor/ceiling assemblies are required, voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies shall be sealed with an *approved* system to prevent the interior spread of fire. Such systems shall be securely installed and tested in accordance with ASTME 2307 to prevent the passage of flame for the time period at least equal to the *fire-resistance rating* of the floor assembly and prevent the passage of heat and hot gases sufficient to ignite cotton waste. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 705.8.5.

> **Exception**: Voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies where the vision glass extends down to the finished floor level shall be permitted to be sealed with an approved material to prevent the interior spread of fire. Such material shall be securely installed and cable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) for the time period at least equal to the fire-resistance rating of the floor assembly.

Reason: The purpose of the proposed change is to reinstate the allowance for testing at least some curtain wall assemblies, specifically those which incorporate full height vision glass, based on fire exposure to an ASTM E119 time-temperature curve.

Justification: The proposed language in the exception existed in the Code until the 2009 edition of the IBC. While ASTM E2307 was specifically developed to test perimeter fire barrier systems, there is a problem for certain types of assemblies in terms of being able to meet the new performance criteria. The proposed exception would permit the continued use of full height vision glass curtain wall assemblies based on compliance with the traditional ASTM E119 testing.

Cost Impact: This code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: STAHL-FS1-714.4

FS89–09/10
714.4

Proponent: John Valiulis, representing Hilti, Inc.

Revise as follows:

714.4 Exterior curtain wall/floor intersection. Where fire resistance-rated floor or floor/ceiling assemblies are required, voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies shall be sealed with an *approved* system to prevent the interior spread of fire. Such systems shall be securely installed and tested in accordance with ASTME 2307 to prevent the passage of flame for the time period at least equal to the *fire-resistance rating* of the floor assembly and prevent the passage of heat and hot gases sufficient to ignite cotton waste. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 705.8.5.

Exception: Voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies where the size of the joint between the outer edge of the floor and the nearest interior surface of the curtain wall framing exceeds 11 inches shall be permitted to be sealed with an approved material to prevent the interior spread of fire. Such material shall be securely installed and cable of preventing the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E119 time-temperature fire conditions under a minimum positive pressure differential of 0.01 inch (0.254 mm) of water column (2.5 Pa) for the time period at least equal to the fire-resistance rating of the floor assembly.

Reason: The purpose of the proposed change is to reinstate the allowance for testing at least some curtain wall assemblies using the E119 fire exposure combined with specific test conditions and acceptance criteria, which were contained in previous IBC editions, for curtain walls that incorporate a joint size larger than the E2307 test currently accommodates in North American test labs.

Justification: The proposed allowance to test to E119 using specific test and acceptance conditions existed in the Code until the 2009 edition of the IBC. While ASTM E2307 was specifically developed to test perimeter fire barrier systems, the test method and equipment has some physical limitations which make it impossible to test a curtain wall that would have a joint width exceeding 11 inches, as explained below. Thus, another option is needed for assessing the fire safety of any solution proposed to seal the perimeter gap in those situations. The E119 testing option that was in IBC 2000, 2003 and 2006 can provide that needed assessment.

ASTM E 2307 currently requires that the exterior wall assembly be secured to the test apparatus at each end while completely closing the front face of the test apparatus (except for the simulated window). The floor assembly used is installed into the test apparatus and will butt up against the floor of the observation room. The floor assembly which is used as part of the perimeter fire barrier system is required to be at least 12" wide. With these parameters and current test apparatus construction, joint widths are limited to approximately 11". The test laboratories conducting E2307 testing measure and report joint width as the distance from the outer edge of the floor slab to the inner edge of the wall framing.

Field conditions often exceed this 11" joint width, with curtain walls having joint widths up to 24" being installed in some buildings. These are applications that cannot currently be tested utilizing the test apparatus specified in ASTM E 2307. The maximum perimeter joint width currently listed with a third party testing agency is 10". The proposed exception would permit the continued use of joint widths exceeding 11" based on compliance with the traditional ASTM E119 testing.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: VALIULIS-FS1-714.4

FS90–09/10
714.4, 714.4.1, 714.4.2 (New)

Proponent: Jesse J. Beitel, Rick Thornberry, Hughes Associates, Inc., The Code Consortium, representing Centria, Trespa North America, Inc., Alcan Composites USA, Inc.

Revise as follows:

714.4 Exterior curtain wall/floor intersection<u>s</u>. <u>The intersections of exterior curtain wall assemblies and floor or floor/ceiling assemblies shall be protected against interior fire spread in accordance with Sections 714.4.1 through 714.4.3 as applicable. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 705.8.5.</u>

<u>714.4.1 Fire-resistance-rated exterior curtain wall/fire-resistance-rated floor intersections.</u> Where fire resistance-rated floor or floor/ceiling assemblies are required, ~~voids created at~~ the intersection of ~~the~~ <u>fire-resistance-rated</u> exterior curtain wall assemblies and such floor assemblies shall be sealed with an approved system<u>.</u> ~~to prevent the interior spread of fire.~~ Such systems shall be securely installed and tested in accordance with ASTM E 2307 to ~~prevent the passage of flame~~ <u>provide an "F" rating and a "T" rating for</u> ~~the~~ <u>a</u> time period at least equal to the fire-

resistance rating of the floor assembly. ~~and prevent the passage of heat and hot gases sufficient to ignite cotton waste. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 705.8.5.~~

714.4.2 Nonfire-resistance-rated exterior curtain wall/fire-resistance-rated floor intersections. Voids created at the intersection of nonfire-resistance-rated exterior curtain wall assemblies and fire-resistance-rated floor assemblies shall be sealed with an approved system. Such systems shall be securely installed and tested in accordance with ASTM E2307 to provide an "F" rating when tested with the nonfire-resistance-rated exterior curtain wall assembly. The "F" rating shall be the greater of 30 minutes or the time at which one of the following occurs .

1. The "F" rating is determined in the ASTM E2307 test, or
2. A through-crack, hole or other opening is observed in the exterior exposed face of the curtain wall assembly at a location above the upper surface of the floor assembly during the ASTM E2307 test.

714.4.~~1~~ 3 Exterior curtain wall/nonfire-resistance-rated floor assembly intersections. Voids created at the intersection of exterior curtain wall assemblies and nonfire-resistance-rated floor or floor/ceiling assemblies shall be sealed with an approved material or system to retard the interior spread of fire and hot gases between stories.

Reason: This code change is a revision to Section 714.4. This revision addresses several issues with respect to the existing wording and provides in some cases, new requirements. The proposed reorganization of Section of 714.4 now provides requirements based on the fire-resistance ratings of the types of wall assemblies and floors or floor/ceiling assemblies that intersect. This reorganization greatly simplifies the use of this section of the Code.

One new item is the requirement for the seal when a fire-resistance-rated wall meets a fire-resistance-rated floor or floor/ceiling assembly. In this case, the seal must exhibit an "F" rating and a "T" rating equivalent to the fire-resistance rating of the floor or floor ceiling assembly. This change is appropriate for this application and incorporates the reported results of ASTM E2307 ('F" and "T" ratings) and thus clarifies the requirements.

Another change is the addition of a section to address the intersection of a nonfire-resistance-rated wall assembly and a fire-resistance-rated floor or floor/ceiling assembly. This is a very common type of intersection when curtain walls are used. In this case, the wall assembly does not have a fire-resistance rating and when tested in the ASTM E2307, the wall may not remain intact for the fire-resistance-rating period of the floor or floor/ceiling assembly. This new section recognizes this fact but still requires ASTM E2307 testing with the nonfire-resistance-rated wall assembly and requires a minimum fire-resistance rating for the seal material. The time period of 30 minutes was selected as providing a significant but yet realistic fire performance criteria for this condition.

The current 714.4.1 which addresses the issue of nonfire-resistance-rated floors is unchanged.

This reorganization provides significant clarity to this section of the Code and provides appropriate requirements based on the fire-resistance ratings of the intersecting walls and floors or floor ceiling assemblies.

Cost Impact: This code change will not increase the cost of construction.

Analysis: Code change proposals FS90 and FS91 address fire-resistance rated curtain wall/floor intersection requirements. The committee needs to make its intent clear with respect to these provisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEITEL-FS13-714.4

FS91–09/10

702, 714.4, 714.4.1, 714.4.1.1 (New), 714.4.3 (New)

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing Alcan Composites USA, Inc.

1. Add new text as follows:

702 DEFINITIONS

PERIMETER FIRE BARRIER. The perimeter joint protection installed between the exterior curtain wall assembly and the floor assembly to resist the passage of fire and hot gases between stories within the building at the voids created at the intersection of the exterior curtain wall assembly and the floor assembly.

2. Revise as follows:

714.4 Exterior curtain wall/floor intersection. Exterior curtain wall/floor intersections shall comply with Sections 714.4.1 and 714.4.2 as applicable.

714.4.1 Exterior curtain wall/fire-resistance rated floor assembly intersections. Where fire-resistance-rated floor or floor/ceiling assemblies are required, voids created at the intersection of the exterior curtain wall assemblies and such floor assemblies shall be protected by ~~sealed with~~ an *approved* perimeter fire barrier designed to resist ~~system to prevent~~ the interior spread of fire and hot gases between stories. ~~Such systems~~ The perimeter fire barrier shall be

~~securely installed and~~ tested in accordance with ASTM E 2307 ~~to prevent the passage of flame~~ for the time period at least equal to the *fire-resistance rating* of the floor assembly ~~and prevent the passage of heat and hot gases sufficient to ignite cotton waste. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 705.8.5~~.

714.4.1.1 Installation. The perimeter fire barrier shall be securely installed so as not to dislodge, loosen or otherwise impair its ability to accommodate expected building movements and to resist the passage of fire and hot gases.

714.4.~~1~~2 Exterior curtain wall/nonfire-resistance-rated floor assembly intersections. Voids created at the intersection of exterior curtain wall assemblies and nonfire-resistance-rated floor or floor/ceiling assemblies shall be sealed with an *approved* material or system to retard the interior spread of fire and hot gases between *stories*.

714.4.3 Curtain wall spandrels. Height and fire-resistance requirements for curtain wall spandrels shall comply with Section 705.8.5.

Reason: This section was revised during the last code cycle to eliminate the alternate method of testing which was utilized prior to the development of ASTM E 2307. So now the protection of the voids created at the intersection of exterior curtain wall assemblies and floor assemblies is required to be tested in accordance with ASTM E 2307. We believe it is appropriate to further revise this section to clarify that fact. Therefore, we have deleted some of the unnecessary terminology since that is already covered within the test method itself or within the new definition for "Perimeter Fire Barrier" which we are also including as a part of this code change proposal.

The definition for "Perimeter Fire Barrier" being proposed is similar to that contained in ASTM E 2307 and is the term contained in the title of the standard which is "Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus." So we have incorporated the term "Perimeter Fire Barrier" within this code change to make it very clear what protection the section prescribes based on tests conducted in accordance with ASTM E 2307. Some of the other terminology we have substituted parallels that in Section 714.1 General for fire-resistant joint systems so that they are consistent since Section 714.4 is a subsection of Section 714 Fire-Resistant Joint Systems.

We have also reformatted Section 714.4 and subdivided it into two additional subsections. Subsection 714.4.1 specifically deals with the installation of the perimeter fire barrier where the floor assembly is required to have a fire-resistance rating and utilizes terminology based on Section 714.2 Installation for fire-resistant joint systems for consistency. Subsection 714.4.3 is simply the last sentence of Section 714.4 relocated. Current Subsection 714.4.1 has been renumbered as 714.4.2 to fit into this reformatting. We believe that this will provide for better clarity, interpretation, and enforcement of these provisions for exterior curtain wall/floor intersection protection utilizing perimeter fire barriers.

In summary, no technical changes have been made to this section. It has simply been editorially revised to be consistent with the referenced test method ASTM E 2307 and similar requirements in Section 714 for fire-resistant joint systems of which this Section 714.4 is a subsection.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposals FS90 and FS91 address fire-resistance rated curtain wall/floor intersection requirements. The committee needs to make its intent clear with respect to these provisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THORNBERRY-FS7-714.4.1

FS92–09/10
714.7 (New)

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., representing International Firestop Council

Add new text as follows:

714.7 Dissimilar materials. Joints installed in or between fire-resistance-rated walls or horizontal assemblies consisting of two or more dissimilar assemblies shall be protected by an *approved fire-resistant joint system* complying with Section 714.3.

Reason: There are several instances within the IBC that provide specific guidance on the requirements governing the interaction of dissimilar materials. Specific examples are included in Sections 713, 721 and 1403. There is a need to provide specific requirements for assemblies complying with the both Sections 703 (tested) and Section 721 (calculated) fire resistance ratings.

Purpose: To clarify the application of Section 714 to joints between dissimilar fire-resistance rated wall, floor or ceiling assembly materials used adjacent to one another.

Substantiation: Joint systems are installed in joints, voids, gaps, or other discontinuities between or bounded by two or more fire-resistance rated elements. When these assemblies are tested and listed to ASTM E119 in order to obtain their fire resistance rating, the testing/listing includes the joints that would normally occur within the floor, wall or ceiling, which would bind together and provide continuity between independent units of the same building material, such as the compound and tape joints between gypsum boards, or the mortared joints between concrete masonry units. However, the joint that could occur when that floor, wall or ceiling intersects another assembly of a different material is not anticipated nor accounted for in the E119 test. Preventing fire spread through the joint between such dissimilar materials is in fact the principle reason for testing fire-resistance rated joint systems to ASTM E1996, UL 2079. This code change would help to clarify that it is these joints between dissimilar materials/assemblies that require a joint system tested for each desired combination of materials.

There are numerous systems which have been tested by nationally recognized testing organizations for these applications. Information concerning these details is described in the individual systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CRIMI-FS1-714.7 NEW

FS93–09/10
715.3.1 (New)

Proponent: Lynn Warren Manley, Staff Architect State of Illinois Department of Public Health/Health Care Facilities and Programs, representing self

Add new text as follows:

715.3 Alternative methods for determining fire protection ratings. The application of any of the alternative methods *listed* in this section shall be based on the fire exposure and acceptance criteria specified in NFPA 252, NFPA 257 or UL 9. The required *fire resistance* of an opening protective shall be permitted to be established by any of the following methods or procedures:

1. Designs documented in *approved* sources.
2. Calculations performed in an *approved* manner.
3. Engineering analysis based on a comparison of opening protective designs having *fire protection ratings* as determined by the test procedures set forth in NFPA 252, NFPA 257 or UL 9.
4. Alternative protection methods as allowed by Section 104.11.

715.3.1 Testing. Opening protective shall be considered to comply with or shall be deemed equivalent to the testing requirement's of NFPA 252, NFPA 257 or U L 263 only if it has been tested without use or consideration of a fire suppression system.

Exception:

1. Opening protection used in exterior walls in accordance with 705.8.2
2. Glazlng wall systems or window openings used in atriums as permitted under 404.6

Reason: This change is necessary to clarify the conditions where **ES** Report NERS16 may not be used. NERdl6 was originally approved by the ES Committee under BOCA and was reissued by the ICC ES Committee in Reno in 2007. According to the proponents and with supporting agreement from ES staff members, this glazing system may be used as an equivalent system in any fire barrier, with almost no limitations.

The glazing system **is** tempered glass, it **can** be no higher than **13-0"** and it cannot be used for hazardous areas. However, according to ES Staff and according to the report (NER-516) there are no limitations for its use as a glazing system in any fire barriers, including but not limited to: exit enclosures, shaf4 enclosures, occupancy separations, horizontal exits, etc.

The test that this system passed was a simulated **E** 119 test that was terminated when the sprinkler system activated. No testing was conducted that simulated total or partial failure of the sprinkler system. This system did not pass **E**119, but the ES Committee accepts the test as equivalent.

NER-516 amounts to a sprinkler trade off, eliminating all of the requirements for fire ratings where a sprinkler system is provided and installed as proposed in the ES Report.

The proponent ***of*** the above change suggests that NER-516 is not a demonstration of equivalency but rather a code change that has no€ been considered or voted on by the ICC voting members.

Cost Impact: The cost impact is negligible and not relevant when compared to the loss from fire and loss of **life** if NER-516 becomes widely used without limitations.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: MANLEY-FS1-715.3.1 NEW

FS94–09/10
Table 715.4

Proponent: Clay Aler, PE, representing Koffel Associates

Revise Table as follows:

TABLE 715.4
FIRE DOOR AND FIRE SHUTTER FIRE PROTECTION RATINGS

TYPE OF ASSEMBLY	REQUIRED ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4 3 2 1 1/2	3 3a 1 1/2 1 1/2
Fire barriers having a required fire-resistance rating of 1 hour: Shaft, exit enclosure and exit passageway walls Atrium Other fire barriers	 1 1 1	 1 1/3 b 3/4
Fire partitions: Corridor walls Other fire partitions	 1 0.5 1 0.5	 1/3 b 1/3 b 3/4 1/3
Exterior walls	3 2 1	1 1/2 1 1/2 3/4
Smoke barriers	1	1/3 b

a. Two doors, each with a fire protection rating of 11/2 hours, installed on opposite sides of the same opening in a firewall, shall be deemed equivalent in fire protection rating to one 3-hour fire door.
b. For testing requirements, see Section 715.4.3.

Reason: Atriums have additional fire protection measures in excess of typical 1 hour fire-resistive shaft enclosures (I.e approved materials, automatic sprinkler protection, minimum Class B interior finishes, and smoke control). These additional fire protection features minimize the risk *attire* and smoke spread from the atrium to the remainder of the building. Where incidental use fire barriers are required to be of 1 hour fire-resistance, the presence of sprinkler protection allows a reduction in 1he wall construction to a smoke partition per 508.2.2.1. Where occupancy separations are required to be of 2 hour fire-resistance, the presence of sprinkler protection permits a 1-hour reduction of the fire barrier construction where allowed by Table 508.3.3. Similarly, the fire protection measures required for atriums in 404 provide mitiga1ing justification for a reduction of the opening protective rating associated with an atrium enclosure.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: ALER-FS1-Table 715.4.doc

FS95–09/10
715.4.2.1 (New)

Proponent: John W. Park, John Park consulting, representing Won-Door Corporation.

Add new text as follows:

715.4.2.1 Electronic Controls for Horizontal Sliding Doors. Electronic controls for horizontal sliding doors that include closing and signaling functions shall be listed and tested in accordance with UL 864.

Reason: Self closing or automatic closing devices referenced need to work seamlessly with fire alarm systems, including providing feedback signals to achieve joint control with the fire control center. UL 864, *Standard for Control Units and Accessories for Fire Alarm Systems* is a nationally recognized standard that provides appropriate tests and guidelines to assure compatibility. It further deals with critical functions such as alarm verification, endurance, life safety networks, notification, power supplies, resets, risk of electrical shock, risk of fire, standby power sources, storage batteries, dual power source systems, supervisory signals, and trouble signals. Since the closing device essentially releases the door from its open

to closed position on receipt of a signal from the fire alarm system, they should be evaluated to the 864 standard under the "Releasing Device" category. Holding said closing devices to nationally recognized standards ensures consistency and compatibility for these types of products.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: Test standard UL 864 is currently referenced in the I-codes.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PARK-FS1-715.4.2.1

FS96–09/10
715.4.3.1

Proponent: Bill Ziegert, representing Smoke Guard, Inc.

Revise as follows:

715.4.3.1 Smoke and draft control. *Fire door* assemblies <u>including elevator hoistway doors opening into fire-resistance rated corridors</u> shall also meet the requirements for a smoke and draft control door assembly tested in accordance with UL 1784. The air leakage rate of the door assembly shall not exceed 3.0 cubic feet per minute per square foot (0.01524 $m_3/s \cdot m_2$) of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature and elevated temperature tests. Louvers shall be prohibited. Installation of smoke doors shall be in accordance with NFPA 105.

Reason: Just as it is important that room to corridor doors in fire rated corridors meet not only the fire-resistance rating requirements, but also the requirements for smoke and draft control, it is equally if not more important that the elevator hoistway doors which are fire- resistance rated meet the same smoke leakage requirements when they open into fire resistance rated corridors. Fires on one floor can potentially overcome the corridor doors, filling the corridor with smoke and then enter the elevator shaft where the stack effect would force the smoke out onto non affected floors. If the hoistway doors resist the passage of smoke, occupants on other floors would not be as likely to be exposed to the smoke hazard.

Cost Impact: Moderate cost increase that would apply only to occupancies without elevator lobbies.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ZIEGERT-FS2-715.4.3.1

FS97–09/10
715.4.3.2, TABLE 715.4

Proponent: William F. O'Keeffe, representing SAFTIFirst

1. Revise as follows:

715.4.3.2 Glazing in door assemblies. <u>Where Table 715.4 identifies 1-hour rated corridor walls or 1-hour rated smoke barriers, i</u>~~i~~n a 20-minute fire door assembly, the glazing material in the door itself shall have a minimum fire-protection rating of 20 minutes and shall be exempt from the hose stream test. Glazing material in any other part of the door assembly including transom lites and sidelites, shall be tested <u>for 45-minutes</u> in accordance with NFPA ~~257~~ <u>252</u> or UL ~~9~~ <u>10C</u>, including the hose stream test~~, in accordance with Section 715.5~~.<u>Where Table 715.4 identifies 0.5-hour rated corridor walls or other fire partitions, in a 20-minute fire door assembly, the glazing material in the door vision panel, sidelights and transoms shall have a minimum fire-protection rating of 20 minutes when tested to NFPA 252 or UL 10C, and shall be exempt from the hose stream test.</u>

2. Revise as follows:

TABLE 715.4
FIRE DOOR AND FIRE SHUTTER FIRE PROTECTION RATINGS

TYPE OF ASSEMBLY	REQUIRED ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)
Fire walls and fire barriers having a required fire-resistance rating greater than 1 hour	4 3 2 1 1/2	3 3[a] 1 1/2 1 1/2
Fire barriers having a required fire-resistance rating of 1 hour:		
Shaft, exit enclosure and exit passageway walls	1	1
Other fire barriers	1	3/4
Fire partitions:		
Corridor walls	1 0.5	1/3 [b] 1/3 ~~[b]~~
Other fire partitions	1 0.5	3/4 1/3
Exterior walls	3 2 1	1 1/2 1 1/2 3/4
Smoke barriers	1	1/3 [b]

a. Two doors, each with a fire protection rating of 11/2 hours, installed on opposite sides of the same opening in a firewall, shall be deemed equivalent in fire protection rating to one 3-hour fire door.
b. For testing requirements, see Section 715.4.3.

Reason: This code change provides for testing of a 20-minute door assembly, including the sidelight and transom panels, to NFPA 252 without hose stream, when the assembly is in a half-hour rated corridor or fire partition. Since a half hour wall tested to ASTM E119 is not required to be hose stream tested, there is no fire safety reason to require the door assembly component in that wall to meet a hose stream test.

In past code cycle testimony it has been suggested that there is a reason to treat sidelights and transoms differently than the glazing in the vision panel of the door, because combustibles can be stacked next to a sidelight (of course, that argument doesn't apply to the transom, because it is above the door). It has also been suggested that 20-minute tempered products are subject to "disintegration."

The first point is not a hose stream issue, but a radiant heat issue, and applying a hose stream test to products does not assure that they will block radiant heat from passing through the glazing and spreading the fire. Indeed, as seen by the test data in the supporting fire test video, http://www.safti.com/video/resist/resistive.html, one type of fire protection material, ceramic, transmits enough radiant heat in the first 20-minutes of fire exposure to cause spontaneous combustion. Wired glass, another fire protection product that can pass the hose stream test, likewise transmits dangerous levels of radiant heat during the early stages of a fire.

The second point simply isn't true, and was not substantiated by any test data showing alleged "disintegration." Specialty tempered products have undergone rigorous fire testing, and have proven to be effective fire protection materials by fire case history. Millions of square feet of these products have been used worldwide without any reports of the alleged "disintegration" alleged by opponents to this code change. Significantly, opponents of this code change have never come forward with any reported instances of failure.
The fact is, products not tested to the hose stream protect against fire equally as well as those that are tested.

This change also changes the test standard for sidelights and transoms back to NFPA 252 and UL 10C, which is the standard historically applied to door assemblies that include sidelights and transoms, and is consistent with the test protocol specified in NFPA 80. The application of NFPA 257 under the existing provision has caused confusion and impractical test methods for testing one door assembly to two different test standards.

In 20-minute window applications in half hour walls, there is no legitimate fire safety reason for requiring one element of the fire resistive construction to pass the hose stream test, where the half hour wall assembly and 20-minute door components do not pass that same test.

Cost Impact: The code change proposal will reduce the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: OKEEFFE-FS6-715.4.3.2

FS98–09/10
715.4.3.2, 715.4.3.2.1 (New)

Proponent: William F. O'Keeffe, representing SAFTIFirst

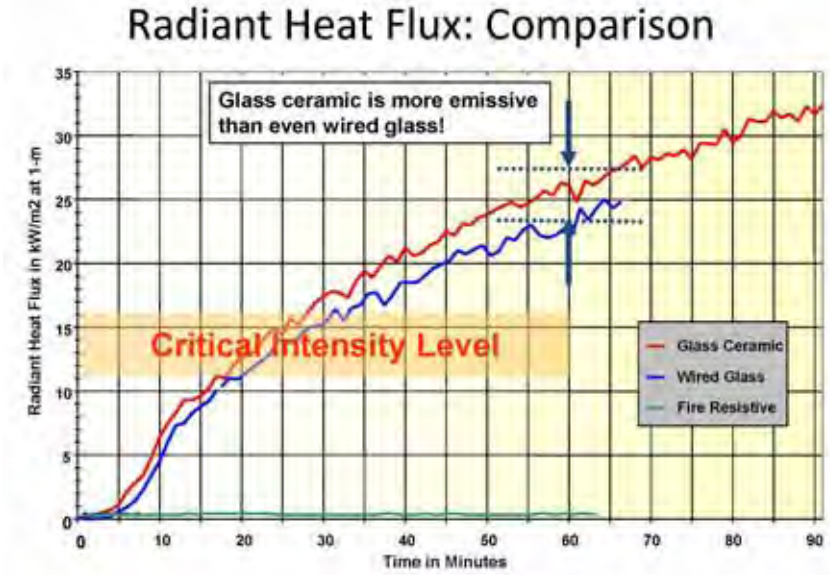
Revise as follows:

715.4.3.2 Glazing in door assemblies. In a 20-minute fire door assembly, the glazing material in the door itself shall have a minimum fire-protection rating of 20 minutes and shall be exempt from the hose stream test. Glazing material in any other part of the door assembly including transom lites and sidelites, shall be tested in accordance with NFPA 252 or UL10C ~~NFPA 257 or UL 9~~, including the hose stream test, in accordance with Section 715.5, subject to the limitations in Section 715.4.3.2.1.

715.4.3.2.1 Fire protection rated glazing in sidelites shall be limited to not more than 24"(610 mm) on either side of the door assembly measured from the edge of the door frame. Fire protection rated glazing in transoms shall be limited to not more than 24" in height and extending no more than 24" (610 mm) on either side of the fire door assembly, measured from the edge of the door frame. Fire resistance rated glazing tested as an assembly to ASTM E119 or UL 263 shall be permitted in excess of these limits where the fire resistance rating is equal to or greater than 1-hour.

Reason: Fire protection rated glazing materials do not protect against radiant heat. The unrestricted use of these materials in exit corridors in the large sizes for which they have been tested and listed threaten the life safety of building occupants attempting to exit past them in a fire.

Fire test data show that at 20 minutes of fire exposure, these materials transmit in excess of 10 kW/m^2, and at 10 minutes of fire exposure, transmit 5 kW/m^2. http://www.safti.com/video/resist/resistive.html See Cumulative Radiant Heat Data Chart, prepared by the test sponsor of the test depicted in the video, below. The Society of Fire Protection Engineers Fire Protection Engineering Handbook identifies a fairly obvious tolerance limit for exposure to radiant heat of 2.5 kW/m^2 due to unbearable pain. (See SFPE Handbook of Fire Protection Engineering, 2nd edition, page 2-114).



Also included as further support of this code change are two test reports from the Coast Guard testing of (1) Ceramic (FireLite) in steel bulkheads (Report No. CG-D-37-95), and (2) wired glass in steel bulkheads (Report No. CG-D-38-95). Temperature rise and radiant heat flux measurements were recorded. The tests were intended to measure radiant heat flux and surface temperature performance at 60 minutes.

The tests can be summarized as follows:

Wired Glass Test

The test of the wired glass panels resulted in glazing failure prior to 60-minutes, so radiant heat and temperature rise were only recorded up to the time of the wired glass failure.

Test 1
Heat flux at end of test (41:24 minutes) - 71 kW/m sq.
Surface temperature - wired glass temperature - 730 degrees C; steel frame - 540 degrees C

Test 2
Heat flux at end of test (37:46 minutes) - 48 kW/m sq.
Surface temperature - wired glass temperature - 730 degrees C; steel frame - 550 degrees C

Test 3
Heat flux at end of test (48:30 minutes) - 57 kW/m sq.
Surface temperature - wired glass temperature - 760 degrees C; steel frame - 585 degrees C

Conclusion on page 8 - As the window panes began to reach their melting point and flow out of the test frame, the recorded heat flux levels showed obvious increases. In all three tests, the recorded heat flux increased approximately 5-7 kW/m sq. until the wire glass fell out of the test frame and the test was terminated.

Ceramic (FireLite) Test
Test 1
Heat flux at end of test (60:00 minutes) - 75 kW/m sq.
Surface temperature - ceramic glass temperature - 800 degrees C; steel frame - 600 degrees C
Test 2
Heat flux at end of test (60:00 minutes) - 69 kW/m sq.
Surface temperature - ceramic glass temperature - 800 degrees C; steel frame - 600 degrees C
Test 3
Heat flux at end of test (60:00 minutes) - 73 kW/m sq.
Surface temperature - ceramic glass temperature - 800 degrees C; steel frame - 600 degrees C

According to these test reports, the surface temperature is significantly higher on the glazing than it is on the steel frame. Also, the report notes that the radiant heat measurements taken that included the "cooler steel frame" were several percentages lower than the view that included just the glazing. (see Ceramic test report (Report No. CG-D-37-95), page 6.)

Limitations on area uses of fire protection glazing products is long overdue. In Europe, code regulators have recognized the need for restricting use of fire protection materials based on radiant heat hazards, particularly their use in egress paths. Reasonable limits protecting life safety are achieved by limiting the area of use in sidelights in exit corridors, permitting building occupants safe egress. This code change at the same time permits use in larger sizes of products that meet fire resistance radiant heat and temperature rise limits of ASTM E119, because those products do not transmit dangerous levels of radiant heat.

As stated in NFPA 80 (200&), Annex I:

"Because the present fire test standard, NFPA 257, does not require measuring and reporting temperature rise on the unexposed face of the glazing material or radiant heat transmission, glazing products tested to this standard have not been required to retard radiant heat transfer. However, these data are required in many European fire test standards. As a result, European building codes place limitations on the use of glazing in fire-resistant partitions inside buildings and require the use of insulating glazing in means of egress as well as where combustibles could be in close proximity. Research by Margaret Law, Bsc, Ministry of Technology and Fire Offices Committee, Joint Fire Research Organization, led to the development of such limitations in British building regulations."

This change also changes the test standard for sidelights and transoms back to NFPA 252 and UL 10C, which is the standard historically applied to door assemblies that include sidelights and transoms, and is consistent with the test protocol specified in NFPA 80. The application of NFPA 257 under the existing provision has caused confusion and impractical test methods for testing one door assembly to two different test standards. The change to NFPA 252 will improve safety in that the acceptance criteria for passing the hose stream test is more stringent under NFPA 252. NFPA 252 does not allow glass loss at the end of the hose stream test, compared to NFPA 257, which allows 30% perimeter loss, and 10% loss out of the center.

Bibliography

1. Test Report, Fire Performance of Three Wired Glazed Window Assemblies, Report No. CG-D-38-95
2. Test Report, Fire Performance Evaluation of Three A-O Glazed Window Assemblies, Report No. CG-D-37-95

Cost Impact: This code change will not increase construction costs, as fire protection materials are still permitted, and the cost of fire resistance products permitted for larger area uses is now comparable to safety rated fire protection products that pass hose stream testing.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: OKEEFFE-FS11-715.4.3.2.1

FS99–09/10
715.4.4 (New)

Proponent: William F. O'Keeffe, representing SAFTIFirst

Revise as follows:

715.4.4 (New) 20-Minute door assemblies in other fire partitions. Fire door assemblies required to have a minimum fire protection rating of 20-minutes where located on other fire partitions required to have a fire resistance rating of 0.5 in accordance with Table 715.4 shall be tested in accordance with NFPA 252 or UL 10C without the hose stream test. Glazing in the door vision panel, and in any other part of the door assembly, including transom lites and sidelites, shall be tested in accordance with NFPA 252 or UL 10C without the hose stream test, and shall have a minimum fire protection rating of 20 minutes.

(Renumber subsequent sections)

Reason: Table 715.4 provides for 1/3-hour door opening protection of "other fire partitions" with a half hour wall rating. However, there is not specific provision elsewhere in Chapter 7 that spells out the requirements, as there is for doors assemblies in corridors and smoke barriers, which are addressed in 715.4.2. This provides for testing of a 20-minute door assembly to NFPA 252 without hose stream. Since a half hour wall tested to

ASTM E119 is not required to be hose stream tested, there is no fire safety reason to require the door assembly component in that wall to meet a hose stream test.

In past cycles, during testimony concerning the application of the hose stream test to glazing, it has been suggested that there is a reason to treat sidelights and transoms differently than the glazing in the vision panel of the door, because combustibles can be stacked next to a sidelight (of course, that argument doesn't apply to the transom, because it is above the door). It has also been suggested that 20-minute tempered products are subject to "disintegration."

The first point is not a hose stream issue, but a radiant heat issue, and applying a hose stream test to products does not assure that they will block radiant heat from passing through the glazing and spreading the fire. Indeed, as seen by the test data in the supporting fire test video, http://www.safti.com/video/resist/resistive.html, one type of fire protection material, ceramic, transmits enough radiant heat in the first 20-minutes of fire exposure to cause spontaneous combustion. Wired glass, another fire protection product that can pass the hose stream test, likewise transmits dangerous levels of radiant heat during the early stages of a fire.

The second point simply isn't true, and was not substantiated by any test data showing alleged "disintegration." Specialty tempered products have undergone rigorous fire testing, and have proven to be effective fire protection materials by fire case history. Millions of square feet of these products have been used worldwide without any reports of the alleged "disintegration" alleged by opponents to this code change. Significantly, past opponents of this code change have never come forward with any reported instances of failure.

The fact is, products not tested to the hose stream protect against fire equally as well as those that are tested.

In 20-minute window applications in half hour walls, there is no legitimate fire safety reason for requiring one element of the fire resistive construction to pass the hose stream test, where the half hour wall assembly and 20-minute door components do not pass that same test.

Cost Impact: The code change proposal will reduce the cost of construction.

Analysis: Code change proposals FS99 and FS107 address hose stream testing requirements for 20 minute door assemblies in other fire partitions. The committee needs to make its intent clear with respect to these provisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: OKeeffe-FS2-715.4.4-New

FS100–09/10
715.4.4.1

Proponent: William F. O'Keeffe, representing SAFTIFirst

Revise as follows:

715.4.4 Doors in exit enclosures and exit passageways. Fire door assemblies in exit enclosures and exit passageways shall have a maximum transmitted temperature end point of not more than 450° F (250° C) above ambient at the end of 30 minutes of standard fire test exposure.

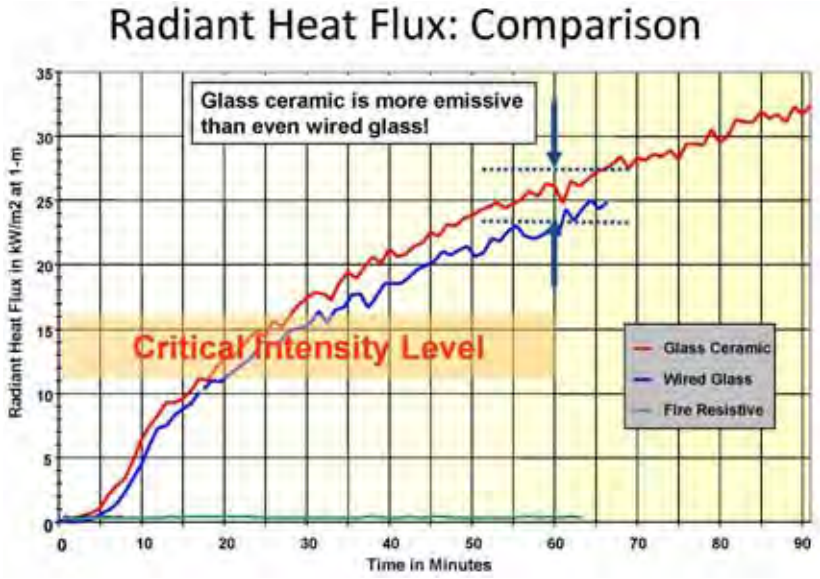
Exception: The maximum transmitted temperature rise is not required in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.1.2.

715.4.4.1 Glazing in doors. Fire-protection-rated glazing in excess of 100 sq inches (0.065 m^2) is not permitted. Fire-resistance rated glazing in excess of 100 sq inches (0.065 m^2) shall be permitted in fire door assemblies when tested as components of the door assemblies, and not as glass lights, and shall have a maximum transmitted temperature rise of 450° F (250° C) in accordance with 715.4.4.

~~**Exception:** The maximum transmitted temperature end rise is not required in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.~~

Reason: This code change will make the size limits fire protection glazing in 60-and 90-minute doors in exit enclosures and passageways consistent with size limits for 60-and 90-minute doors elsewhere in the code. The presence of sprinklers in the building does not eliminate the life safety and fire spread hazard posed by unrestricted transmission of radiant heat flux through large sizes of fire protection rated glazing panels in 60-and-90-minute doors, especially when those doors are protecting exit enclosures and exit passageways deemed essential for occupant life safety.

Fire test data show that at 45-minutes, fire protection rated products such as ceramics and wired glass transmit in excess of 20 kW/m^2. At 20 minutes of fire exposure, these materials transmit in excess of 10 kW/m^2, and at 10 minutes of fire exposure, transmit 5 kW/m^2. See http://www.safti.com/video/resist/resistive.html See Chart Cumulative Radiant Heat Energy Data Chart below, prepared by the test sponsor, Vetrotech SaintGobain. The Society of Fire Protection Engineers Fire Protection Engineering Handbook identifies a fairly obvious tolerance limit for exposure to radiant heat of 2.5 kW/m^2 due to unbearable pain. (See SFPE Handbook of Fire Protection Engineering, 2nd edition, page 2-114)



Included as further support of this code change are two test reports from the Coast Guard testing of (1) Ceramic (FireLite) in steel bulkheads and (2) wired glass in steel bulkheads. Temperature rise and radiant heat flux measurements were recorded. The tests were intended to measure radiant heat flux and surface temperature performance at 60 minutes. The tests can be summarized as follows:

Wired Glass Test

The test of the wired glass panels resulted in glazing failure prior to 60-minutes, so radiant heat and temperature rise were only recorded up to the time of the wired glass failure.

Test 1
Heat flux at end of test (41:24 minutes) - 71 kW/m sq.
Surface temperature - wired glass temperature - 730 degrees C; steel frame - 540 degrees C

Test 2
Heat flux at end of test (37:46 minutes) - 48 kW/m sq.
Surface temperature - wired glass temperature - 730 degrees C; steel frame - 550 degrees C

Test 3
Heat flux at end of test (48:30 minutes) - 57 kW/m sq.
Surface temperature - wired glass temperature - 760 degrees C; steel frame - 585 degrees C

Conclusion on page 8 - As the window panes began to reach their melting point and flow out of the test frame, the recorded heat flux levels showed obvious increases. In all three tests, the recoded heat flux increased approximately 5-7 kW/m sq. until the wire glass fell out of the test frame and the test was terminated.

Ceramic (FireLite) Test

Test 1
Heat flux at end of test (60:00 minutes) - 75 kW/m sq.
Surface temperature - ceramic glass temperature - 800 degrees C; steel frame - 600 degrees C

Test 2
Heat flux at end of test (60:00 minutes) - 69 kW/m sq.
Surface temperature -ceramic glass temperature - 800 degrees C; steel frame - 600 degrees C

Test 3
Heat flux at end of test (60:00 minutes) - 73 kW/m sq.
Surface temperature -ceramic glass temperature - 800 degrees C; steel frame - 600 degrees C

According to these test reports, the surface temperature is significantly higher on the glazing than it is on the steel frame. Also, the report notes that the radiant heat measurements taken that included the "cooler steel frame" were several percentages lower than the view that included just the glazing. (see Ceramic test report, page 6.)

As further support, the following is a published listing of the ceramic product that was tested in the weblink video provided above, which shows a maximum tested area of 3627 sq. inches.

Product Designation: Keralite FR-F, Keralite FR-R, Keralite FR-L, Keralite
Thickness: 3/16 in. or 5/16 in. (5 or 8 mm)
Glazing Compound: closed cell PVC tape for 3/4 hr and 1 hr ratings. Kerafix ceramic tape for 1-1/2 hr ratings.
Furnace Pressure: Neutral and Positive

Rating	Application	Max Exposed Area of Glass (Sq In.)	Max Width of Exposed Glass (In.)	Max Height of Exposed Glass (In.)	Min Depth of Groove (In.)	Groove Width (In.)	Building Code Marking
1 hr.	Door	3627	46-1/2	78	5/8	5/16, 7/16	D-H-NT-60
1 hr.	Window, Transom, Sidelight	3627	46-1/2	78	5/8	5/16, 7/16	D-H-NT-60, OH-60

The use of this much glazing in a fire door protecting an exit enclosure or passageway is a threat to life safety, and should not be permitted.

Finally, the current provision, which appears to allow fire protection rated glazing to exceed 100 sq. inches when the building is sprinklered, was never intended by the proponent of the code change to the 2000 IBC that allowed fire resistance rated glazing that limited temperature rise to 450 F degrees to exceed 100 sq. inches. In the Draft 2000 IBC, there was one exception in the section specifying the requirements for temperature rise doors in exit enclosures and passageways, which applied to allow a non-temperature rise door when the building is sprinklered. The proposal submitted in 1998 that amended that section to allow fire resistance rated glazing to exceed 100 sq. inches when tested to limit temperature rise to 450- degrees F did not propose a second exception that would allow fire protection glazing to exceed 100 sq. inches when the building was sprinklered. However, when the monograph was published, a duplicate exception was printed, though never intended or proposed by the proponent of that code change.

The proponent of the 1998 code change intended this section to limit fire protection rated glazing to 100 sq. inches, consistent with the size limits provided by the legacy codes, and currently applicable in Section Section 715.4.7.1—regardless of whether the building is sprinklered. The same reasons for limiting fire protection glazing in 90-minute fire doors certainly apply in 60-minute exit enclosure and passageway fire doors.

As stated in NFPA 80 (2007), Annex I:

Traditional glazing materials have been prohibited from being used in fire windows in exit stair enclosures because of the concern for radiant heat transfer. Recently, the model building codes also incorporated requirements for limiting the temperature rise on the unexposed face of fire doors opening into exit stair enclosures in order to address the problem of heat transfer (both conducted and reradiated) that could expose evacuating occupants passing doors at each landing. Therefore, caution should be exercised when considering glazing materials with fire protection ratings of 60-minutes or more in such applications, since they can transmit excessive radiant heat into the exit stair enclosure. However, glazing materials with fire resistance ratings are suitable for such situations, since they have been tested to limit radiant heat transfer.

In sum, there is good reason to clarify that fire protection rated glazing is limited to 100 sq. inches in 1-hour exit enclosures and passageways, without an exception when automatic sprinklers are installed in accordance with Chapter 9 provisions. These exit enclosures and passageways are integral to life safety, and there is no justification for not providing for passive fire protection, protecting occupants from dangerous radiant heat levels from fully glazed exit enclosure doors, especially since the cost of fire resistance rated glazing is comparable to the cost of laminated safety-rated ceramics.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposals FS100 and FS107 propose similar revisions to Section 715.4.4.1. The committee needs to make its intent clear with respect to these provisions.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: OKeeffe-FS1-715.4.4.1

FS101–09/10

703.5, 715.4.7.3, 715.5.9, 1703.5.4 (New)

Proponent: William F. O'Keeffe, representing SAFTIFirst

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

PART I- IBC FIRE SAFETY

Revise as follows:

703.5 Fire-resistance-rated glazing. Fire-resistance-rated glazing, when tested in accordance with ASTM E 119 or UL 263 and complying with the requirements of Section 707, shall be permitted. Fire-resistance-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and the identifier "W-XXX," where the "XXX" is the fire-resistance rating in minutes. Such label or identification shall be issued by an agency and shall be permanently ~~affixed to~~ identified on the glazing.

715. 4.7.3 Labeling. Fire-protection-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and information required in Section ~~715.5.9.1~~ 715.4.7.3.1 that shall be issued by an approved agency and shall be permanently ~~affixed to~~ identified on the glazing.

715. 5.9 Labeling. Fire-protection-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and information required in Section 715.5.9.1 that shall be issued by an approved agency and shall be permanently ~~affixed to~~ identified on the glazing.

PART II- IBC STRUCTURAL

Add new text as follows:

1703.5.4 Method of labeling. Information required to be permanently identified on the product shall be acid etched, sand blasted, ceramic fired, laser etched, embossed or of a type that, once applied, cannot be removed without being destroyed.

Reason: This code change provides for a method of permanently identifying information required by the code on the label. The language for permanent identification is taken from Section 2403.1, which applies to the permanent identification of information on glazing required by Chapter 24. This clarifies that the same method of permanent identification applies to other labeling required in the code, and specifically, Chapter 7.

This change also makes an editorial correction to Section 715.4.7.3 by correcting the reference to 715.4.7.3.1, instead of the incorrect reference to 715.5.9.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: OKeeffe-FS5-703.5

FS102–09/10
715.5

Proponent: William F. O'Keeffe, representing SAFTIFirst

Revise as follows:

715.5 Fire-protection-rated glazing. Glazing in fire window assemblies shall be fire-protection rated in accordance with this section and Table 715.5. Glazing in fire door assemblies shall comply with Section 715.4.7. Fire-protection-rated glazing in fire window assemblies shall be tested in accordance with and shall meet the acceptance criteria of NFPA 257 or UL 9. Fire-protection-rated glazing shall also comply with NFPA 80. Openings in nonfire-resistance-rated exterior wall assemblies that require protection in accordance with Section 705.3, 705.8, 705.8.5 or 705.8.6 shall have a fire protection rating of not less than 3/4 hour.

Exceptions:

1. Wired glass in accordance with Section 715.5.4
2. Fire-protection-rated glazing in 0.5-hour fire-resistance-rated partitions is permitted to have an 0.33-hour fire-protection rating.

715.5.8 Interior fire window assemblies. Fire-protection-rated glazing used in fire window assemblies located in fire partitions and fire barriers shall be limited to use in assemblies with a maximum fire-resistance rating of 1 hour in accordance with this section.

715.5.8.1 Where 3/4–hour fire protection window assemblies permitted. Fire-protection-rated glazing requiring 45-minute opening protection in accordance with Table 715.5 shall be limited to fire partitions designed in accordance with Section 709 and fire barriers utilized in the applications set forth in Sections 707.3.6 and 707.3.8 where the fire-resistance rating does not exceed 1 hour.

715.5.8.2 Area limitations. The total area of fire-protection rated window~~s~~ assemblies shall not exceed 25 percent of the area of a common wall with any room.

Reason: This code change is a clarification that fire protection-rated window assemblies are subject to area limits. Since there are some window assemblies that are fire resistance rated to ASTM E119, this code change aids the user in clarifying that fire protection rated window assemblies are subject to these limits.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: OKeeffe-FS10-715.5-2

FS103–09/10
715.5, TABLE 715.5.4

Proponent: William F. O'Keefe, representing SAFTIFirst

1. Revise as follows:

715.5 Fire-protection-rated glazing. Glazing in *fire window assemblies* shall be fire-protection rated in accordance with this section and Table 715.5. Glazing in *fire door* assemblies shall comply with Section 715.4.7. Fire-protection-rated glazing shall be tested in accordance with and shall meet the acceptance criteria of NFPA 257 or UL 9. Fire-protection-rated glazing shall also comply with NFPA 80. Openings in nonfire-resistance-rated *exterior wall* assemblies that require protection in accordance with Section 705.3, 705.8, 705.8.5 or 705.8.6 shall have a fire-protection rating of not less than ¾ hour. Fire protection-rated glazing in 0.5-hour fire-resistance-rated partitions is permitted to have an 0.33-hour fire-protection rating.

~~**Exceptions:**~~

1. ~~Wired glass in accordance with Section 715.5.4.~~
2. ~~Fire protection-rated glazing in 0.5-hour fire-resistance-rated partitions is permitted to have an 0.33-hour fire-protection rating.~~

~~**715.5.4 Wired glass.** Steel window frame assemblies of 0.125-inch (3.2 mm) minimum solid section or of not less than nominal 0.048-inch-thick (1.2 mm) formed sheet steel members fabricated by pressing, mitering, riveting, interlocking or welding and having provision for glazing with 1/4 inch (6.4 mm) wired glass where securely installed in the building construction and glazed with 1/4-inch (6.4 mm) labeled wired glass shall be deemed to meet the requirements for a 3/4-hour *fire window assembly*.Wired glass panels shall conform to the size limitations set forth in Table 715.5.4.~~

715.5.4 ~~715.5.5~~ Nonwired glass. Glazing ~~other than wired glass~~ in *fire window assemblies* shall be fire-protection-rated glazing installed in accordance with and complying with the size limitations set forth in NFPA 80.

(Renumber subsequent sections)

2. Delete without substitution.

~~Table 715.5.4~~
~~**Limiting Sizes of Wired Glass Panels**~~

~~**Opening Fire Protection Rating**~~	~~**Maximum Area (square inches)**~~	~~**Maximum Height (Inches)**~~	~~**Maximum Width (Inches)**~~
~~3 hours~~	~~0~~	~~0~~	~~0~~
~~1-1/2 hour doors in exterior walls~~	~~0~~	~~0~~	~~0~~
~~1 and 1-1/2 hours~~	~~100~~	~~33~~	~~10~~
~~3/4 hour~~	~~1,296~~	~~54~~	~~54~~
~~20 minutes~~	~~Not limited~~	~~Not limited~~	~~Not limited~~
~~Fire window Assemblies~~	~~1,296~~	~~54~~	~~54~~

~~For SI: 1 inch = 25.4 mm, 1 square inch = 645.2 mm^2.~~

Reason: This code change deletes the exception for wired glass from complying with NFPA 257 test standards, and removes the Table as unnecessary to distinguish wired glass from other fire rated glazing products. NFPA 80, the underlying standard for fire doors and other opening protectives, has been revised to eliminate any special reference to wired glass, and wired glass is treated as any other fire rated glazing product.

The special prescriptive regulation of wired glass in steel frames is unnecessary if wired glass is tested to and listed as a fire rated window assembly. If wired glass in a steel frame cannot meet the performance criteria of NFPA 257, it should not be permitted in applications requiring fire rated protection.

Traditional wired glass is no longer allowed in fire doors because it does not meet CPSC safety glazing requirements located in Section 2406.1 of the IBC. Section 715.4.7.1 was revised last code cycle to delete reference to wired glass fire door size limits and the reference to Table 715.5.4. Accordingly Table 715.5.4 is confusing because it purports to prescribe permitted size limits for wired glass in doors which are no longer allowed in any size. The only valid application for wired glass is in fire assemblies in non-hazardous locations, and a table is not needed to prescribe those size limits.

Further, the Table is confusing to code users because there are now laminated and filmed safety wired glass products that have been tested to larger sizes, and are listed just as any other fire rated glazing product, to the maximum size tested, with dimensions as published in their individual listings.

Elimination of these special provisions also eliminates a product that would not comply with the marking and labeling requirements that have formed the basis of some confusion on the part of manufacturers and code officials and which a CTC task group worked hard to comprehensively address in between the last code change cycle and this one.

This code change also makes an editorial revision in stating the requirements for 1/3-hour rated fire windows in half hour walls as an affirmative requirement rather than as an exception.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: OKEEFFE-FS4-715.5

FS104–09/10
Table 715.5

Proponent: William F. O'Keeffe, representing SAFTIFirst

1. Revise as follows:

TABLE 715.5
FIRE WINDOW ASSEMBLY FIRE PROTECTION RATINGS

TYPE OF WALL ASSEMBLY		REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE WINDOW ASSEMBLY RATING (hours)
Interior walls:	Fire walls	All	NPa
	Fire barriers	> 1 1	NPa 3/4
	Smoke barriers	1	3/4
	Fire partitions	1 1/2	3/4 1/3
Exterior walls		> 1 1	~~1 1/2~~ NP[a] 3/4
Party wall		All	NP

NP – Not Permitted
a. Not permitted except fire resistance rated glazing assemblies tested to ASTM E119 or UL 263, as specified in Section 715.2.

Reason: The purpose of this proposed change is to eliminate an anomaly in the table. Fire walls and Party walls do not permit a fire window assembly unless, (in the case of the fire wall), the window assembly is tested in accordance with ASTM E-119 or UL 263. The purpose of the fire wall or party wall is to prevent the spread of fire to the next building for a specified amount of time.

An exterior wall also is expected to prevent the spread of fire to the next exposure (building or structure) and may have a required fire resistance rating of 3 hours depending on the separation distance, occupancy group and/or type of construction. Being that the purpose of the level of fire resistance rating is the same, preventing the transmittal of fire from one building to another, the fire window assembly rating requirements should be the same. An additional consideration is why would a 1.5 hour rated window assembly be permitted in a 3 hour exterior wall when Table 715.4 would require a fire door or shutter to have a 3 hour rating in a 3 hour rated wall.

The proposal is also supported when comparing the "Exterior wall" category to the "Fire barriers" category.

The language added to Note a is editorial in that Section 715.2 only deals with fire-resistance rated glazing..

Cost Impact: Due to the wide availability of glazing meeting the requirements of Section 715.2 this proposal will not increase the cost of construction.

Analysis: Test standards ASTM E119 and UL 263 are currently referenced in the I-codes.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: OKeeffe-FS9-T715.5

FS104–09/10
Table 715.5

Proponent: William F. O'Keeffe, representing SAFTIFirst

1. Revise as follows:

TABLE 715.5
FIRE WINDOW ASSEMBLY FIRE PROTECTION RATINGS

TYPE OF WALL ASSEMBLY		REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE WINDOW ASSEMBLY RATING (hours)
Interior walls:	Fire walls	All	NPa
	Fire barriers	> 1 1	NPa 3/4
	Smoke barriers	1	3/4
	Fire partitions	1 1/2	3/4 1/3
Exterior walls		> 1 1	~~1 1/2~~ NP[a] 3/4
Party wall		All	NP

NP – Not Permitted
a. Not permitted except fire resistance rated glazing assemblies tested to ASTM E119 or UL 263, as specified in Section 715.2.

Reason: The purpose of this proposed change is to eliminate an anomaly in the table. Fire walls and Party walls do not permit a fire window assembly unless, (in the case of the fire wall), the window assembly is tested in accordance with ASTM E-119 or UL 263. The purpose of the fire wall or party wall is to prevent the spread of fire to the next building for a specified amount of time.

An exterior wall also is expected to prevent the spread of fire to the next exposure (building or structure) and may have a required fire resistance rating of 3 hours depending on the separation distance, occupancy group and/or type of construction. Being that the purpose of the level of fire resistance rating is the same, preventing the transmittal of fire from one building to another, the fire window assembly rating requirements should be the same. An additional consideration is why would a 1.5 hour rated window assembly be permitted in a 3 hour exterior wall when Table 715.4 would require a fire door or shutter to have a 3 hour rating in a 3 hour rated wall.

The proposal is also supported when comparing the "Exterior wall" category to the "Fire barriers" category.

The language added to Note a is editorial in that Section 715.2 only deals with fire-resistance rated glazing..

Cost Impact: Due to the wide availability of glazing meeting the requirements of Section 715.2 this proposal will not increase the cost of construction.

Analysis: Test standards ASTM E119 and UL 263 are currently referenced in the I-codes.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: OKeeffe-FS9-T715.5

FS105–09/10
715.5.8

Proponent: William F. O'Keeffe, representing SAFTIFirst

1. Revise as follows:

715.5.8.1 Where 3/4–hour fire protection window assemblies permitted. Fire-protection-rated glazing requiring 45-minute opening protection in accordance with Table 715.5 shall be limited to fire partitions designed in accordance with Section 709 and fire barriers utilized in the applications set forth in Sections 707.3.6 and 707.3.8 where the fire-resistance rating does not exceed 1 hour, and shall be subject to Section 715.5.8.3.

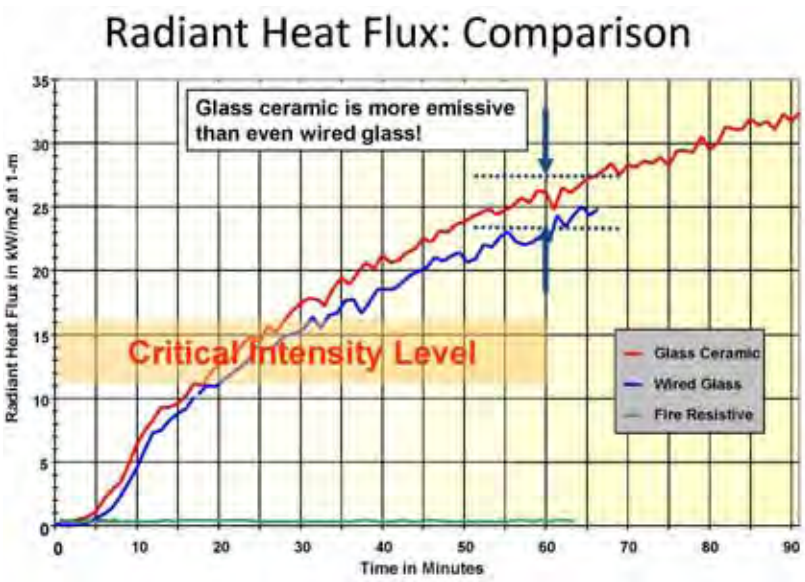
715.5.8.2 Area limitations. The total area of windows shall not exceed 25 percent of the area of a common wall with any room.

2. Add new text as follows:

715.5.8.3 Interior fire windows in fire barriers, corridors and smoke barriers. Fire protection-rated glazing in fire windows tested to NFPA 257 used in fire barriers, corridors and smoke barriers requiring a 1-hour fire resistance rating shall be limited to applications where the bottom edge of the window frame is a minimum of 36-inches above the finished floor surface. The bottom edge height of fire resistance rated glazing tested as an assembly to ASTM E119 or UL 263 and rated a minimum of 1-hour shall not be limited.

Reason: Fire protection rated glazing materials do not protect against radiant heat. The unrestricted use of these materials in exit corridors in the large sizes for which they have been tested and listed threaten the life safety of building occupants attempting to exit past them in a fire. Their unrestricted use in other fire barriers and partitions where combustibles may be stored next to them also contribute to fire spread. By restricting the use of these materials to above 36" from the floor, occupants can crawl underneath fire windows, and combustibles piled on the floor are not as likely to pose a threat to windows installed at this height.

Fire test data show that at 45-minutes, these products transmit in excess of 20 kW/m^2, at 20 minutes of fire exposure, these materials transmit in excess of 10 kW/m^2, and at 10 minutes of fire exposure, transmit 5 kW/m^2. http://www.safti.com/video/resist/resistive.html See below, Chart Cumulative Radiant Heat Energy Data Chart, prepared by the test sponsor of the test cited above. The Society of Fire Protection Engineers Fire Protection Engineering Handbook identifies a fairly obvious tolerance limit for exposure to radiant heat of 2.5 kW/m^2 due to unbearable pain. (See SFPE Handbook of Fire Protection Engineering, 2nd edition, page 2-114).



Also included as further support of this code change are two test reports from the Coast Guard testing of (1) Ceramic (FireLite) in steel bulkheads (Report No. CG-D-37-95), and (2) wired glass in steel bulkheads (Report No. CG-D-38-95). Temperature rise and radiant heat flux measurements were recorded. The tests were intended to measure radiant heat flux and surface temperature performance at 60 minutes.

The tests can be summarized as follows:

Wired Glass Test

The test of the wired glass panels resulted in glazing failure prior to 60-minutes, so radiant heat and temperature rise were only recorded up to the time of the wired glass failure.

Test 1
Heat flux at end of test (41:24 minutes) - 71 kW/m sq.
Surface temperature - wired glass temperature - 730 degrees C; steel frame - 540 degrees C
Test 2
Heat flux at end of test (37:46 minutes) - 48 kW/m sq.
Surface temperature - wired glass temperature - 730 degrees C; steel frame - 550 degrees C
Test 3
Heat flux at end of test (48:30 minutes) - 57 kW/m sq.
Surface temperature - wired glass temperature - 760 degrees C; steel frame - 585 degrees C

Conclusion on page 8 - As the window panes began to reach their melting point and flow out of the test frame, the recorded heat flux levels showed obvious increases. In all three tests, the recorded heat flux increased approximately 5-7 kW/m sq. until the wire glass fell out of the test frame and the test was terminated.

Ceramic (FireLite) Test

Test 1
Heat flux at end of test (60:00 minutes) - 75 kW/m sq.
Surface temperature - ceramic glass temperature - 800 degrees C; steel frame - 600 degrees C
Test 2
Heat flux at end of test (60:00 minutes) - 69 kW/m sq.
Surface temperature - ceramic glass temperature - 800 degrees C; steel frame - 600 degrees C
Test 3
Heat flux at end of test (60:00 minutes) - 73 kW/m sq.

Surface temperature - ceramic glass temperature - 800 degrees C; steel frame - 600 degrees C

According to these test reports, the surface temperature is significantly higher on the glazing than it is on the steel frame. Also, the report notes that the radiant heat measurements taken that included the "cooler steel frame" were several percentages lower than the view that included just the glazing. (see Ceramic test report (Report No. CG-D-37-95), page 6.)

Limitations on area uses of fire protection-rated glazing products is long overdue. In Europe, code regulators have recognized the need for restricting use of fire protection-rated glazing materials based on radiant heat hazards, particularly their use in egress paths. Reasonable limits protecting life safety are achieved by limiting the height of windows in exit corridors, permitting building occupants safe egress. The restriction on use in other fire barriers and fire partitions reduces the possibility of fire spread due to auto-ignition, which test data show can occur well before the 45-minute fire exposure to which fire protection-rated glazing products have been tested.

As stated in NFPA 80 (2007), Annex I:

"Because the present fire test standard, NFPA 257, does not require measuring and reporting temperature rise on the unexposed face of the glazing material or radiant heat transmission, glazing products tested to this standard have not been required to retard radiant heat transfer. However, these data are required in many European fire test standards. As a result, European building codes place limitations on the use of glazing in fire-resistant partitions inside buildings and require the use of insulating glazing in means of egress as well as where combustibles could be in close proximity. Research by Margaret Law, Bsc, Ministry of Technology and Fire Offices Committee, Joint Fire Research Organization, led to the development of such limitations in British building regulations.

This code change at the same time permits use in larger sizes of products that meet fire resistance radiant heat and temperature rise limits of ASTM E119, as those products do not transmit dangerous levels of radiant heat.

Bibliography

1. Test Report, Fire Performance of Three Wired Glazed Window Assemblies, Report No. CG-D-38-95
2. Test Report, Fire Performance Evaluation of Three A-O Glazed Window Assemblies, Report No. CG-D-37-95

Cost Impact: This code change will not increase construction costs, as fire protection-rated glazing materials are still permitted, and the cost of fire resistance products permitted for larger applications and next to the floor is now comparable to safety rated fire protection products that pass hose stream testing.

Analysis: Standard NFPA 257 is currently referenced in the I-codes.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: OKEEFFE-FS8-715.5.8.1

FS106–09/10
715.5.8.2, Table 715.5

Proponent: William F. O'Keeffe, representing SAFTIFirst

1. Add new text as follows.

715.5.8.2 Where 1/3-hour fire protection window assemblies permitted. Fire-protection rated glazing in fire window assemblies in ½-hour fire -resistant rated fire partitions requiring 1/3-hour opening protection in accordance with Table 715.5 shall be exempt from the hose stream test.

(Renumber subsequent section)

2. Revise as follows.

TABLE 715.5
FIRE WINDOW ASSEMBLY FIRE PROTECTION RATINGS

TYPE OF ASSEMBLY		REQUIRED ASSEMBLY RATING (hours)	MINIMUM FIRE WINDOW ASSEMBLY RATING (hours)
Interior walls:	Fire walls	All	NP[a]
	Fire barriers	> 1 1	NP[a] 3/4
	Smoke barriers	1	3/4
	Fire partitions	1 1/2	3/4 1/3[b]
Exterior walls		> 1 1	1 1/2 3/4
Party wall		All	NP

NP = Not Permitted.

a. Not permitted except as specified in Section 715.2.
b. For testing requirements, see Section 715.5.8.2

Reason: New section 715.5.8.2 addresses 20-minute windows now specified in Table 715.5 for ½-hour fire partitions. Since the fire partition assembly tested to ASTM E119 for a ½-hour fire resistance rating is not subject to the hose stream test, and fire doors tested for 20-minutes as required in Table 715.4 are not subject to the hose stream test, for consistency in the code, the fire window component of a ½-hour fire partition should be likewise exempt from the hose stream test.

The Fire Safety Committee approved this proposal last code cycle, stating as a reason:

Committee Reason: Based on the fact that ASTM E119 does not require the hose stream test for partitions qualifying for a 30 minute fire rating and Section 715.4.3 allows 20 minute rated fire doors to be tested without the hose stream test, the committee agreed that the hose stream test was not required for a 20 minute rated fire protection window.

A public comment was submitted, and the Committee's decision was overturned. The Commenter submitted two reasons for overturning the code changes: One, that 20-minute windows are subject to fuel loads, and two, that 20-minute tempered products are subject to "disintegration."

The first point is not a hose stream issue, but a radiant heat issue, and applying a hose stream test to products does not assure that they will block radiant heat from passing through the glazing and spreading the fire. Indeed, as seen by the test data in the supporting fire test video, http://www.safti.com/video/resist/resistive.html, one type of fire protection material, ceramic, transmits enough radiant heat in the first 20-minutes of fire exposure to cause spontaneous combustion. Wired glass, another fire protection product that can pass the hose stream test, likewise transmits dangerous levels of radiant heat during the early stages of a fire.

The second point simply isn't true, and was not substantiated by any test data showing alleged "disintegration." Specialty tempered products have undergone rigorous fire testing, and have proven to be effective fire protection materials by fire case history. Millions of square feet of these products have been used worldwide without any reports of the alleged "disintegration" alleged by opponents to this code change. Significantly, opponents of this code change have never come forward with any reported instances of failure.

The fact is, products not tested to the hose stream protect against fire equally as well as those that are tested.

In 20-minute window applications in half hour walls, there is no legitimate fire safety reason for requiring one element of the fire resistive construction to pass the hose stream test, where the half hour wall assembly and 20-minute door components do not pass that same test.

Cost Impact: This will reduce the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: OKEEFFE-FS7-715.5.8.2

FS107–09/10

702, 703.5, 715.2, 715.3, 715.3.1, Table 715.3 (New), 715.4, 715.4.1, 715.4.2, 715.4.3, 715.4.3.1, 715.4.3.2, 715.5.4, 715.4.4, 715.4.4.1, 715.4.5, 715.4.6, 715.4.6.1, 715.4.6.1.1, 715.4.7, 715.4.7.1, 715.5.8.1.1, 715.5.8.1.2, 715.5.8.1.2.1, 715.5.8.1.2.2, 715.4.7.2, 715.4.7.3, 715.5, 715.4.7.3.1, 715.4.7.4, 715.5.8, 715.5.8.1, 715.5.8.2, 715.6.8.3, Table 715.5, 715.5.9, 715.5.9.1, TABLE 715.4,

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC); William F. O'Keeffe, representing SAFTIFirst

1. Add new text:

SECTION 702 DEFINITIONS

Fire-rated glazing. Glazing with either a fire protection rating or a fire resistance rating.

2. Revise as follows:

SECTION 703 FIRE RESISTANCE RATINGS AND FIRE TESTS

703.5 Fire-resistance-rated glazing. Fire-resistance-rated glazing, when tested in accordance with ASTM E 119 or UL 263 and complying with the requirements of Section 707, shall be permitted. Fire-resistance-rated glazing shall bear a label ~~or other identification showing the name of the manufacturer, the test standard and the identifier "W-XXX," where the "XXX" is the fire-resistance rating in minutes. Such label or identification shall be~~ marked in accordance with Table 715.3 issued by an approved agency and shall be permanently affixed to the glazing.

SECTION 715 OPENING PROTECTIVES

715.1 General. (*No change to current text)*

715.2 Fire-resistance-rated glazing. Fire-resistance-rated glazing tested as part of a fire-resistance-rated wall assembly in accordance with ASTM E 119 or UL 263 and labeled in accordance with Section 703.5, shall be permitted

in fire doors and fire window assemblies where tested and installed in accordance with their listings and shall not otherwise be required to comply with this section.

3. Add new text as follows:

715.3 Marking Fire-Rated Glazing Assemblies Fire-rated glazing assemblies shall be marked in accordance with Tables 715.3, 715.5, and 715.6.

715.3.1 Fire-rated glazing that exceeds the code requirements. Fire-rated glazing assemblies marked as complying with hose stream requirements (H) shall be permitted in applications that do not require compliance with hose stream requirements. Fire-rated glazing assemblies marked as complying with temperature rise requirements (T) shall be permitted in applications that do not require compliance with temperature rise requirements. Fire-rated glazing assemblies marked with ratings (XXX) that exceed the ratings required by this code shall be permitted.

Table 715.3
Marking Fire-Rated Glazing Assemblies

Fire Test Standard	Marking	Definition of Marking
ASTM E119 or UL 263	W	Meets wall assembly criteria.
NFPA 257 or UL 9	OH	Meets fire window assembly criteria including the hose stream test.
NFPA 252 or UL 10B or UL 10C	D H T	Meets fire door assembly criteria. Meets fire door assembly "Hose Stream" test. Meets to 450º F temperature rise criteria for 30 minutes
	XXX	The time in minutes of the fire resistance or fire protection rating of the glazing assembly

~~715.3~~ **715.4 Alternate methods for determining fire-protection.** *(No change to current text)*

~~715.4~~ **715.5 Fire door and shutter assemblies.** *(No change to current text)*

Exceptions:

(Exceptions to remain unchanged)

~~715.4.1~~ **715.5.1 Side hinged or pivoted swinging doors.** *(No change to current text)*

~~715.4.2~~ **715.5.2 Other types of assemblies.** *(No change to current text)*

~~715.4.3~~ **715.5.3 Door assemblies in corridors and smoke barriers.** Fire door assemblies required to have a minimum fire protection rating of 20 minutes where located in corridor walls or smoke barrier walls having a fire-resistance rating in accordance with Table ~~715.4~~ 715.5 shall be tested in accordance with NFPA 252, UL 10B or UL 10C without the hose stream test.

Exceptions:

(Exceptions to remain unchanged)

~~715.4.3.1~~ **715.5.3.1 Smoke and draft control.** *(No change to current text)*

~~715.4.3.2~~ **715.5.3.2 Glazing in door assemblies.** In a 20-minute fire door assembly, the glazing material in the door itself shall have a minimum fire-protection rating of 20-minutes and shall be exempt from the hose stream test. Glazing material in any other part of the door assembly, including transom lites and sidelites, shall be tested in accordance with NFPA 257 or UL 9, including hose stream test, in accordance with Section 715.5.

715.5.4 Door assemblies in other fire partitions. Fire door assemblies required to have a minimum fire-protection rating of 20-minutes where located in other fire partitions having a fire resistance rating of 0.5-hour in accordance with Table 715.4 shall be tested in accordance with NFPA 252, UL 10B or UL 10C with the hose stream test.

(Renumber subsequent sections)

~~715.4.4~~ **715.5.5 Doors in exit enclosures and exit passageways.** Fire door assemblies in exit enclosures and exit passageways shall have a maximum transmitted temperature ~~end point~~ rise of not more than 450F degrees (250C degrees) above ambient at the end of 30 minutes of standard fire test exposure.

Exception: The maximum transmitted temperature rise is not required ~~limited~~ in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

~~715.4.4.1~~ **715.5.5.1 Glazing in doors.** Fire protection rated glazing shall be limited to 100-sq. inches (0.065 m^2). ~~Fire protection-rated glazing in excess of 100 sq.inches (0.065 m^2) shall be permitted in fire door assemblies when~~ unless the glazing has been tested as components of the door assemblies and not as glass lights, and ~~shall have~~ has a maximum transmitted temperature rise of 450F degrees (250C degrees) in accordance with Section ~~715.4.4~~ 715.5.5.

Exception: The maximum temperature rise is not ~~required~~ limited in buildings equipped with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

~~715.4.5~~ **715.5.6 Fire door frames with transom lights and sidelights.** Door frames with transom lights, sidelights, or both shall be permitted where a ¾-hour fire protection rating or less is required in accordance with Table 715.4. ~~Where a fire protection rating exceeding ¾ hour is required in accordance with Table 715.4,~~ Fire door frames with transom lights, sidelights, or both, ~~shall be permitted where~~ installed with fire-resistance rated glazing tested as an assembly in accordance with ASTM E119 or UL 263 shall be permitted where a fire-protection rating exceeding ¾-hour is required in accordance with Table 715.4.

~~715.4.6~~ **715.5.7 Labeled protective assemblies.** *(No change to current text)*

~~715.4.6.1~~ **715.5.7.1 Fire door labeling requirements.** Fire doors shall be labeled showing the name of the manufacturer or other identification readily traceable back to the manufacturer, the name or trademark of the third-party inspection agency, the fire protection rating and, where required for fire doors in exit enclosures and exit passageways by Section ~~715.4.4~~ 715.5.5, the maximum transmitted temperature point. Smoke and draft control doors complying with UL 1784 and shall be labeled as such and shall also comply with Section ~~715.4.6.3~~ 715.5.7.3. Labels shall be approved and permanently affixed. The label shall be applied at the factory or location where fabrication and assembly are performed.

~~715.4.6.1.1~~ **715.5.7.1.1 Light kits, louvers and components.** Listed light kits and louvers and their required preparations shall be considered as part of the labeled door where such installations are done under the listing program of the third-party agency. Where tested for such use, fire doors and door assemblies shall be permitted to consist of components, including glazing, vision light kits and hardware that are labeled, listed or classified by different third party agencies.

~~715.4.6.2~~ **715.5.7.2 Oversized doors.** *(No change to current text)*

~~715.4.6.3~~ **715.5.7.3 Smoke and draft control door labeling requirements.** *(No change to current text)*

~~715.4.7~~ **715.5.8 Glazing material.** *(No change to current text)*

~~715.4.7.1~~ **715.5.8.1 Size limitations.** Fire-protection-rated glazing ~~used in fire doors~~ shall comply with the size limitations of NFPA 80, and as provided in sections 715.5.8.1.1 and 715.8.1.2.

~~**Exceptions:**~~

715.5.8.1.1 Fire-resistance-rated glazing in door assemblies in fire walls and fire barriers rated greater than 1-hour. Fire-resistance-rated glazing tested to ASTM E119 or UL 263 and NFPA 252, UL10B or UL 10C shall be permitted in fire door assemblies located in fire walls and in fire barriers in accordance with Table 715.4 to the maximum size tested and in accordance with their listings.

715.5.8.1.2 Fire-protection-rated glazing in door assemblies in fire walls and fire barriers rated greater than 1-hour. Fire-protection-rated glazing shall be prohibited in fire walls and fire barriers except as provided in 715.5.8.1.2.1 and 715.5.8.1.2.2

715.5.8.1.2.1 Horizontal exits. ~~1. Fire protection rated glaing in fire doors located in fire walls shall be prohibited except where serving a fire door in a horizontal exit, a self closing swinging door shall be permitted to have a vision panel of not more than 100 square inches without a dimension exceeding 10 inches.~~ Fire-protection-rated glazing shall be permitted as vision panels in self-closing swinging fire door assemblies serving as horizontal exits in fire walls where limited to 100 square inches with no dimension exceeding 10 inches.

715.5.8.1.2.2 Fire barriers. ~~2.~~ Fire-protection-rated glazing ~~shall not be installed in fire doors~~ shall be permitted in fire doors having a 1-1/2-hour fire protection rating intended for installation in fire barriers, where limited to 100 square inches. ~~unless the glazing is not more than 100 square inches in area.~~

~~715.4.7.2~~ 715.5.8.2 Exit and elevator protectives. *(No change to current text)*

~~715.4.7.3~~ 715.5.8.3 Labeling. *(No change to current text)*

~~715.4.7.3.1~~ 715.5.8.3.1 Identification. *(No change to current text)*

~~715.4.7.4~~ 715.5.8.4 Safety glazing. *(No change to current text)*

(Renumber subsequent sections)

~~715.5.8~~ 715.6.8 Interior fire window assemblies. Fire-protection-rated glazing used in fire window assemblies located in fire partitions and fire barriers shall be limited to use in assemblies with a maximum fire-resistance rating of 1-hour in accordance with this section.

~~715.5.8.1~~ 715.6.8.1 Where ¾-hour fire-protection window assemblies permitted. Fire-protection-rated glazing requiring 45 minute opening protection in accordance with Table ~~715.5~~ 715.6 shall be limited to fire partitions designed in accordance with Section 709 and fire barriers utilized in the applications set forth in Sections 707.3.6 and 707.3.8 where the fire resistance rating does not exceed 1 hour. Fire-resistance-rated glazing assemblies tested in accordance with ASTM E119 or UL 263 shall not be subject to the limitations of this section.

~~715.5.8.2~~ 715.6.8.2 Area limitations. The total area of windows shall not exceed 25 percent of the area of a common wall with any room.

715.6.8.3. Where 1/3- hour fire-protection window assemblies permitted. Fire-protection-rated glazing shall be permitted in window assemblies tested to NFPA 257 or UL 9 in smoke barriers and fire partitions requiring 1/3-hour opening protection in accordance with Table 715.6

TABLE ~~715.5~~ 715.6
FIRE WINDOW ASSEMBLY FIRE-PROTECTION RATINGS

TYPE OF WALL ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE WINDOW ASSEMBLY RATING (hours)	FIRE RATED GLAZING MARKING
Interior walls			
Fire walls	All	NP[a]	W-xxx[b]
Fire barriers	>1	NP[a]	W-xxx[b]
	1	NP[a]	W-xxx[b]
Incidental use areas (707.3.6), Mixed occupancy separations(707.3.8)	1	¾	OH-45 or W-60
Fire partitions	1	¾	OH-45 or W-60
	0.5	1/3	OH-20 or W-30
Smoke barriers	1	¾	OH-45 or W-60
Exterior walls	>1	1-1/2	OH-90 or W-XXX [B]
	1	¾	OH-45 or W-60
	0.5	1/3	OH-20 or W-30
Party wall	All	NP	Not Applicable

NP – Not Permitted

a. Not permitted except fire resistance rated glazing assemblies tested to ASTM E119 or UL 263, as specified in Section 715.2

b. xxx = The fire rating duration period in minutes, which shall be equal to the fire resistance rating required for the wall assembly.

~~**715.5.9**~~ **715.6.9 Labeling.** Fire-protection-rated glazing shall bear a label or other identification showing the name of the manufacturer, the test standard and information required ~~Section 715.5.9.1~~ Table 715.6 that shall be issued by an approved agency and shall be permanently affixed to the glazing.

~~**715.5.9.1 Identification.** For fire protection-rated glazing, the label shall bear the following two-part identifiers: "OH – XXX." "OH" shall indicate that the glazing has been tested to and meets both the fire protection and the hose-stream requirements of NFPA 257 or UL 9. "XXX" shall indicate the fire-protection rating period, in minutes, that was tested.~~

TABLE ~~715.4~~ 715.5
~~FIRE DOOR AND FIRE SHUTTER PROTECTION RATINGS~~
OPENING FIRE PROTECTION ASSEMBLIES, RATINGS AND MARKINGS

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE RATED GLAZING MARKING DOOR VISION PANEL[e]	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE RATED GLAZING MARKING SIDELITE/TRANSOM PANEL	
					Fire protection	Fire resistance	Fire protection	Fire resistance
Fire walls and fire barriers having a required fire resistance rating greater than 1 hour	4	3	Not Permitted	Not Permitted	Not permitted	4	Not Permitted	W-240
	3	3[a]	Not Permitted	Not Permitted	Not Permitted	3	Not Permitted	W-180
	2	1-1/2	100 sq. in.[c]	<=100 sq.in. = D-H--90 >100 sq.in.= D-H-W-90	Not Permitted	2	Not Permitted	W-120
	1-1/2	1-1/2	100 sq. in.[c]	<=100 sq.in. = D-H- 90 >100 sq.in.= D-H-W-90	Not Permitted	1-1/2	Not Permitted	W-90
Shaft, exit enclosures and exit passageway walls	2	1-1/2	100 sq. in.[c, d]	<=100 sq.in. = D-H-90 <=100 sq.in.= D-H- T-or D-H-T-W-90	Not Permitted	2	Not Permitted	W-120

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE RATED GLAZING MARKING DOOR VISION PANEL[e]	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)		FIRE RATED GLAZING MARKING SIDELITE/TRANSOM PANEL	
Fire barriers having a required fire-resistance rating of 1 hour: Shaft, exit enclosure and exit passageway walls	1	1	100 sq. in.[c, d]	<=100 sq.in. = D-H-60 >100 sq.in.= D-H- T-60 or D-H-T-W-60	Fire protection Not Permitted	Fire resistance 1	Fire protection Not Permitted	Fire resistance W-60
Other fire barriers	1	3/4	Maximum size tested	D-H-NT-45	Fire protection ¾		D-H-~~NT~~-45	
	1	1/3[b]	Maximum size tested	D- 20	3/4[b]		D-H-OH-45	
Fire partitions:: Corridor walls	0.5	1/3[b]	Maximum size tested	D-20	1/3		D-H- OH-20	
Other fire partitions	1	¾	Maximum size tested	D-H-45	¾		D-H-45	
	0.5	1/3		D-H--20	1/3		D-H-20	
Exterior walls	3	1-1/2	100 sq. in.[c]	<=100 sq.in. = D-H-90 >100 sq.in D-H-W-90	Fire protection Not Permitted	Fire resistance 3	Fire protection Not Permitted	Fire resistance W-180
	2	1-1/2	100 sq. in.[c]	<=100 sq.in. = D-H-90 >100 sq.in.= D-H-W-90	Not Permitted	2	Not Permitted	W-120
				D-H- 45			D-H-~~NT~~-45	

TYPE OF ASSEMBLY	REQUIRED WALL ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)	DOOR VISION PANEL SIZE	FIRE RATED GLAZING MARKING DOOR VISION PANEL[e]	MINIMUM SIDELIGHT/TRANSOM ASSEMBLY RATING (hours)	FIRE RATED GLAZING MARKING SIDELITE/TRANSOM PANEL
	1	3/4	Maximum size tested		Fire Protection 3/4	
Smoke barriers	1	1/3[b]	Maximum size tested	D-20	Fire protection 3/4	D-H-OH-45

a. Two doors, each with a fire protection rating of 1-1/2 hours, installed on opposite sides of the same opening in a fire wall, shall be deemed equivalent in fire protection rating to one 3-hour fire door.
b. For testing requirements, see Section 715.5.3 ~~715.4.3~~.
c. Fire resistance rated glazing tested to ASTM E119 per section 715.2 shall be permitted, in the maximum size tested.
d. Except where the building is equipped throughout with an automatic sprinkler and the fire-rated glazing meets the criteria established in Section 715.5.5.1.
e. Under the column heading "Fire rated glazing marking door vision panel", W refers to the fire-resistance rating of the glazing, not the frame.

Reason:
(Heilstedt) The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Labeling of Fire Rated Glazing". The scope of the activity is noted as:

Identify root causes of problems selecting, specifying, installing, and inspecting fire protective and fire resistive glazing and other assembly components including the frames. Propose identification requirements and other related code changes.

The marking provisions of the IBC applicable to fire rated glazing ("Marking Provisions") were first adopted as a part of Chapter 7 of the IBC in 2004. In the last development cycle, the Fire Safety Committee recommended that the ICC Board consider submitting the marking of fire rated glazing to the Code Technology Committee (CTC) as an area of study since repeat proposals to change the Marking Provisions were being submitted on a regular basis.

The ICC Board referred the Marking Provisions to the CTC as an area of study and a Study Group (SG), Chaired Carl Wren, was formed. The SG consisted of both fire and building code officials; architects; engineers; fire rated window and door manufacturers; primary fire rated glazing manufacturers; and a fire protection engineer. It was recognized by the SG that the existing marking system, as those marks were designated in product listings, was leading to fire protection products in applications not allowed by the IBC. After numerous meetings and a full hearing before the CTC, the SG and the CTC unanimously approved proposing these changes to the IBC's Marking Provisions.

The primary objective of the CTC in proposing these changes is to make the Marking Provisions of Chapter 7 easier to understand and enforce and to minimize the possibility that the system could result in confusion between fire protection rated products in applications where fire-resistance rated products meeting ASTM E 119 are permitted. The proposal includes the following changes:

1- Adds a new Table 715.3, to define and relate the various test standards for fire rated glazing to the designations used to mark fire rated glazing. A new definition of the term "fire rated glazing" would also be included.

2- While the designations "W," "OH," "D," "DT," "DH" and "XXX" used to mark fire rated glazing will remain as they were originally adopted in 2004, the marking of fire rated glazing in fire door assemblies (D) are simplified by deleting the NH designation (not hose stream tested) and the NT designation (not temperature rise tested). It is clarified that those designations correspond to test standards, not end uses. Tables 715.4 and 715.5 show the markings required for acceptance in specified applications.

3- All text provision used to define and relate test standards to marking designations are deleted in favor of including all of the required marking provisions in Tables 715.3, 715.4 and 715.5. This is intended to provide building and fire code officials with easy access to all of the information needed when inspecting fire window and fire door installations, including required marking designations.

4- In connection with removing many of the text provisions referring to the marking of fire rated glazing and the inclusion of all pertinent marking requirements in tables 715.4 and 715.5, a number of columns are added to those Tables. These new columns specify the required designations that the building and fire code officials will need to look for when inspecting fire rated glazing in the various categories of fire resistance rated walls, fire door assemblies and fire window assemblies identified in Tables 715.4 and 715.5.

5- The size limitation provisions starting at 715.4.6.1 are re-written to eliminate the use of "exceptions" and thus clarify them - no substantive changes to these provisions are intended.

6- It was determined that Table 715.4 inadvertently omitted reference to 1 1/2 hour doors in shaft, exit enclosures and exit passageway walls and this proposal adds that reference to the Table.

7- The Marking Provisions have been written to clarify that fire protection rated glazing tested to NFPA 257 and used in transoms and sidelites in certain fire barriers and corridor walls will also have to be tested to NFPA 252 since they are a part of a door assembly. Accordingly, these glazings are marked D-H-OH-XXX.

(O'Keefe) The marking provisions of the IBC applicable to fire rated glazing ("Marking Provisions") were first adopted as a part of Chapter 7 of the IBC in 2004. In the last development cycle, the Fire Safety Committee recommended that the ICC Board consider submitting the marking of fire rated glazing to the Code Technology Committee (CTC) as an area of study since repeat proposals to change the Marking Provisions were being submitted on a regular basis, because of confusion and misuse of products being marked by individual manufacturers under the current system.

The ICC Board referred the Marking Provisions to the CTC as an area of study and a Study Group (SG), Chaired by Carl Wren, was formed. The SG consisted of both fire and building code officials; architects; engineers; fire rated window and door manufacturers; primary fire rated glazing manufacturers; and a fire protection engineer.

It was recognized by the SG that the existing marking system, as those marks were designated in product listings, was leading to the misuse of fire protection products in applications not allowed by the IBC. It was also recognized that "T" marking were being applied by some manufacturers to designate use of fire protection products in temperature rise doors that in fact did not limit temperature rise and should not be so marked. Attached as support are documents submitted to the CTC Labeling Study Group that show the confusion in listings showing end-use marks that are

not permitted by the IBC. After numerous meetings and a full hearing before the CTC, the SG and the CTC unanimously approved proposing these changes to the IBC's Marking Provisions.

The primary objective of the CTC in proposing these changes is to make the Marking Provisions of Chapter 7 easier to understand and enforce and to minimize the possibility that the system could result in confusion between fire protection rated products in applications where fire-resistance rated products meeting ASTM E 119 are required. The proposal includes the following changes:

1- Adds a new Table 715.3, to define and relate the various test standards for fire rated glazing to the designations used to mark fire rated glazing. A new definition of the term "fire rated glazing" would also be included.

2- While the designations "W," "OH," "D," "DT," "DH" and "XXX" used to mark fire rated glazing will remain as they were originally adopted in 2004, the marking of fire rated glazing in fire door assemblies (D) are simplified by deleting the NH designation (not hose stream tested) and the NT designation (not temperature rise tested). It is clarified that those designations correspond to compliance with test standards only, not that they are permitted for end uses. Tables 715.4 and 715.5 show the markings required for acceptance in specified applications.

3- All text provision used to define and relate test standards to marking designations are deleted in favor of including all of the required marking provisions in Tables 715.3, 715.4 and 715.5. This is intended to provide building and fire code officials with easy access to all of the information needed when inspecting fire window and fire door installations, including required marking designations.

4- In connection with removing many of the text provisions referring to the marking of fire rated glazing and the inclusion of all pertinent marking requirements in tables 715.4 and 715.5, a number of columns are added to those Tables. These new columns specify the required designations that the building and fire code officials will need to look for when inspecting fire rated glazing in the various categories of fire resistance rated walls, fire door assemblies and fire window assemblies identified in Tables 715.4 and 715.5.

5- The size limitation provisions starting at 715.4.6.1 are re-written to eliminate the use of "exceptions" and thus clarify them - no substantive changes to these provisions are intended.

6- It was determined that Table 715.4 inadvertently omitted reference to 1 1/2 hour doors in shaft, exit enclosures and exit passageway walls and this proposal adds that reference to the Table.

7- The Marking Provisions have been written to clarify that fire protection rated glazing tested to NFPA 257 and used in transoms and sidelites in certain fire barriers and corridor walls will also have to be tested to NFPA 252 since they are a part of a door assembly. Accordingly, these glazings are marked D-H-OH-XXX. It has also been clarified where fire rated glazing products must be tested to and marked as complying with ASTM E119 in sidelight and transom assemblies in openings requiring greater than ¾-hour protection, and for glazing sizes exceeding 100 sq. inches in doors rated 1-hour and greater.

8. Section 715.4.6.1 was revised to clarify labeling of door assembly components, and to recognize that door assemblies are permitted to have components labeled by different test agencies.

Bibliography: Examples of UL Listing Markings submitted to CTC Labeling Study Group.

Cost Impact: This code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HEILSTEDT-FS3-702

FS108–09/10

716.1 (IMC 607.1), 716.1.1 (IMC 607.1.1), 716.2.2 (IMC 607.2.2)

Proponent: Vickie Lovell representing 3M Company

Revise as follows:

716.1 (IMC 607.1) General. The provisions of this section shall govern the protection of air duct penetrations and air transfer openings in assemblies required to be protected. Protection of exhaust ducts shall comply with Chapter 5 of the International Mechanical Code.

716.1.1 (IMC 607.1.1) Ducts that penetrate fire-resistance-rated assemblies without dampers. Ducts that penetrate fire-resistance-rated wall assemblies and are not required by this section to have dampers shall be protected as required for penetrations and shall comply with the requirements of Sections 713.2.1.1 through 713.3.3. Ducts that penetrate horizontal assemblies not required to be contained within a shaft and not required by this section to have dampers shall be protected as required for penetrations and comply with the requirements of Sections 713.4 through 713.4.2.2.

716.2 (IMC 607.2) Installation. Fire dampers, smoke dampers, combination fire/smoke dampers and ceiling radiation dampers located within air distribution and smoke control systems shall be installed in accordance with the requirements of this section, the manufacturer's installation instructions and listing and the dampers' listing.

716.2.1 (IMC 607.2.1) Smoke control system. Where the installation of a fire damper will interfere with the operation of a required smoke control system in accordance with Section 909 of the International Building Code, approved alternative protection shall be utilized. Where mechanical systems including ducts and dampers utilized for normal building ventilation serve as part of the smoke control system, the expected performance of these systems in smoke control mode shall be addressed in the rational analysis required by Section 909.4.

716.2.2 (IMC 607.2.2) Hazardous exhaust ducts. Fire dampers for hazardous exhaust duct systems shall comply with the International Mechanical Code. Fire dampers, smoke dampers and combination fire/smoke dampers are prohibited in hazardous exhaust duct systems.

Reason: This section was written with better formatting to clarify where dampers are prohibited altogether. The change was based on Section 510.6.1 of the IMC. Dampers in hazardous ducts cannot "comply with the IMC" in hazardous exhaust ducts. They are not permitted.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LOVELL-FS1-716.1

FS109–09/10
716.3.1 (IMC 607.3.1)

Proponent: Bob Eugene, representing Underwriters Laboratories Inc

Revise as follows:

716.3.1 (IMC 607.3.1) Damper testing. Dampers shall be listed and labeled in accordance ~~bear the label of an approved testing agency indicating compliance~~ with the standards in this section. Fire dampers shall comply with the requirements of UL 555. Only fire dampers labeled for use in dynamic systems shall be installed in heating, ventilation and air-conditioning systems designed to operate with fans on during a fire. Smoke dampers shall comply with the requirements of UL 555S. Combination fire/smoke dampers shall comply with the requirements of both UL 555 and UL 555S. Ceiling radiation dampers shall comply with the requirements of UL 555C.

Reason: The definition of "labeled" requires the approved agency to maintain periodic inspections of the product.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-FS6-716.3.1

FS110–09/10
716.3.2.2, 716.3.2.3

Proponent: Bob Eugene, representing Underwriters Laboratories Inc

Revise as follows:

716.3.2.2 (IMC 607.3.2.2) Smoke damper ratings. Smoke damper leakage ratings shall ~~not~~ be ~~less than~~ Class I or II. Elevated temperature ratings shall not be less than 250 F (121 C).

716.3.2.3 (IMC 607.3.2.3) Combination fire/smoke damper ratings. Combination fire/smoke dampers shall have the minimum fire protection rating specified for fire dampers in Table 716.3.2.1 for the type of penetration and shall also have a minimum ~~Class II leakage rating and a minimum elevated temperature rating of 250 F (121 C)~~.smoke damper ratings as specified in Section 716.3.2.2.

Reason: Provides consistency in the wording for the smoke damper ratings, and clarity of the two acceptable leakage rating Classes.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-FS7-716.3.2.2

FS111–09/10
716.5.3 (IMC 607.5.5)

Proponent: Guy McMann, Jefferson County Colorado, representing Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

716.5.3 (IMC 607.5.5) Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with approved fire and smoke dampers installed in accordance with their listing.

Exceptions:

1. Fire dampers are not required at penetrations of shafts where:
   1.1. ~~Steel exhaust subducts are extended at least 22 inches (559 mm) vertically in exhaust shafts, provided there is a continuous airflow upward to the outside; or~~ Sub-duct exhaust systems are installed in accordance with Sections 504.8 and 515 of the *International Mechanical Code*
   1.2. Penetrations are tested in accordance with ASTM E 119 or UL 263 as part of the fire-resistance rated assembly; or
   1.3. Ducts are used as part of an approved smoke control system designed and installed in accordance with Section 909 and where the fire damper will interfere with the operation of the smoke control system; or
   1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
2. In ~~Group B and R occupancies~~ multi story buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, smoke dampers are not required at penetrations of shafts where sub-duct exhaust systems are installed in accordance with Sections 504.8 and 515 of the *International Mechanical Code*.
   ~~2.1. Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a minimum wall thickness of 0.187 inch (0.4712 mm) (No. 26 gage).~~
   ~~2.2. That extend at least 22 inches (559 mm) vertically; and~~
   ~~2.3. An exhaust fan is installed at the upper terminus of the shaft that is powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outside.~~
3. Smoke dampers are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
4. Smoke dampers are not required at penetrations of shafts where ducts are used as part of an approved mechanical smoke control system designed in accordance with Section 909 and where the smoke damper will interfere with the operation of the smoke control system.
5. Dampers, ~~F~~ fire dampers, ~~and~~ combination fire/smoke dampers and smoke dampers are not required in sub-duct ~~kitchen and clothes dryer~~ exhaust systems when installed in accordance with ~~the~~ Sections 504.8 and 515 of the *International Mechanical Code*.

Reason: This is an effort to update this section as it relates to sub-duct exhaust systems found in the Mechanical Code. There is no need to restate mechanical requirements in this section that are already covered in the Mechanical Code under exhaust system installation. This is intended as a steering mechanism to guide the user to the appropriate code sections. Sub-duct systems have been utilized for many years and they enjoy a good track record. These systems will work in any occupancy and there is no technical justification to limit their use to B and R occupancies. Item# 5 failed to include smoke dampers. Combination smoke/fire dampers are different than plain smoke dampers. This text will streamline this section by dispensing with unnecessary language.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-FS1-716.5.3.doc

FS112–09/10

716.5.3 (IMC 607.5.5)

Proponent: Robert Adkins representing Virginia Plumbing & Mechanical Inspectors Assn and Virginia Building and Code Officials Assn.

Revise as follows:

716.5.3 (IMC 607.5.5) Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with *approved* fire and smoke *dampers* installed in accordance with their listing.

Exceptions:

1. Fire dampers are not required at penetrations of shafts where:
   1.1. Steel exhaust subducts are extended at least 22 inches (559 mm) vertically in exhaust shafts, provided there is a continuous airflow upward to the outside. Dampers shall not be installed in the shaft that have the ability to interrupt the continuous airflow upward ; or
   1.2. Penetrations are tested in accordance with ASTM E119 or UL 263 as part of the fire-resistance-rated assembly; or
   1.3. Ducts are used as part of an *approved* smoke control system designed and installed in accordance with Section 909 and where the *fire damper* will interfere with the operation of the smoke control system; or
   1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.

(Exceptions not shown, remain unchanged)

Reason: The added wording will prevent a fire damper from being installed at the top of a shaft where the shaft isn't installed to the underside of the roof deck as allowed by IBC 708.12. The installation of such a fire damper, and the resulting disruption of a continuous upward airflow, would render the subduct protection useless and allow a fire to exit the rated shaft at unprotected openings. Where an exhaust duct utilizing subducts turns horizontal before penetrating the roof deck, the rated shaft must also turn horizontal and follow the exhaust duct to the roof penetration.

The new wording does allow for the combined use of a subduct penetration into the shaft from one exhaust location, along with a fire damper protected penetration into the shaft from another exhaust location if a designer chooses to combine these uses into one shaft.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Adkins-FS1-716.5.3

FS113–09/10
716.5.3 (IMC 607.5.5)

Proponent: Dave Frable, US General Services Administration, representing the US General Services Administration

Revise as follows:

716.5.3 (IMC 607.5.5) Shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with *approved* fire and smoke *dampers* installed in accordance with their listing.

Exceptions:

1. *Fire dampers* are not required at penetrations of shafts where:
   1.1. Steel exhaust subducts are extended at least 22 inches (559 mm) vertically in exhaust shafts, provided there is a continuous airflow upward to the outside; or
   1.2. Penetrations are tested in accordance with ASTM E 119 or UL 263 as part of the fire-resistance-rated assembly; or
   1.3. Ducts are used as part of an *approved* smoke control system designed and installed in accordance with Section 909 and where the *fire damper* will interfere with the operation of the smoke control system; or
   1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
2. In Group B and R occupancies equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, *smoke dampers* are not required at penetrations of shafts where:

2.1. Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a minimum wall thickness of 0.187-inch (0.4712 mm) (No. 26 gage);
2.2. The subducts extend at least 22 inches (559 mm) vertically; and
2.3. An exhaust fan is installed at the upper terminus of the shaft that is powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outside.

3. *Smoke dampers* are not required at penetrations of shafts in Group B occupancies equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 where the air in ducts continues to move and the air handling system is configured to prevent recirculation of return or exhaust air upon fire conditions.

4.~~3.~~ *Smoke dampers* are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.

5.~~4.~~ *Smoke dampers* are not required at penetrations of shafts where ducts are used as part of an *approved* mechanical smoke control system designed in accordance with Section 909 and where the *smoke damper* will interfere with the operation of the smoke control system.

6.~~5.~~ *Fire dampers* and *combination fire/smoke dampers* are not required in kitchen and clothes dryer exhaust systems when installed in accordance with the *International Mechanical Code*.

Reason: The intent of this code change is to acknowledge that Group B occupancies protected by an operational fire sprinkler system where the air in ducts continues to move and the air handling system is configured to prevent recirculation of return or exhaust air upon fire conditions provides an acceptable level of safety for building occupants and therefore does not warrant the need for the installation of smoke dampers at all penetrations of shaft duct/air transfer opening penetrations. This code change proposes to remove the current requirement for smoke dampers in shaft wall penetrations, but leave fire dampers in place. This is because smoke travel through ducted ventilation shafts has not been a contributing factor to fire deaths in sprinklered Group B occupancies in recent history. Note: all high-rise office fires where smoke spread has been cited as a problem have either occurred in unsprinklered buildings, partially sprinklered buildings or buildings subject to terrorist attacks. Fire sprinklers control the burning rate (and thus limit smoke production) and maintain near ambient temperature which limits the buoyancy forces that drive smoke to the shafts where stack affect may cause smoke spread to other floors. It is also widely accepted that operating fire sprinklers will prevent room flashover and full floor fires, and will limit the size of room fires. The reliability of sprinklers should not be called into question as an NFPA report issued in 2005 indicated that automatic fire sprinklers successfully operating in reported structural fires was an exemplary 93%. This same report indicated that two-thirds of the automatic fire sprinkler system failures were because the automatic fire sprinkler systems were shut off, an unlikely scenario where jurisdictions adopt the IBC since the IBC requires the supervision of the automatic fire sprinkler system. Hence, the successful operation of an automatic fire sprinkler system designed and installed in compliance with the IBC requirements could be reasonably estimated at 98% (or better, since NFPA indicated that a number of fire incidents extinguished by sprinklers may not even be reported).

In addition to fire sprinklers, these buildings have a number of additional safeguards in place. For example, the IMC and NFPA 90A both require duct smoke detectors to shut off of air handling equipment to minimize the potential of smoke spread through ventilation ducts. Also, the 2009 edition of the IBC now requires a number of additional safety enhancements such as: two way communication at elevator landings; an increase of 50% in egress capacity for exit stairs in all buildings; increased cohesive/adhesive bond strength for sprayed fire resistive materials; exit stair path markings in all high rise buildings; fire service access elevators for buildings greater than 120 feet; and an additional stair and redundant sprinkler risers for buildings greater than 420 feet, etc.

Given the aforementioned protection coupled with the excellent track record for sprinklered B occupancies, and keeping in mind that the purpose of the IBC is to provide minimum requirements to safeguard occupants of buildings from fire and other hazards attributed to the built environment based on sound technical documentation, we strongly believe that it is unreasonable to require smoke dampers in shaft duct/air transfer opening penetrations as an additional means for slowing or stopping the spread of smoke throughout a building.

Note: Though not relevant to this code change, NFPA 90A does not require smoke dampers in shaft walls regardless of whether the building is sprinklered. Also note that some jurisdictions (e.g., Commonwealth of Virginia) are granting similar modifications to the requirement for smoke dampers in exhaust ducts because it is impractical to comply with the IBC and there is no demonstrated need.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Frable-FS1-716.5.3

FS114–09/10
716.5.4 (IMC 607.5.3)

Proponent: Tom Hedges, representing the Arizona Building Officials

Revise as follows:

716.5.4 (IMC 607.5.3) Fire partitions. Ducts and air transfer openings that penetrate *fire partitions* shall be protected with *listed fire dampers* installed in accordance with their listing.

Exceptions: In occupancies other than Group H, *fire dampers* are not required where any of the following apply:

1. Corridor walls in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 and the duct is protected as a *through penetration* in accordance with Section 713.
2. Tenant partitions in *covered mall buildings* where the walls are not required by provisions elsewhere in the code to extend to the underside of the floor or roof sheathing, slab or deck above.
3. The duct system is constructed of *approved* materials in accordance with the *International Mechanical Code* and the duct penetrating the wall complies with all of the following requirements:
   3.1. The duct shall not exceed 100 square inches (0.06 m2).
   3.2. The duct shall be constructed of steel a minimum of 0.0217 inch (0.55 mm) in thickness.
   3.3. The duct shall not have openings that communicate the *corridor* with adjacent spaces or rooms.
   3.4. The duct shall be installed above a ceiling.
   3.5. The duct shall not terminate at a wall register in the fire-resistance-rated wall.
   3.6. A minimum 12-inch-long (305 mm) by 0.060-inch-thick (1.52 mm) steel sleeve shall be centered in each duct opening. The sleeve shall be secured to both sides of the wall and all four sides of the sleeve with minimum 11/2-inch by 11/2-inch by 0.060-inch (38mmby 38mmby 1.52 mm) steel retaining angles. The retaining angles shall be secured to the sleeve and the wall with No. 10 (M5) screws. The *annular space* between the steel sleeve and the wall opening shall be filled with mineral wool batting on all sides.
4. Such walls are penetrated by ducted HVAC systems, have a required fire-resistance rating of 1 hour or less, and are in areas of other than Group H and are in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. For the purposes of this exception, a ducted HVAC system shall be a duct system for conveying supply, return or exhaust air as part of the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than 26 gage thickness and shall be continuous from the air-handling appliance or equipment to the air outlet and inlet terminals.

Reason: Currently the code is less restrictive for penetrations of a fire barrier than a fire partition. This proposal adds an additional exception for fire partitions. This proposal duplicates text of Section 716.5.2 Exception 3 as an exception 4 for fire partitions. It is logical to allow the exception for a wall type where the code places lesser restrictions on its use. This exception does not limit the size of a duct penetration as Exception 3 does currently. If this exception is acceptable for fire barriers, it should be acceptable for fire partitions.

Cost Impact: The code change proposal will not increase the cost of construction. Will lower cost.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HEDGES-FS1-716.5.4

FS115–09/10
716.6.1 (IMC 607.6.1)

Proponent: Wesley R. Davis, representing Air Conditioning Contractors of America

Revise as follows:

716.6.1 (IMC 607.6.1) Through penetrations. In occupancies other than Groups I-2 and I-3, a duct constructed of approved materials in accordance with the International Mechanical Code that penetrates a fire-resistance-rated floor/ceiling assembly that connects not more than two stories is permitted without shaft enclosure protection provided that a listed fire damper is installed at the floor line or the duct is protected in accordance wth Section 713.4. For air transfer openings, see Exception 7 to Section 708.2.

Exception: A duct is permitted to penetrate three floors or less without a *fire damper* at each floor, provided such duct meets all of the following requirements:

1. The duct shall be contained and located within the cavity of a wall, where the duct passes through occupied areas, and shall be constructed of steel having a minimum wall thickness of 0.187-inches (0.4712 mm) (No. 26 gage).
2. The duct shall open into only one *dwelling or sleeping unit* and the duct system shall be continuous from the unit to the exterior of the building.
3. The duct shall not exceed 4-inch (102 mm) nominal diameter and the total area of such ducts shall not exceed 100 square inches (0.065 m2) in any 100 square feet (9.3 m2) of floor area.

4. The annular space around the duct is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 or UL 263 time-temperature conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the *fire-resistance rating* of the construction penetrated.
5. Grille openings located in a ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly shall be protected with a *listed ceiling radiation damper* installed in accordance with Section 716.6.2.1.

Reason: This change will accurately reflect the requirement. Duct must be protected from damage from those in the occupied space, a wall provides that protection. In unoccupied spaces, such as interstitial ceiling/floor areas or attics, this requirement is unnecessary.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Davis-FS1-716.6.1

FS116–09/10
716.6.3 (IMC 607.6.3)

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., representing International Firestop Council

Revise as follows:

716.6.3 (IMC 607.6.3) Non fire-resistance-rated floor assemblies. Duct systems constructed of *approved* materials in accordance
with the *International Mechanical Code* that penetrate non fire-resistance-rated floor assemblies shall be protected by any of the following methods:

1. A shaft enclosure in accordance with Section 708,or an *approved* alternative duct assembly that is a *listed* and *labelled* material, system, product or method of construction specifically evaluated for such purpose.
2. The duct connects not more than two *stories*, and the *annular space* around the penetrating duct is protected with an *approved* noncombustible material that resists the free passage of flame and the products of combustion.
3. The duct connects not more than three *stories*, and the *annular space* around the penetrating duct is protected with an *approved* noncombustible material that resists the free passage of flame and the products of combustion and a *fire damper* is installed at each floor line.

   Exception: *Fire dampers* are not required in ducts within individual residential *dwelling units*.

Reason: To introduce alternative methods for protection of ducts penetrating non fire-resistance rated assemblies. The protection of these ducts can be accomplished using *approved* alternative duct enclosures that are *listed* and *labelled* systems or product specifically evaluated for such purpose. There are alternative methods available for providing protection for duct enclosures beyond the existing shaft provisions.

Substantiation: For these applications, Section 708 requires shafts to be constructed as *fire barriers* in accordance with Section 707 or *horizontal assemblies* in accordance with Section 712. There are potentially cost-effective alternatives for protection of penetrations through non fire-resistance rated assemblies.

As an example, in November of 2005, ICC-ES approved the publication of AC 179, *Acceptance Criteria for Metallic HVAC Duct Enclosure Assemblies,* which can be used to evaluate products used for these applications. The purpose of the acceptance criteria is to establish requirements for fire protection enclosure systems applied to metallic HVAC ducts, as alternatives to shaft enclosures for vertical ducts with required fire-resistance-rated shafts under specified conditions, with limitations on their application. The criteria also provides an alternate to fire dampers in horizontal ducts (penetrating fire barriers, fire partitions, and or smoke barriers) and vertical ducts connecting not more than two stories. AC 179 evaluates the enclosure materials and the HVAC duct enclosure systems using the following test methods: Flame spread, smoulder resistance, a fire engulfment test based on ISO 6944 with a through-penetration fire stop, durability tests, and thermal conductivity.

Another example of a listed and labeled system which could potentially fulfill this function are systems tested in conformance with the ASTM E2336, *Standard Test Methods for Fire Resistive Grease Duct Enclosure Systems*. This standard evaluates enclosure materials and the duct enclosure systems using the following test methods: non-combustibility, full scale fire resistance, durability, internal fire, and fire-engulfment with a through-penetration fire stop. Enclosure systems which meet the ASTM E2336 criteria demonstrate the ability to resist the passage of flames and hot gases during a standardized fire resistance test and a standardized internal fire test, as well as an ability to resist transmission of heat through the duct and the enclosure material(s). The ability of a fire stop to meet the requirements of Test Method E 814 when used with the duct enclosure system is also evaluated. The test method prescribes an ASTM E119 fire exposure for both a fire engulfment and a fire resistance wall test. The fire resistance test illustrates the ability of the enclosure material to resist the effects of fire when applied in a vertical application (i.e. as a wall assembly tested in accordance with ASTM E119).

In addition, an internal fire test uses two standardized fire exposures occurring inside the protected duct itself. Both tests illustrate the enclosure material's ability to resist thermal transmission of heat to the unexposed side in a horizontal application. The first standardized fire exposure is intended to simulate long term exposure of the enclosure material to a standardized service condition. The test simulates an internal fire within the duct by maintaining a minimum 500°F (260°C) average interior temperature for at least 4 h. The second standardized fire exposure is intended to simulate a sudden rise in the exposure conditions within the duct. Within 15 min after the end of the 4-h period, increase the average

interior temperature in the duct is increased to 2000°F (1093°C). This exposure is then maintained for 30 minutes, which simulates a large fire event within the duct. The current provisions of 5.10.8.2 do not explicitly take this into account. A durability test is included for the materials, which is intended to simulate the effects of long-term exposure of typical in-service conditions on the thermal transmission qualities of the enclosure materials when subjected to a modified version of Test Method C 518. A fire-engulfment test uses a standardized fire exposure, the time temperature curve of Test Methods E 119, to simulate a fire occurring on the outside of the grease duct, and demonstrates the ability of the duct enclosure system to remain intact without a through opening. The fire-engulfment test also tests the fastening methods used to secure the enclosure material to the grease duct and the supporting system. The fire-engulfment test also provides a means to test a through-penetration fire stop to determine its compatibility with the duct enclosure system. The fire-engulfment and vertical fire resistance tests are followed by the application of a standardized hose stream test.

Work is currently underway on the development of an ASTM Consensus Standard for this application, but until such time as that process is complete, the proposed language incorporated here will provide a means of evaluating the performance of these products and systems, which are becoming more widespread in their use, while not restricting the choice of acceptable solutions available to designers.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRIMI-FS2-716.6.3

FS117–09/10

716.1, 716.5, 716.5.1, 716.5.1.1, 716.5.2, 716.5.2.1, 716.5.3, 716.5.4, 716.5.4.1, 716.5.5. 716.5.6, 716.5.7, 716.6, 716.6.1, 716.6.2, 716.6.2.1, 716.6.3, 716.2, 716.2.1, 716.2.2, 716.1.1.1 (IMC 607.1, 607.5, 907.5.1, 607.5.1.1, 907.5.2, 607.5.2.1, 607.5.5, 607.5.3, 607.5.4, 607.5.6, 607.5.7, 607.6, 607.6.1, 607.6.2, 607.6.2.1, 607.6.3, 607.1.1, 607.2, 607.2.1, 607.2.2, 607.1.1.1, 607.7)

Proponent: Sarah A. Rice, CBO, representing self

Revise as follows:

SECTION 716 DUCTS AND AIR TRANSFER OPENINGS

716.1 (IMC 607.1) General. The provisions of this section shall govern the protection of duct penetrations and air transfer openings in assemblies required to be protected.

~~**716.5**~~ **716.2 (IMC 607.5) Where required.** *Fire dampers, smoke dampers* and *combination fire/smoke dampers* shall be provided at the locations prescribed in Sections 716.2.1 through 716.2.7 and 716.6. Where an assembly is required to have both *fire dampers* and *smoke dampers*, *combination fire/smoke dampers* or a *fire damper* and a *smoke damper* shall be required.

~~**716.5.1**~~ **716.2.1 (IMC 607.5.1) Fire walls.** Ducts and air transfer openings permitted in *fire walls* in accordance with Section 706.11 shall be protected with *listed fire dampers* installed in accordance with their listing.

~~**716.5.1.1**~~ **716.2.1.1 (IMC 607.5.1.1) Horizontal exits.** A *listed smoke damper* designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a *fire wall* that serves as a horizontal *exit*.

~~**716.5.2**~~ **716.2.2 (IMC 607.5.2) Fire barriers.** Ducts and air transfer openings of *fire barriers* shall be protected with *approved fire dampers* installed in accordance with their listing. Ducts and air transfer openings shall not penetrate *exit* enclosures and *exit* passageways except as permitted by Sections 1022.4 and 1023.6, respectively.

Exception: *Fire dampers* are not required at penetrations of *fire barriers* where any of the following apply:

1. Penetrations are tested in accordance with ASTM E 119 or UL 263 as part of the fire-resistance-rated assembly.
2. Ducts are used as part of an *approved* smoke control system in accordance with Section 909 and where the use of a *fire damper* would interfere with the operation of a smoke control system.
3. Such walls are penetrated by ducted HVAC systems, have a required *fire-resistance rating* of 1 hour or less, are in areas of other than Group Hand are in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2. For the purposes of this exception, a ducted HVAC system shall be a duct system for conveying supply, return or exhaust air as part of the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than No. 26 gage thickness and shall be continuous from the air-handling appliance or equipment to the air outlet and inlet terminals.

~~716.5.2.1~~ **716.2.2.1 (IMC 607.5.2.1) Horizontal exits.** A *listed smoke damper* designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a *fire barrier* that serves as a horizontal *exit*.

~~716.5.3~~ **716.2.3 (IMC 607.5.5) Shaft enclosures.** Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with *approved* fire and smoke *dampers* installed in accordance with their listing.

Exceptions:

1. *Fire dampers* are not required at penetrations of shafts where:
   1.1. Steel exhaust subducts are extended at least 22 inches (559 mm) vertically in exhaust shafts, provided there is a continuous airflow upward to the outside; or
   1.2. Penetrations are tested in accordance with ASTM E 119 or UL 263 as part of the fire-resistance-rated assembly; or
   1.3. Ducts are used as part of an *approved* smoke control system designed and installed in accordance with Section 909 and where the *fire damper* will interfere with the operation of the smoke control system; or
   1.4. The penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
2. In Group B and R occupancies equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, *smoke dampers* are not required at penetrations of shafts where:
   2.1. Kitchen, clothes dryer, bathroom and toilet room exhaust openings are installed with steel exhaust subducts, having a minimum wall thickness of 0.187-inch (0.4712 mm) (No. 26 gage);
   2.2. The subducts extend at least 22 inches (559 mm) vertically; and
   2.3. An exhaust fan is installed at the upper terminus of the shaft that is powered continuously in accordance with the provisions of Section 909.11, so as to maintain a continuous upward airflow to the outside.
3. *Smoke dampers* are not required at penetration of exhaust or supply shafts in parking garages that are separated from other building shafts by not less than 2-hour fire-resistance-rated construction.
4. *Smoke dampers* are not required at penetrations of shafts where ducts are used as part of an *approved* mechanical smoke control system designed in accordance with Section 909 and where the *smoke damper* will interfere with the operation of the smoke control system.
5. *Fire dampers* and *combination fire/smoke dampers* are not required in kitchen and clothes dryer exhaust systems when installed in accordance with the *International Mechanical Code*.

~~716.5.4~~ **716.2.4 (IMC 607.5.3) Fire partitions.** Ducts and air transfer openings that penetrate *fire partitions* shall be protected with *listed fire dampers* installed in accordance with their listing.

Exceptions: In occupancies other than Group H, *fire dampers* are not required where any of the following apply:

1. Corridor walls in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2 and the duct is protected as a *through penetration* in accordance with Section 713.
2. Tenant partitions in *covered mall buildings* where the walls are not required by provisions elsewhere in the code to extend to the underside of the floor or roof sheathing, slab or deck above.
3. The duct system is constructed of *approved* materials in accordance with the *International Mechanical Code* and the duct penetrating the wall complies with all of the following requirements:
   3.1. The duct shall not exceed 100 square inches (0.06 m_2).
   3.2. The duct shall be constructed of steel a minimum of 0.0217 inch (0.55 mm) in thickness.
   3.3. The duct shall not have openings that communicate the *corridor* with adjacent spaces or rooms.
   3.4. The duct shall be installed above a ceiling.
   3.5. The duct shall not terminate at a wall register in the fire-resistance-rated wall.
   3.6. A minimum 12-inch-long (305 mm) by 0.060-inch-thick (1.52 mm) steel sleeve shall be centered in each duct opening. The sleeve shall be secured to both sides of the wall and all four sides of the sleeve with minimum $1_1/_2$-inch by $1_1/_2$-inch by 0.060-inch (38mmby 38mmby 1.52 mm) steel retaining angles. The retaining angles shall be secured to the sleeve and the wall with No. 10 (M5) screws. The *annular space* between the steel sleeve and the wall opening shall be filled with mineral wool batting on all sides.

~~716.5.4.1~~ **716.2.4.1 (IMC 607.5.4) Corridors.** A *listed smoke damper* designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a *corridor* enclosure required to have smoke and draft control doors in accordance with Section 715.4.3.

Exceptions:

1. *Smoke dampers* are not required where the building is equipped throughout with an *approved* smoke control system in accordance with Section 909, and *smoke dampers* are not necessary for the operation and control of the system.
2. *Smoke dampers* are not required in *corridor* penetrations where the duct is constructed of steel not less than 0.019 inch (0.48 mm) in thickness and there are no openings serving the *corridor*.

~~716.5.5~~ **716.2.5 (IMC 607.5.4) Smoke barriers.** A *listed smoke damper* designed to resist the passage of smoke shall be provided at each point a duct or air transfer opening penetrates a *smoke barrier*. *Smoke dampers* and *smoke damper* actuation methods shall comply with Section 716.3.3.2.

Exception: *Smoke dampers* are not required where the openings in ducts are limited to a single smoke compartment and the ducts are constructed of steel.

~~716.5.6~~ **716.2.6 (IMC 607.5.6) Exterior walls.** Ducts and air transfer openings in fire-resistance-rated *exterior walls* required to have protected openings in accordance with Section 705.10 shall be protected with *listed fire dampers* installed in accordance with their listing.

~~716.5.7~~ **716.2.7 (IMC 607.5.7) Smoke partitions.**A*listed smoke damper* designed to resist the passage of smoke shall be provided at each point that an air transfer opening penetrates a smoke partition. *Smoke dampers* and *smoke damper* actuation methods shall comply with Section 716.3.3.2.

Exception: Where the installation of a *smoke damper* will interfere with the operation of a required smoke control system in accordance with Section 909, *approved* alternative protection shall be utilized.

~~716.6~~ **716.3 (IMC 607.6) Horizontal assemblies.** Penetrations by ducts and air transfer openings of a floor, floor/ceiling assembly or the ceiling membrane of a roof/ceiling assembly shall be protected by a shaft enclosure that complies with Section 708 or shall comply with Sections 716.3.1 through 716.3.3.

~~716.6.1~~ **716.3.1 (IMC 607.6.1) Through penetrations.** In occupancies other than Groups I-2 and I-3, a duct constructed of *approved* materials in accordance with the *International Mechanical Code* that penetrates a fire-resistance-rated floor/ceiling assembly that connects not more than two *stories* is permitted without shaft enclosure protection, provided a *listed fire damper* is installed at the floor line or the duct is protected in accordance with Section 713.4. For air transfer openings, see Exception 7 to Section 708.2.

Exception: A duct is permitted to penetrate three floors or less without a *fire damper* at each floor, provided such duct meets all of the following requirements:

1. The duct shall be contained and located within the cavity of a wall and shall be constructed of steel having a minimum wall thickness of 0.187 inches (0.4712 mm) (No. 26 gage).
2. The duct shall open into only one *dwelling or sleeping unit* and the duct system shall be continuous from the unit to the exterior of the building.
3. The duct shall not exceed 4-inch (102 mm) nominal diameter and the total area of such ducts shall not exceed 100 square inches (0.065 m_2) in any 100 square feet (9.3 m_2) of floor area.
4. The annular space around the duct is protected with materials that prevent the passage of flame and hot gases sufficient to ignite cotton waste where subjected to ASTM E 119 or UL 263 time-temperature conditions under a minimum positive pressure differential of 0.01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the *fire-resistance rating* of the construction penetrated.
5. Grille openings located in a ceiling of a fire-resistance- rated floor/ceiling or roof/ceiling assembly shall be protected with a *listed ceiling radiation damper* installed in accordance with Section 716.6.2.1.

~~716.6.2~~ **716.3.2 (IMC 607.6.2) Membrane penetrations.** Ducts and air transfer openings constructed of *approved* materials in accordance with the *International Mechanical Code* that penetrate the ceiling membrane of a fire-resistance-rated floor/ceiling or roof/ceiling assembly shall be protected with one of the following:

1. A shaft enclosure in accordance with Section 708.

2. A *listed ceiling radiation damper* installed at the ceiling line where a duct penetrates the ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly.
3. A *listed ceiling radiation damper* installed at the ceiling line where a diffuser with no duct attached penetrates the ceiling of a fire-resistance-rated floor/ceiling or roof/ceiling assembly.

~~716.6.2.1~~ 716.3.2.1 **(IMC 607.6.2.1) Ceiling radiation dampers.** *Ceiling radiation dampers* shall be tested as part of a fire-resistance-rated floor/ceiling or roof/ceiling assembly in accordance with ASTME 119 orUL263. *Ceiling radiation dampers* shall be installed in accordance with the details *listed* in the fire-resistance-rated assembly and the manufacturer's installation instructions and the listing. *Ceiling radiation dampers* are not required where either of the following applies:

1. Tests in accordance with ASTM E 119 or UL 263 have shown that *ceiling radiation dampers* are not necessary in order to maintain the *fire-resistance rating* of the assembly.
2. Where exhaust duct penetrations are protected in accordance with Section 713.4.1.2, are located within the cavity of a wall and do not pass through another *dwelling unit* or tenant space.

~~716.6.3~~ 716.3.3 **(IMC 607.6.3) Nonfire-resistance-rated floor assemblies.** Duct systems constructed of *approved* materials in accordance with the *International Mechanical Code* that penetrate nonfire-resistance-rated floor assemblies shall be protected by any of the following methods:

1. A shaft enclosure in accordance with Section 708.
2. The duct connects not more than two *stories*, and the *annular space* around the penetrating duct is protected with an *approved* noncombustible material that resists the free passage of flame and the products of combustion.
3. The duct connects not more than three *stories*, and the *annular space* around the penetrating duct is protected with an *approved* noncombustible material that resists the free passage of flame and the products of combustion and a *fire damper* is installed at each floor line.

   Exception: *Fire dampers* are not required in ducts within individual residential *dwelling units*.

~~716.1.1~~ 716.3 **(IMC 607.1.1) Ducts that penetrate fire-resistance-rated assemblies without dampers.** Ducts that penetrate fire-resistance-rated assemblies and are not required by this section to have *dampers* shall comply with the requirements of Sections 713.2 through 713.3.3. Ducts that penetrate *horizontal assemblies* not required to be contained within a shaft and not required by this section to have *dampers* shall comply with the requirements of Sections 713.4 through 713.4.2.2.

~~716.2~~ 716.4 **(IMC 607.2) Installation.** *Fire dampers, smoke dampers, combination fire/smoke dampers* and *ceiling radiation dampers* located within air distribution and smoke control systems shall be installed in accordance with the requirements of this section, the manufacturer's installation instructions and the *dampers*' listing.

~~716.2.1~~ 716.4.1 **(IMC 607.2.1) Smoke control system.** Where the installation of a fire *damper* will interfere with the operation of a required smoke control system in accordance with Section 909, *approved* alternative protection shall be utilized. Where mechanical systems including ducts and *dampers* utilized for normal building ventilation serve as part of the smoke control system, the expected performance of these systems in smoke control mode shall be addressed in the rational analysis required by Section 909.4.

716.4.2 ~~716.2.2~~ (IMC 607.2.2) Hazardous exhaust ducts. *Fire dampers* for hazardous exhaust duct systems shall comply with the *International Mechanical Code*.

716.4.3 ~~716.1.1.1~~ (IMC 607.1.1.1) Ducts that penetrate nonfire-resistance- rated assemblies. The space around a duct penetrating a nonfire-resistance-rated floor assembly shall comply with Section 716.6.3.

Sections 716.3 – 716.4 to become Sections 716.5 – 716.6. *(Content unchanged)*

716.7 (IMC 607.7) Flexible ducts and air connectors. *(No change to text)*

Reason: This code change is one in a series of code changes intended to add clarity to the provisions of Chapter 7. Unless otherwise specifically stated, each code change can be accepted on its own merits.

This code change addresses and Section 716 (Ducts and Air Transfer Openings). This proposal is intended to accomplish several things:

Reorganization to bring the “where required” sections to the front. As a code user, the primary piece of information needed is – is a damper is even needed. If not there is no need to go any further in the section, if a damper is required, then the user will need to know the other elements that go with the devices, e.g., installation details, testing, etc. The proposed reorganization follows the format which is used for the sprinkler and fire alarm sections of the code;
Clarification regarding what types of other protection are required when a damper is not required by Section 716;
Clarification and simplification of the exceptions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-FS1L-716

FS118–09/10
717.2.1; IRC R302.11.1

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing Cellulose Insulation Manufacturers Association (CIMA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Revise as follows:

717.2.1 Fireblocking materials. Fireblocking shall consist of the following materials:

1. Two-inch (51 mm) nominal lumber.
2. Two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints.
3. One thickness of 0.719-inch (18.3 mm) wood structural panels with joints backed by 0.719-inch (18.3 mm) wood structural panels.
4. One thickness of 0.75-inch (19.1 mm) particleboard with joints backed by 0.75-inch (19 mm) particleboard.
5. One-half-inch (12.7 mm) gypsum board.
6. One-fourth-inch (6.4 mm) cement-based millboard.
7. Batts or blankets of mineral wool, mineral fiber or other approved materials installed in such a manner as to be securely retained in place.
8. Spray-applied cellulose insulation installed as tested for the specific application

PART II – IRC BUILDING/ENERGY

Revise as follows:

R302.11.1 Fireblocking materials. Except as provided in Section R302.11, Item 4, fireblocking shall consist of the following materials:

1. Two-inch (51 mm) nominal lumber.
2. Two thicknesses of 1-inch (25 mm) nominal lumber with broken lap joints.
3. One thickness of 23/32-inch (18.3 mm) wood structural panels with joints backed by 23/32-inch (18.3 mm) wood structural panels.
4. One thickness of ¾-inch (19.1 mm) particleboard with joints backed by ¾-inch (19 mm) particleboard.
5. One-half-inch (12.7 mm) gypsum board.
6. One-quarter-inch (6.4 mm) cement-based millboard.
7. Batts or blankets of mineral wool or glass fiber or other approved materials installed in such a manner as to be securely retained in place.
8. Spray-applied cellulose insulation installed as tested for the specific application.

Reason: This code change simply adds a new Item 8 to the list of fireblocking materials to recognize spray-applied cellulose insulation as a suitable fireblocking material. It qualifies the use of spray-applied cellulose insulation by indicating that it must be installed as tested for the specific application. The Cellulose Insulation Manufacturers Association (CIMA) has conducted a variety of fireblocking fire tests based on the ASTM E119 time-temperature fire curve exposure to demonstrate that spray-applied cellulose insulation will serve as an adequate fireblocking material.

It should be noted that spray-applied cellulose insulation is different than loose-fill cellulose insulation in that it is sprayed in place using a nozzle under pressure with a small quantity of water added to the insulation to activate the adhesive that, when dried, holds the cellulose insulation in place. Thus, it can be exposed in vertical applications, as well as horizontal applications. Furthermore, it will remain in place after it has dried without any need to restrain or otherwise contain or enclose it.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Thornberry-FS4-717.2.1; RB-1-R302.11.1

FS119–09/10
717.2.6

Proponent: Rick Thornberry, PE, Jesse J. Beitel, The Code Consortium, Inc., Hughes Associates, Inc., representing Trespa North America, Ltd.

Revise as follows:

717.2.6 ~~Architectural trim~~ Exterior Wall Coverings. Fireblocking shall be installed within concealed spaces of exterior wall coverings ~~finish~~ and other exterior architectural elements where permitted to be of combustible construction as specified in Section 1406 or where erected with combustible frames.~~,~~ Fireblocking shall be installed at maximum intervals of 20 feet (6096 mm)~~,~~ in either dimension so that there will be no ~~open~~ concealed space exceeding 100 square feet (9.3m^3) between fireblocking. Where wood furring strips are used, they shall be of approved wood of natural decay resistance or preservative-treated wood. If noncontinuous, such elements shall have closed ends, with at least 4 inches (102 mm) of separation between sections.

Exceptions:

1. Fireblocking of cornices is not required in single-family dwellings. Fireblocking of cornices of a two-family dwelling is required only at the line of dwelling unit separation.
2. Fireblocking shall not be required where the exterior wall covering is installed on noncombustible framing and the face of the exterior wall covering ~~finish~~ exposed to the concealed space is covered by one of the following materials:
   2.1. Aluminum having a minimum thickness of 0.019 inch (0.5 mm).
   2.2. Corrosion-resistant steel having a base of metal thickness not less than 0.016 inch (0.4 mm) at any point.
   2.3. Other approved noncombustible materials.
3. Fireblocking shall not be required where the exterior wall covering has been tested in accordance with, and complies with the acceptance criteria of, NFPA 285. The exterior wall covering shall be installed as tested in accordance with NFPA 285.

Reason: This proposed code change contains editorial revisions to clarify the text as well as a proposed new Exception 3.

The editorial clarifications are proposed to utilize consistent terminology based on the definition for "Exterior Wall Coverings" found in Section 1402.1. It also clarifies how the required fireblocking is to be installed in the concealed space between the exterior wall covering and the exterior wall face.

Exception 3 is being proposed to allow the omission of the fireblocking required by this section in those cases where the exterior wall covering has been tested in accordance with NFPA 285 Standard Method of Test for the Evaluation of Flammability Characteristics of Exterior Nonload-Bearing Wall Assemblies Containing Combustible Components and complies with the acceptance criteria therein as indicating successful performance for resisting exterior fire and flame spread along the face of and within the interior cavities of the exterior wall system. It follows that if the exterior wall covering installation meets successful performance based on the NFPA 285 exterior wall fire test, there is no need to install fireblocking within the concealed space of the exterior wall created by the installation of the exterior wall covering since it has demonstrated the ability to resist the spread of fire and flame within the concealed space. In fact, the NFPA 285 test is used to qualify combustible materials for use on exterior walls of buildings of Types I, II, III, and IV construction which are otherwise required to be of noncombustible construction. And it is specifically referenced in Section 1407 for metal composite materials (MCM) and Section 2603.5 for foam plastic insulated exterior walls.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Thornberry-Beitel-FS11-717.2.6

FS120–09/10
717.3.2

Proponent: Jeff Hugo, CBO, representing National Fire Sprinkler Association

Revise as follows:

717.3.2 Groups R-1, R-2, R-3 and R-4. Draftstopping shall be provided in floor/ceiling spaces in Group R-1 buildings, in Group R-2 buildings with three or more dwelling units, in Group R-3 buildings with two dwelling units and in Group R-4 buildings. Draftstopping shall be located above and in line with the dwelling unit and sleeping unit separations.

Exceptions:

1. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2, provided that automatic sprinklers are also installed in the combustible concealed spaces where the draftstopping is being omitted.

Reason: Section 903.3.1.2 refers to NFPA 13R, which does not require sprinklers in the concealed floor/ceiling assemblies, other combustible concealed spaces, and attics. However, the wording of this section often leads to misinterpretation by the AHJ or designer to install sprinklers in all these spaces exempted by NFPA 13R. The intent of this section is to eliminate the draftstopping above the sleeping unit or dwelling spaces in the attic space, if the attic is sprinklered, and the inserted new text further clarifies the intent of the section.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HUGO-FS1-717.3.2

FS121–09/10
717.4.2

Proponent: Jeff Hugo, CBO, representing National Fire Sprinkler Association

Revise as follows:

717.4.2 Groups R-1 and R-2. Draftstopping shall be provided in attics, mansards, overhangs or other concealed roof spaces of Group R-2 buildings with three or more dwelling units and in all Group R-1 buildings. Draftstopping shall be installed above, and in line with, sleeping unit and dwelling unit separation walls that do not extend to the underside of the roof sheathing above.

Exceptions:

1. Where corridor walls provide a sleeping unit or dwelling unit separation, draftstopping shall only be required above one of the corridor walls.
2. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. In occupancies in Group R-2 that do not exceed four stories above grade plane, the attic space shall be subdivided by draftstops into areas not exceeding 3,000 square feet (279 m2) or above every two dwelling units, whichever is smaller.
4. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2, provided that automatic sprinklers are also installed in the combustible concealed space. ~~,~~ where the draftstopping is being omitted.

Reason: Section 903.3.1.2 refers to NFPA 13R, which does not require sprinklers in the concealed floor/ceiling assemblies, other combustible concealed spaces, and attics. However, the wording of this section often leads to misinterpretation by the AHJ or designer to install sprinklers in all these spaces exempted by NFPA 13R. The intent of this section is to eliminate the draftstopping above the sleeping unit or dwelling spaces in the attic space, if the attic is sprinklered, and the inserted new text further clarifies the intent of the section.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: HUGO-FS2-717.4.2

FS122–09/10
719.1

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., representing North American Insulation Manufacturers Association

Revise as follows:

719.1 General. Insulating materials, including facings such as vapor retarders and *vapor-permeable membranes*, similar coverings and all layers of single and multilayer reflective foil insulations, shall comply with the requirements of this section. Where a flame spread index or a smoke-developed index is specified in this section, such index shall be determined in accordance with ASTM E 84 or UL 723. Any material that is subject to an increase in flame spread index or smoke-developed index beyond the limits herein established through the effects of age, moisture or other atmospheric conditions shall not be permitted.

Exceptions:

2. Foam plastic insulation shall comply with Chapter 26 and have a smoke developed index of not more than 450.

(Exceptions not shown, remain unchanged)

Reason: The exception for foamed plastics in Chapter 26 does not adequately cover smoke developed performance of foamed plastics. Current requirements for glass fiber, mineral fiber, cellulose and reflective plastic core insulation all require both flame spread and smoke development requirements either based on ASTM E84 or UL 723 or 803.1.2. Alternative methods are acceptable for use, however, their performance level needs to address the same hazards as the base requirement, plus any additional hazards that might arise as a result of a specific material.

Justification: For all other thermal and sound insulating materials within the IBC, **including non-combustible insulation materials**, the minimum performance level for materials permitted to be used includes at least some requirements for both flame spread (fire growth) and smoke production. These requirements are primarily based on either ASTM E84 testing or alternative methods such as NFPA 286, CAN/ULC-S102.2, or even UL 1715 with the inclusion of the criterion from 803.1.2. However, in the case of foamed plastics, of the four alternative test methods permitted by 2603.9, only NFPA 286 contains any limits on smoke developed for any foamed plastics by virtue of the inclusion of a reference to section 803.1.
Room corner tests such as FM 4880, UL 1040, NFPA 286 or UL 1715 do evaluate fire growth and flashover. However, with the exception of the criteria for NFPA 286 in 803.1.2, the pass/fail criteria proposed for the room corner tests in the proposed acceptance criteria do not include quantitative evaluation of smoke density. Criteria for fire and smoke performance of building materials are based as much on issues arising from smoke production from burning materials, and smoke migration within the occupied spaces. It is not reasonable to provide an exception to the basic ASTM E84 flame spread and smoked developed requirements which apply to all other types of insulations, even noncombustible insulations, for foamed plastics based on room corner tests unless the limits on smoke production are applied to all of the room corner tests.
There are numerous reported instances of the hazards associated with smoke production from building materials. One is the tragic fire at the Greenwood Health Center in Hartford, CT on Feb 26 2003. The New York Times quoted Chief Charles A. Teale of the Hartford Fire Department as stating that "Most of the 10 residents killed, ranging in ages from 27 to 76, died of smoke inhalation". The same article further goes on to quote officials as saying: "The nursing home itself suffered little damage, though, and the fire was put out in about 15 minutes. Most of the residents were then led back inside, and by midday, 84 of the 148 residents remained at the center".

It is reasonable to allow alternative methods of testing materials to determine their acceptability for use, however, their performance criteria needs to address the same hazards as the base requirement, plus any additional hazards that might arise as a result of a specific material.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CRIMI-FS8-719.1

FS123–09/10
719.7

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

Revise as follows:

719.7 Insulation and covering on pipe and tubing. Insulation and covering on pipe and tubing shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450. This shall include insulation coverings on exposed water supply and drainpipes under accessible lavatories and sinks.

Exception: Insulation and covering on pipe and tubing installed in plenums shall comply with the *International Mechanical Code.*

Reason: There have been some statements that insulation coverings required on exposed water supply and drainpipes for ADA compliance are not really insulation products and, therefore, need to comply with the requirements for insulation in the IBC. This code proposal is simply clarification.

The ADA requires that exposed hot water and drainpipes under lavatories and sinks be insulated (sections 4.19.4 and 4.24.6). The ICC/ANSI A117.1/2003 Standard (Accessible and Usable Buildings and Facilities 606.6 Exposed Pipes and Surfaces) states that: "*Water supply and drainpipes under lavatories and sinks shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories and sinks.*" This indicates that we are dealing with an exposed insulation product or material.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-FS2-719.7.doc

FS124–09/10

202 (New); IPC 202 (New); IRC 202 (New)

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

THESE PROPOSALS ARE ON THE AGENDAS FOR THE IBC GENERAL AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES AS THREE SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THOSE COMMITTEES.

PART I – IBC GENERAL

Add new definition as follows:

SECTION 202
DEFINITIONS

INSULATION. Protective layer or covering, usually described based on its location, function or composition. Examples include acoustical insulation, cavity-wall insulation, duct insulation, foam-plastic insulation, loose-fill insulation, pipe insulation and thermal insulation.

Acoustical Insulation. Insulation material or assembly of materials used as a means for reducing the intensity of sound; also known as soundproofing.

Dust Insulation. Insulation which is in a form suitable for application to surfaces of ducts, air ducts or plenums.

Pipe Insulation. Insulation which is in a form suitable for application to cylindrical surfaces.

Thermal Insulation. Insulation material or assembly of materials used to reduce unwanted heat losses.

PART II – IPC

Add new definition as follows:

SECTION 202
DEFINITIONS

INSULATION. Protective layer or covering, usually described based on its location, function or composition. Examples include acoustical insulation, cavity-wall insulation, duct insulation, foam-plastic insulation, loose-fill insulation, pipe insulation and thermal insulation.

PART III – IRC BUILDING/ENERGY

Add new definition as follows:

SECTION R202
DEFINITIONS

INSULATION. Protective layer or covering, usually described based on its location, function or composition. Examples include acoustical insulation, cavity-wall insulation, duct insulation, foam-plastic insulation, loose-fill insulation, pipe insulation and thermal insulation.

Reason: (IBC) The concept of insulation is well understood, but it is usually considered to be associated purely with thermal insulation (heat losses). However, insulation is also used, often, for acoustical (sound) and other purposes. Moreover, insulation can be used as a layer within cavity walls, behind interior finish materials and on the outside of pipes and ducts; this is usually, but not always, done to protect from heat losses. However, this term remains undefined and there is a belief by some that the term insulation applies only to thermal insulation (often concealed).

Several IBC chapters address insulations of various types and they are not always referencing concealed thermal insulation. This includes IBC sections 603.1 and 807, which address acoustical insulation as well as thermal, and Section 719.1, which addresses pipe and duct insulation, and describes acoustical insulation materials (or sound-insulating materials). It is important for the IBC to have the appropriate definitions.

"**603.1 Allowable materials.** Combustible materials shall be permitted in buildings of Type I or Type II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:
2. Thermal and acoustical insulation, other than foam plastics, having a flame spread index of not more than 25.
Exceptions:
1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a flame spread index of not more than 100.
2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a flame spread index of not more than 200."

"**SECTION 719 - THERMAL- AND SOUND-INSULATING MATERIALS**
719.1 General. Insulating materials, including facings such as vapor retarders and *vapor-permeable membranes*, similar coverings and all layers of single and multilayer reflective foil insulations, shall comply with the requirements of this section. Where a flame spread index or a smoke-developed index is specified in this section, such index shall be determined in accordance with ASTM E 84 or UL 723. Any material that is subject to an increase in flame spread index or smoke-developed index beyond the limits herein established through the effects of age, moisture or other atmospheric conditions shall not be permitted.
Exceptions:
1. Fiberboard insulation shall comply with Chapter 23.
2. Foam plastic insulation shall comply with Chapter 26.
3. Duct and pipe insulation and duct and pipe coverings and linings in plenums shall comply with the *International Mechanical Code*."

"**807 Insulation.** Thermal and acoustical insulation shall comply with Section 719."

Reason: (IPC) The concept of insulation is well understood, but it is usually considered to be associated purely with thermal insulation (heat losses). However, insulation is also used, often, for acoustical (sound) and other purposes. Moreover, insulation can be used as a layer within cavity walls, behind interior finish materials and on the outside of pipes and ducts; this is usually, but not always, done to protect from heat losses. However, this term remains undefined and there is a belief by some that the term insulation applies only to thermal insulation (often concealed).

Reason: (IRC) The concept of insulation is well understood, but it is usually considered to be associated purely with thermal insulation (heat losses). However, insulation is also used, often, for acoustical (sound) and other purposes. Moreover, insulation can be used as a layer within cavity walls, behind interior finish materials and on the outside of pipes and ducts; this is usually, but not always, done to protect from heat losses. However, this term remains undefined and there is a belief by some that the term insulation applies only to thermal insulation (often concealed).

Cost Impact:

PART I – IBC - GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART I – IRC – B/E

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-G7-202.doc

FS125–09/10
Table 720.1(2)

Proponent: Sam Francis representing American Forest & Paper Association

Revise as follows:

TABLE 720.1(2)
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS [a,o,p]

MATERIAL	ITEM NUMBER	CONSTRUCTION	MINIMUM FINISHED THICKNESS FACE-TO-FACE [b] (INCHES)			
			4 hour	3 hour	2 hour	1 hour
15. Exterior or interior walls (continued)	15-1.16[q]	2″ X 6" wood studs at 24" with double top plates, single bottom plate; interior and exterior sides covered with two layers of 5/8" Type X gypsum wallboard, 4', wide, applied horizontally with vertical joints over studs. Base layer fastened with 2-1/4" Type S drywall screws, spaced 24" on center and face layer fastened with Type S drywall screws, spaced 8" on center, wallboard joints covered with paper tape and joint compound, fastener heads covered with joint compound. Cavity to be filled with 5-1/2" mineral wool insulation.	—	—	~~7-3/4~~ 8	—
16. Exterior walls rated for fire resistance from the inside only in accordance with Section 705.5. (continued)	16-1.3[q]	2″X 6″ wood studs at 16″ centers with double top plates, single bottom plates; interior side covered with 5/8″ Type X gypsum wallboard, 4″ wide, applied vertically with all joints over framing or blocking and fastened with 2-1/4″ Type S drywall screws spaced 7″ on center. Joints to be covered with tape and joint compound. Exterior covered with 3/8″ wood structural panels (oriented strand board), applied vertically with edges over framing or blocking and fastened with 6d common nails (bright) at 12″ on center in the field and 6″ on center on panel edges. R-19 fiberglass insulation installed in stud cavity.	—	—	—	6-1/2

q. The design stress of studs shall be equal to a maximum of 100 percent of the allowable F'_c calculated in accordance with Section 2306.

(Footnotes not shown, remain unchanged)

Reason: Editorial corrections to the table

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: FRANCIS-FS5-TABLE 720.1(2)

FS126–09/10
Table 720.1(2)

Proponent: Brad Douglas, representing American Forest & Paper Association

Revise as follows:

TABLE 720.1(2)
RATED FIRE-RESISTANCE PERIODS FOR VARIOUS WALLS AND PARTITIONS
(No changes to the table)

m. For studs with a slenderness ratio, l_e/d, greater than 33, the ~~The~~ design stress ~~of studs~~ shall be reduced to 78 percent of allowable F_c'. For studs with a slenderness ratio, l_e/d, not exceeding 33, the design stress shall be reduced to 78 percent of the adjusted stress F_c' calculated for studs ~~with the maximum not greater than 78 percent of the calculated stress with studs~~ having a slenderness ratio l_e/d of 33.

(Footnotes not shown remain unchanged)

Reason: Revisions clarify application of the footnote with regard to stud slenderness ratio and update terminology from “allowable” to “adjusted” to be consistent with terminology used in 2005 NDS.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: FRANSIS-FS6-TABLE 720.1(2)

FS127–09/10
Table 720.1(3)

Proponent: Sam Francis representing American Forest & Paper Association

Add new text as follows:

TABLE 720.1(3)
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS[a,q]

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hr	3 hr	2 hr	1 hr	4 hr	3 hr	2 hr	1 hr
30. Wood I-joist (minimum I-joist depth 9-1/2" with a minimum flange depth of 1-1/2" and a minimum flange cross-sectional area of 2.25 square inches; minimum web thickness of 3/8") @24" o.c. Fiberglass insulation placed between I-joists supported by the resilient channels.	30-1.1	Minimum 0.019" thick resilient channel 16" o.c. (Channels doubled at wallboard end joints), placed perpendicular to the joists and attached to each joist by 1-1/4" Type S drywall screws. Two Layers of ½" Type X gypsum wallboard applied with the long dimension perpendicular to the I-joists with end joints staggered. The base layer is fastened with 1-1/4" Type S drywall screws spaced 12" o.c. and the face layer is fastened with 1-5/8" Type S drywall screws spaced 12" o.c. Face layer end joints shall not occur on the same I-joist as base layer end joints and edge joints shall be offset 24" from base layer joints. Face layer to also be attached to base layer with 1-1/2" Type G drywall screws spaced 8" o.c. placed 6" from face layer end joints. Face layer wallboard joints to be taped and covered with joint compound.	=	=	—	Varies	—	—	—	5/8

Reason: Many code officials have come to rely upon Table 720 as the preferred source of information regarding fire resistance rated assemblies. Because of its importance, we believe that the table should offer the most common generic assemblies. Floor systems utilizing I-joists have increased from less than 10 percent in 1990 to more than 50 percent. With the increased prevalence of I-joist floor/ceiling assemblies, including this assembly in the table will make the IBC more complete and it will be more useful to code officials. It is also expected that the document will be "user friendly", particularly for designers. In an effort to fulfill this expectation, we propose this common assembly for incorporation into Table 720.1(3). It is supported by ASTM E-119 test results as shown on the attached page. The following information and test results are provided with the understanding that their inclusion does not place them within the copyright release requirements of the signature statement.

Cost Impact: This code change proposal will reduce the cost of construction by an unknown amount.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: FRANCIS-FS4-TABLE 720.1(3)

FS128–09/10

Table 720.1(3)

Proponent: Sam Francis representing American Forest & Paper Association

Revise as follows:

TABLE 720.1(3)
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS[a,q]

FLOOR OR ROOF CONSTRUCTION	ITEM NUMBER	CEILING CONSTRUCTION	THICKNESS OF FLOOR OR ROOF SLAB (inches)				MINIMUM THICKNESS OF CEILING (inches)			
			4 hr	3 hr	2 hr	1 hr	4 hr	3 hr	2 hr	1 hr
23. Wood I-joist (minimum joist depth 9-1/4" with a minimum flange depth of $1\ ^{5}/_{16}$" and a minimum flange cross-sectional area of ~~2.3~~ 2.25 square inches) at 24" o.c. spacing with ~~1" by 4 inch (nominal)~~ a minimum 1x4 (3/4" x 3.5" actual) ~~wood furring strip spacer~~ ledger strip applied parallel to and covering the bottom of the bottom flange of each member, tacked in place. 2" mineral wool insulation, 3.5 pcf (nominal) installed adjacent to the bottom flange of the I-joist and supported by the ~~1"x4" furring strip spacer~~ 1x4 ledger strip.	23-1.1	½" deep single leg resilient channel 16" on center (channels doubled at wallboard end joints), placed perpendicular to the furring strip and joist and attached to each joist by 1-7/8" Type S drywall screws, 5/8" Type C gypsum wallboard applied perpendicular to the channel with end joints staggered at least 4' and fastened with 1-1/8 Type S drywall screws spaced 7" on center. Wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	5/8
27. Wood I-joist (minimum I-joist depth 9-1/2" with a minimum flange depth of $1\ ^{5}/_{16}$" and a minimum flange cross-sectional area of 1.95 square inches; minimum web thickness of 3/8") @24" o.c.	27-1.1	Minimum 0.019" thick resilient channel 16" o.c. (Channels doubled at wallboard end joints), placed perpendicular to the joists and attached to each joist by ~~1-5/8~~ 1-1/4" Type S drywall screws. Two Layers of ½" Type X gypsum wallboard applied with the long dimension perpendicular to the I-joists with end joints staggered. The base layer is fastened with 1-1/4" Type S drywall screws spaced 12" o.c. and the face layer is fastened with 1-5/8" Type S drywall screws spaced 12" o.c. Face layer end joints shall not occur on the same I-joist as base layer end joints and edge joints shall be offset 24" from base layer joints. Face layer to also be attached to base layer with 1-1/2" Type G drywall screws spaced 8" o.c. placed 6" from face layer end joints. Face layer wallboard joints to be taped and covered with joint compound.	—	—	—	Varies	—	—	—	1

Reason: Editorial corrections to entries in the table.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: FRANCIS-FS3-TABLE 720.1(3)

FS129–09/10
Table 720.1(3)

Proponent: Steve Kuchenski, Architect, Onyx Architects, representing self

Revise as follows:

TABLE 720.1(3)
MINIMUM PROTECTION FOR FLOOR AND ROOF SYSTEMS[a]
(Table remains unchanged)

Notes.

(a-l no change)
m. Double wood floor shall be permitted to be either of the following:
(a) Subfloor of 1-inch nominal tongue-and-groove boarding, a layer of ~~asbestos~~ building paper weighing not less than 14 pounds per 100 square feet and a layer of 1-inch nominal tongue-and-groove finished flooring; or

(Footnotes not shown remain unchanged)

Reason: Asbestos is no longer considered a safe building material.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KUCHENSKI-FS1-T720.1 (3)

FS130–09/10
721.3.1.5 (New)

Proponent: Richard Porter and Robert Sullivan, cfiFOAM, Inc., representing self

Add new text as follows:

721.3.1.5 Airspaces and cells filled with foamed-in-place foam plastic insulation. The equivalent thickness of concrete masonry completely filled with foamed-in-place foam plastic insulation shall be the average thickness of the solid material in the unit, as contained in Table 721.3.2.

Reason: Amino-plast foamed-in-place foam plastic insulation is often marketed to extend the fire-resistance ratings of concrete masonry walls by up to 2-hrs despite the fact that product literature specifically warns not to use the product against surfaces with sustained temperatures in excess of 190ºF (87ºC).

Sections 721.2.1.2, and 721.2.1.2.2 recognize the contribution of a ≥ 1 inch (≥ 25 mm) thickness of foam plastic insulation sandwiched between two wythes of concrete to such a panel's fire-resistance rating, and that it may be calculated using Equation 7-4. For this calculation, the contribution is 5 minutes; therefore, $R_n^{0.59} = 2.5$. That being the case, the contribution of foam plastic insulation encased within the core cells of either concrete masonry or precast hollow core panel wall assemblies to the fire-resistance rating of such assemblies should be recognized by the code as, at most, only a few minutes.

When the Trenton NJ CBO discovered 3-hr fire-resistance rated UL Design No. U904 walls were built using 2-hr CMU, the proposed cure of the deficiency was injecting foamed-in-place foam plastic insulation into the walls to increase their fire-resistance rating to 3-hrs. Two foam plastic insulation manufacturers claim their foam plastic insulation can increase CMU wall fire-resistance ratings by 2-hrs. Each offers ASTM E-119 test data supporting their claim. In a report submitted to the CBO, a P.E. with extensive masonry experience, stated his professional opinion that "the foam will achieve a 3-hour or greater fire rating." However, the CBO recognized that 1) the test results upon which the P.E. staked his "professional opinion" did not represent UL Design U904, instead 2) they were reports of ASTM E-119 testing of an unlisted CMU wall assembly, and 3) the 2006 IBC does not address how to calculate the fire-resistance rating of a CMU wall assembly injected with foam plastic insulation. Thus, the CBO had no choice but to challenge the claim which, in turn, led to new ASTM E-119 testing that failed at 1 hour 58 minutes 45 seconds. The testing laboratory's engineer concluded 1) "The data indicate that the wall assembly did not meet the requirements for a 2-hour rating." and 2) "The addition of Core-Fill 500 [the trade name of the foam plastic insulation] did not improve the rating of the assembly tested." Additionally, the above expert P.E. reversed his earlier "professional opinion" to conclude separately: 1) "For the Core-Fill 500 to achieve a four-hour fire rating with an 8-inch or 12-inch CMU [wall], the CMU would have to be specially manufactured to produce results similar to what is written in their literature. By specially manufactured we mean that the face shell or percent solid was greater than 'standard' or a special aggregate was used such as 100% pumice" and 2) "Further, inspecting the cores of the demolished panel showed the Core-Fill to have disintegrated."

The claim that foam plastic insulation extends fire-resistance ratings is patently ludicrous and places life & fire safety at increased risk whenever architects and/or building & fire officials accept the claim. ICC board member Barbara Koffron is well aware of this problem. As the Fire Marshal of Phoenix, AZ she has informed other Arizona code enforcement officials by letter and personal contact that foam plastic insulation does not increase the fire-resistance rating of CMU wall assemblies.

In the interest of life and fire safety, the ICC is urged to add the proposed language to the code as a guide to architects and building & fire officials faced with similar life & fire safety dilemmas. The code should specifically acknowledge the minimal contribution made by foam plastic insulation to fire-resistance ratings. Furthermore, the ICC should seek development of an NFPA 259 linked equivalent thickness method to calculate the fire-resistance rating of concrete masonry and/or hollow precast concrete panel wall assemblies so that fire-resistance rating test reports offered in support of claims made by plastic foam insulation manufacturers are acknowledged and fully understood in their proper context. The ICC is urged to add the proposed language to the code to provide clear guidance to architects and building & fire officials faced with similar dilemmas.

Bibliography of Substantiating Information:

Miscellaneous documents:

Letter dated 3/20/2002 from Barbara Koffron, Phoenix, AZ.
Koffron's bio and opinion confirmed.
Letter dated 4/13/2009 from Virginia SFM Ed Altizer, P.E.
Email from former BOAF Executive Director Robert McCormick.
FM Global Property Loss Prevention Data Sheet 1-22 page 3.
Report of testing per UL 263 (ASTM E-119) dated 3/13/1987 of an 8" CMU wall assembly containing plastic foam (polystyrene) inserts.
Report of testing by CTC per ASTM E-119-83 dated 3/25/1986 (excerpt).

Documentation of the complete failure of injected foam plastic insulation to increase the fire-resistance rating of CMU walls in Trenton, NJ.

Memo dated 12/19/2000 notifying GC of possible work stoppage.
Letter with attachment dated 12/22/2000 listing deficiency re: U.L. Design No. U904 compliance.
Notice of Violation dated 12/22/2000.
Biographical sketches of the principals of TSE, an engineering firm retained for the masonry contractor.
Professional opinion of the P.E. dated 1/25/2001 re: result of proposed cure previously rejected by the CBO.
Engineering Evaluation by SwRI dated 5/3/2001 includes comments re: failed results of ASTM E-119-00 testing (SwRI Project No. 01.04019.01.312a) of the masonry contractor's proposed cure.
Project Status by SwRI dated 5/7/2001 outlining results of successful testing of the alternate cure ultimately approved by the CBO.
Report by TSE principal dated 6/13/2002 re: ASTM E-119-00 testing of the proposed cure stating the TSE principal's ***revised*** professional opinion.
Notice of auction sale of the masonry contractor's assets 6/24/2008.

cfiFOAM, Inc. fire-resistance rating information:

Advisory sheet summarizing the Trenton, NJ incident.
"Caveats are Placed on ASTM E-119 Test Reports for Good Reasons".
Product Information Sheet dated 9/2007
IMI Detail 19.101 revised 12/13/2008 illustrating properly injected generic foamed-in-place masonry foam insulation.

Polymaster® fire-resistance rating information:

Report of testing by CTC per ASTM E-119-88 dated 10/18/1994.
R-501® brochure page 4.

Thermal Corporation of America fire-resistance rating claims:

Thermco™ brochure.
Thermco™ product data sheet.
Thermco™ Spec Data sheet.
Thermco™ Guide Specification.
BIA/Stark County, OH flyer (excerpt).
Eco-Smart, Inc. power point presentation (excerpt).
SwRI Project No. 01-1205-312 (excerpt) dated 9/1998 per ASTM E-119-95.

Tailored Chemical Products, Inc. fire-resistance rating claims:

Core-Fill 500® brochure dated 2001.
Cerny & Ivey #20374 dated 11/9/2000
Cerny & Ivey #28008 dated 1/9/2008
SwRI Project No. 01-5920-305 (excerpt) dated 3/1994.
SwRI Project No. 01-7522-607 (excerpt) dated 10/1996.
Jim Griffith/SwRI letter dated 11/4/1996.
Dale Jolley/GA SFM staff letter dated 10/4/1996.
TF of FL letterhead dated 7/21/2003
James Robertson/TN Dir. Codes Enforcement letter dated 1/9/1996.
Al Hancock/TN Ass't. Dir. Codes Enforcement letter dated 5/26/2009.
Submittal for CDBG project funds (excerpt) – Miami-Dade County, FL.

Examples of fire-resistance rating claims based upon injected plastic foam in CMU walls downloaded from web sites:

London Bay Homes – FL.
Arburton Homes, Inc. – FL.
Marlin Bay Yacht Club Residences – FL.
2922 Bellwind Circle Viera FL 32955 – FL.
SureBlock Company of Northfield, IL exports to the Republic of China.

Examples of architectural notes and specifications requiring passing and/or attaining 4-hour fire-resistance rating for CMU walls based, in part, upon injecting plastic foam insulation:

STONEYBROOK 6K RETAIL, Winter Haven, FL.
L.A. Fitness – Lake Worth, FL.
New Weight Room for SE Louisiana University, Hammond, LA.
Echols County K-8 Facility – GA.
Project No. 08-149 – Unknown location.
Arkansas Valley Fairgrounds Event Center
East Germantown Fire Station – PA.
Orlando Fire Station 1 – FL.
Walgreens – Criteria Specification – February 2007 – US.
Audubon Crossing Phase 2 – NJ.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PORTER-SULLIVAN-FS2-721.3.1.5

FS131–09/10
Table 721.6.2(1)

Proponent: Joe Holland or Dave Bueche, Hoover Treated Wood Products, representing Hoover Treated Wood Products

Revise as follows:

TABLE 721.6.2(1)
TIME ASSIGNED TO WALLBOARD MEMBRANES[a,b,c,d]

DESCRIPTION OF FINISH	TIME[e] (minutes)
3/8-inch wood structural panel bonded with exterior glue	5
15/32-inch wood structural panel bonded with exterior glue	10
19/32-inch wood structural panel bonded with exterior glue	15
3/8-inch gypsum wallboard	10
1/2-inch gypsum wallboard	15
5/8-inch gypsum wallboard	30
1/2-inch Type X gypsum wallboard	25
5/8-inch Type X gypsum wallboard	40
Double 3/8-inch gypsum wallboard	25
1/2- + 3/8-inch gypsum wallboard	35
Double 1/2-inch gypsum wallboard	40

For SI: 1 inch = 25.4 mm.

a. These values apply only when membranes are installed on framing members which are spaced 16 inches o.c. or less

(Footnotes not shown, remain unchanged)

Reason: Correlate Note a in Table 721.6.2(1) to note a in Table 721.6.2(2). The critical spacing is not greater than16 inches. A spacing of less than 16 inches will give more support to the wallboard membrane.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Holland-Bueche-FS2-T721.6.2(1)

FS132–09/10
721.6.2.3

Proponent: Eirene Oliphant, MCP, Building Official, representing Metropolitan Kansas City Chapter of the ICC; Rick Thornberry, PE, The Code Consortium, Inc., representing California Fire Safety Advisory Council (CFSAC)

Revise as follows:

721.6.2.3 Exterior Walls. For an exterior wall with a fire separation distance greater than ~~5 feet (1524 mm)~~ 10 feet (3048 mm), the wall is assigned a rating dependant on the interior membrane and the framing as described in Tables 721.6.2(1) and 721.6.2(2). The membrane on the outside of the nonfire-exposed side of exterior walls with a fire separation distance greater than ~~5 feet (1524 mm)~~ 10 feet (3048 mm) may consist of sheathing, sheathing paper and siding as described in Table 721.6.2(3).

Reason:
(Oliphant)-This change is to provide consistent language between this section and Section 705.5. The issue is dealing with the exterior walls and the fact that the 2009 code changed Section 705.5 so the wall was rated from both sides if it had 10 feet or less fire separation distance. The 2000 to 2006 codes said that once you got past 5 feet that you only needed to rate the interior side. Code change FS16-07/08 was approved in the last round and it changed the 5 foot requirement to 10 feet in Section 705.5. Section 721.6.2.3 (dealing with calculated fire resistance for exterior walls) did not change the 5 foot dimension. The apparent conflict means that people have to decide whether you use 705.5 as the most restrictive or use 721.6.2.3 as the specific. Section 721.6.2.3 should mirror 705.5
(Thornberry)- This is a correlative code change that makes Section 721.6.2.3 consistent with Section 705.5 which was revised during the last code development cycle based on Code Change FS16-07/08. This simply changes the 5 foot separation distance to 10 feet as required for exterior walls for determining their fire-resistance ratings based on testing from both sides when the fire separation distance is not greater than 10 feet.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Oliphant- Thornberry-FS1-721.6.2.3

FS133–09/10
708.14, 801.4, 2303.3

Proponent: Joe Holland or Dave Bueche, Hoover Treated Wood Products, representing Hoover Treated Wood Products

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE AS 2 SEPARATE CODE CHANGES.

PART I – IBC FIRE SAFETY

Add new text as follows:

801.3 Fire retardant paints and coating. Fire retardant paints and coating applied to wood products shall be permitted in accordance with this chapter for interior finish when there is a change of occupancy. Paints and coatings shall comply with NFPA 703 and be maintained in accordance with the International Fire Code.

(Renumber subsequent sections)

PART II – IBC STRUCTURAL

Add new text as follows:

2303.3 Fire retardant paints and coating. Fire retardant paints and coating applied to wood products shall be permitted in accordance with Chapter 8. Paints and coatings shall comply with NFPA 703 and be maintained in accordance with the International Fire Code.

(Renumber subsequent sections)

Reason: To correlate the IBC with the IFC and IEBC. This proposal incorporates the provisions currently contained in the IFC and IEBC. Both of these documents are concerned with structures after being occupancy. The IBC does govern existing buildings when there is a change of occupancy, Chapter 34. There is concern with this class of product being used in inappropriate applications in new construction.
Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Standard NFPA 703 is currently referenced in the I-codes.

PART I – IBC FIRE SAFETY

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

PART II – IBC STRUCTURAL

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: HOLLAND-BUESHE-FS1-801.1.1.3; S2-2303.3

FS134–09/10
801.9

Proponent: Bob Eugene, representing Underwriters Laboratories Inc

Add new text as follows:

801.9 Labeling and identification. Materials or its packaging required by this chapter to be tested in accordance with ASTM E84 or UL 723 shall bear the label of an approved agency showing the manufacturer's name, product listing, product identification, the flame spread index, and the smoke-developed index.

Reason: Identifying the ratings of interior finish materials can be difficult to determine in the field, especially if the packaging containing certification and ratings is not provided. The proposed requirements are intended to address this situation, and are based on the requirements included in section 2603.2. Only listing and labeling of a product can verify that the product installed at a jobsite is composed of the same material originally tested

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Standards ASTM E84 and UL 723 are currently referenced in the I-codes.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: EUGENE-FS5-801.9

FS135–09/10
803.11

Proponent: Marcelo M Hirschler (GBH International), representing American Fire Safety Council

Revise as follows:

803.11 Application of interior finish materials to fire-resistance-rated or noncombustible ~~structural~~ building elements. Where *interior finish* materials are applied on walls, ceilings or structural elements required to have a *fire-resistance rating* or to be of noncombustible construction, they shall comply with the provisions of this section.

803.11.1 Direct attachment and furred construction. Where walls and ceilings are required by any provision in this code to be of fire-resistance-rated or noncombustible construction, the *interior finish* material shall be applied directly against such construction or to furring strips not exceeding 1 ¾ inches (44 mm), applied directly against such surfaces.

803.11.1.1 ~~The~~ If the interior finish material is applied to furring strips, the intervening spaces between such furring strips shall comply with one of the following:

1. Be filled with material that is inorganic or noncombustible;
2. Be filled with material that meets the requirements of a Class A material in accordance with Section 803.1.1 or 803.1.2; or
3. Be fireblocked at a maximum of 8 feet (2438 mm) in every ~~any~~ direction in accordance with Section 717

803.11.2 Set-out construction. Where walls and ceilings are required to be of fire-resistance-rated or noncombustible construction and walls are set out or ceilings are dropped distances greater than specified in Section 803.11.1, Class A finish materials, in accordance with Section 803.1.1 or 803.1.2, shall be used.

Exceptions:

1. Where ~~except where~~ *interior finish* materials are protected on both sides by an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Where *interior finish* materials are~~, or~~ attached to noncombustible backing or furring strips installed as specified in Section 803.11.1.

803.11.2.1 Hangers and assembly members. The hangers and assembly members of such dropped ceilings that are below the ~~main ceiling line~~ horizontal fire-resistive floor or roof assemblies shall be of noncombustible materials~~, except that in Types III and V construction, *fire-retardant-treated wood* shall be permitted~~. The construction of each set-out wall and horizontal fire-resistive floor or roof assembly shall be of fire-resistance-rated construction as required elsewhere in this code.

Exception: In Types III and V construction, *fire-retardant-treated wood* shall be permitted for use as hangers and assembly members of dropped ceilings.

803.11.3 Heavy timber construction. Wall and ceiling finishes of all classes as permitted in this chapter that are installed directly against the wood decking or planking of Type IV construction or to wood furring strips applied directly to the wood decking or planking shall be fireblocked as specified in Section 803.11.1.

803.11.4 Materials. An interior wall or ceiling finish material that is not more than ¼ inch (6.4 mm) thick shall be applied directly onto the wall, ceiling or structural element without the use of furring strips and shall not be suspended away from the building element to which it is applied. ~~against a noncombustible backing.~~

Exceptions:

1. Noncombustible interior finish materials.
2. Materials that meet the requirements of Class A materials in accordance with Sections 803.1.1 or 803.1.2 where the qualifying tests were made with the material ~~suspended or~~ furred out from the noncombustible backing shall be permitted to be used with furring strips.
3. Materials that meet the requirements of Class A materials in accordance with Sections 803.1.1 or 803.1.2 where the qualifying tests were made with the material suspended away from the noncombustible backing shall be permitted to be used suspended away from the building element.

Reason: This section is very unclear and full of run-on sentences. The code proposal only clarifies the intent of the section. In particular it clarifies the issue of thin materials and of the constructions using furring strips or suspended away from the backing. The code proposal does not change the present code requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-FS7-803.11

FS136–09/10
803.12; IFC 803.8

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE AS 2 SEPARATE CODE CHANGES.

PART I – IBC FIRE SAFETY

Revise as follows:

803.12 High Density Polyethylene (HDPE) and Polypropylene (PP). Where high density polyethylene or polypropylene is used as an interior finish it shall comply with Section 803.1.2.

PART II – IFC

803.8 High Density Polyethylene (HDPE) and Polypropylene (PP). Where high density polyethylene or polypropylene is used as an interior finish it shall comply with Section 803.1.2.

Reason: Polypropylene interior finish materials need to be treated the same way as polyethylene interior finish materials, because polypropylene and polyethylene behave in a very similar fashion in fires.

In proposal FS 165 in the last cycle, James Lathrop explained the problems associated with polyethylene (HDPE), when it is used as an interior finish material, as follows (exact quote):

"HDPE is a thermoplastic that when it burns gives off considerable energy and produces a pooling flammable liquids fire. Recent full scale room-corner tests using NFPA 286 have demonstrated a significant hazard. These tests had to be terminated prior to the standard 15 minute duration due to flashover occurring, yet there was still much of the product left to burn. Extensive flammable liquid pool fires occurred during the tests. Yet this same material when tested in accordance with the tunnel test, ASTM E-84, is often given a FSI of 25 or less. However the resulting test is so intense some labs will not test HDPE partitions in their tunnel due to the damage it can do to the tunnel. This proposal will assure that when using HDPE partitions they will be formulated in such a manner to reduce the hazard that they present. Following is some of the data from one of the NFPA 286 tests: Peak HRR (excl burner) 1733 kW; Total Heat Released (excl. burner) 121 MJ; Peak Heat Flux to the floor 35.2 kW/m^2; Peak Avg Ceiling Temp 805^{o}C, 1481^{o}F."

Jim Lathrop also explained (FS 166) that HDPE was extensively used in toilet room privacy partitions.

It is worth putting the data Jim Lathrop presented into perspective by noting that pass/fail criteria are 800 kW and that those materials which perform well in the room-corner test usually exhibit heat release rates less than 400 kW, as opposed to over 1700 kW for HDPE.

The materials in Table 1 (attached) were tested in a room corner test and in the Steiner tunnel test (ASTM E 84). Most materials were tested in the NFPA room corner tests but some were tested in the much more severe ISO 9705 room corner test (where the ignition burner is at 100 kW for 10 min and then at 300 kW for a further 10 min, as opposed to 40 kW/150 kW or 40 kW/160 kW for NFPA room-corner tests). Even here, some materials perform with low peak heat release rates.

Table 1: Steiner tunnel and room corner test data

FSI ASTM E 84	Pk RHR (kW) Room Corner Test (NFPA 286)	FSI ASTM E 84	Pk RHR (kW) Room Corner Test (NFPA 265)
15	195	Old Textile Wall Covering Data (1986)	
27	359	Cases Where E 84 is Poor Predictor	
10	40	25	684
70	1460	15	5771
15	128	15	928
15	153	25	1166
0	40		
0	35	Cases Where E 84 Is not a Poor Predictor	
15	22	15	310
28	120	15	182
25	106	15	297
200	930	25	249
200	945	25	309
200	1070		
200	1075		
25	125		
< 25	234		
< 25	1733		

ASTM E 84	Room Corner Test (ISO 9705)	(Jim Lathrop Data on HDPE) Room Corner Test Comments (ISO 9705)
22	120	(walls and ceiling)
< 25	54	(ceiling only)
< 25	160	(ceiling only)
< 25	154	(walls and ceiling)
22	20 @ 10 min – 548 @ 11 min	(walls and ceiling)
22	110	(ceiling only)
< 25	517	(walls and ceiling)
< 25	58	(ceiling only)

Experience in the past has long shown that materials with FSI values of less than 25 when tested in accordance with ASTM E 84, particularly if they are thermally thin materials or materials that melt and drip during the test (such as HDPE or polypropylene) cannot be guaranteed to be safe enough to be permitted to be used based simply on ASTM E 84 testing.

Apparently some manufacturers have figured out that they can address the letter of the code but not the spirit. A new product has now become available in the market: polypropylene toilet room privacy partitions.

Polypropylene is a material that is very similar to polyethylene. Polypropylene is also a thermoplastic polyolefin material, just like polyethylene and there is almost no difference in fire performance. Both materials melt and drip and cause flaming drips when they burn and release large amounts of heat. The consequence of this is that pool fires are formed on the floor beneath the material. Table 2 shows cone calorimeter (ASTM E 1354) data for polypropylene and polyethylene. These materials

Table 2 – Cone calorimeter test data for
standard polypropylene and polyethylene materials – 6 mm, 0.25 inch, thick (1992)

	PP	PE	Average of Plastics (*)
Pk HRR @ 20 kW/m^2 (in kW/m^2)	1,170	913	295
Pk HRR @ 40 kW/m^2 (in kW/m^2)	1,509	1,408	443
Pk HRR @ 70 kW/m^2 (in kW/m^2)	2,421	2,735	640
Total Heat Released @ 20 kW/m^2 (in MJ/m^2)	231	162	92
Total Heat Released @ 40 kW/m^2 (in MJ/m^2)	207	221	126
Total Heat Released @ 70 kW/m^2 (in MJ/m^2)	231	228	131

*: based on cone calorimeter study of 35 materials, published in:
"Heat Release in Fires" by V. Babrauskas and S.J. Grayson – Elsevier, 1992.

The photograph above shows a 3 mm (1/8 inch) thick sheet of polypropylene exposed to fire and the resulting pool fire (Photo and quotes below from NIST Technical Note 1493, T.J. Ohlemiller and J.R. Shields, "Aspects of the Thermal Behavior of Thermoplastic Materials", 2008).

In the above work, NIST tests were conducted with thin sheets of polypropylene and revealed the problems associated with the generation of melt pool fires and the role of a pool fire in the overall fire growth process. The publication states that the results showed the following: "Thermoplastic materials yield extra complexity when they burn in the context of the products in which they are found. Under the influence of gravity, the liquid phase formed during thermal degradation flows downward. If, as is typical, this liquid is burning, then it extends the flaming zone on the solid downward onto whatever surfaces are available to catch the liquid (ultimately a horizontal floor or ground surface). This constitutes, at the least, a new form of flame spread on the object containing the thermoplastic (in addition to normal forms of flame spread over solid surfaces, which are typically fastest in the upward direction), extending the area of fuel that is burning and thereby increasing the overall heat release rate from the object. In many cases this downward flow of flaming liquid results in a pool fire under the object. If that pool fire is close enough to the object that its plume reaches the object, the result can be a self feeding pool fire that further enhances the rate of heat release from the burning system. In addition to this penchant for liquid-assisted flame spread, thermoplastic materials also tend to deform significantly as they burn. Thus large changes in the geometric shape of the burning object are common. These two aspects of thermoplastics make modeling fire growth on them, or on objects containing them, extraordinarily difficult."

With regard to the polypropylene sheet experiment described in the photograph the report states: "The pool fire is centered near the rear edge of the sample, not under the leading edge of the flames on the sheet. This is because it is being fed flaming polymer melt most rapidly from an area several centimeters behind the forward-most portion of the sample flame front where the shape of the trailing edge of the sheet curves rapidly from near vertical toward the horizontal. There is a flow separation region there that tends to dump nearly all of the melt flow accumulated from higher up on the trailing edge of the sheet. From this flow impingement area on the catch surface, the melt tends to flow radially at first. That portion of the melt that is going forward (in the direction of flame spread) under the leading edge of the flames on the base of the sheet encounters a cold catch surface that extracts heat from the melt, lowers its temperature and rapidly raises its viscosity. This nearly halts the flow in this direction, which, in fact, greatly slows the potential rate of fire spread. Because much of the "forward" flow of melt is inhibited and, because the catch surface in the opposite direction has been pre-heated by the pool fire in its march forward, there is a preferential melt flow backward, away from the direction of fire spread and toward the rear end of the pool fire. This tends to somewhat disengage the pool fire from the overall forward fire spread process. The melt flow on the catch surface appears to be driven by the small hydrostatic head that develops due to the finite thickness of the melt layer on this horizontal surface. Near the foot of the pool fire flames, the flow is also driven outward, away from the pool fire center, by the surface tension gradient that is large in this region. (One can often see a step up in melt layer thickness beneath the flame foot.) Note that the region of the pool directly beneath the flames is bubbling, indicating in-depth generation of gaseous degradation products from the polymer melt. Also note that, on the left (just to the left of the flame foot), the pool fire has burned out by locally consuming all of the melt, leaving a dry central area. Around this area, however, there is a substantial amount of melt that has not burned and is left by the fire. Evidently, this residue has cooled sufficiently (and remains sufficiently heat-sunk to the catch surface) that it will not allow flame spread onto its surface (in effect, its temperature cannot be raised to the point where it will ignite). Note that the polymer sheet itself is somewhat wavy on its rear edge (warped out of the plane defined by the cold portion of the sample sheet). This is a consequence of the heat induced softening (and, perhaps, expansion) of the sheet before it actually begins to melt and flow at an appreciable rate. This aspect of the sample behavior was not reproducible. It interacts with the location of the separation point on the rear edge of the sample and thus influences where the bulk of the melt gets deposited in relation to the leading edge of the fire on the base of the sample. This appeared to be a major source of scatter in the evolution of the heat release rate from the fire, as described further below. The above processes could conceivably produce an essentially steady-state, propagating fire after some initial transient. Interestingly, while the flame spread rate along the bottom edge of the sample sheet is nearly steady in all cases, other aspects of the fire, including the heat release rate, are not steady."

It needs to be pointed out that this is not an indictment of all polypropylene materials. It is possible to prepare polypropylene materials that exhibit excellent fire performance, including no significant flaming when tested in the ASTM E 84, Steiner tunnel. When one non fire retarded polypropylene material (1.5 mm, 0.06 inch thick) was subjected to a small open flame screening test, it ignited, dripped a flaming stream of plastic to

the floor and continued to burn on the floor until it was consumed on the specimen holder and on the floor. On the other hand, a fire retarded polypropylene material (3 mm, 1/8 inch thick) was subjected to the same small open flame screening test and caused no flaming drips. When it was then subjected to the ASTM E 84 test, it produced a flame spread index of 50 and a smoke developed index of 215, without flaming drips. Table 3 shows some cone calorimeter results on nine fire retarded polypropylene materials, which gave very adequate fire performance.

Table 3 - Cone Calorimeter Tests on Fire Retarded Polypropylene Specimens (3 mm, 1/8 inch, thick)

	Tests at 20 kW/m^2	Tests at 40 kW/m^2
Material	Pk HRR	Pk HRR
	kW/m^2	kW/m^2
FR PP 1	236	243
FR PP 2	168	206
FR PP 3	207	209
FR PP 4	195	206
FR PP 5	301	231
FR PP 6	215	193
FR PP 7	228	193
FR PP 8	207	188
FR PP 9	202	172
PP Car HVAC duct	480 (at 25 kW/m^2)	

Cost Impact: The code change proposal will increase the cost of construction. NFPA 286 is a more expensive test than is ASTM E 84. However it yields data that can be usable for fire hazard assessment while ASTM E 84 does not. Moreover, the test arrangement is more representative of how an interior finish product is used since the room is lined with the product in the NFPA 286 (room-corner) test.

PART I- IBC FIRE SAFTEY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II- IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-FS1-803.12.doc

FS137–09/10
804.4.1, Chapter 35

Proponent: Marcelo M. Hirschler, GBH International

1. Revise as follows:

804.4.1 Minimum critical radiant flux. Interior floor finish and floor covering materials in exit enclosures, exit passageways and corridors shall not be less than Class I in Groups I-1, I-2 and I-3 and not less than Class II in Groups A, B, E, H, I- 4, M, R-1, R-2 and S. In all areas, floor covering materials shall comply with the DOC FF-1 Apill test@ (CPSC 16 CFR, Part 1630) or with ASTM D 2859.

Exception: Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, Class II materials are permitted in any area where Class I materials are required, and materials complying with DOC FF-1 Apill test@ (CPSC 16 CFR, Part 1630) or with ASTM D 2859 are permitted in any area where Class II materials are required.

2. Add new standard to Chapter 35 as follows:

ASTM D 2859-06 Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials

Reason: In this proposal only one change is being made to the IBC wording, as follows. There are two versions of the "pill test": the US federal government, through CPSC, regulates all carpets and rugs based on 16 CFR 1630 since the 1970s. However, the IBC is an international code and ASTM D 2859 is an equivalent test to 16 CFR 1630 and is included as an alternate. In fact, it is ASTM D 2859 that complies with the ICC policy on referenced standards.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM D 2589-06, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-FS4-804.4.1.doc

FS138–09/10
804.4

Proponent: Marcelo M Hirschler (GBH International), representing American Fire Safety Council

Revise as follows:

804.4 Interior floor finish requirements. Interior floor covering materials shall comply with Sections 804.4.1 and 804.4.2 and interior floor finish materials shall comply with Section 804.4.2. ~~In all occupancies, interior floor finish and floor covering materials in exit enclosures, exit passageways, corridors and rooms or spaces not separated from corridors by full-height partitions extending from the floor to the underside of the ceiling shall withstand a minimum critical radiant flux as specified in Section 804.4.1.~~

~~**804.4.1 Minimum critical radiant flux.** Interior floor finish and floor covering materials in exit enclosures, exit passageways and corridors shall not be less than Class I in Groups I-1, I-2 and I-3 and not less than Class II in Groups A, B, E, H, I- 4, M, R-1, R-2 and S. In all areas, floor covering materials shall comply with the DOC FF-1 Apill test@ (CPSC 16 CFR, Part 1630).~~

804.4.1 Pill test. In all occupancies, interior floor covering materials shall comply with the requirements of the DOC FF-1 Apill test@ (CPSC 16 CFR, Part 1630).

804.4.2 Minimum critical radiant flux. In all occupancies, interior floor finish and floor covering materials in exit enclosures, exit passageways, corridors and rooms or spaces not separated from corridors by full-height partitions extending from the floor to the underside of the ceiling shall withstand a minimum critical radiant flux. The minimum critical radiant flux shall not be less than Class I in Groups I-1, I-2 and I-3 and not less than Class II in Groups A, B, E, H, I- 4, M, R-1, R-2 and S.

> **Exception:** Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, Class II materials are permitted in any area where Class I materials are required and materials complying with DOC FF-1 Apill test@ (CPSC 16 CFR, Part 1630)are permitted in any area where Class II materials are required.

Reason: In this proposal two changes have been made to the IBC wording:

1. The "pill test" is applied to all carpets and carpet-like floor finish materials, in view of the fact that the federal government, through CPSC, regulates all carpets and rugs based on 16 CFR 1630 since the 1970s. Note that traditional finish floors and floor coverings, such as wood flooring and resilient floor coverings, have not proved to present an unusual hazard and are known to pass the "pill test" and are exempted by the exception in 804.1.
2. In the IBC there is confusion because section 804.4 states that "interior floor finish and floor covering materials in exit enclosures, exit passageways, corridors and rooms or spaces not separated from corridors by full-height partitions extending from the floor to the underside of the ceiling shall withstand a minimum critical radiant flux" and then section 804.4.1 states that "interior floor finish and floor covering materials in exit enclosures, exit passageways and corridors shall not be ...". This leaves undefined what minimum critical radiant flux is required for "interior floor finish and floor covering materials in rooms or spaces not separated from corridors by full-height partitions extending from the floor to the underside of the ceiling". Since section 804.2 only distinguishes two classes for NFPA 253, the logical conclusion is that the words are missing and that these rooms or spaces have to meet the same requirements as the corridors from which they are not separated.

Note that the exception to 804.1 already exempts all floor finishes and floor coverings that are not comprised of fibers. Therefore this entire section applies basically only to textile floor coverings, such as carpets.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-FS11-804.4

FS139–09/10
809 (New)

Proponent: Joe McELvaney, representing himself

Add new Section as follows:

Section 809
Children's Playground Structures

809.1 Children's playground structures. Structures intended as children's playgrounds that exceed 10 feet (3048 mm) in height and 150 square feet (14 m2) in area shall comply with Sections 809.1.1 through 809.1.4.

809.1.1 Materials. Children's playground structures shall be constructed of noncombustible materials or of combustible materials that comply with the following:

1. Fire-retardant-treated wood complying with Section 2302.
2. Light-transmitting plastics complying with Section 2606.
3. Foam plastics (including the pipe foam used in soft-contained play equipment structures) having a maximum heat-release rate not greater than 100 kilowatts when tested in accordance with UL 1975.
4. Aluminum composite material (ACM) meeting the requirements of Class A interior finish in accordance with Chapter 8 when tested as an assembly in the maximum thickness intended for use.
5. Textiles and films complying with the flame propagation performance criteria contained in NFPA 701.
6. Plastic materials used to construct rigid components of soft-contained play equipment structures (such as tubes, windows, panels, junction boxes, pipes, slides and decks) exhibiting a peak rate of heat release not exceeding 400 kW/m^2 when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation at a thickness of 6 mm.
7. Ball pool balls, used in soft-contained play equipment structures, having a maximum heat-release rate not greater than 100 kilowatts when tested in accordance with UL 1975. The minimum specimen test size shall be 36 inches by 36 inches (914mmby 914 mm) by an average of 21 inches (533 mm) deep, and the balls shall be held in a box constructed of galvanized steel poultry netting wire mesh.
8. Foam plastics shall be covered by a fabric, coating or film meeting the flame propagation performance criteria of NFPA 701.
9. The floor covering placed under the children's playground structure shall exhibit a Class I interior floor finish classification, as described in Section 804, when tested in accordance with NFPA 253.

809.1.2 Fire protection. Children's playground structures located within the compartment shall be provided with the same level of approved fire suppression and detection devices required for similar structures in the same compartment.

809.1.3 Separation. Children's playground structures shall have a minimum horizontal separation from other structures of 20 feet (6090 mm).

809.1.4 Area limits. Children's playground structures shall not exceed 300 square feet (28 m^2) in area, unless a special investigation has demonstrated adequate fire safety.

Reason: The current 2009 IBC has a section 402.12 for children's playground structures. This section currently only applies to Malls. However children's playground equipment can be found in all types of buildings and not just in malls. This new section will allow the code official to enforce these rules in any building that chooses to have children's playground equipment.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCELVANEY-FS1-809 NEW.doc

FS140–09/10
1403.2; R703.1.1

Proponent: Theresa Weston, PhD., DuPont Building Innovations representing DuPont Building Innovations

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Revise as follows:

1403.2 Weather protection. Exterior walls shall provide the building with a weather-resistant *exterior wall envelope*. The *exterior wall envelope* shall include flashing, as described in Section 1405.4. The *exterior wall envelope* shall be designed and constructed in such a manner as to prevent the accumulation of water within the wall assembly by providing a durable and continuous *water-resistive barrier* behind the exterior veneer, as described in Section 1404.2, and a means for draining water that enters the assembly to the exterior. Protection against condensation in the *exterior wall* assembly shall be provided in accordance with Section 1405.3.

Exceptions:

(Exceptions remain unchanged)

PART II – IRC BUILDING/ENERGY

Revise as follows:

R703.1.1 Water resistance. The exterior wall envelope shall be designed and constructed in a manner that prevents the accumulation of water within the wall assembly by providing a durable and continuous water-resistant barrier behind the exterior veneer as required by Section R703.2 and a means of draining to the exterior water that enters the assembly. Protection against condensation in the exterior wall assembly shall be provided in accordance with Section R601.3 of this code.

Exceptions:

(Exceptions remain unchanged)

Reason: Durability and continuity are critical to the performance of water-resistive barriers within a wall system, therefore they should be qualities that are referenced in the code. For example, one investigation of building failures[1] reported the following causes for water breacyhing the water-resistive barrier:

-32% At flashing and penetrations
-30% Discontinuities
-14% No exterior sheathing paper
-11% Material degradation
-10% No or reverse lap
-3% Other

Enhanced durability and continuity would have accounted for the majority of the issues found in this study. The proposed usage is compatible with current code language as “durability” and “continuity” are concepts referenced throughout the code.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WESTON-FS1-1403.2

FS141–09/10
1401, 1403.2, 1405.2, 1405.17

Proponent: Joseph Lstiburek, Building Science Corporation, representing self

Revise as follows:

1401 DEFINITIONS

~~**EXTERIOR WALL ENVELOPE**~~ **WALL ENCLOSURE.** A system or assembly of *exterior wall* components, including *exterior wall* finish materials, that provides protection of the building structural members, including framing and sheathing materials, and conditioned interior space, from the detrimental effects of the exterior environment.

1403.2 Weather protection. ~~Exterior walls shall provide the building with a weather-resistant *exterior wall envelope*. The *exterior wall envelope* shall include flashing, as described in Section 1405.4. The *exterior wall envelope*~~ The wall enclosure shall be designed and constructed in such a manner as to prevent the accumulation of water within the wall assembly by providing a *water-resistive barrier* behind the exterior veneer, as described in Section 1404.2, and a means for draining water that enters the assembly to the exterior. The wall enclosure shall include flashing as required in Section 1405.4. Protection against condensation in the *exterior wall* assembly shall be provided in accordance with Section 1405.3.

Exceptions:

1. ~~A weather-resistant *exterior wall envelope* shall not be required over concrete~~ Concrete or masonry walls designed in accordance with Chapters 19 and 21, respectively.
2. Compliance with the requirements for a means of drainage, and the requirements of Sections 1404.2 and 1405.4, shall not be required for a wall enclosure ~~an *exterior wall envelope*~~ that has been demonstrated through testing to resist wind-driven rain, including joints, penetrations and intersections with dissimilar materials, in accordance with ASTM E 331 under the following conditions:
   2.1. ~~*Exterior wall envelope*~~ Wall enclosure test assemblies shall include at least one opening, one control joint, one wall/eave interface and one wall sill. All tested openings and penetrations shall be representative of the intended end-use configuration.
   2.2. ~~*Exterior wall envelope*~~ Wall enclosure test assemblies shall be at least 4 feet by 8 feet (1219 mm by 2438 mm) in size.
   2.3. ~~*Exterior wall envelope*~~ Wall enclosure assemblies shall be tested at a minimum differential pressure of 6.24 pounds per square foot (psf) (0.297 kN/m2).
   2.4. ~~*Exterior wall envelope*~~ Wall enclosure assemblies shall be subjected to a minimum test exposure duration of 2 hours.

   The ~~*Exterior wall envelope*~~ Wall enclosure design shall be considered to resist wind-driven rain where the results of testing indicate that water did not penetrate control joints in the *exterior wall* envelope, joints at the perimeter of openings or intersections of terminations with dissimilar materials.

3. Exterior insulation and finish systems (EIFS) complying with Section 1408.4.1.

TABLE 1405.2
MINIMUM THICKNESS OF WEATHER COVERINGS

WALL COVERING AND CLADDING TYPE	**MINIMUM THICKNESS (inches)**

(Portions of table not shown remain unchanged)

SECTION 1405
INSTALLATION OF WALL COVERINGS AND CLADDINGS

1405.2 Weather protection. *Exterior walls* shall provide weather protection for the building. The materials of the minimum nominal thickness specified in Table 1405.2 shall be acceptable as *approved* ~~weather~~ wall coverings and claddings

1405.17 Fastening. ~~Weather~~ Wall coverings ~~boarding~~ and claddings ~~wall coverings~~ shall be securely fastened with aluminum, copper, zinc, zinc-coated or other *approved* corrosion-resistant fasteners in accordance with the nailing schedule in Table 2304.9.1 or the *approved* manufacturer's installation instructions. Shingles and other ~~weather~~ wall coverings and claddings shall be attached with appropriate standard- shingle nails to furring strips securely nailed to

studs, or with *approved* mechanically bonding nails, except where sheathing is of wood not less than 1-inch (25 mm) nominal thickness or of wood structural panels as specified in Table 2308.9.3(3).

Reason: The current language of the building code is inconsistent with terms in the engineering, scientific, technical, educational, building science and "common use" communities. In fact terms and language within the code itself are inconsistently used. "Codespeak" makes it difficult to communicate appropriate requirements and concepts. The I-Codes are likely the most effective educational documents used in the construction industry. It behooves us to use the language in them correctly. If you don't call "things" by their proper names how can you expect users of the documents to execute the actions correctly. The changes proposed in this code change do not change the intent of any of the sections nor do they change any specific requirement they only fix bad terms and language and bad physics.

Cost Impact: This proposal will not raise the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LSTIBUREK-FS1-1402

FS142–09/10
1403.5 (NEW)

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing The Extruded Polystyrene Foam Association

Add new text as follows:

1403.5 Vertical and Lateral Flame Propagation. Exterior walls greater than 20 feet (6 096 mm) in height above grade plane that contain combustible exterior wall coverings shall be tested in accordance with and comply with the acceptance criteria of NFPA 285.

Exceptions:

1. Exterior walls of Type V construction
2. Exterior walls that contain as the only combustible material, one or more of the following components:
   1. Thermal- and sound-insulating materials that meet the requirements of Section 1406.2.2.
   2. Architectural trim and embellishments.
   3. Combustible exterior wall veneers installed to heights not exceeding 40 ft. above grade plane.

(Renumber subsequent numbers)

Reason: This new section is proposed to address the potential vertical and lateral flame spread that can occur either on or within exterior wall assemblies that contain combustible materials.

Newer construction practices such as the addition of combustible weather resistant barriers allow significant amounts of combustible materials/products (other than foam plastics) to be installed on or in exterior walls. This code change proposal adds the requirement for NFPA 285 testing for exterior walls that contain these types of combustible materials. This requirement is already in place for any exterior walls that contain foam plastic insulation or use MCM exterior veneers.

Testing has shown that when a combustible weather resistive barrier was added to an exterior wall system that had successfully met the criteria for NFPA 285, that the addition of the barrier caused failure to occur in the NFPA 285 test.

Small-scale testing has shown that these types of materials can provide significant amounts of combustible fuel loading to a wall assembly and they are not currently regulated by the Code.

With the advent of newer exterior wall technologies such as “rainscreen” systems, the openings in the exterior veneer will allow flames and or heat to readily impact and ignite the barrier material. Due to the built-in standoffs of these systems, the barrier materials could then exhibit significant vertical or lateral flame propagation.

The Code proposal requires the NFPA 285 testing for exterior walls on Types I, II, III, or IV construction since these types of construction allow either none or limited combustibles in the exterior walls. The 20 ft. height limit provides a safety margin on the height of wall that can use these materials without testing. Also, while the code allows combustible exterior wall covering up to 40 ft., this proposal has as a limit 20 ft. since these materials can provide a hidden or concealed fire situation.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: Standard NFPA 285 is currently referenced in the I-codes.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEITEL-FS1-1403.5.doc

FS143–09/10
1404.12 (New)

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

1. Add a new definition as follows:

SECTION 1402
DEFINITIONS

Polypropylene siding - a shaped material, made principally from polypropylene homopolymer, or copolymer, which in some cases may contain fillers and/or reinforcements, that is used to clad exterior walls of buildings.

2. Add new section as follows

1404.12 Polypropylene siding. Polypropylene siding shall be certified and labeled as conforming to the requirements of 1404.12.1, 1404.12.2 or 1404.12.3 by an approved quality control agency. Polypropylene siding shall be installed in accordance with the manufacturer's installation instructions.

1404.12.1 Flame Spread Index. The polypropylene siding material shall comply with the requirements of ASTM D 7254. The certification shall be accompanied by a test report stating that all portions of the test specimen ahead of the flame front remained in position during the test in accordance with ASTM E 84 or UL 723.

1404.12.2 Heat Release. The polypropylene siding material shall comply with the requirements of ASTM D 7254 and a 4 foot by 8 foot (1.22 x 2.44 m) section of the polypropylene siding material shall exhibit a peak rate of heat release not exceeding 100 kW when tested in accordance with NFPA 289 using the 20 kW ignition source at the thickness intended for use.

1404.12.3 Fire Separation Distance. The polypropylene siding shall comply with all the requirements of ASTM D 7254 and the fire separation distance between a building with polypropylene siding and the adjacent building shall be no less than 10 feet (3.05 m).

1405.18 Polypropylene siding. Polypropylene siding conforming to the requirements of this section and complying with 1404.12 shall be permitted on exterior walls of buildings of Type V construction located in areas where the basic wind speed specified in Chapter 16 does not exceed 100 miles per hour (45 m/s) and the building height is less than or equal to 40 feet (12 192 mm) in Exposure C. Where construction is located in areas where the basic wind speed exceeds 100 miles per hour (45 m/s), or building heights are in excess of 40 feet (12 192 mm), tests or calculations indicating compliance with Chapter 16 shall be submitted. Polypropylene siding shall be secured to the building so as to provide weather protection for the exterior walls of the building.

1405.18.1 Application. The siding shall be applied over sheathing or materials listed in Section 2304.6. Siding shall be applied to conform with the water-resistive barrier requirements in Section 1403. Siding and accessories shall be installed in accordance with approved manufacturer's instructions. Unless otherwise specified in the approved manufacturer's instructions, nails used to fasten the siding and accessories shall have a minimum 0.313-inch (7.9 mm) head diameter and 0.125-inch (3.18 mm) shank diameter. The nails shall be corrosion resistant and shall be long enough to penetrate the studs or nailing strip at least 0.75 inch (19 mm). Where the siding is installed horizontally, the fastener spacing shall not exceed 16 inches (406 mm) horizontally and 12 inches (305 mm) vertically. Where the siding is installed vertically, the fastener spacing shall not exceed 12 inches (305 mm) horizontally and 12 inches (305 mm) vertically.

3. Add new standards to Chapter 35 as follows:

ASTM D 7254-07	Standard specification for polypropylene (PP) siding,
NFPA 289-09	Standard Method of Fire Test for Individual Fuel Packages

Reason: Polypropylene siding is being used in construction now although the IBC does not permit it. Therefore, it is important to regulate the use of polypropylene siding in a way that it can be used safely. The new sections are similar to the existing sections on vinyl siding, except for the fire testing. Vinyl siding is known to have adequate fire performance since the siding needs to be made of rigid (unplasticized) PVC in accordance with ASTM D 3679. Polypropylene is known not to have adequate fire performance unless properly fire retarded.

A new standard specification has been issued for polypropylene siding, ASTM D 7254. The specification addresses many of the key requirements for the material. Unfortunately the fire test requirement in ASTM D 7254 is not explicit enough. ASTM D 7254 does not require that, when fire testing is conducted in the ASTM E 84 (Steiner tunnel), the test specimen must remain in place during the test and flaming drips and falling test specimens are not allowed to happen. This requirement is critical for materials that are used exposed so that the flame spread index assesses actual surface flame spread on the material surface. The standards committee responsible for the ASTM E 84 fire test (ASTM E05) decided that this issue should be addressed in the code rather than in the standard itself. Polypropylene that has not been appropriately fire retarded will release abundant amount of heat, much more than other combustible sidings permitted by the code, such as wood siding or vinyl (PVC) siding, and spread

fire through flaming drips. Such flaming drips will contribute to ignite mulch and debris found near the building and spread the fire. Table 1 shows such results.

Recent fire tests were also conducted in the Steiner tunnel, ASTM E 84, on a rigid PVC material 0.06 in. thick; it exhibited a flame spread index of 10. Under the same test conditions, a fire retarded polypropylene material 0.15 in. thick exhibited a flame spread index of 50. These are both very adequate values, in view of the fact that both the polypropylene material and the PVC material remained in place during the ASTM E 84 test and did not generate flaming drips.

Table 1: Results of Steiner Tunnel Tests (ASTM E 84)

Material	Flame Spread Index	Maximum Flame Front Advance (ft)	Time to Max. Flame Front Advance (min:s)	Flaming on Floor (Duration) (min:s)
PVC	10	4.6	7:48	None
FR Polypropylene	50	19.5	6:24	4:18

This shows that it is possible to use fire retarded polypropylene materials that give very adequate flame spread values and also very adequate heat release values, without flaming drips. Consequently, polypropylene siding should only be used when it is shown to exhibit the appropriate fire performance.

When polypropylene siding material (which does not have the appropriate fire performance) is tested in ASTM E 84 (Steiner tunnel) the test specimen will often fall ahead of the arrival of the flame giving incorrect results.

Table 2 shows new results of cone calorimeter heat release tests with polypropylene and PVC:

Table 2: Results of Cone Calorimeter (ASTM E 1354) Tests

Material	Peak Heat Release Rate	Total Heat Released	Time to Ignition	Effective Heat of Combustion	Fire Performance Index
	kW/m^2	MJ/m^2	s	MJ/kg	$s\ m^2/kW$
PVC	186.8	16.7	36	9.2	0.19
Non FR Polypropylene	768.3	47.2	23	40.3	0.03

Table 3 shows some earlier results with polypropylene, PVC and wood materials in the cone calorimeter:

Table 3 - Cone Calorimeter Data on Plastics and Douglas Fir

Material	Pk HRR (kW/m^2)	THR (MJ/m^2)	TTI (s)	EHC (MJ/kg)	FPI ($s\ m^2/kW$)
		Flux 20 kW/m^2			
PVC Rigid, Custom Inj. Mold.	40	3.0	5159	1.4	1343
PVC Rigid, Extrusion	102	2.9	3591	7.3	31.4
PP Non FR	1170	231.3	218	72.0	0.19
PP FR	236		382	23.6	1.62
PE Non FR	913	161.9	403	41.1	0.44
XLPE FR	88	87.6	750	22.4	8.08
Douglas Fir	237	46.5	254	13.1	1.10
		Flux 40 kW/m^2			
PVC Rigid, Custom Inj. Mold.	175	24.3	73	5.1	0.42
PVC Rigid, Extrusion	183	90.8	85	13.3	0.46
PP Non FR	1509	206.9	86	42.1	0.06
PP FR	243		80	23.9	0.33
PE Non FR	1408	221.0	159	46.6	0.06
XLPE FR	192	126.2	105	24.2	0.55
Douglas Fir	221	64.1	34	17.6	0.15
		Flux 70 kW/m^2			
PVC Rigid, Custom Inj. Mold.	191	93.0	45	12.7	0.24
PVC Rigid, Extrusion	190	96.5	48	10.8	0.25
PP Non FR	2421	231.1	41	43.1	0.02
PE Non FR	2735	227.5	47	42.6	0.02
XLPE FR	268	129.2	35	24.7	0.13
Douglas Fir	196	50.0	12	13.5	0.06

Table 3 shows that, when tested in the cone calorimeter, ASTM E 1354, under the same conditions, it was found that non fire retarded polypropylene exhibits a peak heat release rate of 1509 kW/m^2, while a non fire retarded PVC material exhibits a peak heat release rate of 183 kW/m^2, and a Douglas fir material exhibits a peak heat release rate of 221 kW/m^2. Such a very high heat release rate is unacceptable for a siding

material. Testing in the cone calorimeter, including the testing above, is normally conducted in the horizontal orientation with radiant heat exposing the test specimen from above, thus capturing any flaming drips and assessing their effects.

Table 4 shows that wood materials, when not fire retarded, will usually exhibit flame spread index values that are less than 200 and will correspond to Class B or Class C categories. At the same time rigid PVC (vinyl) materials will generally exhibit flame spread index values less than 25. Neither wood nor PVC materials will cause flaming drips or molten material burning on the ground.

Table 4. Steiner tunnel (ASTM E 84) Data for Wood and Vinyl Materials

Material/Product	Flame Spread Index		Material/Product	Flame Spread Index	
	Low	High		Low	High
Cellulose fiberboard ceiling tile	70	80	Ponderosa pine B	105	170
Cottonwood	115		Poplar	170	185
Cypress	145	150	Red Gum	140	155
Douglas fir	70	100	Red oak flakeboard	70	190
Douglas fir overlay	110	140	Red Oak Flooring	100	100
Douglas fir/cedar plywood	190	230	Red Pine	140	
Eastern White Pine	85		Redwood	65	70
Hemlock/cedar plywood	190		Southern yellow pine	130	195
Lauan hardwood	150	170	Vinyl faced plywood	110	130
Lodgepole Pine	95		Vinyl profile	15	20
Maple flooring	105		Vinyl Siding	10	15
Northern white pine A	190	215	Vinyl vapor barrier	10	15
Northern white pine B	120	180	Walnut	130	140
Pacific silver fir	70		West Coast Hemlock	60	70
Pacific Yellow Cedar	80		Western Red Cedar	70	
Particleboard	135	180	Western spruce	100	
Plywood paneling over gypsum	130	150	Western white pine	75	
Ponderosa pine A	170	230	Yellow birch	105	110

Figure 1 shows char from a PVC siding fire (no foam backing): the material softened, charred and burned but is still substantially intact. Figure 2 shows a vertical PP sheet melting and resulting in flaming drips on the floor.

The reason that heat release rate and floor flaming are important issues is because it has been shown that the heat radiated by siding is a major contributor to the ignition of neighboring houses, as is the spread of fire along the ground, particularly when there are loose combustibles present.

That is the reason that the third option allows polypropylene siding to be used, but with a larger separation distance, when the results of the ASTM E 84/UL 723 (Steiner tunnel) test are based on a test specimen that is not self supporting and falls to the floor of the tunnel during the test. The standard ASTM E 84 states: "1.4 Testing of materials that melt, drip, or delaminate to such a degree that the continuity of the flame front is destroyed, results in low flame spread indices that do not relate directly to indices obtained by testing materials that remain in place." Therefore valid test results require the test specimen to stay in place ahead of the exposing flame.

Polypropylene siding should not be used in buildings other than Type V construction.

Figure 1 – remains of vinyl siding fire

Figure 2 Polypropylene siding melting and flaming on the floor.
(No figure 2 attached)

NFPA 289 was developed to test individual fuel packages and is similar in concept to UL 1975, already widely used in the code.

Cost Impact The code does not at present allow the use of polypropylene siding. In order to safely use polypropylene siding construction costs would have to increase either by using materials that would meet test requirements for adequate fire safety or by increasing fire separation distances.

Analysis: Code change proposal FS143 and FS144 address new requirements for polypropylene siding. The committee needs to make its intent clear with respect to these provisions. A review of the standard(s) proposed for inclusion in the code, ASTM D 7254-07 and NFPA 289-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-FS6-1404.12.doc

FS144–09/10

1402 (New), 1404.8 (New), 1405.13 (New), Chapter 35; IRC R202, 703.13, 703.13.1, Chapter 44

Proponent: Matthew Dobson, representing Vinyl Siding Institute

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTTIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

1. Add new text as follows:

1402 DEFINITIONS

Polypropylene Siding. A shaped material made principally from polypropylene that is used to clad exterior walls covering.

2. Add new text as follows:

1404.8 Polypropylene Siding. Polypropylene siding shall conform to the requirements of ASTM D7254.

(Renumber subsequent sections)

3. Add new text as follows:

1405.13 Polypropylene Siding. Polypropylene siding conforming to the requirements of this section and complying with ASTM D7254 shall be permitted on exterior walls of buildings located in areas where the wind speed specified in Chapter 16 does not exceed 100 miles per hours (45m/s) and the building height is less than or equal to 40 feet (12 192 mm) in Exposure C. Where construction is located in areas where the basic wind speed exceed 100 mile per hour (45 m/s), or building heights are in excess of 40 feet (12 192 mm), tests or calculations indicating compliance with Chapter 16 shall be submitted. Polypropylene siding shall be secured to the building so as to provide weather protection for the exterior walls of the building.

1405.13.1 Application. The siding shall be applied over sheathing or materials listed in Section 2304.6. Siding shall be applied to conform with the weather-resistive barrier requirements in Section 1403. Siding and accessories shall be installed in accordance with approved manufacturer's instructions.

(Renumber subsequent sections)

4. Add new text to Chapter 35 standards as follows:

ASTM D7254 – 07 Standard Specification for Polypropylene (PP) Siding…1402, 1404.8, 1405.13

PART II – IRC BUILDING/ENERGY

1. Add new text as follows:

R202 DEFINITIONS

Polypropylene Siding. A shaped material made principally from polypropylene that is used to clad exterior walls covering.

2. Add new text as follows:

TABLE R703.4
WEATHER–RESISTANT SIDING ATTACHMENT AND MINIMUM THICKNESS

SIDING MATERIAL	NOMINAL THICKNESS[a] (inches)	JOINT TREATMENT	Water Resistive Barrier Required	Wood or wood structural panel sheathing	Fiberboard sheathing into stud	Gypsum sheathing into stud	Foam plastic sheathing into stud	Direct to studs	Number or spacing of fasteners
(NEW) Polypropylene Siding[X]	Varies	Lap	Yes	0.120 nail (shank) with a .313 head[y,z]	Not allowed[aa,bb]	Not allowed[aa,bb]	Not allowed[aa,bb]	Not allowed	As specified by the manufacturer instructions or test report

(Portions of table and footnotes not shown remain unchanged)

aa. Where the sheathing is applied directly over wood structural panels or other approved backing capable of independently resisting the design wind pressure, the polypropylene siding shall be installed in accordance with the manufacturer's installation instructions.

bb. Where the polypropylene siding manufacturer's product specifications provide an approved design wind pressure rating for installation over fiberboard, gypsum or foam plastic sheathing, use of this design wind pressure rating shall be permitted and the siding shall be installed in accordance with the manufacture's installation instructions.

3. Add new text as follows:

R703.13 Polypropylene Siding. Polypropylene siding shall comply with requirements of ASTM D 7254.

R703.13.1 Installation. Polypropylene siding shall be installed in accordance with the manufacturer's installation instructions.

4. Add new text to Chapter 44 standards as follows:

ASTM D7254 – 07 Standard Specification for Polypropylene (PP) Siding…Table R703.4, R703.13

Reason: The purpose of this change is to assist code officials with the recognition of polypropylene (PP) siding. This product has reached a level of maturity including the establishment of an acceptance criterion through ES and an ASTM product standard. By providing this recognition in the code, building officials will be able to quickly reference the product and installation provisions.

Currently there is confusion in the market place between vinyl siding and PP siding. In many instances the PP siding is thought to be vinyl siding, this new language will help the code official to understand the requirements of the product established by ES and ASTM and what to enforce relative to its installation.

D7254 – 07 Standard Specification for Polypropylene (PP) Siding

The ASTM standard provides all necessary manufacturing tests and specifications to ensure the product meets the intent of the code from safety and welfare to wind performance. Included with this proposal are copies of the acceptance criteria and the ASTM standard D7254.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposal FS143 and FS144 address new requirements for polypropylene siding. The committee needs to make its intent clear with respect to these provisions. A review of the standard(s) proposed for inclusion in the code, ASTM D7254-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DOBSON-FS1-1404.8; RB2-202 PART II

FS145–09/10

1402 (New), 1404.13 (New), Table 1405.2, 1405.10.2 (New)

Proponent: Olene Bigelow, representing International Masonry Institute

1. Add new text as follows:

1402 DEFINITIONS

COMPOSITE NATURAL STONE. A veneer consisting of natural stone laminated to, or combined with, other like units to form a larger unit, or to dissimilar materials to form a cladding to be anchored or adhered to an approved substrate.

2. Add new text as follows:

1404.13 Porcelain Tile. Porcelain tile shall conform to the requirements of ANSI 137.1.3 for ceramic tile having an absorption of 0.5% or less according to ANSI 137.4.1 – Class Table and ANSI 137.1.6.1 Allowable Properties by Tile Type – Table 10.

3. Revise as follows:

TABLE 1405.2
MINIMUM THICKNESS OF WEATHER COVERINGS

Covering Type	Minimum Thickness (Inches)
Porcelain Tile	0.25
Composite Natural Stone	0.50

(Portions of table not shown remain unchanged)

4. Add new text as follows:

1405.10.2 Exterior adhered masonry veneers - porcelain tile and composite natural stone. Adhered units shall not exceed 5/8" thickness and a maximum of 24" in any face dimension nor more than 3 square feet in total face area and shall not weigh more than 9 pounds per square foot. Porcelain tile and composite natural stone shall be adhered to an approved backing system.

Reason: There is currently no definition for composite natural stone in the IBC. This proposal would add that definition. Currently, there is no definition for porcelain tile in the IBC. As one of myriad types of ceramic tile, its unique characteristics and extremely low absorption rate requires it be dealt with differently from other materials, especially when applied as an exterior adhered veneer. These materials are relatively new in exterior applications and fall outside the scope of TMS 402/ACI 530/ASCE 6. With no specific code requirements found in IBC, installations of these materials are being found inadequate and some significant failures have occurred. See attached photographs. When these units and/or their adhesion system fail, for whatever ultimate reason, public safety is put at risk.

Here, only a few units have fallen, so far. No mechanical attachment.

Another project: Upon stripping the façade, it appears an attempt was made to “anchor” the units, but it was clearly unsuccessful

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Standards ANSI A137 are currently referenced in the I-codes.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BIGELOW-FS1, FS2, FS3, FS4

FS146–09/10

Table 1405.2

Proponent: John Woestman, The Kellen Company, representing the Masonry Veneer Manufacturers Association (MVMA)

Revise as follows:

TABLE 1405.2
MINIMUM THICKNESS OF WEATHER COVERING

OVERING TYPE	MINIMUM THICKNESS (inches)
Precast stone facing	0.625[e]
Stone (cast artificial, anchored)	1.5

e. Includes scratch coat, setting bed, and precast stone.

(Portions of table and footnotes not shown, remain unchanged)

Reason: Table 1405.2 contains several items which have been interpreted as applying to adhered masonry veneer. The proposed revisions to Table 1405.2 attempt to clarify the IBC with a footnote to the table for the precast stone facing. The revisions also clarify that cast artificial stone, with a minimum thickness of 1.5 inches, is an anchored veneer, not an adhered veneer.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: WOESTMAN-FS2-Table 1405.2

FS147–09/10
Table 1405.3; IRC Table R601.3.1

Proponent: Edward L. Keith, PE, APA, The Engineered Wood Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Revise as follows:

TABLE 1405.3.1
CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a]
Marine 4	~~Vented cladding over OSB~~ ~~Vented cladding over plywood~~ Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Insulated sheathing with *R*-value ≥ .5 over 2x4 wall Insulated sheathing with *R*-value ≥ 3.75 over 2x6 wall
5	~~Vented cladding over OSB~~ ~~Vented cladding over plywood~~ Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Insulated sheathing with *R*-value ≥ 5 over 2x4 wall Insulated sheathing with *R*-value ≥ 7.5 over 2x6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Insulated sheathing with *R*-value ≥ 7.5 over 2x4 wall Insulated sheathing with *R*-value ≥ 11.25 over 2x6 wall
7 and 8	Insulated sheathing with *R*-value ≥ 10 over 2x4 wall Insulated sheathing with *R*-value ≥ 15 over 2x6 wall

For SI: 1 pound per cubic foot = 16 kg/m^3.

a. Spray foam with a minimum density of 2 lb/ft3 applied to the interior cavity side of ~~OSB, plywood~~ wood structural panels, fiberboard, insulating sheathing or gypsum is deemed to meet the insulating sheathing requirement where the spray foam *R*-value meets or exceeds the specified insulating sheathing *R*-value.

PART II – IRC BUILDING/ENERGY

Revise as follows:

TABLE R601.3.1
CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a]
Marine 4	~~Vented cladding over OSB~~ ~~Vented cladding over plywood~~ Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Insulated sheathing with *R*-value ≧ 2.5 over 2x4 wall Insulated sheathing with *R*-value ≧ 3.75 over 2x6 wall
5	~~Vented cladding over OSB~~ ~~Vented cladding over plywood~~ Vented cladding over wood structural panels Vented cladding over fiberboard Vented cladding over gypsum Insulated sheathing with *R*-value ≧ 5 over 2x4 wall Insulated sheathing with *R*-value ≧ 7.5 over 2x6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Insulated sheathing with *R*-value ≧ 7.5 over 2x4 wall Insulated sheathing with *R*-value ≧ 11.25 over 2x6 wall
7 and 8	Insulated sheathing with *R*-value ≧ 10 over 2x4 wall Insulated sheathing with *R*-value ≧ 15 over 2x6 wall

For SI: 1 pound per cubic foot = 16.02 kg/m3.

a. Spray foam with a minimum density of 2 lb/ft3 applied to the interior cavity side of ~~OSB, plywood~~ wood structural panels, fiberboard, insulating sheathing or gypsum is deemed to meet the insulating sheathing requirement where the spray foam *R*-value meets or exceeds the specified insulating sheathing *R*-value.

Reason:
PART I- The proposed change is made to foster consistency in the code. The IBC and other codes only differentiate between plywood and OSB when there is a difference in performance. In all other cases, in this and the other codes, the generic term "wood structural panel" is used. As there is no difference in performance between plywood, OSB, or composite panels where the use of a Class III vapor retarder is concerned, the term "wood structural panel" is appropriate.

Note that the use of a vapor retarder for wood structural panel products is in line with our long-standing recommendations.

PART II- The proposed change is made to foster consistency in the code. The IRC and other codes only differentiate between plywood and OSB when there is a difference in performance. In all other cases, in this and the other codes, the generic term "wood structural panel" is used. As there is no difference in performance between plywood, OSB, or composite panels where the use of a Class III vapor retarder is concerned, the term "wood structural panel" is appropriate.

Note that the use of a vapor retarder for wood structural panel products is in line with our long-standing recommendations.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KEITH-FS2-TABLE 1405.3

FS148–09/10
1405.6.2

Proponent: Charles Clark, representing Brick Industry Association-Masonry Alliance for Codes and Standards (MACS)

THIS CODE CHANGE WILL BE HEARD BY THE IBC STRUCTUAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Revise as follows:

1405.6 Anchored masonry veneer. Anchored masonry veneer shall comply with the provisions of Sections 1405.6, 1405.7, 1405.8 and 1405.9 and Sections 6.1 and 6.2 of TMS 402/ACI 530/ASCE 5.

1405.6.1 Tolerances. Anchored masonry veneers in accordance with Chapter 14 are not required to meet the tolerances in Article 3.3 F1 of TMS 602/ACI 530.1/ASCE 6.

1405.6.2 Seismic requirements. Anchored masonry veneer located in Seismic Design Category C, D, E or F shall conform to the requirements of Section 6.2.2.10 of TMS 402/ACI 530/ASCE 5. ~~Anchored masonry veneer located in Seismic Design Category D shall also conform to the requirements of Section 6.2.2.10.3.3 of TMS 402/ACI 530/ASCE 5.~~

Reason: This proposed code change addresses anchored masonry veneer constructed on a building located in Seismic Design Category D and removes the requirement to include wire joint reinforcement in the veneer and mechanically attach the reinforcement to the veneer anchors. This proposed change is based on shaking-table testing conducted in January and March 2009 on full-scale structures (one wood-stud frame and one reinforced masonry structure) at The University of California San Diego complemented by prior shaking-table testing and quasi-static testing of wall segments, all with clay masonry veneer. The testing conclusively demonstrated that incorporating wire reinforcement in anchored veneer does not improve the performance or behavior of the anchored masonry veneer during or after the maximum considered earthquake for a structure located in Seismic Design Category D (Bibliography References 1 & 2 below).

The testing was conducted separately on two full-scale specimens: a 20 ft x 20 ft prototypical wood-stud frame structure with anchored brick veneer and a 20 ft x 20 ft prototypical concrete masonry structure with anchored brick veneer. For each specimen, two of the four veneer elevations included joint reinforcement with the remaining two veneer elevations constructed without joint reinforcement. Both specimens were each subjected separately to a seismic load imposed by the Maximum Considered Earthquake (2% probability of exceedance in 50 years) for Seismic Design Category D. In each specimen, no differences in performance or behavior were observed in the veneers with and without joint reinforcement.

Not requiring reinforcement in the veneer will likely decrease the possibility of corrosion occurring in the veneer. By not requiring reinforcement, the extent of metal accessories present in the veneer is substantially lowered thus reducing the probability of corrosion.

As way of background, the Masonry Alliance for Codes and Standards has previously submitted this change as FS179-07/08 based on previous out-of-plane shaking-table testing conducted on wall segments (Bibliography Reference 5 below) as well as analysis (Bibliography References 3 & 4 below) that supported the change. The full-scale entire structure testing program mentioned above was not yet complete. Aware of this program, the IBC Structural Committee disapproved the change citing their preference to "wait until that testing is complete and those results are made available before approving the proposal." That testing has now been completed and has indicated that the requirement to include joint reinforcement in anchored masonry veneer located in Seismic Design Category D is not necessary.

Bibliography:

1. Klingner, Richard E., Shing, P. Benson, McGinley, Mark W., McLean, David I., Okail, Hussein, and Jo, Seongwoo, "NSF NEES Small-Group Project on Performance-based Design of Masonry and Masonry Veneer: Overview and Preliminary Results," *TMS Journal*, The Masonry Society, Boulder, Colorado, December 2008 (date submitted for publication).
2. Klingner, Richard E., "Behavior of Anchored Masonry Veneer with Light Wood Stud-Framing or Masonry Backing in Full-Scale Whole-Building Shaking-Table Tests," *TMS Journal*, The Masonry Society, Boulder, Colorado, June 2009 (date submitted for publication).
3. McEwen, William, Wibowo, A., Adebar, P., Anderson, D., Effect of Veneer Joint Reinforcement on Brick Tie Embedment, *Ninth Canadian Masonry Symposium*, June, 2001.
4. McGinley, M., Bennett, R., Johnson, E., "Effects of Horizontal Joint Reinforcement on the Seismic Behavior of Masonry Veneers," 6th *International Masonry Conference*, November, 2002.
5. Turek, Ventura, "Out-of-Plane Shake-Table Testing of Brick Veneer With and Without Wire Joint Reinforcement," The University of British Columbia, June, 2002.

Cost Impact: The code change proposal will reduce the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CLARK-FS1-1405.6.2

FS149–09/10
1405.7

Proponent: Gary J. Ehrlich, PE, representing National Association of Home Builders

THIS CODE CHANGE WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER OF THIS COMMITTEE.

Revise as follows:

1405.7 Stone veneer. Stone veneer units not exceeding 10 inches (254 mm) in thickness shall be anchored directly to masonry, concrete or to stud construction by one of the following methods:

1. *(No change to current text)*
2. With wood stud backing, a 2-inch by 2-inch (51 by 51 mm) 0.0625-inch (1.59 mm) corrosion-resistant wire mesh with two layers of water-resistive barrier in accordance with Section 1404.2 shall be applied directly to wood studs spaced a maximum of 16 inches (406 mm) o.c. On studs, the mesh shall be attached with 2-inch-long (51 mm) corrosion-resistant steel wire furring nails at 4 inches (102 mm) o.c. providing a minimum 1.125-inch (29 mm) penetration into each stud and with 8d common nails at 8 inches (203 mm) o.c. into top and bottom plates or with equivalent wire ties. There shall be not less than a 0.1055-inch (2.68 mm) corrosion-resistant wire, or approved equal, looped through the mesh for every 2 square feet (0.2 m2) of stone veneer. This tie shall be a loop having legs not less than 15 inches (381 mm) in length, so bent that it will lie in the stone veneer mortar joint. The last 2 inches (51 mm) of each wire leg shall have a right-angle bend. One-inch (25 mm) minimum thickness of cement grout shall be placed between the backing and the stone veneer.
3. With cold-formed steel stud backing, a 2-inch by 2-inch (51 by 51 mm) 0.0625-inch (1.59 mm) corrosion-resistant wire mesh with two layers of water-resistive barrier in accordance with Section 1404.2 shall be applied directly to steel studs spaced a maximum of 16 inches (406 mm) o.c. The mesh shall be attached with 2-inch-long (51 mm) corrosion-resistant #8 self-drilling, tapping screws at 4 inches (102 mm) o.c. providing a minimum 0.5-inch (12.7 mm) penetration into each stud, and at 8 inches (203 mm) o.c. into top and bottom tracks or with equivalent wire ties. There shall be not less than a 0.1055-inch (2.68 mm) corrosion-resistant wire, or approved equal, looped through the mesh for every 2 square feet (0.2 m2) of stone veneer. This tie shall be a loop having legs not less than 15 inches (381 mm) in length, so bent that it will lie in the stone veneer mortar joint. The last 2 inches (51 mm) of each wire leg shall have a right-angle bend. One-inch (25 mm) minimum thickness of cement grout shall be placed between the backing and the stone veneer. The cold-formed steel framing members shall have a minimum uncoated thickness of 0,043 inches (1.09 mm).

Reason: The purpose of this proposal is to provide guidance for stone veneer anchored to cold-formed steel stud backing. The current language only addresses wood studs, leaving attachment to cold-formed steel stud backing as an alternate means and methods. The language mirrors the wood stud language, with appropriate revisions based on ICC-ES stone veneer reports and BIA Technical Note 28B on Brick Veneer/Steel Stud Walls.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Ehrlich-FS1-1405 7

FS150–09/10
1405.10.2 (New), 1405.10.2.1 (New), 1405.10.2.2 (New), 1405.10.2.3 (New); IRC R703.12.1 (New)

Proponent: John Woestman, The Kellen Company, Representing the Masonry Veneer Manufacturers Association (MVMA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Add new text as follows:

1405.10 Adhered masonry veneer. Adhered masonry veneer shall comply with the applicable requirements in Section 1405.10.1 and Sections 6.1 and 6.3 of TMS 402/ACI 530/ASCE 5.

1405.10.1 Interior adhered masonry veneers. Interior adhered masonry veneers shall have a maximum weight of 20 psf (0.958 kg/m2) and shall be installed in accordance with Section 1405.10. Where the interior adhered masonry veneer is supported by wood construction, the supporting members shall be designed to limit deflection to 1/600 of the span of the supporting members.

1405.10.2 Exterior adhered masonry veneer. Exterior adhered masonry veneer shall be in accordance with section 1405.10

1405.10.2.1 Water-resistive barriers. Water-resistive barriers shall be installed as required in Section 1404.2 and, where applied over wood-based sheathing, shall include a water-resistive vapor-permeable barrier with a performance at least equivalent to two layers of Grade D paper.

> **Exception:** Where the water-resistive barrier that is applied over wood-based sheathing has a water resistance equal to or greater than that of 60-minute Grade D paper and is separated from the adhered masonry veneer by an intervening, substantially nonwater-absorbing layer or drainage space.

1405.10.2.2 Flashing at foundation. A corrosion-resistant screed or flashing of a minimum 0.019-inch (0.48 mm) or 26 gage galvanized or plastic with a minimum vertical attachment flange of 3 ½ inches (89 mm) shall be installed a minimum of 1 inch (25 mm) below the foundation plate line on exterior stud walls in accordance with Section 1405.4 to direct moisture to the exterior. The water-resistive barrier shall lap over the exterior of the attachment flange of the screed or flashing.

1405.10.2.3 Installation. Adhered masonry veneer shall be installed in accordance with the manufacturer's instructions..

PART II – IRC BUILDING/ENERGY

Add new text as follows:

R703.12 Adhered masonry veneer installation. Adhered masonry veneer shall be installed in accordance with the manufacturer's instructions.

R703.12.1 Flashing at foundation. A corrosion-resistant screed or flashing of a minimum 0.019-inch (0.48 mm) or 26 gage galvanized or plastic with a minimum vertical attachment flange of 3 ½ inches (89 mm) shall be installed a minimum of 1 inch (25 mm) below the foundation plate line on exterior stud walls in accordance with Section R703.8 to direct moisture to the exterior. The water-resistive barrier, as required by Table R703.4 Footnote w, shall lap over the exterior of the attachment flange of the screed or flashing.

Reason:

PART I-The added section for exterior adhered masonry veneer compliments the existing section for interior adhered masonry veneer.

The proposed language for water-resistive barriers is modeled after similar requirements for stucco (section 2510.6).

The proposed language for flashing at the foundation is similar to the weep screed requirements for stucco and compliments the performance requirements of section 1405.4 Flashing (*Flashing shall be installed in such a manner so as to prevent moisture from entering the wall or to redirect it to the exterior* . . . . . .) while at the same time allowing for alternates to the stucco-specific weep screed.

Adhered masonry veneer manufacturers require their products to be installed per their instructions and the building code should support this requirement with enforceable language.

PART II- The proposed language for flashing at the foundation is similar to the weep screed requirements for stucco and compliments the flashing performance requirements of section R703.8 Flashing (*Approved* corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components . . . .) while at the same time allowing for effective alternates to the stucco-specific weep screed.

Cost Impact: The code change proposal will not increase the cost of construction

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: WOESTMAN -FS3-1410.2 PART I AND WOESTMAN-RB2-703.12.1 PART II

FS151–09/10

1405.10.2 (New), 1405.2.1 (New); IRC R703.12.1 (New)

Proponent: John Woestman, The Kellen Company, Representing the Masonry Veneer Manufacturers Association (MVMA)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY AND THE IRC BUILDING/ENERGY CODE DEVELOPMENT COMMITTEES. SEE THE TENTTIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Add new text as follows:

1405.10 Adhered masonry veneer. Adhered masonry veneer shall comply with the applicable requirements in Section 1405.10.1 and Sections 6.1 and 6.3 of TMS 402/ACI 530/ASCE 5.

1405.10.1 Interior adhered masonry veneers. Interior adhered masonry veneers shall have a maximum weight of 20 psf (0.958 kg/m2) and shall be installed in accordance with Section 1405.10. Where the interior adhered masonry veneer is supported by wood construction, the supporting members shall be designed to limit deflection to 1/600 of the span of the supporting members.

1405.10.2 Exterior adhered masonry veneer. Exterior adhered masonry veneer shall be in accordance with section 1405.10

1405.10.2.1 Clearances. Adhered masonry veneer shall be installed a minimum of 4 inches (102 mm) above the earth or 2 inches (51 mm) above paved areas or ½ inch (12 mm) above exterior walking surfaces supported by the same foundation which supports the exterior wall.

Cost Impact: The code change proposal will not increase the cost of construction.

PART II – IRC BUILDING/ENERGY

Add new text as follows:

R703.12 Adhered masonry veneer installation. Adhered masonry veneer shall be installed in accordance with the manufacturer's instructions.

R703.12.1 Clearances. Adhered masonry veneer shall be installed a minimum of 4 inches (102 mm) above the earth or 2 inches (51 mm) above paved areas or ½ inch (12 mm) above exterior walking surfaces supported by the same foundation which supports the exterior wall.

Reason:

PART I: The added section for exterior adhered masonry veneer compliments the existing section for interior adhered masonry veneer.

The clearance requirements are consistent with stucco applications and go one step further by specifying a minimum of ½" clearance to exterior walking surfaces which are supported by the same foundation that supports the wall to which the exterior veneer is adhered. The proposed requirement that both the wall and the walking surface be supported by the same foundation, along with existing IBC flashing performance requirements of section 1405.4 for exterior wall intersections with porches, decks, balconies, and similar architectural features, limits this ½" clearance to building elements stable to each other and required to be flashed to manage water. This ½" clearance requirement allows for architectural and aesthetic improvements in the installation of adhered masonry veneer.

PART II: The clearance requirements proposed are consistent with stucco applications and go one step further by specifying a minimum of ½" clearance to exterior walking surfaces which are supported by the same foundation that supports the wall to which the exterior veneer is adhered. The proposed requirement that both the wall and the walking surface be supported by the same foundation, along with existing IRC flashing performance requirements of section R703.8 for exterior wall intersections with porches, decks, or stairs, limits this ½" clearance to building elements stable to each other and required to be flashed to manage water. This ½" clearance requirement allows for architectural and aesthetic improvements in the installation of adhered masonry veneer.

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WOESTMAN -FS4-1410.2 PART I AND WOESTMAN-RB3-R703.12.1 PART II

FS152–09/10
1405.13.2

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC)

Revise as follows:

IBC 1405.13.2 Window sills. In Occupancy Groups R-2 and R-3, one- and two-family and multiple-family dwellings, where the opening of the sill portion of an operable window is located more than 72 inches (1829 mm) above the finished grade or other surface below, the lowest part of the clear opening of the window shall be at a height not less than 24 inches (610 mm) above the finished floor surface of the room in which the window is located. Glazing between the floor and a height of 24 inches (610 mm) shall be fixed or have openings through which a 4-inch (102 mm) diameter sphere cannot pass through.

Exception: Openings that are more than 75 feet above grade that are provided with window ~~guards~~ fall prevention devices that comply with ASTM F 2006 ~~or F 2090.~~

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Child Window Safety". The scope of the activity is noted as:

Study the incidence and mechanisms of falls from open windows by children and to investigate the necessity and suitability of potential safeguards and/or revisions to the current codes.

In a related change, both the IBC and IRC are proposed to be updated to allow the use of window opening control devices to abate the hazard of child falls through windows. These devices can be used for buildings of any height and are regulated by updated standard ASTM F2090 – 2008.

The scope of ASTM F 2006 – 00 (2005) entitled "Standard Safety Specification for Window Fall Prevention Devices for Non-Emergency Escape (Egress) and Rescue (Ingress) Windows" is noted in Section 1.2 of the standard which states; "This safety specification applies only to window fall prevention devices that are to be used on windows that are not intended for escape (egress) and rescue (ingress)." Further, Section 1.3 states that: " This safety specification applies only to devices intended to be applied to windows installed at heights of more than 75 above ground level in multiple family dwelling buildings. This safety specification is not intended to apply to windows below 75 feet because all windows below 75 feet that are operable could be used as a possible secondary means of escape."

Cost Impact: This code change proposal will slightly increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HEILSTEDT-FS2-1405.13.2

FS153–09/10
1405.13.2, 1405.13.2.1, Chapter 35

Proponent: Julie Ruth, PE, J Ruth Code Consulting, representing the American Architectural Manufacturers Association Window Opening Control Device Task Group

1. Revise as follows:

1405.13.2 Window sills. In Occupancy Groups R-2 and R-3, one- and two-family and multiple-family dwellings, where the opening of the sill portion of an operable window is located more than 72 inches (1829 mm) above the finished grade or other surface below, the lowest part of the clear opening of the window shall be at a height not less than 24 inches (610 mm) above the finished floor surface of the room in which the window is located. Glazing between the floor and a height of 24 inches (610 mm) shall be fixed or have openings through which a 4-inch (102 mm) diameter sphere cannot pass.

Exceptions:

1. Openings that are provided with window guards that comply with ASTM F 2006 or F 2090.
2. Windows that are provided with window opening control devices that comply with Section 1405.13.2.1.

1405.13.2.1 Window opening control devices. When required elsewhere in this code, window opening control devices shall comply with the provisions of AAMA 909.

2. Revise Chapter 35 as follows:

AAMA
AAMA 909 Voluntary Specification for Window Opening Control Devices….. 1405.13.2.1

Reason: The 2009 IRC permits an exception to the current minimum sill height requirement of Section R612.3 for windows that are provided with window opening limiting devices. For consistency with the IRC, the IBC should permit the same. The criteria for these devices within the IRC, however, is inadequate. The 2008 edition of ASTM F2090 attempts to provide greater guidance, but the members of the AAMA Window Opening Control Device task group, which was created specifically to respond to this new requirement in the International Codes, have found inconsistencies and confusion within ASTM F2090-08 as well. Therefore, the members of the AAMA WOCD TG have committed of the development and completion of an AAMA standard in time for the 2012 International Residential Code in late 2010.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, AAMA-909, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Ruth-FS2-1405.13.2

FS154–09/10
1013.1 (New), 1405.13.2

Proponent: Daniel E. Nichols, PE, New York State Div. of Code Enforcement and Administration

1. Add new text as follows:

1013.1 General. Guards and operable windows shall comply with this section. Guards shall comply with the provisions of Sections 1013.2 through 1013.7. Operable windows with sills located more than 72 inches above finished grade or other surface below shall comply with Section 1013.8.

(Renumber subsequent sections)

2. Relocate Section 1405.13.2 to new Section 1013.8 as follows:

~~**1405.13.2**~~ **1013.8 Window Sills**. In Occupancy Groups R-2 and R-3, one – and two-family and multiple-family dwellings, where the opening of the sill portion of an operable window is located more than 72 inches above the finished grade or other surface below, the lowest part of the clear opening of the window shall be at a height not less than 24 inches above the finished floor surface of the room in which the window is located. Glazing between the floor and a height of 24 inches shall be fixed or have openings through which a 4-inch diameter sphere cannot pass.

Exception: Openings that are provided with window guards that comply with ASTM F2006 or F2090.

Reason: The reason for Section 1405.13.2 is essentially a protection from fall requirement. That is the same reason that 1013 exists. Having this section located in Chapter 14 results in it being frequently overlooked by designers and building officials alike. Section 1013.1 is modified to scope the section to include fall protection requirements from windows.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NICHOLS-FS1-1405.13.2

FS155–09/10
1406.2.1; IRC R302.1.2 (New)

Proponent: Michael Love, representing Metropolitan Washington DC Fire Marshal's Committee

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE FIRE SAFETY COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC Fire Safety

Revise as follows:

1406.2.1 Ignition resistance. Combustible exterior wall coverings shall be tested in accordance with NFPA 268.

Exceptions:

1. Wood or wood-based products.
2. Other combustible materials covered with an exterior covering other than vinyl sidings listed in Table 1405.2.
3. Aluminum having a minimum thickness of 0.019 inch (0.48mm).
4. Exterior wall coverings on exterior walls of Type V construction.

1406.2.1.1 Fire separation 5 feet or less. Where installed on exterior walls having a fire separation distance of 5 feet (1524 mm) or less <u>to buildings, structures or decks</u>, combustible exterior wall coverings shall not exhibit sustained flaming as defined in NFPA 268.

<u>Exceptions:</u>

1. <u>Decks constructed of fire retardant treated wood</u>
2. <u>Exterior balconies and decks protected by automatic sprinklers as provided for in Section 903.3.1.2.1</u>

1406.2.1.2 Fire separation greater than 5 feet. For fire separation distances greater than 5 feet (1524 mm) <u>to buildings, structures or decks</u>, an assembly shall be permitted that has been exposed to a reduced level of incident radiant heat flux in accordance with the NFPA 268 test method without exhibiting sustained flaming. The minimum fire separation distance required for the assembly shall be determined from Table1406.2.1.2 based on the maximum tolerable level of incident radiant heat flux that does not cause sustained flaming of the assembly.

<u>Exceptions:</u>

1. <u>Decks constructed of fire retardant treated wood</u>
2. <u>Exterior balconies and decks protected by automatic sprinklers as provided for in Section 903.3.1.2.1</u>

PART II – IRC Building/Energy

Add new text as follows:

R302.1 Exterior walls. Construction, projections, openings and penetrations of *exterior walls* of *dwellings* and accessory buildings shall comply with Table R302.1.

Exceptions:

1. Walls, projections, openings or penetrations in walls perpendicular to the line used to determine the *fire separation distance*.
2. Walls of *dwellings* and *accessory structures* located on the same *lot*.
3. Detached tool sheds and storage sheds, playhouses and similar structures exempted from permits are not required to provide wall protection based on location on the *lot*. Projections beyond the *exterior wall* shall not extend over the *lot line*.
4. Detached garages accessory to a *dwelling* located within 2 feet (610 mm) of a *lot line* are permitted to have roof eave projections not exceeding 4 inches (102 mm).

5. Foundation vents installed in compliance with this code are permitted.

R302.1.2. Combustible Exterior Walls and Combustible Decks . Combustible exterior wall coverings and sheathing that are ignitable below 12.5 KW/m^2 and exhibit sustained flaming shall not be used where installed on exterior walls having a fire separation distance of 5 feet (1524 mm) to combustible decks or balconies.

Exception: Decks constructed of fire retardant treated wood

Reason:
Part I- A technical change is needed to Section 1406 relating to the lack of fire resistance of the exterior surface of exterior combustible walls when directly exposed to combustible decks. It is likely that code development did not consider the need to require fire resistance for the exterior wall from these structures but there is a growing concern for the number of fires that start on and under combustible decks which when ignited burn fiercely.

This code change proposal is not intended to address all fires that could present an exposure to combustible exterior walls. It focuses on the higher risk and increased likelihood for a fire involving a combustible deck that is directly attached or within five feet of the combustible exterior wall. Since decks would have a limited exposure to a building any additional expenditure for more fire resistant materials is reduced. Ultimately a sheathing of gypsum even in thin layers increases the resistance.

1406.2.1.1 and 1406.2.1.1 both add the same language to include proximity to buildings, structures or decks and allows an exception for decks constructed of fire retardant wood.

This code change proposal is not intended to address all fires that could present an exposure to combustible exterior walls. It focuses on the higher risk and increased likelihood for a fire involving a combustible deck that is directly attached to or within five feet of the combustible exterior wall. Since decks would have a limited exposure to a building any additional expenditure for more fire resistant materials is reduced. Ultimately a sheathing of gypsum even in thin layers increases the resistance.

These fires are rarely extinguished before it has spread into the void of the exterior combustible wall or up the exterior surface of the walls and into the attic. While the most frequent facing surface of the exterior wall is vinyl siding this is listed in specs as non-combustible. There is experience that indicates no effective resistance to fire though as the siding readily melts away to allow fire access to the substrate sheathing which most often is a combustible material such as Oriented Strand Board (OSB), low density fiber board and Rigid Foam Insulation. These common materials are combustible but OSB resists direct flame longer then rigid foam insulation. Tests conducted by the National Institute for Standards and Technology showed that when a plume of heated gases and flame impinges on a combustible exterior wall it will ignite the combustible exterior wall that is within five feet. This scenario may actually be less dramatic then a well advanced fire involving an attached deck which could preheat the combustible wall and directly expose it to a vertical flame. This exposure and create a more intense flame spread vertically on the wall. Some materials used as a substrate to the exterior siding will resist fire more then others; some materials readily spread fire vertically directly to the roof along the exterior surface; into a non-fire resistant soffit then into the attic, or destroys the integrity of the substrate material and the enters the wall void.

Decks have become more like exterior rooms with furniture, outdoor kitchens and primarily the presence of people. Barbecue grills, lighting and the inappropriate disposal of smoking materials are all hazards that have been the causes of fires that first ignite decks then spread easily to and into the structure of a home or similar building. Once ignited decks burn violently with direct flame and radiant heat exposure to combustible exterior walls. The fact that the fuel in a deck is open on all sides which enhances oxidization for complete combustion and ample direct flame as well as preheating from radiant heat make them a perfect primary fire source to feed fires that most often spread to and involve the roof and attic of homes. The direct flaming attack on these walls cause nearly immediate destruction of combustible and easily degraded sidings to allow immediate access and exposure to the interior structure. Due to the unique flow of the heat and gases from the deck fires into the structure these fires most often result in near total loss of structure. In the Washington D.C Metro area these fires have resulted in many fires one incident which killed a firefighter and another fire incident that severely burned multiple firefighters.

Part II- Add a new section to IRC Chapter 3 as R302.1.2 to increase fire resistance of combustible exterior walls when directly exposed to combustible decks. It is likely that the code development process did not consider the need to require fire resistance for the exterior wall from decks but there is a growing concern for the number of fires that start on and under combustible decks which when ignited burn fiercely. IRC considers exposure buildings in regard to fire spread but does not include the hazard of combustible deck fires. While IRC has some limited passive fire resistance of residential construction through use of fire blocking and compartmentation it does not recognize the hazard of a deck involved in fire to the structure of the main building through the exterior facing of the wall.

This code change proposal is not intended to address all fires that could present an exposure to combustible exterior walls. It focuses on the higher risk and increased likelihood for a fire involving a combustible deck that is directly attached to or within five feet of the combustible exterior wall. Since decks would have a limited exposure to a building any additional expenditure for more fire resistant materials is reduced. Ultimately a sheathing of gypsum even in thin layers increases the resistance.

These fires are rarely extinguished before it has spread into the void of the exterior combustible wall or up the exterior surface of the walls and into the attic. While the most frequent facing surface of the exterior wall is vinyl siding this is listed in specs as non-combustible. There is experience that indicates no effective resistance to fire though as the siding readily melts away to allow fire access to the substrate sheathing which most often is a combustible material such as Oriented Strand Board (OSB), low density fiber board and Rigid Foam Insulation. These common materials are combustible but OSB resists direct flame longer then rigid foam insulation. Tests conducted by the National Institute for Standards and Technology showed that when a plume of heated gases and flame impinges on a combustible exterior wall it will ignite the combustible exterior wall that is within five feet. This scenario may actually be less dramatic then a well advanced fire involving an attached deck which could preheat the combustible wall and directly expose it to a vertical flame. This exposure and create a more intense flame spread vertically on the wall. Some materials used as a substrate to the exterior siding will resist fire more then others; some materials readily spread fire vertically directly to the roof along the exterior surface; into a non-fire resistant soffit then into the attic, or destroys the integrity of the substrate material and the enters the wall void.

Decks have become more like exterior rooms with furniture, outdoor kitchens and primarily the presence of people. Barbecue grills, lighting and the inappropriate disposal of smoking materials are all hazards that have been the causes of fires that first ignite decks then spread easily to and into the structure of a home or similar building. Once ignited decks burn violently with direct flame and radiant heat exposure to combustible exterior walls. The fact that the fuel in a deck is open on all sides which enhances oxidization for complete combustion and ample direct flame as well as preheating from radiant heat make them a perfect primary fire source to feed fires that most often spread to and involve the roof and attic of homes. The direct flaming attack on these walls cause nearly immediate destruction of combustible and easily degraded sidings to allow immediate access and exposure to the interior structure. Due to the unique flow of the heat and gases from the deck fires into the structure these fires most often result in near total loss of structure. In the Washington D.C Metro area these fires have resulted in many fires one incident which killed a firefighter and another fire incident that severely burned multiple firefighters.

Cost Impact: Part I & II- Product information indicates that a product such as a gypsum-based exterior sheathing is comparable to other sheathing and is more resistant to fire.

Part I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

Part II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LOVE-FS1-1406.2.1.1-RB-1-R302.1.2

FS156–09/10

1404.12, 1405.2, 1405.18 (New), 1405.18.1 (New), Table 1405.18.1 (New), 1405.18.2 (New), 1405.18.2.1 (New), Table 1405.18.2.1 (New), 1405.18.2.2 (New), Table 1405.18.2.2 (New), 1405.14.1, 1405.14.2 (New), 1405.14.2.1 (New), 1405.14.2.2 (New), 1405.14.2.3 (New), 2304.6; IRC R703.3 (New), R703.3.1 (New), Table R703.3.1 (New), R703.3.2 (New), R703.3.2.1 (New), Table R703.3.2.1 (New), R703.3.2.2 (New), Table R703.3.2.2 (New), R703.4, Table R703.4, R703.5.1, R703.6.1, R703.7.4.1, R703.11.2, R703.11.2.1, R703.11.2.2, R703.11.2.3

Proponent: Jay H. Crandell, PE, d/b/a ARES Consulting, representing the Foam Sheathing Coalition

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARI8NG ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

1. Add new text as follows:

1404.12 Foam plastic sheathing. Foam plastic sheathing shall comply with requirements for foam plastic insulation in Section 2603. When used as a water-resistive barrier, the foam plastic sheathing material and installation shall be approved in accordance with Section 1404.2.

2. Revise as follows:

1405.2 Weather protection. *Exterior walls* shall provide weather protection for the building. The materials of the minimum nominal thickness specified in Table 1405.2 shall be acceptable as *approved* weather coverings. Foam plastic sheathing used in exterior wall covering assemblies with approved exterior weather coverings shall comply with Section 1405.18.

3. Add new text as follows:

1405.18 Foam plastic sheathing. Foam plastic sheathing used in exterior wall covering assemblies shall comply with this section, Section 2603, Chapter 13, and the foam sheathing manufacturer's approved installation instructions.

1405.18.1 Minimum thickness. The thickness of foam plastic sheathing shall comply with Table 1405.18.1.

Exception: Where foam plastic sheathing is applied directly over or behind wall sheathing or other solid substrate capable of separately resisting the required wind pressure, the limitations of Table 1405.18.1 shall not apply.

TABLE 1405.18.1
REQUIREMENTS FOR FOAM PLASTIC SHEATHING
IN EXTERIOR WALL COVERING ASSEMBLIES[1,2]

Foam Plastic Sheathing Material[3]	Foam Sheathing Thickness (in)[3]	Maximum Wind Speed (mph) – Exposure B[4]			
		Walls with Interior Finish[5]		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
Siding Attached Directly Over Foam Plastic Sheathing per Section 1405.18.2.1					
EPS	¾"	110	NP	90	NP
	1"	130	100	125	NP
	≥1-1/2"	130	130	130	125
Polyiso-cyanurate	½" (faced)	130	90	115	NP
	¾" (faced)	130	120	130	100
	1" (faced)	130	130	130	110
	≥1-1/2" (faced)	130	130	130	115
XPS	½" (faced)	125	85	105	NP
	¾"	110	NP	90	NP
	1"	130	95	120	NP
	≥1-1/2"	130	130	130	115
Siding Offset from Foam Sheathing per Section 1405.18.2.2					
EPS	¾"	95	NP	NP	NP
	1"	125	85	105	NP
	≥1-1/2"	130	130	130	105
Polyiso-cyanurate	½" (faced)	120	NP	100	NP
	¾" (faced)	130	100	130	85
	1" (faced)	130	110	130	95
	≥1-1/2" (faced)	130	120	130	100
XPS	½" (faced)	110	NP	90	NP
	¾"	95	NP	NP	NP
	1"	125	85	105	NP
	≥1-1/2"	130	120	130	100

For SI: 1 inch = 25.4 mm, 1 mile per hour = 1.609 km/h

NP = not permitted

1. Tabulated maximum wind speed values are based on a mean roof height of 30-feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m) or 0.9 for a mean roof height of 60 feet (18.3 m). For greater mean roof heights, an approved design shall be required.
2. Foam plastic sheathing panels shall be permitted to be oriented parallel or perpendicular to framing members.
3. Foam plastic sheathing shall meet or exceed the following material standards: Expanded Polystyrene (EPS) – ASTM C578 (Type II, min.1.35 lb/ft^3 density), Polyisocyanurate – ASTM C1289 (Type 1, min.), and extruded polystyrene (XPS) – ASTM C578 (Type X, min. 1.30 lb/ft^3 density). Where a "faced" product is indicated, a facer shall be provided on both faces of the foam plastic sheathing. Where facing is not indicated in the table, faced and unfaced foam plastic sheathing shall be permitted. For all foam plastic sheathing products, approved manufacturer data shall be permitted in lieu of the table requirements.
4. Multiply tabulated maximum wind speed by 0.85 for wind exposure C or by 0.78 for wind exposure D.
5. Interior finish shall be minimum 1/2-inch (12.7 mm) thick gypsum wall board or an approved product with equivalent or greater out-of-plane bending strength and stiffness.

1405.18.2 Siding attachment over foam sheathing. Siding shall be attached over foam sheathing in accordance with Section 1405.18.2.1, Section 1405.18.2.2, or an approved design. In no case shall the siding material be used in a manner that exceeds its application limits.

Exception: Where the siding manufacturer has provided approved installation instructions for application over foam sheathing, those requirements shall apply.

1405.18.2.1 Direct siding attachment. Approved weather coverings installed directly over foam sheathing without separation by an air space shall comply with Table 1405.18.2.1 in regard to nail diameter, penetration, and nail spacing for the applicable foam sheathing thickness and wind speed condition. The siding fastener and siding installation shall otherwise comply with Chapter 14.

Exceptions:

1. For adhered masonry veneer, refer to Section 1405.10
2. For vinyl siding, refer to Section 1405.14.
3. For exterior insulation and finish systems, refer to Section 1408.

TABLE 1405.18.2.1
FASTENING REQUIREMENTS FOR DIRECT SIDING ATTACHMENT OVER FOAM PLASTIC SHEATHING[1,2]

Minimum Nail Diameter[3] (inches)	Nail Spacing along Stud[4] (inches)	Maximum Foam Sheathing Thickness[5] (inches)	16"oc WALL FRAMING Maximum Wind Speed (mph)			24"oc WALL FRAMING Maximum Wind Speed (mph)		
			Exposure B	Exposure C	Exposure D	Exposure B	Exposure C	Exposure D
0.113	6	2	140	120	110	120	100	90
	8	2	130	110	100	100	85	DR
	12	1	100	85	DR	85	DR	DR
0.120	6	3	140	120	110	120	100	90
	8	2	130	110	100	110	90	85
	12	1.5	110	90	85	90	DR	DR
0.135	6	3	140	120	110	130	110	100
	8	3	140	120	110	110	90	85
	12	2	110	90	85	90	DR	DR

For SI: 1 inch = 25.4 mm; 1 mph = 1.609 km/h
DR = design required

1. Maximum wind speed values are based on a minimum 1-1/4 inch (31.8 mm) penetration of a smooth shank nail fastener into wood framing of Spruce-Pine-Fir or any wood species with a specific gravity of 0.42 or greater in accordance with AFPA/NDS.
2. Tabulated maximum wind speed values are based on a mean roof height of 30-feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m) or 0.9 for a mean roof height of 60 feet (18.3 m). For greater mean roof heights, an approved design shall be required.
3. Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths to provide a minimum 1-1/4 inch (31.8 mm) penetration into wood framing. Specified nails in accordance with Chapter 1405 or the siding manufacturer's approved installation instructions shall meet all other requirements in ASTM F1667 or be otherwise approved for the intended application.
4. 'Nail spacing along stud' refers to spacing of siding fasteners in the vertical direction. A minimum of one fastener shall be applied at each intersection of an individual siding member with a wall stud.
5. Maximum foam sheathing thickness values are based on a maximum 24-inch (0.6 m) stud spacing, a maximum siding dead load of 11 psf (0.53 kPa), and S_{DS} per Section 1613.5.4 not exceeding 0.83g. Siding dead load shall not exceed 8 psf (0.39 kPa) for and S_{DS} of 1.17g, 6 psf (0.29 kPa) for S_{DS} of 1.5g, or 3.0 psf (0.14 kPa) for S_{DS} of 3.0 g.

1405.18.2.2 Offset siding attachment. When an airspace separates the siding from direct contact with the foam plastic sheathing, the approved weather coverings shall be attached in accordance with Chapter 14 to minimum 1x3 wood furring strips placed over the foam sheathing. Furring shall be attached through the foam sheathing to wall framing in accordance with Table 1405.18.2.2. When placed horizontally, wood furring strips shall be preservative treated wood in accordance with Section 2303.1.8 or naturally durable wood and fasteners shall be corrosion resistant in accordance with Section 2304.9.5.

Exception: Furring strips shall not be required over foam plastic sheathing behind anchored stone and masonry veneer installed in accordance with Section 1405.6. Veneer ties shall be installed on the surface of the foam plastic sheathing with fasteners of sufficient length to pass through the thickness of foam plastic sheathing and penetrate framing to provide required pull-out resistance determined in accordance with Chapter 16.

TABLE 1405.18.2.2
FASTENING REQUIREMENTS FOR WOOD FURRING OVER FOAM PLASTIC SHEATHING[1,2,3]

Fastener Type	Minimum Penetration into Wall Framing (inches)	Fastener Spacing in Furring[4] (inches)	Maximum Thickness of Foam Sheathing[5] (inches)	16"oc FURRING Maximum Wind Speed (mph)			24"oc FURRING Maximum Wind Speed (mph)		
				Exposure B	Exposure C	Exposure D	Exposure B	Exposure C	Exposure D
0.120" diameter smooth shank nail	1-1/4	8	2	130	110	100	110	90	85
		12	1.5	110	90	85	90	DR	DR
		16	1	90	DR	DR	DR	DR	DR
0.135" diameter smooth shank nail	1-1/4	8	3	130	110	100	110	90	85
		12	2	110	90	85	90	DR	DR
		16	1.5	100	85	DR	DR	DR	DR
#8 wood screw	1	12	3	140	120	110	140	120	110
		16	2	140	120	110	140	120	110
¼" lag screw[6]	1-1/2	24	3	140	120	110	140	120	110

For SI: 1" = 25.4 mm; 1 mph = 1.609 km/h
DR = design required

1. Furring strips shall be spaced a maximum of 24"oc in a vertical or horizontal orientation. Table values are based on minimum ¾-inch (19.1 mm) thick furring strip and wood studs of Spruce-Pine-Fir or any softwood species with a specific gravity of 0.42 or greater per AFPA/NDS.
2. Tabulated maximum wind speed values are based on a mean roof height of 30-feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m) or 0.9 for a mean roof height of 60 feet (18.3 m). For greater mean roof heights, an approved design shall be required.
3. Where minimum required siding fastener penetration exceeds ¾ inch (19.1 mm), a minimum 2x furring strip shall be used unless approved deformed shank siding nails or siding screws are used to provide equivalent withdrawal strength.
4. In a vertical orientation, furring strips shall be located over wall studs and attached with the required fastener spacing. In a horizontal orientation, furring strips shall be fastened at each stud intersection with a number of fasteners equivalent to the required fastener spacing. In no case shall fasteners be spaced more than 24 inches (0.6 m) apart.
5. Maximum foam sheathing thickness values are based on a maximum 24-inch (0.6 m) stud spacing, a maximum siding dead load of 11 psf (0.53 kPa), and S_{DS} per Section 1613.5.4 not exceeding 0.83g. Siding dead load shall not exceed 8 psf (0.39 kPa) for and S_{DS} of 1.17g, 6 psf (0.29 kPa) for S_{DS} of 1.5g, or 3.0 psf (0.14 kPa) for S_{DS} of 3.0 g.
6. Lag screws shall be installed with a standard cut washer and shall be pre-drilled in accordance with AF&PA NDS-05. Approved self-drilling screws of equal or greater shear and withdrawal strength shall be permitted without pre-drilling.

4. Revise as follows:

1405.14.1 Application. The siding shall be applied over sheathing or materials listed in Section 2304.6 or foam plastic sheathing in accordance with Sections 1405.14.2 and 1405.18. Siding shall be applied to conform with the water-resistive barrier requirements in Section 1403. Siding and accessories shall be installed in accordance with approved manufacturer's instructions. Unless otherwise specified in the approved manufacturer's instructions, nails used to fasten the siding and accessories shall have a minimum 0.313-inch (7.9 mm) head diameter and 1/8-inch (3.18 mm) shank diameter. The nails shall be corrosion resistant and shall be long enough to penetrate the studs or nailing strip at least 3/4 inch (19 mm). Where the siding is installed horizontally, the fastener spacing shall not exceed 16 inches (406 mm) horizontally and 12 inches (305 mm) vertically. Where the siding is installed vertically, the fastener spacing shall not exceed 12 inches (305 mm) horizontally and 12 inches (305 mm) vertically.

5. Add new text as follows:

1405.14.2 Foam Plastic Sheathing. Vinyl siding used with foam plastic sheathing shall be installed in accordance with 1405.14.2.1, 1405.14.2.2., and 1405.14.2.3.

Exception: Where the foam plastic sheathing is applied directly over wood structural panels, fiberboard, gypsum sheathing, or other approved backing capable of independently resisting the design wind pressure, the vinyl siding shall be installed in accordance with 1405.14.1.

1405.14.2.1 Basic Wind Speed Not Exceeding 90 mph and Exposure Category B. Where the basic wind speed does not exceed 90 mph, the Exposure Category is B and gypsum wall board or equivalent is installed on the side of the wall opposite the foam plastic sheathing, the minimum siding fastener penetration into wood framing shall be 1-1/4 inches (32 mm) using minimum 0.120-inch diameter nail (shank) with a minimum 0.313-inch diameter head, and fastened 16 inches on center. The foam plastic sheathing shall comply with Section 1405.18.1 and shall not exceed a maximum thickness of 1.5 inches (38 mm) for a 0.120-inch diameter nail or 2.0 inches (51 mm) for a 0.135-inch diameter nail. Vinyl siding shall be permitted to be installed on furring strips in accordance with Section 1405.18.2.2 and the siding manufacturer's installation instructions when foam plastic sheathing thickness complies with Section 1405.18.1.

1405.14.2.2 Basic Wind Speed Exceeding 90mph or Exposure Categories C and D. Where the basic wind speed exceeds 90 mph or the Exposure Category is C or D, or all conditions of 1405.14.2.1 are not met, the adjusted design pressure rating for the assembly shall meet or exceed the wind loads required by Chapter 16. The design wind pressure rating of the vinyl siding for installation over solid sheathing as provided in the vinyl siding manufacturer's product specifications shall be adjusted for the following wall assembly conditions:

1. For wall assemblies with foam plastic sheathing on the exterior side and minimum ½-inch (12.7 mm) thick gypsum wall board or equivalent on the interior side of the wall, the vinyl siding's design wind pressure rating shall be multiplied by 0.39.
2. For wall assemblies with foam plastic sheathing on the exterior side and no gypsum wall board or equivalent on the interior side of wall, the vinyl siding's design wind pressure rating shall be multiplied by 0.27.

   Exception: The above adjustments shall not apply when vinyl siding is attached to wood furring strips installed over the foam plastic sheathing in accordance with Section 1405.18.2.2 and such installation is in accordance with the vinyl siding manufacturer's installation instructions.

1405.14.2.3 Manufacturer Specification. Where the vinyl siding manufacturer's product specifications provide an approved design wind pressure rating for installation over foam plastic sheathing, use of this design wind pressure rating shall be permitted and the siding shall be installed in accordance with the manufacturer's installation instructions.

6. Revise as follows:

2304.6 Wall sheathing. Except as provided for in Section 1405 for weatherboarding or where stucco construction that complies with Section 2510 is installed, enclosed buildings shall be sheathed with one of the materials of the nominal thickness specified in Table 2304.6, foam sheathing in accordance with Section 1405.18, or any other approved material of equivalent strength and durability.

PART II – IRC BUILDING/ENERGY

1. Add new text as follows:

R703.3 Foam plastic sheathing. Foam plastic sheathing used in exterior wall covering assemblies shall comply with this section, Section R316, Chapter 11 and the manufacturer's installation instructions.

R703.3.1 Minimum thickness. The thickness of foam plastic sheathing shall comply with Table R703.3.1.

Exception: Where foam plastic sheathing is applied directly over or behind wall sheathing or other solid substrate capable of separately resisting the required wind pressure, the limitations of Table R703.3.1 shall not apply.

TABLE R703.3.1
REQUIREMENTS FOR FOAM PLASTIC SHEATHING
IN EXTERIOR WALL COVERING ASSEMBLIES[1,2]

Foam Plastic Sheathing Material[3]	Foam Sheathing Thickness (in)[3]	Maximum Wind Speed (mph) – Exposure B[4]			
		Walls with Interior Finish[5]		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
Siding Attached Directly Over Foam Plastic Sheathing per Section R703.3.2.1					
EPS	¾"	110	NP	90	NP
	1"	130	100	125	NP
	≥1-1/2"	130	130	130	125
Polyiso-cyanurate	½" (faced)	130	90	115	NP
	¾" (faced)	130	120	130	100
	1" (faced)	130	130	130	110
	≥1-1/2" (faced)	130	130	130	115
XPS	½" (faced)	125	85	105	NP
	¾"	110	NP	90	NP
	1"	130	95	120	NP
	≥1-1/2"	130	130	130	115
Siding Offset from Foam Sheathing per Section R703.3.2.2					
	¾"	EPS	NP	NP	NP
	1"		85	105	NP
	≥1-1/2"		130	130	105
Polyiso-cyanurate	½" (faced)	120	NP	100	NP
	¾" (faced)	130	100	130	85
	1" (faced)	130	110	130	95
	≥1-1/2" (faced)	130	120	130	100
XPS	½" (faced)	110	NP	90	NP
	¾"	95	NP	NP	NP
	1"	125	85	105	NP
	≥1-1/2"	130	120	130	100

For SI: 1 inch = 25.4 mm, 1 mile per hour = 1.609 km/h

NP = not permitted

1. Tabulated maximum wind speed values are based on a mean roof height of 30-feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m).

2. Foam plastic sheathing panels shall be permitted to be oriented parallel or perpendicular to framing members.
3. Foam plastic sheathing shall meet or exceed the following material standards: Expanded Polystyrene (EPS) – ASTM C578 (Type II, min.1.35 lb/ft^3 density), Polyisocyanurate – ASTM C1289 (Type 1, min.), and extruded polystyrene (XPS) – ASTM C578 (Type X, min. 1.30 lb/ft^3 density). Where a "faced" product is indicated, a facer shall be provided on both faces of the foam plastic sheathing. Where facing is not indicated in the table, faced and unfaced foam plastic sheathing shall be permitted. For all foam plastic sheathing products, approved manufacturer data shall be permitted in lieu of the table requirements.
4. Multiply tabulated maximum wind speed by 0.85 for wind exposure C or by 0.78 for wind exposure D.
5. Interior finish shall be minimum 1/2-inch (12.7 mm) thick gypsum wall board or an approved product with equivalent or greater out-of-plane bending strength and stiffness.

R703.3.2 Siding attachment over foam sheathing. Siding shall be attached over foam sheathing in accordance with Section R703.3.2.1, Section R703.3.2.2, or an approved design. In no case shall the siding material be used in a manner that exceeds its application limits.

Exception: Where the siding manufacturer has provided installation instructions for application over foam sheathing, those requirements shall apply.

R703.3.2.1 Direct siding attachment. Siding installed directly over foam sheathing without separation by an air space shall comply with Table R703.3.2.1 in regard to nail diameter, penetration, and nail spacing for the applicable foam sheathing thickness and wind speed condition. The siding fastener and siding installation shall otherwise comply with Section R703.4 and Table R703.4.

Exceptions:

1. For vinyl siding, refer to Section R703.11.2.
2. For exterior insulation and finish systems, refer to Section R703.9.
3. For adhered veneer, refer to Section R703.12.

TABLE R703.3.2.1
FASTENING REQUIREMENTS FOR DIRECT SIDING ATTACHMENT OVER FOAM PLASTIC SHEATHING[1,2]

Minimum Nail Diameter[3] (inches)	Nail Spacing along Stud[4] (inches)	Maximum Foam Sheathing Thickness[5] (inches)	16"oc WALL FRAMING Maximum Wind Speed (mph)			24"oc WALL FRAMING Maximum Wind Speed (mph)		
			Exposure B	Exposure C	Exposure D	Exposure B	Exposure C	Exposure D
0.113	6	2	140	120	110	120	100	90
	8	2	130	110	100	100	85	DR
	12	1	100	85	DR	85	DR	DR
0.120	6	3	140	120	110	120	100	90
	8	2	130	110	100	110	90	85
	12	1.5	110	90	85	90	DR	DR
0.135	6	3	140	120	110	130	110	100
	8	3	140	120	110	110	90	85
	12	2	110	90	85	90	DR	DR

For SI: 1 inch = 25.4 mm; 1 mph = 1.609 km/h
DR = design required

1. Maximum wind speed values are based on a minimum 1-1/4 inch (31.8 mm) penetration of a smooth shank nail fastener into wood framing of Spruce-Pine-Fir or any wood species with a specific gravity of 0.42 or greater in accordance with AFPA/NDS.
2. Tabulated maximum wind speed values are based on a mean roof height of 30-feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m).
3. Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths to provide a minimum 1-1/4 inch (31.8 mm) penetration into wood framing. Specified nails in accordance with Section R703.4 or the siding manufacturer's installation instructions shall meet all other requirements in ASTM F1667 or be otherwise approved for the intended application.
4. 'Nail spacing along stud' refers to spacing of siding fasteners in the vertical direction. A minimum of one fastener shall be applied at each intersection of an individual siding member with a wall stud.
5. Maximum foam sheathing thickness values are based on a maximum 24-inch (0.6 m) stud spacing and a maximum siding dead load of 11 psf (0.53 kPa) based on 7/8-inch (22 mm) thick Portland cement plaster, For Seismic Design Category D2, the maximum siding dead load shall be 8 psf.

R703.3.2.2 Offset siding attachment. When an airspace separates the siding from direct contact with the foam plastic sheathing, the siding shall be attached in accordance with Section R703.4 and Table R703.4 to minimum 1x3 wood furring strips placed over the foam sheathing. Furring shall be attached through the foam sheathing to wall framing in accordance with Table R703.3.2.2. When placed horizontally, wood furring strips shall be preservative treated wood or naturally durable wood and fasteners shall be corrosion resistant in accordance with Section R317.

Exception: Furring strips shall not be required over foam plastic sheathing located behind anchored stone and masonry veneer installed in accordance with Section R703.7. Veneer ties shall be installed in accordance with Section R703.7.4.1.

TABLE R703.3.2.2
FASTENING REQUIREMENTS FOR WOOD FURRING OVER FOAM PLASTIC SHEATHING[1,2,3]

Fastener Type	Minimum Penetration into Wall Framing (inches)	Fastener Spacing in Furring[4] (inches)	Maximum Thickness of Foam Sheathing[5] (inches)	16"oc FURRING Maximum Wind Speed (mph)			24"oc FURRING Maximum Wind Speed (mph)		
				Exposure B	Exposure C	Exposure D	Exposure B	Exposure C	Exposure D
0.120" diameter smooth shank nail	1-1/4	8	2	130	110	100	110	90	85
		12	1.5	110	90	85	90	DR	DR
		16	1	90	DR	DR	DR	DR	DR
0.135" diameter smooth shank nail	1-1/4	8	3	130	110	100	110	90	85
		12	2	110	90	85	90	DR	DR
		16	1.5	100	85	DR	DR	DR	DR
#8 wood screw	1	12	3	140	120	110	140	120	110
		16	2	140	120	110	140	120	110
¼" lag screw[6]	1-1/2	24	3	140	120	110	140	120	110

For SI: 1" = 25.4 mm; 1 mph = 1.609 km/h
DR = design required

1. Furring strips shall be spaced a maximum of 24"oc in a vertical or horizontal orientation. Table values are based on minimum ¾-inch (19.1 mm) thick furring strip and wood studs of Spruce-Pine-Fir or any wood species with a specific gravity of 0.42 or greater per AFPA/NDS.
2. Tabulated maximum wind speed values are based on a mean roof height of 30-feet (9.1 m). Multiply maximum wind speed by 0.95 for a mean roof height of 45 feet (13.7 m).
3. Where minimum required siding fastener penetration exceeds ¾ inch (19.1 mm), a minimum 2x furring strip shall be used unless approved deformed shank siding nails or siding screws are used to provide equivalent withdrawal strength.
4. In a vertical orientation, furring strips shall be located over wall studs and attached with the required fastener spacing. In a horizontal orientation, furring strips shall be fastened at each stud intersection with a number of fasteners equivalent to the required fastener spacing. In no case shall fasteners be spaced more than 24 inches (0.6 m) apart.
5. Maximum foam sheathing thickness values are based on a maximum 24-inch (0.6 m) stud spacing and a maximum siding dead load of 11 psf (0.53 kPa) based on 7/8-inch (22 mm) thick Portland cement plaster. For Seismic Design Category D2, the maximum siding dead load shall be 8 psf.
6. Lag screws shall be installed with a standard cut washer and shall be pre-drilled in accordance with AF&PA NDS-05. Approved self-drilling screws of equal or greater shear and withdrawal strength shall be permitted without pre-drilling.

(Renumber subsequent sections)

2. Revise as follows:

R703.4 Attachments. Unless specified otherwise, all wall coverings shall be securely fastened in accordance with Table R703.4 or with other *approved* aluminum, stainless steel, zinc-coated or other *approved* corrosion-resistive fasteners. Additional requirements in accordance with Section R703.3.2 shall apply when siding is installed over foam sheathing. Where the basic wind speed per Figure R301.2(4) is 110 miles per hour (49 m/s) or higher, the attachment of wall coverings shall be designed to resist the component and cladding loads specified in Table R301.2(2), adjusted for height and exposure in accordance with Table R301.2(3).

TABLE R703.4
WEATHER–RESISTANT SIDING ATTACHMENT AND MINIMUM THICKNESS

SIDING MATERIAL		NOMINAL THICKNESS[a] (inches)	JOINT TREATMENT	WATER RESISTIVE BARRIER REQUIRED	TYPE OF SUPPORTS FOR THE SIDING MATERIAL AND FASTENERS[b,c,d]					
					Wood or wood structural panel sheathing	Fiberboard sheathing into stud	Gypsum sheathing into stud	Foam plastic sheathing into stud	Direct to studs	Number or spacing of fasteners
Horizontal aluminum[e]	Without insulation	0.019[f]	Lap	Yes	0.120 nail 1½" long	0.120 nail 2" long	0.120 nail 2" long	0.120 nail[y]	Not allowed	Same as stud spacing
		0.024	Yes	Yes	0.120 nail 1½" long	0.120 nail 2" long	0.120 nail 2" long	0.120 nail[y]	Not allowed	
	With insulation	0.019	Yes	Yes	0.120 nail 1½" long	0.120 nail 2½" long	0.120 nail 2½" long	0.120 nail[y]	0.120 nail 1½" long	

SIDING MATERIAL	NOMINAL THICKNESS[a] (inches)	JOINT TREATMENT	WATER RESISTIVE BARRIER REQUIRED	TYPE OF SUPPORTS FOR THE SIDING MATERIAL AND FASTENERS[b,c,d]					
				Wood or wood structural panel sheathing	Fiberboard sheathing into stud	Gypsum sheathing into stud	Foam plastic sheathing into stud	Direct to studs	Number or spacing of fasteners
Anchored veneer; brick, concrete, masonry or stone	2	Section R703	Yes	See Section R703 and Figure R703.7[g]					
Adhered veneer; concrete, stone or masonry[w]	–	Section R703	Yes Note w	See Section R703.6.1[g] or in accordance with the manufacturer's instructions					
Hardboard[k] Panel siding-vertical	7/16	–	Yes	Note m	Note m	Note m	Note m	Note m	6" Panel edges 12" inter. Sup."
Hardboard[k] Lap-siding horizontal	7/16	Note p	Yes	Note o	Note o	Note o	Note o	Note o	Same as stud spacing 2 per bearing
Steel[h]	29 ga.	Lap	Yes	0.113 nail and 1¼" Staple-1¾"	0.113 nail and 2¾"Staple 2 ½""	0.113 nail and 2½" Staple-2¼"	0.113 nail[v] Staple[v]	Not allowed	Same as stud spacing
Partcleboard panels	3/8-1/2	–	Yes	6d box nail (2" x 0.099")	6d box nail (2" x 0.099")	6d box nail (2" x 0.099")	box nail[v]	6d box nail (2"x0.099), 3/8 not allowed	6" panel edge, 12"inter. sup.
	3/8	–	Yes	6d box nail (2" x 0.099")	8d box nail (2" x 0.099")	8d box nail (2" x 0.099")	box nail[v]	6d box nail (2" x0.099")	
Wood structural panel siding[l] (exterior grade)	3/8	Note p	Yes	0.099 nail-2"	0.113 nail-2½"	0.113 nail-2½"	0.113 nail[v]	0.099 nail-2"	6" panel edge. 12" inter.sup.
Wood structural panel lapsiding	3/8-1/2	Note p Note x	Yes	0.099 nail-2"	0.113 nail-2½"	0.113 nail-2½"	0.113 nail[x]	0.099 nail-2"	8" along bottom edge
Vinyl siding[l]	0.035	Lap	Yes	0.120 nail (shank) with a 0.313 head or 16 gauge staple with 3/8 to 1/2-inch crown[y,z]	0.120 nail (shank) with a 0.313 head or 16 gauge staple with 3/8 to 1/2-inch crown[y]	0.120 nail (shank) with a 0.313 head or 16 gauge staple with 3/8 to 1/2-inch crown[y]	0.120 nail (shank) with a 0.313 head per Section R[z]03.11.2	Not allowed	16 inches on center or specified by the manufacturer instructions or test report
Wood[j] rustic, drop	3/8 Min	Lap	Yes	Fastener penetration into sud-1"				0.113 nail-2 ½" Staple-2"	Face nailing up to 6" widths, 1 nail per bearing, 8" widths and over, 2 nails per bearing
Shiplap	19/32 Average	Lap	Yes						
Bevel	7/16	Lap	Yes						
Butt tip	3/16	Lap	Yes						
Fiber cement panel siding[q]	5/16	Note q	Yes Note u	6d common corrosion-resistant nail[r]	6d common corrosion-resistant nail[r]	6d common corrosion-resistant nail[r]	6d common corrosion-resistant (12" x 0.113") nail[r]	6d common corrosion-resistant nail[r]	6" o.c. on edges, 12" o.c. on intermed. Studs
Fiber cement lap siding[s]	5/16	Note s	Yes Note u	6d common corrosion-resistant nail[r]	6d common corrosion-resistant nail[r]	6d common corrosion-resistant nail[r]	6d common corrosion-resistant (12" x 0.113") nail[r]	6d common corrosion-resistant nail or 11 gage roofing nail[r]	Note t

For SI: 1 inch = 25.4 mm.

a. Based on stud spacing of 16 inches on center where studs are spaced 24 inches, siding shall be applied to sheathing approved for that spacing.

b. Nail is a general description and shall be T-head, modified round head, or round head with smooth or deformed shanks.

c. Staples shall have a minimum crown width of 7/16-inch outside diameter and be manufactured of minimum 16 gage wire.

d. Nails or staples shall be aluminum, galvanized, or rust-preventative coated and shall be driven into the studs where for fiberboard, or gypsum, or foam plastic sheathing backing is used

e. Aluminum nails shall be used to attach aluminum siding.
f. Aluminum (0.019 inch) shall be unbacked only when the maximum panel width is 10 inches and the maximum flat area is 8 inches. The tolerance for aluminum siding shall be +0.002 inch of the nominal dimension.
g. All attachments shall be coated with a corrosion-resistant coating.
h. Shall be of approved type.
i. Three-eighths-inch plywood shall not be applied directly to studs spaced more than 16 inches on center when long dimension is parallel to studs. Plywood 1/2-inch or thinner shall not be applied directly to studs spaced more than 24 inches on center. The stud spacing shall not exceed the panel span rating provided by the manufacturer unless the panels are installed with the face grain perpendicular to the studs or over sheathing approved for that stud spacing.
j. Wood board sidings applied vertically shall be nailed to horizontal nailing strips or blocking set 24 inches on center. Nails shall penetrate 1 1/2 inches into studs, studs and wood sheathing combined or blocking. For application over foam sheathing, refer to Section R703.3.2.2. combined or blocking.
k. Hardboard siding shall comply with CPA/ANSI A135.6.
l. Vinyl siding shall comply with ASTM D 3679.
m. Minimum shank diameter of 0.092 inch, minimum head diameter of 0.225 inch, and nail length must accommodate sheathing and penetrate framing 1 1/2 inches. For application over foam sheathing, minimum shank diameter and penetration into framing shall comply with Section R703.3.2.
n. When used to resist shear forces, the spacing must be 4 inches at panel edges and 8 inches on interior supports.
o. Minimum shank diameter of 0.099 inch, minimum head diameter of 0.240 inch, and nail length must accommodate sheathing and penetrate framing 1 1/2 inches. For application over foam sheathing, minimum shank diameter and penetration into framing shall comply with Section R703.3.2.
p. Vertical end joints shall occur at studs and shall be covered with a joint cover or shall be caulked.
q. See Section R703.10.1.
r. Fasteners shall comply with the nominal dimensions in ASTM F 1667. For application over foam sheathing, refer to Section R703.3.2
s. See Section R703.10.2.
t. Face nailing: one 6dcommonnail through the overlapping planks at each stud. Concealed nailing: one 11 gage 11/2 inch long galv. roofing nail through the top edge of each plank at each stud.
u. See Section R703.2 exceptions.
v. Minimum nail length must accommodate sheathing and penetrate framing 11/2 inches. For application over foam sheathing, refer to Section R703.3.2
w. Adhered masonry veneer shall comply with the requirements of Section R703.6.3 and shall comply with the requirements in Sections 6.1 and 6.3 of ACI 530/ASCE 5/TMS-402.
x. Vertical joints, if staggered shall be permitted to be away from studs if applied over wood structural panel sheathing.
y. Minimum fastener length must accommodate sheathing and penetrate framing .75 inches or in accordance with the manufacturer's installation instructions. For application over foam sheathing, fastener penetration into framing shall comply with Section R703.3.2.
z. Where approved by the manufacturer's instructions or test report siding shall be permitted to be installed with fasteners penetrating not less than .75 inches throughwood orwood structural sheathing with or without penetration into the framing.
aa. Refer to Section R703.3 for additional requirements.
bb. For siding application over foam sheathing, fastener spacing shall comply with the more stringent requirement of this table or Section R703.3.2.

R703.5.1 Application. Wood shakes or shingles shall be applied either single-course or double-course over nominal 1/2-inch (13 mm) wood-based sheathing or to furring strips over nominal 1/2-inch (13 mm) nonwood sheathing.

Exception: Wood shakes or shingles over foam plastic sheathing, shall be applied to wood furring strips in accordance with Section R703.3.2.2.

A permeable water-resistive barrier shall be provided in accordance with Section R703.2 over all sheathing, with horizontal overlaps in the membrane of not less than 2 inches (51mm) and vertical overlaps of not less than 6 inches (152 mm). Where furring strips are used, they shall be 1 inch by 3 inches or 1 inch by 4 inches (25mmby 76 mm or 25mm by 102 mm), and shall be fastened horizontally to the studs with 7d or 8d box nails. For application over foam plastic sheathing, furring strips shall be fastened in accordance with Section R703.3.2.2. and Furring strips shall be spaced a distance on center equal to the actual weather exposure of the shakes or shingles, not to exceed the maximum exposure specified in Table R703.5.2. The spacing between adjacent shingles to allow for expansion shall not exceed 1/4 inch (6 mm), and between adjacent shakes, it shall not exceed 1/2 inch (13 mm). The offset spacing between joints in adjacent courses shall be a minimum of 11/2 inches (38 mm).

R703.6.1 Lath. All lath and lath attachments shall be of corrosion-resistant materials. Expanded metal or woven wire lath shall be attached with 1 1/2-inch-long (38 mm), 11 gage nails having a 7/16-inch (11.1 mm) head, or 7/8-inch-long (22.2 mm), 16 gage staples, spaced at no more than 6 inches (152 mm), or as otherwise *approved*. For application of maximum 7/8-inch-thick Portland cement plaster over foam plastic sheathing, nail length and shank diameter shall comply with Section R703.3.2.

R703.7.4.1 Size and spacing. Veneer ties, if strand wire, shall not be less in thickness than No. 9 U.S. gage [(0.148 in.) (4 mm)] wire and shall have a hook embedded in the mortar joint, or if sheet metal, shall be not less than No. 22 U.S. gage by [(0.0299 in.)(0.76 mm)] 7/8 inch (22 mm) corrugated. Each tie shall be spaced not more than 24 inches (610 mm) on center horizontally and vertically and shall support not more than 2.67 square feet (0.25 m2) of wall area. For application over foam plastic sheathing, corrugated metal ties shall be fastened through the foam plastic sheathing using a 10d common nail with a minimum penetration of 1 1/2 inches (38 mm) into wood framing for a maximum wind condition of 90 miles per hour (40 m/s) in wind exposure B. For a basic wind speed not exceeding

110 miles per hour (49 m/s) in any wind exposure and in Seismic Design Categories C, D_0, D_1, and D_2, a #8 wood screw with a minimum 1 inch (25.4 mm) penetration into wood wall framing shall be used in each tie. Alternatively, an approved fastener with equivalent withdrawal strength shall be permitted.

Exception: In Seismic Design Category D_0, D_1 or D_2 or townhouses in Seismic Design Category C or in wind areas of more than 30 pounds per square foot pressure (1.44 kPa), each tie shall support not more than 2 square feet (0.2 m2) of wall area.

R703.11.2 Foam plastic sheathing. Vinyl siding used with foam plastic sheathing shall be installed in accordance with Section R703.11.2.1, R703.11.2.2, or R703.11.2.3.

Exception: Where the foam plastic sheathing is applied directly over wood structural panels, fiberboard, gypsum sheathing or other *approved* backing capable of independently resisting the design wind pressure, the vinyl siding shall be installed in accordance with Section R703.11.1.

R703.11.2.1 Basic wind speed not exceeding 90 miles per hour and Exposure Category B. Where the basic wind speed does not exceed 90 miles per hour (40 m/s), the Exposure Category is B and gypsum wall board or equivalent is installed on the side of the wall opposite the foam plastic sheathing, the minimum siding fastener penetration into wood framing shall be 11/4 inches (32 mm) using minimum 0.120-inch diameter nail (shank) with a minimum 0.313-inch diameter head, 16 inches on center. The foam plastic sheathing minimum thickness shall comply with Section R703.3.1 and shall not exceed a maximum thickness of 1.5 inches (38mm) for a 0.120-inch diameter nail or 2.0 inches (51 mm) for a 0.135-inch diameter nail. shall be 1/2-inch-thick (12.7 mm) (nominal) extruded polystyrene per ASTM C578, 1/2-inch-thick (12.7 mm) (nominal) polyisocyanurate per ASTM C1289, or 1-inch-thick (25 mm)(nominal) expanded polystyrene per ASTM C578. Vinyl siding shall be permitted to be installed on furring strips in accordance with Section 1405.18.2.2 using the siding manufacturer's installation instructions when foam plastic sheathing thickness complies with Section1405.18.1.

R703.11.2.2 Basic wind speed exceeding 90 miles per hour or Exposure Categories C and D. Where the basic wind speed exceeds 90 miles per hour (40 m/s) or the Exposure Category is C or D, or all conditions of Section R703.11.2.1 are not met, the adjusted design pressure rating for the assembly shall meet or exceed the loads listed in Tables R301.2(2) adjusted for height and exposure using Section R301.2(3). The design wind pressure rating of the vinyl siding for installation over solid sheathing as provided in the vinyl siding manufacturer's product specifications shall be adjusted for the following wall assembly conditions:

1. For wall assemblies with foam plastic sheathing on the exterior side and minimum ½-inch-thick gypsum wall board or equivalent on the interior side of the wall, the vinyl siding's design wind pressure rating shall be multiplied by 0.39.
2. For wall assemblies with foam plastic sheathing on the exterior side and no gypsum wall board or equivalent on the interior side of wall, the vinyl siding's design wind pressure rating shall be multiplied by 0.27.

   Exception: The above adjustments shall not apply when vinyl siding is attached to wood furring strips installed over the foam plastic sheathing in accordance with Section R703.3.2.2 and such installation is in accordance with the vinyl siding manufacturer's installation instructions.

R703.11.2.3 Manufacturer specification. Where the vinyl siding manufacturer's product specifications provide an *approved* design wind pressure rating for installation over foam plastic sheathing, use of this design wind pressure rating shall be permitted and the siding shall be installed in accordance with the manufacturer's installation instructions.

Reason:

Part I-As with a related IRC proposal, this proposal is a comprehensive clarification and upgrading of requirements for foam plastic sheathing and siding installation over foam plastic sheathing. It primarily addresses adequate foam sheathing thickness and siding attachment over foam sheathing to resist a range of design wind load conditions, beyond which design is required or installation in accordance with manufacturer instructions specific to application of siding over foam sheathing. It also provides siding connections through foam sheathing that provide adequate support to resist the dead load of siding installed over foam sheathing and limits the siding weight, particularly in higher seismic conditions (beyond which design is required or approved installation guidelines). As a whole, these provisions are necessary to ensure appropriate use of foam sheathing and siding materials together on exterior wall assemblies in a way that best compliments existing exterior wall covering provisions in Chapter 14. A detailed explanation of the test data and analysis justifying the proposed requirements can be found at www.foamsheathing.org.

In support of proposed new Section 1405.18.1, the wind pressure resistance of foam sheathing used in this proposal is based on certified full-scale (4'x8' panel) testing conducted at the NAHB Research Center, Inc. Samples included specimens from various manufacturers representing the industry at large. The design wind speed data (without rounding or capping values) is shown in the table below for informational purposes. The values in the proposed table have been rounded to the nearest 5 mph increment and capped at 130 mph (Exposure B) which corresponds to a maximum wind speed of 110 mph in exposure C or 100 mph Exposure D. This proposal is needed to avoid potential exclusion of foam sheathing products due to the incompleteness of current code requirements which can negatively affect other concerns such as energy conservation code

requirements and green building interests. Most importantly, these requirements will ensure that foam sheathing is used appropriately to prevent building envelope damage, particularly in higher wind conditions and with thinner material used on more widely spaced studs (e.g., 24"oc center on gable roof ends which typically have no interior finish). These requirements also agree reasonably well with the generally successful use of foam sheathing on typical wall assemblies (e.g., 16"oc framing or 24"oc framing with interior finish) on many buildings in lower wind regions of the U.S.

TABLE R703.3.1- Part A (Actual design values based on test data – not rounded or capped as in the proposal)
MAXIMUM WIND SPEED (mph – 3 SECOND GUST) PERMITTED
FOR FOAM PLASTIC SHEATHING
WITH DIRECTLY ATTACHED SIDING PER SECTION R703.3.2.1

Foam Sheathing Material[3]	Foam Sheathing Nominal Thickness (in)	Maximum Wind Speed (mph) – Exposure B[4]			
		Walls with Interior Finish[5]		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
EPS	¾" (unfaced)	110	73	92	61
	1" (unfaced)	147	98	123	82
	1-1/2" (unfaced)	222	148	186	124
Polyiso-cyanurate	½" (faced)	136	91	114	76
	¾" (faced)	177	118	148	99
	1" (faced)	193	129	162	108
	1-1/2" (faced)	207	138	173	116
XPS	½" (faced)	125	84	105	70
	¾" (unfaced)	109	73	91	61
	1" (unfaced)	145	97	121	81
	1-1/2" (unfaced)	208	139	174	116

Design value based on the minimum tested uniform pressure capacity for each sheathing type and thickness category divided by a safety factor of 1.5 and ASCE 7-05 positive pressure design loads for wall corner zone and a 10 sq ft wind effective area (negative pressure is resisted by the foam sheathing and siding assembly). Because the 1.5 safety factor is applied to a minimum test value (not the average), these requirements are more stringent than safety margins required for other building envelop components such as doors and windows which are also important to envelope integrity. This "minimum test value" basis also serves to better control safety margins with regard to variability in material properties or performance.

TABLE R703.3.1 – Part B (Actual design values based on test data – not rounded or capped as in the proposal)
MAXIMUM WIND SPEED (mph – 3 SECOND GUST) PERMITTED
FOR FOAM PLASTIC SHEATHING
WITH FURRED SIDING PER SECTION R703.3.2.2[1]

Foam Plastic Sheathing Material[2]	Foam Sheathing Nominal Thickness (in)[2]	Maximum Wind Speed (mph) – Exposure B[3,4]			
		Walls with Interior Finish[5]		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
EPS	¾"	95	63	80	53
	1"	127	85	106	71
	≥1-1/2"	192	128	161	107
Polyiso-cyanurate	½" (faced)	118	78	98	66
	¾" (faced)	153	102	128	85
	1" (faced)	167	112	140	93
	≥1-1/2" (faced)	179	120	150	100
XPS	½" (faced)	108	72	91	61
	¾"	94	63	79	53
	1"	126	84	105	70
	≥1-1/2"	180	120	151	101

Design value based on the minimum tested uniform pressure capacity for each sheathing type and thickness category divided by a safety factor of 1.5 and ASCE 7-05 negative pressure design loads for wall corner zone and a 10 sq ft wind effective area. Because the siding is spaced away from foam sheathing in this wall covering assembly condition, it does not contribute to foam sheathing resistance. Thus, the foam sheathing must independently resist the negative wind pressure load. The furring strips provide adequate bearing at connection to secure the foam sheathing as well as the siding material.

In support of proposed new Section 1405.18.2, the generalized connection requirements for siding over foam sheathing are based on an analysis using the AF&PA NDS-2005 connection design provisions in consideration of withdrawal to resist wind pressure and shear strength to resist siding dead load. To account for the "gap" in the connection caused by the presence of foam sheathing, the provisions of AF&PA TR12 were used to downgrade connection strength based on the thickness of foam sheathing (i.e., width of gap in the connection). The design shear strength was based on calculated ultimate capacity divided by a safety factor of 2 while conservatively ignoring any benefit of the foam material filling the gap in the siding or furring connection to wall framing. Wind loads were based on application of the full ASCE 7-05 components and cladding wind pressure applied to the exterior wall covering while conservatively ignoring any distribution of wind pressure to other wall layers. In addition, the wind pressures were based on the most stringent wall corner zone condition and an effective wind area of 10 sq ft.

Addition of new Section 1405.14.2 provides special requirements and limitations for use of foam plastic sheathing with vinyl siding. The proposed changes are consistent approved changes now included in the 2009 IRC. These changes are needed to ensure appropriate use of vinyl siding wind pressure ratings when foam sheathing is used, thus preventing inadequate performance.

Limited changes to other parts of the code are made in coordination with the above improvements.

Part II- As with a related IBC proposal, this proposal is a comprehensive clarification and upgrading of requirements for foam sheathing and siding installation over foam sheathing. It primarily addresses adequate foam sheathing thickness and siding attachment over foam sheathing to resist design wind loads within the scope of the IRC (e.g., up to 110 mph, Exposure D). It also provides siding connections through foam sheathing that provide adequate support to resist the dead load of siding installed over foam sheathing. As a whole, these provisions are necessary to ensure appropriate use of foam sheathing and siding materials together on exterior wall assemblies in a way that best compliments existing exterior wall covering provisions in Section R703 of the code. A detailed explanation of the test data and analysis justifying the proposed requirements can be found at www.foamsheathing.org.

In support of proposed new Section R703.3.1, the wind pressure resistance of foam sheathing used in this proposal is based on certified full-scale (4'x8' panel) testing conducted at the NAHB Research Center, Inc. Samples included specimens from various manufacturers representing the industry at large. The design wind speed data (without rounding or capping values) is shown in the table below for informational purposes. The

values in the proposed table have been rounded to the nearest 5 mph increment and capped at 130 mph (Exposure B) as this corresponds to a maximum wind speed of 110 mph in exposure C, which is essentially the scope limit of the IRC. This proposal is needed to avoid potential exclusion of foam sheathing products due to the incompleteness of current code requirements which can negatively affect other concerns such as energy conservation code requirements and green building interests. Most importantly, these requirements will ensure that foam sheathing is used appropriately to prevent building envelope damage, particularly in higher wind conditions and with thinner material used on more widely spaced studs (e.g., 24"oc center on gable roof ends which typically have no interior finish). These requirements also agree reasonably well with the generally successful use of foam sheathing on typical wall assemblies (e.g., 16"oc framing or 24"oc framing with interior finish) on many homes in lower wind regions of the U.S.

TABLE R703.3.1- Part A (Actual design values based on test data – not rounded or capped as in the proposal)
MAXIMUM WIND SPEED (mph – 3 SECOND GUST) PERMITTED
FOR FOAM PLASTIC SHEATHING
WITH DIRECTLY ATTACHED SIDING PER SECTION R703.3.2.1

Foam Sheathing Material[3]	Foam Sheathing Nominal Thickness (in)	Maximum Wind Speed (mph) – Exposure B[4]			
		Walls with Interior Finish[5]		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
EPS	¾" (unfaced)	110	73	92	61
	1" (unfaced)	147	98	123	82
	1-1/2" (unfaced)	222	148	186	124
Polyiso-cyanurate	½" (faced)	136	91	114	76
	¾" (faced)	177	118	148	99
	1" (faced)	193	129	162	108
	1-1/2" (faced)	207	138	173	116
XPS	½" (faced)	125	84	105	70
	¾" (unfaced)	109	73	91	61
	1" (unfaced)	145	97	121	81
	1-1/2" (unfaced)	208	139	174	116

Design value based on the minimum tested uniform pressure capacity for each sheathing type and thickness category divided by a safety factor of 1.5 and ASCE 7-05 positive pressure design loads for wall corner zone and a 10 sqft wind effective area (negative pressure is resisted by the foam sheathing and siding assembly). Because the 1.5 safety factor is applied to a minimum test value (not the average), these requirements are more stringent than safety margins required for other building envelop components such as doors and windows which are also important to envelope integrity. This "minimum test value" basis also serves to better control safety margins with regard to variability in material properties or performance.

TABLE R703.3.1 – Part B (Actual design values based on test data – not rounded or capped as in the proposal)
MAXIMUM WIND SPEED (mph – 3 SECOND GUST) PERMITTED
FOR FOAM PLASTIC SHEATHING
WITH FURRED SIDING PER SECTION R703.3.2.2[1]

Foam Plastic Sheathing Material[2]	Foam Sheathing Nominal Thickness (in)[2]	Maximum Wind Speed (mph) – Exposure B[3,4]			
		Walls with Interior Finish[5]		Walls without Interior Finish	
		16"oc framing	24"oc framing	16"oc framing	24"oc framing
EPS	¾"	95	63	80	53
	1"	127	85	106	71
	≥1-1/2"	192	128	161	107
Polyiso-cyanurate	½" (faced)	118	78	98	66
	¾" (faced)	153	102	128	85
	1" (faced)	167	112	140	93
	≥1-1/2" (faced)	179	120	150	100
XPS	½" (faced)	108	72	91	61
	¾"	94	63	79	53
	1"	126	84	105	70
	≥1-1/2"	180	120	151	101

Design value based on the minimum tested uniform pressure capacity for each sheathing type and thickness category divided by a safety factor of 1.5 and ASCE 7-05 negative pressure design loads for wall corner zone and a 10 sqft wind effective area. Because the siding is spaced away from foam sheathing in this wall covering assembly condition, it does not contribute to foam sheathing resistance. Thus, the foam sheathing must independently resist the negative wind pressure load. The furring strips provide adequate bearing at connection to secure the foam sheathing as well as the siding material.

In support of proposed new Section R703.3.2, the generalized connection requirements for siding over foam sheathing are based on an analysis using the AF&PA NDS-2005 connection design provisions in consideration of withdrawal to resist wind pressure and shear strength to resist siding dead load. To account for the "gap" in the connection caused by the presence of foam sheathing, the provisions of AF&PA TR12 were used to downgrade connection strength based on the thickness of foam sheathing (i.e., width of gap in the connection). The design shear strength was based on calculated ultimate capacity divided by a safety factor of 2 while conservatively ignoring any benefit of the foam material filling the gap in the siding or furring connection to wall framing. Wind loads were based on application of the full ASCE 7-05 components and cladding wind pressure applied to the exterior wall covering while conservatively ignoring any distribution of wind pressure to other wall layers. In addition, the wind pressures were based on the most stringent wall corner zone condition and an effective wind area of 10 sqft.

Changes to other parts of Section R703, including changes to Table R703.4 and various siding attachment requirements, are made in coordination with the above improvements.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: ASTM standards within this proposed are currently referenced in the I-codes.

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRANDELL-FS1-1404.12

FS157–09/10
1406.2, 1406.3, 1406.4, TABLE 1406.2.1.2

Proponent: Rick Thornberry, PE, Jesse J. Beitel, The Code Consortium, Inc., Hughes Associates, Inc., representing Alcan Composites USA, Inc., Trespa North America, Ltd.

Revise as follows:

SECTION 1406
COMBUSTIBLE MATERIALS ON THE EXTERIOR SIDE OF EXTERIOR WALLS

1406.1 General. Section 1406 shall apply to exterior wall coverings; balconies and similar protections: and bay and oriel windows constructed of combustible materials.
1406.2 Combustible exterior wall coverings. Combustible exterior wall coverings shall comply with this section.

Exception: Plastics complying with Chapter 26.

1406.2.2<u>1</u> Type I, II, III and IV construction. On buildings of Type I, II, III and IV construction, exterior wall coverings shall be permitted to be constructed of ~~wood in accordance with Section 1405.5, or other equivalent~~ combustible material<u>s</u>, complying with the following limitations:

1. Combustible exterior wall coverings shall not exceed 10 percent of an exterior wall surface area where the fire separation distance is 5 feet (1524 mm) or less.
2. Combustible <u>exterior wall coverings</u> ~~architectural trim~~ shall be limited to 40 feet (12 192mm) in height above grade <u>plane</u>.
3. Combustible exterior wall coverings constructed of fire-retardant-treated wood complying with Section 2303.2 for exterior installation shall not be limited in wall surface area where the fire separation distance is 5 feet (1524 mm) or less and shall be permitted up to 60 feet (18 288 mm) in height above grade <u>plane</u> regardless of the fire separation distance.
4. <u>Wood veneers shall comply with Section 1405.5.</u>

1406.2.1<u>.1</u> Ignition resistance. <u>Where permitted by Section 1406.2.1,</u> combustible exterior wall coverings shall be tested in accordance with NFPA 268.

Exceptions:

1. Wood or wood-based products.
2. Other combustible materials covered with an exterior covering other than vinyl sidings listed in Table 1405.2.
3. Aluminum having a minimum thickness of 0.019 inch (0.48 mm).
4. ~~Exterior wall coverings on exterior walls of Type V construction.~~

1406.2.1.1<u>.1</u> Fire separation 5 feet or less. Where installed on exterior walls having a fire separation distance of 5 feet (1524 mm) or less, combustible exterior wall coverings shall not exhibit sustained flaming as defined in NFPA 268.

1406.2.1.<u>1.</u>1.2 Fire separation greater than 5 feet. For fire separation distances greater than 5 feet (1524 mm), any <u>exterior wall covering</u> ~~assembly~~ shall be permitted that has been exposed to a reduced level of incident radiant heat flux in accordance with the NFPA 268 test method without exhibiting sustained flaming. The minimum fire separation distance required for the <u>exterior wall covering</u> ~~assembly~~ shall be determined from Table 1406.2.1.<u>1</u>.2 based on the

maximum tolerable level of incident radiant heat flux that does not cause sustained flaming of the exterior wall covering ~~assembly~~.

Table 1406.2.1.1.2
MINIMUM FIRE SEPARATION FOR COMBUSTIBLE EXTERIOR WALL COVERINGS ~~VENEERS~~
(Potions of Table not shown, remain unchanged)

1406.2.~~3~~2 Location. ~~Where~~ Combustible exterior wall coverings ~~is~~ located along the top of exterior walls~~, such trim~~ shall be completely backed up by the exterior wall and shall not extend over or above the top of the exterior walls~~.~~

1406.2.~~4~~ 3 Fireblocking. Where the combustible exterior wall covering is furred out from the exterior wall and forms a solid surface, the distance between the back of the covering and the wall shall not exceed 1 5/8 inches (41 mm). ~~Where required by Section 717,~~ The concealed space thereby created shall be fireblocked in accordance with Section 717.

1406.3 Balconies and similar projections. Balconies and similar projections of combustible construction other than fire-retardant-treated wood shall be fire-resistance rated ~~in accordance with~~ where required by Table 601 for floor construction or shall be of Type IV construction in accordance with Section 602.4. The aggregate length of the projections shall not exceed 50 percent of the building's perimeter on each floor.

Exceptions:

1. On buildings of Type I and II construction, three stories or less above grade plane, fire-retardant-treated wood shall be permitted for balconies, porches, decks and exterior stairways not used as required exits.
2. Untreated wood is permitted for pickets and rails or similar guardrail devices that are limited to 42 inches (1067 mm) in height.
3. Balconies, and similar projections on buildings of Types III, IV and V construction shall be permitted to be of Type V construction~~,~~ and shall not be required to have a fire-resistance rating where sprinkler protection is extended to these areas.
4. Where sprinkler protection is extended to the balcony areas, the aggregate length of the balcony on each floor shall not be limited.

1406.4 Bay ~~windows~~ and oriel windows. Bay and oriel windows shall conform to the type of construction required for the building to which they are attached.

Exception: Fire-retardant-treated wood shall be permitted on buildings three stories or less above grade plane of Type I, II, III or ~~and~~ IV construction.

Reason: This code change is editorial. It accomplishes a number of things as indicated in the following.

1. It slightly reorganizes the section so that the provisions that permit combustible exterior wall coverings to be installed on exterior walls of buildings of Types I, II, III, and IV construction (current Section 1406.2.2) comes before the section that requires those combustible exterior wall coverings to be tested in accordance with NFPA 268 (current Section 1406.2.1).
2. It clarifies that current Section 1406.2.1 (redesignated as Section 1406.2.1.1 by this code change) applies where combustible exterior wall coverings are permitted by current Section 1406.2.2 (redesignated as Section 1406.2.1 by this code change). The purpose for doing this is so that the users of the code are not misled into thinking that if a combustible exterior wall covering complies with this section, it can be used wherever noncombustible exterior wall coverings are required. In other words, the code has to first permit the use of combustible exterior wall coverings and when that is satisfied, then the combustible exterior wall coverings are required to comply with this section.
3. Current Section 1406.2.1.2 (redesignated as Section 1406.2.1.1.2 by this code change) is editorially revised to utilize the defined term "Exterior Wall Covering" in lieu of "assembly" since the test method is intended to apply to the exterior wall covering.
4. The title to current Table 1406.2.1.2 (redisignated as Table 1406.2.1.1.2 by this code change) is editorially revised to delete the reference to "Veneers" and substitute the term "Exterior Wall Coverings" which, as noted above, is a defined term applicable to this particular section.
5. The charging sentence in current Section 1406.2.2 (redesigated as Section 1406.2.1 by this code change) has been revised to delete the reference to Section 1405.5 and relocate it as a new Item 4 in the list of limitations for the allowable use of combustible materials. We believe this makes more sense to have the requirements for the use of wood veneers on exterior walls of buildings of Type I, II, III, and IV construction referenced in the list of limitations rather than in the charging sentence. The charging sentence should be more general by just referring to combustible materials which are the subject of this section.
6. In current Section 1406.2.2 (redesignated as Section 1406.2.1 by this code change) Item 2 has been clarified to indicate that it applies to all "exterior wall coverings" and not just "architectural trim." It should be noted in the definition for "exterior wall coverings" that architectural trim is included. However, architectural trim is not defined by itself. So it follows that if architectural trim is allowed up to 40 feet in height above grade plane, then any type of combustible exterior wall covering should be so limited as well.
7. The rest of the changes are editorial clarifications without making any technical changes.

In summary, we believe the revisions proposed to this code change will help to clarify the application and interpretation of this section and make it easier to use, as well as to enforce.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Thornberry-FS5-1406

FS158–09/10
1406.2.1.2

Proponent: Don Davies representing Utah Chapter of ICC

Delete without substitution:

~~**1406.2.1.2 Fire separation greater than 5 feet.** For fire separation distances greater than 5 feet (1524 mm), an assembly shall be permitted that has been exposed to a reduced level of incident radiant heat flux in accordance with the NFPA 268 test method without exhibiting sustained flaming. The minimum fire separation distance required for the assembly shall be determined from Table 1406.2.1.2 based on the maximum tolerable level of incident radiant heat flux that does not cause sustained flaming of the assembly.~~

~~TABLE 1406.2.1.2~~
~~MINIMUM FIRE SEPARATION FOR COMBUSTIBLE VENEERS~~

~~FIRE SEPARATION DISTANCE (feet)~~	~~TOLERABLE LEVEL INCIDENT RADIANT HEAT ENERGY(kW/m2)~~	~~FIRE SEPARATION DISTANCE (feet)~~	~~TOLERABLE LEVEL INCIDENT RADIANT HEAT ENERGY(kW/m2)~~
~~5~~	~~12.5~~	~~16~~	~~5.9~~
~~6~~	~~11.8~~	~~17~~	~~5.5~~
~~7~~	~~11.0~~	~~18~~	~~5.2~~
~~8~~	~~10.3~~	~~19~~	~~4.9~~
~~9~~	~~9.6~~	~~20~~	~~4.6~~
~~10~~	~~8.9~~	~~21~~	~~4.4~~
~~11~~	~~8.3~~	~~22~~	~~4.1~~
~~12~~	~~7.7~~	~~23~~	~~3.9~~
~~13~~	~~7.2~~	~~24~~	~~3.7~~
~~14~~	~~6.7~~	~~25~~	~~3.5~~
~~15~~	~~6.3~~		

Reason: Now that I.B.C. Section 705.5 has been changed in the 2009 I.B.C. increasing the fire separation distance from 5 feet to 10 where the fire-resistance of the exterior walls is required on both sides of the wall there is no longer a compelling reason to address radiant heat flux in the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Davies-FS1-1406.2.1.2

FS159–09/10
1406.2.4

Proponent: Rick Thornberry, PE, Jesse J. Beitel, The Code Consortium, Inc., Hughes Associates, Inc., representing Trespa North America, Ltd.

Revise as follows:

1406.2.4 Fireblocking. Where the combustible exterior wall covering is furred <u>out</u> from the <u>exterior</u> wall and forms a solid surface, the distance between the back of the <u>exterior wall</u> covering and the <u>exterior</u> wall shall not exceed 1 5/8 inches (41 mm). Where required by Section 717, the <u>concealed</u> space thereby created shall be fireblocked.

> **<u>Exception:</u>** <u>The distance between the back of the exterior wall covering and the exterior wall shall be permitted to exceed 1 5/8 inches (41 mm) where the concealed space is not required to be fireblocked by Section 717.</u>

Reason: Some editorial clarifications are made to Section 1406.2.4 to make the section more enforceable and subject to less interpretation. Also a new Exception is added to allow for the distance between the back of the exterior wall covering and the exterior wall to exceed the 1-5/8 inches limit where the concealed space so created is not required to be fireblocked by Section 717. In our opinion, it follows that if the concealed space does not require fireblocking, there is no need to be concerned about the maximum set off of the exterior wall covering from the face of the exterior wall.

The applicable Exception in Section 717.2.6 is Exception 2 which allows the fireblocking to be omitted when the face of the combustible exterior wall covering exposed to the concealed space is covered by the noncombustible materials listed in that Exception. Furthermore, we have proposed a separate code change which will further modify Section 717.2.6 to add a new Exception 3 that will allow the omission of fireblocking in these concealed spaces when the exterior wall covering has been tested in accordance with NFPA 285 Standard Method of Test for the Evaluation of Flammability Characteristics of Exterior Nonload-Bearing Wall Assemblies Containing Combustible Components and has successfully met the acceptance criteria therein. In both those cases there will be little opportunity for a fire in the concealed space to spread via the materials in the concealed space because of their noncombustible coverings or because they successfully passed NFPA 285 to show limited fire and flame spread over the face of, as well as within the interior of, the exterior wall system.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Thornberry-Beitel-FS9-1406.2.4

FS160–09/10

1407.10.2, 2603.4, Chapter 35; IRC R316.4

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC FIRE SAFETY. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

1. Revise as follows:

1407.10.2 Thermal barriers. MCM shall be separated from the interior of a building by an approved thermal barrier consisting of ½ -inch (12.7 mm) gypsum wallboard or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275. ~~equivalent thermal barrier material that will limit the average temperature rise of the unexposed surface to not more than 250°F (121°C) after 15 minutes of fire exposure in accordance with the standard time-temperature curve of ASTME 119 or UL 263. The thermal barrier shall be installed in such a manner that it will remain in place for not less than 15 minutes based on a test conducted in accordance withUL1715.~~

2603.4 Thermal barrier. Except as provided for in Sections 2603.4.1 and 2603.9, foam plastic shall be separated from the interior of a building by an approved thermal barrier of ½-inch (12.7 mm) gypsum wallboard or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275. ~~equivalent thermal barrier material that will limit the average temperature rise of the unexposed surface to not more than 250°F (120°C) after 15 minutes of fire exposure, complying with the standard time-temperature curve of ASTM E 119 or UL 263. The thermal barrier shall be installed in such a manner that it will remain in place for 15 minutes based on FM 4880, UL 1040, NFPA 286 or UL 1715.~~ Combustible concealed spaces shall comply with Section 717.

2. Add new standard to Chapter 35 as follows:

NFPA 275–09	Standard Method of Fire Tests for the Evaluation of Thermal Barriers Used Over Foam Plastic Insulation

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

R316.4 Thermal barrier. Unless otherwise allowed in Section R316.5 or Section R316.6, foam plastic shall be separated from the interior of a building by an *approved* thermal barrier of minimum ½ inch (12.7 mm) gypsum wallboard or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275. ~~an *approved* finish material equivalent to a thermal barrier material that will limit the average temperature rise of the unexposed surface to no more than 250°F (139°C)~~

~~after 15 minutes of fire exposure complying with the ASTM E 119 or UL 263 standard time temperature curve. The thermal barrier shall be installed in such a manner that it will remain in place for 15 minutes based on NFPA 286 with the acceptance criteria of Section R302.9.4, FM 4880, UL 1040 or UL 1715.~~

2. Add new standard to Chapter 35 as follows:

NFPA 275–09 Standard Method of Fire Tests for the Evaluation of Thermal Barriers Used Over Foam Plastic Insulation

Reason: The thermal barrier requirement has been in the Codes since the addition of the foam plastics Sections/Chapters in the late 1970's. The Code requirements for a material to be a thermal barrier are vague and imprecise. Over time confusion has occurred relating to the specific test(s) to use and the interpretation of the existing Code language.

The new NFPA 275 "Standard Method of Fire Tests for the Evaluation of Thermal barriers Used Over Foam Plastic Insulation" was developed to specifically address the testing of materials to qualify as a thermal barrier. The test method provides specific sample construction, fire exposures and acceptance criteria to qualify a material to be a 15-minute thermal barrier. The test method address both the capability of the material to retard heat transfer via a fire-resistance test and to remain in place via a full-scale fire test.

Cost Impact: The code change proposal will not increase the cost of construction.
Analysis: Code change proposal FS160 and FS161 address thermal barrier requirements. The committee needs to make its intent clear with respect to these provisions. A review of the standard(s) proposed for inclusion in the code, NFPA 275-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEITEL-FS11-2603.4

FS161–09/10

1407.10.2, 1407.10.2.1 (New), 1407.2.1 (New), 2603.4, 2603.4.1, 2603.4.2, Chapter 35

Proponent: Marcelo M Hirschler (GBH International), representing American Fire Safety Council

1. Revise as follows:

1407.10.2 Thermal barriers. MCM shall be separated from the interior of a building by an approved thermal barrier consisting of $^1/_2$-inch (12.7 mm) gypsum wallboard or equivalent thermal barrier material ~~that will limit the average temperature rise of the unexposed surface to not more than 250°F (121°C) after 15 minutes of fire exposure in accordance with the standard time-temperature curve of ASTM E 119 or UL 263. The thermal barrier shall be installed in such a manner that it will remain in place for not less than 15 minutes based on a test conducted in accordance with UL 1715~~.The thermal barrier material shall comply with Section 1407.10.2.1 or 1407.10.2.2.

1407.10.2.1 Temperature transmission and integrity. The thermal barrier material shall comply with the requirements of the temperature transmission fire test and of the integrity fire test in NFPA 275, Standard Method of Fire Tests for the Evaluation of Thermal Barriers Used Over Foam Plastic Insulation.

1407.10.2.2 Temperature transmission and conditions of acceptance. The thermal barrier material shall comply with the temperature transmission test in NFPA 275 and with the conditions of acceptance of UL 1715 when tested in conjunction with the MCM, at the maximum thickness intended for use, for a period of 15 minutes.

2. Revise as follows:

2603.4 Thermal barrier. Except as provided for in Sections ~~2603.4.1~~ 2603.4.3 and 2603.9, foam plastic shall be separated from the interior of a building by an approved thermal barrier of 0.5-inch (12.7 mm) gypsum wallboard or equivalent thermal barrier material ~~that will limit the average temperature rise of the unexposed surface to not more than 250°F (120°C) after 15 minutes of fire exposure, complying with the standard time-temperature curve of ASTM E 119 or UL 263. The thermal barrier shall be installed in such a manner that it will remain in place for 15 minutes based~~

~~on FM 4880, UL 1040, NFPA 286 or UL 1715~~. The thermal barrier material shall comply with 2603.4.1 or 2603.4.2. Combustible concealed spaces shall comply with Section 717.

2603.4.1 Temperature transmission and integrity. The thermal barrier material shall comply with the requirements of the temperature transmission fire test and of the integrity fire test in NFPA 275, Standard Method of Fire Tests for the Evaluation of Thermal Barriers Used Over Foam Plastic Insulation.

2603.4.2 Temperature transmission and conditions of acceptance. The thermal barrier material shall comply with the temperature transmission test in NFPA 275 and with the conditions of acceptance of FM 4880, UL 1040 or UL 1715 when tested in conjunction with the foam plastic insulation for a period of 15 minutes.

~~2603.4.1~~ 2603.4.3 Thermal barrier not required. *(No change to text)*

(Renumber subsequent sections)

2. Add new standard to Chapter 35

NFPA 275-08	Standard Method of Fire Tests for the Evaluation of Thermal Barriers Used Over Foam Plastic Insulation, 2009 Edition

Reason: NFPA 275 was specifically developed to clarify the test for thermal barrier materials to be used over foam plastic insulation. It contains two tests.

The temperature transmission fire test in NFPA 275 uses the ASTM E 119 (or UL 263) time-temperature fire curve to expose the thermal barrier specimen and it requires the following: "4.8.1 During the 15-minute test period, the average measured temperature rise above the average temperature at the start of the fire test for the thermocouples described in Section 4.3 shall not exceed 250°F (139°C), and the measured temperature rise of any such single thermocouple shall not exceed 325°F (181°C)." Therefore, the temperature transmission fire test in NFPA 275 corresponds to what the code requires now.

The integrity fire test in NFPA 275 requires that the thermal barrier material, together with the foam plastic insulation, be tested to NFPA 286 (which is a 15 minute test) and that the pass/fail criteria are identical to those used for NFPA 286 elsewhere in the code (for example Chapter 8). NFPA 275 explains that when thermal barriers are to be used over MCM, the test specimen must contain the MCM at the maximum thickness intended for use.

The code recognizes at present that thermal barrier materials tested, in conjunction with MCM, to UL 1715 and complying with the conditions of acceptance of this test is acceptable. It should continue to do so. NFPA 275 also states that the integrity fire test can be conducted in accordance with UL 1715 if its pass/fail criteria are used.

With regard to MCM, the code, in section 1407.10.2 recognizes at present that thermal barrier materials tested, in conjunction with MCM, to UL 1715 and complying with the conditions of acceptance of this test, are acceptable. It should continue to do so. NFPA 275 also states that the integrity fire test can be conducted in accordance with UL 1715 if the pass/fail criteria of UL 1715 are used.

With regard to foam plastics, the code recognizes, in section 2603.4, that thermal barrier materials tested, in conjunction with foam plastic insulation, to FM 4880, UL 1040 and UL 1715 and complying with the conditions of acceptance of these tests are equally acceptable. It should also continue to do so. NFPA 275 also states that the integrity fire test can be conducted in accordance with the UL 1715, UL 1040 and FM 4880 alternate test methods, if the pass/fail criteria of those test methods are used.

Note that there is an error in unit conversion in the code since the actual equivalent in degrees centigrade of a temperature rise of 250 ºF is 139 ºC. The equivalent of 250 ºF actual temperature is 121 ºC. This becomes a moot point since the relevant information will now be contained within NFPA 275.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposal FS160 and FS161 address thermal barrier requirements. The committee needs to make its intent clear with respect to these provisions. Standards FM 4480, UL 1040 and UL 1715 are currently referenced in the I-codes. A review of the standard(s) proposed for inclusion in the code, NFPA 275-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-FS8-2603.4

FS162–09/10
1407.10.3

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

Revise as follows:

1407.10.3 Thermal barrier not required. The thermal barrier specified for MCM in Section 1407.10.2 is not required where:

1. The MCM system is specifically approved based on tests conducted in accordance with NFPA 286 (with the acceptance criteria of Section 803.1.2.1), UL 1040 or UL 1715. Such testing shall be performed with the MCM in the maximum thickness intended for use. The MCM system shall include seams, joints and other typical details used in the installation and shall be tested in the manner intended for use.
2. The MCM is used as elements of balconies and similar projections, architectural trim or embellishments.

Reason: The code recognizes that NFPA 286 is an acceptable test for assessing the fire performance of materials that cannot be properly tested in accordance with ASTM E 84. In fact, NFPA 286 is a more modern test than UL 1715 or UL 1040.

There are three key differences between UL 1715 and NFPA 286: (a) the ignition source is a wood crib in UL 1715 and a gas burner in NFPA 286; (b) NFPA 286 lines the material fully on all three walls and the ceiling of the room while in UL 1715 wall lining is only partial and (c) the pass fail criteria or UL 1715 are qualitative ("During the test, the test specimen shall not project flame through the doorway opening at any time, and flames shall not extend to the extremities of the specimen. The char pattern shall show a decreasing char layer as measured from the fire source to the extremities."), while those for NFPA 286 are contained in the code (in 803.1.2.1) and include heat release, flame spread and smoke (as shown below).

This clearly indicates that a material that complies with the pass fail criteria in the IBC for NFPA 286 will pass the criteria for UL 1715 and therefore NFPA 286 should be allowed as an alternate test. In fact, acceptability for NFPA 286 as an alternate test to UL 1715 is already in the code in 2603.4 and in 2603.9.

This code proposal does not make any changes to the acceptability of materials tested to UL 1715 or to UL 1040.

IBC 803.1.2.1 Acceptance criteria for NFPA 286. During the 40 kW exposure, the interior finish shall comply with Item 1. During the 160 kW exposure, the interior finish shall comply with Item 2. During the entire test, the interior finish shall comply with Items 3 and 4.

1. During the 40kW exposure, flames shall not spread to the ceiling.
2. During the 160 kW exposure, the interior finish shall comply with the following:
2.1. Flame shall not spread to the outer extremity of the sample on any wall or ceiling.
2.2. Flashover, as defined in NFPA 286, shall not occur.
3. The peak rate of heat release throughout the NFPA 286 test shall not exceed 800 kW.
4. The total smoke released throughout the NFPA 286 test shall not exceed 1,000 m^2.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Standard NFPA 286 is currently referenced in the I-codes.

Public Hearing:				
Committee:	AS	AM	D	
Assembly:	ASF	AMF	DF	

ICCFILENAME: HIRSCHLER-FS5-1407.10.3.doc

FS163–09/10

1407.11,1407.11.3 (New) through 1407.11.4.4 (New)

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing Alcan Composites USA, Inc.

1. Revise as follows:

1407.11 Alternate conditions. MCM and MCM systems shall not be required to comply with Sections 1407.10.1 through 1407.10.4 provided such systems comply with Section 1407.11.1, ~~or~~ 1407.11.2, 1407.11.3 or 1407.11.4.

2. Add new text as follows:

1407.11.3 Installations up to 75 feet in height (Option 1). MCM shall not be installed more than 75 feet (22 860 mm) in height above grade plane where installed in accordance with Sections 1407.11.3.1 through 1407.11.3.5.

Exception: Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall be exempt from the height limitation.

1407.11.3.1 Prohibited occupancies. MCM shall not be permitted on buildings classified as Group A-1, A-2, H, I-2 or I-3 occupancies.

1407.11.3.2 Non-fire-resistance-rated exterior walls. MCM shall not be permitted on exterior walls required to have a fire-resistance-rating by other provisions of this code.

1407.11.3.3 Specifications. MCM shall be required to comply with all of the following:

1. MCM shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D 1929.

2. MCM shall have a smoke-developed index of not more than 450 when tested in the maximum thickness intended for use in accordance with ASMT E 84 or UL 723 or a maximum average smoke density rating not greater than 75 when tested in the maximum thickness intended for use in accordance with ASTM D 2843.
3. MCM shall conform to one of the following combustibility classifications when tested in accordance with ASTM D 635:

   Class CC1: Materials that have a burning extent of 1 inch (25 mm) or less when tested at a nominal thickness of 0.060 inch (1.5 mm) or in the thickness intended for use.

   Class CC2: Materials that have a burning rate of 2 ½ inches per minute (1.06 mm/s) or less when tested at a nominal thickness of 0.060 inch (1.5 mm) or in the thickness intended for use.

1407.11.3.4 Area limitation and separation. The maximum area of a single MCM panel and the minimum vertical and horizontal separation requirements for MCM panels shall be as provided for in Table 1407.11.3.4. The maximum percentage of exterior wall area of any story covered with MCM panels shall not exceed that indicated in Table 1407.11.3.4 or the percentage of unprotected openings permitted by Section 705.8, whichever is smaller.

Exception: In buildings provided with flame barriers complying with Section 705.8.5 and extending 30 inches (760 mm) beyond the exterior wall in the plane of the floor, a vertical separation shall not be required at the floor other than that provided by the vertical thickness of the flame barrier.

1407.11.3.5 Automatic sprinkler system increases. Where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the maximum percentage area of exterior wall of any story covered with MCM panels and the maximum square footage of a single area of MCM panels in Table 1407.11.3.4 shall be increased 100 percent. The area of MCM panels shall not exceed 50 percent of the exterior wall area of any story or the area permitted by Section 704.8 for unprotected openings, whichever is smaller.

TABLE 1407.11.3.4
AREA LIMITATION AND SEPARATION REQUIREMENTS FOR MCM PANELS

FIRE SEPARATION DISTANCE (feet)	COMBUSTIBILITY CLASS OF MCM	MAXIMUM PERCENTAGE AREA OF EXTERIOR WALL COVERED WITH MCM PANELS	MAXIMUM SINGLE AREA OF MCM PANELS (square feet)	MINIMUM SEPARATION OF MCM PANELS (feet)	
				Vertical	Horizontal
Less than 6	---	Not Permitted	Not Permitted	---	---
6 or more but less than 11	CC1	10	50	8	4
	CC2	Not Permitted	Not Permitted	---	---
11 or more but less than or equal to 30	CC1	25	90	6	4
	CC2	15	70	8	4
More than 30	CC1	50	Not Permitted	3[a]	0
	CC2	50	100	6[a]	3

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2.
a. For reductions in the minimum vertical separation, see Section 1407.11.3.4.

1407.11.4 Installations up to 75 feet in height (Option 2). MCM shall not be installed more than 75 feet (22 860 mm) in height above grade plane where installed in accordance with Sections 1407.11.4.1 through 1407.11.4.4.

Exception: Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall be exempt from the height limitation.

1407.11.4.1 Minimum fire separation distance. MCM shall not be installed on any wall with a fire separation distance less than 30 feet (9 144 mm).

Exception: Where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the fire separation distance shall be permitted to be reduced to not less than 20 feet (6 096 mm).

1407.11.4.2 Specifications. MCM shall be required to comply with all of the following:

1. MCM shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D 1929.
2. MCM shall have a smoke-developed index of not more than 450 when tested in the maximum thicknesses intended for use in accordance with ASMT E 84 or UL 723 or a maximum average smoke density rating not greater than 75 when tested in the maximum thicknesses intended for use in accordance with ASTM D 2843.
3. MCM shall conform to one of the following combustibility classifications when tested in accordance with ASTM D 635:

   Class CC1: Materials that have a burning extent of 1 inch (25 mm) or less when tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use.

   Class CC2: Materials that have a burning rate of 2 ½ inches per minute (1.06 mm/s) or less when tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use.

1407.11.4.3 Area and size limitations. The aggregate area of MCM panels shall not exceed 25 percent of the area of any exterior wall face of the story on which it is installed. The area of a single MCM panel installed above the first story above grade plane shall not exceed 16 square feet (1.5 m^2) and the vertical dimension of a single MCM panel shall not exceed 4 feet (1219 mm).

Exception: Where the building is equipped throughout with an automatic sprinkler system is provided throughout in accordance with Section 903.3.1.1, the maximum aggregate area of MCM panels shall be increased to 50 percent of the exterior wall face of the story on which it is installed and there shall not be a limit on the maximum dimension or area of a single MCM panel.

1407.11.4.4 Vertical separations. Flame barriers complying with Section 705.8 and extending 30 inches (762 mm) beyond the exterior wall or a vertical separation of not less than 4 feet (1219 mm) in height shall be provided to separate MCM panels located on the exterior walls at one story intervals.

Exception: Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

Reason: This code change proposal is a follow up to Code Change FS184-06/07 which we had also submitted on behalf of Alcan Composites USA, Inc. for a previous code development cycle. However, that code change simply provided a direct reference to the light-transmitting plastic Sections (Sections 2607 and 2608) in Chapter 26 with a statement that the MCM panels should be substituted for the light-transmitting plastic wall panels or glazing in those sections. The Comamittee at that time recommended disapproval of the code change because they basically thought it would create confusion by referring to Chapter 26 without more clear guidance on how the MCM panels would replace the light-transmitting plastic wall panels or glazing. But the Committee did indicate that the concept was fine although they thought it would be preferable to bring the provisions from Chapter 26 into Chapter 14 instead of referring to Chapter 26. So that is what this code change proposal has done to respond to the Committee's concerns at that time.

This code change proposal provides for additional alternate conditions under which MCM and MCM systems can be installed on buildings greater than 50 feet in height. Two conditions are allowed which are based on the allowable use of light-transmitting plastics in the exterior walls of buildings in accordance with Section 2607 Light-transmitting Plastic Wall Panels and Section 2608 Light-transmitting Plastic Glazing. These two sections have been in the International Building Code (IBC) since its inception and were basically contained in all three of the legacy model building codes for many years prior to the development of the IBC. Thus, they have a long history of successful fire performance under the previous legacy codes, as well as under the IBC.

It is our belief that if exposed light-transmitting plastics can be used on the exterior walls of buildings under the provisions indicated in those sections, it is reasonable to expect that MCMs which contain a solid plastic core covered by a metal skin, such as aluminum or steel, should perform as well or better. It should be noted that the MCM meet all the requirements necessary to be an approved plastic which is also the requirement for light-transmitting plastics. And the MCM must meet an even more stringent burning limitation than light-transmitting plastics since MCMs are required to be tested in accordance with ASTM E84 or UL 723 to demonstrate a flame spread index not greater than 75 and a smoke-developed index not greater than 450.

Furthermore, it should be noted that the legacy evaluation services evaluated several manufacturers' MCMs based on meeting the criteria for approved light-transmitting plastics and their applications for both wall panels and glazing under the conditions previously allowed for those plastics by the legacy model codes. Those evaluation reports were based on the same concept that the MCMs would perform under fire conditions as well or better than the light-transmitting plastics allowed to be used in the exterior applications indicated above.

Alcan Composites USA, Inc. has a history of over 25 years of experience manufacturing and installing MCMs to meet those code requirements for light-transmitting plastics. To our knowledge, there has not been a fire involving the installation of their products that has resulted in unacceptable performance when installed in accordance with the code. Therefore, we respectfully request the Committee approve this code change proposal to allow for additional applications of MCMs on buildings greater than 50 feet in height.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Thornberry-FS6-1407.11

FS164–09/10
1409 (New)

Proponent: Rick Thornberry, PE, Jesse J. Beitel, The Code Consortium, Inc., Hughes Associates, Inc., representing Trespa North America, Ltd.

1. Add new text as follows:

SECTION 1409
HIGH-PRESSURE DECORATIVE EXTERIOR-GRADE COMPACT LAMINATES (HPL)

1409.1 General. The provisions of this section shall govern the materials, construction and quality of High-Pressure Decorative Exterior-Grade Compact Laminates (HPL) for use as exterior wall coverings in addition to other applicable requirements of Chapters 14 and 16.

1409.2 Exterior wall finish. HPL used as exterior wall covering or as elements of balconies and similar projections and bay and oriel windows to provide cladding or weather resistance shall comply with Sections 1409.4 and 1409.14.

1409.3 Architectural trim and embellishments. HPL used as architectural trim or embellishments shall comply with Sections 1409.7 through 1409.14.

1409.4 Structural design. HPL systems shall be designed and constructed to resist wind loads as required by Chapter 16 for components and cladding.

1409.5 Approval. Results of approved tests or an engineering analysis shall be submitted to the building official to verify compliance with the requirements of Chapter 16 for wind loads.

1409.6 Weather resistance. HPL systems shall comply with Section 1403 and shall be designed and constructed to resist wind and rain in accordance with this section and the manufacturer's installation instructions.

1409.7 Durability. HPL systems shall be constructed of approved materials that maintain the performance characteristics required in Section 1409 for the duration of use.

1409.8 Fire-resistance rating. Where HPL systems are used on exterior walls required to have a fire-resistance rating in accordance with Section 705, evidence shall be submitted to the building official that the required fire-resistance rating is maintained.

> **Exception:** HPL systems not containing foam plastic insulation, which are installed on the outer surface of a fire-resistance-rated exterior wall in a manner such that the attachments do not penetrate through the entire exterior wall assembly, shall not be required to comply with this section.

1409.9 Surface-burning characteristics. Unless otherwise specified, HPL shall have a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in the minimum and maximum thicknesses intended for use in accordance with ASTM E 84 or UL 723.

1409.10 Type I, II, III, and IV construction. Where installed on buildings of Type I, II, III and IV construction, HPL systems shall comply with Sections 1409.10.1 through 1409.10.4, or Section 1409.11.

1409.10.1 Surface-burning characteristics. HPL shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450 when tested in the minimum and maximum thicknesses intended for use in accordance with ASTM E 84 or UL 723.

1409.10.2 Thermal barriers. HPL shall be separated from the interior of a building by an approved thermal barrier consisting of ½-inch (12.7 mm) gypsum wallboard or equivalent thermal barrier material that will limit the average temperature rise of the unexposed surface to not more than 250°F (121°C) after 15 minutes of fire exposure in accordance with the standard time-temperature curve of ASTM E 119 or UL 263. The thermal barrier shall be installed in such a manner that it will remain in place for not less than 15 minutes based on a test conducted in accordance with UL 1715.

1409.10.3 Thermal barrier not required. The thermal barrier specified for HPL in Section 1409.10.2 is not required where:

1. The HPL system is specifically approved based on tests conducted in accordance with UL 1040 or UL 1715. Such testing shall be performed with the HPL in the minimum and maximum thicknesses intended for use. The HPL system shall include seams, joints and other typical details used in the installation and shall be tested in the manner intended for use.
2. The HPL is used as elements of balconies and similar projections, architectural trim or embellishments.

1409.10.4 Full-scale tests. The HPL system shall be tested in accordance with, and comply with, the acceptance criteria of NFPA 285. Such testing shall be performed on the HPL system with the HPL in the minimum and maximum thicknesses intended for use.

1409.11 Alternate conditions. HPL and HPL systems shall not be required to comply with Sections 1409.10.1 through 1409.10.4 provided such systems comply with Section 1409.11.1 or 1409.11.2.

1409.11.1 Installations up to 40 feet in height. HPL shall not be installed more than 40 feet (12 190 mm) in height above grade plane where installed in accordance with Sections 1409.11.1.1 and 1409.11.1.2.

1409.11.1.1 Fire separation distance of 5 feet or less. Where the fire separation distance is 5 feet (1524 mm) or less, the area of HPL shall not exceed 10 percent of the exterior wall surface.

1409.11.1.2 Fire separation distance greater than 5 feet. Where the fire separation distance is greater than 5 feet (1524 mm), there shall be no limit on the area of exterior wall surface coverage using HPL.

1409.11.2 Installations up to 50 feet in height. HPL shall not be installed more than 50 feet (15 240 mm) in height above grade plane where installed in accordance with Sections 1409.11.2.1 and 1409.11.2.2.

1409.11.2.1 Self-ignition temperature. HPL shall have a self-ignition temperature of 650°F (343°C) or greater when tested in accordance with ASTM D 1929.

1409.11.2.2 Limitations. Sections of HPL shall not exceed 300 square feet (27.9 m^2) in area and shall be separated by a minimum 4 feet (1219 mm) vertically.

1409.12 Type V construction. HPL shall be permitted to be installed on buildings of Type V construction.

1409.13 Foam plastic insulation. HPL systems containing foam plastic insulation shall also comply with the requirements of Section 2603.

1409.14 Labeling. HPL shall be labeled in accordance with Section 1703.5.

2. Add new definitions as follows:

1402.1 General.

HIGH-PRESSURE DECORATIVE EXTERIOR-GRADE COMPACT LAMINATE (HPL). Panels consisting of layers of cellulose fibrous material impregnated with thermosetting resins and bonded together by a high pressure process to form a homogeneous non-porous core suitable for exterior use.

HIGH-PRESSURE DECORATIVE EXTERIOR-GRADE COMPACT LAMINATE (HPL) SYSTEM. An exterior wall covering fabricated using HPL in a specific assembly including joints, seams, attachments, substrate, framing and other details as appropriate to a particular design.

Reason: This code change proposes to add an entirely new Section 1409 titled “High-Pressure Decorative Exterior-Grade Laminates (HPL)” which specifies requirements for the installation of high-pressure decorative exterior-grade compact laminates (HPL) when used as exterior wall coverings. This proposed new section parallels Section 1407 on Metal Composite Materials (MCM) which pioneered the code provisions for combustible composite materials used as exterior wall coverings on buildings of all types of construction including Types I, II, III, and IV construction where the walls are required to be noncombustible. MCM complying with Section 1409 have an excellent fire performance record in the field. We believe the basic requirements contained in that section would also be appropriate for regulating HPL to provide the same excellent level of fire safety performance. Trespa North America, Ltd. has conducted tests of its high-pressure decorative exterior-grade compact laminates in accordance with of the provisions of this proposed new section. These tests have demonstrated that Trespa’s exterior wall coverings meet, and even exceed, those requirements including the full-scale fire testing conducted in accordance with NFPA 285.

This code change also contains new definitions for “High-Pressure Decorative Exterior-Grade Compact Laminate (HPL)” and “High-Pressure Decorative Exterior-Grade Compact Laminate (HPL) System” consistent with the definitions for “MCM” and “MCM System.” They are based on the International Standard EN 438.

These systems have been used successfully throughout Europe for the last 35 years with even less fire safety regulations than those proposed in this code change. They are now finding their way into the United States and have gained wide acceptance from the architectural community as being desirable exterior wall claddings for buildings under many different applications including high-rise buildings. These high-pressure decorative exterior-grade compact laminates have been developed in accordance with the International Standard EN 438-2005 High-Pressure Decorative Laminates Part 6 Classification and Specification for Exterior-Grade Compact Laminates of Thickness 2 mm and Greater which specifies the classification, quality, performance and testing of high-pressure decorative exterior-grade compact laminates and Part 7 Compact Laminate and HPL Composite Panels for Internal and External Wall and Ceiling Finishes.

It should also be noted that Trespa North America, Ltd. is not the only manufacturer of these laminates. In fact, Trespa is a member of the International Committee of the Decorative Laminate Industry (ICDLI) which has been in existence for more than 40 years. Currently, there are 14 international members of the ICDLI and of those, 8 manufacture high-pressure decorative exterior-grade compact laminates. So this is certainly not a proprietary code change proposal. More information on the ICDLI can be found by going to their website at www.icdli.com. Of most interest would be the ICDLI Product Data Sheet for High-Pressure Laminates (HPL) dated August, 2008.

Trespa North America, Ltd. testing experience to date, as well as field experience with HPL installations, has shown that its high-pressure decorative exterior-grade compact laminates and systems perform as well as, and even better than, some of the MCM panels and systems currently allowed and regulated by Section 1407. Therefore, we believe it is appropriate to include this new Section 1409 on high-pressure decorative exterior-grade compact laminates (HPL) in the International Building Code at this time.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Thornberry-Beitel-FS10-1409

FS165–09/10
2603.3

Proponent: Mike Ennis, representing Single Ply Roofing Industry (SPRI, Inc.)

Revise as follows:

2603.3 Surface-burning characteristics. Unless otherwise indicated in this section, foam plastic insulation and foam plastic cores of manufactured assemblies shall have a flame-spread index of not more than 75 and a smoke-developed index of not more than 450 where tested in the maximum thickness intended for use in accordance with ASTM E 84 or UL 723. Loose fill-type foam plastic insulation shall be tested as board stock for the flame-spread and smoke-developed indexes.

Exceptions:

1. Smoke-developed index for interior *trim* as provided for in Section 2604.2.
2. In cold storage buildings, ice plants, food plants, food processing rooms and similar areas, foam plastic insulation where tested in a thickness of 4 inches (102 mm) shall be permitted in a thickness up to 10 inches (254 mm) where the building is equipped throughout with an automatic fire sprinkler system in accordance with Section 903.3.1.1. The approved *automatic sprinkler system* shall be provided in both the room and that part of the building in which the room is located.
3. Foam plastic insulation that is part of a Class A, B or C roof covering assembly provided the assembly with the foam plastic insulation satisfactorily passes FM 4450 or UL 1256. The flame spread index and the smoke-developed index shall not be limited for roof applications.
4. Foam plastic insulation greater than 4 inches (102 mm) in thickness shall have a maximum flame-spread index of 75 and a smoke-developed index of 450 where tested at a minimum thickness of 4 inches (102 mm), provided the end use is approved in accordance with Section 2603.9 using the thickness and density intended for use.
5. Flame-spread and smoke-developed indexes for foam plastic interior signs in *covered mall buildings* provided the signs comply with Section 402.15.

Reason: The exceptions for this section appear to relate to both flame spread and smoke-developed indexes. Testing used to provide Fire Classifications A, B and C evaluate the potential for flame spread when the roof assembly is exposed to a topside fire source. UL 1256 and FM 4450 evaluate fire spread potential when the roof assembly is exposed to a fire source from below. By conducting these tests the flame spread of the roofing assembly containing the foam plastic insulation has already been evaluated. There is no need to have additional flame spread requirements for the foam plastic insulation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENNIS-FS1-2603_3

FS166–09/10
2603.4.1.5, 2603.6

Proponent: Tony Crimi, AC Consulting Solutions Inc., representing North American Insulation Manufacturers Association

Revise as follows:

2603.4.1.5 Roofing. Foam plastic insulation under a roof assembly or roof covering having a smoke-developed index of not more than 450, and ~~that is~~ installed in accordance with the code and the manufacturer's instructions shall be separated from the interior of the building by wood structural panel sheathing not less than 0.47 inch (11.9 mm) in thickness bonded with exterior glue, with edges supported by blocking, tongue-and-groove joints or other approved type of edge support, or an equivalent material. A thermal barrier is not required for foam plastic insulation that is a part of a Class A,B or C roof-covering assembly, provided the assembly with the foam plastic insulation satisfactorily passes FM 4450 or UL 1256.

2603.6 Roofing. Foam plastic insulation meeting the requirements of Sections 2603.2, 2603.3 and 2603.4 and having a smoke-developed index of not more than 450, shall be permitted as part of a roof-covering assembly, provided the assembly with the foam plastic insulation is a Class A, B or C roofing assembly where tested in accordance with ASTM E 108 or UL 790.

Reason: Fires in roofing materials can occur during installation or maintenance of roofing, during the normal course of operations, or during maintenance and installation of building equipment. While ASTM E108 and UL 790 are a means of evaluating fire spread, they do not measure smoke production.

Although roofing materials are installed on the exterior of a building, the smoke from burning roof insulations can be a hazard to both firefighters and the environment. Combustible smoke and off-gassing from combustible insulating materials pose a serious risk to building occupants and firefighters. Excessive quantities of smoke emanating from burning roofing materials also prevent effective firefighting operations, potentially delay response times or the effectiveness of fire fighting operations. There are also documented cases of fires starting in roofing materials causing sprinklers inside the building to activate and cause additional property damage.

Even when a fire is contained within the building, sufficient heat can be generated through a metal roof deck to cause smoldering combustion and smoke release. While a smoke developed index of 450 is consistent with some interior applications, it still represents a limit which most foam plastic insulations can conform with.

Several foam plastic insulation products have direct-to-steel-deck approvals from both FM and UL. FM approval for Class 1 roof systems based on passing FM 4450 and UL 1256. Both of these tests are specifically referenced in the IBC. The International Building Code (IBC) already waives the requirements for a thermal barrier for foam plastic roof insulation used in roof deck construction that complies with FM 4450 or UL 1256. Some minimum smoke developed rating should be maintained.

Cost Impact: This proposal should not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRIMI FS9 AND FS10

FS167–09/10
2603.4.1.5, 2603.4.1.5.1, 2603.4.1.5.2

Proponent: Mike Ennis, Single Ply Roofing Industry (SPRI), representing the Single Ply Roofing Industry (SPRI)

Revise as follows:

2603.4.1.5 Roofing. Foam plastic insulation under a roof assembly or roof covering shall comply with Sections 2603.4.1.5.1 and 2603.4.1.5.2 as applicable.

2603.4.1.5.1 Wood roof decks. A thermal barrier is not required for foam plastic insulation that is part of a Class A, B or C roof-covering assembly, provided the assembly ~~under a roof assembly or roof covering that~~ is installed in accordance with the code and the manufacturer's instructions and is ~~shall be~~ separated from the interior of the building by wood structural panel sheathing not less than 0.47 inch (11.9 mm) in thickness bonded with exterior glue, with edges supported by blocking, tongue-and-groove joints or other approved type of edge support, or an equivalent material.

2603.4.1.5.2 Any roof deck. A thermal barrier is not required for foam plastic insulation that is part of a Class A, B or C roof-covering assembly, provided the assembly with the foam plastic insulation satisfactorily passes FM 4450 or UL 1256.

Reason: The proposed wording is offered to clarify when the two exceptions for a thermal barrier in Section 2603.4.1.5 are applicable. The first sentence in the current version 2603.4.1.5 is only applicable when a wood roof deck is used. The second sentence is applicable for any type of roof deck. The proposed wording provides clarification without changing the intent.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENNIS-FS2-2603.4.1.5

FS168–09/10
2603.4.1.6; IRC R316.5.3, R316.5.4

Proponent: Jesse J. Beitel, Hughes Associates, Inc. representing The Extruded Polystyrene Foam Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTTIVE HEARING ORDERS FOR THESE COMMITTEES.
PART I – IBC FIRE SAFETY

Revise as follows:

2603.4.1.6 Attics and crawl spaces. Within an attic or crawl space where entry is made only for service of utilities, and where there is no direct air circulation between the attic or crawl space and the interior of the building, foam plastic insulation shall be protected against ignition by 1 $^1/_2$-inch-thick (38 mm) mineral fiber insulation; $^1/_4$-inch-thick (6.4 mm) wood structural panel, particleboard or hardboard; $^3/_8$-inch (9.5 mm) gypsum wallboard, corrosion-resistant steel having a base metal thickness of 0.016 inch (0.4 mm) or other approved material installed in such a manner that the foam plastic insulation is not exposed. The protective covering shall be consistent with the requirements for the type of construction.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R316.5.3 Attics. The thermal barrier specified in Section R316.4 is not required where all of the following apply:

1. *Attic* access is required by Section R807.1.
2. The space is entered only for purposes of repairs or maintenance.
3. There is no direct air circulation between the attic space and the interior of the building.
~~3~~ 4. The foam plastic insulation is protected against ignition using one of the following ignition barrier materials:
   - ~~3.1~~ 4.1. $1^1/_2$-inch-thick (38 mm) mineral fiber insulation;
   - ~~3.2~~ 4.2. $^1/_4$-inch-thick (6.4 mm) wood structural panels;
   - ~~3.3~~ 4.3. $^3/_8$-inch (9.5 mm) particleboard;
   - ~~3.4~~ 4.4. $^1/_4$-inch (6.4 mm) hardboard;
   - ~~3.5~~ 4.5. $^3/_8$-inch (9.5 mm) gypsum board; or
   - ~~3.6~~ 4.6. Corrosion-resistant steel having a base metal thickness of 0.016 inch (0.406 mm).

The above ignition barrier is not required where the foam plastic insulation has been tested in accordance with Section R316.6.

R316.5.4 Crawl spaces. The thermal barrier specified in Section R316.4 is not required where all of the following apply:

1. Crawlspace access is required by Section R408.4
2. Entry is made only for purposes of repairs or maintenance.
3. There is no direct air circulation between the crawl space and the interior of the building.
~~3~~ 4. The foam plastic insulation is protected against ignition using one of the following ignition barrier materials:
   - ~~3.1~~ 4.1. $1^1/_2$-inch-thick (38 mm) mineral fiber insulation;
   - ~~3.2~~ 4.2. $^1/_4$-inch-thick (6.4 mm) wood structural panels;
   - ~~3.3~~ 4.3. $^3/_8$-inch (9.5 mm) particleboard;
   - ~~3.4~~ 4.4. $^1/_4$-inch (6.4 mm) hardboard;

~~3.5~~ 4.5. $^3/_8$-inch (9.5 mm) gypsum board; or
~~3.6~~ 4.6. Corrosion-resistant steel having a base metal thickness of 0.016 inch (0.406 mm).

The above ignition barrier is not required where the foam plastic insulation has been tested in accordance with Section R316.6.

Reason: This Section of the Code was developed in the mid 1970's, to recognize that there was limited potential fire exposure to foam plastics in these areas of a building. Thus, the foam is allowed to be protected by an ignition barrier instead of the usual thermal barrier. Also, at that time, attics and crawl spaces were vented to the outside and since there was no direct communication between attics or crawl spaces and the interior of the buildings, the movement of smoke was not a potential issue.

In today's buildings, there may be direct communication between crawl spaces and possibly attics and the interior of the building. Thus, if the foam plastic becomes involved in a fire, smoke can migrate into the building sooner than if the foam plastic was covered by a thermal barrier.

This Code proposal addresses this issue such that if the foam plastic is covered by an ignition barrier, there can be no direct air circulation to the interior of the building. As with all foam plastics, if the foam is protected by a thermal barrier, then it can be used anywhere in the building per Section 2603.4. This proposal provides an increase in life safety for the occupants of the building.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEITEL-FS9-2603.4.1.6 PART I AND BEITEL-RB3-R316.5.3 PART II

FS169–09/10
2603.4.1.6; IRC R316.5.3, R316.5.4

Proponent: Ted Grant, Atlas Roofing Corporation, representing Atlas Roofing Corporation

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC FIRE SAFETY. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITEES.

PART I – IBC FIRE SAFETY

Revise as follows:

2603.4.1.6 Attics and crawl spaces. Within an *attic* or crawl space where entry is made only for service of utilities, foam plastic insulation shall be protected against ignition by 1½-inch-thick (38 mm) mineral fiber insulation; ¼-inch-thick (6.4 mm) wood structural panel, particleboard or hardboard; $^3/_8$-inch (9.5 mm) gypsum wallboard, corrosion-resistant steel having a base metal thickness of 0.016 inch (0.4 mm)<u>; inorganic coated glass mat having a thickness not less than 0.016 inch (0.406 mm) and ash test results greater than 85 wt/wt%,</u> or other approved material installed in such a manner that the foam plastic insulation is not exposed. The protective covering shall be consistent with the requirements for the type of construction.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R316.5.3 Attics. The thermal barrier specified in Section R316.4 is not required where all of the following apply:
1. *Attic* access is required by Section R807.1.
2. The space is entered only for purposes of repairs or maintenance.
3. The foam plastic insulation is protected against ignition using one of the following ignition barrier materials:
   3.1. 1½-inch-thick (38 mm) mineral fiber insulation;
   3.2. ¼-inch-thick (6.4 mm) wood structural panels;
   3.3. $^3/_8$-inch (9.5 mm) particleboard;
   3.4. ¼-inch (6.4 mm) hardboard;

3.5. $^3/_8$-inch (9.5 mm) gypsum board; ~~or~~
3.6. Corrosion-resistant steel having a base metal thickness of 0.016 inch (0.406 mm); or
3.7. Inorganic coated glass mat having a thickness not less than 0.016 inch (0.406 mm) and ash test result greater than 85 wt/wt%.

The above ignition barrier is not required where the foam plastic insulation has been tested in accordance with Section R316.6.

R316.5.4 Crawl spaces. The thermal barrier specified in Section R316.4 is not required where all of the following apply:

1. Crawlspace access is required by Section R408.4
2. Entry is made only for purposes of repairs or maintenance.
3. The foam plastic insulation is protected against ignition using one of the following ignition barrier materials:
   3.1. 1½-inch-thick (38 mm) mineral fiber insulation;
   3.2. ¼-inch-thick (6.4 mm) wood structural panels;
   3.3. $^3/_8$-inch (9.5 mm) particleboard;
   3.4. ¼-inch (6.4 mm) hardboard;
   3.5. $^3/_8$-inch (9.5 mm) gypsum board; ~~or~~
   3.6. Corrosion-resistant steel having a base metal thickness of 0.016 inch (0.406 mm); or
   3.7. Inorganic coated glass mat having a thickness not less than 0.016 inch (0.406 mm) and ash test results greater than 85 wt/wt%.

The above ignition barrier is not required where the foam plastic insulation has been tested in accordance with Section R316.6.

Reason: Inorganic coated glass mats are referred to as slip sheets in the commercial roofing industry, and are used as ignition barriers to prevent the roof insulation from catching fire in the event of hot embers or other fire exposure. The inorganic coated glass mats are composed of drywall-like compounds over glass mat, and are approved by Underwriters Laboratories and Factory Mutual in many roofing constructions as replacements for ½" gypsum cover boards. They are available in rolls and can thus be easily installed inside crawl spaces or attics with complete coverage over the insulation as well as the roof or floor joists. Allowing this ignition barrier to be used in attics and crawl spaces will provide another option to end users where sheet products may not be feasible and 1-1/2" mineral fiber insulation may not be desirable.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRANT-FS1-2306.4.1.6

FS170–09/10
2603.4

Proponent: Jeff Inks, representing the Window and Door Manufacturers Association (WDMA)

Revise as follows:

2603.4.1.7 Doors not required to have a fire protection rating. Where pivoted or side-hinged doors are permitted without a fire protection rating, foam plastic insulation, having a flame spread index of 75 or less and a smoke-developed index of not more than 450, shall be permitted as a core material ~~where the door facing is of metal having a minimum thickness of 0.032-inch (0.8 mm) aluminum or steel having a base metal thickness of not less than 0.016 inch (0.4 mm) at any point.~~ provided the door is faced with aluminum, steel, fiberglass, wood or other approved material.

2603.4.1.8 Exterior doors in buildings of Group R-2 or R-3. In occupancies classified as Group R-2 or R-3, foam-filled exterior entrance doors to individual *dwelling units* that do not require a fire-resistance rating shall be faced with aluminum, steel, fiberglass, wood or other approved materials.

Reason: The language above is unchanged since at least the 2000 IBC. However, insulated side-hinged doors with facing materials other than aluminum or steel have become widely accepted in the market and without demonstrated issues. In addition, the specified minimum thickness text proposed to be deleted is not needed because durability requirements of doors results in facing material significantly thicker than the specified thickness.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WOESTMAN-FS1-2603.4.1.7

FS171–09/10
2603.4.1.14; IRC R316.5.13

Proponent: Jesse J. Beitel, Hughes Associates, Inc. representing The Extruded Polystyrene Foam Association

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC FIRE SAFETY

Add new text as follows:

2603.4.1.14 Floors. The thermal barrier specified in Section 2603.4 is not required to be installed on the walking surface of a structural floor system that contains foam plastic insulation when the foam plastic is covered by a minimum nominal ½-inch (12.7 mm) thick wood structural panel or equivalent. The thermal barrier specified in Section 2603.4 is required on the underside of the structural floor system that contains foam plastic insulation when the underside of the structural floor system is exposed to the interior of the building.

Exception: Foam plastic used as part of an interior floor finish.

(Renumber subsequent section)

PART II – IRC BUILDING/ENERGY

Add new text as follows:

R316.5.13 Floors. The thermal barrier specified in Section R316.4 is not required to be installed on the walking surface of a structural floor system that contains foam plastic insulation when the foam plastic is covered by a minimum nominal ½-inch (12.7 mm) thick wood structural panel or equivalent. The thermal barrier specified in Section R316.4 is required on the underside of the structural floor system that contains foam plastic insulation when the underside of the structural floor system is exposed to the interior of the building.

Reason: In today's construction new types of products are being used which incorporate foam plastic insulation for energy reasons. One example is SIPS panels where the foam plastic is laminated between two structural wood facings. This type of panel can be used as a wall, floor or roof.

Foam plastic is required to be protected by a thermal barrier which typically is ½ inch gypsum wallboard. In the case of flooring, gypsum wallboard or other common thermal barrier materials cannot be used on the walking surfaces due to their friability to load, etc.

This Code proposal addresses this problem. The proposed requirement for the ½ inch thick plywood or equivalent will provide sufficient protection to the foam plastic insulation. While ½-inch plywood is not by itself a thermal barrier, in the case of a floor, it will provide sufficient protection since in the event of an interior fire, the floor is typically the last building element to be significantly exposed by the fire.

If the floor is used in multistory construction, then the underside of the floor system (ceiling of the room below) must be covered by the required thermal barrier.

An exception is added to the IBC to address items such as carpet padding, etc. that have not and do not need to be covered by a thermal barrier.

Cost Impact: This code change will not increase the cost of construction.

PART I – IBC FIRE SAFETY:

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/COMMITTEE:

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEITEL-FS8-2603.4.13; RB4-R316.5.13 PART II

FS172–09/10
2603.5.3, 2603.5.5, 2603.5.5.1 (New)

Proponent: Gene Boecker, Code Consultants, Inc, representing Code Consultants, Inc.

1. Delete without substitution:

~~**2603.5.3 Potential heat.** The potential heat of foam plastic insulation in any portion of the wall or panel shall not exceed the potential heat expressed in Btu per square feet (mJ/m2) of the foam plastic insulation contained in the wall assembly tested in accordance with Section 2603.5.5. The potential heat of the foam plastic insulation shall be determined by tests conducted in accordance with NFPA 259 and the results shall be expressed in Btu per square feet (mJ/m2).~~

~~**Exception:** One-story buildings complying with Section 2603.4.1.4.~~

(Renumber subsequent sections)

2. Revise as follows:

2603.5.5 Test standard<u>s</u>. The wall assembly shall be tested in accordance with and comply with the acceptance criteria of NFPA 285. <u>The potential heat of the foam plastic insulation shall be determined by tests conducted in accordance with NFPA 259 and the results shall be expressed in Btu per square feet (mJ/m2).</u>

Exception: One-story buildings complying with Section 2603.4.1.4.

3. Add new text as follow:

<u>**2603.5.5.1 Alternate Material.** An alternate foam plastic insulation is permitted to be used provided that the potential heat of the alternate material does not exceed the potential heat of the foam plastic insulation contained in the wall assembly tested in accordance with Section 2603.5.5.</u>

Reason: The proposed revisions are not technical and are intended for clarity only. All foam plastic insulation is currently required to be tested in accordance with NFPA 259. However, the existing text is confusing to the user as to how the results from the NFPA 259 test are related to the results of NFPA 285 test required by Section 2603.5.5. The new Section 2603.5.5.3.1 clarifies that a substitute material can be used provided that the potential heat of the substitute foam plastic is less than the potential heat of the foam plastic that was used in the NFPA 285 test.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Standard NFPA 259 is currently referenced in the I-codes.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOECKER-FS2-2603.5.3

FS173–09/10
2603.5.6

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing Dow Chemical Company

Revise as follows:

2603.5.6 Label required. The edge or face of each piece<u>, package or container</u> of foam plastic insulation shall bear the label of an approved agency. The label shall contain the manufacturer's or distributor's identification, model number, serial number or definitive information describing the product or materials' performance characteristics and approved agency's identification.

Reason: When this Section was written, the typical foam plastic insulation materials used for exterior walls were delivered to the jobsite in sheets or panels. Thus, they were marked as required by the existing Code Section. Currently, different types of foam plastic insulations are being used in these applications. These foam plastics such as spray polyurethane foam are delivered to the job site in drums which contain the components of the foam plastic insulation and typically, materials from two drums are mixed as they are sprayed and the resultant foam plastic insulation is applied to the wall surfaces. The component (drums or packaging) bears a label with the information required in the Section.

This Code proposal provides recognition for these types of foam plastics and their packaging method (drums versus boards) and requires labeling per this section of the Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEITEL-FS4-2603.5.6.doc

FS174–09/10
2603.7, 2603.8 (New)

Proponent: Marcelo M. Hirschler (GBH International) (representing American Fire Safety Council)

Revise as follows:

2603.7 Interior Finish in plenums. ~~Foam plastic insulation shall not be used as interior wall or ceiling finish in plenums except as permitted in Section 2604 or when protected by a thermal barrier in accordance with Section 2603.4.~~ Foam plastic insulation used as interior wall or ceiling finish in plenums shall comply with one or more of the following:

1. The foam plastic insulation shall be separated from the plenum by a thermal barrier complying with Section 2603.4 and shall exhibit a flame spread index of 75 or less and a smoke developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.
2. The foam plastic insulation shall exhibit a flame spread index of 25 or less and a smoke developed index of 50 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use and shall meet the acceptance criteria of Section 803.1.2 when tested in accordance with NFPA 286.
3. The foam plastic insulation shall be covered by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm) and shall exhibit a flame spread index of 75 or less and a smoke developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.

2603.8 Interior trim in plenums. Foam plastic insulation used as interior trim in plenums shall comply with the requirements of Section 2603.7.

(Renumber subsequent sections)

Reason: This code proposal revises the requirements for use of foam plastic insulation as interior wall and ceiling finish or as interior trim in plenums. The IBC and IMC requirements for materials in plenums has always been that they be noncombustible or exhibit a flame spread index of 25 or less and a smoke developed index of 50 when tested to ASTM E 84. As presently written there is some confusion because the foam plastic insulation could be approved based on tests using any of the standards from 2603.9 (and only NFPA 286 has pass/fail criteria for smoke) and there is the additional potential for conflict between that section and the remainder of 2603. Moreover, as written interior trim could be used in plenums based on section 2604.2, which is unacceptable. This proposal requires that exposed foam plastic insulation (i.e. foam plastic left unprotected), whether used as interior finish or as interior trim, shall exhibit a flame spread index of 25 or less and a smoke developed index of 50 and meet the requirements of the full scale room-corner fire test (NFPA 286) with requirements for flame spread, heat release, no flashover and smoke release. Additionally, two alternatives are provided to protect foam plastics and thus allow them even when they have a higher flame spread index and smoke developed index, namely a thermal barrier and a corrosion-resistant steel barrier. This is also consistent with the requirements of NFPA 90A, which has the same requirements for foam plastic insulation used as interior finish in plenums.
A parallel proposal was submitted to the IBC, for consistency.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposal FS174 and FS175 address foam plastic interior finish requirements. The committee needs to make its intent clear with respect to these provisions. Standards ASTM E84, UL 723 and NFPA 286 are currently referenced in the I-codes.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-FS14-2603.7

FS175–09/10
2603.7

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing self

Delete and substitute as follows:

~~**2603.7 Plenums.** Foam plastic insulation shall not be used as interior wall or ceiling finish in plenums except as permitted in Section 2604 or when protected by a thermal barrier in accordance with Section 2603.4.~~
2603.7 Plenums. Foam plastic insulation used as wall or ceiling finish in plenums shall comply with one or more of the following:

1. The foam plastic insulation shall be separated from the plenum by a thermal barrier complying with Section 2603.4 and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.
2. The foam plastic insulation shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use and shall be tested in accordance with and meet the criteria of Section 803.1.2.
3. The foam plastic insulation shall be covered by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm) and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.

Reason: This code proposal revises the requirements for use of foam plastics in plenums. The intent of the IBC and the IMC has been to require that all materials used in plenums shall be noncombustible or exhibit a flame spread index of 25 or less and a smoke-developed index of 50. The same criteria should also be applied to foam plastics used as wall or ceiling finish in plenums. This proposal requires that if the foam plastic is left unprotected then it shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 and meet the requirements of a full-scale fire test (NFPA 286). Additionally, several alternatives are provided to protect foam plastics and thus allow them to have a greater flame spread index and smoke-developed index.

Cost Impact: The code change proposal will increase the cost of construction

Analysis: Code change proposal FS174 and FS175 address foam plastic interior finish requirements. The committee needs to make its intent clear with respect to these provisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEITEL-FS12-2603.7 NEW

FS176–09/10
2603.8; IRC R316.7, R318.4, R403.3.4, R404.1.2.3.6.1

Proponent: Todd Bergstrom, Ph.D., AFM Corporation, representing AFM Corporation

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE FIRE SAFETY COMMITTEE.

PART I – IBC FIRE SAFETY

Revise as follows:

2603.8 Protection against termites. In areas where the probability of termite infestation is very heavy or moderate to heavy in accordance with Figure 2603.8, extruded and expanded polystyrene, polyisocyanurate and other foam plastics shall not be installed on the exterior face or under interior or exterior foundation walls or slab foundations located below grade. The clearance between foam plastics installed above grade and exposed earth shall be at least 6 inches (152 mm).

Exceptions:

1. Buildings where the structural members of walls, floors, ceilings and roofs are entirely of noncombustible materials or preservative-treated wood.

2. An approved method of protecting the foam plastic and structure from subterranean termite damage is provided.
3. On the interior side of basement walls.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R316.7 Termite damage. The use of foam plastics in areas of "very heavy" or "moderate to heavy" termite infestation probability shall be in accordance with Section R318.4.

R318.4 Foam plastic protection. In areas where the probability of termite infestation is "very heavy" or "moderate to heavy" as indicated in Figure R301.2(6), extruded and expanded polystyrene, polyisocyanurate and other foam plastics shall not be installed on the exterior face or under interior or exterior foundation walls or slab foundations located below grade. The clearance between foam plastics installed above grade and exposed earth shall be at least 6 inches (152 mm).

Exceptions:

1. Buildings where the structural members of walls, floors, ceilings and roofs are entirely of noncombustible materials or pressure-preservative-treated wood.
2. When in addition to the requirements of Section R318.1, an approved method of protecting the foam plastic and structure from subterranean termite damage is used.
3. On the interior side of basement walls.

R403.3.4 Termite damage. The use of foam plastic in areas of "very heavy" or "moderate to heavy" termite infestation probability shall be in accordance with Section R318.4.

R404.1.2.3.6.1 Stay-in-place forms. Stay-in place concrete forms shall comply with this section.

1. Surface burning characteristics. The flame-spread index and smoke-developed index of forming material, other than foam plastic, left exposed on the interior shall comply with Section R302. The surface burning characteristics of foam plastic used in insulating concrete forms shall comply with Section R316.3.
2. Interior covering. Stay-in-place forms constructed of rigid foam plastic shall be protected on the interior of the building as required by Section R316. Where gypsum board is used to protect the foam plastic, it shall be installed with a mechanical fastening system. Use of adhesives in addition to mechanical fasteners is permitted.
3. Exterior wall covering. Stay-in-place forms constructed of rigid foam plastics shall be protected from sunlight and physical damage by the application of an approved exterior wall covering complying with this code. Exterior surfaces of other stay-in-place forming systems shall be protected in accordance with this code.
4. Termite hazards. In areas where hazard of termite damage is "very heavy" or "moderate to heavy" in accordance with Figure R301.2(6), foam plastic insulation shall be permitted below grade on foundation walls in accordance with one of the following conditions:
   4.1. Where in addition to the requirements in Section R318.1, an approved method of protecting the foam plastic and structure from subterranean termite damage is provided.
   4.2. The structural members of walls, floors, ceilings and roofs are entirely of noncombustible materials or pressure-preservative-treated wood.
   4.3. On the interior side of basement walls.

Reason:
Part I-Damage to foam plastic insulations installed below grade (and subsequently building structures) in termite regions of moderate to heavy probability (see Figure 2603.8) is an area of the IBS that provides the possibility for significant potential for damage. The use of alternative methods as provided by the Exception to 2603.8 are real solutions that help minimize the risk to structures and this should be extended to the moderate to heavy probability regions to protect the long term integrity of building structures.
Part II- Damage to foam plastic insulations installed below grade (and subsequently building structures) in termite regions of moderate to heavy probability [see Figure R301.2(6)] is an area of the IRC that leaves open the possibility for significant potential for damage to structures. The use of alternative methods as provided by the Exception to R318.4 are real solutions that help minimize the risk to structures and this should be extended to the moderate to heavy probability regions to protect the long term integrity of building structures

Cost Impact: The code change proposal will not increase the cost of construction.

Part I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

Part II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BERGSTROM-FS1-2603.8

FS177–09/10
2603.8

Proponent: Steve Heller, representing the Insulating Concrete Form Association

Revise as follows:

2603.8 Protection against Termites. In areas where the probability of termite infestation is very heavy in accordance with Figure 2603.8, extruded and expanded polystyrene, polyisocyanurate and other foam plastics shall not be installed on the exterior face or under interior or exterior foundation walls or slab foundations located below grade. The clearance between foam plastics installed above grade and exposed earth shall be at least 6 inches (152 mm).

Exceptions:

1. Buildings where the structural members of walls~~,~~ and floors~~, ceiling and roofs~~ are entirely of noncombustible materials or pressure-preservative-treated wood; or the exterior wall envelope is entirely monolithic concrete walls, including flat-wall and waffle grid ICFs, with continuous concrete from the footings to the roofline.
2. An approved method of protecting the foam plastic and structure from subterranean termite damage is provided.
3. On the interior side of basement walls.

Reason: This proposal acknowledges the protection of concrete construction from structural damage due to termites.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HELLER-FS1-2603.8

FS178–09/10
2603.9

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., representing North American Insulation Manufacturers Association

Revise as follows:

2603.9 Special approval. Foam plastic shall not be required to comply with the requirements of Sections 2603.4 through 2603.7 where specifically approved based on large-scale tests such as, but not limited to, NFPA 286 (with the acceptance criteria of Section 803.2), FM 4880, UL 1040 or UL 1715. Such testing shall be related to the actual end-use configuration and be performed on the finished manufactured foam plastic assembly in the maximum thickness intended for use. Foam plastics that are used as interior finish on the basis of special tests shall also conform to the flame spread and smoke developed requirements of Chapter 8. Assemblies tested shall include seams, joints and other typical details used in the installation of the assembly and shall be tested in the manner intended for use.

Reason: At a minimum, the provision for special approvals for foamed plastics, which waives other requirements of Chapters 8 and 26 for foamed plastics needs to provide a comparable level of performance and safety to the existing provisions.

Justification: In the 2007 Supplement, additional language was introduced to 2603.9 to retain the flame spread requirements for interior finish materials, despite the fact that additional fire testing was required in 2603.9. With the exception of the performance criterion in 803.1.2 related to NFPA 286, the smoke developed requirements on foamed plastics arising from Chapters 7 & 8 are being waived, despite the fact that testing in accordance with FM 4880, UL 1040 and UL 1715 does not contain any smoke development criterion.

By requiring testing to be related to the actual end-use configuration and be performed on the finished manufactured foam plastic assembly in the maximum thickness intended for use, the Code does not clearly include or exclude smoke development requirements. For all other thermal and sound insulating materials within the IBC, including non-combustible insulation materials, the minimum performance level for materials permitted to be used includes at least some requirements for both flame spread (fire growth) and smoke production. These requirements are primarily based on either ASTM E84 testing or alternative methods such as NFPA 286, CAN/ULC-S102.2, or even UL 1715 with the inclusion of the criterion from 803.1.2. However, in the case of foamed plastics, of the four alternative test methods permitted by 2603.9, only NFPA 286 contains any limits on smoke developed for any foamed plastics by virtue of the inclusion of a reference to section 803.1. The additional language proposed here covers this omission by using a widely accepted testing methodology of ASTM E84 and UL 723.

Further, by virtue of the language contained in article 2603.7 and Section 2604, foamed plastics are permitted to be installed in plenums without any limitations on the smoke development, and without requiring protection with a thermal barrier. Section 2603.9 permits foamed plastic insulation to be used as interior wall or ceiling finish in plenums even without the installation of a thermal barrier.

Cost Impact: This proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRIMI-FS11-2603.9

FS179–09/10

2603.9.1 (New)

Proponent: Jesse J. Beitel, Hughes Associates, Inc. representing The Extruded Polystyrene Foam Association

Add new text as follows:

2603.9 Special approval. Foam plastic shall not be required to comply with the requirements of Sections 2603.4 through 2603.7 where specifically approved based on large-scale tests such as, but not limited to, NFPA 286 (with the acceptance criteria of Section 803.2), FM 4880, UL 1040 or UL 1715. Such testing shall be related to the actual end-use configuration and be performed on the finished manufactured foam plastic assembly in the maximum thickness intended for use. Foam plastics that are used as interior finish on the basis of special tests shall also conform to the flame spread requirements of Chapter 8. Assemblies tested shall include seams, joints and other typical details used in the installation of the assembly and shall be tested in the manner intended for use.

2603.9.1 Exterior walls. Testing based on Section 2603.9 shall not be used to eliminate any component of the construction of an exterior wall assembly when that component was included in the construction that has met the requirements of Section 2603.5.5.

Reason: Section 2603.5.5 of the IBC requires that when foam plastic insulation is used in or on an exterior wall, the NFPA 285 must be conducted on the wall assembly. In this test, typically one layer of gypsum wallboard is used to cover the interior surface of the wall assembly. See Figure 1.

Sections 2603.4 and 2603.5.2 of the IBC require that the foam plastic be separated from the interior of the building by a thermal barrier, typically gypsum wallboard. Section 2603.9 allows that when a foam plastic is successfully tested in a full-scale test such as NFPA 286, UL 1715, etc. then the thermal barrier can be eliminated.

A question has arisen in that if the gypsum wallboard is used to pass the NFPA 285 test, then can it be eliminated if the assembly also passes for example, an NFPA 286 test?

The NFPA 285 is a test in which the interior wall surface is exposed to the equivalent of an ASTM E 119 fire exposure for 30 minutes. This test evaluates vertical and lateral flame propagation away from the compartment of fire origin and the performance of the wall support system (i.e., steel studs, etc.) plays a significant role in the wall's performance.

The tests specified in Section 2603.9 evaluate the flame spread of a foam plastic when exposed to a fire of limited size and typically for on 15 minutes. These methods evaluate the flame spread potential of the foam plastic.

The NFPA 285 test evaluates different performance parameters than the Section 2603.9 test. Also, the exposure to the interior of the wall in the NFPA 285 is significantly more severe.

Thus, if the gypsum wallboard used in the successful performance of the NFPA 285 test is eliminated based on tests in Section 2603.9, then the support system for the wall may not perform since it is now unprotected, and the results of the NFPA 285 test may no longer be valid. In fact, the wall system without the gypsum wallboard could now fail the NFPA 285 test.

This Code change will clarify the intent of the Code with respect to this question by requiring that the specific assembly successfully tested in NFPA 285 be the assembly used for these applications in the field. Thus if a foam plastic assembly successfully passes a full-scale test such as NFPA 286, UL 1715, etc. to remove the thermal barrier, the same assembly (without the thermal barrier) must also pass the NFPA 285 to be used in commercial walls.

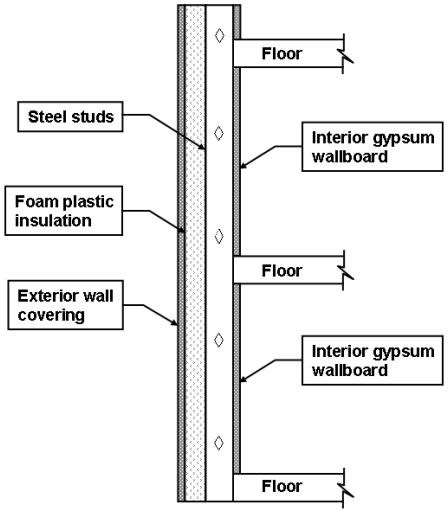


FIGURE 1

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEITEL-FS10-2603.9

FS180–09/10
2606.5, 2609.1.1 (New), 2610.1.1 (New)

Proponent: J. Nigel Ellis, representing Ellis Fall Safety Solutions, LLC

THIS CODE CHANGE WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. SEE THE HEARING ORDER FOR THIS COMMITTEE.

1. Revise as follows:

2606.5 Structural requirements. Light-transmitting plastic materials in their assembly shall be of adequate strength and durability to withstand the loads indicated in Chapter 16. Technical data shall be submitted to establish stresses, maximum unsupported spans and such other information for the various thicknesses and forms used as deemed necessary by the *building official*. Every skylight shall be guarded by a standard skylight screen or a fixed standard railing on all exposed sides. Skylight screens shall be of such construction and mounting that they are capable of withstanding a load of at least 200 lbs applied perpendicularly at any one area on the screen. They shall also be of such construction and mounting that under ordinary loads or impacts, they will not deflect downward sufficiently to break the glass below them. The construction shall be of grillwork with openings not more than 4 inches long or of slatwork with openings not more than 2 inches wide with length unrestricted.

2. Add new text as follows:

2609.1 General. Light-transmitting plastic roof panels shall comply with this section and Section 2606. Light-transmitting plastic roof panels shall not be installed in Groups H, I-2 and I-3. In all other groups, light-transmitting plastic roof panels shall comply with any one of the following conditions:

1. The building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
2. The roof construction is not required to have a fire-resistance rating by Table 601.
3. The roof panels meet the requirements for roof coverings in accordance with Chapter 15.

2609.1.1 Guarding. Light-transmitting roof panels and assemblies shall be guarded as required by Section 2606.5.

3. Add new text as follows:

2610.1 Light-transmitting plastic glazing of skylight assemblies. Skylight assemblies glazed with light-transmitting plastic shall conform to the provisions of this section and Section 2606. Unit skylights glazed with light-transmitting plastic shall also comply with Section 2405.5.

Exception: Skylights in which the light-transmitting plastic conforms to the required roof-covering class in accordance with Section 1505.

2610.1.1 Guarding. Unit skylight assemblies shall be guarded as required by Section 2606.5.

Reason: The proposed wording is verbatim Federal OSHA standard from 1971 and needs to be reflected in the building code because Chapter 16 loading is inadequate for human falls onto skylights and skylight manufacturers are not the only users of the skylights they produce. In other words some building owners may not be employers who maintain the roof skylights and therefore need the protection from the manufacturers in each installation going forward with the inclusion or design integration of a necessary hazard control.

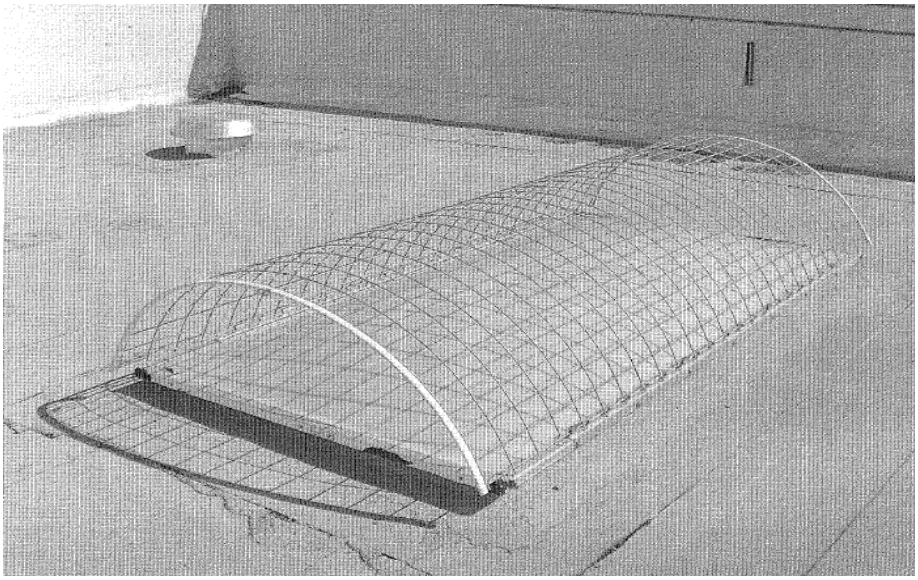
Fatalities from falls through skylights which category for inclusion includes light-transmitting panels and smoke vents are documented by the Bureau of Labor Statistics which in 2006 accounted for 36 deaths in non-government buildings in the USA www.bls.gov. Skylights have their own fatal fall category as opposed to roof or floor openings that also have their own listing. The Federal requirement for General Industry is 29CFR1910.23(a)(4) and (e)(8) which became mandatory in 1971 for employers.

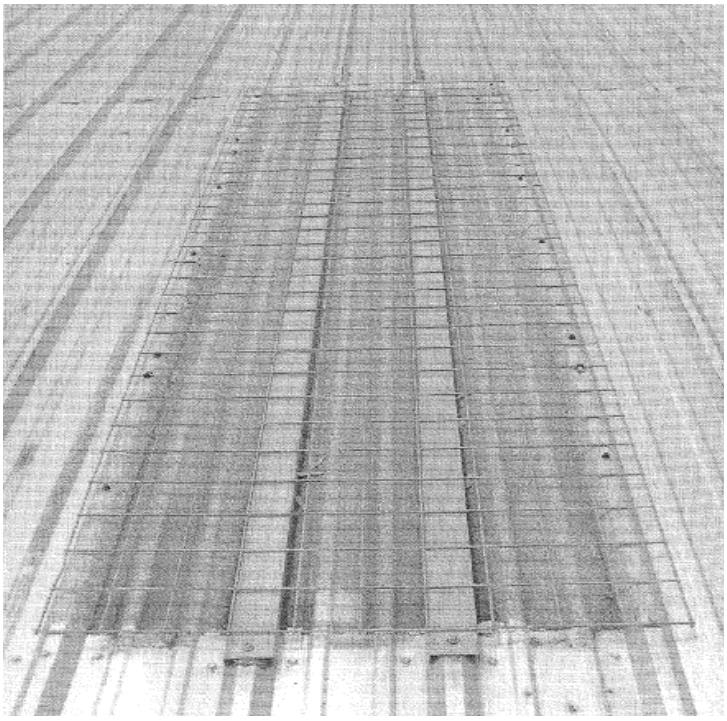
There are also similar requirements in the 1926.500-503 Construction regulations that equate skylights with open holes and require the use of adequate covers. The ANSI A1264.1 and A10.18 are similarly worded but all are aimed ineffectively at employers with exposed employees but not exposed independent contractors who visit dozens of building roofs each month without a feasible protection method e.g. HVAC, Laborers, roofers, Window Cleaners etc.).

However after 38 years not even 1% of skylights have the required screen protection. Ref Plasteco President Key Sandow. Skylight manufacturers do not mark their skylights clearly in the same way that auto glazers do, so that manufacturers may never know their skylight ever failed to support a falling worker. Instead, the blame falls on the injured person for not knowing to stay away from or be careful around skylights. My experience is that workers do not know the degree of danger stepping close to skylights until it is too late nor do their employers.

Plastic skylights may survive impacts from falling or tripping by the trades (of which there may be 25 or more) when new but almost all suffer from uv light degradation over the years. An alternative that also takes care of controlling intruders is under-skylight grills especially for opening smoke vents and similar skylights and corrosive conditions and sometimes both to reduce fall distances to 4 ft or less per OSHA General Industry requirements. Skylights are maintained today by sealing leaks with silicone, fiberglass or equivalent and appear in “good” condition on maintenance company reports to the building owner if they do not presently leak despite the fact that they have cracks after a few years in the sun and are patched regularly. There is no common lifetime for plastic skylights that may now be 50+ years old and users do not currently replace a skylight unless a leak cannot be stemmed.

The request is to include the federal requirement in the IBC Building Code and carry the responsibility to architects, engineers and building owners and managers to protect the work trades that maintain the roof systems in those buildings by including adequate protection in specifications. No building owner expects that a skylight will have a disastrously weak strength that a worker can step onto and through as the years progress eventually almost as easily as pushing a finger through. The OSHA interpretation by John Miles in 1984 does not anticipate the degradation that occurs with almost all synthetic-related skylights nor the dynamic force of a slip, trip and/or fall by a passing worker. Use of personal fall arrest is a last resort but no system is legal without a 5,000 lbs anchorage point which is simply unavailable on a roof unless designed by a structural engineer and regularly recertified (OSHA 1926.500-503 and ANSI Z359-2007 The Fall Protection Code) and building owners do not contract or pay for 5000 lbs anchors in their roofs or confirm roof strengths with any contractors at this time (ref: 1926.501(a)(2) adequate surface strength requirements). Examples of skylight screens follow:





Cost Impact: Approx. $300 including a 4'x8' skylight screen and installation

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ELLIS-FS1-2606.5

FS181–09/10
2610.2

Proponent: Ennis, representing the Single Ply Roofing Industry (SPRI))

Revise as follows:

2610.2 Mounting. The light-transmitting plastic shall be mounted above the plane of the roof on a curb constructed in accordance with the requirements for the type of construction classification, but at least 4 inches (102 mm) above the plane of the roof. ~~Edges of the light-transmitting plastic skylights or domes shall be protected by metal or other approved noncombustible material, or the~~ <u>The</u> light transmitting plastic dome or skylight shall be shown to be able to resist ignition where exposed at the edge to a flame from a Class B brand as described in ASTM E 108 or UL 790.

Exceptions:

1. Curbs shall not be required for skylights used on roofs having a minimum slope of three units vertical in 12 units horizontal (25-percent slope) in occupancies in Group R-3 and on buildings with a nonclassified roof covering.
2. ~~The metal or noncombustible edge material is not required where nonclassified roof coverings are permitted.~~

Reason: The flames of the Class B brand can extend above the noncombustible edge and contact the dome, allowing for the possibility of catching fire and test failure. ASTM E108 tests have been conducted on products with non-combustible edge material in which the flame extended beyond the noncombustible edge material and contacted the dome. This could result in ignition of the dome depending upon the type of material used for the dome. Testing per ASTM E108 or UL790 with a Class B brand should be the accepted requirement.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENNIS-F3-2610.2 AND ENNIS-F5-2610.2

FS182–09/10
2610.2

Proponent: Mike Ennis, representing Single Ply Roofing Industry (SPRI, Inc.)

Revise as follows:

2610.2 Mounting. The light-transmitting plastic shall be mounted above the plane of the roof on a curb constructed in accordance with the requirements for the type of construction classification, but at least 4 inches (102 mm) above the plane of the roof. Edges of the light-transmitting plastic skylights or domes shall be protected by metal or other approved noncombustible material, or the light transmitting plastic dome or skylight shall be shown to be able to resist ignition where exposed at the edge to a flame from a Class B brand as described in ASTM E 108 or UL 790. The Class B brand test shall be conducted on a skylight that is elevated to a height specified by the manufacturer, but not less than 4 inches (102 mm)

Exceptions:

(Exception remain unchanged)

Reason: The skylights should be tested at the minimum curb height specified for installation by the manufacturer, but not less than the 4-inch minimum required by the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENNIS-FS4-2610_2b

FS183–09/10
2610.3

Proponent: Julie Ruth, PE, JRuth Code Consulting, representing American Architectural Manufacturers Association

Revise as follows:

2610.3 Slope. Flat or corrugated light-transmitting plastic skylights shall slope at least four units vertical in 12 units horizontal (4:12). Dome-shaped skylights shall rise above the mounting flange a minimum distance equal to 10 percent of the maximum ~~span~~ width of the dome but not less than 3 inches (76 mm).

Exception: Skylights that pass the Class B Burning Brand Test specified in ASTM E 108 or UL 790.

Reason: The aspect ratios (length/width) of early generation plastic dome skylights tended to be 1:1 or 1.5:1, and seldom exceeded 2:1. Therefore, basing the dome rise required on the maximum span of the skylight, with a minimum of 3 inches, and the slope this imposed on the shorter span, was not considered to be excessive.

With more recent advances, however, it is now possible for the length of dome shaped skylights to be much greater than the width, with aspect ratios (length/width) of 4 or more not being uncommon. For these products, basing the rise required on the maximum span is excessive and referring to the maximum width, while retaining the minimum of 3 inches, is more appropriate.

Cost Impact: Could reduce cost for domed skylights, will not increase cost.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RUTH-FS1-2610.3

FS184–09/10
2602, 2612.3.1 (New)

Proponent: Jesse J. Beitel, Hughes Associates, Inc. representing American Composites Manufacturers Association

1. Revise as follows:

2602 DEFINITIONS

FIBER REINFORCED POLYMER. Polymeric composite material consisting of reinforcement fibers impregnated with a fiber-binding polymer which is then molded and hardened. Fiber reinforced polymers are permitted to contain cores laminated between fiber reinforced polymer facings.

FIBERGLASS REINFORCED POLYMER. Polymeric composite material consisting of glass reinforcement fibers impregnated with a fiber-binding polymer which is then molded and hardened. Fiberglass reinforced polymers are permitted to contain cores laminated between fiberglass reinforced facings.

2. Add new text as follows:

2612.3 Interior Finish. Fiber reinforced polymer or fiberglass reinforced polymer used as *interior finish* shall comply with Chapter 8.

2612.3.1 Foam plastic cores. Fiber reinforced polymer or fiberglass reinforced polymer used as interior finish and which contain foam plastic cores shall comply with Chapter 8 and Chapter 26.

Reason: Some fiber reinforced polymers or fiberglass reinforced polymers may be constructed as sandwich panels. These panels would have fiber reinforced polymer or fiberglass reinforced polymer on both sides of a core material. The core material provides additional support to the fiber reinforced polymer or fiberglass reinforced polymer system. Typical core materials can be but are not limited to balsa wood, plywood or even foam plastic materials. The change in the definitions for fiber reinforced polymer or fiberglass reinforced polymer address these types of materials.

When foam plastic is used as a core material and the resultant fiber reinforced polymer or fiberglass reinforced polymer is used as interior finish, the resultant fiber reinforced polymer or fiberglass reinforced polymer must comply with both the requirements of Chapter 8 and Chapter 26.

Since foam plastic is regulated by Chapter 26, it is appropriate that fiber reinforced polymers or fiberglass reinforced polymers which contain foam plastic cores also be regulated by Chapter 26.

Cost Impact: This code change will increase the cost of construction

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: BEITEL-FS6-2602

FS185–09/10

2602, 2612.1, 2612.2, 2612.3, 2612.4, 2612.5, 2612.6

Proponent: Maureen Traxler, City of Seattle, representing City of Seattle Dept of Planning & Development

1. Revise as follows:

SECTION 2602
DEFINITIONS

FIBER REINFORCED POLYMER. A polymeric composite material consisting of reinforcement fibers , such as glass, impregnated with a fiber-binding polymer which is then molded and hardened.

~~**FIBERGLASS REINFORCED POLYMER.** A polymeric composite material consisting of glass reinforcement fibers impregnated with a fiber-binding polymer which is then molded and hardened.~~

SECTION 2612
FIBER REINFORCED POLYMER ~~AND FIBERGLASS REINFORCED POLYMER~~

2612.1 General. The provisions of this section shall govern the requirements and uses of fiber reinforced polymer ~~or fiberglass reinforced polymer~~ in and on buildings and structures.

2612.2 Labeling and identification. Packages and containers of fiber reinforced polymer ~~or fiberglass reinforced polymer~~ and their components delivered to the job site shall bear the *label* of an *approved agency* showing the manufacturer's name, product listing, product identification and information sufficient to determine that the end use will comply with the code requirements.

2612.3 Interior finishes. Fiber reinforced polymer ~~or fiberglass reinforced polymer~~ used as *interior finishes, decorative materials* or *trim* shall comply with Chapter 8.

~~**2612.4 Decorative materials and trim.** Fiber reinforced polymer or fiberglass reinforced polymer used as *decorative materials* or *trim* shall comply with Section 806.~~

(Renumber subsequent sections)

2612.5 Light-transmitting materials. Fiber reinforced polymer ~~or fiberglass reinforced polymer~~ used as light-transmitting materials shall comply with Sections 2606 through 2611 as required for the specific application.

2612.6 Exterior use. Fiber reinforced polymer ~~or fiberglass reinforced polymer~~ shall be permitted to be installed on the *exterior walls* of buildings of ~~any type of~~ Types IV and V construction when such polymers meet the requirements of Section 2603.5. ~~and is fireblocked~~ Fireblocking shall be installed in accordance with Section 717. ~~The fiber reinforced polymer or the fiberglass reinforced polymer shall be designed for uniform live loads as required in Table 1607.1 as well as for snow loads, wind loads and earthquake loads as specified in Sections 1608, 1609 and 1613, respectively.~~

Exceptions:

1. Compliance with Section 2603.5 is not required when ~~When~~ all of the following conditions are met:
   1.1. When the area of the fiber reinforced polymer ~~or the fiberglass reinforced polymer~~ does not exceed 20 percent of the respective wall area, the fiber reinforced polymer ~~or the fiberglass~~ ~~reinforced polymer~~ shall have a flame spread index of 25 or less. ~~or w~~When the area of the fiber reinforced polymer ~~or the fiberglass reinforced polymer~~ does not exceed 10 percent of the respective wall area, the fiber reinforced polymer ~~or the fiberglass reinforced polymer~~ shall have a flame spread index of 75 or less. The flame spread index requirements do not apply to ~~shall not be required for~~ coatings or paints having a thickness of less than 0.036 inch (0.9 mm) that are applied directly to the surface of the fiber reinforced polymer ~~or the fiberglass reinforced polymer~~.
   1.2. Fireblocking complying with Section 717.2.6 shall be installed.
   1.3. The fiber reinforced polymer ~~or the fiberglass reinforced polymer~~ shall be installed directly to a noncombustible substrate or be separated from the *exterior wall* by one of the following materials: corrosion-resistant steel having a minimum base metal thickness of 0.016 inch (0.41 mm) at any point, aluminum having a minimum thickness of 0.019 inch (0.5 mm) or other approved noncombustible material.
   ~~1.4. The fiber reinforced polymer or the fiberglass reinforced polymer shall be designed for uniform live loads as required in Table 1607.1 as well as for snow loads, wind loads and earthquake loads as specified in Sections 1608, 1609 and 1613, respectively.~~
2. Compliance with Section 2603.5 is not required when the fiber reinforced polymer is ~~When~~ installed on buildings that are 40 feet (12 190 mm) or less above grade when all of the following conditions are met:
   2.1. ~~t~~The fiber reinforced polymer ~~or the fiberglass reinforced polymer~~ shall meet the requirements of Section 1406.2. ~~and shall comply with all of the following conditions:~~
   ~~2.1~~ 2.2. Where the fire separation distance is 5 feet (1524 mm) or less, the area of the fiber reinforced polymer ~~or the fiberglass reinforced polymer~~ shall not exceed 10 percent of the wall area. Where the fire separation distance is greater than 5 feet (1524 mm), there shall be no limit on the area of the *exterior wall* coverage using fiber reinforced polymer ~~or the fiberglass reinforced polymer~~.
   ~~2.2~~2.3. The fiber reinforced polymer ~~or the fiberglass reinforced polymer~~ shall have a flame spread index of 200 or less. The flame spread index requirements do not apply to ~~shall not be required for~~ coatings or paints having a thickness of less than 0.036 inch (0.9 mm) that are applied directly to the surface of the fiber reinforced polymer ~~or the fiberglass reinforced polymer~~.
   ~~2.3~~2.4. Fireblocking complying with Section 717.2.6 shall be installed.
   ~~2.4 The fiber reinforced polymer or the fiberglass reinforced polymer shall be designed for uniform live loads as required in Table 1607.1 as well as for snow loads, wind loads and earthquake loads as specified in Sections 1608, 1609 and 1613, respectively~~

Reason: "Fiberglass reinforced polymer" is a type of "fiber reinforced polymer", so the definitions can be combined. The provisions regulating fiber reinforced polymers are found in Section 2612, which includes identical regulations for polymers reinforced with glass as with other types of fibers. The two terms always appear together.

Section 2612.4 is unnecessary because Section 2612.3 already requires compliance with Chapter 8. The title of Chapter 8 is "Interior Finishes" and encompasses decorative materials and trim as well as "interior finish".

A substantive change is proposed that limits the use of this provision to combustible construction. Fireblocking is a crucial element of safe use of this material, and the only fireblocking provisions available are suitable only for combustible construction types. Section 717.2 clearly limits the scope of Section 717's fireblocking provisions to combustible buildings. Referencing that section creates the inference that the fireblocking requirements only apply when the fiber reinforced polymers are used on buildings of combustible construction. Unless fireblocking requirements appropriate to noncombustible buildings are provided, use of this material should be limited to combustible buildings.

The last sentence of the paragraph is not needed because the provisions of Chapter 16 apply regardless.

The changes to the exceptions are editorial. Charging language is added to both of them to specify that they are exceptions from the requirements of Section 2603.5. Other changes to the exceptions are consistent with changes proposed for the rest of Section 2612.

Cost Impact: This code change proposal will not increase the cost of construction.

Analysis: Code change proposal FS185, FS186 and FS187 address Exception #1 to Section 2612.6. The committee needs to make its intent clear with respect to these provisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Traxler-FS3-2602

FS186–09/10
2612.6

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing American Composites Manufacturers Association

Revise as follows:

2612.6 Exterior use. Fiber reinforced polymer or fiberglass reinforced polymer shall be permitted to be installed on the exterior walls of buildings of any type of construction when such polymers meet the requirements of Sections 2603.5 and is fire-blocked in accordance with Section 717. The fiber reinforced polymer or the fiberglass reinforced polymer shall be designed for uniform live loads as required in Table 1607.1 as well as for snow loads, wind loads and earthquake loads as specified in Sections 1608, 1609 and 1613 respectively.

Exceptions:

1. When all of the following conditions are met:
   - 1.1. The fiber reinforced polymer or the fiberglass reinforced polymer shall not exceed an aggregate total of 20% of the area of the specific wall to which it is attached, and no single architectural element shall exceed 10% of the area of the specific wall to which it is attached, and no contiguous set of architectural elements shall exceed 10% of the area of the specific wall to which they are attached. ~~When the area of the fiber reinforced polymer or the fiberglass reinforced polymer does not exceed 20% of the respective wall area, the fiber reinforced polymer or the fiberglass reinforced polymer shall have a flame-spread index of 25 or less or when the area of the fiber reinforced polymer or the fiberglass reinforced polymer does not exceed 10% of the respective wall area, the fiber reinforced polymer or the fiberglass reinforced polymer shall have a flame-spread index of 75 or less. The flame-spread index requirement shall not be required for coatings or paints having a thickness of less than 0.036 inch (0.9 mm) that are applied directly to the surface of the fiber reinforced polymer or the fiberglass reinforced polymer~~
   - 1.2. The fiber reinforced polymer or the fiberglass reinforced polymer shall have a flame-spread index of 25 or less. The flame-spread index requirement shall not be required for coatings or paints having a thickness of less than 0.036 inch (0.9 mm) that are applied directly to the surface of the fiber reinforced polymer or the fiberglass reinforced polymer.
   - 1.3. Fireblocking complying with Section 717.2.6 shall be installed.
   - 1.4. The fiber reinforced polymer or the fiberglass reinforced polymer shall be installed directly to a noncombustible substrate or be separated from the exterior wall by one of the following materials: corrosion-resistant steel having a minimum base metal thickness of 0.016 inch (0.41 mm) at any point, Aluminum having a minimum thickness of 0.019 inch (0.5 mm) or other approved noncombustible material.
   - 1.5. The fiber reinforced polymer or the fiberglass reinforced polymer shall be designed for uniform live loads as required in Table 1607.1 as well as for snow loads, wind loads and earthquake loads as specified in Sections 1608, 1609 and 1613 respectively.

(Exception 2 remains unchanged)

Reason: This proposal addresses “large amounts of fuel loading” in any given area on the exterior wall. In essence, while a total of 20% of the wall surface can have the fiber reinforced polymer installed on it this modification will require that the fiber reinforced polymer be limited to discrete areas of not more than 10% of the area of the wall. This 10% limitation applies not only to a single architectural element but it also applies to a group of elements such that if they are touching, the grouping cannot exceed 10%. By this modification, the area of the fiber reinforced polymer elements must be less than 10% of the wall area, be noncontiguous and thus separation of the elements is provided. This modification addresses the issue whereby the 20% aggregate total would be in a single area.

Also, the industry has removed the Section whereby materials with a Class B flame spread are allowed and only materials with a Class A flame spread can be used on the exterior of a wall in this Exception. By this modification, the industry continues to improve the fire performance of these materials.

This Code proposal is based on a proposed comment made during the last Code cycle. At that time some issues with wording were identified and we feel that this has been corrected.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposal FS185, FS186 and FS187 address Exception #1 to Section 2612.6. The committee needs to make its intent clear with respect to these provisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEITEL-FS5-2612.6.doc

FS187–09/10
2612.6

Proponent: Douglas H. Evans, P.E., FSFPE, Clark County, NV, representing the Department of Development Services – Building Division

Revise as follows:

2612.6 Exterior use. Fiber reinforced polymer or fiberglass reinforced polymer shall be permitted to be installed on the exterior walls of buildings of any type of construction when such polymers meet the requirements of Sections 2603.5 and is fireblocked in accordance with Section 717. The fiber reinforced polymer or the fiberglass reinforced polymer shall be designed for uniform live loads as required in Table 1607.1 as well as for snow loads, wind loads and earthquake loads as specified in Sections 1608, 1609 and 1613 respectively.

Exceptions~~:~~:

~~1. When all of the following conditions are met:~~
- ~~1.1. When the area of the fiber reinforced polymer or the fiberglass reinforced polymer does not exceed 20 percent of the respective wall area, the fiber reinforced polymer or the fiberglass reinforced polymer shall have a flame spread index of 25 or less or when the area of the fiber reinforced polymer or the fiberglass reinforced polymer does not exceed 10 percent of the respective wall area, the fiber reinforced polymer or the fiberglass reinforced polymer shall have a flame spread index of 75 or less.The flame spread index requirement shall not be required for coatings or paints having a thickness of less than 0.036 inch (0.9 mm) that are applied directly to the surface of the fiber reinforced polymer or the fiberglass reinforced polymer~~
- ~~1.2. Fireblocking complying with Section 717.2.6 shall be installed.~~
- ~~1.3. The fiber reinforced polymer or the fiberglass reinforced polymer shall be installed directly to a noncombustible substrate or be separated from the exterior wall by one of the following materials: corrosion-resistant steel having a minimum base metal thickness of 0.016 inch (0.41 mm) at any point, Aluminum having a minimum thickness of 0.019 inch (0.5 mm) or other approved noncombustible material.~~
- ~~1.4. The fiber reinforced polymer or the fiberglass reinforced polymer shall be designed for uniform live loads as required in Table 1607.1 as well as for snow loads, wind loads and earthquake loads as specified in Sections 1608, 1609 and 1613 respectively.~~

~~2~~1. When installed on buildings that are 40 feet (12 190 mm) or less above grade, the fiber reinforced polymer or the fiberglass reinforced polymer shall meet the requirements of Section 1406.2 and shall comply with all of the following conditions:
- ~~2~~1.1. Where the fire separation distance is 5 feet (1524 mm) or less, the area of the fiber reinforced polymer or the fiberglass reinforced polymer shall not exceed 10 percent of the wall area. Where the fire separation distance is greater than 5 feet (1524 mm), there shall be no limit on the area of the exterior wall coverage using fiber reinforced polymer or the fiberglass reinforced polymer.
- ~~2~~1.2. The fiber reinforced polymer or the fiberglass reinforced polymer shall have a flame spread index of 200 or less. The flame spread index requirement shall not be required for coatings or paints having a thickness of less than 0.036 inch (0.9 mm) that are applied directly to the surface of the fiber reinforced polymer or the fiberglass reinforced polymer.
- ~~2~~1.3. Fireblocking complying with Section 717.2.6 shall be installed.
- ~~2~~1.4. The fiber reinforced polymer or the fiberglass reinforced polymer shall be designed for uniform live loads as required in Table 1607.1 as well as for snow loads, wind loads and earthquake loads as specified in Sections 1608, 1609 and 1613 respectively.

Reason: Section 2612.1 through the base requirements/allowances of 2612.6 and Exception 2 of 2612.6 appear to provide a level of protection consistent with other established allowances (e.g. EIFS under Section 2603.5). However, **the first exception** to Section 2612.6 **allows an unacceptable increase in the amount of combustible materials on exterior facades of any height and any type of construction**.

Exception 1 allows up to 20 percent of the respective wall area of any type of construction to be covered with these materials when they have a flame spread index of 25 or less (or up to 10 percent with a flame spread index not exceeding 75). Twenty percent (and even 10 percent) of the

respective wall area can constitute **one extremely large continuous fuel package that can allow fire on an exterior façade to propagate unchecked**.

The test used to determine flame spread (ASTM E 84) is not an appropriate test to ensure plastics provide the level of protection intended by code for the proposed applications. The ignition source used for ASTM E 84 is substantially less than the exposure required for EIFS under Section 2603.5 (which is intended to simulate a fully involved room fire projecting out of a window onto the exterior façade). It has been demonstrated a number of times that **polymers only formulated to pass the E 84 test will typically not pass more rigorous tests**.

In addition, some polymers create flaming droplets and pool fires on the floor of the E 84 furnace. Installing such materials over locations where exits discharge would not be prudent.

As written, **Exception 1 applies to exterior facades of high-rise buildings that may be out of reach of fire department hose lines**. A façade fire out of reach of standard fire-fighting operations creates a hazard to occupants of the building, the building itself and the emergency responders trying to keep it from propagating. This does not reflect the intent of code.

In addition, Section 2612 does not provide guidance to restrict the thickness of these materials. The photo included with the initial proposed code change shows a cornice projecting from an exterior wall at least 5 feet. Although the "area" of polymer to exterior wall may not exceed the 10 or 20 percent limitation, the extent of projection (depth) can create a substantial combustible load on an exterior façade any height above grade and also needs to be limited. Eliminating Exception 1 requires that these materials pass the same test as EIFS, or be limited to buildings not exceeding 40 feet high.

The Report of Public Hearings indicates the one of the reasons the committee supported approval was that "the products are currently widely in use." The floor discussion indicated that these products have been installed outside of the limitations of the code for years. Just because an application has been installed "illegally" is not a reason to revise the code. These non-compliant installations in no way indicate that these materials provide the level of protection intended by code.

In summary, the amount of combustible materials allowed by Exception 1 on exterior facades of any height and any type of construction creates a potentially unsafe condition to building occupants, increases the risk to property and places unreasonable demands on firefighting personnel.

Cost Impact: This code change proposal will increase the cost of construction beyond what Section 2612 would otherwise allow.

Analysis: Code change proposal FS185, FS186 and FS187 address Exception #1 to Section 2612.6. The committee needs to make its intent clear with respect to these provisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EVANS-FS2-Section 2612

FS188–09/10

2613.3, 2613.3.1, 2613.3.2, Chapter 35

Proponent: Marcelo Hirschler (GBH International) on behalf of American Fire safety Council

1. Revise as follows:

2613.3 Surface-burning characteristics. Reflective plastic core insulation shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450 when tested in accordance with ASTM E 84 or UL 723. The reflective plastic core insulation shall be tested at the maximum thickness intended for use . Test specimen preparation and mounting shall be in accordance with ASTM E 2599. ~~and shall be tested using one of the mounting methods in Section 2613.3.1 or 2613.3.2.~~

~~**2613.3.1 Mounting of test specimen.** The test specimen shall be mounted on 2-inch-high (51 mm) metal frames so as to create an air space between the unexposed face of the reflective plastic core insulation and the lid of the test apparatus.~~

~~**2613.3.2 Specific testing.** A set of specimen preparation and mounting procedures shall be used which are specific to the testing of reflective plastic core insulation.~~

2. Add new standard to Chapter 35 as follows:

ASTM E 2599-09	Standard Practice for Specimen Preparation and Mounting of Reflective Insulation Materials and Radiant Barrier Materials for Building Applications to Assess Surface Burning Characteristics

Reason: ASTM E 2599 was specifically developed as the test specimen preparation and mounting method for reflective insulation materials when using ASTM E 84 or UL 723, Steiner tunnel test. The sections proposed to be deleted were written in anticipation that the standard practice would be issued and describe both a mounting method that is specific for reflective plastic core insulation and that uses a test specimen mounted on two inch metal frames to create an air space.

Note that this code proposal does not affect testing in accordance with the room corner test or the other requirements for the reflective insulation materials.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM E2599-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-FS13-2613.3

FS189–09/10
2601.1, 2602.1, 2612.1, 2612 (New), Chapter 35

Proponent: Sam Francis, representing American Forest & Paper Association

THIS CODE CHANGE WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PLEASE SEE THE AGENDA FOR THIS COMMITTEE.

1. Revise as follows:

SECTION 2601
GENERAL

2601.1 Scope. These provisions shall govern the materials, design, application, construction and installation of foam plastic, foam plastic insulation, plastic veneer, interior plastic finish and trim, and light-transmitting plastics, and composite plastics. See Chapter 14 for requirements for exterior wall finish and trim and Chapters 6, 10 and 16 for structural requirements.

SECTION 2602
DEFINITIONS

2. Add new text as follows:

2602.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

COMPOSITE, WOOD- PLASTIC. A composite material made primarily from wood or cellulose-based materials in combination with a smaller fraction of plastic(s) by weight.

3. Add new text as follows:

SECTION 2612
WOOD-PLASTIC COMPOSITES USED AS STRUCTURAL MATERIALS

2612.1 General. Wood-plastic composite materials used in any exterior structural application, including deck boards, stair treads, handrails and guardrail systems shall bear a label indicating compliance with the provisions of ASTM D 7032,

2612.1.1 Structural applications. Wood-plastic composite materials used for structural purposes shall comply with the provisions of this code or with Section 2612.2. The label required in Section 2612.1 shall indicate the type and magnatude of the load determined in ASTM D 7031 or ASTM D 7032.

2612.1.2 Flame Spread Index. Wood-plastic composite materials required elsewhere in this code to have a Flame Spread Index, shall have those properties determined in accordance with Chapter 8. Otherwise, wood-plastic composite materials shall meet the requirements of ASTM D 7032.

Exception: materials determined to be noncombustible in accordance with Section 703.4.2.

2612.2 Prescriptive Design Considerations. Wood-plastic composite material shall be permitted to be installed in accordance with the following requirements.

2612.2.1 Span rating. Wood-plastic composite materials used as structural components of a floor or stair system shall have a span rating determined in accordance with ASTM D 7032 with a deflection limit of L/360.

2612.2.2 Guard construction and attachment. Guard construction and attachment shall be in accordance with ICC ES Acceptance Criteria AC174 or by engineering analysis.

2612.2.3 Termite and Decay resistance. Wood-plastic composite materials shall be termite and decay resistant as determined in accordance with Section 4.8 of ASTM D 7032. The sampling requirements for ASTM D 2017 shall be modified to require six specimens for each of the two fungi tested.

2612.2.4 Differential movement of components. Wood-plastic composite materials used as structural elements shall have approved fastening to allow for differential movement of the structural members to which it is fastened.

(Renumber subsequent sections)

4. Add new standard to Chapter 35 as follows:

ASTM
D7031-04 Standard Guide for Evaluating Mechanical and Physical Properties of Wood- Plastic Composite Products, ASTM International.

ASTM
D7032-04 Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails), ASTM International.

ICC ES Acceptance Criteria For Deck Board Span Ratings And Guardrail Systems (Guards And Handrails) AC 174

Reason: In the last cycle of the code, proposals were made to introduce language for materials which that industry calls wood/plastic composite material. The proposal was to include it in Chapter 23 –Wood. This is clearly inappropriate because the base material is plastic. Chapter 26 – Plastic is the more reasonable place for these requirements to reside. Moreover, Section 1406 *Combustible Materials On The Exterior Side of Exterior Walls*, specifically notes plastic-based materials as a separate category and has an exception for Plastics complying with Chapter 26. Since Section 1406.3 (Balconies and similar projections) describes the precise uses for these composites, it makes sense to consider them in the same manner as other products with similar base materials (plastic resin) and place them in Chapter 26.

In the past, it was argued that because the composite materials contain wood, they ought to reside in that chapter. This is flawed. The Standard referenced for this material has no minimum amount of non-plastic material so that it can be exclusively plastic under the standard. In fact, additives, which may be fillers, are not compelled to be 'wood'. Hence, the resin base is the material which is the basis for the mechanical and fire properties of this material. It should therefore logically be included with other materials also of the same type.

In the development of the standard, certain requirements from ICC ES Acceptance Criteria were reduced. This proposal also seeks to maintain the criteria by which the products have been successfully judged and brought into the building code arena in the past. Maintaining those levels of performance seem to be necessary to ensure that the material is evaluated consistently with other products.

Finally the basic issues of fire performance, mechanical properties, and interface with other building materials are included in this proposal to facilitate correlation with the rest of the code.

Cost Impact: Unable to determine any cost impact.

Staff Analysis: Acceptance criteria are developed for use solely by ICC-ES for purposes of issuing ICC-ES evaluation reports. They are available to the public as a courtesy to ICC-ES report applicants and to testing laboratories and inspection agencies that provide services to applicants. Acceptance criteria are not for use outside of the ICC-ES system. ICC-ES Acceptance Criteria are not intended to be code-referenced documents and they do not meet the ICC criteria for referenced standards as contained in ICC Council Policy CP-28. A review of the standard(s) proposed for inclusion in the code, ASTM D7031-04 and ASTM D7032-04, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FRANCIS-FS7-2601.1

FS190–09/10
2606.12, 2612 (New)

Proponent: David M. Baker, representing PDM Solar, Inc.

Delete and substitute as follows:

~~**2606.12 Solar collectors.** Light-transmitting plastic covers on solar collectors having noncombustible sides and bottoms shall be permitted on buildings not over three stories in height or 9,000 square feet (836.1 m^2) in total floor area, provided the light-transmitting plastic cover does not exceed 33.33 percent of the roof area for CC1 materials or 25 percent of the roof area for CC2 materials.~~

~~**Exception:** Light-transmitting plastic covers having a thickness of 0.010 inch (0.3 mm) or less or shall be permitted to be of any plastic material provided the area of the solar collectors does not exceed 33.33 percent of the roof area.~~

SECTION 2612
LIGHT-TRANSMITTING PLASTIC COVERS ON SOLAR COLLECTORS

2612.1 General. Light-transmitting plastic covers on solar collectors having noncombustible sides and bottoms shall comply with this section and Section 2606. Light-transmitting plastic solar collector covers shall not be installed in Groups H, I-2 and I-3. In all other groups, light-transmitting plastic solar collector covers shall comply with any one of the following conditions:

1. The building is not over three stories in height or 9,000 square feet (836.1 m^2) in total floor area.
2. The building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
3. The roof construction is not required to have a fire-resistance rating by Table 601.

2612.2 Location. Where exterior wall openings are required to be protected by Section 704.8, a plastic solar collector cover shall not be installed within 6 feet (1829 mm) of such exterior wall.

2612.3 Area limitations. Plastic solar collector covers shall be limited in area and the aggregate area of plastic solar collector covers shall be limited as a percentage of the roof area in accordance with Table 2612.3.

Exceptions:

1. The area limitations of Table 2612.3 shall be permitted to be increased by 100 percent in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

2. Light-transmitting plastic covers having a thickness of 0.010 inch (0.3 mm) or less or shall be permitted to be of any plastic material provided the area of the solar collectors does not exceed 33.33 percent of the roof area.

TABLE 2612.3
AREA LIMITATIONS FOR LIGHT-TRANSMITTING PLASTIC COVERS ON SOLAR COLLECTORS

CLASS OF PLASTIC	MAXIMUM AREA OF INDIVIDUAL PLASTIC SOLAR COLLECTOR COVERS (square feet)	MAXIMUM AGGREGATE AREA OF PLASTIC COVERS (percent of roof area)
CC1	150	33.33
CC2	30	25

For SI: 1 square foot = 0.0929 m^2

Reason: The code as currently written is overly restrictive in regards to the use of plastic covers on solar collectors on large buildings. As is shown in further detail in this justification, the identical material is currently permitted for use on buildings of the same size as that proposed in applications which pose more of a risk to the building than in the solar collector cover application.

As a result of the current focus on energy costs and emissions of greenhouse gases, renewable energy in general and solar energy in particular is being considered for new building construction. A significant amount of research in currently being conducted in order to develop new cost effective solar energy applications which have the potential to be widely adopted and provide a part of the solution to our energy and environmental problems. For example, PDM Solar, Inc. is developing a solar powered vapor compression air conditioning system, using a patent pending solar powered vapor compression technology. This technology uses solar heated hot water between 180 F and 200 F to provide the steam to operate the concentrator or energy conversion unit.

The use of light-transmitting plastic covers provides significant benefits over the use of glass for our applications. The plastic has dual walls, which lowers the convection and radiation losses, allowing the collectors to produce the desired water temperature with a higher efficiency. The higher efficiency enables the production of more hot water from a given area, providing more air conditioning. The plastic covers are also substantially lighter than glass, lowering the added roof load. The plastic covers are also available at a lower cost than glass. The lower cost combined with higher efficiency provides a more economical system with a faster payback, which is necessary to ultimately make solar air conditioning competitive with air conditioning provided from fossil fuels.

Although ICC staff was unable to discover the original motivation for 2606.12, we believe that the prohibition of the use of light-transmitting plastic solar collector covers on buildings over 3 stories or 9000 square feet is a result of safety concerns for occupants and firefighters. However, use of the same product is already permitted by the code on the roofs of the same size buildings with the same area limitations as included in the proposed change. As detailed below, we believe that use of the product for solar collector covers poses no more, and often less, risk to both occupants and fire fighters than the uses for which the product is currently permitted. At the suggestion of ICC staff, we are seeking a change in ICC 2606.12 during the 2009/2010 ICC code development cycle.

The light-transmitting plastic that we are requesting to use is a 2-layer 10-mm (3/8") structured polycarbonate sheet. Each layer is approximately 0.020" thick. We are planning to purchase the polycarbonate from Gallina USA, but equivalent product is made by several companies, including MacroLux , PolyGal, and General Electric. The proposed product has been tested by the ICC Evaluation Service and others and is a class CC1 product. The product is considered self-extinguishing. It will burn when exposed to a flame, but will self extinguish when the flame is removed (per ASTM D 635). The product has a spontaneous ignition temperature of 896 F per ASTM D-1929, 246 F higher than required by the code (2606.4). It has a flame spread of 25 and a smoke-developed classification of 135 when tested per ASTM E84-01, which compares favorably to the maximum 450 smoke developed index allowed in the code. The product has been found to have a linear burn rate of 0.0 mm/min when tested to ASTM D 635-98.

Two sections of the code permit the use of the proposed product on the roof of buildings larger than 9000 square feet. Section 2609 of the code permits the use of light-transmitting plastic roof panels and section 2610 permits the use of light-transmitting plastic for skylight glazing. We believe that the proposed use of light-transmitting plastic poses no more, and generally less, risk to occupants and firefighters than either of these permitted uses.

In section 2609, the product is permitted to be used in all groups except H, I-2, and I-3. Section 2609 permits the CC1 class plastic to cover 60% of the floor space, if the building is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.

In section 2610, the product is permitted to be used without restriction by group. Section 2610 permits the CC1 class plastic to cover 66.6% of floor area, if the building is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.

We believe that use of the product for solar collector covers poses no more, and generally less, risk to both occupants and fire fighters than for either of these two permitted uses.

Both of the permitted uses allow for the product to be used in place of, or replace part of, the roof assembly. The proposed use does not replace the roof assembly, which remains intact to provide the fire safety for which it was designed.

Use of the product on the roof of the building has the potential to increase the risk to occupants and firefighters in the following areas: 1) an increase in the amount of combustible material available to support a fire, 2) an increase in the amount of smoke and byproducts which would develop during a fire, 3) shortening the time until a fire penetrates the roof assembly, and 4) increasing the potential to provide a ignition source.

In the first three areas, the proposed use would pose either the same risk as the currently permitted uses or, in many cases, substantially less.

In the case of a fire that originates within the building, the proposed use should have substantially less effect on the occupants than either of the currently permitted uses. Unlike the currently permitted uses, the proposed use does not affect the fire safety capabilities of the existing roof assembly and the product is not directly in contact with the interior of the building. As a result, the proposed use of the product would have a minimal affect on the amount of combustible material available and the smoke generated when compared to either of the currently permitted uses. Unlike the permitted uses, the proposed use would have no affect on shortening the time until the fire penetrates the roof.

In the case of a fire that originated from an external source, such as a lightning strike or a fire in another structure, the amount of combustible material available and smoke generated externally, affecting the firefighters, would be no more than under the currently permitted uses. Because the proposed use of the product does not pierce the roof, the effect on the occupants of the combustible material available, the smoke generated, and the time for a fire to penetrate the roof should be less than under the currently permitted uses.

In either the case of an internally generated or an externally generated fire, the use of the product in the proposed application should have no more (and often substantially less) affect on the safety of the occupants and firefighters than other currently permitted uses in the areas of combustible material, smoke developed, and effectiveness of the roof assembly.

The final area of potential concern would be the potential for use of the light-transmitting plastic as a solar collector material to act as an ignition source. The self ignition temperature of the proposed light-transmitting plastic has been tested at 896 F. The maximum solar collector stagnation temperature for our flat panel non concentrating solar collectors is less than 450 F, which provides a safety margin of 400 F. In addition, both the walls and bottom of the solar collectors are constructed of non-combustible material (aluminum), providing an additional level of protection between the plastic cover and the roof assembly.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BAKER-FS1-2606.12.doc

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE — GENERAL

GENERAL CODE COMMITTEE

Dan Weed, CBO - Chair
Rep: City of Central
Plans Analyst/Instructor
Colorado Code Consulting
Thornton, CO

Mark Stimac, RA, CBO - Vice Chair
Director of Building and Zoning
City of Troy
Troy, MI

Don Davies
Chief Plans Examiner
Salt Lake City Corporation
Salt Lake City, UT

Christina Jamison
Rep: International Assoc. of Fire Chiefs
Division Chief/Fire Marshal
San Ramon Valley Fire Protection District
San Ramon, CA

Vickie Lovell
President
InterCode Incorporated
Delray Beach, FL

Homer Maiel, PE, CBO
Senior Engineer
City of San Jose, Building Division
San Jose, CA

Anthony Merlino
Construction Official
Village of Ridgewood
Ridgewood, NJ

John Morgan, MCP
Building Commissioner
City of Frontenac
Frontenac, MO

Agustin Mujica
Rep: National Assoc. of Home Builders
Co-Owner & Vice President of Operations
Levitt Homes Corporation
San Juan, PR

Sharon Myers
Master Plans Examiner
State of Ohio
Reynoldsburg, OH

Gregory Nicholls, AIA
Chief Building Official
City of Mason
Mason, OH

Carroll Pruitt, FAIA
President/CEO
Pruitt Consulting, Inc.
Keller, TX

Sarah Rice, CBO
SRice Consulting
Cincinnati, OH

Carol Sue Rouw, AIA, LEED, AP
Senior Project Manager/Architect
Treanor Architects
St. Louis, MO

Scott Satula
Rep: ICC Upper Great Plains Region III
Director of Inspection Services
Village of Greendale
Greendale, WI

Staff Secretariat:
Kermit Robinson, CBO
Senior Technical Staff
International Code Council

TENTATIVE ORDER OF DISCUSSION

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE

GENERAL

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does **not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair.

G3-09/10
G4-09/10
G5-09/10, Part I
G6-09/10
G7-09/10
G9-09/10
G10-09/10
G11-09/10
G12-09/10
G13-09/10
G14-09/10
G15-09/10
    G113-09/10
G16-09/10
G17-09/10
G19-09/10
    G65-09/10
G20-09/10
G21-09/10
G22-09/10
G23-09/10
    G66-09/10
G24-09/10
G25-09/10
G26-09/10
    G30-09/10
G27-09/10
G28-09/10, Part I
G29-09/10
G31-09/10
G32-09/10
G33-09/10
G35-09/10
G36-09/10
G37-09/10
G38-09/10
G39-09/10
G40-09/10
G43-09/10
G44-09/10, Part I
G44-09/10, Part II
G45-09/10
    G84-09/10
G50-09/10
G51-09/10
    G55-09/10
    G56-09/10, Part 1
G53-09/10
G54-09/10
G58-09/10, Part I
G59-09/10
G60-09/10
G61-09/10
G62-09/10
G63-09/10
G64-09/10, Part I
G64-09/10, Part II
    G57-09/10
G68-09/10
G69-09/10
    G1-09/10
G76-09/10
G77-09/10
G78-09/10
G79-09/10
G80-09/10
G82-09/10
G83-09/10
G84-09/10
    G34-09/10
G85-09/10
G86-09/10
G87-09/10
G88-09/10
G89-09/10
G90-09/10
    G81-09/10
G91-09/10
G92-09/10
G93-09/10
G94-09/10
G96-09/10
G97-09/10
G98-09/10
G99-09/10
G100-09/10
G101-09/10
G102-09/10
G103-09/10
G104-09/10
G105-09/10
G106-09/10
G107-09/10
G108-09/10
G109-09/10
G110-09/10
G111-09/10
G112-09/10
G114-09/10
G115-09/10
G116-09/10
G117-09/10
G118-09/10
G119-09/10
G120-09/10
    G18-09/10
G121-09/10
G122-09/10
G123-09/10
G124-09/10
G125-09/10
    G130-09/10
G126-09/10
G127-09/10
G128-09/10
G129-09/10
G131-09/10
G132-09/10
G133-09/10
G134-09/10
G135-09/10
G136-09/10
G137-09/10
G138-09/10
G139-09/10
G140-09/10
G141-09/10
G142-09/10
G143-09/10
    G75-09/10
G144-09/10
G145-09/10, Part I
G146-09/10, Part I
G147-09/10, Part I
G148-09/10
G149-09/10
G150-09/10
    S26-09/10
    S27-09/10
    S28-09/10
G151-09/10
G152-09/10
G153-09/10, Part I
G153-09/10, Part II
G153-09/10, Part III
G154-09/10
G155-09/10
G156-09/10
    G8-09/10
G178-09/10
G179-09/10
G180-09/10
G182-09/10
    RB176-09/10, Part II
    RB177-09/10, Part II
G183-09/10
G184-09/10
G185-09/10, Part I
G185-09/10, Part II
G186-09/10
G187-09/10
G188-09/10
G189-09/10
G198-09/10, Part I
G198-09/10, Part II
G199-09/10
G201-09/10
G202-09/10
G203-09/10
G204-09/10, Part I
G205-09/10
G206-09/10

G1–09/10
202, 419.1

Proponent: Maureen Traxler representing Washington Association of Building Officials Technical Code Development Committee

1. Add new definition as follows:

SECTION 202
DEFINITIONS

LIVE/WORK UNIT. A *dwelling unit* or *sleeping unit* in which a significant portion of the space includes a nonresidential use that is operated by the tenant. See Section 419.

2. Revise as follows:

419.1 General. A live/work unit ~~is a dwelling unit or sleeping unit in which a significant portion of the space includes a nonresidential use that is operated by the tenant and~~ shall comply with Sections 419.1 through 419.8.

Exception: Dwelling or sleeping units that include an office that is less than 10 percent of the area of the dwelling unit ~~shall not be classified as a live/work unit~~ are permitted to be classified as dwelling units with accessory occupancies in accordance with Section 508.2.

Reason: The term live/work unit is found in several sections of the IBC, including Sections 310, 419, 508 and 1103, so the definition should be located in Chapter 2. This proposed definition of live/work unit is currently contained within 419, but not identified as a definition.

Section 419 is revised to relocate the definition of "live/work unit" to Chapter 2. The exception to Section 419.1 is revised to more clearly coordinate with the accessory occupancy provisions of Section 508.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TRAXLER-G1-202

G2–09/10
202, Appendix I; IRC R202, Appendix H

Proponent: Daniel J. Walker, P.E., Thomas Associates, Inc., representing the National Sunroom Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

1. Add new text as follows:

SECTION 202
DEFINITIONS

PATIO COVER. A one story structure with open or glazed walls which is used for recreational and outdoor living purposes associated with a dwelling unit.

2. Revise text as follows:

APPENDIX I
PATIO COVERS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION I101
GENERAL

I101.1 General. Patio covers shall be permitted to be detached from or attached to *dwelling units*. Patio covers shall be used only for recreational, outdoor living purposes and not as carports, garages, storage rooms or habitable rooms. ~~Openings shall be permitted to be enclosed with insect screening, approved translucent or transparent plastic not more that 0.125 inch (3.2 mm) in thickness, glass conforming to the provisions of Chapter 24 or any combination of the foregoing.~~

SECTION I102
HEIGHT ~~DEFINITIONS~~

I102.1 ~~PATIO COVERS.~~ Height. Patio covers are limited to one story structures not exceeding 12 feet (3657 mm) in height. ~~Enclosure walls shall be permitted to be of any configuration, provided the open or glazed area of the longer wall and one additional wall is equal to at least 65 percent of the area below a minimum of 6 feet 8 inches (2032 mm) of each wall, measured from the~~ floor.

SECTION I103
EXTERIOR WALLS AND OPENINGS

I103.1 Enclosure walls. Enclosure walls shall be permitted to be of any configuration, provided the open or glazed area of the longer wall and one additional wall is equal to at least 65 percent of the area below a minimum of 6 feet 8 inches (2032 mm) of each wall, measured from the floor. Openings shall be permitted to be enclosed with insect screening, approved translucent or transparent plastic not more that 0.125 inch (3.2 mm) in thickness, glass conforming to the provisions of Chapter 24 or any combination of the foregoing.

~~I103.1~~ I1032. Light, ventilation and emergency egress. Exterior openings of the dwelling unit required for light and ventilation shall be permitted to open into a patio structure. However, the patio structure shall be unenclosed if such openings are serving as emergency egress or rescue openings from sleeping rooms. Where such exterior openings serve as an exit from the dwelling unit, the patio structure, unless unenclosed, shall be provided with exits conforming to the provision of Chapter 10.

SECTION I104
STRUCTURAL PROVISIONS

I104.1 Design loads. Patio covers shall be designed and constructed to sustain, within the stress limits of this code, all dead loads plus a minimum vertical live load of 10 pounds per square foot (0.48 kN/m^2) except that snow loads shall be used where such snow loads exceed this minimum. Such patio covers shall be designed to resist the minimum wind and seismic loads set forth in this code.

I104.2 Footings. In areas with a frost depth of zero, a patio cover shall be permitted to be supported on a concrete slab on grade without footings, provided the slab conforms to the provisions of Chapter 19 of this code, is not less than $3^1/_2$ inches (89 mm) thick and further provided that the columns do not support loads in excess of 750 pounds (3.36 kN) per column.

PART II – IRC BUILDING/ENERGY

1. Add new definition as follows:

SECTION R202
DEFINITIONS

PATIO COVER. A one story structure with open or glazed walls which is used for recreational and outdoor living purposes associated with a dwelling unit.

2. Revise text as follows:

APPENDIX H
PATIO COVERS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION AH101
GENERAL

AH101.1 Scope. Patio covers shall conform to the requirements of ~~this appendix chapter~~ Sections AH101 through AH106.

AH101.2 Permitted uses. Patio covers shall be permitted to be detached from or attached to *dwelling units*. Patio covers shall be used only for recreational, outdoor living purposes and not as carports, garages, storage rooms or habitable rooms.

SECTION AH102
~~DEFINITION~~ HEIGHT

~~**Patio covers.**~~ **AH102.1 Height.** Patio covers are limited to one-story structures not exceeding 12 feet (3657 mm) in height. ~~Enclosure walls shall be permitted to be of any configuration, provided the open or glazed area of the longer wall and one additional wall is equal to at least 65 percent of the area below a minimum of 6 feet 8 inches (2032 mm) of each wall, measured from the floor. Openings shall be permitted to be enclosed with (1) insect screening, (2) *approved* translucent or transparent plastic not more than 0.125 inch (3.2 mm) in thickness, (3) glass conforming to the provisions of Section R308, or (4) any combination of the foregoing.~~

~~SECTION AH103~~
~~PERMITTED USES~~

~~**AH103.1 General.** Patio covers shall be permitted to be detached from or attached to *dwelling units*. Patio covers shall be used only for recreational, outdoor living purposes and not as carports, garages, storage rooms or habitable rooms.~~

~~SECTION AH104~~
~~DESIGN LOADS~~

~~**AH104.1 General.** Patio covers shall be designed and constructed to sustain, within the stress limits of this code, all dead loads plus a minimum vertical live load of 10 pounds per square foot (0.48 kN/m^2) except that snow loads shall be used where such snow loads exceed this minimum. Such covers shall be designed to resist the minimum wind loads set forth in Table R301.2(1).~~

SECTION AH104
EXTERIOR WALLS AND OPENINGS

AH 104.1 Enclosure walls. Enclosure walls shall be permitted to be of any configuration, provided the open or glazed area of the longer wall and one additional wall is equal to at least 65 percent of the area below a minimum of 6 feet 8 inches (2032 mm) of each wall, measured from the floor. Openings shall be permitted to be enclosed with the following:

1. Insect screening,
2. Approved translucent or transparent plastic not more than 0.125 inch (3.2 mm) in thickness,
3. Glass conforming to the provisions of Section R308, or
4. Any combination of the foregoing.

~~SECTION AH105~~
~~LIGHT AND VENTILATION/EMERGENCY EGRESS~~

~~**AH105.1 General.**~~ **AH104.2 Light, ventilation and emergency egress.** Exterior openings required for light and ventilation shall be permitted to open into a patio structure conforming to Section AH101, provided that the patio structure shall be unenclosed if such openings are serving as emergency egress or rescue openings from sleeping rooms. Where such exterior openings serve as an exit from the *dwelling unit*, the patio structure, unless unenclosed, shall be provided with exits conforming to the provisions of Section R310 of this code.

SECTION AH105
STRUCTURAL PROVISIONS

~~**AH104.1 General.**~~ **AH 105.1 Design loads.** Patio covers shall be designed and constructed to sustain, within the stress limits of this code, all dead loads plus a minimum vertical live load of 10 pounds per square foot (0.48 kN/m^2) except that snow loads shall be used where such snow loads exceed this minimum. Such covers shall be designed to resist the minimum wind loads set forth in Table R301.2(1).

~~**SECTION AH106**~~
~~**FOOTINGS**~~

~~**AH106.1 General.**~~ **AH 105.2 Footings.** In areas with a frostline depth of zero as specified in Table R301.2(1), a patio cover shall be permitted to be supported on a slab on *grade* without footings, provided the slab conforms to the provisions of Section R506 of this code, is not less than 3.5 inches (89 mm) thick and the columns do not support live and dead loads in excess of 750 pounds (3.34 kN) per column.

(Renumber subsequent sections)

Reason: This language has long been included in Appendix I of the code. Although the term is defined in the Patio Cover Appendix, this appendix is not a mandatorily adopted part of the code.

Because the term patio cover is used in the main body of the code, the definition needs to be placed in Chapter 2. However because the existing definition contains many regulatory provisions, a new definition needs to be created, leaving the regulatory provisions in Appendix I of IBC and Appendix H of IRC. This provides an opportunity to restructure the provisions of the appendix to put related items together. The section by section changes are as follows:

- 202 – Definition. This is simply the essence that this is a one story structure of open construction that is associated with a dwelling unit which is limited in use.
- I101.1 General – The general provision is reduced to the general limitations on the location of the structure and its use. The details on bug screens are moved to I103
- I102.1 Height. This was the definition, but the all that is left from the definition is the height limitation. The wall and opening limits are moved to I103.
- I103 Exterior Walls and Openings. 103.1 is the new location of the opening limits formerly in the definition and the screening limits moved out of the General Section. 103.2 is the existing 103 section, but with the minor clarification that the exterior openings are those of the dwelling unit, not the patio cover.
- I104. Structural provisions are unchanged.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WALKER-G1-202-PATIO COVER.doc

G3–09/10
202

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC)

Revise as follows:

SECTION 202
DEFINITIONS

SECONDARY MEMBERS. The following structural members shall be considered secondary members and not part of the primary structural frame:

1. Structural members not having direct connections to the columns;
2. Members of the floor construction <u>and roof construction</u> not having direct connections to the columns; and
3. Bracing members other than those that are part of the primary structural frame.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Review of NIST WTC Recommendations". The scope of the activity is noted as:

> Review the recommendations issued by NIST in its report entitled "Final Report on the Collapse of the World Trade Center Towers", issued September 2005, for applicability to the building environment as regulated by the I-Codes. To evaluate the necessity of developing code changes in response to the NIST report.

The text for "primary structural frame" and "secondary members" was originally developed for placement in Section 704 on Fire-resistance Ratings of Structural Members (Section 714 in the 2006 IBC). At the most recent final action hearings, however, this text was relocated to Section 202 essentially without revision. In the 2009 IBC, bracing members are defined as members of the primary structural frame where they are essential to the stability of the primary structural frame under gravity loading regardless of whether they are designed to resist gravity loads. All other bracing members are defined as secondary members.

This proposal corrects the oversight that roof construction should be treated the same a floor construction within the context of secondary members.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HEILSTEDT-G7-202.doc

G4–09/10
202

Proponent: John England, MCO, England Enterprises Inc., representing the Cities of Beaufort and Hardeeville, SC

Revise definition as follows:

SECTION 202
DEFINITIONS

TOWNHOUSE. ~~A single-family *dwelling unit* constructed in a group of three or more attached units in which each unit extends from the foundation to roof and with open space on at least two sides~~. Single family Group R-3 dwelling unit with zero lot lines which are connected to other dwelling units where three or more exist. The units extend from the foundation to the roof and are open on two or more sides. When three or more townhouses are on the same property they are considered Group R-2 Apartments

Reason: To clarify the confusion of which code(s) applies Town houses build under the IRC are considered separate properties and are really houses with zero lot lines. They will have 2 hr fire walls build between them. They will be sprinkled with NFPA 13D requirements. Accessibility will not become an issue.

Townhouses which are on the same property and are rented are considered Group R-2 (Apartments) and need to be regulated by the IBC when it comes to fire partitions, NFPA 13R sprinklers and accessibility.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Changing the definition of townhouse may affect the scoping of the *International Building Code* and *International Residential Code.*

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENGLAND-G8-202-TOWNHOUSE.doc

G5–09/10
202; IRC R202

Proponent: Theresa Weston, PhD., DuPont Building Innovations

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC GENERAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

Revise definition as follows:

SECTION 202
DEFINITIONS

VAPOR-PERMEABLE MEMBRANE. A material or covering having a permeance rating of ~~5~~ 10 perms (~~52.9~~ 5.7 x 10^{-10} kg/Pa●s●m^2) or greater, when tested in accordance with the desiccant method using Procedure A of ASTM E 96. A vapor-permeable material permits the passage of moisture vapor.

PART II – IRC BUILDING/ENERGY

Revise definition as follows:

SECTION R202
DEFINITIONS

VAPOR PERMEABLE MEMBRANE. A material or covering having a permeance rating of ~~5~~ 10 perms (~~2.9~~ 5.7 x 10^{-10} kg/Pa●s●m^2) or greater, when tested in accordance with the desiccant method using Procedure A of ASTME 96. A vapor permeable material permits the passage of moisture vapor.

Reason: (IBC) This change is to correct an apparent contradiction between definitions within the code. Currently, a *Class III Vapor Retarder* is defined as having a permeance between 1 and 10 perms, while a *Vapor-Permeable Membrane* is defined having vapor permeance greater than 5 perms. The permeance region of 5 to 10 perms is therefore both vapor permeable and vapor retarding. I propose resolving this contradiction by raising the vapor permeable minimum permeance to 10 perms. Additionally, currently the metric conversion number is incorrect and a correct metric conversion is provided in this change.

(IRC) This change is to correct an apparent contradiction between definitions within the code. Currently, a *Class III Vapor Retarder* is defined as having a permeance between 1 and 10 perms, while a *Vapor-Permeable Membrane* is defined having vapor permeance greater than 5 perms. The permeance region of 5 to 10 perms is therefore both vapor permeable and vapor retarding. I propose resolving this contradiction by raising the vapor permeable minimum permeance to 10 perms.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WESTON-G1-202.doc

G6–09/10
202, 304.1 (IFC 202)

Proponent: Ali M. Fattah, City of San Diego, San Diego Area Chapter ICC Code Committee

1. Add new definition as follows:

DEFINITIONS
SECTION 202

FIRE STATION. A building or a portion of a building used by fire and rescue personnel to store equipment and apparatus, for on site living quarters and for administrative and training spaces exclusively dedicated for use by fire station personnel.

2. Revise as follows:

304.1 (IFC 202) Business Group B. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

Airport traffic control towers
Ambulatory health care facilities
Animal hospitals, kennels and pounds
Banks
Barber and beauty shops
Car wash
Civic administration
Clinic—outpatient
Dry cleaning and laundries: pick-up and delivery stations and self-service
Educational occupancies for students above the 12th grade

Electronic data processing
Fire Stations
Laboratories: testing and research
Motor vehicle showrooms
Post offices
Print shops
Professional services (architects, attorneys, dentists, physicians, engineers, etc.)
Radio and television stations
Telephone exchanges
Training and skill development not within a school or academic program

Reason: This proposed change is to update the 2009 IBC due to recently adopted and published changes to Section 508 in the prior code change cycle. The code change also adds clarity since most designers and building officials we contacted consider the fire station to be a use that falls into one occupancy category. Just like a dwelling can have a garage and a storage area a fire station has an apparatus room, office and training space as well as living quarters for personnel to be comfortably accommodated while on standby awaiting deployment to a call. Currently Fire Stations are not classified and as a result the code forces an un-separated mixed occupancy building design that includes Group R-3 congregate residence, Group S-2 parking, Group B business (office/training) and therefore the 2009 IBC requires the following additional fire protection due to the R-3 occupancy classification: a one-hour occupancy separation between the living quarters and the rest of the fire station as well as a fire suppression system throughout the building. NFPA 13-D is the sprinkler design and installation standard for residential occupancies such as R-3 but would not be appropriate for a fire station which would be most likely protected with a NFPA 13-R or full NFPA 13 system.

Many fire stations have been protected voluntarily with a fire sprinkler system, and in some cases are located in jurisdictions where all buildings require sprinkler protection and therefore so are fire stations. The one hour occupancy separation required in Section 508.2.4 Exception 3, does not allow R-3 occupancies to be non-separated uses. The occupancy separation will be onerous since in many fire stations living quarters can occupy one half of the floor area and can be immediately adjacent to or above the apparatus room and office spaces.

The primary use for a fire station is not for living but for storage of apparatus and to stage fire and rescue personnel prior to deployment. Fire fighters are able bodied and on duty when at the fire station. The 1997 UBC in Section 304.1 item 12 classifies a fire station as a Group B occupancy, as did the 2000 IBC when first published. The 2000 IBC was changed in code Change G20-01 submitted by William Koffel without substantiation, the argument was that a fire station is mixed occupancy and that non-separated use option is available. The 2009 CBC has now changed to require separations for R-3 occupancies despite the non-separated use option. Additionally there were concerns that fire stations in some communities can contain community rooms. The 2009 IBC includes requirements for live-work, however it was not the intent of the proponents of live-work-units to include fire stations which can be considered a place of work where employees live. The only alternative without approval of this code change is to consider the fire station a mixed use occupancy building. By adding the fire station definition, the code change makes clear that when located as a part of a building or as a standalone unit only the fire station operation shall be classified as a Group B occupancy.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FATTAH-G1-304.1.doc

G7–09/10
202

Proponent: Phillip A. Brown, American Fire Sprinkler Association

Add new definition as follows:

SECTION 202
DEFINITIONS

LIMITED-COMBUSTIBLE MATERIAL. A building construction material that in the form it is used has a potential heat release value not exceeding 3,500 Btu per pound.

Reason: A definition needs to be added to define Limited-Combustible Material. The IBC and IFC do not provide a definition of limited combustible construction. But both the IBC and IFC send you to Section 903.3 for the requirements of providing fire sprinklers protection. And as explained in Section 903.3.1 of the 2006 IBC Code and Commentary automatic sprinkler systems are to be installed to comply with the code and NFPA 13, 13R or 13D. NFPA 13:8.15.1.2.1 and 8.15.1.2.10 sets the criteria that will allow for the omission of sprinkler protection, as such explained in the IBC Commentary, the IBC will also allow this. If the IBC or IFC did not want to allow this it would have addressed it as it does in Section 903.3.1.2.1 which requires the sprinklering of balconies and decks where the building is of Type V construction.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The term 'limited-combustible material' is not presently used in the IBC. A proposal by Ohler for Section 3302 does include the use of this term.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BROWN-G1-202 (NEW).doc

G8–09/10
202, 3103.1

Proponent: Patrick Vandergriff, Vandergriff Code Consulting Services

1. Add new definition as follows:

SECTION 202
DEFINITIONS

MODULAR BUILDING. Prefabricated structures that are manufactured off site and constructed in accordance with the adopted code at the time of construction. Modular buildings are delivered to the customer in one or more complete modular sections for either temporary or permanent installation.

2. Revise as follows:

3103.1 General. The provisions of this section shall apply to structures erected for a period of less than ~~180 days~~ 24 months for modular buildings and similar structures. Tents and other membrane structures erected for a period of less than 180 days shall comply with the *International Fire Code*. Those erected for a longer period of time shall comply with applicable sections of this code.

Reason: Sec. 3103.1. This change provides for time period for temporary structures that is more in keeping with the issue of buildings used as temporary offices and temporary use buildings during construction projects and for other purposes where the old 180 days is simply not going to cover it. It keeps the building official from having to repeatedly review and re-issue permission over and over on such uses which have become common within the industry. It also provides a vehicle for separating modular or other code constructed structures from the Tent and membrane structures.

Definition: There is currently no definition within the code for a modular structure. This language provides a definition and establishes a basis for current proposed language and future development of requirements relative to modular construction building.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: This is one of several changes by this proponent which would add modular buildings into existing text, or adds specific text addressing modular buildings.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: VANDERGRIFF-G3-202.doc

G9–09/10
202

Proponent: Tony Crimi, A.C., Consulting Solutions Inc., representing North American Insulation Manufacturers Association

Add new definition as follows:

SECTION 202
DEFINITIONS

NONCOMBUSTIBLE MATERIAL. A material that will not ignite or burn when subjected to specified fire or heat conditions. Materials that meet the acceptance criteria of ASTM E 136 are considered noncombustible materials.

Reason: There is a need for a definition of "noncombustible material" in the IBC. Several of the I-Codes have varying definitions of the term "non-combustible material", each based upon the way in which the concept of "non-combustible" is used within that Code. Throughout the ICC code system, the concept of "noncombustible material" is based on the idea that the material should not ignite or burn when subjected to fire or heat The IBC, which uses the term extensively, does not contain a specific definition.

The concept of "noncombustible materials" and "noncombustibility" in terms of types of construction is widely used throughout the International Codes. While the IRC, IMC, and IWUIC all contain definitions of the term, they are all different from each other.

In contrast, the IBC, IFC, IEBC and IFGC do not contain a separate definition, even though they use the terminology "non-combustible materials". There is a need for a consistent definition of "noncombustible material" in all ICC codes that use the term.

In common usage, the term "noncombustible" is used to denote materials which do not ignite or are not capable of sustaining combustion. The common Dictionary definitions for "noncombustible" are typically as follows:

Noncombustible, adj – not capable of igniting and burning (Webster's Third New International Dictionary of the English Language, Unabridged, 2007)

In contrast to the common usage, the traditional use of the terminology and concept of "noncombustible materials" in the Codes has been based on acceptable performance when tested in accordance with ASTM E136, Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C. Materials passing the test are permitted limited flaming and other indications of combustion. However, these have traditional been acceptable. Understandably, ASTM E136 does not replicate the full spectrum of actual building fire exposure conditions. However, this test method does provide an assessment indicating those materials which do not act to aid combustion or add appreciable heat to an ambient fire.

While each of the model I-Codes which reference the term "noncombustible" do have unique additional attributes, we are in agreement with the original proponent, that these are best addressed outside of the definition. For example, section 703.4 of the IBC does provide additional requirements and acceptance criteria which are specific to its own intent and contained in Sections 602.2, 602.3, and 602.4. However, this section only describes "Noncombustibility Tests", rather than providing a definition.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRIMI-G2-202.doc

G10–09/10
303.1 (IFC [B] 202)

Proponent: Ron Hoover, City of Marion, Alburnett Fire, representing self

Revise as follows:

303.1 (IFC [B] 202) Assembly Group A. Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption or awaiting transportation.

Exceptions:

1. A building or tenant space used for assembly purposes with an *occupant load* of less than 50 persons shall be classified as a Group B occupancy.
2. A room or space used for assembly purposes with an *occupant load* of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.
3. A room or space used for assembly purposes that is less than 750 square feet (70m^2) in area and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.
4. ~~Assembly areas~~ A room or space used for assembly purposes that ~~are~~ is ~~accessory to~~ associated with a Group E ~~occupancies~~ occupancy ~~are not considered separate~~ shall be classified as a Group E ~~occupancies~~ occupancy ~~except when applying the assembly occupancy requirements of Chapter 11~~.
5. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.

(Portions of text not shown remain unchanged)

Reason: In previous Code cycles, the wording of this exception was extracted from the general requirement of Section 303 and moved to Section 508, then moved back to 303.1 as an exception. In doing so, the text was changed slightly and the logic of English language was lost, resulting in an exception that is not consistent in format with other exceptions to 303.1 and is not logical in literal meaning. The proposed change will recapture the original intent of this exception in concise language that is consistent with the remainder of this section. Change of wording from 'accessory to' to 'associated with' will clarify that these areas are not separate accessory occupancies subject to the provisions of Section 508.2 and individually classified, but are part of the primary occupancy to which they are associated, and classified accordingly. This exception is an exception only to the occupancy classification and not an exception to the requirements found elsewhere in the Code. By referencing only Chapter 11 in this exception, the code user is left to think that they don't have to comply with other assembly provisions of Chapter 10 or other Code sections. It is not necessary to state here that these areas must comply with the Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The phrase "accessory to Group E occupancies" also occurs in Sections 1010.2, 1014.3, 1028.1, 1028.2, 1028.3 and 1028.9. If this proposal is approved, staff will editorially revise the other sections.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOOVER-G1-303.1

G11–09/10
303.1 (IFC [B] 202)

Proponent: Ron Hoover, City of Marion, Alburnett Fire, representing self

Revise as follows:

303.1 (IFC [B] 202) Assembly Group A. Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for the purposes such as civic, social or religious functions; recreation, food or drink consumption or awaiting transportation.

Exceptions:

1. A building or tenant space used for assembly purposes with an *occupant load* of less than 50 persons shall be classified as a Group B occupancy.
2. A room or space used for assembly purposes with an *occupant load* of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.
3. A room or space used for assembly purposes that is less than 750 square feet (70m_2) in area and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.
4. Assembly areas that are accessory to Group E occupancies are not considered separate occupancies except when applying the assembly occupancy requirements of Chapter 11.
5. ~~Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.~~

Assembly occupancies shall include the following:

A-3 Assembly uses intended for worship, recreation or amusement and other assembly uses not classified elsewhere in Group A including, but not limited to:

Amusement arcades
Art galleries
Bowling alleys
Community halls
Courtrooms
Dance halls (not including food or drink consumption)
Exhibition halls
Funeral parlors
Gymnasiums (without spectator seating)
Indoor swimming pools (without spectator seating)
Indoor tennis courts (without spectator seating)
Lecture halls
Libraries
Museums
Places of religious worship
Pool and billiard parlors
<u>Religious education rooms</u>
Waiting areas in transportation terminals

(Portions of text not shown remain unchanged)

Reason: In previous Code cycles, the wording of this exception was extracted from the general requirement of Section 303 and moved to Section 508, then moved back to 303.1 as an exception for the 2009 Edition. In doing so, the text was changed slightly and the logic of English language was lost, resulting in an exception that is not consistent in format with other exceptions to 303.1 and is not logical in literal meaning. The threshold of occupant load less than 100 in the current Code language would put in doubt the proper classification of similar uses with an occupant load greater than 100 and is not needed. The Current Code language is more clarification that the uses described are indeed assembly rather than an exception to assembly classification, it is appropriate to delete the exception and insert “religious educational rooms” in the list of A-3 uses. Religious auditoriums would be included in the current list as “Lecture halls”.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOOVER-G2-303.1

G12–09/10
303.1 (IFC [B] 202)

Proponent: Ron Hoover, City of Marion, Alburnett Fire, representing self

Revise as follows:

303.1 (IFC [B] 202) Assembly Group A. Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for the purposes such as civic, social or religious functions; recreation, food or drink consumption or awaiting transportation.

Exceptions:

1. A building or tenant space used for assembly purposes with an *occupant load* of less than 50 persons shall be classified as a Group B occupancy.
2. A room or space used for assembly purposes with an *occupant load* of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.
3. A room or space used for assembly purposes that is less than 750 square feet (70m_2) in area and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.
4. Assembly areas that are accessory to Group E occupancies are not considered separate occupancies except when applying the assembly occupancy requirements of Chapter 11.
5. ~~Accessory~~ A room or space used for religious education ~~educational rooms and~~ or as a religious auditorium ~~auditoriums with occupant loads of less than 100 are not considered separate occupancies~~ and associated with a Group A-3 occupancy place of religious worship shall be classified as a Group A-3 occupancy.

(Portions of text not shown remain unchanged)

Reason: In previous Code cycles, the wording of this exception was extracted from the general requirement of Section 303 and moved to Section 508, then moved back to 303.1 as an exception for the 2009 Edition. In doing so, the text was changed slightly and the logic of English language was lost, resulting in an exception that is not consistent in format with other exceptions to 303.1 and is not logical in literal meaning. The proposed change will recapture the original intent of this exception in concise language that is consistent with the remainder of this section. The threshold of occupant load less than 100 was removed in the proposed language because an occupant load of greater than 100 would also be classified as an assembly Group A-3. The current Code language would put in doubt the proper classification of similar uses with an occupant load greater than 100. Change of wording from 'accessory to' to 'associated with' will clarify that these areas are not separate accessory occupancies subject to the provisions of Section 508.2 and individually classified, but are part of the primary occupancy to which they are associated, and classified accordingly.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOOVER-G3-303.1.doc

G14–09/10
303.1 (IFC [B] 202)

Proponent: Stephen Thomas, Colorado Code Consulting, LLC representing the Colorado Chapter ICC

Revise as follows:

303.1 (IFC [B] 202) Assembly Group A. Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption or awaiting transportation.

A-2 Assembly uses intended for food and/or drink consumption including, but not limited to:

Banquet halls
Casinos
Night clubs
Restaurants
Taverns and bars

(Portions not shown are unchanged.)

Reason: Casinos are being constructed across the country. These occupancies are sometimes very large. The current code does not specify the occupancy classifications for casinos. Therefore, different classifications are given by building departments and there is inconsistency between jurisdictions. Some jurisdictions classify casinos as Group A-2 and other classify them as Group A-3. This proposal designates casinos as A-2 occupancies. This is the occupancy that is used by the Southern Nevada area including the Las Vegas and Clark County. The A-2 occupancy classification is also appropriate because the casinos have similar hazard characteristics of the other uses in this category. There are distracting lights, sounds, decorations and in some cases alcohol being served. The occupants can become disoriented and confused in an emergency condition and have difficulty finding the exits. Therefore, it seems reasonable to place casinos in the Group A-2 Occupancy Classification.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THOMAS-G4-303.1

G15–09/10

202, 304.1 (IFC [B] 202), 304.1.1 304.2, 422, 710.5, [F] 903.2.2, [F] 903.3.2, [F] 907.2.2, [F] 907.2.2.1 (IFC 903.2.2, 903.3.2, 907.2.2, 907.2.2.1)

Proponent: Paul K. Heilstedt, PE, Chair, representing ICC Code Technology Committee (CTC)

1. Revise as follows:

304.1 (IFC [B] 202) Business Group B. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

Ambulatory ~~health~~ care facilities
Clinic – outpatient

(Portions of list not shown remain unchanged)

~~304.1.1~~ 304.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

(Relocate definition for Ambulatory Health Care Facilities from Section 202, and revise)

AMBULATORY ~~HEALTH~~ CARE FACILITY. Buildings or portions thereof used to provide medical, surgical, psychiatric, nursing or similar care on a less than 24-hour basis to individuals who are rendered incapable of self-preservation by the services provided.

CLINIC-OUTPATIENT. Buildings or portions thereof used to provide medical care on less than a 24-hour basis to individuals who are not rendered incapable of self-preservation by the services provided.

SECTION 422
AMBULATORY ~~HEALTH~~ CARE FACIILITIES

422.1 General. Occupancies classified as ~~Group B~~ ambulatory ~~health~~ care facilities shall comply with the provisions of Sections 422.1 through ~~422.6~~ 422.7 and other applicable provisions of this code.

422.2 Separation. Ambulatory care facilities where the potential for four or more care recipients are to be incapable of self preservation at any time, whether rendered incapable by staff or staff accepted responsibility for a care recipient already incapable, shall be separated from adjacent spaces, corridors or tenants with a fire partition installed in accordance with Section 708.

~~422.2~~ 422.3 Smoke ~~barriers~~ compartments. ~~Smoke barriers shall be provided to subdivide every~~ Where the aggregate area of one or more ambulatory ~~health~~ care facilities ~~greater than~~ exceeds 10,000 square feet on one story, the story shall be provided with a smoke barrier to subdivide the story into not less than ~~into a minimum of~~ two smoke compartments ~~per story~~. The area of any one such smoke compartment shall not exceed 22,500 square feet (2092 m^2). The travel distance from any point in a smoke compartment to a smoke barrier door shall not exceed 200 feet (60 960 mm). The smoke barrier shall be installed in accordance with Section 710 with the exception that smoke barriers shall be continuous from outside wall to an outside wall, a floor to a floor, or from a smoke barrier to a smoke barrier or a combination thereof.

~~422.3~~ **422.4 Refuge area.** At least 30 net square feet (2.8 m^2) per nonambulatory ~~patient~~ care recipient shall be provided within the aggregate area of corridors, ~~patient~~ care recipient rooms, treatment rooms, lounge or dining areas and other low-hazard areas ~~on each side of each smoke barrier~~ within each smoke compartment. Each occupant of an ambulatory care facility shall be provided with access to a refuge area~~s~~ without passing through or utilizing adjacent tenant spaces.

~~422.4~~ **422.5 Independent egress.** A means of egress shall be provided from each smoke compartment created by smoke barriers without having to return through the smoke compartment from which means of egress originated.

~~422.5~~ **422.6 Automatic sprinkler systems.** Automatic sprinklers systems shall be provided for ambulatory care facilities in accordance with Section 903.2.2.

~~422.6~~ **422.7 Fire alarm systems**. A fire alarm system shall be provided for ambulatory care facilities in accordance with Section 907.2.2.1.

710.5 Openings. Openings in a *smoke barrier* shall be protected in accordance with Section 715.

Exceptions:

1. In Group I-2 and ambulatory care facilities, where doors are installed across *corridors*, a pair of opposite-swinging doors without a center mullion shall be installed having vision panels with fire-protection-rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested. The doors shall be close fitting within operational tolerances, and shall not have undercuts in excess of 3/4-inch, louvers or grilles. The doors shall have head and jamb stops, astragals or rabbets at meeting edges and shall be automatic closing by smoke detection in accordance with Section 715.4.8.3. Where permitted by the door manufacturer's listing, positive-latching devices are not required.
2. In Group I-2 and ambulatory care facilities, horizontal sliding doors installed in accordance with Section 1008.1.4.3 and protected in accordance with Section 715.

[F] 903.2.2 (IFC 903.2.2) ~~Group B~~ ambulatory ~~health~~ care facilities. An automatic sprinkler system shall be installed throughout all fire areas containing an ~~Group B~~ ambulatory ~~health~~ care facility ~~occupancy~~, when either of the following conditions exist at any given time:

1. Four or more care recipients are incapable of self preservation, whether rendered incapable by staff or staff have accepted responsibility for care recipients already incapable.
2. One or more care recipients that are incapable of self preservation are located at other than the level of exit discharge.

In buildings where care is provided on levels other than the level of exit discharge, an automatic sprinkler system shall be installed on the entire floor where care is provided as well as all floors below, and all floors between the level of care and the closest level of exit discharge.

[F] 903.3.2 (IFC 903.3.2) Quick-response and residential sprinklers. Where automatic sprinkler systems are required by this code, quick-response or residential automatic sprinklers shall be installed in the following areas in accordance with Section 903.3.1 and their listings:

1. Throughout all spaces within a smoke compartment containing ~~patient~~ sleeping units in Group I-2 in accordance with this code.
2. Throughout all spaces within a smoke compartment containing treatment rooms in ambulatory care facilities.
3. ~~2.~~ Dwelling units, and sleeping units in Group R and I-1 occupancies.
4. ~~3.~~ Light-hazard occupancies as defined in NFPA 13.

[F] 907.2.2 (IFC 973.2.2) Group B. A manual fire alarm system shall be installed in Group B occupancies where one of the following conditions exists:

1. The combined Group B *occupant load* of all floors is 500 or more.
2. The Group B *occupant load* is more than 100 persons above or below the lowest *level of exit discharge*.
3. The ~~Group B~~ *fire area* contains a ~~Group B~~ ambulatory ~~health~~ care facility.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

[F] 907.2.2.1 (IFC 907.2.2.1) ~~Group B~~ ambulatory ~~health~~ care facilities. Fire areas containing ~~Group B~~ ambulatory ~~health~~ care facilities shall be provided with an electronically supervised automatic smoke detection system installed within the ambulatory ~~health~~ care facility and in public use areas outside of tenant spaces, including public *corridors* and elevator lobbies.

Exception: Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, provided the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

Reason: Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Care Facilities". The scope of the activity is noted as: Study issues associated with Day Care/Adult Care, Ambulatory Health Care and Assisted Living facilities with an emphasis on the number of occupants in relation to the supervision, and the determination of the resident's capability of responding to an emergency situation without physical assistance from the facility's supervision.

The Code Technology Committee Study Group on Care Facilities has conducted a comprehensive review of current building and fire codes, federal regulations and prior code change proposals dealing with the provision of "care". "Care" as it relates to the scope of this work relates to an occupant of a building who is compromised (mentally or physically) and receives some type of support (care). These facilities encompass a full spectrum of acuity and span a wide range of occupancy types including Groups B, E, I and R. On the lower end of the spectrum, occupants may be aged and receive occasional day living assistance such as cooking and cleaning. On the opposite end of the spectrum, occupants may be completely bedridden and dependant on medical gases and emergency power to maintain life.

The proposed changes provide clear direction for design and construction by using terms and concepts consistently and clearly identifying thresholds related to the condition of an occupant. Federal regulations and state licensing provisions were considered, but primarily in terms of avoiding conflicting requirements. It is not the intent of these changes to address licensing or operational issues. We do believe that the proposed changes will provide consistent and correlated language between these multiple sources of regulations that will help design and code professionals address the needs of care recipients in the many different types of facilities.

A major goal is to provide clarity and consistency of terminology. New definitions are added to specifically describe each type of care or facility and identify the distinct differences in these. Some terms are consolidated to be more descriptive of a group of occupants, yet generic enough to be used interchangeably. For example: a "Patient" is now identified as a "care recipient" and "nurse" is now "care provider". People receive care of varying types but they are not always referred to as "patients". They receive care from a wide range of persons with different technical abilities, not just a "nurse" or "staff". Other definitions address existing terms not defined within current code. The study group believes that these changes bring a practical response to the recent developments within the healthcare delivery system.

Ambulatory Care Facilities, Section 422 and related sections

This public comment represents the collaborative efforts to address the more specifically concerns regarding these uses over the past several cycles.

Change modifying the existing language includes:

- Remove an unneeded reference to "Health" as the definition clearly expresses that these types of facilities are related to some form or care. Also relocate the definition to Section 304.2 to align with the formatting of other Groups that provide definitions for special occupancies within that specifically related section.
- Remove an unneeded reference to "Group B" whenever the term Ambulatory Health Care Facility is used.
- Added Section 422.2 to require fire partition separation from adjacent spaces in facilities with greater than 4 care recipients. The intent is to subdivide the floor to allow for a reasonable level of safety for care recipients who made need assistance to evacuate, or to allow for the option of protecting in place for a limited period of time.
- Modified the continuity requirements of a smoke barrier to deal with intersection or connection to adjacent tenants, and maintain the integrity and safety.
- Several of these changes are mindful of existing buildings to allow for renovations without going into other tenant spaces.
- Added 22,500 square foot limit to a smoke compartment, similar to Group I-2s.
- For multiple tenant spaces, language is added to the area of refuge requirements to clarify that the area of refuge must be accessed without going through adjacent tenant spaces.

Correlative changes to Sections 710, 903 and 907 are bringing consistency of terminology and provision cross references.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HEILSTEDT-G2-304.1.doc

G16–09/10

305.1, 305.2 (New), 305.2 (IFC [B] 202); 308.5, 308.5.1, 308.5.2 (IFC [B] 202), 310.2; [F] 903.2.6 (IFC 903.2.6); 1015.1, Table 1015.1, 1015.7 (New), 1021.2, Table 1021.2 (IFC [B] 1015.1, Table 1015.1, 1015.7 (New), 1021.2, Table 1021.2); 1103.2.12; [P] Table 2902.1, [P] 2903.1, [P] 2903.2 (IPC Table 403.1, 403.1, 403.2)

Proponent: Paul K. Heilstedt, PE, Chair, representing ICC Code Technology Committee (CTC)

1. Revise as follows:

SECTION 305
EDUCATIONAL GROUP E

305.1 (IFC [B] 202) Educational Group E. Educational Group E occupancy includes, among others, the use of a building or structure, or a portion thereof, by six or more persons at any one time for educational purposes through the 12th grade.

Exception: Religious educational rooms and religious auditoriums, which are accessory to *places of religious worship* in accordance with Section 303.1 and have *occupant loads* of less than 100, shall be classified as a Group A-3 occupancies.

305.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

(Relocate definition for Personal Care Service from Section 310.2, and revise)

PERSONAL CARE SERVICE. The care of ~~residents~~ occupant's who do not require ~~chronic or convalescent~~ medical ~~or nursing~~ care. Personal care involves responsibility for the safety of the ~~residents~~ occupants while inside the building.

~~**305.2**~~ **305.3 (IFC [B] 202) Group E, Day care facilities.** The use of a building or structure, or portion thereof, for educational, supervision or *personal care services* or more than five children older than 2 1/2 years of age, shall be classified as a Group E occupancy.

A facility such as the above within a dwelling unit and having five or fewer persons shall be classified as a Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2.

SECTION 308
INSTITUTIONAL GROUP I

308.5 (IFC [B] 202) Group I-4, day care facilities. This group shall include buildings and structures occupied by persons of any age who receive custodial care for less than 24 hours by individuals other than parents or guardians, relatives by blood, marriage or adoption, and in a place other than the home of the person cared for. ~~A facility such as the above five or fewer persons shall be classified as a Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2. Places of worship during religious functions are not included.~~ This group shall include, but not be limited to, the following:

Adult day care
Child day care

~~**308.5.1 (IFC [B] 202) Adult care facility.** A facility that provides accommodations for less than 24 hours for more than five unrelated adults and provides supervision and custodial care shall be classified as Group I-4.~~
~~**Exception:** A facility where occupants are capable of responding to an emergency situation without physical assistance from the staff shall be classified as Group R-3.~~

~~**308.5.2 (IFC [B] 202) Child care facility.** A facility that provides supervision and custodial care on less than a 24-hour basis for more than five children 2 1/2 years of age or less shall be classified as Group I-4.~~

Exceptions:

1. A child day care facility that provides custodial care for more than five but no more than 100 children 2-1/2 years or less of age, when the rooms where such children are cared for are located on the level of exit discharge and each of these child care rooms has an exit door directly to the exterior, shall be classified as Group E.
2. Rooms and spaces within places of worship providing such care during religious functions shall be classified as part of the primary occupancy.

A facility such as the above within a dwelling unit and having five or fewer persons shall be classified as a Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2.

[F] 903.2.6 (IFC 903.2.6) Group I. An *automatic sprinkler system* shall be provided throughout buildings with a Group I *fire area*.

Exceptions:

1. An *automatic sprinkler system* installed in accordance with Section 903.3.1.2 or 903.3.1.3 shall be allowed in Group I-1 facilities.
2. An *automatic sprinkler system* is not required where day care facilities are at the *level of exit discharge* and where every room where care is provided has at least one exterior *exit* door.
3. In buildings where Group I-4 day care is provided on levels other than the level of exit discharge, an automatic sprinkler system in accordance with 903.3.1.1 shall be installed on the entire floor where care is provided as well as all floors below, and all floors between the level of care and the closest level of exit discharge.

1015.1 (IFC [B] 1015.1) Exits or exit access doorways from spaces. Two *exits* or *exit access doorways* from any space shall be provided where one of the following conditions exists:

Exception: Group I-2 occupancies shall comply with Section 1014.2.2 through 1014.2.7.

1. The *occupant load* of the space exceeds one of the values in Table 1015.1.

   Exception: In Group R-2 and R-3 occupancies, one *means of egress* is permitted within and from individual dwelling units with a maximum *occupant load* of 20 where the dwelling unit is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

2. The *common path of egress travel* exceeds one of the limitations of Section 1014.3.
3. Where required by Section 1015.3, 1015.4, 1015.5, 1015.6 ~~or~~ 1015.6.1, or 1015.7.

Where a building contains mixed occupancies, each individual occupancy shall comply with the applicable requirements for that occupancy. Where applicable, cumulative *occupant loads* from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1.

TABLE 1015.1 (IFC [B] TABLE 1015.1)
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAXIMUM OCCUPANT LOAD
A, B, E[a], F, M, U	49
H-1, H-2, H-3	3
H-4, H-5, I-1, I-3, I-4, R	10
S	29

~~a. Day care maximum occupant load is 10.~~

2. Add new text as follows:

1015.7 (IFC [B] 1015.7) Day care means of egress. Day care facilities, rooms or spaces where care is provided for more than 10 children that are 2-1/2 years of age or less, shall have access to not less than two exits or exit access doorways.

3. Revise as follows:

1021.2 (IFC [B] 1021.2) Single exits. Only one *exit* shall be required from Group R-3 occupancy buildings or from stories of other buildings as indicated in Table 1021.2. Occupancies shall be permitted to have a single *exit* in buildings otherwise required to have more than one *exit* if the areas served by the single *exit* do not exceed the limitations of Table 1021.2. Mixed occupancies shall be permitted to be served by single *exits* provided each individual occupancy complies with the applicable requirements of Table 1021.2 for that occupancy. Where applicable, cumulative *occupant loads* from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1. Basements with a single *exit* shall not be located more than one *story* below *grade plane*.

TABLE 1021.2 (IFC [B] TABLE 1021.2)
STORIES WITH ONE EXIT

STORY	OCCUPANCY	MAXIMUM OCCUPANTS (OR DWELLING UNITS) PER FLOOR AND TRAVEL DISTANCE
First story or basement	A, B[d], E[e], F[d], M, U, S[d]	49 occupants and 75 feet travel distance
	H-2, H-3	3 occupants and 25 feet travel distance
	H-4, H-5, I, R	10 occupants and 75 feet travel distance
	S[a]	29 occupants and 100 feet travel distance
Second story	B[b], F, M, S[a]	29 occupants and 75 feet travel distance
	R-2	4 dwelling units and 50 feet travel distance
Third story	R-2[c]	4 dwelling units and 50 feet travel distance

For SI: 1 foot = 304.8 mm.

a. For the required number of exits for parking structures, see Section 1021.1.2.
b. For the required number of exits for air traffic control towers, see Section 412.3.
c. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1029.
d. Group B, F and S occupancies in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall have a maximum travel distance of 100 feet.
~~e. Day care occupancies shall have a maximum occupant load of 10.~~

1103.2.12 Day care facilities. Where a day care facility ~~(Groups A-3, E, I-4 and R-3)~~ is part of a dwelling unit, only the portion of the structure utilized for the day care facility is required to be accessible.

[P] TABLE 2902.1 (IPC TABLE 403.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]
(See Sections 2902.2 and 2902.3)

No.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 419.2 OF THE INTERNATIONAL PLUMBING CODE)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAINS [e, f] (SEE SECTION 410.1 OF THE INTERNATIONAL PLUMBING CODE)	OTHER
				MALE	FEMALE	MALE	FEMALE			
5	Institutional	I-4	Adult day care and child <u>day</u> care	1 per 15		1 per 15		1	1 per 100	1 service sink

(Portions of table not shown remain unchanged)

[P] 2903.1 (IPC 403.1) Water closet compartment. Each water closet utilized by the public or employees shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy.

Exceptions:

1. Water closet compartments shall not be required in a single-occupant toilet room with a lockable door.
2. Toilet rooms located in ~~day care and~~ child <u>day</u> care facilities and containing two or more water closets shall be permitted to have one water closet without an enclosing compartment.
3. This provision is not applicable to toilet areas located within Group I-3 housing areas.

[P] 2903.2 (IPC 403.2) Urinal partitions. Each urinal utilized by the public or employees shall occupy a separate area with walls or partitions to provide privacy. The walls or partitions shall begin at a height not more than 12 inches (305 mm) from and extend not less than 60 inches (1524 mm) above the finished floor surface. The walls or partitions shall extend from the wall surface at each side of the urinal a minimum of 18 inches (457 mm) or to a point not less than 6 inches (152 mm) beyond the outermost front lip of the urinal measured from the finished back wall surface, whichever is greater.

Exceptions:

1. Urinal partitions shall not be required in a single occupant or unisex toilet room with a lockable door.
2. Toilet rooms located in ~~day care and~~ child day care facilities and containing two or more urinals shall be permitted to have one urinal without partitions.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Care Facilities". The scope of the activity is noted as: Study issues associated with Day Care/Adult Care, Ambulatory Health Care and Assisted Living facilities with an emphasis on the number of occupants in relation to the supervision, and the determination of the resident's capability of responding to an emergency situation without physical assistance from the facility's supervision.

The Code Technology Committee Study Group on Care Facilities has conducted a comprehensive review of current building and fire codes, federal regulations and prior code change proposals dealing with the provision of "care". "Care" as it relates to the scope of this work relates to an occupant of a building who is compromised (mentally or physically) and receives some type of support (care). These facilities encompass a full spectrum of acuity and span a wide range of occupancy types including Groups B, E, I and R. On the lower end of the spectrum, occupants may be aged and receive occasional day living assistance such as cooking and cleaning. On the opposite end of the spectrum, occupants may be completely bedridden and dependant on medical gases and emergency power to maintain life.

The proposed changes provide clear direction for design and construction by using terms and concepts consistently and clearly identifying thresholds related to the condition of an occupant. Federal regulations and state licensing provisions were considered, but primarily in terms of avoiding conflicting requirements. It is not the intent of these changes to address licensing or operational issues. We do believe that the proposed changes will provide consistent and correlated language between these multiple sources of regulations that will help design and code professionals address the needs of care recipients in the many different types of facilities.

A major goal is to provide clarity and consistency of terminology. New definitions are added to specifically describe each type of care or facility and identify the distinct differences in these. Some terms are consolidated to be more descriptive of a group of occupants, yet generic enough to be used interchangeably. For example: a "Patient" is now identified as a "care recipient" and "nurse" is now "care provider". People receive care of varying types but they are not always referred to as "patients". They receive care from a wide range of persons with different technical abilities, not just a "nurse" or "staff". Other definitions address existing terms not defined within current code. The study group believes that these changes bring a practical response to the recent developments within the healthcare delivery system.

Day Care Facilities, Section 305.3 and related sections

This public comment represents the collaborative efforts of the CTC Study Group on Care to clarify the scope and intent of the code as it applies to the subject of when care is provided and what are the appropriate elements of the building code to address the risks associated with Day Care. Changes to modify the existing language include:

- Changing the provisions for religious educational facilities to become an exception.
- Adding a definition section for the educational group and moving the definition of personal care services from 310.2 to 305.2, clarifying the day care as a day care facility, and adding the correlation to classify that a Group E, day care facility with five or fewer is allowed in an R-3 or may be constructed per the IRC.
- Adding clarifications to the I-4 Group to include both adult and child day care services, and adding an exception for such services within a place of worship, and clarifying that day care facility with five or fewer is allowed in an R-3 or may be constructed per the IRC.
- Correlating the requirements for fire suppression in Chapter 9 with the provisions for day care.
- Clarifying the requirement for means of egress from day care where more than 10 children receive care.
- Removing the occupancy group designations from the scoping criteria in Chapter 11 as being unnecessary, C
- Clarifying that the plumbing table is applicable for day care, and that the exclusion for partitions is meant to apply to child day care, not all day care.

Issues concerning the multitude of occupancies, conflicting criteria and/or confusion between the occupancies identified as "Day Care vs. Child or Adult Day Care" were the initial impetus for the study of care. The overlap and inconsistencies for all types of care were eventually included once the true scope of the issues was recognized.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HEILSTEDT-G3-305.1.doc

G17–09/10
305.3 (New) [IFC [B] 202 (New)]

Proponent: James R. Mason, III, Home School Legal Defense Association (HSLDA)

Add new text as follows:

305.3 (IFC [B] 202) Home education. The use of a portion of a dwelling unit for a home school or private school for children who normally reside in the dwelling unit shall be classified the same occupancy as the dwelling unit.

Reason: Home School Legal Defense Association is a national organization that exists to protect the right of parents to teach their children at home. With over 85,000 member families across the United States, we are the largest homeschooling association in the world. Recently we have run into some difficulty with officials who believe that residences where children both reside and are home educated should be classified as school buildings. For families with six or more children, this would mean that their home must comply with all school fire and safety codes—an extremely burdensome requirement, and not at all in line with the intent of building and fire codes. This is no small problem; the Department of Education recently estimated that over 1.5 million children are taught by their parents in their own home.[1]

Most recently, this issue arose in Ohio, a state where families have the option of teaching their own children by filing either as a homeschool or as a religious private school. The Ohio Department of Education has taken the position that families with more than six children who file as a private school must also ensure that their homes comply with the building and safety requirements of Educational Group E; even though these are "private schools" only on paper and actually consist of parents educating only their own children in their own residences. On April 20, 2009, a Hearing Officer agreed with the Department, stating that Educational Group E "applies, ***inter alia***, if a structure or part thereof is used for educational purposes by six or more persons. This provision does not provide an exception for structures which also serve other purposes (such as homes), nor does it distinguish between 'persons' who are family members and those who are not." (Report and Recommendation of Hearing Officer, April 17, 2009, Attachment A) On June 12, 2009, the Ohio Department of Education adopted the Hearing Officer's decision.

To prevent this problem, we are proposing a clarification, not an alteration. Teaching one's own children in one's own home does not transform the residence into a school building, as is clear from a detailed reading of the building and residential codes. However, such a conclusion is never explicitly stated within the ICC codes, leading some education officials to erroneously conclude that parents who teach six or more of their own children in their residence automatically convert the residence to a school building, subject to all school building requirements.

Other organizations associated with safety codes have already recognized the need for a clarification. The NFPA codes read: "In cases where instruction is incidental to some other occupancy, the section of this *Code* governing such other occupancy shall apply." (101 Life Safety Code, 6.1.33; 14.1.4.3; & 15.1.4.3, Attachment B). The North Dakota Supreme Court has applied the NFPA clarification to homeschoolers. (*Birst v. Stansted,* 493 N. W. 2d 690 (1992), Attachment C) In California, where the same issue came up tangentially in 2008, the Fire Marshall had already clarified the ICC codes with the following caveat to Educational Group E: "Exception: A residence used as a home school for the children who normally reside at the residence. Such residences shall remain classified as Group R-2, or Group R-3." (California Fire Code, Attachment D)

Since the way homeschooling is defined varies by state, with some states labeling them "homeschools" while other states require parents to file as home-based private schools, the clarification for homeschooling needs to be broad enough to account for variation between state statutes. This proposed wording accounts for the variety between states. Such a clarification in the IBC would pre-empt the confusion brought on by erroneous readings of the codes and avoid the costly litigation that can result from such readings.

[1] National Center for Education Statistics Issue Brief, "1.5 Million Homeschooled Students in the United States in 2007," December 23, 2008, NCES 2009030, http://nces.ed.gov/pubs2009/2009030.pdf.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MASON-G1-305.3 (NEW)

G18–09/10
306.2 (IFC [B] 202)

Proponent: Stephen Thomas, Colorado Code Consulting, LLC representing the Colorado Chapter

Revise as follows:

306.2 (IFC [B] 202) Factory Industrial F-1 Moderate-hazard Occupancy. Factory industrial uses which are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

Aircraft (manufacturing, not to include repair)
Appliances
Athletic equipment
Automobiles and other motor vehicles
Bakeries
Beverages: over 16-percent alcohol content
Bicycles
Boats
Brooms or brushes
Business machines
Cameras and photo equipment
Canvas or similar fabric
Carpets and rugs (includes cleaning)
Clothing
<u>Commercial kitchens containing commercial cooking appliances</u>
Construction and agricultural machinery

Disinfectants
Dry cleaning and dyeing
Electric generation plants
Electronics
Engines (including rebuilding)
Food processing
Furniture
Hemp products
Jute products
Laundries
Leather products
Machinery
Metals
Millwork (sash and door)
Motion pictures and television filming (without spectators)
Musical instruments
Optical goods
Paper mills or products
Photographic film
Plastic products
Printing or publishing
Recreational vehicles
Refuse incineration
Shoes
Soaps and detergents
Textiles
Tobacco
Trailers
Upholstering
Wood; distillation
Woodworking (cabinet)

Reason: Commercial kitchens are not currently classified in the IBC. However, Table 508.4 has footnote d which states that a separation between a commercial kitchen and the seating areas that they serve is not required. That would indicate that the kitchen is a separate occupancy. The designation has been included within a Group F-1 Occupancy because it is similar to a Bakery and Food Processing facility. Essentially, meals are being assembled in a kitchen to be served in the dining area. It is the same general process that occurs in a food processing plant. This category would also clarify the occupancy classification for a catering kitchen that is not attached to a dining area. Many people try to classify a kitchen as a Group B Occupancy because this occupancy has been a catch all occupancy in the past. That classification is reserved for personal service uses and office. A kitchen does not fit into this type of occupancy. The additional language regarding the commercial cooking appliance is to clarify that a break room that has a microwave and sink is not a commercial kitchen. If a commercial cooking appliance is not installed, the use would not be classified as a Group F Occupancy, but a part of the main occupancy. The International Mechanical Code defines the term Commercial Cooking Appliance.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THOMAS-G1-306.2

G19–09/10
306.2, 311.2, [F] 903.2.9.1, (IFC [B] 202, 903.2.9.1)

Proponent: Lou Malattia, representing Washington Association of Building Officials

Revise as follows:

306.2 (IFC [B] 202) Factory Industrial F-1 Moderate-hazard Occupancy. Factory industrial uses which are not classified as Factory Industrial F-2 Low Hazard shall be classified as F-1 Moderate Hazard and shall include, but not be limited to, the following:

Aircraft (manufacturing, not to include repair)
Appliances
Athletic equipment

Automobiles and other motor vehicles
Bakeries
Beverages: over 16-percent alcohol content
Bicycles
Boats
Brooms or brushes
Business machines
Cameras and photo equipment
Canvas or similar fabric
Carpets and rugs (includes cleaning)
Clothing
Construction and agricultural machinery
Disinfectants
Dry cleaning and dyeing
Electric generation plants
Electronics
Engines (including rebuilding)
Food processing
Furniture
Hemp products
Jute products
Laundries
Leather products
Machinery
Metals
Millwork (sash and door)
Motion pictures and television filming (without spectators)
Motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed in Table 307.1(1) (see Section 406.6)
Musical instruments
Optical goods
Paper mills or products
Photographic film
Plastic products
Printing or publishing
Recreational vehicles
Refuse incineration
Shoes
Soaps and detergents
Textiles
Tobacco
Trailers
Upholstering
Wood; distillation
Woodworking (cabinet)

311.2 (IFC [B] 202) Moderate-hazard storage, Group S-1. Buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

Aerosols, Levels 2 and 3
Aircraft hangar (storage and repair)
Bags: cloth, burlap and paper
Bamboos and rattan
Baskets
Belting: canvas and leather
Books and paper in rolls or packs
Boots and shoes
Buttons, including cloth covered, pearl or bone
Cardboard and cardboard boxes
Clothing, woolen wearing apparel
Cordage

Dry boat storage (indoor)
Furniture
Furs
Glues, mucilage, pastes and size
Grains
Horns and combs, other than celluloid
Leather
Linoleum
Lumber
~~Motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed in Table 307.1(1) (see Section 406.6)~~
Photo engravings
Resilient flooring
Silks
Soaps
Sugar
Tires, bulk storage of
Tobacco, cigars, cigarettes and snuff
Upholstery and mattresses
Wax candles

[F] ~~903.2.9.1~~ 903.2.4.2 (IFC ~~903.2.9.1~~ 903.2.4.2) Repair garages. An automatic sprinkler system shall be provided throughout all buildings used as repair garages in accordance with Section 406, as shown:

1. Buildings having two or more stories above grade plane, including basements, with a fire area containing a repair garage exceeding 10,000 square feet (929 m^2).
2. Buildings no more than one story above grade plane, with a fire area containing a repair garage exceeding 12,000 square feet (1115 m^2).
3. Buildings with repair garages servicing vehicles parked in the basement.
4. A Group S-1 fire area used for the repair of commercial trucks or buses where the fire area exceeds 5,000 square feet (464 m^2).

Reason: Propose changing the occupancy classification for motor vehicle repair from Group S-1 to F-1.

Group S occupancies are described as “Storage Group S occupancy includes, among others, the use of a building or structure, or a portion thereof, for storage that is not classified as hazardous occupancy”; and Group F-1 occupancies are described as “Factory Industrial Group F occupancy includes, among others, the use of a building or structure, or a portion thereof, for assembling, disassembling, fabrication, finishing, manufacturing, packaging, repair or processing operations that are not classified as a Group H hazardous or Group S storage occupancy.

The requirements for automotive repair garages are consistent with the activities of Group F use; assembling, disassembling, and repairing. Group S occupancy is described as storage use, therefore, automotive repair garages should be placed within the Group F rather than Group S occupancy classification.

Group S-1 Type VB building has an allowable area of 9,000 square feet, whereas the Group F-1 Type 5B has an allowable area of 8,500 square feet. This difference in allowable area will have a negligible effect the size and construction type of these structures, particularly when considering the increases permitted by sprinkling the building throughout.

Table 503 permits Group F-1 of Type IA and IB construction to be unlimited area, but limits Group S-1 Type IB to 48,000 sq.ft. However, Groups S-1 and F-1 may be still unlimited under any type of construction where meeting Section 507.3 and this may even be further mitigated using Section 507.5 to reduce one of the required yards.

Section 414 addresses issues related to quantities of hazardous materials stored within the occupancy other than what is within the vehicle, which is regulated by the IFC. Storage of hazardous material would require control rooms where exceeding Tables 307.1 (1) & (2).

Repair garages are not buildings that store vehicles, but rather, repair facilities.

Codes covering other requirements are under Section 406.6 (IBC), ventilation Section 403.3 (IMC), spray painting Chapter 15 (IFC), hot work Chapter 26 (IFC), repair garages Chapter 22 (IFC), and Section 1004.7.2 (IPC).

The Interior Finish Classification requirement in Table 803.9 for a non-sprinkled corridor requires Class B for Group S occupancy and a Class C for Group F occupancy. The change of classification would benefit to proposed new classification of this occupancy by reduce code requirements and somewhat reduce constructions costs a bit in this area. This also holds true with regard to minimum radiant flux criteria of flooring under Section 804.4.1 where the Group F occupancy, unlike the Group S occupancy, is not required to meet minimum requirement of Class II in exits and exit access components.

Large Group F occupancies would require an alarm system per Section 907.2.4, but with sprinklers this becomes a mote point by the exception.

Table 1004.1.1 provides a specific square foot gross (200) for egress design for fabrication and manufacturing, where the Group S-1 did not. As a Group S-1 many designers many be using the storage criterion listed in Table 1004.1 of 300. Others may even utilize 100 for industrial area. By changing automotive repair garages to the Group F-1 classification we can now have a more specific guide line to determine occupant load which is more realistic to the repair shop use.

Section 1015 and Table 1015.1 may save some costs for additional exits and exit discharges due to higher allowed occupant loads allowed within F compared to Group S occupancies. However, when one compares building size permitted between Groups S-1 and F-1 occupancy using 300 square feet per occupant for Group S-1 and 200 square feet per occupant for F-1 the difference in building square footage permitted is only 12.6% area increase before two exits are required for Group F-1 occupancies. The travel distance is the same for both occupancies.

To summarize: automotive repair should be classified as a Group F-1 occupancy in order to be more consistent with the described use. The impact this change has on other code requirements is minimal and the change helps clarify some of the code requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: MALATTIA-G2-306.2

G20–09/10

308.1, 308.2, 308.3, 308.3.1, 310.1, 310.2, (IFC [B] 202); [F] 903.2.6, [F] 903.2.8, [F] 903.3.1.3, [F] 903.3.2, [F] 907.2.6, [F] 907.2.6.2, (IFC 903.2.6, 903.2.8, 903.3.1.3, 903.3.2, 907.2.6, 907.2.6.2); Table 1021.2 (IFC [B] Table 1021.2); 1107.5.3; [P] Table 2902.1 (IPC Table 403.1)

Proponent: Paul K. Heilstedt, PE, Chair, representing ICC Code Technology Committee (CTC)

Revise as follows:

308.1 (IFC [B] 202) Institutional Group I. Institutional Group I occupancy includes, among others, the use of a building or structure, or a portion thereof, in which ~~people are cared for or live in a supervised environment, having physical limitations because of health or age are harbored for medical treatment or other care or treatment, or in which people are detained for penal or correctional purposes or in which the liberty of the occupants is restricted~~ care or supervision is provided to individuals who, are or are not capable of self preservation without physical assistance or in which people are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, I-2, I-3 or I-4.

308.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

(Relocate revised definitions from Section 308.3.1, and revise)

24 HOUR CARE. The actual time that a person is an occupant within a facility for the purpose of receiving care. It shall not include a facility that is open for 24 hours and is capable of providing care to someone visiting the facility during any segment of the 24 hours.

CUSTODIAL CARE. Assistance with day-to-day living tasks; such as assistance with cooking, taking medication, bathing, using toilet facilities and other tasks of daily living, usually on a long-term basis. Custodial care include occupants who evacuate at a slower rate and/or who have mental and psychiatric complications.

DETOXIFICATION FACILITIES. Facilities that ~~serve patients who are~~ provided treatment for substance abuse ~~on a 24-hour basis and~~ serving care recipients who are incapable of self-preservation or who are harmful to themselves or others.

~~CHILD~~ FOSTER CARE FACILITIES. Facilities that provide care ~~on a 24-hour basis~~ to more than five children, $2^1/_2$ years of age or less,

HOSPITALS AND ~~MENTAL~~ PSYCHIATRIC HOSPITALS. Facilities ~~buildings or portion thereof used on a 24 hour basis~~ that provides care or treatment for the medical, psychiatric, obstetrical, or surgical treatment of inpatients ~~who~~ care recipients that are incapable of self-preservation.

INCAPABLE OF SELF PRESERVATION. Persons because of age; physical limitations; mental limitations; chemical dependency; or medical treatment cannot respond as an individual to an emergency situation.

MEDICAL CARE. Care involving medical or surgical procedures, nursing or for psychiatric purposes.

NURSING HOMES. ~~Nursing homes are long-term care~~ Facilities that provide long-term care ~~on a 24-hour basis~~, including both intermediate care facilities and skilled nursing facilities, ~~serving more than five persons and~~ where any of the persons are incapable of self-preservation.

~~308.2~~ 308.3 (IFC [B] 202) Group I-1. This occupancy shall include buildings, structures or portions thereof ~~housing~~ for more than 16 persons who reside on a 24 hour basis ~~who because of age, mental disability or other reasons, live~~ in a supervised ~~residential~~ environment ~~that provides *personal care services*~~ and receive custodial care. The occupants are capable of ~~responding to an emergency situation without physical assistance from staff~~ self preservation. This group shall include, but not be limited to, the following:

Alcohol and drug centers
Assisted living facilities
Congregate care facilities
Convalescent facilities
Group homes
Halfway houses
Initial stage Alzheimer's facilities
Residential board and custodial care facilities
Social rehabilitation facilities

A facility such as the above with five or fewer persons shall be classified as a Group R-3 or shall comply with the International Residential Code in accordance with Section 101.2. A facility such as above, housing at least six and not more than 16 persons, shall be classified as Group R-4.

~~308.3~~ 308.4 (IFC [B] 202) Group I-2. This occupancy shall include buildings and structures used for medical~~, surgical, psychiatric, nursing or custodial~~ care on a 24 hour basis for more than five persons who are not capable of self-preservation. This group shall include, but not be limited to, the following:

Foster ~~Child~~ care facilities
Detoxification facilities
Hospitals
Nursing homes
~~Mental~~ Psychiatric hospitals

A facility such as the above with five or fewer residents shall be classified as Group R-3 or shall comply with the International Residential Code in accordance with Section 101.2.

~~**308.3.1 Definitions.** The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.~~

(Relocate revised definitions to Section 308.2)

310.1 (IFC [B] 202) Residential Group R. Residential Group R includes, among others, the use of a building, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the International Residential Code in accordance with Section 101.2. Residential occupancies shall include the following:

R-1 Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including:

Boarding houses (transient)
Hotels (transient)
Motels (transient)

Congregate living facilities (transient) with 10 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-2 Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:

Apartment houses
Boarding houses (not transient)
Convents
Dormitories
Fraternities and sororities
Hotels (nontransient)
Live/work units
Monasteries
Motels (nontransient)
Vacation timeshare properties

Congregate living facilities with 16 or fewer individuals are permitted to comply with the requirements for Group R-3.

R-3 Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, or I, including:

Buildings that do not contain more than two dwelling units.
~~Adult care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.~~
~~Child care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.~~
Care facilities as that provide accommodations for five or fewer persons
Congregate living facilities with 16 or fewer individuals**.**

~~Adult care and child~~ Care facilities for 5 or fewer individuals receiving care that are within a single-family ~~home~~ dwellings are permitted to comply with the International Residential Code.

R-4. This occupancy shall include buildings, structures or portions thereof for more than five but not more than 16 persons, excluding staff, who reside on a 24 hour basis in a supervised residential environment and receive custodial care. The occupants are capable of self preservation. This group shall include, but not be limited to, the following:

Alcohol and drug centers
Assisted living facilities
Congregate care facilities
Convalescent facilities
Group homes
Halfway houses
Initial stage Alzheimer's facilities
Residential board and custodial care facilities
Social rehabilitation facilities

~~Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living facilities including more than five but not more than 16 occupants, excluding staff.~~

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code ~~or shall comply with the *International Residential Code* provided the building is protected by an *automatic sprinkler system* installed in accordance with Section 903.2.8.~~

310.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

BOARDING HOUSE. A building arranged or used for lodging for compensation, with or without meals, and not occupied as a single-family unit.

CONGREGATE LIVING FACILITIES. A building or part thereof that contains sleeping units where residents share bathroom and/or kitchen facilities.

DORMITORY. A space in a building where group sleeping accommodations are provided in one room, or in a series of closely associated rooms, for persons not members of the same family group, under joint occupancy and single management, as in college dormitories or fraternity houses.

GROUP HOME. A facility for social rehabilitation, substance abuse or mental health problems that contain a group housing arrangement that provides custodial care but does not provide acute care.

~~**RESIDENTIAL CARE/ASSISTED LIVING FACILITIES.** A building or part thereof housing persons on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment which provides personal care services. The occupants are capable of responding to an emergency situation without physical assistance from staff. This classification shall include, but not be limited to, the following: residential board and care facilities, assisted living facilities, halfway houses, group homes, congregate care facilities, social rehabilitation facilities, alcohol and drug abuse centers and convalescent facilities.~~

TRANSIENT. Occupancy of a *dwelling unit* or *sleeping unit* for not more than 30 days.

[F] 903.2.6 (IFC 903.2.6) Group I. An *automatic sprinkler system* shall be provided throughout buildings with a Group I *fire area*.

Exception: An *automatic sprinkler system* installed in accordance with Section 903.3.1.2 ~~or 903.3.1.3~~ shall be ~~allowed~~ permitted in Group I-1 facilities.

[F] 903.2.8 (IFC 903.2.8) Group R. An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R *fire area*.

An *automatic sprinkler system* installed in accordance with 903.3.1.3 shall be permitted in congregate residences with 16 or fewer residents. An automatic sprinkler system installed in accordance with 903.3.1.3 shall be permitted in care facilities with 5 or fewer individuals a single family dwelling.

[F] 903.3.1.3 (IFC 903.3.1.3) NFPA 13D sprinkler systems. *Automatic sprinkler systems* installed in one and two-family *dwellings*, Group R-3 and R-4 congregate residences and *townhouses* shall be permitted to be installed throughout in accordance with NFPA 13D.

[F] 903.3.2 (IFC 903.3.2) Quick-response and residential sprinklers. Where automatic sprinkler systems are required by this code, quick-response or residential automatic sprinklers shall be installed in the following areas in accordance with Section 903.3.1 and their listings:

1. Throughout all spaces within a smoke compartment containing ~~patient~~ care recipient sleeping units in Group I-2 in accordance with this code.
2. Dwelling units, and sleeping units in Group R and I-1 occupancies.
3. Light-hazard occupancies as defined in NFPA 13.

[F] 907.2.6 (IFC 907.2.6) Group I. A manual fire alarm system that activates the occupant notification system shall be installed in Group I occupancies. An automatic smoke detection system that activates the occupant notification system shall be provided in accordance with Sections 907.2.6.1, 907.2.6.2 and 907.2.6.3.3.

Exceptions:

1. Manual fire alarm boxes in ~~resident or~~ ~~patient~~ sleeping units of Group I-1 and I-2 occupancies shall not be required at *exits* if located at all ~~nurses'~~ care providers' control stations or other constantly attended staff locations, provided such stations are visible and continuously accessible and that travel distances required in Section 907.4.2 are not exceeded.
2. Occupant notification systems are not required to be activated where private mode signaling installed in accordance with NFPA 72 is *approved* by the fire code official.

[F] 907.2.6.2 (IFC 907.2.6.2) Group I-2. An automatic smoke detection system shall be installed in *corridors* in nursing homes, long term care facilities ~~(both intermediate care and skilled nursing facilities)~~, detoxification facilities and spaces permitted to be open to the *corridors* by Section 407.2. The system shall be activated in accordance with Section 907.5. Hospitals shall be equipped with smoke detection as required in Section 407.

Exceptions:

1. *Corridor* smoke detection is not required in smoke compartments that contain ~~patient~~ sleeping units where such units are provided with smoke detectors that comply with UL 268. Such detectors shall provide a visual display on the *corridor* side of each ~~patient~~ *sleeping unit* and shall provide an audible and visual alarm at the care provider ~~nursing~~ station attending each unit.
2. *Corridor* smoke detection is not required in smoke compartments that contain ~~patient~~ *sleeping units* where ~~patient~~ *sleeping unit* doors are equipped with automatic door-closing devices with integral smoke detectors on the unit sides installed in accordance with their listing, provided that the integral detectors perform the required alerting function.

1021.2 (IFC [B] 1021.2) Single exits. Only one *exit* shall be required from Group R-3 occupancy buildings or from stories of other buildings as indicated in Table 1021.2. Occupancies shall be permitted to have a single *exit* in buildings otherwise required to have more than one *exit* if the areas served by the single *exit* do not exceed the limitations of Table 1021.2. Mixed occupancies shall be permitted to be served by single *exits* provided each individual occupancy complies with the applicable requirements of Table 1021.2 for that occupancy. Where applicable, cumulative *occupant loads* from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1. Basements with a single *exit* shall not be located more than one *story* below *grade plane*.

TABLE 1021.2 (IFC [B] TABLE 1021.2)
STORIES WITH ONE EXIT

STORY	OCCUPANCY	MAXIMUM OCCUPANTS (OR DWELLING UNITS) PER FLOOR AND TRAVEL DISTANCE
First story or basement	A, B[d], E[e], F[d], M, U, S[d]	49 occupants and 75 feet travel distance
	H-2, H-3	3 occupants and 25 feet travel distance
	H-4, H-5, I, ~~R~~ R-1, R-2, R-4	10 occupants and 75 feet travel distance
	S[a]	29 occupants and 100 feet travel distance
Second story	B[b], F, M, S[a]	29 occupants and 75 feet travel distance
	R-2	4 dwelling units and 50 feet travel distance
Third story	R-2[c]	4 dwelling units and 50 feet travel distance

For SI: 1 foot = 304.8 mm.

a. For the required number of exits for parking structures, see Section 1021.1.2.
b. For the required number of exits for air traffic control towers, see Section 412.3.
c. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1029.
d. Group B, F and S occupancies in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall have a maximum travel distance of 100 feet.
e. Day care occupancies shall have a maximum occupant load of 10.

1107.5.3 Group I-2 hospitals. Accessible units and Type B units shall be provided in General-purpose hospitals, psychiatric facilities, and detoxification facilities ~~and residential care/assisted living facilities~~ of Group I-2 occupancies in accordance with Sections 1107.5.3.1 and 1107.5.3.2.

[P] TABLE 2902.1 (IPC TABLE 403.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]
(See Sections 2902.2 and 2902.3)

No.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 419.2 OF THE INTERNATIONAL PLUMBING CODE)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAINS [e, f] (SEE SECTION 410.1 OF THE INTERNATIONAL PLUMBING CODE)	OTHER
				MALE	FEMALE	MALE	FEMALE			
7	Residential	R-3	Congregate living facilities with 16 or fewer persons	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink
		R-4	~~Residential care/assisted living facilities~~ Congregate living facilities with 16 or fewer persons	1 per 10		1 per 10		1 per 8	1 per 100	1 service sink

(Portions of table not shown remain unchanged)

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Care Facilities". The scope of the activity is noted as:

> Study issues associated with Day Care/Adult Care, Ambulatory Health Care and Assisted Living facilities with an emphasis on the number of occupants in relation to the supervision, and the determination of the resident's capability of responding to an emergency situation without physical assistance from the facility's supervision.

The Code Technology Committee Study Group on Care Facilities has conducted a comprehensive review of current building and fire codes, federal regulations and prior code change proposals dealing with the provision of "care". "Care" as it relates to the scope of this work relates to an occupant of a building who is compromised (mentally or physically) and receives some type of support (care). These facilities encompass a full spectrum of acuity and span a wide range of occupancy types including Groups B, E, I and R. On the lower end of the spectrum, occupants may be aged and receive occasional day living assistance such as cooking and cleaning. On the opposite end of the spectrum, occupants may be completely bedridden and dependant on medical gases and emergency power to maintain life.

The proposed changes provide clear direction for design and construction by using terms and concepts consistently and clearly identifying thresholds related to the condition of an occupant. Federal regulations and state licensing provisions were considered, but primarily in terms of avoiding conflicting requirements. It is not the intent of these changes to address licensing or operational issues. We do believe that the proposed changes will provide consistent and correlated language between these multiple sources of regulations that will help design and code professionals address the needs of care recipients in the many different types of facilities.

A major goal is to provide clarity and consistency of terminology. New definitions are added to specifically describe each type of care or facility and identify the distinct differences in these. Some terms are consolidated to be more descriptive of a group of occupants, yet generic enough to be used interchangeably. For example: a "Patient" is now identified as a "care recipient" and "nurse" is now "care provider". People receive care of varying types but they are not always referred to as "patients". They receive care from a wide range of persons with different technical abilities, not just a "nurse" or "staff". Other definitions address existing terms not defined within current code. The study group believes that these changes bring a practical response to the recent developments within the healthcare delivery system.

Group I-1, I-2, R-4; Section 308 and related correlations

Change modifying the existing language includes:

- A modification is proposed to the general charging language of Group I to more clearly express the various types of occupancy conditions found within Group I.
- Consolidate the definitions from Section 308.3.1 and 308.1 to create a definition Section 308.2 for all of Group I, consistent with current format within the code. Some of the definitions have been modified to add clarity; others are new to remove confusion of meaning and intent.
- Modified the general language of specific use occupancies within Group I and R to reflect the new definitions proposed and be more current with industry and licensing descriptions, but not the provisions.
- Modifications or additions have been made to the example listings of uses and correlate the terminology for a consistency of application. The threshold of more than 5 persons was added to the first paragraph of Group I-2 and the last sentence was added after the example listing to allow for families to care for person without becoming an I-2 use. This also correlates how the occupancies with less than 5 persons are handled in the other care facilities.
- The definition of Child Care Facilities has been to Foster Care Facilities and the provision of 24 hours was removed as it is redundant to the general language of an I-2 use. Foster Care for more than 5, children 2 ½ years of age or less is still an I-2 use. Facilities providing care to 6 to 16 children greater than 2 ½ years of age, is an R-4 and facilities for greater than 16 children it will be an I-1. Additionally, this will eliminate the confusion between day care and 24 hour care facilities.
- In Section 903.2.6 it is proposed to delete the option for the NFPA13D sprinkler system for Group I-1 because a NFPA 13D system is not permitted based on the threshold for Group I-1 being greater than 16 occupants. The sprinkler requirements for Group R is generic and currently not clear for facilities such as small congregate residences. As a small assisted living facility, the NFPA 13D sprinkler system is appropriate permitted in Group R-4 (see the revisions to Section 903.2.8) as well as other congregate residences with 16 or fewer occupants. Indicating the used in Section 903.1.3 clarifies that congregate residences with 16 or fewer occupants, while not single family dwellings, are permitted to use NFPA 13D systems. This is consistent with NFPA13D requirements. This was permitted specifically for Group R-4 in the 2000 IBC. This would also be consistent with Fair Housing Act court cases based on non-discrimination for group homes.
- Changes proposed beyond Chapter 3 are correlative in nature to reflect the new definitions or provisions previously allowed under chapter 3 provisions but not correlated for ease of use.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HEILSTEDT-G5-308.1.doc

G21–09/10

308.2 (IFC 202), 310.1, 310.2, 420.1, 420.2, 420.4 (New), 420.4.1 (New), 420.4.2 (New), 420.4.3 (New), 420.5 (New), 420.5.1 (New), Table 503, 504.2, 508.2.4, 508.3.3, Table 706.4, 710.5, 1006.1, 1107.6.4.1; IFC 903.2.6, 907.2.6.1, 907.5.2.3.3

Proponent: Daniel Purgiel, LRS Architects Inc.

1. Revise as follows:

308.2 (IFC [B] 202) Group I-1. This occupancy shall include buildings, structures or parts thereof housing more than ~~16~~ five persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment that provides personal care services. The occupants require physical assistance with evacuation in responding to an emergency situation. ~~The occupants are capable of responding to an emergency situation without physical assistance from staff.~~ This group shall include, but not be limited to, the following:

Alcohol and drug centers
Alzheimer's facilities
Assisted living facilities
~~Congregate care facilities~~
Convalescent facilities
Group homes
~~Halfway houses~~
Residential board and care facilities
~~Social rehabilitation facilities~~

A facility such as the above with five or fewer persons shall be classified as a Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2. A facility such as above, housing at least six and not more than 16 persons, ~~shall be classified as Group R-4.~~ shall meet the requirements for construction as defined for Group R-3, except as otherwise provided in this code or shall comply with the *International Residential Code*, provided the building complies with Section 903.2.6. A facility such as above, where occupants are capable of responding to an emergency situation without physical assistance, shall be classified as Group R-4.

310.1 (IFC [B] 202) Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code* in accordance with Section 101.2. Residential occupancies shall include the following:

R-1 Residential occupancies where the occupants are primarily transient in nature, including:

Boarding houses (transient)
Hotels (transient)
Motels (transient)

Congregate living facilities (transient) with 10 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-2 Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:

Apartment houses
Boarding houses (not transient)
Convents
Dormitories
Fraternities and sororities
Hotels (nontransient)
Monasteries
Motels (nontransient)
Vacation timeshare properties

Congregate living facilities with 16 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-3 Residential occupancies where the occupants are primarily permanent in nature and not classified as R-1, R-2, R-4 or I including:

Buildings do not contain more than two dwelling units.
Adult facilities that that provide accommodations for five or fewer persons of any age for less than 24 hours.
Child care facilities that that provide accommodations for five or fewer persons of any age for less than 24 hours.
Congregate living facilities with 16 or fewer persons.
Adult and child care facilities that are within a single-family home are permitted to comply with the *International Residential Code*.

R-4 ~~Residential occupancies shall include buildings, arranged for occupancy as residential care/assisted living facilities including more than five but not more than 16 occupants, excluding staff.~~ Residential occupancies located in buildings or portions thereof housing more than five persons, excluding staff, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment that provides personal care services. The occupants are capable of responding to an emergency situation without physical assistance. This group shall include, but not be limited to, the following:

Alcohol and drug centers
Assisted living facilities
Congregate care facilities
Convalescent facilities
Group homes
Halfway houses
Residential board and care facilities
Social rehabilitation facilities

Group R-4 occupancies housing 16 or fewer persons, shall meet the requirements for construction as defined for Group R-3 except as otherwise provided for in this code, or shall comply with the *International Residential Code* provided the building is protected by an automatic sprinkler system installed in accordance with Section 903.2.7.

310.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

RESIDENTIAL CARE/ASSISTED LIVING FACILITIES. A building or part thereof housing persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment which provides personal care services. ~~The occupants are capable of responding to an emergency situation without physical assistance from staff.~~ The occupants are not bedridden, except during temporary sickness. Occupancy classification is based on the ability of occupants to respond to an emergency situation with or without physical assistance. ~~This classification~~ Residential care/ assisted living facilities shall include, but not be limited to, the following: residential board and care facilities, assisted living facilities, halfway houses, group homes, congregate care facilities, social rehabilitation facilities, alcohol and drug abuse centers and convalescent facilities.

(Definitions not shown remain unchanged)

SECTION 420
GROUPS I-I~~, R-1, R-2, R-3~~ and R

420.1 General. Occupancies in Groups I-1~~, R-1, R-2 R-3~~ and R shall comply with the provisions of this section and other applicable provisions of this code.

420.2 Separation walls. Walls separating dwelling units in the same building, walls separating sleeping units in the same building and walls separating dwelling or sleeping units from other occupancies contiguous to them in the same building shall be constructed as fire partitions in accordance with Section 709.

Exception: Walls separating dwelling units and sleeping units within Groups I-1 and R-4 occupancies, housing 16 or fewer persons are not required to be constructed as fire partitions.

420.3 Horizontal separation. Floor assemblies separating dwelling units in the same buildings, floor assemblies separating sleeping units in the same building and floor assemblies separating dwelling or sleeping units from other occupancies contiguous to them in the same building shall be constructed as horizontal assemblies in accordance with Section 712.

2. Add new text as follows:

420.4 Groups I-1 smoke barriers. Group I-1 occupancies housing more than 16 residents shall be provided with smoke barriers in accordance with Section 710. Smoke barriers shall subdivide every story used by residents for sleeping or treatment into at least two smoke compartments. Each smoke compartment shall have a maximum of 16 sleeping rooms, or 10,500 square feet (976 m^2), whichever is less, and the travel distance from any point in a smoke compartment to a smoke barrier door shall not exceed 150 feet (60 960 mm).

420.4.1 Refuge area. At least 6 net square feet (0.56 m^2) of refuge area per resident shall be provided within the aggregate area of corridors, treatment rooms, or other low hazard common space rooms on each side of each smoke barrier.

420.4.2 Independent egress. A means of egress shall be provided from each smoke compartment created by smoke barriers without having to return through the smoke compartment from which means of egress originated.

420.4.3 Horizontal assemblies. Horizontal assemblies supporting smoke barriers required by this section shall be designated to resist the movement of smoke and shall comply with Section 712.9.

420.5 Group I-1 corridors. Group I-1 occupancies shall have an exit access door from dwelling units or sleeping rooms leading directly to a corridor. Corridors in Group I-1 shall be continuous to the exits and separated from other areas in accordance with Section 1018, except areas conforming to Section 420.5.1

Exception: Sleeping rooms and dwelling units with exit doors opening directly to the exterior at ground level shall not be required to have an exit access door leading directly to a corridor.

420.5.1 Group I-1 multipurpose areas. Multipurpose areas directly adjacent to sleeping rooms that are not part of a dwelling unit shall be permitted to be open to the corridor where the following criteria are met:

1. The area shall be under continuous 24 hour supervision by the facility staff;
2. The area is not used as an exit access for more than 16 sleeping rooms;
3. Travel distance within the smoke compartment, where the sleeping rooms and multipurpose areas are located, shall not exceed 75 feet (30 480 mm);
4. The area shall have direct access to an exit or shall exit into a fire-resistance rated corridor in accordance with Section 1018;
5. The area is arranged so as not to obstruct any access to the required exits;
6. The area is equipped with an automatic fire detection system installed in accordance with Section 907.2;
7. The walls and ceilings of the area outside the sleeping rooms are constructed as required for corridors;
8. The area shall be separated from incidental accessory occupancies in accordance with Section 508.2.5; and
9. Doors from the sleeping rooms opening into the area shall not have a required protection rating and shall not be required to be equipped with self-closing or automatic closing devices, but shall provide an effective barrier to limit the transfer of smoke and shall be equipped with positive latching. Roller latches are not permitted.

3. Revised text as follows:

TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS
Height limitations shown as stories and feet above grade plane.
Area limitations as determined by the definition of "Area, building," per floor

		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
GROUP	HEIGHT (feet) HEIGHT (s)	UL	160	65	55	65	55	65	50	40
I-1[e]	S	UL	~~9~~ 6	~~4~~ 2	~~3~~ 1	~~4~~ 1	~~3~~ 1	~~4~~ 1	~~3~~ 1	~~2~~ NP
	A	UL	55,000	19,000	10,000	16,500	10,000	18,000	10,500	~~4,500~~ NP
R-4	S	UL	~~11~~ 9	4	~~4~~ 3	4	~~4~~ 3	4	3	2
	A	UL	~~UL~~ 55,000	~~24,000~~ 19,000	~~16,000~~ 10,000	~~24,000~~ 16,500	~~16,000~~ 10,000	~~20,500~~ 18,000	~~12,000~~ 10,500	~~7,000~~ 4,500

(Portions of table and footnotes not shown remain unchanged)

504.2 Automatic sprinkler system increase. Where a building is equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum *building height* is increased by 20 feet (6096 mm) and the maximum number of *stories* is increased by one. These increases are permitted in addition to the *building area* increase in accordance with Sections 506.2 and 506.3. For Group R buildings equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum *building height* is increased by 20 feet (6096 mm) and the maximum number of *stories* is increased by one, but shall not exceed 60 feet (18 288 mm)or four *stories*, respectively.

Exceptions:

1. Buildings or portions of buildings, classified as a Group I-1 occupancy, specifically designated or licensed by a state to house residents with Alzheimer's disease in Types IIB, III, IV, or V construction.
2. ~~1.~~ Buildings or portions of buildings, classified as a Group I-2 occupancy of Type IIB, II, IV or V construction.
3. ~~2.~~ Buildings or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.
4. ~~3.~~ Fire resistance rating substitution in accordance with Table 601, Note d.

508.2.4 Separation of occupancies. No separation is required between accessory occupancies and the main occupancy.

Exceptions:

1. Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4.
2. Incidental accessory occupancies required to be separated or protected by Section 508.2.5.

3. Group ~~I-1,~~ R-1, R-2 and R-3 dwelling units and sleeping units shall be separated from other dwelling or sleeping units and from accessory occupancies contiguous to them in accordance with the requirements of Section 420.
4. Groups I-1 and R-4 occupancies with more than 16 dwelling units and sleeping units shall be separated from other dwelling or sleeping units and from accessory occupancies contiguous to them in accordance with the requirements of Section 420.

508.3.3 Separation. No separation is required between nonseparated occupancies.

Exceptions:

1. Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4.
2. Group ~~I-1,~~ R-1, R-2 and R-3 dwelling units and sleeping units shall be separated from other dwelling or sleeping units and from accessory occupancies contiguous to them in accordance with the requirements of Section 420.
3. Groups I-1 and R-4 occupancies with more than 16 dwelling units and sleeping units shall be separated from other dwelling or sleeping units and from accessory occupancies contiguous to them in accordance with the requirements of Section 420.

Table 706.4
FIRE WALL FIRE RESISTANCE RATINGS

A, B, E, H-4, I, R-1, R-2, R-4, U	3[a]
F-1, H-3[b], H-5, M, S-1	3
H-1, H-2	4[b]
F-2, S-2, R-3, ~~R-4~~	2

(Footnotes not shown, remain unchanged)

710.5 Openings. Openings in a smoke barrier shall be protected in accordance with Section 715.

Exceptions:

1. In Groups I-1 and I-2, where such doors are installed across corridors, a pair of opposite-swinging doors without a center mullion shall be installed having vision panels with fire-protection-rated glazing materials in fire-protection-rated frames, the area of which shall not exceed that tested. The doors shall be close fitting within operational tolerances, and shall not have undercuts in excess of ¾- inch, louvers or grilles. The doors shall have head and jamb stops, astragals or rabbets at meeting edges and shall be automatic-closing by smoke detection in accordance with Section 715.4.8.3. Where permitted by the door manufacturer's listing, positive-latching devices are not required.
2. In Groups I-1 and I-2, horizontal sliding doors installed in accordance with Section 1008.1.4.3 and protected in accordance with Section 715.

[F] 903.2.6 (IBC [F] 903.2.6) Group I. An automatic sprinkler system shall be provided throughout buildings with Group I fire area.

Exception: An automatic sprinkler system installed in accordance with Section 903.3.1.2 or 903.3.1.3 shall be allowed in Group I-1 facilities, housing 16 or fewer persons.

[F] 907.2.6.1 (IBC 907.2.6.1) Group I-1. An automatic ˙ smoke detection system shall be installed in *corridors,* waiting areas open to *corridors* and *habitable spaces* other than *sleeping units* and kitchens. The system shall be activated in accordance with Section 907.5.

Exceptions:

~~1. Smoke detection in habitable spaces is not required where the facility is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.~~
~~2~~. 1. Smoke detection is not required for exterior balconies.

[F] 907.5.2.3.3 (IBC 907.5.2.3.3) Groups I-1, ~~and~~ R-1, and R-4. Groups I-1, ~~and~~ R-1, and R-4 dwelling units or sleeping units in accordance with Table 907.5.2.3.3 shall be provided with a visible alarm notification appliance, activated by both the in-room smoke alarm and the building fire alarm system.

Exception: Visible alarm notification appliances are not required in Groups I-1 and R-4 occupancies, housing 16 or fewer persons.

1006.1 Illumination required. The means of egress, including the exit discharge, shall be illuminated at all times the building space served by the means of egress is occupied.

Exceptions:

1. Occupancies in Group U.
2. Aisle accessways in Group A.
3. Dwelling units and sleeping units in Groups R-1, R-2, ~~and~~ R-3 and R-4.
4. Dwelling units and sleeping units of Group I occupancies.

1107.6.4 Group R-4. Accessible Units and Type B units shall be provided in Group R-4 occupancies shall be provided in accordance with Sections 1107.6.4.1 and 1107.6.4.2.

1107.6.4.1 Accessible units. At least 4 percent but not less than one of the dwelling or sleeping units shall be an Accessible unit.

1107.6.4.2 Type B units. In structures with four or more dwelling or sleeping units or sleeping units intended to be occupied as a residence, every dwelling and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

Reason: IBC PERSONAL CARE OCCUPANCY REVISIONS: SUMMARY OVERVIEW OF THE ISSUE

This proposal revises Group I-1 to allow not capable of self preservation residents in facilities that provide personal care services. This reflects the actual conditions that currently occur across the country as is now indicated in a referenced national study. This proposal keeps all not capable of self preservation occupants in the Group I occupancy. The study also shows that there are capable of self preservation personal care uses. This proposal moves the current capable Groups I-1 and R-4 uses exclusively to the R-4. This makes Group R for overnight residential and personal care uses that are capable of self preservation. The smaller 6-16 resident personal care uses (current R-4), and their five current "exceptions" due to size, are now proposed to be made by "exceptions" in the new proposed I-1 and R-4, instead of by a separate occupancy classification.

This following Summary Overview provides background information required to understand why these revisions are proposed. More detailed background information is provided in attachment G- Additional Detailed Substantiation and the other referenced attachments in *(parenthesis and italics).*

Issue: The IBC Groups I-1 and R-4 are the occupancy designations for personal care. The resident profile requirement in Section 308.2 states that the "occupants are capable of responding to an emergency situation without physical assistance from staff."

The IBC statement above about the types of residents in personal care assisted living, is a central point of reference in the findings of a 130 page national analysis conducted by the State of Hawaii in 2007. The analysis is entitled "Assisted Living Analysis of All State Regulations Relative to Building Codes and Life Safety Codes," hereafter referred to as the study or analysis. Attachments A, B, and D are from the Hawaii analysis. This national review of assisted living resident types and related protection features was conducted to give recommendations to Hawaii on how it should regulate its assisted living. The findings included in the study are also used here to help substantiate the reasons for the proposed changes to the IBC.

The Hawaii Study Is The Only Known In Depth National Review of Assisted Living Relative to These Subjects.

- The analysis indicates that assisted living facilities and Alzheimer's facilities have the largest populations in personal care service occupancies. There are approximately 35,000 assisted living facilities in the United States. They are licensed by state governments under similar assisted living licenses in all 50 states, each with their own unique licensure regulations.
- The study shows that the current resident profile requirements in the IBC I-1 and R-4 occupancies are exclusively applicable in just 4 states, relative to assisted living. *(See Attachment A-All State Summary Table.)*
- The study finds that 51 of the 89 total assisted living categories in all 50 states have residents that require physical assistance with evacuation. The IBC does not currently allow non capable types of residents in its I-1 or R-4 personal care assisted living occupancies, and personal care is not listed in the I-2 occupancy.
- The study recommends that the IBC personal care occupancies should be revised to include personal care service assisted living with its actual resident types, while adding more I-2 protection requirements.
- It recommends that personal care assisted living not incorporate numerous other I-2 requirements and exceptions for reasons stated later in this summary.
- The recommendations in the study also allow for personal care occupancies having capable of self preservation residents as is currently found in the I-1 and R-4 occupancies, closely matching the current R-2 requirements.
- The IBC revisions proposed here follow concepts from the Hawaii recommendations and three other states that have created statewide amendments to the IBC, for the same reasons found in the Hawaii study.

Both Federal and Individual State Licensing Requirements Override Current IBC Personal Care Criteria and Requirements

The study shows that approximately 36 states allow Federal Medicaid waivers to allow Medicaid reimbursement to residents in their state's assisted living facilities, bringing other Federal requirements to personal care assisted living. *(See Attachment A-All State Summary Table).* Most of these states and other individual state licensing regulations then add other life safety protection requirements not currently covered in the IBC personal care I-1 and R-4 occupancies. (*See Attachment G-Additional Detailed Substantiation-Protection Feature Sampling of Recent Projects).* The Federal Centers for Medicare and Medicaid Services (CMS) enforce these requirements in many states, similar to what occurs in nursing facilities. This majority of states across the country, under additional enforcement of life safety, allow residents who need evacuation assistance, now further limit wood frame stories, and require full coverage commercial sprinklers and smoke barriers. *(See Attachment C-IBC Revision Summary Table.)*

The current lack of coordination with a majority of state licensing regulations life safety requirements, Federal CMS regulations, and the lack of classification of actual conditions in assisted living in the IBC, cause inconsistent application of the IBC across the country. Assisted living with residents of the same capabilities, and the same number of residents and stories, may be wood frame, have residential sprinklers with no smoke barriers in one city; and be required to be steel frame, have full coverage commercial sprinklers, and have smoke barriers in a nearby city. *(See Attachment G-Additional Detailed Substantiation.)*

Proposal Includes a Broad Spectrum National Approach

Finally, this proposal takes a broad spectrum national approach to personal care service uses, while not emphasizing preferences of one or a few states**.** It deals with the issue that each state has numerous types of these personal care uses and that each state regulates them differently. This proposal realigns the personal care occupancies to match the actual conditions and variations of occupant capabilities across the country. It will help eliminate the current inconsistent application of the IBC and make the code more consistent with other Federal and state enforced regulations. Once incorporated, the proposed revisions in the IBC will cover the full spectrum of the different types of personal care uses. *(See Attachment B-Elder Care Resident Profile Guide and C-IBC Revision Summary Table.)*

SUMMARY OF CONCEPTS & PROPOSED REVISIONS

A. Proposed Not Capable of Self Preservation Personal Care Requiring Similar Protection Found in Nursing

Most actual personal care assisted living have residents that may not be capable of self evacuation. This revision concept makes the Group I occupancy for those who are not capable of responding to emergencies on their own, and makes the R occupancy for those who are capable of responding on their own. The revision allows the non capable personal care resident type in the I-1. It then revises the I-1 to have similar protection features found in I-2 nursing. This is versus the current I-1 closely matching the current the R-2 resident capability and protection features. The remaining personal care uses that have residents that are capable of evacuation are proposed to be moved to the R-4 occupancy. *(See Attachment C-IBC Revision Summary Table, E-Current IBC Occupancy Requirements Comparison Table, and F- Proposed IBC Occupancy Requirements Comparison Table.)*

These revisions:

- Allow residents that may need assistance with evacuation in the I-1 occupancy. (Matching current CMS and a majority of state assisted living regulations.)
- Keep the current IBC "personal care" definition the same: Personal care is care of residents that do not require chronic nursing care etc.
- Adds the three main applicable protection features from I-2 into the I-1: Further story limitations on wood framing, full sprinklerization (NFPA 13 versus the current NFPA 13R), and smoke barriers providing compartmentalization. (Matching current CMS and a majority of state regulation concepts.)
- Changes the I-1 from housing more than 16 to housing over five persons, and then includes “exceptions” for 6 to 16 occupant facilities, instead of making a separate occupancy classification for them.
- Includes specially designated Alzheimer’s facilities in I-1 while providing exceptions for corridors and story limitations in the proposed Chapters 4 and 5 for Alzheimer’s facilities. (Aligning with current CMS concepts, matching 47 states that allow Alzheimer’s facilities under assisted living licenses, and matching a majority of state licensing regulations.)

B. **Proposed Not Capable of Self Preservation Personal Care Requiring More Stringent Protection than Nursing**

The State of Hawaii review of all 50 states assisted living regulations showed that personal care assisted living is different from I-2 nursing care. *(See Attachment A-All State Summary Table and G-Additional Detailed Substantiation)*

- It showed that all states limit assisted living care to not include nursing care beyond intermittent care which is also consistent with the current IBC personal care definition. All states regulate nursing as another higher level of care not allowed in assisted living.
- All states do not allow bedridden residents in personal care assisted living, except due to short term sickness. Residents who are bedridden beyond temporary sickness, or require beyond intermittent nursing care from temporary sickness, are required to be discharged to a nursing facility in all states assisted living regulations.
- Assisted living residents are required to participate in fire drills and eventually disperse to a point of safety in case of an emergency in the fire code, in state assisted living regulations, and by most CMS enforced regulations. Nursing facilities are "protect in place," meaning residents are instructed to stay in their rooms and wait for rescue as needed.
- Assisted living has generally less required staff to resident ratios than nursing due to assisted living residents generally being more capable of evacuation than nursing residents.

These four criteria differentiate personal care services in assisted living from nursing care, substantiating why it is and should continue to be classified as a different occupancy. These differences then require personal care service occupancies to have some different protection features that the I-2 nursing occupancy does not require. *(See Attachment G-Additional Detailed Substantiation)*

These proposed IBC revisions:

- Make corridors in I-1 and R-4 more stringent than in I-2 nursing. The current requirement for protected rated corridors in I-1 and R-4 is maintained in most cases. This is more stringent than the unprotected corridor openings and spaces open to corridors allowed in I-2 nursing in the IBC Chapter 4. Having protected corridors in personal care service assisted living is appropriate because they are not "protect in place" and they have lower staff to resident ratios.
- Make smoke barriers in I-1 more stringent than in I-2 nursing. The proposal requires the smoke barrier "compartments" to be smaller in size versus what is allowed in nursing. This effectively reduces travel distance and travel time to reach a point of safety, taking into account slower residents than the general public and less staff than found in nursing.

C. Proposed Capable of Self Preservation Personal Care Requiring Similar Protection Found in Residential Occupancies

The proposed IBC revisions moves current personal care service uses with occupants capable of exiting on their own without physical assistance, to Group R-4. This makes Group R for overnight uses for those that are considered generally capable of self preservation except for short term sickness. This proposal accomplishes the following:

- Makes R-4 as fully capable personal care: It moves the current I-1 and R-4 personal care uses that have all residents that can evacuate on their own to the R-4 occupancy. It changes the current R-4 from housing 6 to 16 to housing over five persons. It then includes “exceptions” for 6 to 16 occupant facilities in other sections, instead of making a whole occupancy classification for them. There are only five exceptions for differentiating the current I-1 from the R-4, so combining the two resident counts into one-occupancy is appropriate.
- The detailed analysis of the current I-1, R-2 and R-4 shows essentially the same protection features between these occupancies*. (See the Attachment E Current IBC Occupancy Requirements Comparison Table)* The only differences currently between I-1 and R-2 are minor

Chapter 5 and 9 differences. There are also currently no differences between the R-2 and R-4 allowable areas and stories. So moving personal care uses that have residents capable of self evacuation such as boarding homes, halfway houses, social rehab, and some assisted living to the general Group R and specifically Group R-4 is appropriate.

D. Proposal Offers Conceptual Differentiation Between Two Letter Group Occupancies

This proposal creates a true conceptual difference between the Group I and R occupancies. It also eliminates the splitting of personal care uses between the Group I (I-1) and Group R (R-4) occupancies, based solely on the number of occupants. That current condition of changing an occupancy letter group (I and R) solely for the number of residents, only occurs in these two occupancies in the code. This proposal changes this previous "number only" split, and now provides a definitive user capability difference between Groups I and R. It makes the general Group I for persons most likely depending on others to exit a building. It creates a capability level order in Group I from limited capability to fully detained occupants:

- Group I-1 is revised for non bedridden conscious persons needing limited assistance in exiting a building.
- Group I-2 is maintained as a "protect in place" occupancy and for persons who may require full assistance to exit a building, including bedridden and unconscious patients.
- Group I-3 is maintained for persons under restraint or security.
- Group I-4 is maintained as more of an exception to typical 24 hour Group I, but who's occupants still most likely require assistance with evacuation.
- The proposal then keeps the R for overnight sleeping occupancies for persons generally capable of self preservation. It keeps transient and non transient differences in R, while now also including only capable of self preservation personal care uses.

E. **Other Proposed Assisted Living Substantiations**

The proposed IBC revisions maintain assisted living as I-1 and R-4. It keeps other non-related nursing protection features and exceptions out of these personal care service occupancies. The revisions also more closely match CMS and a majority of states existing additional building protection requirements, while having little or no cost effect.

This proposal accomplishes the following:

- **Keep sole I-2 requirements in I-2:** It keeps exclusive I-2 requirements that are not applicable to personal care, only in I-2 and not in I-1 or R-4 personal care. They include a shorter 200' general allowable travel distance in the I-2 in Chapter 10, which is offset by the proposed smaller smoke compartment area in the I-1. There are numerous egress width differences required in the I-2 occupancy i.e. 8' corridor, 44" door, .3 egress width, that are all related to bed movement of bedridden occupants in I-2. Bedridden residents are not allowed in personal care assisted living, so those requirements are not applicable to personal care and thus are not proposed here. There is also a structural redundancy requirement for I-2 because it is a protect in place occupancy, which is also not applicable to assisted living personal care. *(See Attachment G-Additional Detailed Substantiation)*
- **These proposed personal care revised resident type and associated requirements closely match approximately 40 states current state regulations and CMS regulations.** Also note that last three editions of the CMS enforced life safety regulations for personal care, used in over half the states, have removed the timing of the resident formulas used in older editions that resulted in over complexity of determining capability of residents. This removal of timing is now just referenced as a guide but is not a determinate of its occupancy classification system anymore. The lack of timing of residents and other proposed changes in the IBC for personal care assisted living are consistent with the requirements already in existence in approximately 29 states through current CMS and other state licensing requirements: allowing assistance with evacuation in a non I-2 type occupancy, NFPA 13 sprinklers, further wood framing story limitations, and smoke barriers. The proposed revisions are also similar with 11 other states current licensing requirements for a total of about 40 states that already include the concepts proposed here. This continuity of requirements create national consistency similar to what already occurs between CMS life safety regulations in nursing and the IBC I-2 requirements. *(See Attachment C-IBC Revision Summary Table and G-Additional Detailed Substantiation)*
- **Proposal allows occupancy classification options for the variations of personal care around the country:** The proposal allows assisted living in the 46 or so states that exclusively have assistance with evacuation or both assistance and no assistance categories, to use all the new appropriately categorized occupancies of I-1 and R-4, versus the current lack of applicable occupancy classifications. This then effectively eliminates the discussions that must now occur as to what IBC occupancy is to be used between the building official, fire marshal, state licensing department, and applicant, when not capable residents are proposed as often occurs.
  - The proposal allows the 4 or so states that do not allow assistance with evacuation in personal care assisted living, to keep their regulations essentially the same, and now be classified as a Group R-4 occupancy.
  - The 5 or so states assisted licensing regulations that currently require essentially I-2 assisted living exclusively, can continue doing that through their licensing regulations (as currently occurs) or update them to the proposed new IBC format and/ or current similar CMS regulations. It also allows the 10 or so states to have multiple assisted living classifications in the revised IBC due to requiring older CMS regulations or other licensing regulations.
  - This seemingly complex issue of personal care occupancy classification is now made simpler for the building code plans reviewer compared to the lack of clarity that often now occurs. These classifications are revised and based on only whether the residents are capable or not capable of evacuation: The permit applicant must still confirm the state licensing agency resident type category and comply with their regulations (usually the Department of Human Services or Department of Health).
  - The applicant will initially propose an assumed classification of I-1 or R-4. The submitted set of plans to the building department should also indicate the state license agency category, to confirm in writing that the occupancy classification is correct relative to resident counts and capabilities as defined by the state regulations. The applicant should state on the permit application drawings whether the resident type proposed are capable or not capable of self preservation. The Building Official then makes the final determination of the occupancy classification based on the applicant's statement, and/or state licensing information provided to the building official. The applicant can also be requested by the building department to quote state licensing requirements of the state licensing regulation definitions on the drawings as now often occurs. This can be accomplished because numerous states write in their regulations whether the residents are capable or not capable of self preservation. If not shown in state licensing definitions, other parts of state licensing criteria indicate capability of residents including but not limited to: the types of facilities allowed, admissions and discharge criteria, or referenced CMS enforced life safety code and their resident capability classifications. This can help prove to the Building Official whether the I-1 or R-4 is the appropriate classification.
- **Keeps personal care out of I-2.** There are advocates for moving personal care to the I-2 occupancy. This is misdirected due to the numerous reasons indicated in the above overview including: assisted living having less than the nursing level of care residents, having less staff to resident ratios, not being protect in place, and nursing having numerous non applicable exceptions and additional protection requirements due to being a protect in place occupancy.

- The major difference though is having less staff to resident ratios in assisted living. Higher staff ratios allows nursing and hospitals to be protect in place and exempt corridor protections, while also adding additional structural redundancy requirements.
- These I-2 advocates also do not recognize that moving non capable personal care to I-2 would cause a non justified increase in construction costs with no relative increased occupant protection: A majority of assisted living facilities are constructed of protected wood frame and many are over one story. Wood frame costs are generally in the $100 to $130 per square foot range for these facilities. Steel frame costs up to 5 stories, are generally in the $130 to $160 per square foot range for the limited number of these facilities built this way. Changing these personal care facilities to I-2 would cause a majority of facilities to be steel frame (I-2 limits wood frame to 1 story) for little if any protection increases in comparison to the other protection features included in this proposal. This potential construction cost increase of 20% would be an undue burden on the industry. Keeping them in the new proposed I-1 (2 story wood) and R-4 (4 story wood) will have little if any affect on construction costs, especially in the majority of states under current CMS and state regulations with similar story and protection requirements matching this proposal.

- **Other options for including both capable and non capable personal care, with their different requirements, cause as many or more revised sections to the IBC, but create or do not solve other issues.** Keeping personal care in the I-1 and R-4, while delineating capability differences between these two occupancies is the most appropriate occupancy designation solution for dealing with personal care. The following are summaries of numerous options for revising personal care. All the revision options below assume including both capable and non capable personal care while adding new requirements to non capable uses, similar to what is in this proposal. The following summary concludes that this proposal option in this submittal is the best overall long term solution to match actual conditions across the country.
  - This proposal option:
    - (+) Makes conceptual I and R use differences with I as not capable and R as capable.
    - (+) Ads new requirements in the revised I-1.
    - (+) Removes the number only split of the current I-1 and R-4.
    - (+) Best long term conceptual revision.
    - (+/-) 22 sections revised.
  - Option for making I-1 and R-4 not capable personal care, keeping current number split, and adding capable personal care to R-2:
    - (+) Leaves current I-1 and R-4 mostly in tact with just revising resident type, while adding new requirements.
    - (-) Adds capable personal care list to R-2 and mixes the use with R-2.
    - (-) Leaves the number only split of the current I-1 and R-4.
    - (+) Requires 10-15 revised sections.
  - Option for keeping the current capable I-1 and R-4, and adding not capable personal care to I-2:
    - (+) Leaves current I-1 and R-4 in tact.
    - (-) Adds not capable personal care list to I-2 and adds various exceptions for non bed, not protect in place, and lower staff ratio personal care requirements and exceptions to I-2.
    - (-) Limits not capable personal care to one story wood, increasing construction costs.
    - (-) Leaves the number only split of the current I-1 and R-4.
    - (+/-)Requires 15-20 revised sections.
  - Option for adding a new not capable personal care occupancy designation number in either I or R (R-5?):
    - (-) Creates a new occupancy
    - (-) Requires 40+ revised sections plus major IFC revisions.

ITEMIZED IBC SECTION REASONS

Section 308.2 is revised to allow residents in Group I-1 that require assistance with evacuation. Residential care/assisted living facilities and other personal care uses that are allowed by individual state licensing regulations to have these types of residents remain in this revised Group I-1.

The previous reference of "assistance from staff" is removed, since assistance can be from staff as was previously mentioned in this section, or from other residents, or from first responders, such as fire department personal. The proposed reference of just "assistance" assumes that assistance with evacuation can be from anyone. Assistance from anyone then places a resident in this category.

The term "not capable of self preservation" is not included as part of the personal care occupancy descriptions since the term is not currently defined in the IBC. The term is currently used in the I-2 and is generally accepted as meaning that an occupant is not capable of self preservation when they are incapable of responding to an emergency situation on their own to exit a building without physical assistance. The current I-1 Section 308.2 clarifies what the implied definition of capable of self preservation is by stating that occupants are capable of responding to an emergency situation on their own without physical assistance. This approach of stating the implied definition versus using the term itself is maintained in the proposed I-1 and R-4 occupancy resident type descriptions to clarify the intent without referencing a definition. The statements in the current I-1 and both the proposed I-1 and R-4, then definitively delineate resident capability classification.

Alzheimer's facilities are also specifically itemized since the Hawaii study showed that 47 states allow these facilities under assisted living licenses. *(See Attachment A-All State Summary Table).* Current CMS regulations also allow these facilities in their non nursing health care regulations. Alzheimer's facilities have additional requirements in the proposed Chapter 5 story limitation revisions. There is also a corridor protection exception to allow the current common "neighborhood" designs for Alzheimer's facilities in the proposed Chapter 4. See those section's "Reasons" for substantiation.

Some other types of uses are removed from the current I-1 list because none of those uses are considered to have occupants that are not capable of self preservation.

Group I-1 is also changed from housing more than 16 to housing over five persons, matching the current I-2 resident count. The "exceptions" for 6 to 16 occupant facilities are listed in other revised sections under I-1, instead of making a separate occupancy classification. The facilities that have residents capable of self evacuation are moved from the current I-1 category to the R-4 category since there are currently only minor differences between the I-1, R-2, and R-4 occupancies. The categories moved to the R-4 include the complete list of uses from the current I-1, since some or all of these types of facilities have residents that are capable of self preservation. They include: Alcohol and drug centers, congregate care facilities, convalescent facilities, group homes, halfway houses, social rehabilitation facilities, and the limited types of assisted living and residential care facilities that require full capability. Clarification of the differences between the I-1 and I-2 is that I-1 facilities only provide "personal care service" as appropriately defined in the current IBC. Personal care services (I-1, R-4) do not provide "chronic convalescent, health, medical or surgical care." The Group I-2 occupancy is the appropriate facility to provide those types of services. *(See Attachment C-IBC Revision Summary Table)*

The last paragraph of this section continues cross-referencing other related occupancies, which now include adding cross-referencing R-3, and referring capable personal care to the R-4 occupancy. Exceptions for complying with construction requirements for R-3 are maintained for facilities with 6-16 residents, including requiring added compliance with Section 903.2.6 (sprinklers), written in the same format as the current R-4 last paragraph description.

Section 310.1 Group R-4 is revised to include personal care facilities, all of which have residents that do not require physical assistance with evacuation, similar to the current I-1. The whole section is re-written to match the current I-1 description. These types of facilities that have residents that are capable of self evacuation are moved from the current I-1 category to the R-4 category since there are currently only minor differences between the I-1, R-2, and R-4 occupancies. The categories moved to the R-4 include the complete list of uses from the current I-1, since some or all of these types of personal care service facilities have residents that are capable of self preservation. They include: Alcohol and drug centers, congregate care facilities, convalescent facilities, group homes, halfway houses, social rehabilitation facilities, and the limited types of assisted living and residential care facilities that require full capability by certain individual state licensing regulations. *(See Attachment A-All State Summary Table)*. *(See Attachment C-IBC Revision Summary Table)*

The number of residents is revised from the current 6-16 to more than five residents. The "exceptions" for 6 to 16 occupant facilities are listed in other revised sections under R-4, instead of making a separate occupancy classification. The last paragraph of this section continues cross-referencing other related occupancies, which now include adding cross-referencing R-3.

Section 310.2 The "Residential Care/Assisted Living" definition is revised to delete the previous resident capability limitation. The revised definition states that occupancy classification is based on the ability of occupants to respond to an emergency situation with or without assistance. The limitation on not allowing assistance with evacuation is now only written into the R-4 occupancy description. The Group I-1 occupancies are revised to allow assistance with evacuation. The definition further adds text that the occupants are non bedridden persons, except during temporary common sicknesses that occur in the general public. This is added to clarify the limitation of personal care versus I-2 nursing care. It is consistent with the current "personal care" definition and current assisted living regulations across the country. See the Summary Overview substantiating the concept reasons for the change. Other aspects of the current definitions remain unchanged, since they reflect current common distinctions in the personal care service industry.

Section 420.1 Group R-4 is added since it is now proposed to be similar to the current I-1 in terms of resident types. The new R-4 requirements mostly parallel the current I-1 requirements.

Section 420.2 The exceptions for 6 to 16 occupant facilities are listed here matching current requirements, instead of making a separate occupancy classification.

Section 420.4 Smoke barriers are added as a requirement in Group I-1 occupancies with over 16 residents. They are added to I-1 due to the abilities of the new proposed resident type allowed and to match already existing CMS and state licensing regulations in a majority of states.

The section utilizes similar language and format from the current I-2 Section 407 for smoke barriers. This proposed section provides smoke barrier size and travel distance requirements that are more restrictive than the Group I-2 requirements. These limits, compared to I-2 smoke compartment size, are proposed because of the probability of less staff in personal care occupancies to assist in evacuation when compared to nursing. Smaller smoke compartments and shorter travel distance assumes less time to reach a point of safety from the compartment of origination. The proposed revisions limit the size of smoke compartments to 16 sleeping rooms, or 10,500 square feet, whichever is less, versus the 22,500 square feet allowed in I-2. The proposed limit is taken from the basic Group I-1 exceptions for over 16 occupant criteria throughout the code, or 10,500 square feet, the basic allowable area allowed in the I-1 occupancy. There are four states that have statewide amendments to the IBC for personal care implementing the overall concepts in this proposal. The State of Oregon and Hawaii statewide building code amendments reduce smoke compartment size in their non capable personal care occupancies to the approximately the size proposed here. Oregon has over a twenty year history of amendments for personal care occupancies with residents who are not capable of self preservation, including reduced smoke compartment size.

The use of the term "sleeping room" is included so not to mix the more limiting Chapter 10 occupant load calculations into this requirement. The concept is that actual sleeping rooms will be counted. The travel distance will additionally control the size. The reduction from the I-2 travel distance of 200' is reduced in the I-1 by 25 percent to 150'. This reduction is also based on the probability of less staff to assist residents in personal care during evacuation.
(See Attachment C-IBC Revision Summary Table)

Section 420.4.1 The added refuge area requirement utilizes wording matching the current I-2 Section 407.4.1.

Section 420.4.2 The added Independent egress requirement utilizes wording matching the current I-2 Section 407.4.2.

Section 420.4.3 The added Horizontal assembly requirement utilizes wording matching the current I-2 Section 407.4.3.

Section 420.5 is added to confirm that corridors are required in I-1 occupancies and to provide a scoping statement for the multipurpose areas next to sleeping room exception in lieu of corridors proposed in the new following Section 420.5.1. The language in this Section 420.5 is derived from the same scoping language requiring corridors in I-2 in Section 1014.2.2, then introducing the "suite" exception in the next Section 1014.2.3.

Section 420.5.1 is added to allow "neighborhood designs" often seen in many Alzheimer's facilities. These designs often have 10 to 16 sleeping rooms open into a common shared living, activity, and dining area. Many facilities currently using this design layout use the accessory provisions allowed in the exit access intervening room requirements in Chapter 10, or use Section 407 exceptions if classified as the I-2 occupancy. These proposed provisions utilize concepts and wording from the spaces open to corridor provisions for nursing in found Section 407.2.3.

The intent here is to allow these neighborhood designs when there are only sleeping rooms that open into the spaces as found in Alzheimer's facilities. Typical assisted living units that have their own bathroom, kitchenette, and living rooms, are dwelling units so they are excluded from utilizing this exception. They are not included in this exception due to a self contained dwelling unit not requiring a common shared living, eating and activity area just outside a sleeping room. The key controlling requirement of this exception to corridor protection is the size of the compartment by the further limiting travel distance to 75' within that smoke compartment. This affectively limits travel time before reaching the required protection areas outside the compartment. The 16 sleeping room limit is derived from the maximum number of sleeping rooms allowed in a smoke compartment in the proposed Section 419.4. Other controlling features are from Section 407.2.3.

Table 503 IBC Table 503 is proposed to be revised to reflect changes to the definitions and resident type in the revised Group I-1 occupancy:

- The proposed I-1 basic allowable areas remain with the same limits as the current I-1.
- There are revised limitations on the number of stories allowed that reflect current Federal CMS limits on these occupancies. *(See Attachment D Areas & Height Table)*
- Approximately 36 states reference Federal CMS regulations for their assisted living occupancies, so general continuity between CMS enforced regulations and the IBC should occur. The revisions to the story limitations show a variance from one to three stories. The two story limitation in Type VA construction, also match California's IBC statewide amendments to the story limitations for its similar occupancy. California's state amendments also match other key protection features of CMS board and care regulations. *(See Attachment C-IBC Revision Summary Table)*

- The two story limitation for up to one hour wood protection matches current CMS requirements and is appropriate for this occupancy due to the type of residents. These occupants are expected to be able to evacuate the building with or without assistance in case of emergencies. They are not bedridden as in I-2 nursing, (with one story limits), and with the I-2 occupants that may stay in place during emergencies in a "protect in place" occupancy. This further substantiates the difference in Group I-1 two-stories versus the Group I-2 one story. There are already numerous existing two story wood frame assisted living facilities. This will allow these existing facilities to continue to be in compliance.
- Type IIA with fire sprinklers allows three stories. This matches the Federal CMS limits.
- Type IB is allowed seven stories with fire sprinklers, half way in between the current I-1 and I-2 limits, with two more stories than the current I-2 limits. Type IB construction contains the most differences between various versions of CMS and other state enforced regulations. This proposal is an average of the difference between Federal CMS regulations and Group I-2.

Table 503 is revised for the new Group R-4 to match the current Group I-1, being that the current I-1 is essentially moved to the new R-4. The revisions here are more clerical revisions than actual revisions because of moving the current I-1 occupancy to the R-4.

Section 504.2 Exceptions. Most Group I-1 and all Group R-4 occupancies are still allowed the sprinkler increase of one story and 20 feet in height from Table 503 by the base scoping language of the unrevised Section 504.2. Group I-1 occupancies with specifically designated Alzheimer's facilities are added to the exceptions for not being allowed the sprinkler story and height increases in Type IIB, III, IV, or V construction, similar to the current I-2 exception. The wording of the phrase includes the text "specifically designated or licensed by a state" to clarify that these are specially designated facilities licensed by most state Department of Human Services or Department of Health. This text is included to exclude applying the exception to assisted living facilities that may have some residents with dementia and early Alzheimer's disease as occurs in many assisted living facilities. The exception is only intended for exclusively designated Alzheimer's facilities, due to the likelihood of all residents not being capable of self preservation.

This is an additional requirement for these facilities matching the story limitations of wood frame construction of the I-2, which most jurisdictions have categorized Alzheimer's facilities in the past. The revision affectively keeps Alzheimer's facilities with all the appropriate I-2 protection features except for non applicable protect in place and bedridden requirements. This is a practical exception versus placing these facilities in the I-2 occupancy, which would cause additional exceptions for Alzheimer's facilities due to the additional and reduced protection features required in the I-2 as stated in the Summary Overview. The State of Hawaii study also shows that Alzheimer's facilities are allowed with a special license in 47 state assisted living regulations. So keeping them in the same I-1 occupancy with the additional I-2 protection features, making them almost equivalent to I-2 protection, is appropriate.

The limitation of occurring on the first story in combustible and non protected construction is proposed because numerous state assisted living regulations and states using older CMS life safety codes limit these facilities to the first story in these construction types. (The last three editions of CMS enforced life safety code does allow two stories though.) The first story limitation is appropriate though mostly due to the likelihood that few if any of an exclusive Alzheimer's facility's residents have the capability of responding to an emergency on their own. This is compared to non Alzheimer's assisted living facilities proposed to be allowed to be two stories in height. These proposed two story types of assisted living facilities have fewer to substantially fewer occupants requiring assistance with evacuation.

Section 508.2.4 is revised to reflect the revisions to the I-1 and R-4 occupancies, now incorporating more than 5 residents. Group I-1 and R-4 are moved to number 4 of this section to cover the 16 resident exceptions for both occupancies. The exception for 16 and under residents in I-1 and R-4 occupancies is added to maintain current requirements found in the similar current R-4. This is proposed versus making a whole new occupancy classification based only on the number of residents. The revisions here are more clerical revisions than actual revisions because of revising resident counts in the I-1 and R-4.

Section 508.3.3 is revised to reflect the revisions to the I-1 and R-4 occupancies now incorporating more than 5 residents. Group I-1 and R-4 are moved to number 4 of this section to cover the 16 resident exceptions for both occupancies. The exception for 16 and under residents in I-1 and R-4 occupancies is added to maintain current requirements found in the similar current R-4. This is proposed versus making a whole new occupancy classification based only on the number of residents. The revisions here are more clerical revisions than actual revisions because of revising resident counts in the I-1 and R-4.

Table 706.4 is revised to reflect the revisions to the R-4 occupancy, being that the current I-1 is essentially moved to the new R-4 while now incorporating more than 5 residents. The revisions here are more clerical revisions than actual revisions because of essentially moving the I-1 to the R-4.

Section 710.5 is revised to include cross corridor doors in the new required smoke barriers in Group I-1, matching the same exceptions allowed for I-2. This exception matches current CMS requirements.

Section 903.2.6 is revised to require full NFPA 13 sprinkler coverage in the I-1 occupancy when housing over 16 residents. This is proposed to reflect that the new I-1 residents may require physical assistance to evacuate. The exception is revised to allow NFPA 13R in smaller facilities versus creating a whole new occupancy classification for them for the few exceptions. The requirements also match current CMS and state assisted living regulations in a majority of states. *(See Attachment A-All State Summary Table and C-IBC Revision Summary Table)*

Section 907.2.6.1 is revised to eliminate the exception for eliminating automatic smoke detection when sprinklers are provided. This proposal requires smoke detection even with sprinkler exceptions to reflect that the new less capable I-1 resident type.

Section 907.5.2.3.3 is revised to match the current I-1 and current R-4 requirements. Group R-4 is added because it is now proposed to match the current I-1 in resident capability but not in resident counts. The exception is added to match current R-4 not requiring visible alarms when there are 16 or less residents. The exception for 16 and under residents in I-1 and R-4 occupancies is added to maintain current requirements found in the similar current R-4. This is proposed versus making a whole new occupancy classification based only on the number of residents. The revisions here are more clerical revisions versus technical requirement changes solely due to moving the current I-1 to the new R-4 occupancy and changing resident counts in the occupancies.

Section 1006.1 is revised to match the current I-1 and new R-4 requirements. Group R-4 is added because it is essentially moved from the current I-1. Dwelling units are added in Group I because some I-1 uses have dwelling units, making them consistently exempt.

Section 1107.6.4 is revised to match the current I-1 with the new R-4 requirements. The revisions are clerical revisions versus technical requirement changes solely due to moving the current I-1 to the new R-4 occupancy and changing resident counts in the occupancies.

Cost Impact: The code change proposal will not increase the cost of construction due to current enforcement of similar requirements by other regulations such as CMS and state licensing regulations.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PURGIEL-G1-308.1.DOC

ATTACHMENT A (From the State of Hawaii Analysis)

ALL STATE SUMMARY TABLE

Personal Care "Assisted Living" Regulations and NFPA/ IBC References

State ALF [1,2]	Evacuation Criteria	Type of Facility	No of Residents	Alzheimer Residents Allowed	Admission / Discharge Criteria					Referenced NFPA Codes [2, 5]			Referenced IBC [6] Occupancy	
					Evacuation Capability [3]	Ongoing Nursing Care Allowed	Bedridden Allowed	Beyond Facil. Capabilities	Other	NFPA Referenced	NFPA Occupancy Type	Other 4, [6]	IBC Adoption & Stated IBC Occupancy	Assumed 16+ Res. IBC [6,7, 8]
Alabama		Family Assisted Living Facility:	2-3 adults	Yes in special units	Must at admin, AEA later	Intermittent 90 day max	No	Discharge	Severe cognitive impairment	NFPA 101, 20003 edition	1-2 Family Dwelling		J	
	AEA X	Group Assisted Living Facility:	4-16 adults	Yes in special units	Must at admin, AEA later	Intermittent 90 day max	No	Discharge	Severe cognitive impairment	NFPA 101, 20003 edition	Residential Board & Care - Impractical	1st flr only if NCSP		I-2
	AEA X	Congregate Assisted Living facility:	17+ adults	Yes in special units	Must at admin, AEA later	Intermittent 90 day max	No	Discharge	Severe cognitive impairment	NFPA 101, 20003 edition	Residential Board & Care - Impractical			
Alaska (M)		Assisted Living Home - Small	1-5 adults	Yes, not mentally ill	AEA - transfer allowed	Skilled 45 day max	45 days max	Discharge	Skilled nursing over 45 days				J	
	AEA Y	Assisted Living Home - Medium	6-11 adults	Yes, not mentally ill	AEA - transfer allowed	Skilled 45 day max	45 days max	Discharge	Skilled nursing over 45 days		Facilities based on Prompt,	NFPA 13D, 13R, 13	2000 IBC and IFC	I-2
	AEA X	Assisted Living Home - Large	12+ adults	Yes, not mentally ill	AEA - transfer allowed	Skilled 45 day max	45 days max	Discharge	Skilled nursing over 45 days		Slow and Impractical	NFPA 13D, 13R, 13		
Arizona (M)	**AEA X**	Assisted Living Home:	2-10 adults	Yes in special units		Intermittent only	Short term	Discharge	Unable to self direct care			1st flr only if NCSP	J	I-2
	AEA Y	Assisted Living Center:	11+ adults	Yes in special units		Intermittent only	Short term	Discharge	Unable to self direct care			1st flr only if NCSP		
Arkansas (M)	**X**	Assisted Living Facility Level I:	3+ adults	No	Self-evacuate required	3rd party 60 day max	No	Discharge	Unable to self-admin meds	NFPA 101, 1985 edition			J	I-1, I-2
	AEA Y	Assisted Living Facility Level II:	3+ adults	Yes w/special license	AEA - Limited assist	Intermittent 14 Day max	No	Discharge	Transfers assist beyond staffing	NFPA 101, 1985 edition			I-1 , 2000 IBC	
California (RCFE)	**AEA Y**	Residential Care Facility for Elderly		Yes w/special license		more than Intermittent care	14 days max	Discharge	Continuing nursing care	NFPA 101, 2003 edition		size & evacuation	S	I-1, I-2
		P												
Colorado (M)	**AEA Y**	Assisted Living Residence:	3+ adults	Yes in special units	Per NFPA	3rd party only	Allowed w/limits	Discharge	Continuing skilled nursing	NFPA 101, 2003 edition	Residential Board & Care		J	I-1, I-2
Connecticut (M)	**X**	Managed Residential Communities :Indepent apt.		No	Self-evacuate required	Intermittent only	No	Discharge	Continuous skilled nursing			Facility not licensed	J	I-1
	X	Assisted Living Services Agencies: Provides svcs.		No	Self-evacuate required	Intermittent only	No	Discharge	Continuous skilled nursing	NFPA 101, 2003 edition		Care is licensed	R-2, 2000 IBC	
Delaware (M)	**AEA Y**	Assisted Living facility:		Yes in special units	Cannot req. transfer	No skilled care	14 days max	Discharge	Needs transfer assistance	NFPA 101, 2000 edition	Residential Board & Care		J	I-1, I-2
Florida (M)	**AEA Y**	Assisted Living Facility:	1+ adults	Yes w/special license	Per NFPA	Intermittent only	7 days max	Discharge	Needs 24-hr skilled care	NFPA 101, 2000 edition	Residential Board & Care		S	I-1, I-2
Georgia (M) (PCH)	**AEA X**	Personal Care Homes	2+ adults		Sef-evac or 1st floor	3rd party only	need waver	Discharge	Continuous nursing care	NFPA 101, 2003 edition		Sef evac or I-2	S	I-1, I-2
Hawaii (M)	**AEA X**	Assisted Living Facility		Yes		Nursing allowed	Yes	Discharge	Danger to self & others	NFPA 101, 2006 edition			S, IBC	I-2
Idaho (M)	**AEA X**	Assisted Living Facility Small:	3-16 adults	Yes w/special license	Self-evac or I-2 Facility	Intermittent, Short term	No	Discharge	Beyond fire safety capacity of facility	NFPA 101 or 101A, 2000 ed	Residential Board & Care - Impractical	1st flr only if NCSP	J	I-1, I-2
	AEA X	Assisted Living Facility Large:	17+ adults	Yes w/special license	Self-evac or I-2 Facility	Intermittent, Short term	No	Discharge	Beyond fire safety capacity of facility	NFPA 101, 2000 edition	Limited Care			
Illinois	**AEA Y**	Assisted Living Establishment:	2+ adults	Yes in special units	Min. assist or I-2	Intermittent only	No	Discharge	Ongoing skilled nursing	NFPA 101, 2000 edition	Residential Board & Care		J	I-1, I-2
	X	Shared Housing Establishment:	1-11 adults	Yes in special units	Self-evacuation required	Intermittent only	No	Discharge	Unable to communicate needs	NFPA 101, 2000 edition	Residential Board & Care			
Indiana (M) (RCF)	**AEA X**	Residential Care Facility		Yes in special units	Up to total transfer	Nursing allowed w/license	Yes	Discharge	24-hr ongoing skilled care	State Fire Code			S	I-2
Iowa (M)	**AEA Y**	Assisted Living Facility Small:	3-16 adults	No	Up to 2 person assist	>intermittent	No	Discharge	Needs 2 person transfer	NFPA 101, 2003 edition	Resid. Board & Care - Prompt & Slow		J	
	AEA Y	Assisted Living Facility Large:	17+ adults	No	Up to 2 person assist	>intermittent	No	Discharge	Needs 2 person transfer	NFPA 101, 2003 edition	Resid. Board & Care - Prompt & Slow			I-1, I-2
	AEA Y	Dementia-Specific Assisted Living:	5+ adults	Yes		>intermittent	No	Discharge	Aggressive behavior	NFPA 101, 2003 edition	Residential Board & Care - Impractical			
Kansas	**AEA Y**	Assisted Living Facility	6+ adults	Yes in special units	1 person transfer allowed	Intermitt or limited in scope	Determined by license	Discharge	Needs 2 person transfer				J	I-2
Kentucky	**X**	Assisted Living Facility	5+ adults	Yes in special units	Self-evacuation required	3rd party only	Allowed w/limits	Discharge	Unable to evacuate by self	NFPA 101	Must evac. in 13 min unassisted inc Alz		S	I-1
Louisiana (RCF)	**AEA Y**	Assisted Living Facility - Small (Residential Care)	under 16	Yes in special units		90 day max	Temporary only	Discharge	Continuous nursing care	NFPA 101, 2006 edition			S	I-1, I-2
	AEA Y	Assisted Living Facility - Large (Residential Care)	16 & over	Yes in special units		90 day max	Temporary only	Discharge	Continuous nursing care				I-1 , 2000 IBC	
Maine (M)	**AEA Y**	Assisted Living Type I:	4+ adults	No		3rd party only	No	Discharge	Continuous nursing care	NFPA 101, 2006 edition	Residential Board & Care		J	I-1, I-2
	AEA Y	Assisted Living Type II:	4+ adults	Yes in special units		Nursing allowed	No	Discharge	Continuous nursing care	NFPA 101, 2006 edition	Residential Board & Care			
Maryland (M)	**X**	Assisted Living Program Level 1:	1+ adults	No	Self-evacuate required	Intermittent only	Short term	Discharge	Continuous nursing care	NFPA 101, 2006 edition	1-2 Family Dwelling		J	
	AEA Y	Assisted Living Program Level 2:	1+ adults	No	AEA - Slow	Intermittent only	Short term	Discharge	Continuous nursing care	NFPA 101, 2006 edition	Residential Board & Care - Slow			I-1, I-2
	AEA Y	Assisted Living Program Level 3:	1+ adults	Yes in special units	Impractical to evacuate	Skilled allowed	Short term	Discharge	Continuous nursing care	NFPA 101, 2006 edition	Limited Care			
Massachusetts (M)	**AEA Y**	Assisted Living Residences:	3+ adults	Yes w/special license	Evac. not a requirement	Intermittent by 3rd party	No	Discharge	Ongoing nursing care	State regulations			S	I-2
Michigan (M)		Adult Foster Care Family Homes:	1-6 adults	No		Intermittent only	No	Discharge	Continuous nursing care		1-2 Family Dwelling		S	

Personal Care "Assisted Living" Regulations and NFPA/ IBC References

State ALF [1,2]	Evacuation Criteria	Type of Facility	No of Residents	Alzheimer Residents Allowed	Admission / Discharge Criteria					Referenced NFPA Codes [2, 6]			Referenced IBC [6] Occupancy	
					Evacuation Capability [3]	Ongoing Nursing Care Allowed	Bedridden Allowed	Beyond Facil. Capabilities	Other	NFPA Referenced	NFPA Occupancy Type	Other [4, 6]	IBC Adoption & Stated IBC Occupancy	Assumed 16+ Res. IBC [6,7, 8]
Montana (M)	**X**	Assisted Living Facility - Category A:	1+ adults	No	Self-evacuate required	Intermittent 30 day x4	No	Discharge	Treatment not appropriate	NFPA 101, 2000 edition	Residential Board & Care - Prompt	sprinklers not req	S	
	AEA X	Assisted Living Facility - Category B:	1+ adults	No		Nursing care 30 day x 4	5 bed max	Discharge	Treatment not appropriate	NFPA 101, 2000 edition	Resid. Board & Care - Slow or Impractical	sprinklers required		I-1, I-2
	AEA X	Assisted Living Facility - Category C:	1+ adults	Yes	Impractical to evacuate	Intermittent only	5 bed max	Discharge	Treatment not appropriate	NFPA 101, 2000 edition	Residential Board & Care - Impractical			
Nebraska (M)	**AEA Y**	Assisted Living Facility Level 1	4+ adults			Intermittent only	No	Discharge	Continuous nursing care	NFPA 101, 2000 edition	Resid. Board & Care - Prompt or Slow		J	I-1, I-2
	AEA X	Assisted Living Facility Level 2	16+ adults		Impractical to evacuate	No skilled care	No	Discharge	Complex or unstable condition	NFPA 101, 2000 edition	Limited Care			
Nevada (M) (RFG)	**AEA Y**	Residential Facility for Groups Category 1	3+ adults	No	AEA allowed	Intermittent only	No	Discharge	Skilled nursing care	NFPA 101, 20003 edition	Residential Board & Care - Prompt		J	
	AEA Y	Residential Facility for Groups Category 2	3+ adults	No	Impractical to evacuate	Intermittent only	No	Discharge	Ongoing nursing care	NFPA 101, 20003 edition	Residential Board & Care - Slow			I-1, I-2
	AEA Y	Residential Facility w/ Endorsement:	3+ adults	Yes	AEA allowed	Intermittent only	No	Discharge	Ongoing nursing care	NFPA 101, 20003 edition	Residential Board & Care - Impractical			
New Hampshire (M) (RCF)	**AEA Y**	Residential Care Facility Basic 804:	2+ adults	No	AEA - Slow	Intermittent only	No	Discharge	Continuous nursing care	State Fire Code, Ref NFPA 101	Residential Board & Care		J	
	AEA Y	Residential Care Facility Supported 805:	2+ adults	Yes	Impractical to evacuate	Allow skilled care	Yes	Discharge	Will allow acute nursing care	State Fire Code, Ref NFPA 101	Limited Care			I-2
		Residential Care - Assisted Living Facility 813:	1-3 adults	No	Self-evacuate required	Intermittent only	No	Discharge	Ongoing nursing care	State Fire Code, Ref NFPA 101	1-2 family residence			
New Jersey (M)	**AEA X**	Assisted Living Residences	4+ adults	Yes in special units		Intermittent 45 day max	Short term	Discharge	Bedridden +14 days	State Fire Code			S, I-2	I-2
New Mexico (M)	**AEA Y**	Residential Care Facilities: <Not regulated	2+ adults		AEA - Prompt & Slow	Intermittent only	No	Discharge	Continuous Nursing Care	NFPA 101	Occupancy based on bldg type & evac		J	I-1, I-2
New York (M)	**AEA X**	Assisted Living Residence:	5+ adults	No		Intermittent only	No	Discharge	Ongoing nursing care		Residential Board & Care	1st flr only if NCSP	S	I-1, I-2
	AEA X	Special Needs Assisted Living Residence:	5+ adults	For Alzheimer/Dem.	Impractical to evacuate	Intermittent only	No	Discharge	Aggressive, non-coop. behavior		Limited Care	16+ smoke barriers		
	AEA X	Enhanced Assisted Living Resident:	5+ adults	No	AEA - transfer, walking	Not cont skilled care	Not chronic	Discharge	24-hr skilled care		Residential Board & Care - Impractical	16+ smoke barriers		
North Carolina (M)	**X**	Adult Care Home:	2+ adults	No	Self-evacuate required	Intermittent 3rd party only	No	Discharge	Ongoing nursing care	N.C.Fire Code & N.C.Build Code			S	
	AEA X	Adult Care Home w/ Special Units :	2-12 adults	Yes	Impractical to evacuate	Intermittent only	No	Discharge	Ongoing nursing care	N.C.Fire Code & N.C.Build Code				I-1, I-2
	X	Assisted Housing w/Services:	2+ adults	No	Self-evacuate required	Intermittent 3rd party only	No	Discharge	Ongoing nursing care	N.C.Fire Code & N.C.Build Code				
North Dakota (M)	**X**	Assisted Living Facility:	5+ adults	No	Self-evacuate required	Limited intermittent	No	Discharge	Most are part of a health facility	Modeled on NFPA 101	Residential Board & Care - Prompt	very independent	S, I-1, most part of an I-2	I-1
Ohio (RCF)	**AEA Y**	Residential Care Facility Small:	3+ adults	Yes w/special license	AEA - no requirements	Skilled nursing 120 days	No	Discharge	Complex medical condition				S	I-2
	AEA Y	Residential Care Facility Large:	17+ adults	Yes w/special license	AEA - no requirements	Skilled nursing 120 days	No	Discharge	Skilled nursing over 120 days					
Oklahoma	**AEA Y**	Assisted Living Center:	2+ adults	Yes w/special license	AEA - transfer allowed	Intermittent only	No	Discharge	Requires med/phy restraints	NFPA 101, 2006 edition	Sprinklers, area of refuge, alarms		J	I-2
Oregon (M)	**AEA Y**	Assisted Living Facilities - SR-1:	6+ adults	Yes w/special license	AEA - Slow	Limited intermittent	No	Discharge	Skilled care, memory loss	NFPA 101, 2003 edition	Residential Board & Care - Slow	NFPA 13	S, I-1 (w/ amendments)	I-2
	AEA Y	Assisted Living Facilities - SR-2:	6+ adults	Yes w/special license	Impractical to evacuate	Limited intermittent	No	Discharge	Needs skilled care	NFPA 101, 2003 edition	Limited Care	NFPA 13	I-2 (w/ amendments)	
		Assisted Living Facilities - SR-3:	1-5 adults		AEA	Limited intermittent	No	Discharge	Skilled care, memory loss	NFPA 101, 2003 edition	Resid. Board & Care - Prompt & Slow	NFPA 13D	R-3 (w/ amendments)	
	AEA Y	Assisted Living Facilities - SR-4:	6-16 adults		AEA	Limited intermittent	No	Discharge	Skilled care, memory loss	NFPA 101, 2003 edition	Resid. Board & Care - Prompt & Slow	NFPA 13R	R-4 (w/ amendments)	
Pennsylvania (PCH)	**AEA Y**	Personal Care Home - Small:	4-9 adults	Yes w/special license	AEA	Limited intermittent	Short term	Discharge	Requiring nursing care	Modeled on IFC		based on mobility	S	I-2
	AEA Y	Personal Care Home - Large:	9+ adults	Yes w/special license	AEA	Limited intermittent	Short term	Discharge	Requiring nursing care	Modeled on IFC		based on mobility		
Rhode Island (M)	**AEA X**	Assisted Living Residence Level F1	2+ adults	Yes w/special license	Impractical to evacuate	21 days by 3rd party	No	Discharge	Ongoing skilled care		Limited Care	NCSP	S	I-1, I-2
	AEA X	Assisted Living Residence Level F2	2+ adults	No	Self-evacuate required	21 days by 3rd party	No	Discharge	Ongoing skilled care		Based on residential type	CSP		

South Carolina (M)	**X**	Community Residential Care Facilities:	2+ adults	Yes w/special license	Self-evacuate required	Intermittent, Short term	No	Discharge	Ongoing nursing care	NFPA 101, 2003 edition	Based on facility size & evacuation		S	I-1
South Dakota (M)	**AEA Y**	Assisted Living Center:	1+ adults	Yes in special units	AEA	Intermittent 28hr/week	No	Discharge	Ongoing nursing care	NFPA 101, 2000 edition	Resid. Board & Care and Limited Care	based on mobility	J	I-2
Tennessee (M)	**AEA Y**	Assisted-Care Living Facility:	1+ adults	Early stage only		21 days by 3rd party	No	Discharge	Nursing care, alzheimers	NFPA 101, 2003 edition	Resid. Board & Care & evac. time	Impract.at 1st flr only	J	I-1, I-2
Texas (M)	**AEA Y**	Assisted Living Facility Type A:	4+ adults	No	AEA - Slow	Intermittent limited	No	Discharge	Unable to self-evacuate	NFPA 101, 1988 edition	Resid. Board & Care, Slow		J	I-1, I-2
	AEA X	Assisted Living Facility Type B:	4+ adults	Yes	Allows transfer assistance	Intermittent only	No	Discharge	Ongoing nursing care	NFPA 101, 1988 edition	Resid B&C - slow (small), Limited care	based on size		
	X	Assisted Living Facility Type E:	1-16 adults	No	Self-evacuate required	Intermittent only	No	Discharge	Nursing care, alzheimers	NFPA 101, 1988 edition	Resid. Board & Care, Prompt			
Utah	**AEA X**	Assisted Living Facility Type I:	2+ adults	No	Self-evacuate required	Intermittent 60 day max	No	Discharge	Unable to self-evacuate			size	S	I-1, I-2
	AEA Y	Assisted Living Facility Type II:	2+ adults	Yes	Allows transfer assistance	General nursing OK	No	Discharge	Ongoing skilled care		Evac w/ limited assist inc. alzheimers			
Vermont (M) (RCH)	**AEA Y**	Residential Care Home Level III/ Assisted Living Res.:	3+ adults	Yes in special units		Skilled 3x/wk or 60 days	Short term	Discharge	Ongoing nursing care	Vermont Fire Code incorporates		size & evacuation	S	I-1, I-2
	AEA X	Residential Care Home Level IV:	3+ adults	No	Self-evacuate required	Limited intermittent	No	Discharge	Ongoing nursing care	NFPA 101, 2003 edition		size & evacuation		
Virginia	**AEA Y**	Assisted Living Facility	4+ adults	Yes w/special license	Non-ambulatory ok	Limited to 14 days	Y if licensed	Discharge	Continuous skilled nursing	NFPA 101, 2000 edition			S	I-1, I-2
		Assisted Living Facility (Small Group Home)	1-6 adults	No	Self-evacuation required	Limited intermittent	No	Discharge	Several health conditions	NFPA 101, 2000 edition				

Personal Care "Assisted Living" Regulations and NFPA/ IBC References

State ALF [1,2]	Evacuation Criteria	Type of Facility	No of Residents	Alzheimer Residents Allowed	Admission / Discharge Criteria: Evacuation Capability [3]	Admission / Discharge Criteria: Ongoing Nursing Care Allowed	Admission / Discharge Criteria: Bedridden Allowed	Admission / Discharge Criteria: Beyond Facil. Capabilities	Admission / Discharge Criteria: Other	Referenced NFPA Codes [2, 6]: NFPA Referenced	Referenced NFPA Codes [2, 6]: NFPA Occupancy Type	Referenced NFPA Codes [2, 6]: Other 4, [6]	Referenced IBC [6] Occupancy: IBC Adoption & Stated IBC Occupancy	Referenced IBC [6] Occupancy: Assumed 16+ Res. IBC [6,7,8]
Washington (M) (AFH)		Adult Family Home Level 1:	1-6 adults	No	Self-evacuate required	Limited intermittent	14 days max	Discharge	Unable to self-evacuate	IFC	1-2 Family Dwelling		S	
		Adult Family Home Level 2:	1-6 adults	No	AEA	Limited intermittent	14 days max	Discharge	Continuous or skilled care	IFC	1-2 Family Dwelling			I-1, I-2
		Adult Family Home Level 3:	1-6 adults	Yes	Impractical to evacuate	Limited intermittent	14 days max	Discharge	Continuous or skilled care	IFC		NCSP		
	AEA Y	Boarding Home: Same 3 levels of care	7+ adults	No level 1&2, Yes level 3	Same 3 levels as AFH	Limited intermittent	14 days max	Discharge	Continuous or skilled care	IFC		sprinklers required		
West Virginia		Legally Unlicensed Health Care Home - Class I	1-3 adults	No		Limited intermittent	Y if licensed	Discharge	Ongoing or extensive nursing care	NFPA 101, 20003 edition	1-2 Family Dwelling		S	
	AEA Y	Assisted Living Residence - Class II:	4+ adults	Yes w/special license		Limited intermittent	Y if licensed	Discharge	Ongoing or extensive nursing care	NFPA 101, 20003 edition			IBC	I-1, I-2
	AEA X	Residential Care Community - Class III	17+ adults	No	Self-evacuation required	Limited intermittent	No	Discharge	Unable to self-evacuate	NFPA 101, 20003 edition			IBC	
Wisconsin (M) (CBRF)	**AEA X**	Community Based Residential Facilities - Class A	5+ adults	No	Self-evacuate required	3hr/wk, 90 day max	No	Discharge	Ongoing nursing care	NFPA 101	Based on evacuation ability & time	NFPA 13D & 13R	S	I-1, I-2
	AEA Y	Community Based Residential Facilities - Class C	5+ adults	Yes w/special license	AEA	3hr/wk, 90 day max	90 day max	Discharge	Ongoing nursing care	NFPA 101	and number of beds	NFPA 13		
Wyoming		Assisted Living Facility - Small:	1-8 adults	No	Self-evacuation required	Limited intermittent	No	Discharge	Several health conditions	NFPA 101, 2000 edition	Residential Board & Care, Prompt		J	
	AEA Y	Assisted Living Facility - Large:	9+ adults	No	AEA - Cueing Only	Limited intermittent	No	Discharge	Several health conditions	NFPA 101, 2000 edition	Resid. Board & Care - Prompt & Slow		2003 IBC	I-1, I-2
	AEA Y	Assisted Living - Large:	9+ adults	Yes	Impractical to evacuate	Limited intermittent	No	Discharge	Several health conditions	NFPA 101, 2000 edition	Limited Care		2003 IBC	
Totals **Medicaid Waiver allowed in 36 States**	**AEA in +/- 46 States** **Y in +/- 35 States X in +/- 15 States**	**Assisted Living or Similar** **Allowed in 50 States**		**Alzheimer's** **Allowed in +/- 47 States**	**AEA in +/-37 States**	**Limited Nursing** **Intermittent for 45-90 days max. allowed in +/- 50 States**	**Short term Bedridden up to** **7 - 45 days max. allowed in +/- 21 States**			**NFPA 101** **referenced in 37 States**	**NFPA and it's** **Board & Care, and Limited Care Occupancies referenced in +/- 28 States**		**IBC used in 50 States** **26 states adopt (S)Statewide** **24 states adopt by each (J) Jurisdiction** **IBC Referenced in 10 state assisted regulations**	**I-1 in +/- 4 States** **I-2 in +/- 14 States** **I-1 & I-2 in +/- 32 States**

FOOTNOTES

1. If no Assisted licensing category exists in a particular State, the closest category is listed. See more detailed description in "Assisted Living Occupancy Criteria Analysis by State."
2. **(M)** Indicates Medicaid Waiver is allowed in State.
3. **AEA:** Assistance with Evacuation Allowed is specifically stated. **NCOSP:** (Not) Capable of Self Preservation
4. **Y:** NFPA resident criteria allowed with its wood construction and limitation on wood stories. No limitation of location of residents on first floor when requiring assistance with evacuation is stated.

5. **X:** Self evacuation or nursing design is required, or location of residents on first floor is required when requiring assistance with evacuation is stated.
6. **IBC**: International Building Code, **NFPA:** National Fire Protection Association, **IFC:** International Fire Code.
7. Assumed base IBC Occupancy classification as determined by this analysis without any individual State amendments or interpretations.
   If "unable to evacuate" is a criteria for discharge, then IBC I-1 (Assisted Living) is the assumed IBC classification under this analysis.
   If "unable to evacuate" is not a criteria for discharge, and assistance with evacuation is allowed, only when noted, then the interpretation by this analysis under the IBC is that the occupancy classification would be I-2 (Nursing "not capable of self preservation" i.e. resident cannot get out on their own).
   If continuous nursing is allowed, and unable to evacuate are not marked, then it is assumed that all facilities would fit into the I-2 occupancy under this analysis.
   If Alzheimer's care is allowed then I-2 occupancy is the assumed designation under this analysis.
   If NFPA Residential Board and Care is referenced, then "prompt" is assumed to be I-1, and "slow" and "impractical" are assumed as I-2.
   Assumed IBC occupancy is stated because the personal care/ assisted living occupancy is not listed as part of the IBC I-2 occupancy.
8. Where noted, most likely 2 occupancies are assumed to be used in the State dependent on "Level of Care," or whether Alzheimer's residents allowed in special licensed units.

ATTACHMENT B (From the State of Hawaii Analysis)

ELDER CARE RESIDENT PROFILE GUIDE TABLE [1]				
Retirement/ Apartments	**Assisted Living**			**Skilled Nursing**
Independent	**Minimum Assistance**	**Standby Assistance**	**Hands-on Assistance**	**Total Assistance**
IBC: R-2 [2]	**IBC: I-1 [2]**	**IBC: I-2 [2]**	**IBC: I-2 [2]**	**IBC: I-2 [2]**
NFPA: Apartments[2]	**NFPA: Board & Care[2]**	**NFPA: Board & Care[2]**	**NFPA: Board & Care[2]**	**NFPA: Health Care[2]**
Able to respond independently in an emergency	Able to respond in an emergency	May need assistance in an emergency	Needs assistance in an emergency	Needs supervision and hands-on assistance in an emergency
Able to negotiate stairs in an emergency and exit the building	Walks/transfers independently - infrequent falls	Transfers - Standby assistance may be needed	Transfers- 1 person assist usually needed, and fall risk	Transfers - 2 person assist may be needed/Mechanical lift/bedfast
ADL (Acts of Daily Living)- Resident is able to accomplish all without assistance from staff	ADL - Independent to verbal reminders	ADL - Reminders to giving verbal cues	ADL - Verbal cues and/or hands-on assistance	ADL - Hands-on assistance
Transfer & ambulate. Eats and takes medications	Independent with medications & Dr. appointments	Medication reminders and management	Medication management	Medication adjustments and behavior management
Capable of own toileting and personal hygiene	Continent of bowel and bladder	Occasional incontinence assistance	Incontinence management	Incontinence management
Bathes, dresses, grooms	Independent in bathing	Bathing set up and monitoring	Bathing assistance	Bathing assistance
Meals/housekeeping, provide if chosen. No personal care assistance or monitoring	Meals, nutrition and housekeeping assistance is helpful	Meals, nutrition and housekeeping assistance is helpful	Meals, nutrition and housekeeping assistance is helpful	Verbal cues and hands-on assistance to eat
Would benefit from socialization and activities with minor encouragement	Able to independently plan and participate in social activities	Reminders and encouragement to participate in activities	Encourage and escort to participate inactivities	Encourage and escort to activities
No memory impairment	Little memory impairment	Mild memory impairment - sometimes disoriented	Impaired memory, poor orientation and mild confusion	Needs 24 hour nursing supervision or skilled services such as physical, occupational and/or speech therapy
Capacity for decision-making and understanding consequences	Some decline in capacity for self care and understanding consequences of actions	Declining capacity for self care and understanding consequences	Limited capacity and inability to understand consequences of actions	Limited or no capacity for self care and understanding of consequences of actions
Family does not "need" to move	Family "slightly concerned"	Family "concerned"	Family "very concerned" - "Have to do something"	Family must do something

1. Based on and edited from Nevada Elder Care Assisted Living Guidelines.
2. This analysis assumed occupancy designations from the 2006 IBC and 2003 NFPA 101.

(From the State of Hawaii Analysis)

Specific Criteria of Self-Preservation:
There are very specific details of the ability of occupants of a building to be "capable of self-preservation." NFPA and its codes and guides outline very specific details of this topic. The NFPA 101A Guide on Alternative Approaches to Life Safety (2001 Edition) is referenced and summarized here to underscore the many details of self-preservation.

Chapter 6 of the NFPA defines variations of capabilities of occupants for Residential Board and Care occupancies. This is the most important aspect of determining if a building should have additional life safety elements incorporated into its design, therefore the topic is discussed in detail here. This NFPA Chapter 6 reviews capability and then offers calculation tables to determine occupant's ability of self-preservation. The review below summarizes some specific points of this NFPA Chapter 6. It then assumes the determination of self-preservation at the end of each category in *italics.*

Risk of Resistance

Some residents may resist leaving the building during an emergency situation. “Minimal risk” indicates that there is no specific evidence to suggest that the resident might resist an evacuation.

“Mild resistance” indicates that there is specific evidence that the resident had previously resisted instructions from staff or may have hidden from the staff and then might resist leaving the building in a situation similar enough to a fire emergency. “Strong resistance” includes resistance by the resident who necessitates the full attention of one or more staff members. The resident may have struggled vigorously, refused to cooperate, or has hidden in similar fire situations to predict that behavior recurring in an actual emergency.

Residents who show mild and strong resistance are considered not capable of self-preservation.

Impaired Mobility

The resident is rated according to how easily he can leave a building “given the presence of factors such as physical barriers that hinder movement (e.g. stairs), the resident’s ability to get out of bed, or the chairs normally used. The resident should be given credit for being able to use devices that aid movement (e.g., wheelchairs, walkers, crutches, and leg braces) only if those devices are always available in an emergency situation….Guiding or directing the resident by giving gentle pushes or leading by the hand is not considered requiring physical assistance.”

“Self starting” means a resident is physically able to start and complete an evacuation without physical assistance.

“Slow” is when the resident prepares to leave and travels to the exit or area of refuge at a speed significantly slower than the general population. The NFPA classifies the general
population as “prompt,” meaning they can reach an exit (point of safety or area of refuge) within approximately 3 minutes. The NFPA categorizes a resident as being “slow” if it takes the resident more than 90 or 180 seconds to travel from a sleeping room to an exit, point of safety, or area of refuge. NFPA describes “very slow” as requiring over 150 seconds to reach an exit.

Residents who are self starting and slow or very slow are considered being capable of self-preservation. Residents who are not self starting and are considered beyond slow are not capable of self-preservation.

“Needs limited assistance” means “that the resident might need some initial or brief intermittent assistance but can accomplish most of the evacuation without assistance.” The residents may require help getting into a wheelchair, descending stairs, getting out of bed, or opening a door, for example.

“Needs full assistance” means the resident either needs physical assistance from a staff member during most of the evacuation or must be assisted by staff by being carried from the facility, helped into the wheelchair and wheeled out of the facility, or helped into leg braces and helped to descend stairs.

Residents who require limited and full assistance are considered not capable of self-preservation.

Impaired Consciousness

The resident has experienced seconds or minutes of temporary impairment of consciousness over six times during the previous three months. The resident is only classified this way if the impairment would significantly interfere with his or her ability to exit the building. Temporary medical problems are also not counted in this definition. “Partially” impaired consciousness means the resident is still able to participate in an evacuation to some degree. “Totally” impaired consciousness means the resident needs full assistance by at least one staff member to evacuate out of a building.

Residents who are partially or totally impaired are considered not capable of self-preservation.

Need for Extra Help

The resident may need assistance in various circumstances from more than one staff to egress a building, whether to initially get out of bed or other individual actions or if the resident requires assistance during the duration of exiting the building.

Response to Instructions

This is the resident’s ability to receive, comprehend and follow through with simple instructions during a self directed evacuation. Residents may require non constant “supervision, considerable attention, or might not respond during an evacuation.”

Residents who need extra help or require supervision, considerable attention, or might not respond during an evacuation are considered not capable of self -preservation.

Waking Response to Alarm

Buildings with non-centralized alarm systems, residents who are on medication that inhibits responses to alarms, residents who have apparent hearing impairment (unless they are in a room with visual alarms), or if hearing aids are removed during the night, or residents who are exceptionally sound sleepers are all considered as “response not probable” to responding to an alarm.

Residents who are not probable to responding to an alarm are considered not capable of self-preservation.

ATTACHMENT C

The following Table summarizes the proposed IBC revisions **(Underlined & Bold)** and shows the correlation to CMS regulations which enforce NFPA 101 that is referenced or enforced in approximately 37 state assisted living regulations. The current 2003 and 2006 NFPA 101 requirements are referenced here, which are believed to be enforced in a growing number of states, currently estimated to be about half of the states.

Personal Care/ Assisted Living **IBC REVISION SUMMARY TABLE** & CMS: 2003/ 2006 NFPA 101 Comparison			
Code & Resident Type	**Personal Care**		
	Housing ≤ 5	**Housing 6-16**	**Housing ≥ 17**
PROPOSED IBC			
NO Assistance with Evacuation (Capable) Residents	**International Residential Code**	**R-4 (R-3)** NFPA 13R or 13D Sprinklers Wood Frame Limited to 4 Stories	**R-4** NFPA 13R Sprinklers Wood Frame Limited to 4 Stories
Assistance with Evacuation (Not Capable) Residents		**I-1(R-3)** NFPA 13R or 13D Sprinklers Wood Frame Limited to 4 Stories	**I-1** **NFPA 13 Sprinklers** **Wood Frame Limited to 2 Stories** **Smoke Barriers**
CMS NFPA 101 (2003, 2006)			
Includes all: Prompt: (Capable) & Slow/Impractical: (Not Capable) Residents	**1 & 2 Family Dwelling Code**	**Residential Board & Care (Small)** NFPA 13R or 13D Sprinklers Wood Frame Limited to 4 Stories	**Residential Board & Care (Large)** NFPA 13 Sprinklers Wood Frame Limited to 2 Stories Smoke Barriers

ATTACHMENT D (From the State of Hawaii Analysis)

NFPA/ IBC Comparison

ALLOWABLE HEIGHT AND BUILDING AREAS TABLE

For

Personal Care -Residential Board & Care/ Assisted Living Occupancies

Story Limitations Above Grade

Area Limitations Per Story

		Non-combustible								Combustible			
Construction Type		Type I and II								Type V			
Fire Resistive Hours [1]		3-3-2		2-2-2		1-1-1		0-0-0		1-1-1		0-0-0	
S [2] – P [3]		**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**
NFPA	RB&C (>16)	UL UL	UL UL	12 55,000	NP	3 19,000	NP	2 10,000	NP	2 10,500	NP	1 4,500	NP
IBC	I-1 (>16)	UL UL	UL UL	10 55,000	NP	5 19,000	NP	4 10,000	NP	3 10,500	NP	2 4,500	NP
NFPA	RB&C (6-16)	UL UL	UL UL	12 UL	11	5 24,000	4	5 16,000	4	4 12,000	3	3 7,000	2 7,000
IBC	R-4 (6-16)	UL UL	UL UL	11 UL	NP	5 24,000	NP	5 16,000	NP	4 12,000	NP	3 12,000	2 7,000
NFPA	Health Care (>5)	UL UL	UL UL	12 UL	NP	3 15,000	NP	1 11,000	NP	1 9,500	NP	NP	NP
IBC	I-2 (>5)	UL UL	UL UL	5 UL	NP	3 15,000	NP	1 11,000	NP	1 9,500	NP	NP	NP

Footnotes:

1. Fire resistive protection of Bearing Walls – Columns – Floors are listed.
2. S – Sprinklered buildings maximum stories and allowable area.
3. NS – Non-sprinklered buildings maximum stories and allowable area.

ATTACHMENT E

CURRENT
IBC OCCUPANCY REQUIREMENTS COMPARISON TABLE

IBC Chapter	(2006 IBC) I-2 Nursing / Health Care	(2006 IBC) I-1 Assisted Living / Personal Care	(2006 IBC) R-4 Assisted Living / Personal Care	(2006 IBC) R-2 Apartments/ Permanent Sleeping
3	Chapter 3. IBC requires **health care** occupancies be a Group I-2, such as Nursing Facilities with over 5 persons not capable of self preservation.	Chapter 3. IBC requires **personal care** occupancies be Group I-1, such as Assisted Living with over 16 persons capable of self preservation. **(Same capabilities for over 16 residents)**	Chapter 3. IBC requires **personal care** occupancies be Group R-4, such as Assisted Living with 6-16 persons capable of self preservation. **(Same capabilities for under 16 residents)**	Chapter 3. IBC requires **residential** apartments and permanent sleeping occupancies be in Group R-2. **(Same capabilities in I-1, R-4, and R-2)**
4	*(407.2.) Other spaces allowed to be open to non-rated corridors.*	No exceptions for open spaces in corridors in Group I-1. (Same requirements for I-1, R-4, and R-2)	No exceptions for open spaces in corridors in Group R-4 (Same requirements for I-1, R-4, and R-2)	No exceptions for open spaces in corridors in Group R-2 (Same requirements for I-1, R-4, and R-2)
	(407.3.) Corridor reduced protection allowed. Non-rated corridors with no door closures allowed.	No exceptions for non rated corridors or omitting door closures are allowed in Group I-1. (Same requirements for I-1, R-4, R-2)	No exceptions for non rated corridors or omitting door closures are allowed in Group R-4. (Same requirements for I-1, R-4, R-2)	No exceptions for non rated corridors or omitting door closures are allowed in Group R-2. (Same requirements for I-1, R-4,R-2)
	407.4. Smoke barriers provide compartmentalization.	Smoke barriers are not required. (Same requirements for I-1, R-4, and R-2)	Smoke barriers are not required. (Same requirements for I-1, R-4, and R-2)	Smoke barriers are not required. (Same requirements for I-1, R-4, and R-2)
5	**Chapter 5.** Allowable areas, height and stories are more restrictive than I-1 requirements, especially in Type V construction.	Chapter 5. Allowable areas, height and stories are less restrictive than I-2 requirements, especially in Type V construction. **(Slightly less area, sometimes less stories than R-4, and R-2)**	Chapter 5. Allowable areas, height and stories are less restrictive than I-1 requirements, especially in Type V construction. (Same for R-4, and R-2)	Chapter 5. Allowable areas, height and stories are less restrictive than I-1 requirements, especially in Types II and V construction. (Same for R-4, and R-2)
	Chapter 5, Section 509 Special Provisions with Parking Garages. Additional areas, height and stories are the same as I-1 requirements.	Chapter 5, Section 509 Special Provisions with Parking Garages. Additional areas, height and stories are the same in I-2 and I-1 requirements. **(Less area and less stories than R-4, and R-2)**	Chapter 5, Section 509 Special Provisions with Parking Garages. Additional areas, height and stories are the same in I-2 and I-1 requirements. **(Less area and less stories than R-4, and R-2)**	Chapter 5, Section 509 Special Provisions with Parking Garages. Additional areas, height and stories are the same in I-2 and I-1 requirements. **(Less area and less stories than R-4, and R-2)**
7	*(Chapter 7.) No separation required in I-2 occupancies between sleeping rooms with fire partitions, per Section 708.1.*	Chapter 7. Separation required in I-1 occupancies between sleeping rooms with fire partitions, per Section 708.1. (Same requirements for I-1 and R-2)	Chapter 7. Separation not required in R-4 occupancies between sleeping rooms with fire partitions, per Section 708.1. **(No requirements for R-4 due to 16 or less occupants.)**	Chapter 7. Separation required in R-2 occupancies between sleeping rooms with fire partitions, per Section 708.1. (Same requirements for I-1 and R-2)
8	**Chapter 8.** Interior wall and ceiling finish Class B requirements for I-2 occupancies.	Chapter 8. Interior wall and ceiling finish Class B and C requirements for I-1 occupancies. (Sim. for I-1, R-4, and R-2)	Chapter 8. Interior wall and ceiling finish Class B and C requirements for R-4 occupancies.(Sim. for I-1, R-4, and R-2)	Chapter 8. Interior wall and ceiling finish Class B and C requirements for R-2 occupancies. (Sim. for I-1, R-4, R-2)
9	**Section 903** A NFPA 13 automatic sprinkler system is required in I-2 occupancies.	Section 903. A NFPA 13R automatic sprinkler system is required in I-1 occupancies. (Same requirements for I-1, R-4, and R-2)	Section 903. A NFPA 13R automatic sprinkler system is required in R-4 occupancies. (Same requirements for I-1, R-4, and R-2)	Section 903. A NFPA 13R automatic sprinkler system is required in R-2 occupancies. (Same for I-1, R-4, and R-2)
	Section 907.2.6. A manual fire alarm system is required in I-2 occupancies.	Section 907.2.6. A manual fire alarm system is required in I-1 occupancies. (Similar requirements for I-1, R-4, and R-2)	Section 907.2.6. A manual fire alarm system is not required in R-4 occupancies. **(No requirements for R-4 due to 16 or less occ.)**	Section 907.2.9. A manual fire alarm system is required in R-2 occupancies with exceptions. **(Sim. req. but slightly less than I-1.)**
	Section 907.2.6.2. An automatic fire detection system is required in I-2 occupancies when implementing open non-rated corridors.	Section 907.2.6. An automatic smoke detection system is required in I-1 occupancies spaces open to corridors. **(More requirements for I-1 than R-4, and R-2)**	Section 907.2.6. An automatic smoke detection system is not required in R-4 occupancies in spaces open to corridors. **(No requirements for R-4 due to 16 or less occ.)**	Section 907.2.6. An automatic smoke detection system is not required in R-2 occupancies in spaces open to corridors. **(No requirements for R-4, and R-2. Less req. than I-1.)**
	Section 907.9. Visual alarms are required in I-2 occupancies.	Section 907.9. Visual alarms and limited audible alarms are required in I-1 occupancies. **(More requirements for I-1 than R-4, and R-2)**	Section 907.9. No visual alarms and limited audible alarms are required in R-4 occupancies. **(No requirements for R-4, due to 16 or less occ.)**	Section 907.9. No visual alarms and limited audible alarms are required in R-2 occupancies except when fire alarms are req'd.**(No requirements for R-2 with R-2 exceptions. Less req. than I-1.)**
10	**Chapter 10.** Group I-2 requires egress width be multiplied by a .3 factor, doors for bed movement be 41.5", allows non rated "suites", 8' wide corridors for bed movement are required, and non rated corridors are allowed. All due to bed ridden occupants.	Chapter 10. Group I-1 requires egress width be multiplied by a .2 factor, 44" wide corridors are required (no bedridden allowed), and 1-hour fire resistive corridors are required. (Same for I-1, R-4, and R-2 except for minor 1 exit options.)	Chapter 10. Group R-4 requires egress width be multiplied by a .2 factor, 44" wide corridors are required (no bedridden allowed), and 1-hour fire resistive corridors are required. (Same for I-1, R-4, and R-2 except for minor 1 exit options.)	Chapter 10. Group R-2 requires egress width be multiplied by a .2 factor, 44" wide corridors are required (no bedridden allowed), and 1-hour fire resistive corridors are required. (Same for I-1, R-4, and R-2 except for minor 1 exit option.)
	Table 1016.1. Group I-2 requires a maximum of 200' of travel distance in sprinklered buildings.	Table 1016.1. Group I-1 requires a maximum of 250' of travel distance in sprinklered buildings. (Same for I-1, R-4, and R-2)	Table 1016.1. Group R-4 requires a maximum of 250' of travel distance in sprinklered buildings. (Same for I-1, R-4, and R-2)	Table 1016.1. Group R-2 requires a max. of 250' of travel distance in sprinklered buildings. (Same for I-1, R-4, R-2)
11	**Chapter 11.** 50% accessible units and a covered entry are required in I-2 occupancies.	Chapter 11. Adaptable units are required in I-1 occupancies. (Same requirements for I-1, R-4, and R-2)	Chapter 11. Adaptable units are required in R-4 occupancies. (Same requirements for I-1, R-4, and R-2)	Chapter 11. Adaptable units are required in R-2 occupancies. (Same requirements for I-1, R-4, and R-2)
16	**Table 1604.5.** Health care facilities with 50 or more residents are Occupancy Category III, which implements more stringent structural design load reqmts. in Chapter 16 than Category II.	Table 1604.5. Personal care facilities are Occupancy Category II. (Same requirements for I-1, R-4, and R-2)	Table 1604.5. Personal care facilities are Occupancy Category II. (Same requirements for I-1, R-4, and R-2)	Table 1604.5. Residential Occupancy Category II. (Same requirements for I-1, R-4, and R-2)
NEC	**National Electric Code.** Metal conduit and hard wired nurse call systems are required.	National Electric Code. Multifamily plastic conduit and any wired or wireless approved nurse call systems are allowed.	National Electric Code. Multifamily plastic conduit and any wired or wireless approved nurse call systems are allowed.	National Electric Code. Multifamily plastic conduit and any wired or wireless approved nurse call systems are allowed.
IFC	International Fire Code. Residents do not have to participate in fire drills.	International Fire Code. Residents are encouraged to participate in fire drills.	International Fire Code. Residents are encouraged to participate in fire drills.	International Fire Code. No fire drills.

ATTACHMENT F

PROPOSED
IBC OCCUPANCY REQUIREMENTS COMPARISON TABLE

IBC Chapter	(20012) I-2 Nursing / Health Care	(2012) I-1 more than 5 residents Not Capable Personal Care	(2012) R-4 more than 5 residents Capable Personal Care	(2006 IBC) R-2 Apartments/ Permanent Sleeping
3	Chapter 3. IBC requires **health care** occupancies be a Group I-2, such as Nursing Facilities with over 5 persons not capable of self preservation.	Chapter 3. IBC requires **personal care** occupancies be Group I-1, such as Assisted Living with over ~~16~~ **5 persons NOT capable of self preservation. (Propose allowing residents needing assistance with evacuation.)**	Chapter 3. IBC requires **personal care** occupancies be Group R-4, such as Assisted Living with ~~6-16 persons~~ **over 5 persons capable of self preservation.**	Chapter 3. IBC requires **residential** apartments and permanent sleeping occupancies be in Group R-2. **(Same capabilities in I-1, R-4, and R-2)**
4	*(407.2.) Other spaces allowed to be open to non-rated corridors.*	~~No exceptions for open spaces in corridors in Group I-1~~**. Allow limited open space for Alzheimer's rated corridors following all I-2 criteria. (Propose more stringeant requirements for I-1 than I-2)**	No exceptions for open spaces in corridors in Group R-4.	No exceptions for open spaces in corridors in Group R-2 (Same requirements for I-1, R-4, and R-2)
	(407.3.) Corridor reduced protection allowed. Non-rated corridors with no door closures allowed.	No exceptions for non rated corridors or omitting door closures are allowed in Group I-1. (Same requirements for I-1, R-4, R-2)	No exceptions for non rated corridors or omitting door closures are allowed in Group R-4. (Same requirements for R-4, R-2)	No exceptions for non rated corridors or omitting door closures are allowed in Group R-2. (Same requirements for I-1, R-4,R-2)
	407.4. Smoke barriers provide compartmentalization.	~~**Smoke barriers are not required.**~~ **Add smoke barrier reqmts. (Propose more stringent requirements for I-1 as I-2)**	Smoke barriers are not required. (Same requirements for R-4, and R-2)	Smoke barriers are not required. (Same reguirements for I-1, R-4, and R-2)
5	**Chapter 5.** Allowable areas, height and stories are more restrictive than I-1 requirements, especially in Type V construction.	Chapter 5. Allowable areas, height and stories are less restrictive than I-2 requirements, especially in Type V construction**. (Propose to limit wood frame and others up to type IIB to 2 stories and limit Type IIA to 3 stories with sprinklers similar to CMS.)**	Chapter 5. Allowable areas, height and stories are the same as 2006 less restrictive than I-1 requirements, especially in Type V construction. **(Revise to match current I-1 requirements.)**	Chapter 5. Allowable areas, height and stories are less restrictive than I-1 requirements, especially in Types II and V construction. (Same for R-4, and R-2)
	Chapter 5, Section 509 Special Provisions with Parking Garages. Additional areas, height and stories are the same as I-1 requirements.	Chapter 5, Section 509 Special Provisions with Parking Garages. Additional areas, height and stories are the same in I-2 and I-1 requirements. **(Less area and less stories than R-4, and R-2)**	Chapter 5, Section 509 Special Provisions with Parking Garages. Additional areas, height and stories are the same in I-2 and I-1 requirements. **(Revise to match current I-1 requirements.)**	Chapter 5, Section 509 Special Provisions with Parking Garages. Additional areas, height and stories are the same in I-2 and I-1 requirements. **(Less area and less stories than R-4, and R-2)**
7	*(Chapter 7.) No separation required in I-2 occupancies between sleeping rooms with fire partitions, per Section 708.1.*	Chapter 7. Separation required in I-1 occupancies between sleeping rooms with fire partitions, per Section 708.1. (Same requirements for I-1 and R-2)	Chapter 7. Separation ~~not~~ **now** is required in R-4 occupancies between sleeping rooms with fire partitions, per Section 708.1 **with over 16 residents. (Same requirements for I-1, R-2, and R-4)**	Chapter 7. Separation required in R-2 occupancies between sleeping rooms with fire partitions, per Section 708.1. (Same requirements for I-1 and R-2)
8	**Chapter 8.** Interior wall and ceiling finish Class B requirements for I-2 occupancies.	Chapter 8. Interior wall and ceiling finish Class B and C requirements for I-1 occupancies. (Sim. for I-1, R-4, and R-2)	Chapter 8. Interior wall and ceiling finish Class B and C requirements for R-4 occupancies.(Sim. for I-1, R-4, and R-2)	Chapter 8. Interior wall and ceiling finish Class B and C requirements for R-2 occupancies. (Sim. for I-1, R-4, R-2)
9	**Section 903.** A NFPA 13 automatic sprinkler system is required in I-2 occupancies.	Section 903. ~~A NFPA 13R automatic sprinkler system is required in I-1 occupancies.~~**Require NFPA 13. (Propose same requirements for I-1 as I-2).**	Section 903. A NFPA 13R automatic sprinkler system is required in R-4 occupancies. **(Same for ~~I-1,~~ R-4, and R-2) (Revise to match current I-1 requirements.)**	Section 903. A NFPA 13R automatic sprinkler system is required in R-2 occupancies. (Same for I-1, R-4, and R-2)
	Section 907.2.6. A manual fire alarm system is required in I-2 occupancies.	Section 907.2.6. A manual fire alarm system is required in I-1 occupancies. (Similar requirements for I-1, R-4, and R-2)	Section 907.2.6. A manual fire alarm system is not required in R-4 occupancies. **(Revise to match current I-1 and R-4 requirements.)**	Section 907.2.9. A manual fire alarm system is required in R-2 occupancies with exceptions. **(Sim. req. but slightly less than I-1.)**
	Section 907.2.6.2. An automatic fire detection system is required in I-2 occupancies when implementing open non-rated corridors.	Section 907.2.6 and .10.1.3. An automatic smoke detection system is and smoke alarms are required in I-1 occupancies. **(Remove exception for sprinklers exempting smoke detection and detectors in I-1.)**	Section 907.2.6. An automatic smoke detection system is not required in R-4 occupancies in spaces open to corridors. **(Revise to match current I-1 and R-4 requirements.)**	Section 907.2.6. An automatic smoke detection system is not required in R-2 occupancies in spaces open to corridors. **(No requirements for ~~R-4, and~~ R-2. Less req. than I-1.)**
	Section 907.9. Visual alarms are required in I-2 occupancies.	Section 907.9. Visual alarms and limited audible alarms are required in I-1 occupancies.	Section 907.9. ~~No~~ visual alarms and limited audible alarms are required in R-4 occupancies. **(Revise to match current I-1 and R-4 requirements.)**	Section 907.9. No visual alarms and limited audible alarms are required in R-2 occupancies except when fire alarms are req'd.**(No requirements for R-2 with R-2 exceptions. Less req. than I-1.)**
10	**Chapter 10.** Group I-2 requires egress width be multiplied by a .3 factor, doors for bed movement be 41.5", allows non rated "suites", 8' wide corridors for bed movement are required, and non rated corridors are allowed. All due to bed ridden occupants.	Chapter 10. Group I-1 requires egress width be multiplied by a .2 factor, 44" wide corridors are required (no bedridden allowed), and 1-hour fire resistive corridors are required. (Same for I-1, R-4, and R-2 except for minor 1 exit options.)	Chapter 10. Group R-4 requires egress width be multiplied by a .2 factor, 44" wide corridors are required (no bedridden allowed), and 1-hour fire resistive corridors are required. (Same for I-1, R-4, and R-2 except for minor 1 exit options.)	Chapter 10. Group R-2 requires egress width be multiplied by a .2 factor, 44" wide corridors are required (no bedridden allowed), and 1-hour fire resistive corridors are required. (Same for I-1, R-4, and R-2 except for minor 1 exit option.)
	Table 1016.1. Group I-2 requires a maximum of 200' of travel distance in sprinklered buildings.	Table 1016.1. Group I-1 requires a maximum of 250' of travel distance in sprinklered buildings. (Same for I-1, R-4, and R-2)	Table 1016.1. Group R-4 requires a maximum of 250' of travel distance in sprinklered buildings. (Same for I-1, R-4, and R-2)	Table 1016.1. Group R-2 requires a max. of 250' of travel distance in sprinklered buildings. (Same for I-1, R-4, R-2)
11	**Chapter 11.** 50% accessible units and a covered entry are required in I-2 occupancies.	Chapter 11. Adaptable units are required in I-1 occupancies. (Same requirements for I-1, R-4, and R-2)	Chapter 11. Adaptable units are required in R-4occupancies. (Same requirements for I-1, R-4, and R-2)	Chapter 11. Adaptable units are required in R-2 occupancies. (Same requirements for I-1, R-4, and R-2)
16	**Table 1604.5.** Health care facilities with 50 or more residents are Occupancy Category III, which implements more stringent structural design load reqmts. in Chapter 16 than Category II.	Table 1604.5. Personal care facilities are Occupancy Category II. (Same requirements for I-1, R-4, and R-2)	Table 1604.5. Personal care facilities are Occupancy Category II. (Same requirements for I-1, R-4, and R-2)	Table 1604.5. Residential Occupancy Category II. (Same requirements for I-1, R-4, and R-2)
NEC	**National Electric Code.** Metal conduit and hard wired nurse call systems are required.	National Electric Code. Multifamily plastic conduit and any wired or wireless approved nurse call systems are allowed.	National Electric Code. Multifamily plastic conduit and any wired or wireless approved nurse call systems are allowed.	National Electric Code. Multifamily plastic conduit and any wired or wireless approved nurse call systems are allowed.
IFC	International Fire Code. Residents do not have to participate in fire drills.	International Fire Code. Residents are encouraged to participate in fire drills.	International Fire Code. Residents are encouraged to participate in fire drills.	International Fire Code. No fire drills.

ATTACHMENT G

ADDITIONAL DETAILED SUBSTANTIATION

SUMMARIZATION OF THE 2007 HAWAII ASSISTED LIVING ANALYSIS

The following information is a summarization based on the information found in the "Assisted Living Analysis of All State Regulations Relative to Building Codes and Life Safety Codes," conducted for the State of Hawaii in 2007, from here on referenced as the "Assisted Living Analysis."

The I-1 occupancy is appropriately categorized as a "personal care" occupancy in the IBC. It is different than Group I-2 "health care," which includes nursing and hospitals for health and medical treatment. The largest population base of the personal care uses is assisted living, matching the current nursing population nationwide. Assisted living is the category of concern for the current I-1 occupancy. Nationwide assisted living is regulated by each state differently. Generally speaking assisted living residents:

- Are given assistance with activities of daily living (ADL's) by being given "personal care" services of meals, social and physical assistance, housekeeping, bathing, medication and similar assistance.
- Are generally slower to ambulate than the general population.
- May require staff assistance to evacuate.
- May have different levels of dementia, including Alzheimer's.
- May be incapable of following directions under emergency conditions.
- May require assistance in transferring to and from a wheelchair.
- Are never allowed to be permanently bedridden.
- Are never allowed to have continuous nursing care beyond temporary illness

The Assisted Living Analysis was commissioned by the State of Hawaii to review their assisted living resident types relative to building code regulations. It accomplished the following:

- Researched all 50 States regulations relative to the subject of capabilities of residents and associated regulations.
- Created a 2 page Summary Table of all 50 States regulations, evacuation capability requirements, and IBC assumptions or requirements (Attached).
- Noted that CMS or state regulations required NFPA 101 conformance or was referenced in 37 states, so analyzed NFPA requirements and cross referenced them with IBC requirements.
- Compared nearby State IBC amendments.
- Created Findings and Conclusions.
- Gave national recommendations.
- Made recommendations specific to the State of Hawaii based on the findings and preferences of the State of Hawaii Department of Health.

The findings are summarized as follows:

- "Assisted living or similar State licensed designation is allowed in all 50 States.
- Assistance with evacuation for residents is allowed in assisted living in approximately 46 States.
- Assistance with evacuation is allowed in 51 of the total 89 assisted living categories serving more than five residents in the 50 states.
- NFPA 101 Life Safety Code compliance is referenced in approximately 37 State assisted living licensing requirements.
- Alzheimer residents are allowed in assisted living facilities or in specially designated assisted living facilities in approximately 47 States.
- Temporary limited intermittent nursing care for up to 45 to 90 days is allowed in all 50 States, if care can be properly provided by the facility.
- Residents in assisted living are allowed to be short-term bedridden for up to 7 – 45 days due to temporary illness in approximately 21 States, if care can be properly provided by the facility.
- The IBC is used in all 50 States by local jurisdiction or State-wide adoption.
- The IBC occupancy designation of I-1 and its criteria for residents is exclusively applicable in approximately 4 States for assisted living."

OTHER REFERENCED STANDARDS

The Assisted Living Analysis shows that approximately 37 states require or reference NFPA 101 Life Safety Code conformance in their licensed assisted living facility regulations. The NFPA 101 code is often enforced by the Centers for Medicare and Medicaid Services (CMS) which is related to Medicaid reimbursement.

All of the states that utilize the NFPA 101 Life Safety Code for their assisted living regulations, classify them as the NFPA personal care Residential Board and Care occupancy. This occupancy classification allows residents that may not be fully capable of self preservation, requiring physical assistance to evacuate. The NFPA 101 from the 1980's and up to the 2000 edition, allows residents categorized as "prompt" and "slow" to reside in this occupancy. Residents up to and including the slow category are able to reach a point of safety within 13 minutes. Assisted living facilities with over five residents and with residents categorized as "impractical (over 13 minutes) are then required to conform to NFPA 101 "Limited Care" requirements found in its Health Care Chapter 18.

Essentially the NFPA Limited Care has slightly less stringent requirements than the rest of their Chapter 18 Health Care requirements. Those regulations essentially match the IBC I-2 requirements. Conformance requires the following:

- Wood frame is limited to one story. Three stories require 1 hour non combustible construction.
- Allows nonrated and open corridors.
- Requires smoke barriers.
- Requires NFPA 13 automatic sprinklers.
- Limited Care allows exceptions to the requirements for 44" door and 8' corridors.

It also be noted that due to federal regulation of the nursing industry, conformance to NFPA 101 is required nationally. The IBC I-2 and NFPA New Health Care Occupancy requirements are generally and specifically the same.

The 2003 and the most current 2006 NFPA 101 Life Safety Code revised its approach to the large (over 16) personal care Residential Board and Care (assisted living) occupancy. This occupancy classification is NFPA's equivalent IBC I-1 occupancy classification. Approximately 25 of the 37 states reference compliance with these two most recent editions of NFPA 101:

- **The timing of residents is removed as a requirement for classification and is now just referenced in its Guide on Alternative Approaches to Life Safety. The occupancy now allows prompt, slow and impractical residents.**
- **Facilities with impractical residents are now allowed in this Residential Board and Care occupancy and are not required to be in the Limited Care occupancy anymore.**

- It reduces wood frame construction from 4 stories to 2 stories.
- It adds the requirements for smoke barriers.
- It adds the requirements for NFPA 13 automatic sprinklers.
- It does not require corridor door rating.
- It requires evacuation drills meet its health care chapter requirements.
- It keeps most other Residential Board and Care requirements the same, which are generally consistent with the other current IBC I-1 requirements.

Revisions to the IBC should better generally match the current NFPA 101 Residential Board and Care occupancy criteria and requirements. There should be more consistency in assisted living regulations similar to the consistency between The IBC I-2 and NFPA 101 Health Care requirements.

OTHER STATES IBC AMENDMENTS

There are also at least three states that amend the IBC at a statewide level to incorporate similar aspects of allowing residents that may require assistance with evacuation. Hawaii is also currently in the process of approving similar amendments.

- California, Oregon, and Washington all allow residents that may require assistance in evacuation in their amended IBC I-1 (assisted living) occupancies.
- Oregon and California further limit wood frame stories. Oregon limits wood frame to three stories and requires a horizontal exit in multi story wood frame structures. California limits wood frame to two stories.
- All Add smoke barrier requirements.
- Oregon and California add NFPA 13 automatic sprinklers.

PROTECTION FEATURE SAMPLING OF RECENT PROJECTS

The proponent of this proposal works in an architectural firm that has designed over 200 senior housing projects in 19 states during the past 20 years. The firm has seen inconsistent application of the I-1 occupancy classification since numerous states started enforcing the IBC after 2003. The below information gives a sampling of what is occurring nationally, and offers insight into the inconsistent application of the code due to the issue presented in this proposal. The conclusion that this firm has is that every individual jurisdiction has to be negotiated as to what occupancy requirements are to be applied to assisted living facilities. This is due to the occupant type limitations the IBC places in the I-1 and R-4 requirements when compared to what most states licensing agencies allow. Negotiating each individual project's occupancy requirements is a time consuming, costly, and increased risk issue for developers. The only exceptions for this firm are for projects in the three states that have already amended their building code at a state-wide level (California, Oregon, and Washington.)

Many States are more similar to the Idaho, Nevada, Oklahoma, and Texas examples below. They have no actual IBC amendments to the I-1 or R-4 occupancy. They are like the 37 states that also require compliance with NFPA Residential Board and Care criteria referenced in their State assisted living regulations.

The examples below show different life safety design solutions on a sampling of ten of the firm's last similar assisted living projects since 2004. The two Idaho examples show two different occupancy classifications and construction type requirements for very similar projects. This exemplifies one of the key issues when designing these facilities. It is the construction cost difference between wood frame and steel frame construction. The limited jurisdictions that require assisted living construct to I-2 standards are not necessarily adding appropriate protection to the occupants of these facilities. They may add up to 25 percent in construction cost by requiring I-2 steel frame construction type in a two story building. That subject will be reviewed in more detail later in this substantiation.

A review of the IBC, NFPA 101 and its referenced building code NFPA 5000, along with the State licensing criteria is required when designing facilities in most States like Idaho and Nevada. The most stringent requirements of each code must be found and implemented. Complying with up to three different sets of regulations is complicated when all three may have differing criteria and requirements. The main issue is that most State regulations and NFPA allow evacuation assistance but the IBC does not. That compounds the complexities of dealing with overlapping requirements. That is the main reason why the IBC should be revised. The examples below show how this variation of requirements can cause undo increases in construction cost. It also shows inconsistent application of the IBC causing inconsistent building design.

The summarization of these 10 similar assisted living projects shows:

- 10 required IBC conformance.
- 10 allowed assistance with evacuation mostly through IBC alternate means.
- 9 different states.
- 9 implemented smoke barriers, mostly as alternate means.
- 8 implemented NFPA 13 sprinklers, mostly as alternate means.
- 7 allowed the Group I-1 occupancy classification, implementing some I-2 requirements.
- 7 required NFPA 101 compliance due to state licensing criteria.
- 7 were allowed to be built with wood frame of either two or three stories.
- 3 were required to be built with steel frame of either two or three stories.
- 2 required conformance to I-2 requirements because no equivalency was allowed.
- Construction cost varied from $110 to $170 per square foot, mostly due to requirements for different construction types even though the use was the same.

2005 Alaska Assisted Living Project

- The building cost was $130 per square foot.
- The IBC with no amendments was enforced by the local jurisdiction.
- The local fire marshal enforced the NFPA 101.
- State assisted living licensing allows residents that may need assistance with evacuation.
- A building code alternate means was accepted to allow the resident type for the **Group I-1** occupancy:
    - Residents requiring assistance with evacuation were limited to the first floor.
    - Smoke barriers were required.
    - NFPA 13 sprinklers were required.
    - The two story building was allowed to be Type VA (wood frame).

2007 California Assisted Living Project

- The building cost was $120 per square foot.
- The IBC was enforced with California statewide amendments.
- There were no NFPA 101 requirements.

- State assisted living licensing allows residents that may need assistance with evacuation.
- No Alternate means were required due to the California IBC amendments allowing the resident type in its **Group I-1** occupancy, and being consistent with NFPA 101 current Board and Care requirements:
    - Residents requiring assistance with evacuation were allowed.
    - Smoke barriers were required.
    - NFPA 13 sprinklers were required.
    - The two story building was allowed to be Type VA (wood frame), the maximum allowed under California's amendments.

2007 Colorado Assisted Living Project

- The building cost was $130 per square foot.
- The IBC with no amendments was enforced by the local jurisdiction.
- State assisted living licensing required conformance to the 2006 NFPA 101.
- State assisted living licensing allows residents that may need assistance with evacuation.
- A building code alternate means was accepted to allow the resident type for the **Group I-1** occupancy, allowing for the implementation of NFPA 101 requirements as an equivalency:
    - Residents requiring assistance with evacuation were allowed.
    - Smoke barriers were required.
    - NFPA 13 sprinklers were required.
    - The two story building was allowed to be Type VA (wood frame).

2005 Idaho Assisted Living Project

- The building cost was $110 per square foot.
- The IBC with no amendments was enforced by the local jurisdiction.
- State assisted living licensing required conformance to 2000 NFPA 101.
- State assisted living licensing allows residents that may need assistance with evacuation.
- A building code alternate means was accepted to allow the resident type for the **Group I-1** occupancy, allowing for the implementation of NFPA 101 and Oregon's SR IBC amendments as an equivalency:
    - Residents requiring assistance with evacuation were allowed.
    - Smoke barriers were required.
    - Horizontal exits were required.
    - NFPA 13 sprinklers were required.
    - The two story building was allowed to be Type VA (wood frame).

2006 Idaho Assisted Living Project

- The building cost was $160 per square foot.
- The IBC with no amendments was enforced by the local jurisdiction.
- State assisted living licensing required conformance to 2003 NFPA 101.
- State assisted living licensing allows residents that may need assistance with evacuation.
- A building code alternate means was not accepted to allow the resident type, then requiring the building comply with IBC **Group I-2** requirements:
    - Residents requiring assistance with evacuation were allowed.
    - Smoke barriers were required.
    - NFPA 13 sprinklers were required.
    - The two story building was required to be Type IIA (steel frame).

2008 Nevada Assisted Living Project

- The building cost was $170 per square foot.
- The IBC with no amendments was enforced by the local jurisdiction.
- State assisted living licensing required conformance to 2006 NFPA 101.
- State assisted living licensing allows residents that may need assistance with evacuation.
- A building code alternate means was accepted to allow the resident type for the **Group I-1** occupancy, allowing for the implementation of some I-2 requirements, and NFPA 101 Limited Care requirements as an equivalency:
    - Residents requiring assistance with evacuation were allowed.
    - Smoke barriers were required.
    - NFPA 13 sprinklers were required.
    - The negotiations exempted other I-2 requirements for metal conduit, I-2 fire detection, 44" doors, 8' corridors, and structural redundancy to save cost, since it was not considered a nursing or health care facility.
    - The three story building was required to be Type IIA (steel frame).

2008 Oklahoma Assisted Living Project

- The building cost is $110 per square foot.
- The IBC with no amendments was enforced by the local jurisdiction.
- State assisted living licensing required conformance to 2003 NFPA 101.
- State assisted living licensing allows residents that may need assistance with evacuation.
- A building code alternate means was **not** accepted to allow the resident type. The builing is currently being designed to meet **IBC current Group I-2** requirements to allow residents not capable of self preservation. This increased the cost of the project by approximately $25 per square foot required for I-2 and steel frame construction cost. The State is also considering legislation in a statute to require "I-II" (meaning I-2) design in a hastily written statute for assisted living with residents needing assistance, based mostly on the IBC current limitations.
    - Residents requiring assistance with evacuation are allowed.
    - IBC Group I-2 NFPA 13 sprinklers were required.
    - The two story building was allowed to be Type IIA (steel frame).

2006 Oregon Assisted Living Project

- The building cost was $110 per square foot.
- The IBC was enforced with Oregon statewide amendments.
- State assisted living licensing required conformance to 2000 NFPA 101.
- State assisted living licensing allows residents that may need assistance with evacuation.
- No Alternate means were required due to the Oregon IBC amendments allowing the resident type in its **Group I-1** (Oregon SR-1) occupancy, and being consistent with NFPA 101 current Board and Care requirements:
    - Residents requiring assistance with evacuation were allowed.
    - Smoke barriers were required.
    - NFPA 13 sprinklers were required.
    - Horizontal exits are required in multi story wood frame buildings.
    - The three story building was allowed to be Type VA (wood frame), the maximum allowed under Oregon's amendments.

2008 Texas Assisted Living Project

- The building cost is $170 per square foot.
- The IBC with no amendments is enforced by the local jurisdiction.
- State assisted living licensing require conformance to 2000 NFPA 101.
- State assisted living licensing allows residents that may need assistance with evacuation.
- A building code alternate means was accepted to allow the resident type for the **Group I-1** occupancy, allowing for the implementation of some I-2 requirements, and NFPA 101 Limited Care requirements as an equivalency:
    - Residents requiring assistance with evacuation are allowed.
    - Smoke barriers are proposed.
    - NFPA 13 sprinklers are proposed.
    - The request exempts other I-2 requirements for metal conduit, I-2 fire detection, 44" doors, 8' corridors, and structural redundancy to save cost, since it was not considered a nursing or health care facility.
    - The three story building is proposed to be Type IIA (steel frame).

2006 Washington Assisted Living Project

- The building cost was $110 per square foot.
- The IBC was enforced with Washington statewide amendments.
- There were no NFPA 101 requirements.
- State assisted living licensing allows residents that may need assistance with evacuation.
- No Alternate means were required due to the Washington IBC amendments allowing the resident type in its **Group I-1** (Washington LC) occupancy, and being consistent with NFPA 101 current Board and Care requirements:
    - Residents requiring assistance with evacuation were allowed.
    - Smoke barriers were required.
    - NFPA 13R sprinklers were required.
    - The three story building was allowed to be Type VA (wood frame), the maximum allowed in Washington is four stories.

This review shows that there is inconsistent implementation of evacuation criteria, construction type, sprinkler type, and smoke barriers. This inconsistency can be corrected by incorporating the proposed IBC amendments.

IBC I-1 VERSUS I-2 OCCUPANCY CLASSIFICATION

Some jurisdictions believe that these assisted living facilities should be categorized in the Group I-2 occupancy. This proponent believes that personal care assisted living requiring physical evacuation assistance, should remain in the Group I-1 occupancy.

The Group I-1 and R-4 occupancies provide personal care services as currently defined in the IBC. They do not allow bedridden residents, or provide nursing or health care services, except for short term illness. The current IBC definitions for personal care and assisted living are consistent with the general assisted living regulations across the country except for the requiring of residents to have full capability to egress. There are enough differences between actual I-1 personal care residents and staff and the I-2 health care residents and staff to warrant different occupancy classifications. There are also I-2 nursing exceptions that reduce protection that may not be appropriate for I-1 occupancies. The three key differences between I-1 assisted living and I-2 nursing occupancies are as follows:

- Capabilities of the residents are different. Assisted living residents may require more limited physical assistance in evacuation than nursing residents. Assisted living residents are not bedridden except for temporary illness. Nursing facility residents can be require more physical assistance in evacuation and may be permanently bedridden.
- Assisted living residents participate in fire drills and are trained to egress to a point of safety and then to exit the building in an emergency, with or without assistance. Nursing I-2 occupancies are considered "protect in place," meaning that residents do not generally participate in fire drills, and may wait for rescue in their rooms.
- Assisted living uses generally may have less required staffing levels, notably during the evening and overnight shifts than required nursing facility staff levels. There may not be the same amount of staff in assisted living to allow for the "protect in place" concept that I-2 nursing affords (including allowing I-2 unprotected corridors).

The attached "Current IBC Occupancy Requirements Comparison Table" for I-2, I-1, R-4, and R-2, shows all the detailed differences between the I-1 and I-2 requirements. That table is summarized as follows:

- I-2 exclusively has exceptions for rating corridors and open spaces to corridors.
- I-2 exclusively requires smoke barriers.
- I-2 has more restrictive area and story limitations than I-1.
- I-2 has Class B interior ratings versus B and C for I-1.
- I-2 requires NFPA 13 sprinklers versus NFPA 13R for I-1.
- I-2 means of egress has a more restrictive .3 egress width load factor, corridor and door width bed movement provisions, and a 200' travel distance limitation.
- I-2 has a .3 structural redundancy load factor requirement that is not required in I-1.
- The National Electric Code requires health and nursing care in I-2 use metal conduit and hard wired nurse call that is not generally required in I-1.

The proposed code revisions utilize an appropriate mix of I-1 and I-2 requirements for the Group I-1 that best fits personal care and assisted living occupancies. Refer to the "Proposed IBC Occupancy Requirements Comparison Table" (Attached) for a detailed list of the proposed revisions concepts for all the occupancies discussed. The proposed revisions are consistent with what NFPA and other states require in similar occupancies that are noted in detail prior in this justification. The Group I-1 occupancy is proposed to:

- Allow assistance with evacuation.
- Uses the terms "personal care" for I-1 and R-4.
- Uses the term "health care" for I-2 differentiating I-2 from I-1 and to correlate I-2 with the term "health care" used in the following regulations: IBC Chapter 16, State licensing, State and jurisdictional enforcement of NFPA 101, and The National Electrical Code (NEC).
- Keep the occupancy as personal care, not health care.
- Limit wood frame and non combustible construction to between current I-1 and I-2 requirements.
- Add smoke barrier requirements due to the new resident type allowed.
- Requires additional smoke detection requirements.
- Add NFPA 13 automatic sprinkler requirements.
- Keep the 6-16 resident facilities in place by adding exceptions for areas, construction, and sprinklers.

The proposed revisions utilizes only key provisions from I-2 into the I-1 for allowing persons who may need physical evacuation assistance, including story limitations, smoke barriers, and NFPA 13 sprinklers. This is consistent with other states amendments and current NFPA101 requirements.

The revisions do not utilize the current IBC I-2 Chapter 4 corridor exceptions reducing protection, Chapter 8 interior finish requirements, Chapter 10 bed movement egress limitations, or Chapter 16 additional structural redundancy requirements. The corridor, finish, and bed movement egress limitations are specifically for nursing or health care occupancies so it is not appropriate to include these in personal care occupancies. The non protected corridor allowance in nursing makes the correct assumption of higher staff levels than in assisted living. It also takes into account that nursing is protect in place. The structural redundancy requirements are for non essential health care facilities with over 50 occupants. This is appropriate for those protect in place occupancies that may keep the occupants in the building during emergencies. Personal care occupancies have occupants that leave the building during emergencies. This difference eliminates the need for additional structural redundancy. These I-2 requirements are not included in the new I-1 because they are only appropriate for health care and not for personal care uses.

IBC I-1 VERSUS R OCCUPANCY CLASSIFICATION

The proposed amendments essentially move the current resident type in Groups I-1 and R-4 to Group R-4. This keeps an occupancy group for personal care uses that do not allow assistance with evacuation, such as some categories of assisted living in some states. It also moves other personal care uses capable of evacuation without assistance from the current I-1 to the proposed R-4, including halfway houses, congregate care, social rehabilitation and other types of residential facilities. The proposed amendments keep the current 6-16 resident facilities with residents who may need assistance with self evacuation in the Group R-4 occupancy by adding exceptions. The proposed revisions are also consistent with current I-1, R-4, and R-2 requirements. The Current IBC Occupancy Requirements Comparison Table (Attached) shows that the current I-1 and R-2 have essentially the same requirements. Both occupancies assume that occupants are generally capable of responding to emergencies.

The Current IBC Occupancy Requirements Comparison Table shows basically no substantial life safety differences between Groups I-1, R-4 and R-2 occupancy requirements. The only real measurable difference is allowable story and area differences in Chapter 5. A summary of the only differences shown in the table between the current I-1 and R-2 substantiates why the current I-1 best fits in the current general "Group R" occupancy:

- I-1 is for personal care versus R-2 is general "residential."
- I-1 is for over 16 persons and R-2 is one or two family dwellings and for non transient sleeping residents.
- I-1 has less area and sometimes less story limitations with no extra stories allowed in Section 508. There are two construction types in the I-1 that require one less story. The allowable area is less in the I-1 from 1,500 to 6,000 square feet when compared to the R-2.
- There are some minor differences in smoke and visual alarm requirements.

The proposed code revisions for the R-4 are consistent with current I-1 and R-4 requirements. Refer to the "Proposed IBC Occupancy Requirements Comparison Table" (Attached) for a detailed list of the proposed revisions concepts for all the occupancies discussed. The Group R-2 occupancy is proposed to:

- Not allow assistance with evacuation.
- Adds personal care uses to the occupancy.
- Keeps the I-1 area and story limitations converted to the new R-4.
- Keep current I-1 requirements for NFPA 13R automatic sprinkler requirements.
- Keep current I-1 requirements for manual fire alarms, smoke alarms, and visual alarms.
- Keep the capable of self evacuation 6-16 resident facilities in the R-4 occupancy allowing for exceptions in various sections.

OTHER OPTIONS

The proposed solution for the I-1 and R-4 occupancies is not the only option for correcting the issue with these classifications in the IBC. The proponent believes the proposed amendments are the best overall most practical solution when all things are considered. The proposed revisions are not a "perfect solution. Advocates in the "personal" care industry prefer not being classified with the "I-Institutional" occupancies. They prefer being considered "residential." Note that even the existing I-1 classification description in Section 308.2 states that "residents live in a supervised residential environment that provides personal care services." This seems a contradiction to many in the industry, including the proponent of these amendments. There is a preference stated by some that all personal care be moved out of the "I" occupancy to the "R-Residential" occupancy. The proponent is not an advocate of this option because it would most likely create too many other issues as noted below.

The proponent does not advocate this "R" option because of the following:

- The main reason is that it would probably require creating a new occupancy classification (R-5?) versus the proposed keeping the existing occupancies in tact.
- It would require serious questions about what to do with the current I-1 designation. It could be used for Alzheimer's, but there is not enough difference to create an occupancy classification for Alzheimer's. Otherwise, if all personal care moved to the R classification, then the I-1 may end up not being used at all.
- Finally, another main issue is that moving all personal care to the R occupancy would most likely cause a major amount of code section changes. This "complete move" option would probably require two to three times the amount of code section changes than in this proposal.
- There were already major occupancy revisions in most states between 2003 and 2005 when the old regional codes were deleted for the adoption of the new IBC. Moving all personal care to the R classification would cause another major occupancy revision to the relatively newly established IBC personal care occupancies. This could cause confusion with occupancy permits, classifications, and requirements with three major occupancy classification revisions in 10 years for personal care uses.
- Due to the above, the argument for moving all personal care to the Group R is more philosophical than practical.

Finally, this proponent has a second option that encompasses similar concepts found in the submitted proposal but maintains the resident counts as currently in the I-1 and R-4 occupancies. This option keeps the R-4 as the 6-16 person occupancy but allowing non capable residents. It allows non capable resident in I-1 with over 16 residents. It moves all capable personal care to the R-2. It was not submitted for two main reasons: The proponent did not think it was as appropriate to continue to split personal care between the Group I and R based solely on the number of occupants. It was also perceived that advocates of keeping occupancies similar would not have approved moving capable personal care to the R-2 even though it has similarities. This other option has its merit only requiring 13 code section changes and no occupant number changes. Overall the proposal submitted was chosen due to the fact that it conceptualizes a long term solution to continuity of occupancy classification between to different letter groups. It makes the Group I for persons not capable of self preservation and for persons under detention. It makes the R for overnight occupancies for persons generally capable of self preservation. This proposal is the most appropriate and practical solution for the revision of the personal care occupancies.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: PURGIEL-G1-308.1.DOC

G22–09/10
308.2 (IFC [B] 202), 308.3, 308.3.1, 310.2, 1107.5.2

Proponent: Jay Hall, Virginia Fire Safe Construction Advisory Committee

Revise as follows:

SECTION 308
INSTITUTIONAL GROUP I

308.1 (IFC [B] 202) Institutional Group I. Institutional Group I occupancy includes, among others, the use of a building or structure. or a portion thereof, in which people are cared for or live in a supervised environment, having physical limitations because of health or age are harbored for medical treatment or other care or treatment, or in which people are detained for penal or correctional purposes or in which the liberty of the occupants is restricted. Institutional occupancies shall be classified as Group I-1, 1-2, 1-3 or 1-4.

308.2 (IFC [B] 202) Group I-1. This occupancy shall include buildings, structures or parts thereof housing more than 16 persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment that provides personal care services. The occupants are capable of responding to slow evacuation in an emergency situation without physical assistance from staff. This group shall include, but not be limited to, the following:

Alcohol and drug centers
~~Assisted living facilities~~
Congregate care facilities
~~Convalescent facilities~~
Group homes
Halfway houses
Residential board and care facilities
Residential care
Social Rehabilitation facilities

A facility such as the above with five or fewer persons shall be classified as a Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2. A facility such as above, housing at least six and not more than 16 persons shall be classified as Group R-4.

308.3 (IFC [B] 202) Group 1-2. This occupancy shall include buildings and structures used for medical, surgical, psychiatric, nursing, assisted living or custodial care for persons who are not capable of self-preservation or where complete evacuation is impractical. This group shall include, but not be limited to, the following:

Assisted living facilities
Child care facilities
Convalescent facilities
Detoxification facilities
Hospice care
Hospitals
Mental hospitals
Nursing homes

308.3.1 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

ASSISTED LIVING FACILITIES. Buildings, or portions thereof housing persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment which provide personal care services and in addition could provide convalescent, medical, nursing or hospice care. The occupants are not capable of responding to an emergency situation without physical assistance from staff. This classification shall include, but not be limited to the following: Mental care facilities, nursing homes, assisted living facilities, convalescent facilities, and hospice care facilities.

CHILD CARE FACILITIES. Facilities that provide care on a 24-hour basis ~~to more than five~~ for children, 2½ years of age or less.

DETOXIFICATION FACILITIES. Facilities that serve patients who are provided treatment for substance abuse on a 24-hour basis and who are incapable of self-preservation or who are harmful to themselves or others.

EVACUATION LEVELS

Impractical evacuation. The movement of all occupants, residents and staff to an exit in more than 13 minutes.

Slow evacuation. The movement of all occupants, residents, and staff to an exit in more than three minutes, but not more than thirteen minutes.

HOSPITALS AND MENTAL HOSPITALS. Buildings or portions thereof used on a 24-hour basis for the medical, psychiatric, obstetrical or surgical treatment of inpatients who are incapable of self-preservation.

INDEPENDENT LIVING STATUS. A resident that is assessed as capable of performing all activities of daily living and instrumental activities of daily living for himself without requiring the assistance of another person and is assessed as capable of taking medications without the assistance of another person. Where the policy of a facility dictates that medications are administered or distributed centrally without regard for the residents' capacity, this policy shall not be considered in determining independent status.

NURSING HOMES. Nursing homes are long-term care facilities on a 24-hour basis, including both intermediate care facilities and skilled nursing facilities, serving more than five persons and any of the persons are incapable of self-preservation.

310.2 Definitions. The following words and terms shall, fro the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

RESIDENTIAL CARE/~~ASSISTED LIVING~~ A building or part thereof housing persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment which provides *personal care services.* The occupants are capable of responding to an emergency situation without physical assistance from staff. This classification shall include, but not be limited to the following: residential board and care facilities, ~~assisted living facilities~~, halfway houses, group homes, congregate care facilities, social rehabilitation facilities, alcohol and drug abuse centers and ~~convalescent facilities~~ residential care facilities where all residents have independent living status.

1107.5.2 Group I-2 nursing homes and assisted living facilities. Accessible units and Type B units shall be provided in nursing homes and assisted living facilities of Group I-2 occupancies in accordance with Sections 1107.5.2.1 and 1107.5.2.2.

Reason: This proposal addresses a disconnect between assisted living facilities (ALF) and the current building code.

Based on the current definition for Group I-1, which include ALF, residents are expected to be able to respond to an emergency without any assistance from staff. Today's ALF simply do not operate that way and even the Dept. of Social Services regulations in many states allow for or demand a percentage of non-ambulatory patients.

The census shows a continued increase in the population of older adults, age 65 and older. Given that fact, it is not surprising that we have already seen large increases in senior marketed housing and Assisted Living Facilities (ALF). Construction starts for Assisted living facilities are expected to grow even more to accommodate the rising number of adults who will need assistance for daily activities. Bathing, dressing, toileting, and transferring are a few examples of assistance.

In placing the Assisted Living Facilities use under the Group I-1 there is a tacit acknowledgement that residents in these facilities will eventually need protection levels beyond that provided by the Group I-1, however, no guidance is given to the code official to determine when the level of assistance needed has reached a maximum and the resident needs to be moved to an Group I-2 facility.

Based on the statistics from the U.S. fire Administration, and the National fire data center, older adults are at the highest risk of dying in a fire. The concept behind the existing placement of the ALF use within the Group I-1 is that though the residents may be slower to evacuate, they are still capable of self evacuation without physical assistance. Facilities that house residents not capable of responding to an emergency without physical assistance are classified as Nursing homes or hospitals. Higher degrees of fire safety and life safety are required in these facilities because the code recognizes a higher need for defend in place protection and that evacuation would be difficult or impractical, depending on the condition of the resident and involvement of fire and smoke. In practice most ALF would find themselves in a similar predicament if faced with a fire emergency.

The reality is that many of the residents in ALF are not capable of self preservation. As a result, many facilities go out of compliance with the building code soon after opening, and enforcement is difficult due to a lack of measurable performance standard in the code to be applied by code enforcers. Code enforcers cannot be expected to perform medical/physical/psychiatric assessments of the facility residents, nor should they. Most times the facility operators itself is also not aware of building code limitations based upon their group designation and they are also wrestling with the desires of the resident and family members who may not wish to be moved to a different facility, or even a different wing in the same facility.

In an emergency it obvious that many residents will need assistance to evacuate. Staffing levels nor building construction have been enhanced to balance the added time needed to evacuate. Some patients may not even be able to physically endure evacuating depending on their condition and the amount of smoke and heat present. This may be compounded by the responding fire department having limited resources during the initial response phase.

The lack of definitive guidance for code officials on when a resident goes from needing the protection levels or an R Group, to a Group I-1 to an Group I-2 is incomprehensible when the International Fire Code requires emergency action plans to be developed, submitted and approved by the fire code official for the Group I and specifies that drills be conducted, including evacuation of all residents in an ALF occupancy. What criteria is used to determine if the evacuation was timely?

The criteria has been available and progressive jurisdictions, such as the State of New Jersey, have used that criteria to provide for improved levels of safety for residents of these facilities, and clear guidance to designers and code officials. Virginia is also currently considering a similar proposal and many other states recognize the same problem and are seeking a solution.

The guidance is found in the NFPA 101 Life Safety Code.

From the 2008 edition (and is in previous editions):

3.3.70* Evacuation Capability*. The ability of occupants, residents, and staff as a group either to evacuate a building or to relocate from the point of occupancy to a point of safety.*

3.3.70.1 Impractical Evacuation Capability. *The inability of a group to reliably move to a point of safety in a timely manner.*

3.3.70.2 Prompt Evacuation Capability*. The ability of a group to move reliably to a point of safety in a timely manner that is equivalent to the capacity of a household in the general population.*

3.3.70.3 Slow Evacuation Capability*. The ability of a group to move reliably to a point of safety in a timely manner, but not as rapidly as members of a household in the general population.*

A.3.3.70 Evacuation Capability. *The evacuation capability of the residents and staff is a function of both the ability of the residents to evacuate and the assistance provided by the staff. It is intended that the evacuation capability be determined by the procedure acceptable to the authority having jurisdiction. It is also intended that the timing of drills, the rating of residents, and similar actions related to determining the evacuation capability be performed by persons approved by or acceptable to the authority having jurisdiction. The evacuation capability can be determined by the use of the definitions in 3.3.70, the application of NFPA 101A, Guide on Alternative Approaches to Life Safety, Chapter 6, or a program of drills (timed).*

Where drills are used in determining evacuation capability, it is suggested that the facility conduct and record fire drills six times per year on a bimonthly basis, with a minimum of two drills conducted during the night when residents are sleeping, and that the facility conduct the drills in consultation with the authority having jurisdiction. Records should indicate the time taken to reach a point of safety, date and time of day, location of simulated fire origin, escape paths used, and comments relating to residents who resisted or failed to participate in the drills.
Translation of drill times to evacuation capability is determined as follows

(1) 3 minutes or less — prompt
(2) Over 3 minutes, but not in excess of 13 minutes — slow
(3) More than 13 minutes — impractical

Evacuation capability, in all cases, is based on the time of day or night when evacuation of the facility would be most difficult, such as when residents are sleeping or fewer staff are present.

Evacuation capability determination is considered slow if the following conditions are met:

(1) All residents are able to travel to centralized dining facilities without continuous staff assistance.
(2) There is continuous staffing whenever there are residents in the facility.

This proposal addresses the problem by building the evacuation criteria into the group designation language. When an applicant submits a set of plans for review the plans must include the Group and the requirements of that group become a condition of occupancy when the facility is constructed and occupied. This is no different than when an applicant provides information on how much hazardous materials will be present in an effort to show that the proposed use is not an H Group. The MAQ for hazardous materials becomes a measurable condition of occupancy.

Once occupied, the evacuation parameters in the group designations become the standard the fire code official can measure against when fire drills are conducted or a violation of the certificate of occupancy is suspected. This will help ensure that residents are in the facilities that can provide the proper level of safety.

This proposal also includes moving Assisted Living Facilities from the Group I-1 to the Group I-2 as the most appropriate designation based upon the limitations of many residents of assisted living facilities and the fact that most, if not all of the residents transition to needing increased levels of care once admitted to a facility.

There is no getting around the fact that today's ALF does not fit into an Group I-1. Read Virginia's Assisted Living regulations at http://www.dss.virginia.gov/files/division/licensing/alf/regulations_code/applicable_regulations/032-05-010-17.pdf

Other States have similar regulations.

You will see that ALF facilities are allowed by their regulations to provide care for those cannot sense or even recognize danger, much less respond to it, as well as a multitude of other health conditions where the resident cannot respond to an emergency. Interestingly enough it also says that the facility shall comply with all fire safety regulations by the USBC. So, there is the first disconnect. They are out of compliance with both their regulations and the building code. It is hard to blame the assisted living people, the building code has been evolving too. It now clearly recognizes, that those that cannot reasonably respond be provided with added fire safety, Group I-2 construction and safety features. Those who can respond and under the care of a facility are provided with the systems to give more time for evacuation such as early detection, NFPA 13R, and some light compartmentation in corridors and dwelling units.

Realizing that people who move in and are perfectly capable of responding, will all age in place at the same rate but with different affects. Some will remain healthy and some will not. Some slow down and some will require wheel chairs, walkers etc. and this can change from day to day. Who will ever know, except the resident and maybe the facility, if the resident can or cannot respond to emergency without assistance on a day to day basis? How can this ever be regulated and monitored closely for each resident? Nightmare for all concerned, especially the resident.

The 13 minute evacuation time is an objective time limit that is a combination of the facilities ability and the resident's ability to manage getting the residents out and to safety in a reasonable time. If by combination of both, the facility can achieve total evacuation of the premises in 13 min. then we have a reasonably safe condition no matter how many times the resident/s needed a little more assistance in getting themselves in the right direction. If the residents are the type of residents that the code expects, then 13 minutes should be very achievable with no increase in staffing.

When the resident in no longer able to respond, yes they will need to be relocated, to a facility where they can age in place, and have the systems in place that acknowledge the resident will not be evacuating. From that point on, the building code cares not whether the resident went to a nursing home or an assisted living facility, either way and based on any changes that the DSS may have, assisted living facilities will be in compliance with the building code without the fire official or the facility being concerned with how many might be non-ambulatory at one time on any given day, week or month.

If applied at the time of construction the cost impact is minimal.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HALL-G1-308.2

G23–09/10

308.2, 308.3, 308.3.1, 308.5, 308.5.1, 308.5.2, 310.1 (IFC [B] 202), 1107.5.2

Proponent: Robert J Davidson, Code Consultant, Alan Shuman, President, The National Association of State Fire Marshals (NASFM)

Revise as follows:

308.2 (IFC [B] 202) Group I-1. This occupancy shall include buildings, structures or parts thereof housing more than ~~16~~ five persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment that provides personal care services. The occupants are capable of ~~responding to~~ slow evacuation in an emergency situation without physical assistance from staff. This group shall include, but not be limited to, the following:

Alcohol and drug centers
~~Assisted living facilities~~
Congregate care facilities
Convalescent facilities
Group homes
Halfway houses
Social rehabilitation facilities
Residential board and care facilities

A facility such as the above with five or fewer persons shall be classified as a Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2 provided the building is protected by an automatic sprinkler system installed in accordance with Section 903.2.8. ~~A facility such as above, housing at least six and not more than 16 persons, shall be classified as Group R-4~~.

308.3 (IFC [B] 202) Group I-2. This occupancy shall include buildings and structures used for medical, surgical, psychiatric, nursing or custodial care for persons ~~who are not capable of self-preservation~~ where evacuation is impractical. This group shall include, but not be limited to, the following:

Assisted living facilities
Child care facilities
Detoxification facilities
Hospitals
Mental hospitals
Nursing homes

308.3.1 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

CHILD CARE FACILITIES. Facilities that provide care on a 24-hour basis ~~to more than five~~ for children, 2½ years of age or less.

DETOXIFICATION FACILITIES. Facilities that serve patients who are provided treatment for substance abuse on a 24-hour basis and who are incapable of self-preservation or who are harmful to themselves or others.

EVACUATION LEVELS

Impractical evacuation. The movement of all occupants, residents and staff to an exit in more than 13 minutes.

Slow evacuation. The movement of all occupants, residents, and staff to an exit in more than three minutes, but not more than thirteen minutes.

Prompt evacuation. The movement of all occupants, residents, and staff to an exit in three minutes or less.

HOSPITALS AND MENTAL HOSPITALS. Buildings or portions thereof used on a 24-hour basis for the medical, psychiatric, obstetrical or surgical treatment of inpatients who are incapable of self-preservation.

NURSING HOMES. Nursing homes are long-term care facilities on a 24-hour basis, including both intermediate care facilities and skilled nursing facilities, serving more than five persons and any of the persons are incapable of self-preservation.

308.5 (IFC [B] 202) Group I-4, day care facilities. This group shall include buildings and structures occupied by persons of any age who receive custodial care for less than 24 hours by individuals other than parents or guardians, relatives by blood, marriage or adoption, and in a place other than the home of the person cared for. A facility such as the above ~~with~~ accessory to a dwelling unit and having five or fewer persons shall be classified as a Group R-3 or shall comply with the International Residential Code in accordance with Section 101.2 provided the building is protected by an automatic sprinkler system installed in accordance with Section 903.2.8. Places of worship during religious functions are not included.

308.5.1 (IFC [B] 202) Adult care facility. A facility that provides ~~accommodations for less than 24 hours for more than five unrelated adults and provides~~ supervision and personal care ~~services~~ on less than a 24-hour basis where evacuation is slow or impractical, shall be classified as Group I-4.

Exception: A facility where occupants are capable of ~~responding to an emergency situation~~ prompt evacuation without physical assistance from the staff, is accessory to a dwelling unit and having five or fewer persons shall be classified as Group R-3.

308.5.2 (IFC [B] 202) Child care facility. A facility that provides supervision and personal care on less than a 24-hour basis for ~~more than five~~ children 2 1/2 years of age or less shall be classified as Group I-4.

~~Exception: A child day care facility that provides care for more than five but no more than 100 children 2 1/2 years or less of age, when the rooms where such children are cared for are located on a level of exit discharge serving such rooms and each of these child care rooms has an exit door directly to the exterior, shall be classified as Group E.~~

310.1 (IFC [B] 202) Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the International Residential Code in accordance with Section 101.2. Residential occupancies shall include the following:

R-1 Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including:

Boarding houses (transient)
Hotels (transient)
Motels (transient)

Congregate living facilities (transient) with 10 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-2 Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:

Apartment houses
Boarding houses (not transient)
Convents
Dormitories
Fraternities and sororities
Hotels (nontransient)
Live/work units
Monasteries
Motels (nontransient)
Vacation timeshare properties

Congregate living facilities with 16 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-3 Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

Buildings that do not contain more than two dwelling units.
Adult facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.
Child care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.
Congregate living facilities with ~~16~~ five or fewer persons.

Adult and child care facilities that are within a single-family home are permitted to comply with the International Residential Code provided the building is protected by an automatic sprinkler system installed in accordance with Section 903.2.8.

R-4 Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living facilities including more than five but not more than 16 occupants, excluding staff.

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code or shall comply with the *International Residential Code* provided the building is protected by an *automatic sprinkler system* installed in accordance with Section 903.2.8.

1107.5.2 Group I-2 nursing homes and assisted living facilities. Accessible units and Type B units shall be provided in nursing homes and assisted living facilities of Group I-2 occupancies in accordance with Sections 1107.5.2.1 and 1107.5.2.2.

Reason: The purpose of this proposal is to correct a serious disconnect in life safety between what is contained within the IBC and what occurs in the field and to provide a sound solution that is both fair and effective.

The census shows a continued increase in the population of older adults, age 65 and older. Given that fact, it is not surprising that we have already seen large increases in senior marketed housing and Assisted Living Facilities (ALF). New construction for assisted living facilities are expected to grow even more to accommodate the rising number of adults who will need assistance for daily activities. Bathing, dressing, toileting, and transferring are a few examples of assistance.

In placing the Assisted Living Facilities use under the I-1 Group there is a tacit acknowledgement that residents in these facilities will eventually need protection levels beyond that provided by the I-1, however, no guidance is given to the code official to determine when the level of assistance needed has reached a maximum and the resident needs to be moved to an I-2 Group facility.

Based on the statistics from the U.S. fire Administration, and the National fire data center, older adults are at the highest risk of dying in a fire. The concept behind the existing placement of the ALF use within the I-1 Group is that though the residents may be slower to evacuate, they are still capable of self evacuation without physical assistance. Facilities that house residents not capable of responding to an emergency without physical assistance are classified as I-2 such as Nursing homes or hospitals. Higher degrees of fire safety and life safety are required in these facilities because the code recognizes a higher need for defend in place protection and that evacuation would be difficult or impractical, depending on the condition of the resident and involvement of fire and smoke. In practice most ALF would find themselves in a similar predicament if faced with a fire emergency.

The reality is that many of the residents in ALF are not capable of self preservation. As a result, many facilities go out of compliance with the building code soon after opening, and enforcement is difficult due to a lack of measurable performance standard in the code to be applied by code enforcers. Code enforcers cannot be expected to perform medical/physical/psychiatric assessments of the facility residents, nor should they. Most times the facility operators themselves are not aware of building code limitations based upon their group designation and they are also wrestling with the desires of the resident and family members who may not wish to be moved to a different facility, or even a different wing in the same facility.

In an emergency it obvious that many residents will need assistance to evacuate. Neither staffing levels nor building construction have been enhanced to balance the added time needed to evacuate. Some patients may not even be able to physically endure evacuating depending on their condition and the amount of smoke and heat present. This may be compounded by the responding fire department having limited resources during the initial response phase.

The lack of definitive guidance for code officials on when a resident goes from needing the protection levels or an R Group, to a I-1 Group to an I-2 Group is incomprehensible when the International Fire Code requires emergency action plans to be developed, submitted and approved by the fire code official for the I Group and specifies that drills be conducted, including evacuation of all residents in an ALF occupancy. What criteria is used to determine if the evacuation was timely?

The criteria has been available and progressive jurisdictions, such as the State of New Jersey and the State of Georgia, have used that criteria to provide for improved levels of safety for residents of these facilities, and clear guidance to designers and code officials.

The guidance is found in the NFPA 101 Life Safety Code.

From the 2008 edition (and is in previous editions):

***3.3.70* Evacuation Capability**. The ability of occupants, residents, and staff as a group either to evacuate a building or to relocate from the point of occupancy to a point of safety.*

***3.3.70.1 Impractical Evacuation Capability.** The inability of a group to reliably move to a point of safety in a timely manner.*

***3.3.70.2 Prompt Evacuation Capability**. The ability of a group to move reliably to a point of safety in a timely manner that is equivalent to the capacity of a household in the general population.*

***3.3.70.3 Slow Evacuation Capability**. The ability of a group to move reliably to a point of safety in a timely manner, but not as rapidly as members of a household in the general population.*

***A.3.3.70 Evacuation Capability.** The evacuation capability of the residents and staff is a function of both the ability of the residents to evacuate and the assistance provided by the staff. It is intended that the evacuation capability be determined by the procedure acceptable to the authority having jurisdiction. It is also intended that the timing of drills, the rating of residents, and similar actions related to determining the evacuation capability be performed by persons approved by or acceptable to the authority having jurisdiction. The evacuation capability can be determined by the use of the definitions in 3.3.70, the application of NFPA 101A, Guide on Alternative Approaches to Life Safety, Chapter 6, or a program of drills (timed).*

Where drills are used in determining evacuation capability, it is suggested that the facility conduct and record fire drills six times per year on a bimonthly basis, with a minimum of two drills conducted during the night when residents are sleeping, and that the facility conduct the drills in consultation with the authority having jurisdiction. Records should indicate the time taken to reach a point of safety, date and time of day, location of simulated fire origin, escape paths used, and comments relating to residents who resisted or failed to participate in the drills.

Translation of drill times to evacuation capability is determined as follows:

(1) 3 minutes or less — prompt
(2) Over 3 minutes, but not in excess of 13 minutes— slow
(3) More than 13 minutes — impractical

Evacuation capability, in all cases, is based on the time of day or night when evacuation of the facility would be most difficult, such as when residents are sleeping or fewer staff are present.

Evacuation capability determination is considered slow if the following conditions are met:

(1) All residents are able to travel to centralized dining facilities without continuous staff assistance.
(2) There is continuous staffing whenever there are residents in the facility.

This proposal addresses the problem by building the evacuation criteria into the group designation language. When an applicant submits a set of plans for review the plans must include the Group and the requirements of that group become a condition of occupancy when the facility is constructed and occupied. This is no different than when an applicant provides information on how much hazardous materials will be present in an effort to show that the proposed use is not an H Group. The MAQ for hazardous materials becomes a measurable condition of occupancy.

Once occupied, the evacuation parameters in the group designations become the standard the fire code official can measure against when fire drills are conducted or a violation of the certificate of occupancy is suspected. This will help ensure that residents are in the facilities that can provide the proper level of safety.

This proposal also includes moving Assisted Living Facilities from the Group I-1 to the Group I-2 as the most appropriate designation based upon the limitations of many residents of assisted living facilities and the fact that most, if not all of the residents transition to needing increased levels of care once admitted to a facility. If applied at the time of construction the impact is minimal.

Wherever there is an allowance to construct a facility under the International Residential Code language has been added, *"provided the building is protected by an automatic sprinkler system installed in accordance with Section 903.2.8*." to make sure this important level of protection is provided. Though the IRC was amended to require the installation of automatic sprinkler systems, various builder groups have been waging a state by state campaign to prevent that change from taking effect. They have been successful in some states making this modification imperative to provide the necessary level of safety.

The proposal also reduces from 16 to 5 the number of residents considered appropriate for applying the I-1 Group. While even 5 individuals in home with limited abilities to self evacuate can present a challenge to responding fire service personnel, That number is the traditional number associated with one and two family occupancies and even under legacy code would not have been prohibited. But to allow greater than that number of individuals lacking the ability to self evacuate in a building without the proper levels of protection places the residents at risk and risks the lives of the fire service that arrive and have to attempt rescue of the residents lacking the proper level of protection.

The adult care and child care uses have been modified. The adult care has been modified in a manner similar to the I-1 and I-2 to provide for a qualifier on resident self evacuation capabilities. Many of these occupants have the same personal care needs as those in an assisted living facility, but because of family only need part-time care. The designation of the R-3 group in this case was modified to specify that the option is only available if the adult day care is "accessory" to the dwelling use which is the appropriate allowance. R-3 with its lower safety requirements should not be permitted for someone simply establishing an adult care business not associated with their dwelling.

Child care has been modified that the activity is an I-4 regardless of the number of children below the age of 2.5 years of age. Children that young are for the most part required to be physically removed from harms way during an evacuation, many times on a one ton one basis and as a result the higher level of protection features is needed.

The change to Section 1107.5.2 is a companion change to a proposal to move assisted living facilities to Group I-2 as the appropriate classification for assisted living facilities due to the limitations in mobility and cognitive awareness on the part of many of those living in an assisted living facility. These individuals are also entitled to accessible units to address their limitations just as occupants of a nursing home. In many cases it is a fine line between whether someone lives within an assisted living facility or needs the care provided by a nursing home with occupants having disabilities prevalent in both types of occupancies.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-G2-308.2.doc

G24–09/10
308.2 (IFC [B] 202)

Proponent: Tom Lariviere, Chairman, representing Joint Fire Service Review Committee

Revise as follows:

308.2 (IFC [B] 202) Group I-1. This occupancy shall include buildings, structures or parts thereof housing more than 16 persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment that provides personal care services. The occupants are capable of responding to an emergency situation without physical assistance from staff. This group shall include, but not be limited to, the following:

Alcohol and drug centers
Assisted living facilities
Congregate care facilities
Convalescent facilities
Group homes
Halfway houses
Residential board and care facilities
Social rehabilitation facilities

A facility such as the above ~~with~~ housing five or fewer persons shall be classified as Group R-3 or shall comply with the *International Residential Code* in accordance with Section 101.2, provided the building is protected by an automatic sprinkler system installed in accordance with Section 903.2.8. A facility such as above, housing at least six and not more than 16 persons, shall be classified as Group R-4.

Reason: This proposal will continue to allow the smaller congregate care facilities to be constructed either as an R-3, or under the IRC. But when the IRC is used for this facility, the facility must be sprinklered.

If a new structure is built, it will be required to be sprinklered. A new facility can be constructed either as an R-3 under the IBC which will require a fire sprinkler system, or as a one-family dwelling under the IRC which will also require a fire sprinkler system is installed. However, many congregate care facilities open and occupy an existing structure. This revision will require that when an existing single family home is used as a small congregate care facility, it will also be sprinklered.

These occupancies, even though housing less than six occupants, still have the same clientele as the I-1 occupancy. The facility is still a Group Home, a Congregate Care Facility, or an Assisted Living Facility, etc. Many of the occupants in these facilities have limited capability or delayed response for self-preservation in an emergency.

This proposed wording in this proposal was approved in Item G36 07-08 for R-4 occupancies where a similar concept applies. The sprinkler system provides the desired level of life safety regardless of whether the facility houses 5 or 6 occupants.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-G1-308.2

G25–09/10
309.1 (IFC [B] 202)

Proponent: Gene Boecker, AIA, Code Consultants, Inc., representing Code Consultants, Inc.

Revise as follows:

309.1 (IFC [B] 202) Mercantile Group M. Mercantile Group M occupancy includes, among others, the use of a building or structure, or a portion thereof, for the display and sale of merchandise and involves stocks of goods, wares or merchandise incidental to such purposes and accessible to the public.

Exceptions:

1. A building used for mercantile purposes with an occupant load of less than 50 persons shall be classified as a Group B occupancy.
2. A room or space used for mercantile purposes with an occupant load of less than 50 persons and accessory to another occupancy shall be classified as Group B occupancy or as part of that occupancy.

Mercantile occupancies shall include, but not be limited to, the following:

(Portions of text not shown remain unchanged)

Reason: This is similar to the provision already included in 303.1 for assembly spaces. If a deli serves food and has a place to sit, it could be an Assembly occupancy. However the exception in 303.1 allows the space to be classified as a Group B occupancy. If that deli does not have seating it would logically be classified as a Group M occupancy without the exception.

Similarly, a small gift shop in a large facility would need to be addressed as a separate occupancy. The same size café would be granted the exception in 303.1 of being considered as a part of that main occupancy. The gift shop, however, would not. This is incongruous with a reasonable approach to similar conditions. The exceptions will allow small spaces where goods are sold to be treated in a like manner whether seating is provided or not.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOECKER-G1-309.1

G26–09/10
310.1(IFC 202), 310.2

Proponent: Sarah A. Rice, CBO, representing self

Revise as follows:

310.1 (IFC 202) Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code* in accordance with Section 101.2. Residential occupancies shall include the following:

R-1 Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including:

~~Boarding houses (transient)~~
Congregate living facilities (transient) accommodating more than 10 occupants.
Bed and breakfast
Boarding house
Hotels (transient)
Motels (transient)

~~Congregate living facilities (transient) with 10 or fewer occupants are permitted to comply with the construction requirements of Group R-3.~~

R-2 Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature, including:

Apartments
Congregate living facilities (nontransient) accommodating more than 16 occupants
Boarding House ~~(non-transient)~~
Convents
Dormitories
Fraternities ~~and sororities~~
Monastaries
Sororities
Hotels ~~(non-transient)~~
Live/work units
~~Monastaries~~
Motels ~~(nontransient)~~
Vacation Timeshare properties

~~Congregate living facilities with 16 or fewer occupants are permitted to comply with the construction requirements for Group R-3~~

R-3 Residential occupancies where the occupants are primarily permanent in nature (non-transient) and are not classified as a Group R-1, R-2, R-4 or I occupancy, including:

Buildings that do not contain more than two dwelling units
Adult care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours
Child care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours
Congregate living facilities ~~with 16 or fewer persons~~ (nontransient) accommodating 16 or fewer occupants
Boarding house
Convents
Dormitories
Fraternities
Monastaries
Sororities
Congregate living facilities (transient) accommodating 10 or fewer occupants
Bed and breakfast
Boarding house

Adult care and child care facilities that are within a single-family home are permitted to comply with the International Residential Code

R-4 Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living facilities including more than five but not more than 16 occupants, excluding staff.

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code or shall comply with the International Residential Code provided the building is protected by an automatic sprinkler system installed in accordance with Section 903.2.8.

310.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

CONGREGATE LIVING FACILITY: A building or portion of a building ~~or part thereof~~ that contains sleeping units where residents share bathroom and/or kitchen facilities. Congregate living facilities including, but not limited to, bed and breakfast homes, boarding houses, convents, monasteries, dormitories, fraternities and sororities.

Boarding house. ~~A building~~ A type of congregate living facility arranged or used for lodging for compensation, with or without meals, and not occupied as a ~~single-family~~ dwelling unit.

Dormitory. ~~A space in a building~~ A type of congregate living facility where group sleeping accommodations are provided in one room, or in a series of closely associated rooms, for persons not members of the same family group, under joint occupancy and single management, as in college dormitories, ~~or fraternity houses~~ fraternities and sororities.

Reason: When congregate living facility was added to the code, the proponent explained that this was a generic category of which many of the codes existing categories were subsets. This change simply carries through with that original concept. In addition, the list of occupancies with the R category have become muddled with some uses listed and some explained in paragraphs below the list. Finally there is confusion resulting from the paragraph at the end of the R-1 and R-2 lists which says that certain congregate living facilities are 'permitted to comply with the construction requirements of R-3, but doesn't say there are R-3's, This would seem to imply that they are to be categorized as R1 or R2, but everything else about them will be R-3. That makes no sense.

Finally this eliminates the inconsistent placement of transient and nontransient after various uses. The charging language for each group says either transient or permanent (non-transient), the lists afterward don't need to, with one exception. Because the R-3 can have both transient and non-transient congregate living facilities, that distinction must be provided.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-G1-310.2.doc

G27–09/10
310.1 (IFC [B] 202)

Proponent: Maureen Traxler, City of Seattle, WA, Seattle Dept of Planning & Development

Revise as follows:

310.1 (IFC [B] 202) Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code* in accordance with Section 101.2. Residential occupancies shall include the following:

R-1 Residential occupancies containing *sleeping units* where the occupants are primarily transient in nature, including:

Boarding houses (transient) with more than 10 occupants
Congregate living facilities (transient) with more than 10 occupants
Hotels (transient)
Motels (transient)

~~*Congregate living facilities* (transient) with 10 or fewer occupants are permitted to comply with the construction requirements for Group R-3.~~

R-2 Residential occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily permanent in nature, including:

Apartment houses
Boarding houses (nontransient) with more than 16 occupants
Congregate living facilities (nontransient) with more than 16 occupants
Convents
Dormitories
Fraternities and sororities
Hotels (nontransient)
Live/work units
Monasteries
Motels (nontransient)
Vacation timeshare properties

~~*Congregate living facilities* with 16 or fewer occupants are permitted to comply with the construction requirements for Group R-3.~~

R-3 Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

Buildings that do not contain more than two *dwelling units*.
Adult care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.
Boarding houses (nontransient) with 16 or fewer occupants
Boarding houses (transient) with 10 or fewer occupants
Child care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.
Congregate living facilities (nontransient) with 16 or fewer ~~persons~~ occupants.
Congregate living facilities (transient) with 10 or fewer occupants.

R-4 Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living facilities including more than five but not more than 16 occupants, excluding staff.

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code or shall comply with the *International Residential Code* provided the building is protected by an *automatic sprinkler system* installed in accordance with Section 903.2.8.

Reason: Boarding houses and congregate living facilities as defined in Section 310 are very similar and should be classified the same. Current code language found under the R-1 and R-2 classifications indicates when congregate living facilities shall comply with the construction requirements for R-3, but this leaves the question of how they shall be classified. This proposal clarifies how congregate living facilities and boarding houses shall be classified, based on the transient and nontransient occupant load thresholds.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TRAXLER-G3-310.1.doc

G28–09/10
310.1(IFC [B] 202), 310.2; IRC R101.2, R202

Proponent: Maureen Traxler, City of Seattle, Seattle Dept of Planning & Development

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC GENERAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

1. Revise as follows:

310.1 (IFC [B] 202) Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code* in accordance with Section 101.2. Residential occupancies shall include the following:

R-1 Residential occupancies containing *sleeping units* where the occupants are primarily transient in nature, including:

Boarding houses (transient)
Hotels (transient)
<u>Lodging houses with more than 5 guest rooms</u>
Motels (transient)

Congregate living facilities (transient) with 10 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-2 Residential occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily permanent in nature, including:

Apartment houses
Boarding houses (nontransient)
Convents
Dormitories
Fraternities and sororities
Hotels (nontransient)
Live/work units
Monasteries
Motels (nontransient)
Vacation timeshare properties

Congregate living facilities with 16 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-3 Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

Buildings that do not contain more than two *dwelling units*.
Adult care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.
Child care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.
Congregate living facilities with 16 or fewer persons.
Lodging houses with 5 or fewer guest rooms

Adult care and child care facilities that are within a single-family home are permitted to comply with the *International Residential Code*.
Lodging houses with five or fewer guest rooms are permitted to comply with the *International Residential Code*.

R-4 Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living facilities including more than five but not more than 16 occupants, excluding staff.

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code or shall comply with the *International Residential Code* provided the building is protected by an *automatic sprinkler system* installed in accordance with Section 903.2.7.

2. Add new definitions as follows:

310.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

GUEST ROOM. Any room or rooms used or intended to be used by one or more guests for living or sleeping purposes.

LODGING HOUSE. A dwelling occupied as a single-family unit where rent is paid for guest rooms.

PART II – IRC BUILDING AND ENERGY

1. Revise as follows:

R101.2 Scope. The provisions of the *International Residential Code for One- and Two-family Dwellings* shall apply to the construction, *alteration*, movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal and demolition of detached one- and two-family dwellings and townhouses not more than three stories above *grade plane* in height with a separate means of egress and their *accessory structures*.

Exceptions:

1. Live/work units complying with the requirements of Section 419 of the *International Building Code* shall be permitted to be built as one- and two-family *dwellings* or townhouses. Fire suppression required by Section 419.5 of the *International Building Code* when constructed under the *International Residential Code for One- and Two-family Dwellings* shall conform to Section 903.3.1.3 of the *International Building Code*.
2. Lodging houses with five or fewer guest rooms shall be permitted to be constructed in accordance with the *International Residential Code for One- and Two-family Dwellings.*

2. Add new definitions as follows:

SECTION R202
DEFINITIONS

GUEST ROOM is any room or rooms used or intended to be used by one or more guests for living or sleeping purposes.

LODGING HOUSE is a one-family dwelling where one or more occupants are primarily permanent in nature, and rent is paid for guest rooms.

Reason: This proposal allows small bed and breakfasts to be constructed according to the International Residential Code. Currently, the IRC does not address whether nightly rentals are allowed, so jurisdictions across the country are applying the code differently. We chose to add a definition of "lodging house" to generally encompass rental lodging within dwelling units, distinct from hotels and boarding houses which are "not occupied as a single-family unit." We are proposing a general term rather than the more common term "bed and breakfast" partly because that term would imply that the building official would monitor what meals were served at the lodging.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TRAXLER-G10-310.DOC

G29–09/10
310.1 (IFC [B] 202), 310.2

Proponent: John England, MCO, England Enterprises Inc., representing Cities of Beaufort and Hardeeville, SC

1. Revise as follows:

310.1 (IFC [B] 202) Residential Group R. Residential Group R includes, among others, the use of a building or structure, or a portion thereof, for sleeping purposes when not classified as an Institutional Group I or when not regulated by the *International Residential Code* in accordance with Section 101.2. Residential occupancies shall include the following:

R-1 Residential occupancies containing *sleeping units* where the occupants are primarily transient in nature, including:

Boarding houses (transient)
Hotels (transient)
Motels (transient)

Congregate living facilities (transient) with 10 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-2 Residential occupancies containing *sleeping units* or more than two *dwelling units* where the occupants are primarily permanent in nature, including:

Apartment houses
Boarding houses (nontransient)
Convents
Dormitories
Fraternities and sororities
Hotels (nontransient)
Live/work units
Monasteries
Motels (nontransient)
~~Vacation timeshare properties~~

Congregate living facilities with 16 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

R-3 Residential occupancies where the occupants are primarily permanent in nature and not classified as Group R-1, R-2, R-4 or I, including:

Buildings that do not contain more than two *dwelling units*.
Adult care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.
Child care facilities that provide accommodations for five or fewer persons of any age for less than 24 hours.

Congregate living facilities with 16 or fewer persons. Adult care and child care facilities that are within a single-family home are permitted to comply with the *International Residential Code*.

R-4 Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living facilities including more than five but not more than 16 occupants, excluding staff.

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code or shall comply with the *International Residential Code* provided the building is protected by an *automatic sprinkler system* installed in accordance with Section 903.2.8.

R-5 Residential occupancies in which the building and common area are owned by an association. Dwelling units are individually owned either wholly or as part of a time share agreement.

Condominium, residential
Vacation timeshare properties

Group R-5 occupancies shall meet the requirements for construction as defined for Group R-2, except as otherwise provided for in this code.

2. Add new definitions as follows:

310.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

CONDOMINIUM, RESIDENTIAL. A building, including common areas, consisting of two or more dwelling units which is owned by a common association and in which each dwelling unit is individually owned.

VACATION TIMESHARE PROPERTIES. A building, including common areas, which are owned by a homeowners association in which each dwelling units have multiple owners and the dwelling units can be used on a transient basis by their owners or rented out to nonowners on a daily, weekly or monthly basis.

Reason: Special provisions need to be taken for condos and timeshares since the associations owns the buildings.
When Apartment building (R-2) or Hotels (R-1) are converted to condo's or timeshares the occupancy classification of the building changes requiring the owner to bring it up to code before selling the units.
This is a life safety issue because many buildings will now have to be sprinkled and accessibility issues will be corrected when the conversion occurs.
As the code progresses other changes may change specific requirements for Group R-5.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENGLAND-G1-310.1.doc

G30–09/10
310.2

Proponent: Robert J. Heil, Code Inspections, Inc., representing Pennsylvania Association of Building Code Officials, Inc.

Revise as follows:

310.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in the code, have the meanings shown herein.

CONGREGATE LIVING FACILITIES. A building or part of thereof that contains sleeping units and is used as a group housing setting including, but not limited to dormitories, fraternities, sororities and boarding houses, where residents share bathroom and/or kitchen facilities.

Reason: Provides a clearer understanding of what type of housing a congregate living facility is.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HEIL-G1-310.2

G31–09/10

402.2.1 (New), 402.3, 402.4, 402.4.1 402.4.1.1, 402.4.1.4, 402.4.3, 402.4.4, 402.4.5, 402.5.1, 402.5.2, 402.6, 402.6.1, 402.7.1, 402.7.3, 402.8, 402.9, 402.11, 402.12, 402.12.2, 402.12.3, 402.14, 402.15, 402.16, 905.3.3, 905.4 (IFC 905.3.3, 905.4).

Proponent: Sarah A. Rice, CBO, representing self

1. Add new text as follows:

402.2.1 Open mall building perimeter line. For the purpose of this code, a perimeter line shall be established. The perimeter line shall encircle all buildings and structures which comprise the open mall building, and shall encompass any open-air interior walkways, open-air courtyards or similar open-air spaces. The perimeter line shall define the extent of the open mall building. Anchor buildings shall be outside of the perimeter line and are not considered as part of the open mall building.

2. Revise text as follows:

402.3 Lease plan. Each ~~*covered mall building*~~ owner of a covered mall building or of an open mall building shall provide both the building and fire departments with a lease plan showing the location of each occupancy and its exits after the certificate of occupancy has been issued. No modifications or changes in occupancy or use shall be made from that shown on the lease plan without prior approval of the *building official*.

402.4 Means of egress. ~~Each tenant space and the~~ *Covered mall buildings, open mall buildings and each tenant space within a mall building* shall be provided with *means of egress* as required by this section and this code. Where there is a conflict between the requirements of this code and the requirements of ~~this section~~ Sections 402.4.1 through 402.4.6, the requirements of ~~this section~~ Sections 402.4.1 through 402.4.6 shall apply.

402.4.1 Determination of occupant load. The *occupant load* permitted in any individual tenant space in a *covered or open mall building* shall be determined as required by this code. *Means of egress* requirements for individual tenant spaces shall be based on the *occupant load* thus determined.

402.4.1.1 Occupant formula. In determining required *means of egress* of the mall, the number of occupants for whom *means of egress* are to be provided shall be based on gross leasable area of the *covered or open mall building* (excluding *anchor buildings*) and the *occupant load* factor as determined by the following equation.

$$OLF = (0.00007)\ (GLA) + 25 \qquad \textbf{(Equation 4-1)}$$

where:
OLF = The *occupant load* factor (square feet per person).
GLA = The gross leasable area (square feet).

Exception: Tenant spaces attached to a *covered or open mall building* but with a *means of egress* system that is totally independent of the open mall of an open mall building or of ~~the~~ a *covered mall building* shall not be considered as gross leasable area for determining the required *means of egress* for the *covered mall building*.

402.4.1.2 OLF range. (No change to current text)

402.4.1.3 Anchor buildings. (No change to current text)

402.4.1.4 Food courts. The *occupant load* of a food court shall be determined in accordance with Section 1004. For the purposes of determining the *means of egress* requirements for the mall, the food court *occupant load* shall be added to the *occupant load* of the *covered or open mall building* as calculated above.

402.4.2 Number of means of egress. (No change to current text)

402.4.3 Arrangements of means of egress. Assembly occupancies with an *occupant load* of 500 or more within a covered mall building shall be so located in the *covered mall building* that their entrance will be immediately adjacent to a principal entrance to the mall and shall have not less than one-half of their required *means of egress* opening directly to the exterior of the *covered mall building*. Assembly occupancies with an occupant load of 300 or more within an open mall building shall be permitted to have their main exit open to the open mall.

402.4.3.1 Anchor building means of egress. (No change to current text)

402.4.4 Distance to exits. Within each individual tenant space in a *covered* or open *mall building*, the maximum distance of travel from any point to an *exit* or entrance to the mall shall not exceed 200 feet (60 960 mm).

The maximum distance of travel from any point within a mall of a covered mall building to an *exit* shall not exceed 200 feet (60 960 mm). The maximum distance of travel from any point within an open mall to the perimeter line of the open mall building shall not exceed 200 feet.

402.4.5 Access to exits. Where more than one *exit* is required, they shall be so arranged that it is possible to travel in either direction from any point in a mall of a covered mall building to separate *exits* or from any point in an open mall to two separate locations on the perimeter line of an open mall building. The minimum width of an *exit passageway* or *corridor* from a mall shall be 66 inches (1676 mm).

Exception: Dead ends not exceeding a length equal to twice the width of the mall measured at the narrowest location within the dead-end portion of the mall.

402.4.5.1 Exit passageways. (No change to current text)

402.4.6 Service areas fronting on exit passageways. (No change to current text)

402.5 Mall width. For the purpose of providing required egress, malls are permitted to be considered as *corridors* but need not comply with the requirements of Section 1005.1 of this code where the width of the mall is as specified in this section.

402.5.1 Minimum width The ~~minimum~~ aggregate clear egress width of the mall in either a covered or open mall building shall be a minimum of 20 feet (6096 mm). The mall width shall be sufficient to accommodate the *occupant load* served. ~~There shall be a minimum of 10 feet (3048 mm) clear exit width~~ No portion of the minimum required aggregate egress width of shall be less than 10 feet measured to a height of 8 feet (2438 mm) between any projection of a tenant space bordering the mall and the nearest kiosk, vending machine, bench, display opening, food court or other obstruction to *means of egress* travel.

402.6 ~~402.5.2 Minimum width~~ Open malls. Floor assemblies in, and roof assemblies over the mall of an open mall buildings shall be open for a minimum of 20 feet, measured perpendicular from the face of the tenant spaces on the lowest level, from edge of balcony to edge of balcony on upper floors or from edge of roof line to edge of roof line. The opening, or the unroofed area shall extend from the lowest/grade level of the mall to the sky above the roof. Balconies on upper levels of the mall shall not project into the required width. ~~The minimum floor and roof opening width above grade shall be 20 feet (9096 mm) in open malls.~~

Exception: Interior pedestrian bridges connecting balconies shall be permitted in the required width.

~~402.6~~ 402.7 Types of construction. The building area of any *covered mall or open building*, including *anchor buildings*, of Types I, II, III and IV construction, shall not be limited provided the *covered mall building* or open mall building, and ~~attached~~ adjoining *anchor buildings* and parking garages are surrounded on all sides by a permanent open space of not less than 60 feet (18 288 mm) and the *anchor buildings* do not exceed three *stories above grade plane*. For open mall buildings, the width of the permanent open space shall be measured from the perimeter line established by Section 402.2.1.

The type of construction allowable building height and building area of *anchor buildings* greater than three *stories above grade plane* shall comply with Section 503, as modified by Sections 504 and 506. The construction type of *open parking garages* and enclosed parking garages shall comply with Sections 406.3 and 406.4, respectively.

~~402.6.1~~ 402.7.1 Reduced open space. The permanent open space of 60 feet (18 288 mm) shall be permitted to be reduced to not less than 40 feet (12 192 mm), provided the following requirements are met:

1. The reduced open space shall not be allowed for more than 75 percent of the perimeter of the *covered or open mall building* and *anchor buildings*.
2. The *exterior wall* facing the reduced open space shall have a minimum *fire-resistance rating* of 3 hours.
3. Openings in the *exterior wall* facing the reduced open space shall have opening protectives with a minimum *fire protection rating* of 3 hours.
4. Group E, H, I or R occupancies are not within the *covered or open mall building* or *anchor stores*.

~~402.7~~ **402.8 Fire-resistance-rated separation.** Fire-resistance-rated separation is not required between tenant spaces and the mall. Fire-resistance-rated separation is not required between a food court and adjacent tenant spaces or the mall.

~~402.7.1~~ **402.8.1 Attached garage.** An attached garage for the storage of passenger vehicles having a capacity of not more than nine persons and *open parking garages* shall be considered as a separate building where it is separated from the *covered or open mall building* by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 712, or both.

Exception: Where an *open parking garage* or enclosed parking garage is separated from the *covered or open mall building* or *anchor building* a distance greater than 10 feet (3048 mm), the provisions of Table 602 shall apply. Pedestrian walkways and tunnels that attach the *open parking garage* or enclosed parking garage to the *covered or open mall building* or *anchor building* shall be constructed in accordance with Section 3104.

~~402.7.2~~ **402.8.2 Tenant separations. (**No change to current text)

~~402.7.3~~ **402.8.3 Anchor building separation.** An *anchor building* shall be separated from the *covered or open mall building* by *fire walls* complying with Section 706.

Exceptions:

1. *Anchor buildings* of not more than three *stories above grade plane* that have an occupancy classification the same as that permitted for tenants of the ~~*covered*~~ *mall building* shall be separated by 2-hour fire-resistive *fire barriers* complying with Section 707.
2. The exterior walls of anchor buildings separated from an open mall building by an open mall shall comply with Table 602.

~~402.7.3.1~~ **402.8.3.1 Openings between anchor building and mall. (**No change to current text)

~~402.8~~ **402.9 Interior finish.** *Interior wall* and *ceiling finishes* within the mall of a covered mall and within the *exits* of covered or open mall buildings shall have a minimum *flame spread index* and smoke-developed index of Class B in accordance with Chapter 8. *Interior floor finishes* shall meet the requirements of Section 804.

[F] ~~402.9~~ **402.10 Automatic sprinkler system.** ~~The~~ *Covered and open mall* ~~*building*~~ *buildings* and buildings connected shall be ~~equipped~~ protected throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1, which shall comply with the all of the following:

1. The *automatic sprinkler system* shall be complete and operative throughout occupied space in the ~~*covered*~~ *mall building* prior to occupancy of any of the tenant spaces. Unoccupied tenant spaces shall be similarly protected unless provided with *approved* alternative protection.
2. Sprinkler protection for the mall of a covered mall building shall be independent from that provided for tenant spaces or ~~anchors~~ anchor buildings.
3. Sprinkler protection for the tenant spaces of an open mall building shall be independent from that provided for anchor buildings.
4. Sprinkler protection shall be provided beneath exterior circulation balconies located adjacent to an open mall.
5. Where tenant spaces are supplied by the same system, they shall be independently controlled.

   Exception: An *automatic sprinkler system* shall not be required in spaces or areas of *open parking garages* separated from the covered or open mall in accordance with Section 402.7.1 and constructed in accordance with Section 406.3.

~~402.9.1~~ **[F] 402.11 Standpipe system. (**No change to current text)

~~402.10~~ **402.12 Smoke control. (**No change to current text)

~~402.11~~ **402.13 Kiosks.** Kiosks and similar structures (temporary or permanent) located within the mall of a covered mall building or within the perimeter line of an open mall building shall meet the following requirements:

1. Combustible kiosks or other structures shall not be located within ~~the~~ a covered or open mall unless constructed of any of the following materials:

(Text not shown remains unchanged)

~~402.12~~ **402.14 Children's playground structures.** Where located within the mall of a covered mall or within the perimeter line of an open mall building, structures intended as children's playgrounds that exceed 10 feet (3048 mm) in height and 150 square feet (14 m^2) in area shall comply with Sections 402.12.1 through 402.12.4.

~~402.12.1~~ **402.14.1 Materials. (**No change to current text)

~~402.12.2~~ **402.14.2 Fire protection.** Children's playground structures located within ~~the~~ a mall or open mall shall be provided with the same level of *approved* fire suppression and detection devices required for kiosks and similar structures.

~~402.12.3~~ **402.14.3 Separation.** Children's playground structures shall have a minimum horizontal separation from other structures within ~~the~~ a mall or open mall of 20 feet (6090 mm).

~~402.12.4~~ **402.14.4 Area limits. (**No change to current text)

~~402.13~~ **402.15 Security grilles and doors. (**No change to current text)

~~402.14~~ **[F] 402.16 Standby power.** *Covered mall buildings* exceeding 50,000 square feet (4645 m^2) and open mall buildings exceeding 50,000 square feet within the established perimeter line shall be provided with standby power systems that are capable of operating the emergency voice/alarm communication system.

~~402.15~~ **[F] 402.17 Emergency voice/alarm communication system.** ~~*Covered mall buildings* exceeding 50,000 square feet (4645 m^2) in total floor area shall be provided with an emergency voice/alarm communication system.~~ Where the total floor area exceeds 50,000 square feet within either a covered mall building or within the perimeter line of an open mall building, an emergency voice/alarm communication system shall be provided.

Emergency voice/alarm communication systems serving a mall, required or otherwise, shall be accessible to the fire department. The system shall be provided in accordance with Section 907.5.2.2.

~~402.16~~ **402.18 Plastic signs.** Plastic signs affixed to the storefront of any tenant space facing ~~the~~ a mall or open mall shall be limited as specified in Sections ~~402.16.1 through 402.16.5.2~~ 402.17.1 through 402.17.5.2.

(Text not shown remains unchanged)

~~402.17~~ **[F] 402.19 Fire department access to equipment. (**No change to current text)

905.3.3 (IFC 905.3.3) Covered and open mall buildings. ~~A~~ *Covered mall ~~building~~ and open mall buildings* shall be equipped throughout with a standpipe system where required by Section 905.3.1. ~~*Covered*~~ *Mall buildings* not required to be equipped with a standpipe system by Section 905.3.1 shall be equipped with Class I hose connections connected to the *automatic sprinkler system* sized to deliver water at 250 gallons per minute (946.4 L/min) at the most hydraulically remote hose connection while concurrently supplying the *automatic sprinkler system* demand. The standpipe system shall be designed not to exceed a 50 pounds per square inch (psi) (345 kPa) residual pressure loss with a flow of 250 gallons per minute (946.4 L/min) from the fire department connection to the hydraulically most remote hose connection. Hose connections shall be provided at each of the following locations:

1. Within the mall at the entrance to each *exit* passageway or *corridor*.
2. At each floor-level landing within enclosed stairways opening directly on the mall.
3. At exterior public entrances to the mall of a covered mall building
4. At public entrances at the perimeter line of an open mall building.
5. At other locations as necessary so that the distance to reach all portions of a tenant space does not exceed 200 feet (60 960 mm) from a hose connection.

[F] 905.4 (IFC 905.4) Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. through 3. **(**No change to current text)
4. In covered and open mall buildings, adjacent to each exterior public entrance to ~~the~~ a covered mall, adjacent to each public entrance at the perimeter line of an open mall and adjacent to each entrance from an *exit* passageway or *exit corridor* to the covered mall or an open mall.
5. and 6. **(**No change to current text)

Reason: The 2009 IBC was amended to allow an open mall to be built under the Covered Mall provisions of Section 402. However, the change was minimal in that it defined an open mall and open mall building and provided some specificity about the openness of the mall from the ground to the sky, but it did not address how each of the requirements within Section 402 would be applied to an open mall situation. For example, measuring the travel distance from a tenant space within a mall to an exit is unclear when the whole mall is 'exterior' to the buildings. This proposal goes through each section and revises each to clarify application to open malls. In general this required adding 'and open mall' or 'and open mall building' in various locations. Other locations the existing text stating application to a 'mall' was sufficient to allow application to both covered and open mall situations. Without providing revisions of this sort, the application of Section 402 will result in inconsistent interpretation from designer to designer and from jurisdiction to jurisdiction.

The intent of the 2009 change was to allow an open mall building to enjoy all of the benefits of being considered one unlimited area building with various tenants and occupancies. The key difference is that instead of the mall being covered, it is open to the sky. One then can begin wondering if the mall is 'exterior' to the building and therefore needs to be treated as exit discharge and the walls of the tenant spaces as exterior walls facing an assumed property line, or is it simply a covered mall building without a roof. The balance of this proposal takes the latter position, that the open mall building is simply a covered mall building without a roof.

Sec. 402.2.1. Only one new concept is established by the proposal – 'open mall building perimiter line'. The premise is that the designer establishes a boundary between what is considered to be part of the open mall building and what is outside of the building. This allows determination of the equivalent of exit travel distance for an exterior mall similar to a covered mall without there being a physical separation between the 'mall' and what is outside of the mall.

Sec. 402.3. Editorially revised to address owners of both types of malls and the required lease plan.

Sec. 402.4. Editorially revised to make it clear the egress provisions apply to covered and open malls. "This section' is replaced in two places with the specific section numbers for clarity of reference.

Sec. 402.4.1. Editorially revised in 3 subsections to clarify application of occupant load determinations.

Sec. 402.4.3. This is substantive change for open malls compared to covered mall buildings. Currently assembly occupancies with an occupant load over 500 needs to be located so that the entrance to the occupancy is adjacent to the mall entrance and 50% of the egress capacity goes directly outdoors. This proposal limits the application of this existing section to covered mall buildings. It then goes on to permit the open mall to be used as the discharge location for a main exit for assembly spaces over 300. There are many examples of this arrangement around the country including the theaters on the Citywalk open mall at Universal City in the Los Angeles area.

Sec.402.4.4 and 4.5. These sections use the open mall perimiter line as a substitute for the exterior wall of a covered mall to determine when means of egress transitions from 'within' the mall to 'outside' of the mall.

Sec. 402.5.1 The proposal makes section 402.5.1 generic for both types of malls. There is no intent to make a substantive change here.

Sec. 402.5.2. The existing code is currently in the wrong place –the requirement for 20 foot open is not related to egress but rather to the need for floor and roof assemblies in the mall portion of an open mall building to be open. There is no intent to make a substantive change here only to move to be a separate unique criteria.

Sec. 402.6. Since the concept of an open mall building is that there are many detached buildings, this provision of indicating the 60 foot open perimeter was around the attached buildings needed to be fixed to address that the anchor buildings next to an open mall building may not be physically attached.

Sec. 402.7.3. In an open mall building design, it is likely that the anchor buildings won't actually be attached. Therefore neither the fire wall nor fire barrier concept is appropriate. Therefore an exception is provided to treat such walls as exterior walls. But Section 402.7.3.1 will still apply and the openings in the wall need not be rated.

Sec. 402.8. This section currently requires wall and ceilings of the covered mall to meet specified flame spread of interior finishes. This applies to the mall itself. Tenant spaces need to comply with Chapter 8 independently. However, the walls of the open mall are not interior walls but actually exterior walls, which makes application of Chapter 8 inappropriate in most cases. The added language would still apply to any enclosed exits in an open mall building as well as the exits in a covered mall building.

Sec. 402.9. Since the open mall is open, without roof, there would be no requirement to provide sprinkler protection in the 'mall'. However, this proposal would still require sprinkler protection under exterior balconies which are providing circulation in the open mall. The concept here is there could be a multilevel open mall building with pedestrian walkways paralleling the front of the upper tenant spaces or bridges crossing the open mall. This would require sprinkler protection under such walkways.

Sec. 402.9.1 is changed to 402.10. This section refers to the standpipe requirements in Chapter 9. It is not a subset of sprinklers as is implied by the current numbering. This proposal moves it to its own equal section. Section 402 could use a reformatting of the sections similar to that provided to the 403 Highrise provisions in the 2009 code.

Sec. 402.11 Kiosks and 402.12 Children's play structures. This proposal treats those within the established perimiter line of an open mall building as if they were 'within' the mall.

Sec. 402.14 Standby power and 402.15 Emergency Communication. These would use the open mall building perimiter line to determine when the 50,000 square foot threshold was reached.

Sec. 402.16 Signs. The consistent approach of this proposal is to treat the 'open mall' as if it were interior facades along a mall which will have lots of occupants that are in restricted pathways until there get outside of the perimiter line. Therefore the limitation on signs should apply to those facing the open mall as well.

Sec. 905.3.3 and 905.4. These sections state the requirement for standpipes in a mall building and requires placement near the exits. As the open mall doesn't have 'exits' per se between the mall and the outside, the building perimiter line is used in lieu of the exits to specify the standpipe locations.

Other locations. The term 'covered mall building' is also used in the following sections of the IBC: 507.12, 709.1, 709.4, 716.5.4, Table 903.2.11.6, 907.2.7, 907.2.14, 2702.2.14, 2902.3.2, 2902.3.3 and 3412.6.19. In most of these locations the code should be editorially revised for consistency with this proposal. In most of these sections it will be sufficient to change 'covered mall building to 'covered and open mall buildings'.

Cost Impact: The code change proposal to the extent that it clarifies the application of the code in various situations may result in an increase the cost of construction where otherwise a designer or building official may have not thought that a provision of Section 402 applied.

Analysis: If this change is approved, staff can provide editorial revisions to the balance of the code and to the other I-Codes to be consistent with the intent of this proposal.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-G6-503.1.4.doc

G32–09/10
402.1, 402.6, 402.6.1, 402.6.2 (New), 402.6.3 (New), 402.6.4 (New)

Proponent: Sarah A. Rice, CBO, representing self

Revise text as follows:

402.1 Scope. The provisions of this section shall apply to buildings or structures defined herein as covered mall or open mall buildings ~~not exceeding three floor levels at any point nor more than three stories above grade plane~~. Except as specifically required by this section, covered mall buildings shall meet applicable provisions of this code.

Exceptions:

1. Foyers and lobbies of Groups B, R-1 and R-2 are not required to comply with this section.
2. Buildings need not comply with the provisions of this section when they totally comply with other applicable provisions of this code.

402.6 ~~Types of construction.~~ ~~The area of any covered mall building, including anchor buildings, of Type I, II, III and IV construction, shall not be limited provided the covered mall building and attached anchor buildings and parking garages are surrounded on all sides by a permanent open space of not less than 60 feet (18 288 mm) and the anchor buildings do not exceed three stories in height. The allowable height and area of anchor buildings greater than three stores in height shall comply with Section 503, as modified by Sections 504 and 506. The construction type of open parking garages and enclosed parking garages shall comply with Sections 406.3 and 406.4, respectively.~~ **Construction limitations**. Covered or open mall buildings, anchor buildings and parking garages shall comply with Sections 402.6.1 through 402.6.4, as applicable.

402.6.1 Height limits - covered or open mall buildings. Covered or open mall buildings shall not exceed three stories at any point, nor exceed three stories above grade plane.

402.6.2 Type of construction – covered or open mall buildings. Covered and open mall buildings shall be Type I, II, III or IV construction. The building height for a covered or open mall building shall be as specified in Table 503 as modified by Section 504. The building area shall be as specified in Table 503 as modified by Section 506.

Exception. The building area limits of Table 503 shall not apply to covered or open mall buildings when the following are met:

1. The permanent open space specified in Section 402.6.4 shall be provided around the covered or open mall building, all adjoining anchor buildings and parking garages.
2. Any adjoining anchor buildings shall not exceed three stories in height.

402.6.3 Type of construction – anchor buildings and parking garages. The construction type for anchor buildings and parking garages shall be in accordance with Section 503, as modified by Sections 504 and 506.

Exceptions.

1. The building area limits of Table 503 shall not apply to anchor buildings when the building is three stories or less above grade plane, and a permanent open space specified in Section 402.6.4 is provided around the anchor building, the adjoining covered or open mall building and all parking garages.
2. The building height and area limits of Table 503 shall not apply to open parking garages and enclosed parking garages when they comply with Sections 406.3 and 406.4, respectively, and are separated from the covered or open mall building in accordance with Section 402.7.1.

402.6.4 Permanent open space. Where required, covered mall building, and any adjoining anchor buildings and parking garages shall be surrounded on all sides by a permanent open space of not less than 60 feet (18 288 mm).

~~402.6.1 Reduced open space.~~ Exception: The permanent open space of 60 feet (18 288 mm) shall be permitted to be reduced to not less than 40 feet (12 192 mm), provided the following requirements are met:

1. The reduced open space shall not be allowed for more than 75 percent of the perimeter of the covered mall building and anchor buildings.

2. The exterior wall facing the reduced open space shall have a minimum fire-resistance rating of 3 hours.
3. Openings in the exterior wall facing the reduced open space shall have opening protectives with a minimum fire protection rating of 3 hours.
4. Group E, H, I, or R occupancies are not within the covered mall building or anchor stores.

Reason: This proposal is intended to add clarity to the size and type of construction provisions for covered mall buildings. It essentially does 3 things:

1) Takes a requirement out of the "scoping" section (402.1) and places into the body of the section in new Section 402.6.1. The language is also changed from "not exceeding three floor levels" to "not have more than three stories." This is done to address when there are mezzanines within a tenant space. The current language could be interpreted to say a small mezzanine within a tenant space is a "floor level" and thus count towards the overall height and configuration of the covered or open mall building.
2) Revises how the requirements in 402.6 are presented – NOT changing any of the requirements. The title of section is "Type of Construction" but the content as currently written is not really about type of construction but rather limits on size IF a specific type of construction is used. The proposed language seeks to make it clear what types of construction are allowed for covered and open malls, anchor buildings and parking garages.
3) Change to use the term "adjoin" vs "attach when talking about anchor buildings and garages, as in the case where there is an "open mall building" the anchor stores may not physically be "attached" to the other structures.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-G7a 402.1.doc

G33–09/10
402.2, 402.4.6

Proponent: Gene Boecker, Code Consultants, Inc.

1. Add new definition as follows:

402.2 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

REMOTE STORAGE ROOM. A storage room located in a mall building which is not part of, nor attached to, a specific tenant space.

2. Revise as follows:

402.4.6 Service areas fronting on exit passageways. Mechanical rooms, electrical rooms, building service areas, ~~and~~ service elevators, and remote storage rooms are permitted to open directly into exit passageways, provided the exit passageway is separated from such rooms with not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. The minimum fire protection rating of openings in the fire barrier shall be 1 hour. A fire partition in accordance with Section 709 shall be provided between remote storage rooms, which are accessed from an exit passageway, and tenant spaces and other remote storage rooms.

Reason: Reason: In the development of a covered mall project, it is necessary to locate building service rooms in an area that is accessible at all times to mall personnel. The Code acknowledges this need and specifically allows these typically unoccupied areas to open onto exit passageways in covered malls. The list of "service areas" seems to indicate utility-type rooms and not "storage rooms".

Due to leasing arrangements, there may be instances where vacant leasable space is available at the rear of tenants, adjacent to exit passageways. These vacant spaces can be leased to tenants throughout the covered mall building that may be in need of additional storage space. These areas are also used by mall management for storage rooms of holiday decorations and other miscellaneous mall storage.

The current code text already establishes the fire rated construction associated with the exit passageway wall assemblies. The proposed last sentence will require a 1-hour fire partition between the storage room and adjacent tenant spaces.

This proposal is consistent with that required for building service rooms that open onto exit passageways.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOECKER-G2-402.4.6

G34–09/10

402.6, 406.1.1, 406.1.2, 406.3.5, 406.3.5.1, Table 406.3.5, 406.3.6, 406.4.1, Table 503, 503.1, 506, 507, 508, 509.1, 509.2, 509.3, 509.7

Proponent: David S. Collins, FAIA, The Preview Group, Inc., representing The American Institute of Architects

1. Revise as follows:

SECTION 402
COVERED MALL AND OPEN MALL BUILDINGS

402.6 Type of Construction. ~~The area of any covered mall building, including anchor buildings. of Types, I, II, III and IV construction shall not be limited provided the covered mall building and attached anchor buildings and parking garages are surrounded on all sides by a permanent open space of not less than 60 feet and the anchor buildings do not exceed three stories above grade plane~~. The allowable height ~~and area~~ of anchor buildings greater than three stories above grade plane shall comply with Section 503, as modified by Section~~s~~ 504 ~~and 506~~. The construction type of open parking garages and enclose parking garages shall comply with Sections 406.3 and 406.4, respectively

SECTION 406
MOTOR-VEHICLE-RELATED OCCUPANCIES

406.1.1 Classification. Buildings or parts of buildings classified as Group U occupancies because of the use or character of the occupancy shall not exceed ~~1,000 square feet (93 m2) in area or~~ one *story* in height ~~except as provided in Section 406.1.2~~. Any building or portion thereof that exceeds the limitations specified in this section shall be classified in the occupancy group other than Group U that it most nearly resembles.

~~**406.1.2 Area increase.** Group U occupancies used for the storage of private or pleasure-type motor vehicles where no repair work is completed or fuel is dispensed are permitted to be 3,000 square feet (279 m2) when the following provisions are met:~~

~~1. For a mixed occupancy building, the *exterior wall* and opening protection for the Group U portion of the building shall be as required for the major occupancy of the building. For such a mixed occupancy building, the allowable floor area of the building shall be as permitted for the major occupancy contained therein.~~
~~2. For a building containing only a Group U occupancy, the *exterior wall* shall not be required to have a *fire-resistance rating* and the area of openings shall not be limited when the *fire separation distance* is 5 feet (1524 mm) or more.~~

~~More than one 3,000-square-foot (279 m2) Group U occupancy shall be permitted to be in the same building, provided each 3,000-square-foot (279 m2) area is separated by *fire walls* complying with Section 706~~

406.3.5 ~~Area and height~~ Height. ~~Area and~~ ~~height~~ Height of open parking garages shall be limited as set forth in Chapter 5 for Group S-2 occupancies ~~and as further provided for in Section 508.1~~.

TABLE 406.3.5
OPEN PARKING GARAGES ~~AREA AND~~ HEIGHT

TYPE OF CONSTRUCTION	~~AREA PER TIER (square feet)~~	HEIGHT (in tiers)		
		Ramp access	Mechanical access	
			Automatic sprinkler system	
			No	Yes
IA	~~Unlimited~~	Unlimited	Unlimited	Unlimited
IB	~~Unlimited~~	12 tiers	12 tiers	18 tiers
IIA	~~50,000~~	10 tiers	10 tiers	15 tiers
IIB	~~50,000~~	8 tiers	8 tiers	12 tiers
IV	~~50,000~~	4 tiers	4 tiers	4 tiers

For SI: 1 square foot = 0.0929 m^2.

406.3.5.1 Single use. When the open parking garage is used exclusively for the parking or storage of private motor vehicles, with no other uses in the building, the ~~area and~~ height shall be permitted to comply with Table 406.3.5, along with increases allowed by Section 406.3.6.

~~**Exception:** The grade-level tier is permitted to contain an office, waiting and toilet rooms having a total combined area of not more than 1,000 square feet (93 m2). Such area need not be separated from the *open parking garage*.~~

~~In *open parking garages* having a spiral or sloping floor, the horizontal projection of the structure at any cross section shall not exceed the allowable area per parking tier.~~ In the case of an *open parking garage* having a continuous spiral floor, each 9 feet 6 inches (2896 mm) of height, or portion thereof, shall be considered a tier.

The clear height of a parking tier shall not be less than 7 feet (2134 mm), except that a lower clear height is permitted in mechanical-access *open parking garages* where *approved* by the *building official*.

406.3.6 ~~Area and height~~ Height increases. The allowable ~~area and~~ height of open parking garages shall be increased in accordance with the provisions of this section. Garages with sides open on three-fourths of the building's perimeter are permitted to be increased ~~by 25 percent in area and~~ one tier in height. Garages with sides open around the entire building's perimeter are permitted to be increased ~~by 50 percent in area and~~ one tier in height. For a side to be considered open under the above provisions, the total area of openings along the side shall not be less than 50 percent of the interior area of the side at each tier and such openings shall be equally distributed along the length of the tier.

~~Allowable tier areas in Table 406.3.5 shall be increased for open parking garages constructed to heights less than the table maximum. The gross tier area of the garage shall not exceed that permitted for the higher structure. At least three sides of each such larger tier shall have continuous horizontal openings not less than 30 inches (762 mm) in clear height extending for at least 80 percent of the length of the sides and no part of such larger tier shall be more than 200 feet (60 960 mm) horizontally from such an opening. In addition, each such opening shall face a street or yard accessible to a street with a width of at least 30 feet (9144 mm) for the full length of the opening, and standpipes shall be provided in each such tier.~~

~~*Open parking garages* of Type II construction, with all sides open, shall be unlimited in allowable area where the *building height* does not exceed 75 feet (22 860 mm). For a side to be considered open, the total area of openings along the side shall not be less than 50 percent of the interior area of the side at each tier and such openings shall be equally distributed along the length of the tier. All portions of tiers shall be within 200 feet (60 960 mm) horizontally from such openings or other natural ventilation openings as defined in Section 406.3.3.1. These openings shall be permitted to be provided in *courts* with a minimum dimension of 20 feet (6096 mm) for the full width of the openings.~~

406.4.1 Heights and areas. Enclosed vehicle parking garages and portions thereof that do not meet the definition of open parking garages shall be limited to the allowable heights ~~and areas~~ specified in Table 503 as modified by Section~~s~~ 504, ~~506 and 507~~. Roof parking is permitted.

SECTION 503
GENERAL BUILDING HEIGHT ~~AND~~
~~AREA LIMITATIONS~~

503.1 General. The *building height* ~~*and area*~~ shall not exceed the limits specified in Table 503 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified hereafter. Each portion of a building separated by one or more *fire walls* complying with Section 706 shall be considered to be a separate building.

2. Delete entire Table 503 and substitute new Table as follows:

~~**TABLE 503**~~
~~**ALLOWABLE BUILDING HEIGHTS AND AREASa**~~

TABLE 503
ALLOWABLE BUILDING HEIGHTS
Building height limitations shown in feet above grade plane.

	TYPE OF CONSTRUCTION								
	Type I		Type II		Type III		Tye IV	Type V	
	A	B	A	B	A	B	HT	A	B
HEIGHT (feet)	UL	160	65	55	65	55	65	50	40

3. Delete Sections 506, 507 and 508 without substitution:

~~**SECTION 506**~~
~~**BUILDING AREA MODIFICATIONS**~~

~~**SECTION 507**~~
~~**UNLIMITED AREA BUILDINGS**~~

~~**SECTION 508**~~
~~**MIXED USE AND OCCUPANCY**~~

4. Revise as follows:

SECTION 509
SPECIAL PROVISIONS

509.1 General. The provisions in this section shall permit the use of special conditions that are exempt from, or modify, the specific requirements of this chapter regarding the allowable heights ~~and areas~~ of buildings based on the occupancy classification and type of construction, provided the special condition complies with the provisions specified in this section for such condition and other applicable requirements of this code. The provisions of Sections 509.2 through 509.8 are to be considered independent and separate from each other.

~~**509.2 Horizontal building separation allowance.** A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of fire walls, limitation of number of stories and type of construction where all of the following conditions are met:~~

~~1. The buildings are separated with a *horizontal assembly* having a minimum 3-hour *fire-resistance rating*.~~
~~2. The building below the *horizontal assembly* is no more than one *story above grade plane*.~~
~~3. The building below the *horizontal assembly* is of Type IA construction.~~
~~4. Shaft, *stairway*, ramp and escalator enclosures through the *horizontal assembly* shall have not less than a 2-hour *fire-resistance rating* with opening protectives in accordance with Section 715.4.~~

~~**Exception:** Where the enclosure walls below the *horizontal assembly* have not less than a 3-hour *fire resistance rating* with opening protectives in accordance with Section 715.4, the enclosure walls extending above the *horizontal assembly* shall be permitted to have a 1-hour *fire-resistance rating*, provided:~~

~~1. The building above the *horizontal assembly* is not required to be of Type I construction;~~
~~2. The enclosure connects less than four *stories*; and~~
~~3. The enclosure opening protectives above the *horizontal assembly* have a minimum 1-hour *fire protection rating*.~~

~~5. The building or buildings above the *horizontal assembly* shall be permitted to have multiple Group A occupancy uses, each with an *occupant load* of less than 300, or Group B, M, R or S occupancies.~~
~~6. The building below the *horizontal assembly* shall be protected throughout by an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, and shall be permitted to be any of the following occupancies:~~
~~6.1. Group S-2 parking garage used for the parking and storage of private motor vehicles;~~
~~6.2. Multiple Group A, each with an *occupant load* of less than 300;~~

~~6.3. Group B;~~
~~6.4. Group M;~~
~~6.5. Group R; and~~
~~6.6. Uses incidental to the operation of the building (including entry lobbies, mechanical rooms, storage areas and similar uses).~~

~~7. The maximum *building height* in feet (mm) shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from the *grade plane*.~~

509.3 Group S-2 enclosed parking garage with Group S-2 open parking garage above. A Group S-2 enclosed parking garage with no more than one story above grade plane and located below a Group S-2 open parking garage shall be classified as a separate and distinct building for the purpose of determining the type of construction where all of the following conditions are met:

~~1. The allowable area of the building shall be such that the sum of the ratios of the actual area divided by the allowable area for each separate occupancy shall not exceed 1.~~

~~2.~~ 1. The Group S-2 enclosed parking garage is of Type I or II construction and is at least equal to the fire-resistance requirements of the Group S-2 open parking garage.

~~3~~ 2. The height and the number of tiers of the Group S-2 open parking garage shall be limited as specified in Table 406.3.5.

~~4~~ 3. The floor assembly separating the Group S-2 enclosed parking garage and Group S-2 open parking garage shall be protected as required for the floor assembly of the Group S-2 enclosed parking garage. Openings between the Group S-2 enclosed parking garage and Group S-2open parking garage, except exit openings, shall not be required to be protected.

~~5~~ 4. The Group S-2 enclosed parking garage is used exclusively for the parking or storage of private motor vehicles, but shall be permitted to contain an office, waiting room and toilet room having a total area of not more than 1,000 square feet (93 m2), and mechanical equipment rooms incidental to the operation of the building.

509.7 Open parking garage beneath Groups A, I, B,M and R. Open parking garages constructed under Groups A, I, B, M and R shall not exceed the height ~~and area~~ limitations permitted under Section 406.3. The height ~~and area~~ of the portion of the building above the open parking garage shall not exceed the limitations in Section 503 for the upper occupancy. The height, in both feet and stories, of the portion of the building above the open parking garage shall be measured from grade plane and shall include both the open parking garage and the portion of the building above the parking garage.

Revise as follows: A study group of the ICC's Codes Technology Committee worked for almost four years to examine the rationale and background for the criteria within Table 503 and to determine what needed to be corrected. The study group examined the origins of the table and the procedure used to develop it. No rational basis was identified or established for any of the values within the table. Nothing exists that correlates the performance of a building by construction type and occupancy to fire performance, life safety or property damage. NFPA's latest analysis of the available data indicates that social conditions are far more predictable of likely loss.

Codes limit the arrangement of building areas by several limitations. Means of egress travel distance limits the exposure of the building occupants, the requirements of stairs to discharge to the outside, distance of standpipes and even Appendix B in the IFC, all limit the configuration of a building. Area limits in Table 503 affect little except to provide market share for materials interests.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COLLINS-G1-402.6.doc

G35–09/10
402.7.1

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

402.7.1 Attached garage. An attached garage for the storage of passenger vehicles having a capacity of not more than nine persons and open parking garages shall be considered as separate buildings where it is separated from the covered mall building or anchor building by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

Exceptions:

1. Where an open parking garage or enclosed parking garage is separated from the covered mall building or anchor building ~~a distance greater than 10 feet (3048 mm)~~, the provisions of Table 602 shall apply.
2. Pedestrian walkways and tunnels, which attach the open parking garage or enclosed parking garage to the covered mall building or anchor building, shall be constructed in accordance with Section 3104.

Reason: The proposal does two things – it divides the existing large exception into separate exceptions for clarity and it deletes the reference to the 10 ft distance threshold for application of Table 602.

The section initially addresses a separation to the garage based on the assumption that it is immediately next to the covered mall building. The first exception addresses the condition where there may be a physical separation. However, the application of Table 602 should not be applicable only at a certain distance. If the physical separation is provided, then it must be addressed accordingly.

Section 3104 already addresses the construction of exterior walls (including opening protection) of buildings connected by a pedestrian walkway. The exception continues to include code language acknowledging that pedestrian walkways should comply with Section 3104. However, by combining the two sentences in one exception leads a person to think that both Table 602 and Section 3104 should apply to a pedestrian walkway connecting two buildings. This yields confusion if trying to apply the Exception to Section 3104.5.

The added word in the main body of the text is only correcting a typographical error. The separation applies to the entire covered mall building – not just the portion where the pedestrian mall is located. As written, it could be interpreted that there is no separation between the garage and a tenant space.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOECKER-G3-402.7.1.doc

G36–09/10
402.7.2.1 (New)

Proponent: John England, MCO, England Enterprises Inc., representing the Cities of Beaufort and Hardeeville

Add new text as follows:

402.7.2.1 Tenant spaces in open malls: Each tenant space in an un-sprinkled open mall shall be separated from other tenant spaces by a fire barrier complying with Section 707.

Reason: Sections 402.7.2 assumes the building is a closed mall and is sprinkled. It does not give guidance for open malls that are sprinklered or unsprinklered. This addition to the code would accomplish this and make it compliant with Section 707.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENGLAND-G2-402.7.2.1.doc

G37–09/10
402.10

Proponent: Michael Perrino, Code Consultants, Inc.

Revise as follows:

402.10 Smoke control. Where a covered mall building contains an atrium, the portion of the covered mall building that constitutes an atrium shall be provided with a smoke control system ~~shall be provided~~ in accordance with Section 404.5.

Exception: A smoke control system in not required in covered mall buildings when the portion of the covered mall building that constitutes an atrium connects only two stories.

Reason: Current language can be interpreted to require smoke control throughout a covered mall building, even if an atrium is located in only a portion of the building. This was clearly not the intent of the code change that brought this language into the code. This language clarifies that only the portion of the building that constitutes and atrium must be provided with smoke control.

Cost Impact: The code change proposal will not increase the cost of construction. The proposal will decrease the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PERRINO-G1-402.10.doc

G39–09/10
403.2.1 (New)

Proponent: Gary Lewis, Chair, ICC Ad Hoc Committee on Terrorism-Resistant Buildings

Add new text as follows:

403.2.1 Compartmentation. Buildings more than 420 feet (128 m) in building height containing Group B, E, I or M occupancies shall be separated into compartments not exceeding 10,000 square feet (930 m^2). Compartments shall be enclosed with fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both, having a fire-resistance rating of not less than 1 hour.

(Renumber subsequent sections)

Reason: This code change proposal would add new requirements to the IBC for super high-rise structures only. The National Institute of Standards and Technology (NIST) Final Report on the Collapse of World Trade Center (WTC) Building 7 recommendations for high rise buildings provides justification for this proposal. A key observation from that report that "*buildings should not collapse in infrequent fires that may occur when active fire protection systems are rendered ineffective, e.g., when sprinklers do not exist, are not functional, or are overwhelmed by the fire*",[1] is a message that quantifiable compartmentation is needed in this building type for several reasons.

Recommendation #4 from the original NIST WTC Report[2] reads as follows:
NIST recommends evaluating, and where needed improving, the technical basis for determining appropriate construction classification and fire rating requirements (especially for tall buildings) --- and making related code changes now as much as possible --- by explicitly considering factors including:[23]

- timely access by emergency responders and full evacuation of occupants, or the time required for burnout without partial collapse;
- the extent to which redundancy in active fire protection (sprinkler and standpipe, fire alar, and smoke management) systems should be credited for occupant life safety;
- the need for redundancy in fire protection systems that are critical to structural integrity;
- the ability of the structure and local floor systems to withstand a maximum credible fire scenario without collapse, recognizing that sprinklers could be compromised, not operational, or non-existent;
- compartmentation requirements (e.g. 12,000 $ft^{2\,(27)}$) to protect the structure, including fire rated doors and automatic enclosures, and limiting air supply (e.g. thermally resistant window assemblies) to retard fire spread in buildings with large, open floor plans; (emphasis added)
- the effect of spaces containing unusually large fuel concentrations for the expected occupancy of the building; and
- the extent to which fire control systems, including suppression by automatic or manual means, should be credited as part of the prevention of fire spread.

NIST added a new recommendation for WTC 7's Final Report, over and above those already mentioned in the NIST WTC 1 Reports covering Towers I and II. In NIST NCSTAR 1A, WTC 7 investigation, 5.2.2, Group 2, Recommendation B (NEW):

NIST recommends that buildings be explicitly evaluated to ensure adequate performance of the structural system under maximum credible (infrequent) design fires with any active fire protection system rendered ineffective. Of particular concern are the effects of thermal expansion in buildings with one or more of the following features:

- Long span floor systems which experience thermal expansion and sagging effects;
- connection designs (especially shear connections) that cannot accommodate thermal effects;
- floor framing that induces asymmetric thermally induced (i.e. net lateral) forces on girders;
- shear studs that could fail due to differential thermal expansion in composite floor systems; and
- lack of shear studs on girders. Careful consideration should also be given to the possibility of other design features that may adversely affect the performance of the structural system under fire conditions.[3]

The TRB Committee and others have attempted in prior cycles to deal with this phenomenon by proposing requirements that a more global view of thermal performance of a building frame be considered during the design. That approach included full-floor contents burnout analysis, worst credible fire design and other methodologies that the membership has not yet found acceptable…..but the issue remains unregulated.

For structural purposes, smaller compartments means less rapid fire spread and smaller fuel loads, slowing heat exposure to large lineal footages of beams and columns, and most importantly, the connections. Less heat in smaller areas means less likelihood of warping several structural members simultaneously, meaning less likelihood of collapse due to the conditions stated by NIST in the WTC 7 report, NEW Recommendation B.

Additionally, in Recommendation C, (NIST NCSTAR 1A, Recommendation C (also in NIST WTC report for towers I & II, recommendation 4, bullet 3, & footnote 5), NIST recommends….'the need for redundancy in fire protection systems that are critical to life structural integrity; (passive fire protection system, (including SFRM, compartmentation and firestopping) and the active sprinkler system each provide redundancy for maintaining structural integrity in a building fire, should one of the systems fail to perform it's intended function.' Bullet 5 then adds, "the ability of the structure and local floor systems to withstand a maximum credible fire scenario, without collapse, recognizing that sprinklers could be compromised, not operational, or non existent.".

Although NIST promotes 'redundancy' as a way to improve building safety and structural integrity, we recognize that compartment sizes limited by a 10000 SF fire area can play a large role in fuel load, which in turn reduces possibility of structural collapse, while providing horizontal evacuation for firefighter and occupant staging when egress systems are compromised due to power outage, sabotage or high levels of use.

The 10,000 SF fire area in the proposal stems from the NIST report recommendation, which while it specifically states, 12,000 SF, by footnote 27 clarifies that the value could also be a smaller limit, which represents a reasonable area for active firefighting operations. It is not much less than the fire area used elsewhere in the code when assuming no sprinkler protection in buildings. The area is also associated with the size able to be fought effectively suppressed by firefighters, according to NIST.

In NIST's WTC 7 Report, Chapter 4, 4.6, 'Factors that could have mitigated structural collapse' – "improved compartmentation in tenant areas to limit the spread of fires'[2], was cited as a way to limit the spread of fires, and the impending warpage, connection failures, that may result. There are additional ways to limit the spread of fires in buildings as well.

We believe the code change proposal using fire barriers limiting fire area to 10000 SF adds safety and structural integrity to buildings through compartmentation that meets the intent of NIST's recommendations in the FINAL Report on the Collapse of World Trade Center Building 7.

1. National Institute of Standards & Technology, Final Report of the Collapse of World Trade Center Building 7. United States Government Printing Office: Washington, D.C. November 2008. NIST NCSTAR 1A, WTC Investigation, P63.
2. National Institute of Standards & Technology, Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.
3. Op. cit., NIST NCSTAR 1A, Pg 65

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LEWIS-G1-403.2.doc

G40–09/10
403.2.3.5 (New)

Proponent: Gary Lewis, Chair, ICC Ad Hoc Committee on Terrorism-Resistant Buildings

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

403.2.3 Structural integrity of exit stairway and elevator hoistway enclosures. For all high-rise buildings of occupancy category III or IV buildings in accordance with Section 1604.5, and for all buildings that are more than 420 feet (128 m) in building height, exit enclosures and elevator hoistway enclosures shall comply with Sections 403.2.3.1 through ~~403.2.3.4~~ 403.2.3.5.

403.2.3.1 Wall assembly. The wall assemblies making up the exit enclosures and elevator hoistway enclosures shall meet or exceed Soft Body Impact Classification Level 2 as measured by the test method described in ASTM C1629/C1629M.

403.2.3.2 Wall assembly materials. The face of the wall assemblies making up the exit enclosures and elevator hoistway enclosures that are not exposed to the interior of the exit enclosure or elevator hoistway enclosure shall be constructed in accordance with one of the following methods:

1. The wall assembly shall incorporate not less than two layers of impact-resistant construction board each of which meets or exceeds Hard Body Impact Classification Level 2 as measured by the test method described in ASTM C1629/C1629M.
2. The wall assembly shall incorporate not less than one layer of impact-resistant construction material each that meets or exceeds Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C1629/C1629M.
3. The wall assembly shall incorporate multiple layers of any material, tested in tandem, that meet or exceed Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C1629/C1629M.

403.2.3.3 Concrete and masonry walls. Concrete or masonry walls shall be deemed to satisfy the requirements of Sections 403.2.3.1 and 403.2.3.2.

403.2.3.4 Other wall assemblies. Any other wall assembly that provides impact resistance equivalent to that required by Sections 403.2.3.1 and 4.3.2.3.2 for Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C1629/C1629M shall be permitted.

403.2.3.5 Blast resistance. The wall assemblies of stairway and hoistway enclosures, from the top of each floor to the underside of the floor or roof above and connections to supporting members, shall be capable of resisting a factored load using strength design, expressed as a uniform pressure, of not less than 2 psi (13.8 kPa) applied perpendicularly to the exterior of the enclosure. This load need not be assumed to act concurrently with the loads specified in Chapter 16 and shall be assumed to apply to one floor at a time.

Reason: The purpose of this change is to establish a standard for the structural robustness of exit stairway and elevator shaft enclosures. It implements Recommendation 18 of the National Institute of Standards and Technology (NIST) report on the World Trade Center (WTC) tragedy.

The Code has traditionally looked upon a stair enclosure as a place of relative safety. There are any number of carefully crafted code provisions designed to ensure that goal, but they are based upon only one hazard – fire. The enclosures of these stairways are made fire resistive through the traditional rating and listing system, but the Code does not establish a criterion for structural robustness. The proponents do not believe that the existing "hose stream" test addresses this issue. The hose stream does not and cannot represent the real world impact of blast loads that a stair shaft might encounter. Neither does the ongoing industry work designed to develop an impact resistance test standard. That work relates to durability rather than safety. The proponents believe that a structural standard is needed.

The stairway enclosures of the WTC were destroyed by an aircraft impact. Far lesser events, such as a gas explosion or a vehicle impact (on lower floors) can destroy a stairway enclosure, especially when one considers that the Code contains no structural criteria at all. The 2 psi load requirement is consistent with the overpressure associated with a gas explosion. NIST has performed an analysis to verify this statement. Any structural robustness that existing stairway enclosures have is a by-product of the fire rating process; a process that was never intended to provide structural integrity.

A new criterion is needed for exit stair enclosures – a structural one.

The NIST WTC Report suggests a standard based upon resistance to over-pressure. This approach has two real advantages. It reflects one possible damage scenario and can represent others as well. Secondly, it is a performance standard. All materials can be analyzed and engineered to comply.

Compliance with this standard is determined by engineering analysis, not a test. This is a simple and direct approach that can be implemented immediately.

Bibliography:

National Institute of Standards and Technology. Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Cost Impact: The code change proposal will increase the cost of construction. This proposal will increase the cost of construction but the continued absence of structural criteria for exit stairway enclosures is not possible. This is a cost that must be met for safety's sake.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LEWIS-G4-403.2.3

G41–09/10
403.2.4, Table 403.2.4

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC) and Lawrence G. Perry, AIA, representing Building Owners and Managers Association (BOMA) International

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE.

Delete without substitution as follows:

~~**403.2.4 Sprayed fire-resistive materials (SFRM).** The bond strength of the SFRM installed throughout the building shall be in accordance with Table 403.2.4.~~

~~**TABLE 403.2.4**~~
~~**MINIMUM BOND STRENGTH**~~

~~**HEIGHT OF BUILDING**~~ [a]	~~**SFRM MINIMUM BOND STRENGTH**~~
~~Up to 420 feet~~	~~430 psf~~
~~Greater than 420 feet~~	~~1,000 psf~~

~~For SI: 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kW/m^2~~
~~a. Above the lowest level of fire department vehicle access~~

Reason: Heilstedt - The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public

This proposed change is a result of the CTC's investigation of the area of study entitled "Review of NIST WTC Recommendations". The scope of the activity is noted as:

> Review the recommendations issued by NIST in its report entitled "Final Report on the Collapse of the World Trade Center Towers", issued September 2005, for applicability to the building environment as regulated by the I-Codes. To evaluate the necessity of developing code changes in response to the NIST report.

The current provisions for minimum bond strength were added to the code via G68-06/97. The following is the committees reason for inclusion:

Committee Reason: Although the data which provides technical support was not provided within the proposal, this does go along with the NIST recommendations and should provide better safety in high-rise buildings. Using the greater bond strengths will increase the probability that the protection will stay in place and will reduce the likelihood of being dislodged. These factors should provide for a longer time of safety. Placing the requirements in the high-rise provisions of Chapter 4 instead of within Chapter 7 makes sense because they are only applicable to high-rises and will be more likely to be found within that section. The committee did agree with the different bond strength requirements based upon the thought the taller buildings are at a higher risk and that items such as the vibration of tall buildings will affect the long term performance. Based on testimony which was provided, the cost impact of this requirement was considered as being relatively small. The higher density products which are currently available will generally meet these requirements. The modifications included a revision of the terminology Aspray applied@ to Asprayed@ to be consistent with the action of FS156-06/07 and to create a more global point of reference for building height by moving footnote a to the main title of the first column.

In submitting a public comment to G69-07/08 last cycle to remove the minimimum and retain the 150 psf in Chapter 17, CTC noted that the current provisions for minimum bond strength were the results of G68-06/07 last cycle. As noted in the reason statement for the code change, it

notes “The purpose of this proposal is to increase the required adhesions of Spray Applied Fire Resistant Materials (SFRM).” The proposal further sites Recommendation 6 of the NIST WTC report which calls for improvement of the in-place performance of SFRM. NIST Recommendation 6 reads as follows:

NIST recommends the development of criteria, test methods, and standards: (1) for the in-service performance of sprayed fire-resistive materials (SFRM, also commonly referred to as fireproofing or insulation) used to protect structural components; and (2) to ensure that these materials, as-installed, conform to conditions in tests used to establish the fire resistance rating of components, assemblies, and systems.

The CTC notes that the prior to the approval of the increased bond strength in Table 403.15 that the code mandated cohesive/adhesive bond strength, regardless of height, was 150 psf in Section 1704.10.5. In fact, this section has remained unchanged and was not coordinated with the new provisions in Table 403.15.

Based on input received by the CTC, the CTC position remains that the bond strength should not be increased as a function of height. As noted in the NIST recommendation, the concern is one of in-service performance of the SFRM which means the material must remain in place to perform its intended function, regardless of height. This is an inspection related issue, one for which the CTC submitted code change S39-06/07 to improve the inspection provisions, including:

- Increased number of sampling locations
- Specific sampling for columns, beams, joists and trusses
- Physical and visual tests for: substrates; thickness; density, bond strength

S39-06/07 was approved and the provisions will be incorporated in the 2009 edition of the IBC.

There is no credible technical evidence or documented experience to indicate that the increased minimum bond strength requirements specified in the subject text and Table improve the long term durability of sprayed fire –resistive materials (SFRM) in high-rise buildings or improve the chances of SFRM to be in place when it is needed (in the event of a fire). The single proven effect of these increased bond provisions is to dramatically increase the SFRM installed cost by up to 250%. SFRM minimum bond strength of 150 psf (Section 1704.12.6), in conjunction with inspections and field tests, specified in Section 1704.12, are adequate to ensure SFRM is in place after completion of the construction phase. Regular inspections and timely repairs are needed to ensure SFRM in-place condition over the life of the building, regardless of the bond strength of SFRM.

A survey of the commercially available SFRM products in terms of their bond strength and density, conducted by the American Iron and Steel Institute (AISI) in 2007 clearly indicates that the provisions in Section 403.2.4 and Table 403.2.4 are specifically calibrated and targeted to ban standard-density SFRM products from the high-rise market – i.e., these provisions create an artificial commercial barrier, but do not address any measurable risks or safety concerns tied to any meaningful bond strength values (in terms of SFRM in-place durability).

The current provisions in Section 403.2.4and Table 403.2.4 resulted from proposal G68-06/07 (and further slightly modified by proposal G68-07/08), based on misleading technical information and flawed cost impact analysis provided in the proposal and relevant testimonies during the public hearings:

- G68-06/07 reason statement suggested “building sway” as a “known” “initiating event” for SFRM dislodgement. Testimony during the public hearings also suggested building vibration as a possible cause for SFRM dislodgement. To date, no evidence has been found to document either of these claims.
- G68-06/07 reason statement noted that “The purpose of this proposal is to increase the required adhesions of Spray Applied Fire Resistant Materials (SFRM)”, seeking to achieve the improvements called for in Recommendation 6 of NIST WTC Report. Testimonies during the hearings further suggested that proposal G68-06/07 is somehow based on NIST WTC Investigation and its recommendations. In fact, NIST Recommendation 6 reads as follows:

  “NIST recommends the development of criteria, test methods, and standards: (1) for the in-service performance of sprayed fire-resistive materials (SFRM, also commonly referred to as fireproofing insulation) used to protect structural components; and (2) to ensure that these materials, as-installed, conform to conditions in tests used to establish the fire resistance rating of components, assemblies, and systems.”

  There is nothing in Recommendation 6, or in any other part of the NIST WTC Investigation Report, to justify the immediate need to arbitrarily increase the SFRM bond strength. Nothing in the published NIST report suggested that the SFRM bond strength was inadequate for any of the intended purposes. The compiled records actually indicated that WTC towers endured numerous fires prior to 9/11 with minimal or no structural damage. Nothing in the NIST Report suggested that any existing SFRM product with higher bond strength and/or higher density would have performed better, or would have changed the sequence or the outcome of events.
- G68-06/07 proposal noted that “Many tall buildings already utilize these higher strength materials”. However, in 2006, there was only one high-rise building known to utilize medium-density SFRM throughout the building (the reconstructed WTC 7), and the owner did it for understandable reasons In fact, the absence of long-term nation-wide experience with the “throughout” application of medium-density and high-density SFRM in high-rise buildings should be a cause for concern – due to the lack of long term data to support their use.
- G68-06/07 offered flawed cost impact analysis stating that the associated cost increase will be only marginal. In fact, credible estimates for real projects indicated very significant cost increase for installed medium-density and high-density SFRM. Independent estimates by government agencies (reported in G69-07/08) indicated that minimum bond strength requirement of 430 psf increases the SFRM cost by over 50%, while the requirement of 1000 psf increases SFRM cost by about 170%. Other independent estimates in the 2007 AISI report show similar cost increases: by over 50% for medium-density SFRM, and by over 230% for high-density SFRM. These increases cannot be characterized as “marginal” or “relatively small”. The cost impact of Table 403..2.4 provisions needs to be fully considered, and society’s fire protection resources need to be effectively allocated in a meaningful way.
- Several testimonies during the public hearing exploited the notion of standard-density SFRM dislodgement under its own weight for no apparent reason or due to the lack of bond strength. In fact, SFRM dislodgement are almost always linked to very specific reasons that are irrelevant to bond strength – over the building lifetime, the overwhelming majority of documented dislodgement cases are caused by direct contact/impact removals of SFRM associated with human activities such as construction, demolition, remodeling, testing, structural inspections, maintenance operations, electrical/mechanical installations, and also, associated with equipment failures, such as water leaks, improper elevator operations, and similar reasons. The information compiled in WTC Investigation Report NCSTAR 1-6A clearly illustrates typical cases, e.g.:

  “Section 3.7 with photographs in Figures 3-5 through 3-10 states that, “There were many instances where SFRM had obviously been dislodged in the process of installing utilities. In some cases hardware was attached directly to the lower chords and SFRM was dislodged. These damaged areas should have been repaired when the various trades had completed their work”. Section 3.7 also states that “the overall views of the trusses showed that regions of missing insulation were minor in extent when compared with the total area of applied SFRM”.

  Figure A-36 points to SFRM damage on trusses due to “tenant construction work” or “works over the years in the ceiling” by the Port Authority.

  Figure A-37 points to SFRM damage on trusses "during demolition after tenants move out" as "ductwork, partitions, hangers, etc. are removed".

  Figure A-38 points to SFRM "damaged by installation of new construction".

  Figure A-39 points to SFRM "disturbed by remodeling operations"

Figure A-49 points to SFRM re-occurring "extensive damage" in the elevator shafts caused by "the slack condition in compensating cables, especially on shuttle cars, causing a chafing condition against finished spray-on fireproofing on structural steel within hoistways". Figure A-56 and A-57 (excerpts from LERA reports dated 1993 and 1995) point to SFRM damage in elevator shafts due to "rubbing of the hoist cable against the face of column", or "due to testing purposes". In one instance, the LERA reports also point to the installation of bracket as the cause for missing fireproofing.

The entire compilation of maintenance and inspections documents in the published reports of NIST WTC Investigation does not contain a single case of SFRM dislodgement linked to the lack of SFRM bond strength, despite the fact that all structural steel and steel joists in WTC towers was primed (SFRM application over primed and/or painted steel is known to reduce bond strength).

Similar causes of SFRM dislodgement, irrelevant to bond strength, were reported in the 2007 AISI report of building architects and construction contractors to evaluate their use of SFRM and their experiences with it. This survey is more relevant to the initial construction and/or major renovation phases in buildings' lifetime, and identifies intentional removal of SFRM by construction trades as the primary cause of SFRM dislodgement.

In summary, the two leading causes of SFRM dislodgement during construction and maintenance of buildings are:

- Primary cause - intentional removal of SFRM associated with human activities, such as construction, renovation, electrical/mechanical installations, testing, inspections, maintenance operations, etc. This type of SFRM dislodgement is completely irrelevant to SFRM bond strength. Only inspections and timely repairs could address intentional removal of SFRM.
- Secondary cause - unintentional/accidental removal of SFRM associated with human activities and equipment failures. While the use of higher-density SFRM products could slightly reduce dislodgements associated with some accidental abuses, such as light abrasive actions and light impacts, existing medium-density and high-density SFRM products are still by far incapable to substantially reduce dislodgements or address all common causes of accidental removals (e.g. water leaks, repeated and stronger abrasive actions and impacts, etc). Concealment of SFRM-protected steel elements in protective envelopes (e.g. gypsum board) or behind suspended ceilings is the most effective way in avoiding accidental dislodgement due to most accidental impacts and abrasions. Again, only inspections and timely repairs could adequately address unintentional/accidental removal of SFRM.

Analysis of Proposed Change G68-06/07 to the 2006 Edition of IBC", by Farid Alfawakhiri, Ph.D., American Iron and Steel Institute, January 2007.

Bibliography: NIST NCSTAR 1, "Federal Building and Fire Safety Investigation of the World Trade Center Disaster: Final Report on the Collapse of the World Trade Center Towers", National Institute of Standards and Technology, September 2005 (available at http://wtc.nist.gov/).

Carino et al, NIST NCSTAR 1- 6A, "Federal Building and Fire Safety Investigation of the World Trade Center Disaster: Passive Fire Protection", National Institute of Standards and Technology, September 2005 (available at http://wtc.nist.gov/).

Perry - In their approval of the new SFRM requirements during the 2006/2007 cycle, the Fire Safety Committee specifically noted that neither technical substantiation nor cost data had been provided to the committee. Last cycle (2007/2008), cost information was provided to the committee, clearly indicating that costs are far beyond the moderate 'incremental' increases alluded to by proponents last cycle. The Fire Safety Committee voted to maintain the increased SFRM bond strength provisions, "based on a lack of technical substantiation to take them out".

This committee is on record that they had no technical substantiation when they added this requirement to the code, yet they now will not remove the provisions unless they receive technical substantiation?

There is no evidence that arbitrarily tripling (from 150 psf to 430 psf) the bond strength of SFRM will provide any additional degree of safety in 75' tall buildings, and no evidence that increasing the bond strength by a factor of 7 (from 150 psf to 1000 psf) will provide any additional degree of safety in buildings >420' in height.

The extent of the cost impacts calculated by both GSA and the steel industry make it clear that the first response to this provision, if it remains, will be to look for alternatives. There has been no explanation from those touting the need for increasing SFRM bond strength for how a gypsum-board encased column (which can achieve the required hourly ratings) would compare to columns with any of the various types of SFRM.

Cost Impact: Heilstedt - The code change proposal will not increase the cost of construction.
Perry - The code change proposal will not increase the cost of construction. This change will decrease the cost of construction.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HEILSTEDT-G6-403.2.4.doc

G42–09/10
403.2.4

Proponent: Farid Alfawakhiri, American Iron and Steel Institute (AISI)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE.

Revise as follows:

403.2.4 Sprayed fire-resistant materials (SFRM). The bond strength of the SFRM installed throughout the building shall be in accordance with Table 403.2.4.

TABLE 403.2.4
MINIMUM BOND STRENGTH

HEIGHT OF BUILDING [a]	SFRM MINIMUM BOND STRENGTH
Up to 420 feet	~~430~~ 250 psf
Greater than 420 feet	1,000 psf

For SI: 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kW/m^2.

a. Above the lowest level of fire department vehicle access.

Reason: This proposal attempts to balance reasonable economic considerations with safety concerns (whether substantiated or not) in buildings 75 ft to 420 ft in height. The proposed SFRM minimum bond strength of 250 psf is economically feasible, because it can be achieved with the majority of standard-density SFRM products and attention to application technology practices. The proposed 250 psf bond strength is significantly higher that the 150 psf SFRM minimum bond strength (Section 1704.12.6) required in low and mid-rise buildings.

The current requirement of SFRM minimum bond strength of 430 psf in Table 403.2.4 is not tied to any measurable risks or meaningful performance/durability criteria, i.e. there is no evidence that this increased bond strength requirement reduces SFRM dislodgement or improves the chances of SFRM to remain in place. However, the 430 psf bond strength requirement effectively bans standard-density SFRM products from the high-rise market and dramatically increases the SFRM installed cost by over 50%.

Buildings 75 ft to 420 ft (roughly 6 to 35 stories) in height are very common in urban areas, and they do not pose very high evacuation risks or very high loss risks, associated with "super-high-rises". The broad and lengthy experience with these buildings has not resulted in any documented cases of structural fire damage (let alone structural failure due to fire) linked to poor SFRM bond strength. Therefore, the unsubstantiated and expensive requirement of 430 psf SFRM bond strength can hardly be justified.

The current provisions in Section 403.2.4and Table 403.2.4 are the result of code change proposal G68-06/07, based on misleading technical information and flawed cost impact analysis, stating that the associated cost increase will be only marginal. However, credible estimates for real projects indicated very significant cost increases associated with the substitution of standard-density SFRM by medium-density SFRM. Independent estimates by government agencies (reported in G69-07/08) indicated that minimum bond strength requirement of 430 psf increases the SFRM installed cost by over 50%. Other independent estimates commissioned by the American Iron and Steel Institute (AISI) show similar cost increases. The details of these estimates are provided in the substantiation report referenced below. These increases cannot be characterized as "marginal".

AISI supports cost effective code changes that will improve the real world performance of SFRM. We share the desire to take action that would adequately respond to the events of September 11 and address credible safety concerns. Unfortunately, we believe that the current provisions of 403.2.4 achieve marginal (if any) risk reduction and they have economic implications that are not cost effective. We urge the membership to support this proposed revision.

Substantiation: "Analysis of Proposed Change G68-06/07 to the 2006 Edition of IBC", by Farid Alfawakhiri, Ph.D., American Iron and Steel Institute, January 2007 (available at http://www.iccsafe.org/cs/cc/ctc/WTC/resource/AISI_Analysis_of_Bond_Strength.pdf).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ALFAWAKHIRI-G1-TABLE 403.2.4

G43–09/10
403.3.3 (New), Table 508.2.5

Proponent: Wayne R. Jewell, CBO, City of Southfield, representing self

1. Add new text as follows:

403.3.3 Fire pump room. Fire pumps shall be located in rooms protected in accordance with Section 913.2.1.

2. Revise table as follows:

TABLE 508.2.5
INCIDENTAL ACCOSSORY OCCUPANCIES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic fire-extinguishing system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic fire-extinguishing system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen cut-off rooms, not classified as Group H	1-hour in Group B, F, M, S and U occupancies. 2-hour in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic fire-extinguishing system
Laboratories and vocational shops, not classified as Group H, located in Group E or I-2 occupancies	1 hour or provide automatic fire-extinguishing system
Laundry rooms over 100 square feet	1 hour or provide automatic fire-extinguishing system
Group I-3 cells equipped with padded surfaces	1 hour
Group I-2 waste and linen collection rooms	1 hour
Waste and linen collection rooms over 100 square feet	1 hour or provide automatic fire-extinguishing system
Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons or a lithium-ion capacity of 1,000 pound used for facility standby power, emergency power or uninterrupted power supplies	1-hour in Group B, F, M, S and U occupancies. 2-hour in Group A, E, I and R occupancies
~~Rooms containing fire pumps in nonhigh-rise buildings~~	~~2 hours; or 1 hour and provide automatic sprinkler system throughout the building~~
~~Rooms containing fire pumps in high-rise buildings~~	~~2 hours~~

For SI: 1 square foot = 0.0929 m^2, 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L.

Reason: Adding Section 403.3.3 provides a proper link to the protection requirements found in Section 913.2.1 added during the last cycle for a fire pump room in a high-rise building. Revising Table 508.2.5 in striking the two lines removes the confusion that could occur since all options under Section 508 are not required to use the provisions of the table, yet fire pumps can occur in the multiple types of buildings permitted under Section 508 and these protection provisions are required under all instances.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: JEWELL-G1-403.3.3 NEW

G44–09/10
403.4.5, 403.4.8.1, 708.14.1, Chapter 35; IFC 508.1.5 (IBC [F] 911.1.5)

Proponent: Gary Lewis, Chair, ICC Ad Hoc Committee on Terrorism-Resistant Buildings

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC GENERAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

1. Add new text as follows:

403.4.5 Video surveillance system. A video surveillance system installed in accordance with NFPA 731, shall be installed in each elevator lobby provided in accordance with Section 708.14.1 and at every fifth floor of each required stairway and connected to an approved, constantly attended station. The surveillance system shall not be required to provide positive visual recognition of individual persons.

(Renumber subsequent sections)

2. Revise as follows

403.4.8.1 Emergency power loads. The following are classified as emergency power loads:

1. Exit signs and *means of egress* illumination required by Chapter 10;
2. Elevator car lighting;
3. Emergency voice/alarm communications systems;
4. Automatic fire detection systems;
5. Video surveillance systems;
6. Fire alarm systems; and
7. Electrically powered fire pumps.

708.14.1 Elevator lobby. An enclosed elevator lobby shall be provided at each floor where an elevator shaft enclosure connects more than three stories. The lobby enclosure shall separate the elevator shaft enclosure doors from each floor by fire partitions. In addition to the requirements of Section 709 for fire partitions, doors protecting openings in the elevator lobby enclosure walls shall also comply with Section 715.4.3 as required for corridor walls and penetrations of the elevator lobby enclosure by ducts and air transfer openings shall be protected as required for corridors in accordance with Section 716.5.4.1. Elevator lobbies shall have at least one means of egress complying with Chapter 10 and other provisions within this code. In high-rise buildings the elevator lobby shall be provided with a video surveillance system installed in accordance with NFPA 731.

Exceptions:

1. through 7. (No change to exceptions)

3. Add new standard to Chapter 35 as follows:

NFPA
731-2008 The Standard for the Installation of Electronic Premises Security Systems

PART II – IFC

Revise as follows:

508.1.5 (IBC [F] 911.1.5) Required features. The fire command center shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system control unit.
2. The fire department communications system.
3. Fire detection and alarm system annunciator.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air handling systems.
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking stairway doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, firefighting equipment and fire department access and the location of fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions.
13. Work table.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. Elevator fire recall switch in accordance with ASME A17.1.
17. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.
18. Video monitoring for video surveillance system required by this code.

Reason: This proposal adds new requirements to the code for high-rise buildings. The purpose of this change is to increase the ability of firefighters, and other emergency responders, to develop a clear picture of conditions throughout the building which will enable them to better manage evacuation, fire suppression and other emergency response activities. The purpose is also to enhance the safety of emergency responders by enabling them to maintain better situational awareness.

The National Institute of Standards and Technology's (NIST) report on the World Trade Center (WTC) tragedy amply documented the tactical and informational difficulties experienced by emergency responders and occupants during the WTC event. Similar difficulties occur in much smaller events and they place lives at risk.

The Code already requires many systems which enhance emergency responder and occupant awareness. Their use can be improved and they can be further supplemented. Recommendation 23 of the WTC Report specifically calls for:

The establishment and implementation of detailed procedures and methods for gathering, processing, and delivering critical information through integration of relevant voice, video, graphical and written data to enhance situational awareness of all emergency responders.

This proposal seeks to improve responder awareness of conditions in the building to assist in management of an incident and improve the existing fire command center to enhance its value. Awareness is improved by requiring control center monitoring of video surveillance in stairway shafts and elevator lobbies. With the introduction of dedicated fire service elevators and occupant egress elevators into the IBC, the necessity of monitoring the status of the elevator lobbies becomes even more significant.

There will be those opponents that will claim that that the amount of information generated by the video monitoring in a large building will cause "information overload". They will question the ability of the staff in the fire command center to observe all of the required video feeds at once. In response to this, please be aware that there is commercial off-the-shelf "intelligent software" that is available such that the staff of the fire command center need not observe all of these feeds; the software is "event driven" and will select information that is pertinent and display just this information. This software is currently available off-the-shelf from companies such as Johnson Control and Honeywell. The Port Authority of New York and New Jersey is currently installing a system to monitor the perimeter of the Newark airport by the use of *ONE* video screen. Clearly the perimeter of this airport is substantially larger than the portions of the building that are required to be monitored as a result of this code change. By requiring these video feeds, the situational awareness of the staff in the fire command center is substantially increased. While researching the availability of this software, we were informed by Mr. Alan Reiss the building manager of the World Trade Center, that he was unaware of the magnitude of the event on September 11, 2001. In fact, he commented that the people at home watching the television had a better situational awareness than he did because of the lack of information available at the fire command center. This has to be changed and this proposal will change it.

Bottom line, the video monitoring system will provide fire and emergency responders' immediate information on the life safety condition and status of the areas noted. Having such ability will exceed any expense incurred for the installation of the video monitoring system - the expense is minor to the benefit of the system. (Note: Regardless of this requirement, electronic data access systems can be installed for a reasonable cost in most buildings today). A video monitoring system will provide fire and emergency responders with accurate and up to date information on the condition and activities of the given areas for emergency responders to make tactical decisions under emergency conditions. With that said, the TRB committee encourages consideration and support for this proposal.

Bibliography: National Institute of Standards & Technology, Final Report of the National Construction safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Referenced Standards
National Fire Protection Association Standard 731, the Standard for the Installation of Electronic Premises Security Systems

Cost Impact: The code change proposal will not increase the cost of construction. These proposed amendments will increase the cost of construction, but, the increase will be modest when viewed as a percentage of total construction costs.

Analysis: A review of the standard proposed for inclusion in the code, NFPA 731, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LEWIS-G3-403.12.1.doc

G45–09/10
403.4.7, 403.4.7.2

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry, Inc. (NEII)

Revise as follows:

[F] 403.4.7 Standby power. A standby power system complying with Chapter 27 and Section 3003 shall be provided for standby power loads specified in 403.4.7.2. Where elevators are provided in a high-rise building for accessible means of egress, fire service access or occupant self-evacuation, the standby power system shall also comply with Sections 1007.4, 3007 or 3008, as applicable.

[F] 403.4.7.1 Special requirements for standby power. (No change to current text)

[F] 403.4.7.2 Standby power loads. The following are classified as standby power loads:

1. Power and lighting for the fire command center required by Section 403.4.5;
2. Ventilation and automatic fire detection equipment for smokeproof enclosures; and
3. Elevators. ~~Standby power shall be provided for elevators in accordance with Sections 1007.4, 3003, 3007, and 3008.~~

Reason: As currently formatted and written, the 2009 IBC is unclear that elevators in high-rise buildings which aren't used for compliance with 1007.4, 3007 or 3008 have to have standby power. It almost does. Section 403.4.7.2 should be a simple list of the items that are "defined' as standby power loads'. Section 403.4.7 says there has to be a system for the listed loads. Item 3 however says: Standby power shall be provided in accordance with four other sections in Chapter 30. Three of those four sections have specific requirements for standby power and what it should cover. Section 3003 simply tells you how to design the system for elevators – when it is required in a building. But 3003 isn't the scoping requirement, it's the design requirement.

This proposal makes elevators just another listed item in the standby power loads and then it moves up to Section 403.4.7, the references to the design requirements. Section 403.4.7 is already a reference to part of the design requirements – by sending the user to Chapter 27 – from which one gets to the Electrical Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BLACK-G1-403.4.7.doc

G46–09/10
403.5.2, 3008.4

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing: California Fire Safety Advisory Council (CFSAC); Bill Ziegert, representing Smoke Guard, Inc.

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

2. Revise as follows:

403.5.2 Additional exit stairway. For buildings other than Group R-2 that are more than 420 feet (128 000 mm) in building height, one additional exit stairway meeting the requirements of Sections 1009 and 1022 shall be provided in addition to the minimum number of exits required by Section 1021.1. The total width of any combination of remaining exit stairways with one exit stairway removed shall not be less than the total width required by Section 1005.1. Scissor stairs shall not be considered the additional exit stairway required by this section.

~~**Exception:** An additional exit stairway shall not be required to be installed in buildings having elevators used for occupant self-evacuation in accordance with Section 3008.~~

2. Delete without substitution:

~~**3008.4 Additional exit stairway.** Where an additional means of egress is required in accordance with Section 403.5.2, an additional exit stairway shall not be required to be installed in buildings having elevators used for occupant self-evacuation in accordance with this section.~~

Reason:

Thornberry: We are proposing to delete the Exception to Section 403.5.2 as well as Section 3008.4 which allow the use of occupant evacuation elevators in lieu of the additional exit stairway where required by Section 403.5.2 for super high-rise buildings (buildings greater than 420 ft in height). We believe this technology is too new and unproven to allow it to substitute for a required means of egress. This position is also consistent with Section 1003.7 Elevators, Escalators and Moving Walks which prohibits elevators from being used as a component of a required means of egress. Until such time as occupant evacuation elevators (which are allowed to be used on a voluntary basis without reducing the required means of egress) have proven to be safe, reliable, and effective, this exception should be deleted from the code.

Ziegert: When the concept of Occupant Evacuation Elevators was proposed during the Palm Springs hearings in 2008, while many committee members were in favor of such a concept, the change was Disapproved primarily because it sought a tradeoff of reducing exit stair capacity (width). The proponent brought this change back to the Minneapolis Final Action hearings with substantial modifications and replaced the reduction in exit stair width with this alternate tradeoff to reduce the third stair in High Rise buildings over 420 feet (a different form of tradeoff but still a reduction in exit capacity). Justification for this tradeoff of exit capacity was never sufficiently provided, particularly when one recognizes that the elevator occupant evacuation system will only be operational until the Fire Service arrives (typically in 10 minutes or less from the first alarm). At this time Phase 1 Elevator Recall will normally be implemented which will immediately terminate the use of elevators for occupant evacuation. Following that, occupants needing to use stairs for evacuation in these very tall buildings would be limited to only the two stair systems, rather than the three stair systems the code currently mandates.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THORNBERRY-G6-403.5.2

G47–09/10
403.5.4

Proponent: David S. Collins, FAIA, The Preview Group, Inc., The American Institute of Architects

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

403.5.4 Smokeproof enclosures. Every required exit *stairway* serving floors more than 75 feet (22 860) above the lowest level of fire department vehicle access shall comply with Sections 909.20 and 1020.1.7. The smokeproof enclosure shall be continuous to the level of exit discharge.

> **Exception:** Portions of stairways which extend to serve floors below the level of exit discharge shall not be required to comply with Sections 909.20 and 1020.1.7 provided the portion of the stairway below the level of exit discharge is separated from the smokeproof enclosure with not less than 1-hour fire barriers constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 712, or both.

Reason: This code change clarifies where a smokeproof exit enclosure is required. It isn't clear what a required level exit stairway is intended to be. The proposed exception clarifies the Section does not apply to levels below the point of exit discharge if enclosed with a 1 Hr. fire barrier.

Cost Impact: The code change proposal will not increase the cost of construction. This will reduce the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COLLINS-G5-403.5.2

G48–09/10
403.6.1, 3007.1, 3007.1.1 (New)

Proponent: Dave Frable, U.S. General Services Administration

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

403.6.1 Fire service access elevator. In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, a minimum of ~~one~~ two elevators having a minimum 3,500 pounds (1588 kilograms) capacity serving every floor within the subject building shall be provided to serve as a fire service access elevator ~~shall be provided~~ in accordance with Section 3007.

> **Exception:** One elevator having a minimum capacity of 4,000 pounds (1814 kilograms) shall be permitted instead of 2 elevators of 3,500 pounds (1588 kilograms) capacity.

3007.1 General. Where required by Section 403.6.1, every floor of the building shall be served by ~~a~~ fire service access ~~elevator~~ elevators. Except as modified in ~~this section, the~~ Sections 3007.1 through 3007.7, fire service access ~~elevator~~ elevators shall be installed in accordance with this chapter and ASME A17.1/CSA B44.

3007.1.1 Ambulance stretcher. At least one fire service access elevator shall be sized to accommodate a stretcher in conformance with Section 3002.4.

Reason: Last Code Development Cycle, a code change was submitted to require a minimum of 3 fire service elevators. The subject proposal was disapproved by the Code Committee based on concerns that requiring a minimum of 3 fire service access elevators would have an adverse impact on a small footprint high-rise building and that requiring a minimum of 3 fire service access elevators seemed excessive. The intent of this code change is to provide a compromise that addresses the minimum number of fire service access elevators that are required in a building based on the size and capacity of the elevator and not strictly the number of elevators. The proposed text also allows for design flexibility as well as providing minimum requirements for the size and capacity of the fire service access elevators by correlating with Section 3002.4

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FRABLE-G6-403.6.1

G49–09/10
403.6.1

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry, Inc. (NEII); Sean DeCrane, representing International Association of Fire Fighters (IAFF); Jack Murphy, representing Fire Safety Directors of Greater New York (FSDAGNY)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

403.6.1 Fire service access elevator. In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, a minimum of ~~one~~ three fire service access elevators, or all elevators, whichever is less, shall be provided in accordance with Section 3007.

Reason: The proponents performed a survey of firefighters from across the country to explore the sufficiency of this current code requirement. Thirty-five responses were received from cities such as Charlotte, Orlando, San Francisco, Houston, Los Angeles, Fort Worth, Boston and Pittsburgh, all indicating that the number of elevators used for firefighting operations varies from 2 to 6. (Only one respondent, a suburban bedroom community indicated one elevator is sufficient for firefighting.) Firefighters experienced in high rise operations stated that the Fire Service must be able to count on **at least two** elevators at all times. They are necessary for 1) transporting firefighters to and from the staging area, usually located two floors below the fire floor; 2) moving firefighters to other floors for the purpose of search and rescue, fire extension, recon; hauling of equipment such as spare cylinders, exhaust fans, etc; and, 3) transporting those with disabilities to the building lobby.

Past experience during fires of this type (high-rise), is that on many occasions elevators are not available due to shut downs for various reasons, including problems in operation, routine maintenance, modernization programs, EMS operations in the building prior to firefighter arrival and other reasons. Without this change there will be a high chance that there will not be a Fire Service Access Elevator available for the firefighters' to perform their critical firefighting and life-saving rescue duties.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BLACK-G5-403.6.1

G50–09/10
404.6

Proponent: Michael Perrino, Code Consultants, Inc.

Delete and substitute as follows:

404.6 Enclosure of atriums. Atrium spaces shall be separated from adjacent spaces by a 1-hour fire barrier constructed in accordance with Section 707 or a horizontal assembly constructed in accordance with Section 712, or both.

Exceptions:

~~1. A glass wall forming a smoke partition where automatic sprinklers are spaced 6 feet (1829 mm) or less along both sides of the separation wall, or on the room side only if there is not a walkway on the atrium side, and between 4 inches and 12 inches (102mmand 305 mm) away from the glass and designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction. The glass shall be installed in a gasketed frame so that the framing system deflects without breaking (loading) the glass before the sprinkler system operates.~~

1. A glass wall and doors forming a smoke partition in accordance with Section 711, constructed of a tempered, wired or laminated glass wall and doors, complying with all of the following:

1.1. Automatic sprinklers are spaced 6 feet (1829 mm) or less along both sides of the separation wall and doors, or on the room side only if there is not a walkway on the atrium side, and between 4 inches and 12 inches (102 mm and 305 mm) away from the glass. When activated the sprinkler system shall completely wet the entire surface of the glass.
1.2. The glass shall be in a gasketed frame and installed in a manner that the framing system will deflect without breaking (loading) the glass before the sprinklers operate.
1.3. Obstructions shall not be installed between the sprinklers and the glass wall or doors.

2. A glass-block wall assembly in accordance with Section 2110 and having a 3/4-hour fire protection rating.
3. The adjacent spaces of any three *floors* of the atrium shall not be required to be separated from the atrium where such spaces are accounted for in the design of the smoke control system.

Reason: The change brings to the atrium section the allowance for doors to be protected in the same manner as is permitted for walls and doors separating a pedestrian walkway from a building by Section 3104.5, exception 1. The allowances are almost identical as currently written, the only difference being the specific allowance for doors to be installed in the glass walls separating buildings, but not in glass walls separating atrium spaces.

Cost Impact: The code change proposal will not increase the cost of construction. The proposal will decrease the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PERRINO-G2-404.5

G51–09/10
404.6

Proponent: Clay Aler, PE, Koffel Associates

Revise as follows:

404.6 Enclosure of atriums. Atrium spaces shall be separated from adjacent spaces by a 1-hour *fire barrier* constructed in accordance with Section 707 or a *horizontal assembly* constructed in accordance with Section 712, or both.

Exceptions:

1. A glass wall forming a smoke partition where automatic sprinklers are spaced 6 feet (1829 mm) or less along both sides of the separation wall, or on the room side only if there is not a walkway on the atrium side, and between 4 inches and 12 inches (102 mm and 305 mm) away from the glass and designed so that the entire surface of the glass is wet upon activation of the sprinkler system without obstruction. The glass wall shall be installed in a gasketed frame so that the framing system deflects without breaking (loading) the glass before the sprinkler system operates. Self-closing glass doors shall be permitted in the glass wall.
2. A glass-block wall assembly in accordance with Section 2110 and having a 3/4-hour *fire protection rating*.
3. The adjacent spaces of any three floors of the atrium shall not be required to be separated from the atrium where such spaces are accounted for in the design of the smoke control system.

Reason: Where glass walls are used as an atrium enclosure, it is typical to include glass doors in the glass walls to maintain material continuity. The current code text makes no reference to whether glass doors are permitted as part of the atrium enclosure. The proposed revised text will make it clear that glass doors are permitted in glass walls, so long as the glass doors are sprinkler protected in a manner consistent with that provided for the glass wall.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ALER-G1-404.5.doc

G52–09/10
404.6 (New), 1022.1(IFC [B] 1022.1)

Proponent: David S. Collins, FAIA, The Preview Group, Inc., representing The American Institute of Architects

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

1. Add new text as follows:

404.6 Exit stairway. Up to 50 percent of the exits required by Section 1021 shall be permitted to be located within an atrium without enclosure required by Section 1022, provided:

1. The stairway discharges to the floor of the atrium;
2. The floor of the atrium is at the level of exit discharge and conforms with Section 1027.1; and
3. The footprint of the stairway when measured horizontally within the perimeter of the atrium floor opening shall not equal more than 25 percent of the area of the atrium on a per floor basis.

(Renumber subsequent sections)

2. Revise as follows:

1022.1 (IFC [B] 1022.1) Enclosures required. Interior exit stairways and interior exit ramps shall be enclosed with fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. Exit enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the exit enclosure shall include any basements but not any mezzanines. Exit enclosures shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours. Exit enclosures shall lead directly to the exterior of the building or shall be extended to the exterior of the building with an exit passageway conforming to the requirements of Section 1023, except as permitted in Section 1027.1. An exit enclosure shall not be used for any purpose other than means of egress.

Exceptions:

1. In all occupancies, other than Group H and I occupancies, a stairway is not required to be enclosed when the stairway serves an occupant load of less than 10 and the stairway complies with either Item 1.1 or 1.2. In all cases, the maximum number of connecting open stories shall not exceed two.
   1.1. The stairway is open to not more than one story above its level of exit discharge; or
   1.2. The stairway is open to not more than one story below its level of exit discharge.
2. Exit stairways in atriums conforming to Section 404.6 are not required to be enclosed.
~~2~~3. Exits in buildings of Group A-5 where all portions of the means of egress are essentially open to the outside need not be enclosed.
~~3~~4. Stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.
~~4~~5. Stairways in open parking structures that serve only the parking structure are not required to be enclosed.
~~5~~6. Stairways in Group I-3 occupancies, as provided for in Section 408.3.8, are not required to be enclosed.
~~6~~7. Means of egress stairways as required by Sections 410.5.3 and 1015.6.1 are not required to be enclosed.
~~7~~8. Means of egress stairways from balconies, galleries or press boxes as provided for in Section 1028.5.1 are not required to be enclosed.

Reason: The atrium enclosure provides adequate protection for occupants of the building by providing fire suppression, smoke removal systems and provides additional features that a stair enclosure lacks; the ability to observe the environment in which the stair is located. It would be a simple matter to glance down into the atrium prior to mounting the stairs to see if there are problems associated with the environment, making the decision to use the atrium stair much simpler than a stair whose environment is unknown beyond the one visible flight of stairs.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COLLINS-G4-404.6.doc

G53–09/10
406.1

Proponent: Daniel E. Nichols, PE, New York State Dept. of State, Div. of Code Enforcement and Administration

Revise as follows:

SECTION 406
MOTOR-VEHICLE RELATED OCCUPANCIES

406.1 General. Motor vehicle related occupancies shall comply with Sections 406.1 through 406.8 and the *International Fire Code, International Mechanical Code* and *International Fuel Gas Code*.

~~**406.3.2**~~ **406.2 Definitions.** The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

MECHANICAL-ACCESS OPEN PARKING GARAGES. *Open parking garages* employing parking machines, lifts, elevators or other mechanical devices for vehicles moving from and to street level and in which public occupancy is prohibited above the street level.

OPEN PARKING GARAGE. A structure or portion of a structure with the openings as described in Section 406.5.3 on two or more sides that is used for the parking or storage of private motor vehicles as described in Section 406.5.4.

RAMP-ACCESS OPEN PARKING GARAGES. *Open parking garages* employing a series of continuously rising floors or a series of interconnecting ramps between floors permitting the movement of vehicles under their own power from and to the street level.

~~**406.1**~~ **406.3 Private garages and carports.**

406.3.1 General. Private garages and carports shall comply with Sections 406.3.1 through 406.3.6.

(No change in text here or in the subsequent sections, except where shown.)

~~**406.1.1**~~ **406.3.2 Classification.**

~~**406.1.2**~~ **406.3.3 Area increase.**

~~**406.1.3**~~ **406.3.4 Garages and carports.**

~~**406.1.4**~~ **406.3.5 Separation**

~~**406.1.5**~~ **406.3.6 Automatic garage door openers.**

~~**406.2**~~ **406.4 Public parking garages.**

~~**406.2.1 Classification**~~ **406.4.1 General**. Parking garages other than private parking garages, shall be classified as public parking garages and shall comply with the provisions of Sections 406.4.2 through 406.4.9 and shall be classified as either an open ~~as defined in Section 406.3~~, parking garage or an enclosed parking garage ~~and shall meet appropriate criteria of Section 406.4~~. Open parking garages as defined in Section 406.2 shall also comply with Section 406.5. Enclosed parking garages shall also comply with Section 406.6. Also see Section 509 for special provisions for parking garages.

~~**406.2.2**~~ **406.4.2 Clear height.**

~~**406.2.3**~~ **406.4.3 Guards.**

~~**406.2.4**~~ **406.4.4 Vehicle barrier systems.**

~~**406.2.5**~~ **406.4.5 Ramps.**

~~406.2.6~~ **406.4.6 Floor surface.**

~~406.2.7~~ **406.4.7 Mixed occupancy separation.**

~~406.2.8~~ **406.4.8 Special hazards.**

~~406.2.9~~ **406.4.9 Attached to rooms.**

~~406.3~~ **406.5. Open parking garages.**

~~**406.3.1 Scope** Except where specific provisions are made in Sections 406.3.2 through 406.3.13, other requirements of this code shall apply.~~

406.5.1 General Open parking garages shall comply with Sections 406.5.2 through 406.5.12.

~~**406.3.2 Definitions**~~ (Text relocated to Section 406.2)

~~406.3.3~~ **406.5.2 Construction.**

~~406.3.3.1~~ **406.5.3 Openings.**

~~406.3.4~~ **406.5.4 Uses.**

~~406.3.5~~ **406.5.5 Area and height.**

TABLE ~~406.3.5~~ 406.5.5 OPEN PARKING GARAGES AREA AND HEIGHT

~~406.3.5.1~~ **406.5.5.1 Single use.**

~~406.3.6~~ **406.5.6 Area and height increases.**

~~406.3.7~~ **406.5.7 Fire separation distance.**

~~406.3.8~~ **406.5.8 Means of egress.**

~~406.3.9~~ **406.5.9 Standpipes.**

~~406.3.10~~ **406.5.10 Sprinkler systems.**

~~406.3.11~~ **406.5.11 Enclosure of vertical openings.**

~~406.3.12~~ **406.5.12 Ventilation.**

~~406.3.13~~ **406.5.13 Prohibitions.**

~~406.4~~ **406.6 Enclosed parking garages.**

406.6.1 General. Enclosed parking garages shall comply with Sections 406.6.1 through 406.6.3

~~406.4.1~~ **406.6.2 Heights and areas.**

~~406.4.2~~ **406.6.3 Ventilation.**

~~406.5~~ **406.7 Motor fuel-dispensing facilities.**

~~**406.5.1 Construction**~~ **406.7.1 General.** Motor fuel dispensing facilities shall ~~be constructed in accordance~~ comply with the *International Fire Code* and Sections ~~406.5.1 through 406.5.3~~.406.7.2 through 406.7.3.

~~406.5.2~~ **406.7.2 Vehicle fueling pad.**

~~406.5.3~~ **406.7.3 Canopies.**

~~406.5.3.1~~ 406.7.3.1 Canopies used to support gaseous hydrogen systems.

~~406.6~~ 406.8 Repair Garages.

~~406.6.1~~ 406.8.1 General.

~~406.6.2~~ 406.8.2 Mixed uses.

~~406.6.3~~ 406.8.3 Ventilation.

~~406.6.4~~ 406.8.4 Floor surface.

~~406.6.5~~ 406.8.5 Heating equipment.

[F] ~~406.6.6~~ 406.8.6 Gas detection system.

[F] ~~406.6.6.1~~ 406.8.6.1 System design.

[F] ~~406.6.6.2~~ 406.8.6.2 Operation.

[F] ~~406.6.6.3~~ 406.8.6.3 Failure of the gas detection system.

Reason: This is primarily a reformat similar to the reformat of Section 412 Aircraft Related occupancies, which occurred for the 2009 code. It is also making clear there relationship between the various sections on parking. It also provides consistent format for each subcategory such that each set of requirements starts with a General section. Some of these are new, some are revised sections that had different titles. Finally, there are key provisions in the other I-Code which apply to these occupancies. Only a few are listed and many are not. For example the Fuel Gas code requires appliances located in private garages to have the flame at least 18 inches above the floor. While that is hinted at in 406.2.8, that section doesn't cover the private garages. The existing Section 406 has sections on private garages and then simply 'parking garages'. Parking garages are then distinguished whether they are open or enclosed. Thi s change proposes to call all garages that are not private garages as 'public' garages'. This is not to imply that they are all open to the public, but just as a comparison to private garages. The actual distinction between private garages and others is primarily size. Perhaps the proper titles of Sections 406.3 and 406.4 should be "Small parking garages" and "Big parking garages', respectively.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NICHOLS-G2-406.1.doc

G54–09/10
406.1 (New), 406.2 (New), 406.2.1, 406.3.1, 406.3.2

Proponent: Donald R. Monahan, PE, Walker Parking Consultants, representing the National Parking Association and the Automated & Mechanical Parking Association

1. Add new text as follows:

SECTION 406
MOTOR-VEHICLE-RELATED OCCUPANCIES

406.1 General. Motor –vehicle related occupancies shall comply with Sections 406.1 through 406.8 and other applicable provisions of this code, the *International Fire Code* and *International Mechanical Code*.

406.2 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

PARKING GARAGE. A building, structure, or portion thereof used for the parking, storage, or both, of motor vehicles less than 6500 lbs empty curb weight.

PARKING GARAGE, OPEN. A parking garage that meets the requirements of Section 406.3.

PARKING GARAGE, ENCLOSED. Any parking garage that is not an open parking garage.

PARKING GARAGE, RAMP TYPE. A parking garage that utilizes sloped floors for vertical vehicle circulation.

PARKING GARAGE, ASSISTED MECHANICAL TYPE. A parking garage that uses lifts or other mechanical devices to transport vehicles to the upper or lower floors of a parking garage, where the vehicles are then parked by an attendant.

PARKING GARAGE. AUTOMATED MECHANICAL TYPE. A parking garage that utilizes computer-controlled machines to store and retrieve vehicles, without drivers, in multi-level storage bays.

(Renumber subsequent sections)

2. Delete without substitution as follows:

406.2 Parking garage

~~**406.2.1 Classification.** Parking garages shall be classified as either open, as defined in Section 406.3, or enclosed and shall meet the appropriate criteria in Section 406.4. Also see Section 509 for special provisions for parking garages.~~

(Renumber subsequent sections)

3. Revise as follows:

406.3 Open parking garages.

406.3.1 Scope. Except where specific provisions are made in Sections 406.3.2 through ~~406.3.13~~ 406.3.12, other requirements of this code shall apply.

4. Delete text as follows:

~~**406.3.2 Definitions.** The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.~~

~~**MECHANICAL-ACCESS OPEN PARKING GARAGES.** *Open parking garages* employing parking machines, lifts, elevators or other mechanical devices for vehicles moving from and to street level and in which public occupancy is prohibited above the street level.~~

~~**OPEN PARKING GARAGE.** A structure or portion of a structure with the openings as described in Section 406.3.3.1 on two or more sides that is used for the parking or storage of private motor vehicles as described in Section 406.3.4.~~

~~**RAMP-ACCESS OPEN PARKING GARAGES.** *Open parking garages* employing a series of continuously rising floors or a series of interconnecting ramps between floors permitting the movement of vehicles under their own power from and to the street level.~~

(Renumber subsequent sections)

Reason: Section 406 applies to parking garages in general. Therefore, the different types of parking garages should be defined in this section. Listing the definitions under Section 406.3 is inappropriate as that section is a special subset of parking garages that only applies to Open Parking Garages. In particular, it is necessary to define the different types of mechanical access garages, as some types of mechanical access garages use freight elevators to lift a vehicle to another floor where it is then parked by an attendant. Therefore, ventilation of vehicle emissions is important for that type of garage. However, automated, mechanical access parking garages are finding their way into the U.S. market from Europe and Asia. These garages use computer-controlled machines to store and retrieve vehicles without the vehicle engine running and without human intervention. The vehicles are stored in an unoccupied, enclosed storage vault. Therefore, the life safety provisions inside that unoccupied storage vault are considerably different than in an occupied space. Only access by maintenance personnel and firefighter personnel is required in the storage vault. Ventilation of vehicle emissions is not required. These garages are not defined in the current building code. Further, up to double the number of vehicles can be accommodated in automated mechanical garages so they represent “Green” design in addition to the reduction in vehicle emissions that make this type of garage greener than traditional garages.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MONAHAN-G4-406.2.1

G55–09/10
406.1.4

Proponent: Jeff Inks, representing the Window and Door Manufacturers Association (WDMA)

Revise as follows:

406.1.4 Separation. Separations shall comply with the following:

1. The private garage shall be separated from the *dwelling unit* and its *attic* area by means of a minimum 1/2-inch (12.7 mm) gypsum board applied to the garage side. Garages beneath habitable rooms shall be separated from all habitable rooms above by not less than a 5/8-inch Type X gypsum board or equivalent. Door openings between a private garage and the dwelling unit shall be equipped with either solid wood doors or solid or honeycomb core steel doors not less than 1 3/8 inches (34.9 mm) thick, or doors in compliance with Section 715.4.3 with a minimum fire protection rating of 20 minutes. Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Doors shall be self-closing and self-latching.
2. Ducts in a private garage and ducts penetrating the walls or ceilings separating the dwelling unit from the garage shall be constructed of a minimum 0.019-inch (0.48 mm) sheet steel and shall have no openings into the garage.
3. A separation is not required between a Group R-3 and U carport, provided the carport is entirely open on two or more sides and there are not enclosed areas above.

Reason: This section of the IBC implies that doors in compliance with Section 715.4.3 are to have a 20 minute fire protection rating. However, the language here and in Section 715.4.3 doesn't explicitly require that performance rating. This proposal addresses this oversight and is essentially an editorial improvement to this section of the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WOESTMAN-INKS-G1-406.1.4

G56–09/10
406.1.4. IRC R302.6

Proponent: Dennis Richardson PE, dbr group inc., representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC GENERAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

Revise as follows:

406.1.4 Separation. Separations shall comply with the following:

1. The private garage shall be separated from the *dwelling unit* ~~and~~ including its *attic* area by means of gypsum board, or its equivalent, applied to the wall and ceiling surfaces on the garage side. ~~a~~ A minimum of 1/2-inch (12.7 mm) gypsum board shall be applied to ~~the garage side. Garages beneath habitable rooms shall be separated from all habitable rooms above by~~ wall surfaces of the separation or to protect members supporting the ceiling separation and not less than a 5/8-inch (15.9 mm) Type X gypsum board ~~or equivalent~~ shall be applied to form the ceiling surfaces of the separation. The wall and ceiling surfaces as applicable shall combine to form a complete separation between the garage and any habitable areas of the dwelling unit, including its attic area. Door openings between a private garage and the d*welling unit* shall be equipped with either solid wood doors or solid or honeycomb core steel doors not less than 1 3/8 inches (34.9 mm) thick, or doors in compliance with Section 715.4.3. Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Doors shall be self-closing and self-latching.
2. Ducts in a private garage and ducts penetrating the walls or ceilings separating the *dwelling unit,* including its *attic* area*,* from the garage shall be constructed of a minimum 0.019-inch (0.48 mm) sheet steel and shall have no openings into the garage.
3. A separation is not required between a Group R-3 and U carport, provided the carport is entirely open on two or more sides and there are not enclosed areas above.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R302.6 Dwelling/garage fire separation. The garage shall be separated by wall and ceiling surfaces combined as applicable to form a complete separation between the garage and any habitable areas of the dwelling unit, including its attic area as required by Table R302.6. Openings in garage walls shall comply with Section R302.5. This provision does not apply to garage walls that are perpendicular to the adjacent *dwelling unit* wall unless providing support for ceilings or members used as part of the separation required by this section.

TABLE R302.6
DWELLING/GARAGE SEPARATION

SEPARATION	MATERIAL
~~From the residence and attics~~ Wall surfaces	Not less than ½-inch gypsum board or equivalent applied to the garage side of walls
~~From all habitable rooms above the garage~~ Ceiling surfaces	Not less than 5/8-inch Type X gypsum board or equivalent applied to the garage ceiling
Structure(s) supporting ~~floor/~~ceiling assemblies used for separation required by this section	Not less than 1/2-inch gypsum board or equivalent applied to the wall or structural members.
Garages located less than 3 feet from a dwelling unit on the same lot	Not less than 1/2-inch gypsum board or equivalent applied to the interior side of exterior walls that are within this area

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

Reason: (IBC) The current language in section 406.1.4 does not adequately convey the intent of this section which is to provide a complete separation between garage areas and any habitable areas of the dwelling unit including its attic and to provide protection of walls and members providing support of assemblies used for this separation. The existing language is also confusing because it refers to "garages beneath habitable rooms shall be separated from all habitable rooms above by not less than a 5/8-inch (15.9 mm) Type X gypsum board or equivalent" but fails to describe what to do if the ceiling surface forming the attic space above the garage is utilized fully or partially to form the separation and if the habitable rooms are offset but contiguous to the attic space above the garage.

The proposed language is superior to the existing language because it clarifies there is to be a complete separation including members providing support of the separation which is consistent with the IRC. The proposed language also makes it clear that all ceiling surfaces that are utilized as part of the separation are to be protected by an equivalent of 5/8" type x gypsum board regardless if they are located directly below the habitable room or not. The added strength and fire resistance of 5/8" gypsum board is appropriate in all portions of the separation where gypsum board is applied on horizontal or sloped ceiling surfaces where the gypsum board must support its own weight as well as insulation resting on it while being exposed to a fire directly below.

(IRC) The current language in section R302.6 and Table R302.6 does not adequately convey the intent of this section which is to provide a complete separation between garage areas and any habitable areas of the dwelling unit including its attic. The existing language is confusing because it refers to separations "From all habitable rooms above the garage" is to be separated by "not less than 5/8-inch (15.9 mm) Type X gypsum board or equivalent" but fails to describe what to do if the ceiling surface forming the attic space above the garage is utilized fully or partially to form the separation and if the habitable rooms are offset but contiguous to the attic space above the garage.

The proposed language is superior to the existing language because it clarifies there is to be a complete separation. The proposed language also makes it clear that all ceiling surfaces that are utilized as part of the separation are to be protected by an equivalent of 5/8" type x gypsum board regardless if they are located directly below the habitable room or not. The added strength and fire resistance of 5/8" gypsum board is appropriate in all portions of the separation where gypsum board is applied on horizontal or sloped ceiling surfaces where the gypsum board must support its own weight as well as insulation resting on it while being exposed to a fire directly below.

The proposed language also clarifies walls that are perpendicular to the dwelling unit wall must be protected if they provide support to ceilings or members used as part of this separation.

Cost Impact: (IBC) The code change proposal will increase the cost of construction. This proposal would increase the cost of construction if the current language is interpreted as not requiring the protection of elements supporting the separation. Otherwise this proposed change clarifies the designer has the option to utilize the garage ceiling as part of the separation even when the second floor is not located directly above the garage. When the designer has options there is an opportunity for cost savings.

(IRC) The proposed change clarifies the designer has the option to utilize the garage ceiling as part of the separation even when the second floor is not located directly above the garage. When the designer has options there is an opportunity for cost savings.

PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICHARDSON-G2-406.1.4

G57–09/10
406.2.2

Proponent: Donald R. Monahan/Walker Parking Consultants/Representing National Parking Association, and Automated & Mechanical Parking Association

Revise as follows:

406.2.2 Clear Height. The clear height of each floor level in vehicle and pedestrian traffic areas shall not be less than 7 feet (2134 mm). Vehicle and pedestrian areas accommodating van accessible parking required by Section 1106.5 shall conform to ICC A117.1.

> **Exception:** A lower clear height is allowed in computerized, mechanical-access parking structures equipped with sensors to measure the dimensions of vehicles at entry prior to activation of the storage machinery. Clear height shall not be less than 5 feet (1524 mm). The machinery shall not activate when over-size vehicles are detected.

Reason: Automated parking systems that utilize computer-controlled machines to store and retrieve vehicles are finding their way into the U.S. market from Europe and Asia. Analysis of vehicle dimensions by the Parking Consultants Council of the National Parking Association indicates that 53 percent of vehicles on the road are less than 5-feet high and 83 percent of vehicles are less than 6-feet high. In an automated, mechanical-access garage, sensors are used to measure vehicles and computers are used to sort vehicles to prescribed compartments according to size. Therefore, it is possible to customize different levels in the storage vault for different height vehicles. Also, the public is prohibited from entering the vehicle storage vault where the low clearance vehicle compartments are located.

Cost Impact: The code change proposal will not increase the cost of construction. The lower clear height in an automated parking facility will reduce the construction cost.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MONAHAN-G1-406.2.2.doc

G58–09/10
406.3.2

Proponent: Daniel E. Nichols, PE, New York State Div. of Code Enforcement and Administration

Revise as follows:

406.3.2 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meaning shown herein.

OPEN PARKING GARAGE. A structure or portion of a structure with the openings as described in Section 406.3.3.1 ~~on two or more sides~~ that is used for the parking or storage of private motor vehicles as described in Section 406.3.4.

Reason: Section 406.3.3.1 permits the use of only one side as appropriate openings in the exception on Section 406.3.3.1. The definition is in conflict with the code requirements referenced therein.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NICHOLS-G4-406.3.2.doc

G59–09/10
406.3.3.1

Proponent: Jason J. Krohn, P.E., Precast/Prestressed Concrete Institute

Revise as follows:

406.3.3.1 Openings. For natural ventilation purposes, the exterior side of the structure shall have ~~uniformly~~ distributed openings on two or more sides. The area of ~~such~~ the openings in exterior walls on a tier ~~must~~ shall be at least 20 percent of the total perimeter wall area of each tier~~.~~ and shall comply with one of the following:

1. The aggregate length of the openings considered to be providing natural ventilation shall constitute a minimum of 40 percent of the perimeter of the tier, or
2. The openings shall be distributed around at least 40 percent of the perimeter distance, whereby no portion of the perimeter distance shall be counted when it is further than 6 feet (1829 mm) from an opening, and each opening shall be a least 30 inches (762 mm) in the smallest dimension.

Interior walls shall be at least 20 percent open with uniformly distributed openings.

Exception: Openings are not required to be distributed over 40 percent of the building perimeter where the required openings are uniformly distributed over two opposing sides of the building.

Reason: The current IBC wording for the 40 percent requirement does not reflect what the current IBC commentary describes. The IBC states "*The aggregate length of the openings considered to be providing natural ventilation shall constitute a minimum of 40 percent of the perimeter of the tier.*" The commentary states "This section requires that 40 percent of the building perimeter have openings that are uniformly distributed on no less than two sides of the structure". Previous model codes such as the Standard Building Code stated "*required openings must be distributed along at least 40% of the building perimeter".* We believe the intent of the IBC is to assure that the openings used for natural ventilation be distributed over 40 percent of the building perimeter, not that the sum of their lengths be 40 percent of the perimeter. This change in wording has a significant impact on a "punched opening" parking garage. The figures below show two garages with the same size openings. Since the openings are the same size, they both achieve the 20 percent openness requirement. However, by rotating the openings 90 degrees, one of the garages does not meet the "aggregate length of at least 40 percent of the building perimeter" so it would not be considered an "open" parking garage.

Language is included stating that a designer will not be allowed to count any portion of the exterior that is 6'-0" from an opening and that such openings must be at least 30" in each direction. The selection of 30" was somewhat arbitrary, but has been used in other sections of fire codes. The logic was that fire personnel can access through an opening this size or larger. It is felt that this definition was necessary to preclude a designer from placing a very small opening (4" square for example) every 12'-0" or so, to meet the perimeter distance requirement.

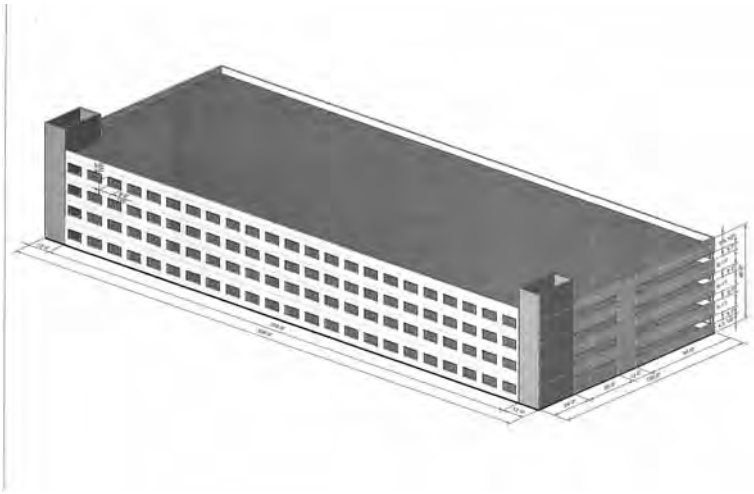


Figure 1: Spandrel type parking garage

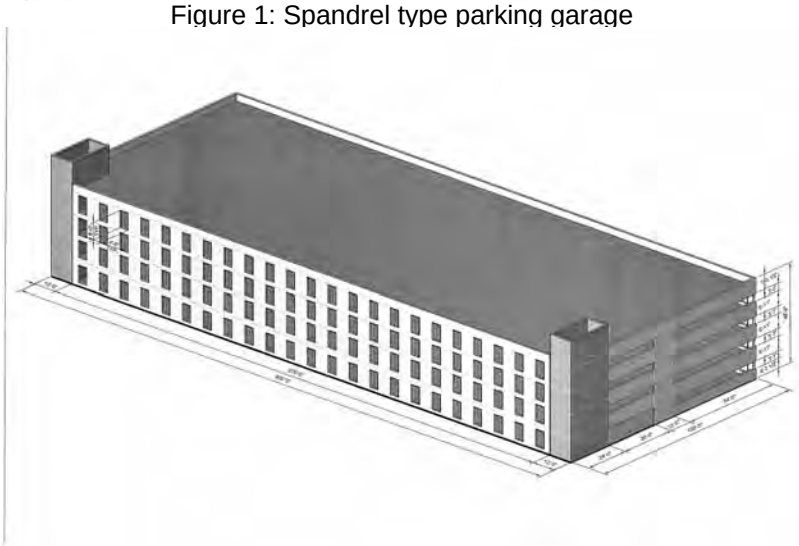


Figure 2: Punched opening parking garage

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KROHN-G1-406.3.3.1

G60–09/10
406.3.3.1.1 (New)

Proponent: Daniel E. Nichols, PE, New York State Div. of Code Enforcement and Administration

Add new text as follows:

406.3.3.1.1 Openings below grade. Where openings below grade provide required natural ventilation, the outside horizontal clear space measured perpendicular to the opening shall be one and one-half times the depth of the opening. The depth of the opening shall be measured from the average adjoining ground level to the bottom of the opening.

Reason: One of the main differences between open parking garages and enclosed garages is the ability of the openness on one or two walls to provide adequate natural ventilation. IBC Section 406.3.1.1 clearly states in the section that the openness is for natural ventilation purposes. This is supported by the IMC being completely silent on any requirements for ventilation in an open parking garage.

Open parking garages are generally separated from a surrounding structure due to limitations of fire separation distance (10 feet). However, fire separation distance isn't needed from grades and retaining walls. A condition has been experienced where an open parking garage has been built into a steep grade, and the openings are provided. In one case, a retaining wall is 5 feet away from the exterior wall of the open parking garage and the vertical distance from the lowest level of the open parking garage to the top of the wall is approximately 50 feet.

IBC Section 1203 has requirements for the use of below ground openings being used for natural ventilation. This proposal uses the exact language in Section 1203 to provide recognized design standards for below ground openings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NICHOLS-G1-406.3.3.1.1.doc

G61–09/10
406.3.6

Proponent: Jason J. Krohn, PE, Precast/Prestressed Concrete Institute

Revise as follows:

406.3.6 Area and height increases. The allowable area and height of *open parking garages* shall be increased in accordance with the provisions of this section and Sections 504 and 506. Garages with sides open on three-fourths of the building's perimeter are permitted to be increased by 25 percent in area and one tier in height. Garages with sides open around the entire building's perimeter are permitted to be increased by 50 percent in area and one tier in height. For a side to be considered open under the above provisions, the total area of openings along the side shall not be less than 50 percent of the interior area of the side at each tier and such openings shall be equally distributed along the length of the tier.

Allowable tier areas in Table 406.3.5 shall be increased for *open parking garages* constructed to heights less than the table maximum. The gross tier area of the garage shall not exceed that permitted for the higher structure. At least three sides of each such larger tier shall have continuous horizontal openings not less than 30 inches (762 mm) in clear height extending for at least 80 percent of the length of the sides and no part of such larger tier shall be more than 200 feet (60 960 mm) horizontally from such an opening. In addition, each such opening shall face a street or *yard* accessible to a street with a width of at least 30 feet (9144 mm) for the full length of the opening, and standpipes shall be provided in each such tier.

Open parking garages of Type II construction, with all sides open, shall be unlimited in allowable area where the *building height* does not exceed 75 feet (22 860 mm). For a side to be considered open, the total area of openings along the side shall not be less than 50 percent of the interior area of the side at each tier and such openings shall be equally distributed along the length of the tier. All portions of tiers shall be within 200 feet (60 960 mm) horizontally from such openings or other natural ventilation openings as defined in Section 406.3.3.1. These openings shall be permitted to be provided in *courts* with a minimum dimension of 20 feet (6096 mm) for the full width of the openings.

Reason: The only section that currently allows for height and area increases to Table 406.3.5 is section 406.3.6. This section gives increases to Table 406.3.5 but they are related to "openness". This section does not give increases for automatic sprinkler systems or building frontage as is allowed by sections 504 and 506 to Table 503 which must be used for "enclosed" parking garages. This means that it is possible to have an "enclosed" parking garage with bigger area per floor than an "open" parking garage.

Sections 406.3.5, 406.3.5.1, and 406.3.6 set the limitations for the Heights and Areas of open parking garages. The logic presumably is that an open garage can be constructed to a greater area per floor for a given construction type than an enclosed garage. However, enclosed parking garage floor areas are able to be increased for multi-story parking garages by 200 percent provided they are sprinklered. No such area increase is allowed for open parking garages. Consequently, an enclosed, sprinklered parking garage of Type IIA can be constructed to 39,000 sf + (200%* 39,000 sf) = 117,000 sf per floor. While an open parking garage of Type IIA construction can be constructed to only 50,000 sf per floor, regardless of whether or not it has fire sprinklers. Therefore, the requirements for the open parking garage are far more stringent under this scenario. Other height and area increases are allowed as outlined in section 406.3.6, yet none allow any additional increase for fire sprinklers as is allowed for almost all other structures.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KROHN-G2-406.3.6

G62–09/10
406.3.6

Proponent: Jason J. Krohn, PE, Precast/Prestressed Concrete Institute

Revise as follows:

406.3.6 Area and height increases. The allowable area and height of *open parking garages* shall be increased in accordance with the provisions of this section. Garages with sides open on three-fourths of the building's perimeter are permitted to be increased by 25 percent in area and one tier in height. Garages with sides open around the entire building's perimeter are permitted to be increased by 50 percent in area and one tier in height. For a side to be considered open under the above provisions, the total area of openings along the side shall not be less than 50 percent of the interior area of the side at each tier and such openings shall be equally distributed along the length of the tier. For purposes of calculating the interior area of the side, the height shall not exceed 7 feet (2134 mm).

Allowable tier areas in Table 406.3.5 shall be increased for *open parking garages* constructed to heights less than the table maximum. The gross tier area of the garage shall not exceed that permitted for the higher structure. At least three sides of each such larger tier shall have continuous horizontal openings not less than 30 inches (762 mm) in clear height extending for at least 80 percent of the length of the sides and no part of such larger tier shall be more than 200 feet (60 960 mm) horizontally from such an opening. In addition, each such opening shall face a street or *yard* accessible to a street with a width of at least 30 feet (9144 mm) for the full length of the opening, and standpipes shall be provided in each such tier.

Open parking garages of Type II construction, with all sides open, shall be unlimited in allowable area where the *building height* does not exceed 75 feet (22 860 mm). For a side to be considered open, the total area of openings along the side shall not be less than 50 percent of the interior area of the side at each tier and such openings shall be equally distributed along the length of the tier. For purposes of calculating the interior area of the side, the height shall not exceed 7 feet (2134 mm). All portions of tiers shall be within 200 feet (60 960 mm) horizontally from such openings or other natural ventilation openings as defined in Section 406.3.3.1. These openings shall be permitted to be provided in *courts* with a minimum dimension of 20 feet (6096 mm) for the full width of the openings.

Reason: Currently, the IBC does not include a definition of "interior area of the side". Consequently, the interior area values have been interpreted differently by building officials in various jurisdictions. To clarify the code, a value of 7 feet is added for the height dimension of interior area. This value of 7 feet is consistent with the minimum height requirement of Sections 406.2.2 and 406.3.5.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KROHN-G3-406.3.6

G63–09/10
406.3.6

Proponent: Donald R. Monahan, PE, Walker Parking Consultants, representing the National Parking Association and the Automated & Mechanical Parking Association

Revise as follows:

406.3.6 Area and height increases. The allowable area and height of open parking garages shall be increased in accordance with the provisions of this section. Garages with sides open on three-fourths of the building's perimeter are permitted to be increased by 25 percent in area and one tier in height. Garages with sides open around the entire building's perimeter are permitted to be increased by 50 percent in area and one tier in height. For a side to be considered open under the above provisions, the total area of openings along the side shall not be less than 50 percent of the interior area of the side at each tier and such openings shall be equally distributed along the length of the tier.

Allowable tier areas in Table 406.3.5 shall be increased for open parking garages constructed to heights less than the table maximum. The gross tier area of the garage shall not exceed that permitted for the higher structure. At least three sides of each such larger tier shall have continuous horizontal openings not less than 30 inches (762 mm) in clear height extending for at least 80 percent of the length of the sides and no part of such larger tier shall be more than 200 feet (60 960 mm) horizontally from such an opening. In addition, each such opening shall face a street or yard accessible to a street with a width of at least 30 feet (9144 mm) for the full length of the opening, and standpipes shall be provided in each such tier.

Open parking garages of Type II construction, with all sides open, shall be unlimited in allowable area where the building height does not exceed 75 feet (22 860 mm). For a side to be considered open, the total area of openings along the side shall not be less than 50 percent of the interior area of the side at each tier and such openings shall be equally distributed along the length of the tier. All portions of tiers shall be within 200 feet (60 960 mm) horizontally from such openings or other natural ventilation openings as defined in Section 406.3.3.1. These openings shall be permitted to be provided in courts with a minimum dimension of 20 feet (6096 mm) for the full width of the openings.

<u>The interior area as used in the paragraphs above shall mean the clear height from the floor to the bottom of the structural frame above times the length of a side.</u>

Reason: There is no definition in the IBC for the interior area. As a result, the interior area has been interpreted differently by many building officials. Since the structural frame inhibits air flow through the garage, the natural ventilation is then accommodated by the clear distance from the floor to the bottom of the structural frame above such that the required opening on each side should be a function of that clear height.

Cost Impact: The code change proposal will not increase the cost of construction. Cost savings as a result of allowing Type II construction with increased height and area as a result of increased openness versus needing Type I construction with higher fire rating.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MONAHAN-G2-406.3.6

G64–09/10
IBC 406.7 (New), IFC 2303.2

Proponent: Donald R. Monahan, PE, Walker Parking Consultants, representing the National Parking Association and the Automated & Mechanical Parking Association

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC GENERAL COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE IBC GENERAL COMMITTEE.

PART I – IBC GENERAL

1. Add new section as follows:

<u>406.7 Parking garages, automated mechanical type.</u>

<u>406.7.1 General.</u> <u>Automated mechanical type parking garages shall comply with Sections 406.7.1 through 406.7.3.</u>

406.7.2 Construction. The storage vault enclosure is classified as a high-bay storage warehouse for motor vehicles, and shall meet the requirements of Chapter 23 of the *International Fire Code*.

406.7.3 Storage Racks. The storage racks shall consist of non-combustible construction. Steel storage racks shall designed in accordance with Section 2208.

PART II – IFC

Revise text as follows:

2303.2 Class I commodities. Class I commodities are essentially noncombustible products on wooden or nonexpanded polyethylene solid deck pallets, in ordinary corrugated cartons with or without single-thickness dividers, or in ordinary paper wrappings with or without pallets. Class I commodities are allowed to contain a limited amount of Group A plastics in accordance with Section 2303.7.4. Examples of Class I commodities include, but are not limited to, the following:

Alcoholic beverages not exceeding 20-percent alcohol
Appliances noncombustible, electrical
Cement in bags
Ceramics
Dairy products in nonwax-coated containers (excluding bottles)
Dry insecticides
Foods in noncombustible containers
Fresh fruits and vegetables in nonplastic trays or containers
Frozen foods
Glass
Glycol in metal cans
Gypsum board
Inert materials, bagged
Insulation, noncombustible
Motor vehicles less than 6500 pounds empty curb weight
Noncombustible liquids in plastic containers having less than a 5-gallon (19 L) capacity
Noncombustible metal products

Reason: (IBC) Automated, mechanical-access parking garages are finding their way into the U.S. market from Europe and Asia. These facilities utilize computer-controlled machines and lifts to store and retrieve vehicles on a platform without the engine running and without human intervention in an unoccupied, high-bay storage vault. They have unique fire and life safety issues and as such need a separate code section to define the code requirements for these unique facilities.

(IFC) Automated, mechanical-access parking garages are finding their way into the U.S. market from Europe and Asia. These facilities utilize computer-controlled machines and lifts to store and retrieve vehicles without the engine running and without human intervention in an unoccupied, high-bay storage vault. They have unique fire and life safety issues that are similar to high piled storage of commodities covered by Chapter 23 of the IFC and therefore should be included in this Chapter. The reference below indicates that the amount of combustibles in a typical passenger vehicle is less than 5 pounds per sf, which then classifies passenger vehicles as low hazard in accordance with NIST standards and qualifies as a Class I commodity in this section.

References: *Parking Structure Fires* by the Parking Consultants Council of the National Parking Association, Washington, DC, December 2008

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART I – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MONAHAN-G5-406.7 NEW (Pt II F2-2303.2)

G65–09/10

407, 1008.1.9.6 (IFC [B] 1008.1.8.6), 1106.3, 1106.4, Table 1604.5, Table [P] 2902.1 (IPC Table 403.1)

Proponent: Paul K. Heilstedt, PE, Chair, representing ICC Code Technology Committee (CTC)

Revise as follows:

SECTION 407
GROUP I-2

407.1 General. Occupancies in Group I-2 shall comply with the provisions of Sections 407.1 through 407.9 and other applicable provisions of this code.

407.2 Corridors. Corridors in occupancies in Group I-2 shall be continuous to the exits and separated from other areas in accordance with Section 407.3 except spaces conforming to Sections 407.2.1 through 407.2.4.

407.2.1 Waiting and similar areas. Waiting areas and similar spaces constructed as required for corridors shall be permitted to be open to a corridor, only where all of the following criteria are met:

1. The spaces are not occupied for ~~patient~~ care recipient's sleeping units, treatment rooms, hazardous or incidental accessory occupancies in accordance with Section 508.2.
2. The open space is protected by an automatic fire detection system installed in accordance with Section 907.
3. The corridors onto which the spaces open, in the same smoke compartment, are protected by an automatic fire detection system installed in accordance with Section 907, or the smoke compartment in which the spaces are located is equipped throughout with quick-response sprinklers in accordance with Section 903.3.2.
4. The space is arranged so as not to obstruct access to the required exits.

407.2.2 ~~Nurses'~~ Care providers' stations. Spaces for care providers', supervisory staff, doctors' and nurses' charting, communications and related clerical areas shall be permitted to be open to the corridor, when such spaces are constructed as required for corridors.

407.2.3 ~~Mental health~~ Psychiatric treatment areas. Areas wherein ~~mental health~~ psychiatric ~~patient~~ care recipient's who are not capable of self-preservation are housed, or group meeting or multipurpose therapeutic spaces other than incidental accessory occupancies in accordance with Section 508.2.5, under continuous supervision by facility staff, shall be permitted to be open to the corridor, where the following criteria are met:

1. Each area does not exceed 1,500 square feet (140 m^2),
2. The area is located to permit supervision by the facility staff.
3. The area is arranged so as not to obstruct any access to the required exits.
4. The area is equipped with an automatic fire detection system installed in accordance with Section 907.2.
5. Not more than one such space is permitted in any one smoke compartment.
6. The walls and ceilings of the space are constructed as required for corridors.

407.2.4 Gift shops. Gift shops and associated storage that are less than 500 square feet (455 m^2) in area shall be permitted to be open to the corridor ~~provided the gift shop and storage areas are fully sprinklered and storage areas are protected in accordance with Section 508.2.5~~ when such spaces are constructed as required for corridors.

407.3 Corridor walls. Corridor walls shall be constructed as smoke partitions in accordance with Section 711.

407.3.1 Corridor doors. Corridor doors, other than those in a wall required to be rated by Section 508.2.5 or for the enclosure of a vertical opening or an exit, shall not have a required fire protection rating and shall not be required to be equipped with self-closing or automatic-closing devices, but shall provide an effective barrier to limit the transfer of smoke and shall be equipped with positive latching. Roller latches are not permitted. Other doors shall conform to Section 715.4.

407.3.2 Locking devices. Locking devices that restrict access to the ~~patient~~ care recipient's room from the corridor, and that are operable only by staff from the corridor side, shall not restrict the means of egress from the ~~patient~~ care recipient's room.

Exceptions:

1. This section shall not apply to rooms in psychiatric treatment and similar care areas.
2. Locking arrangements in accordance with Section 1008.1.9.6.

407.4 Smoke barriers. Smoke barriers shall be provided to subdivide every story used by ~~patients for~~ persons receiving care, ~~sleeping or~~ treatment or sleeping and to divide other stories with an occupant load of 50 or more persons, into at least two smoke compartments. Such stories shall be divided into smoke compartments with an area of not more than 22,500 square feet (2092 m^2) and the travel distance from any point in a smoke compartment to a smoke barrier door shall not exceed 200 feet (60 960 mm). The smoke barrier shall be in accordance with Section 710.

407.4.1 Refuge area. ~~At least 30 net square feet (2.8m^2) per patient shall be provided the aggregate area of corridors, patient rooms, treatment rooms, lounge or dining areas and other low-hazard areas on each side of each smoke barrier. On floors not housing patients confined to a bed or litter, at least 6 net square feel (0.56 m^2) per occupant shall be provided on each side of each smoke barrier for the total number of occupants in adjoining smoke compartments.~~ Refuge areas shall be provided within each smoke compartment. The size of the refuge area shall accommodate the occupants and care recipients from the adjoining smoke compartment. Where a smoke compartment is adjoined by two or more smoke compartments, the minimum area of the refuge area shall accommodate the largest occupant load of the adjoining compartments. The size of the refuge area shall provide the following:

1. A minimum of 30 net square feet (2.8m^2) per care recipient confined to bed or litter.
2. A minimum of 6 square feet (0.56m^2) per ambulatory care recipient not confined to bed or litter and for occupants.

Areas or spaces permitted to be included in the calculation of refuge area are corridors, sleeping areas, treatment rooms, lounge or dining areas and other low hazard areas.

407.4.2 Independent egress. A means of egress shall be provided from each smoke compartment created by smoke barriers without having to return through the smoke compartment from which means of egress originated.

407.4.3 Horizontal assemblies. *Horizontal assemblies* supporting *smoke barriers* required by this section shall be designed to resist the movement of smoke and shall comply with Section 712.9.

[F] 407.5 Automatic sprinkler system. Smoke compartments containing ~~patient~~ sleeping units shall be equipped throughout with an automatic fire sprinkler system in accordance with Sections 903.3.1.1 and 903.3.2. ~~The smoke compartments shall be equipped with *approved* quick-response or residential sprinklers in accordance with Section 903.3.2.~~

[F] 407.6 Fire alarm system. A fire alarm system shall be provided in accordance with Section 907.2.6.

[F] 407.7 Automatic fire detection. Corridors in nursing homes ~~(both intermediate care and skilled nursing facilities)~~, long-term care facilities, detoxification facilities and spaces permitted to be open to the corridors by Section 407.2 shall be equipped with an automatic fire detection system. Hospitals shall be equipped with smoke detection as required in Section 407.2.

Exceptions:

1. Corridor smoke detection is not required where ~~patient~~ sleeping units are provided with smoke detectors that comply with UL 268. Such detectors shall provide a visual display on the corridor side of each ~~patient~~ sleeping unit and an audible and visual alarm at the ~~nursing~~ care provider's station attending each unit.
2. Corridor smoke detection is not required where ~~patient~~ sleeping unit doors are equipped with automatic door-closing devices with integral smoke detectors on the unit sides installed in accordance with their listing, provided that the integral detectors perform the required alerting function.

407.8 Secured yards. Grounds are permitted to be fenced and gates therein are permitted to be equipped with locks, provided that safe dispersal areas having 30 net square feet (2.8 m^2) for bed and litter ~~patients~~ care recipients and 6 net square feet (0.56 m2) for ambulatory ~~patients~~ care recipients and other occupants are located between the building and the fence. Such provided safe dispersal area shall not be located less than 50 feet (15 240 mm) from the building they serve.

407.9 Hyperbaric facilities. Hyperbaric facilities in Group I-2 occupancies shall meet the requirements contained in Chapter 20 of NFPA 99.

1008.1.9.6 (IFC [B] 1008.1.9.6) Special locking arrangements in Group I-2. Approved special ~~delayed~~ egress locks shall be permitted in a Group I-2 occupancy where the clinical needs of persons receiving care require such locking. Special ~~Delayed~~ egress locks shall be permitted in such occupancies where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or an approved automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors are installed ~~unlock~~ in accordance with Items 1 through ~~6~~ 7 below. ~~A building occupant shall not be required to pass through more than one door equipped with a delayed egress lock before entering an exit.~~

1. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.
2. The doors unlock upon loss of power controlling the lock or lock mechanism.
3. The door locks shall have the capability of being unlocked by a signal from the fire command center, a nursing station or other approved location.
4. A building occupant shall not be required to pass through more than one door equipped with a special egress lock before entering an exit.
5. ~~4~~. The procedures for the operation(s) of the unlocking system shall be described and approved as part of the emergency planning and preparedness required by Chapter 4 of the *International Fire Code*.
6. ~~5~~. All clinical staff shall have the keys, codes or other means necessary to operate the locking devices.
7. ~~6~~. Emergency lighting shall be provided at the door.

Exception: Items 1 through ~~3~~ 4 shall not apply to doors to areas where persons which because of clinical needs require restraint or containment as part of the function of a ~~mental hospital treatment facility~~ psychiatric treatment areas.

1106.3 Hospital outpatient facilities. At least 10 percent, but not less than one, of ~~patient~~ care recipient and visitor parking spaces provided to serve hospital outpatient facilities shall be *accessible*.

1106.4 Rehabilitation facilities and outpatient physical therapy facilities. At least 20 percent, but not less than one, of the portion of ~~patient~~ care recipient and visitor parking spaces serving rehabilitation facilities specializing in treating conditions that affect mobility and outpatient physical therapy facilities shall be *accessible*.

TABLE 1604.5
OCCUPANCY CATEGORY OF BUILDINGS AND OTHER STRUCTURES

OCCUPANCY CATEGORY	NATURE OF OCCUPANCY
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: • Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. • Buildings and other structures containing elementary school, secondary school or day care facilities with an occupant load greater than 250. • Buildings and other structures containing adult education facilities, such as colleges and universities with an occupant load greater than 500. • Group I-2 occupancies with an occupant load of 50 or more resident ~~patients~~ care recipients but not having surgery or emergency treatment facilities. • Group I-3 occupancies. • Any other occupancy with an occupant load greater than 5,000a. • Power-generating stations, water treatment facilities for potable water, waste water treatment facilities and other public utility facilities not included in Occupancy Category IV. • Buildings and other structures not included in Occupancy Category IV containing sufficient quantities of toxic or explosive substances to be dangerous to the public if released.

(Portions of table not shown remain unchanged)

[P] TABLE 2902.1 (IPC TABLE 403.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]
(See Sections 2902.2 and 2902.3)

No.	CLASSIFICATION		OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 419.2 OF THE INTERNATIONAL PLUMBING CODE)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAINS [e, f] (SEE SECTION410.1 OF THE INTERNATIONAL PLUMBING CODE)	OTHER
					MALE	FEMALE	MALE	FEMALE			
5		Institutional	I-2	Hospitals, ambulatory nursing home ~~patients~~ care recipient	1 per room		1 per room		1 per 15	1 per 100	1 service sink

(Portions of table not shown remain unchanged)

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Care Facilities". The scope of the activity is noted as:

> Study issues associated with Day Care/Adult Care, Ambulatory Health Care and Assisted Living facilities with an emphasis on the number of occupants in relation to the supervision, and the determination of the resident's capability of responding to an emergency situation without physical assistance from the facility's supervision.

The Code Technology Committee Study Group on Care Facilities has conducted a comprehensive review of current building and fire codes, federal regulations and prior code change proposals dealing with the provision of "care". "Care" as it relates to the scope of this work relates to an occupant of a building who is compromised (mentally or physically) and receives some type of support (care). These facilities encompass a full spectrum of acuity and span a wide range of occupancy types including Groups B, E, I and R. On the lower end of the spectrum, occupants may be aged and receive occasional day living assistance such as cooking and cleaning. On the opposite end of the spectrum, occupants may be completely bedridden and dependant on medical gases and emergency power to maintain life.

The proposed changes provide clear direction for design and construction by using terms and concepts consistently and clearly identifying thresholds related to the condition of an occupant. Federal regulations and state licensing provisions were considered, but primarily in terms of avoiding conflicting requirements. It is not the intent of these changes to address licensing or operational issues. We do believe that the proposed changes will provide consistent and correlated language between these multiple sources of regulations that will help design and code professionals address the needs of care recipients in the many different types of facilities.

A major goal is to provide clarity and consistency of terminology. New definitions are added to specifically describe each type of care or facility and identify the distinct differences in these. Some terms are consolidated to be more descriptive of a group of occupants, yet generic enough to be used interchangeably. For example: a "Patient" is now identified as a "care recipient" and "nurse" is now "care provider". People receive care of varying types but they are not always referred to as "patients". They receive care from a wide range of persons with different technical abilities, not just a "nurse" or "staff". Other definitions address existing terms not defined within current code. The study group believes that these changes bring a practical response to the recent developments within the healthcare delivery system.

Day Care Facilities, Section 305.3 and related sections: This public comment represents the collaborative efforts of the CTC Study Group on Care to clarify the scope and intent of the code as it applies to the subject of when care is provided and what are the appropriate elements of the building code to address the risks associated with Day Care. Changes to modify the existing language include:

- Changing the provisions for religious educational facilities to become an exception.
- Adding a definition section for the educational group and moving the definition of personal care services from 310.2 to 305.2, clarifying the day care as a day care facility, and adding the correlation to classify that a Group E, day care facility with five or fewer is allowed in an R-3 or may be constructed per the IRC.
- Adding clarifications to the I-4 Group to include both adult and child day care services, and adding an exception for such services within a place of worship, and clarifying that day care facility with five or fewer is allowed in an R-3 or may be constructed per the IRC.
- Correlating the requirements for fire suppression in Chapter 9 with the provisions for day care.
- Clarifying the requirement for means of egress from day care where more than 10 children receive care.
- Removing the occupancy group designations from the scoping criteria in Chapter 11 as being unnecessary, C
- Clarifying that the plumbing table is applicable for day care, and that the exclusion for partitions is meant to apply to child day care, not all day care.

Issues concerning the multitude of occupancies, conflicting criteria and/or confusion between the occupancies identified as "Day Care vs. Child or Adult Day Care" were the initial impetus for the study of care. The overlap and inconsistencies for all types of care were eventually included once the true scope of the issues was recognized.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: HEILSTEDT-G1-407.doc

G66–09/10
407.3.1

Proponent: Robert J Davidson, Code Consultant, Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Revise as follows:

407.3 Corridor walls. *Corridor* walls shall be constructed as smoke partitions in accordance with Section 711.

407.3.1 Corridor doors. ~~*Corridor* doors, other than those in a wall required to be rated by Section 508.2.5 or for the enclosure of a vertical opening or an *exit*, shall not have a required *fire protection rating* and shall not be required to be equipped with self-closing or automatic-closing devices, but shall provide an effective barrier to limit the transfer of smoke and shall be equipped with positive latching. Roller latches are not permitted. Other doors shall conform to Section 715.4.~~ Doors in corridors shall comply with Section 715.4 in the following locations:

1. Doors located in a wall required to be rated by Section 508.2.5;
2. Doors opening into an enclosure of a vertical opening or an exit; and
3. Doors in corridors in assisted living facilities.

Doors in corridors not listed above shall not be required to have a fire protection rating and shall not be required to be equipped with self-closing or automatic-closing devices, but shall provide an effective barrier to limit the transfer of smoke and shall be equipped with positive latching. Roller latches are not permitted

Reason: This proposal takes the exception language found within the body of Section 407.3.1 and breaks it out into exceptions 1 and 2. Exception 3 is added to provide an appropriate level of protection for occupants of assisted living facilities, many of whom require assistance to evacuate. For this occupancy smoke migration must be controlled until the occupants can be evacuated and for the migration to be controlled the doors must self closing. The purpose of the rating is to recognize that fires starting in a patient's room must be contained until extinguished to protect the corridor and the remaining portions of the occupancy.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: This proposal is related to Davidson/Shuman proposal to Section 308 which relocates assisted living facilities from Group I-1 to the I-2 Occupancy category.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-G3-407.3.1.doc

G67–09/10
410.2, 410.5.3, 410.6(New), 1009.7, 1015.6, 1015.6.1, 1022.1 (IFC [B] 1009.7, 1015.6, 1015.6.1, 1022.1)

Proponent: Ron Clements, Chesterfield County Virginia Building Inspection Department, representing self; Bill Conner, representing American Society of Theatre Consultants

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

1. Revise as follows:

SECTION 410
STAGES, ~~AND~~ PLATFORMS AND TECHNICAL PRODUCTION AREAS

410.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

~~**FLY GALLERY.** A raised floor area above a stage from which the movement of scenery and operation of other stage effects are controlled.~~

~~**GRIDIRON**. The structural framing over a stage supporting equipment for hanging or flying scenery and other stage effects.~~

TECHNICAL PRODUCTION AREA. Open elevated areas or spaces intended for entertainment technicians to walk on and occupy for servicing and operating entertainment technology systems and equipment. Galleries, including fly and lighting galleries, gridirons, catwalks, and similar areas are designed for these purposes.

(Remaining definitions are unchanged)

2. Delete text as follows:

~~**Section 410.5.3 Stage Exits**. At least one approved means of egress shall be provided from each side of the stage and from each side of the space under the stage. At least one means of escape shall be provided from each fly gallery and from the gridiron. A steel ladder, alternating tread stairway or spiral stairway is permitted to be provided from the gridiron to a scuttle in the stage roof.~~

3. Add text as follows:

410.6 Means of egress. Except as modified or as provided for in this section, the provisions of Chapter 10 shall apply.

410.6.1 Arrangement. Where two or more exits or exit access doorways are required per Section 1015.1 from the stage, at least one exit or exit access doorway shall be provided on each side of a stage.

410.6.2 Stairway and ramp enclosure. Stairways and ramps provided from stages, platforms and technical production areas are not required to be enclosed.

410.6.3 Technical production areas. Technical production areas shall be provided with means of egress andmeans of escape in accordance with Section 410.6.3.1 through 410.6.3.5.

410.6.3.1 Means of egress. At least one means of egress shall be provided from technical production areas.

410.6.3.2 Travel distance. The maximum length of exit access travel shall not exceed 300 feet (91.44 mm) for buildings without a sprinkler system and 400 feet (121.92 m) for buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

410.6.3.3 Two means of egress. Where two means of egress are required the common path of travel shall not exceed 100 feet (30.48 m).

Exception: A means of escape to a roof in place of a second means of egress is permitted.

410.6.3.4 Path of egress travel. The following exit access components are permitted when serving technical production areas:

1. Stairways
2. Ramps
3. Spiral stairways
4. Catwalks
5. Alternating tread devices
6. Permanent ladders

410.6.3.5 Width. The path of egress travel within and from technical support areas shall be a minimum of 22 inches (559 mm).

(Renumber subsequent sections)

4. Revise as follows:

1009.7 Vertical rise. A flight of stairs shall not have a vertical rise greater than 12 feet (3658 mm) between floor levels or landings.

Exceptions:

1. Aisle stairs complying with Section 1028.
2. Alternating tread devices used as a means of egress shall not have a rise greater than 20 feet (6096 mm) between floor levels or landings.
3. Spiral stairways used as a means of egress from technical production areas.

5. Delete without substitution as follows:

~~**1015. 6 (IFC [B] 1015.6) Stage means of egress.** Where two means of egress are required, based on the stage size or occupant load, one means of egress shall be provided on each side of the stage.~~

~~**1015. 6.1 (IFC [B] 1015.6.1) Gallery, gridiron and catwalk means of egress.** The means of egress from lighting and access catwalks, galleries and gridirons shall meet the requirements for occupancies in Group F-2.~~

~~**Exceptions:**~~

1. ~~A minimum width of 22 inches (559 mm) is permitted for lighting and access catwalks.~~
2. ~~Spiral stairs are permitted in the means of egress.~~
3. ~~Stairways required by this subsection need not be enclosed.~~
4. ~~Stairways with a minimum width of 22 inches (559 mm), ladders, or spiral stairs are permitted in the means of egress.~~
5. ~~A second means of egress is not required from these areas where a means of escape to a floor or to a roof is provided. Ladders, alternating tread devices or spiral stairs are permitted in the means of escape.~~
6. ~~Ladders are permitted in the means of egress.~~

6. Revise as follows:

1022.1 (IFC [B] 1022.1) Enclosures required. Interior exit stairways and interior exit ramps shall be enclosed with fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. Exit enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the exit enclosure shall include any basements but not any mezzanines. Exit enclosures shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours. Exit enclosures shall lead directly to the exterior of the building or shall be extended to the exterior of the building with an exit passageway conforming to the requirements of Section 1023, except as permitted in Section 1027.1. An exit enclosure shall not be used for any purpose other than means of egress.

Exceptions:

1. In all occupancies, other than Group Hand I occupancies, a stairway is not required to be enclosed when the stairway serves an occupant load of less than 10 and the stairway complies with either Item 1.1 or 1.2. In all cases, the maximum number of connecting open stories shall not exceed two.
   1.1. The stairway is open to not more than one story above its level of exit discharge; or
   1.2. The stairway is open to not more than one story below its level of exit discharge.
2. Exits in buildings of Group A-5 where all portions of the means of egress are essentially open to the outside need not be enclosed.
3. Stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.
4. Stairways in open parking structures that serve only the parking structure are not required to be enclosed.
5. Stairways in Group I-3 occupancies, as provided for in Section 408.3.8, are not required to be enclosed.
6. Means of egress stairways as ~~required by Sections 410.5.3 and 1015.6.1~~ provided for in Sections 410.6.2 are not required to be enclosed.
7. Means of egress stairways from balconies, galleries or press boxes as provided for in Section 1028.5.1 are not required to be enclosed.

Reason: Currently special means of egress provisions for stages are located in two separate sections and chapters, Section 410.5.3 and 1015.6. The separate sections are in conflict with one another and are not consistent in terminology . Section 410.5.3 requires two exit access routes, one from each side of the stage regardless of occupant load or travel distance. Section 1015.6, however, allows a singe exit or exit access route if common path of travel and occupant load limits per table 1015.1 are met. Section 410.5.3 allows a singe exit or exit access from the fly gallery or the gridiron without a travel distance restriction. Section 1015.6.1 requires the means of egress for the gallery and gridiron to meet means of egress provisions for F-2, which can require multiple exits or exit access routes and limits the travel distance per group F-2 requirements. Current section 1015.6.1 also refers to gallery instead of the currently defined term fly gallery that is referenced in Section 410.5.3.

The proposed change removes the dated terms and definitions of fly gallery and gridiron and replaces them with a single modern term "Technical Production Area". Technical production area encompasses all areas, regardless of their traditional name, used to support entertainment technology from above the performance area. Technical production areas may also be used is venues without stages or platforms, such as sports arenas; therefore it was added to the title of Section 410 as a stand-alone area regulated by proposed Section 410.7.

Proposed sections 410.6 through 410.7.4.1 will completely replace the conflicting sections 410.5.3 and 1015.6 providing a single coordinated set of means of egress requirements for stages, platforms and technical production areas. The proposed section 410.6 language " Except as modified or as provided for in this section, the provisions of Chapter 10 shall apply" removes a need for any pointers or exceptions in Chapter 10 and the language was modeled from existing Group I-3 language in Section 408.3 so the language is consistent with language already in Chapter 4 used for the same purposed.

Section 410.6.1 retains the current Section 1015.6 concept of requiring the number of exits based on occupant load and travel distance per Section 1015 and keeps the current concept that if 2 means of egress are required from the stage, per Section 1015, then they must be located on either side of the stage. The reference to the space under the stage was deleted as this provision was also a bit outdated because modern configurations of spaces below stages are extremely variable.

Proposed Section 410.7 and sub sections sets specific performance based requirements for all technical production areas, regardless of their name or label. This proposal clarifies that both the travel distance and the common path of travel limits apply. The 100' common path of travel was chosen since stages are generally in sprinklered buildings. The 300' and 400' travel distances were based on the current group F-2 designation assigned to galleries in current Section 1015.6.1. The second egress means of escape is based on current Section 410.5.3 and 1015.6.1 exception #5. The permitted exit access components allowed for serving the technical production and the 22" width in proposed Section 410.7.1 are based on current Section 1015.6.1. The allowance for the use of a ladder in the means of egress serving a fly gallery was changed to require the ladder be permanently installed so that a movable ladder cannot be used for egress.

In Section 1009.7 exception #3 is proposed to address the special case of spiral stairs serving technical production areas without the need for the landing at 12' intervals.

Section 1015.6 is proposed to be removed entirely. The code change puts the special detailed requirements for stage, platform and technical production area means of egress completely in Chapter 4. The reason that the two sections, one in Chapter 4 and one in Chapter 10, were in conflict is because having the provisions in two separate code text locations set up the scenario where changes were not made to each section to keep them synchronized. Special provisions of Chapter 4 do not need to be repeated in the code.

Exception #6 to 1022.1 is deleted and replaced with a reference to proposed Sections 410.6.2.

Cost Impact: The code change proposal will reduce the cost of construction by allowing for smaller stages to be constructed with one exit or exit access instead of two. Additional cost savings will be provided by the reduced confusion and misapplication of the code provisions for stage means of egress; inconsistent and confusion code provisions cost extra money to the code users.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CLEMENTS-E3-1015.6

G68–09/10
410.2, 410.3.2

Proponent: Bill Conner, representing American Society of Theatre Consultants

1. Delete without substitution:

410.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

~~**PINRAIL.** A rail on or above a stage through which belaying pins are inserted and to which lines are fastened.~~

2. Revise as follows:

410.3.2 Galleries, gridirons~~,~~ and catwalks ~~and pinrails~~. Beams designed only for the attachment of portable or fixed theater equipment, gridirons, galleries and catwalks shall be constructed of approved materials consistent with the requirements for the type of construction of the building; and a fire-resistance rating shall not be required. These areas shall not be considered to be floors, stories, mezzanines or levels in applying this code.

Exception: Floors of fly galleries and catwalks shall be constructed of any approved material.

Reason: First, this is a nearly antiquated term and feature, replaced by modern lock-rails or completely by electric motors. Second, there is a definition in the Code and the use of the term in a heading of a section but no specific requirements or regulation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CONNER-G4-410.3.2

G69–09/10
410.3.7.1, 410.3.7.2

Proponent: Bill Conner, representing American Society of Theatre Consultants

Revise as follows:

410.3.7.1 Roof vents. Two or more vents constructed to open automatically by approved heat-activated devices and with an aggregate clear opening area of not less than 5 percent of the area of the stage shall be located near the center and above the highest part of the stage area. Supplemental means shall be provided for manual emergency opening ~~operation~~ of the ventilator and for non-emergency manual means to open and close the ventilator. Manual operation shall be possible from the stage floor or other approved location. Curbs shall be provided as required for skylights in Section 2610.2. Vents shall be labeled.

[F] 410.3.7.2 Smoke control. Smoke control in accordance with Section 909 shall be provided to maintain the smoke layer interface not less than 6 feet (1829 mm) above the highest level of the assembly seating or above the top of the proscenium opening where a proscenium wall is provided in compliance with Section 410.3.4. In addition to the manual control provided in accordance with Section 909.16, a manual control for the smoke control system shall be provided from the stage floor or other approved location.

Reason: The requirement to be able for a trained person on stage or the fire service to manual open the vents is fundamental to fire safety. The requirement for manual operation from the stage floor is included in the 1992 BCMC Report on Stages, Platforms, and Sound Stages and in NFPA 101 and 5000.

AThe system shall be activated independently by each of the following; (1) Activation of the sprinkler system in the stage area (2) by manually operated switch at an approved location.@

Fire modeling indicates that the time from a fire starting to detection for automatic operation may exceed 10 minutes. After sprinklers, high extract exhaust over the stage is the most important protection from fire hazards available, and at least anecdotally has been proven to be sufficient protection for very large fires, notably the Empire Palace Theatre in Edinburgh, Scotland, on 9 May 1911, where all 3000 theatre goers escaped without benefit of sprinklers or a fire safety curtain completely closing.

The ability to open and close the vents for testing seems obvious. Without the ability to test manually from the stage floor, and the imposition of having to send someone to the roof to literally push the vent closed, there is little likelihood of periodic testing.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CONNER-G5-410.3.7.1

G70–09/10
[F] 410.6 (IFC 914.6.1)

Proponent: Bill Conner, representing American Society of Theatre Consultants

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENATIVE HEARING ORDER FOR THE IFC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[F] 410.6 (IFC 914.6.1) Automatic sprinkler system. Stages and associated dressing rooms, performer lounges, shops, storerooms and technical production areas located within and adjoining a stage shall be equipped with an automatic ~~fire-extinguishing~~ sprinkler system in accordance with ~~Chapter 9~~ Section 903.3.1.1. ~~Sprinklers shall be installed under the roof and gridiron and under all catwalks and galleries over the stage. Sprinklers shall be installed in dressing rooms, performer lounges, shops and storerooms accessory to such stages.~~

Exceptions:

1. Sprinklers are not required under stage areas less than 4 feet (1219 mm) in clear height that are utilized exclusively for storage of tables and chairs, provided the concealed space is separated from the adjacent spaces by not less than 5/8-inch (15.9 mm) Type X gypsum board.
2. Sprinklers are not required for stages 1,000 square feet (93 m^2) or less in area and 50 feet (15 240 mm) or less in height where curtains, scenery or other combustible hangings are not retractable vertically. Combustible hangings shall be limited to a single main curtain, borders, legs and a single backdrop.
3. Sprinklers are not required within portable orchestra enclosures on stages.

Reason: Update language to be consistent with other parts of the code. This also provides a specific reference to Section 903.3.1.1 which contains the reference to the NFPA 13 requirements. The NFPA standard provides adequate information regarding the placement of sprinklers in the backstage and other technical production areas, and such language is not needed in the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: **C**ode change G67-09/10 contains a definition of technical production areas.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CONNER-G1-410.6

G71 –09/10
412.4.6.2 (IFC 914.8.2.2)

Proponent: A. Hal Key, PE, Mesa, AZ Fire Department

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IFC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

412.4.6.2 (IFC 914.8.2.2) Separation of maximum single fire areas. Maximum single *fire areas* established in accordance with hangar classification and construction type in Table 412.4.6 shall be separated by 2-hour *fire walls* constructed in accordance with Section 706. In determining the maximum single fire area as set forth in Table 412.4.6, ancillary uses which are separated from aircraft servicing areas by a minimum of a one-hour *fire barrier* shall not be included in the area.

Reason: Many times there are ancillary areas associated with an aircraft hangar such as business offices, maintenance shops and storage areas. The intent of Section 412.4.6.2 is to establish the minimum requirements for fire suppression in an aircraft hangar servicing and storage area. The fire suppression requirements contained within NFPA 409 are primarily for the protection of aircraft within the servicing and storage area. The fire protection requirements in the ancillary areas are not as extensive as those required for the aircraft servicing and storage areas. This proposal is consistent with the requirements of NFPA 409.

Cost Impact: The code change proposal will not increase the cost of construction. This will reduce the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KEY-G2-412.4.6.2

G72–09/10
414.5, 415.3 (New)

Proponent: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES

1. Revise as follows:

[F] 414.5 Inside storage, dispensing and use. The inside storage, dispensing and use of hazardous materials ~~in excess of the maximum allowable quantities per control area of Tables 307.1(1) and 307.1(2)~~ shall be in accordance with Sections 414.5.1 through ~~414.5.5~~ 414.5.4 of this code and the *International Fire Code*.

[F] 414.5.1 Explosion control. Explosion control shall be provided in accordance with the *International Fire Code* as required by Table 414.5.1 where quantities of hazardous materials specified in that table exceed the maximum allowable quantities in Table 307.1(1) or where a structure, room or space is occupied for purposes involving explosion hazards as required by Section 415 or the *International Fire Code*.

[F] TABLE 414.5.1
EXPLOSION CONTROL REQUIREMENTS[a]

(No change to table contents)

[F] 414.5.2 Monitor control equipment. (No change to current text)

~~**[F] 414.5.3 Automatic fire detection systems.** Group H occupancies shall be provided with an automatic fire detection system in accordance with Section 907.2.~~

[F] ~~414.5.4~~ 414.5.3 Standby or emergency power. Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required by the *International Mechanical Code*, the *International Fire Code* or this code, such systems shall be provided with an emergency or standby power system in accordance with this code or the ICC Electrical Code.

Exceptions*: (Exceptions not shown remain unchanged.)*

[F] ~~415.5.5~~ 414.5.4 Spill control, drainage and containment. (No change to current text)

2. Add new text as follows:

[F] 415.3 Automatic fire detection systems. Group H occupancies shall be provided with an automatic fire detection system in accordance with Section 907.2.

(Renumber Section 415.3 and subsequent sections)

Reason: The main purpose of this change is to correct a conflict with the International Fire Code when Table 911.1 from the fire code was brought over and placed in the International Building Code as Table 414.5.1.

Table 911.1 in the fire code is applied where an explosion hazard exist regardless of the quantity of the hazardous material and where the quantity exceeds the maximum allowable quantity.

"911.1 General.
Explosion control shall be provided in the following locations:
1. Where a structure, room or space is occupied for purposes involving explosion hazards as identified in Table 911.1.
2. Where quantities of hazardous materials specified in Table 911.1 exceed the maximum allowable quantities in Table 2703.1.1(1)."

In reviewing Section [F] 414.5.1 Explosion Control the requirements of [F] Table 414.5.1 are intended to be applied:

"*in accordance with the International Fire Code as required by Table 414.5.1 where quantities of hazardous materials specified in that table exceed the maximum allowable quantities in Table 307.1(1), or,"*

" where a structure, room or space is occupied for purposes involving explosion hazards as required by Section 415 or the International Fire Code"

This language matches the intent of the fire code requirements, however, Section [F] 414.5 as currently written limits application of everything following to only those locations that exceed the MAQ. That is where the conflict lies.

This proposal strikes the reference to the maximum allowable quantities found in Section [F] 414.5 to eliminate the conflict and allow Section [F] 414.5.1 and [F] Table 414.5.1 to be applied consistent with the language found in [F] 414.5.1 and the International Fire Code. It also provides consistency with the overall scope of Section 414.0 which is to provide for requirements for all buildings and structures containing hazardous materials:

"[F] 414.1 General.
The provisions of this section shall apply to buildings and structures occupied for the manufacturing, processing, dispensing, use or storage of hazardous materials."

Section [F] 415.0 applies to occupancies exceeding the maximum allowable quantities:

"[F] 415.1 Scope.
The provisions of this section shall apply to the storage and use of hazardous materials in excess of the maximum allowable quantities per control area listed in Section 307.1. Buildings and structures with an occupancy in Group H shall also comply with the applicable provisions of Section 414 and the International Fire Code."

The proposal includes a change to move existing [F] 414.5.3 to [F] 415.4 since that section only applies to H Group occupancies and that is the scope of Section [F] 415.0. And the proposal suggests modifying Section [F] 414.5.4 by inserting the words "by the *International Mechanical Code*, the *International Fire Code* or this code" to ensure where ever any of the codes requires such systems in relation to the presence of hazardous materials the required safety systems are provided with stand-by or emergency power.,

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-G1-414.5.doc

G73–09/10
415.3.1, Table 415.3.1; IFC 3904.1.2

Proponent: Larry Fluer, Fluer, Inc*.* representing self

THESE PROPOSALS ARE ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE AS TWO SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

PART I – IBC GENERAL

1. Revise as follows:

[F] 415.3.1 Group H occupancy minimum fire separation distance. Regardless of any other provisions, buildings containing Group H occupancies shall be set back to the minimum fire separation distance as set forth in Items 1 through 4 below. Distances shall be measured from the walls enclosing the occupancy to lot lines, including those on a public way. Distances to assumed lot lines established for the purpose of determining exterior wall and opening protection are not to be used to establish the minimum fire separation distance for buildings on sites where explosives are manufactured or used when separation is provided in accordance with the quantity distance tables specified for explosive materials in the *International Fire Code*.

1. Group H-1. Not less than 75 feet (22 860 mm) and not less than required by the *International Fire Code*.

   Exception~~s~~:

   ~~1.~~ Fireworks manufacturing buildings separated in accordance with NFPA 1124.
   ~~2. Buildings containing the following materials when separated in accordance with Table 415.3.1:~~
   ~~2.1. Organic peroxides, unclassified detonable.~~
   ~~2.2. Unstable reactive materials, Class 4.~~
   ~~2.3. Unstable reactive materials, Class 3 detonable.~~
   ~~2.4. Detonable pyrophoric materials.~~

2. Group H-2. Not less than 30 feet (9144 mm) where the area of the occupancy exceeds 1,000 square feet (93 m^2) and it is not required to be located in a detached building.
3. Groups H-2 and H-3. Not less than 50 feet (15 240 mm) where a detached building is required (see Table 415.3.2).
4. Groups H-2 and H-3. Occupancies containing materials with explosive characteristics shall be separated as required by the *International Fire Code*. Where separations are not specified, the distances required shall be determined by a technical report issued in accordance with Section 414.1.3. ~~not be less than the distances required by Table 415.3.1.~~

2. Delete Table 415.3.1 without substitution:

~~[F] TABLE 415.3.1~~
~~MINIMUM SEPARATION DISTANCES FOR BUILDINGS CONTAINING EXPLOSIVE MATERIALS~~

PART II – IFC

Revise text as follows:

3904.1.2 Distance from detached ~~storage~~ buildings to exposures. In addition to the requirements of the *International Building Code*, detached storage buildings for Class I, II, III, IV and V organic peroxides shall be located in accordance with Table 3904.1.2. Detached buildings containing quantities of unclassified detonable organic peroxides in excess of those set forth in Table 2703.8.2 shall be located in accordance with Table 3304.5.2(1).

Reason: Section 415.3.1 was established to give direction to code users to determine location of buildings of Group H character. Users have frequently been confused as to application of Table 415.3.1 which was developed from the American Table of Distances, published by the Institute of Makers of Explosives. As the code evolved siting requirements for explosive materials were resolved with changes made to Chapter 33 of the IFC. Chapter 33 of the IFC contains specific requirements for each category of explosive material under consideration.

Exceptions to item 1 of Section 415.3.1 were intended to provide direction for specific materials as well as for specific occupancies. IBC Table 415.3.1 in application is now in conflict with requirements in the IFC for certain materials. With minor modification to the IFC and the proposed modifications to Section 415.3.1 the inconsistencies can be resolved. Deleting material specific classes of hazardous materials from the IBC results

in occupancy specific guidance in the building code with material specific requirements to be determined by the fire code. Deleting Table 415.3.1 is an essential part of the change that is needed to clarify the approach. This change will result in a consistent application of requirements for building location based on tabular distances or direction determined by the IFC.

The following requirements will apply with this correlating change. By removing Exception items 2.1 through 2.4 from item 1 of Section 415.3.1 the default distances will be found in the IFC as follows:

Hazard Class	Existing Reference	Required distances
Fireworks	Exception 1, item 1	NFPA 1124 (no change)
Organic peroxide, unclassified detonable	Exception 1, item 2.1	IFC Section 3904.1.2 (as proposed for revision)
Unstable reactive materials, Class 4	Exception 1, item 2.2	Indoors IFC 4304.1; Outdoors IFC 4304.2.1
Unstable reactive materials, Class 3 detonable	Exception 1, item 2.3	Indoors IFC 4304.1; Outdoors IFC 4304.2.2
Detonable pyrophoric materials	Exception 1, item 2.4	Indoors, as for H-1 materials. See item 1 (75 feet minimum); Outdoors IFC 4104.2.1

The modification to 415.3.1, item 4 only applies when the materials under consideration are not addressed by the IFC. In these rare circumstances a technical opinion and report is required under the authority granted to the code official by Section 414.1.3.

IFC Section 3904.1.2 has been modified to address the category of unclassified detonable organic peroxides. As the classification system for organic peroxides addresses finished goods e.g., Class I through Class V, the category of unclassified detonable organic peroxides addresses organic peroxides in the manufacturing process. Building siting for such materials is determined by IFC Table 3304.5.2(1). The resultant distances determined using Table 3304.5.2(1) are comparable with those obtained using existing IBC Table 415.3.1 and the approach is consistent with regulation established by NFPA 400 (NFPA's new hazardous materials code) for detonable organic peroxides. It should be noted that the modification to address unclassified detonable material applies to such materials in conditions of storage or use (includes manufacturing).

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FLUER-G2-415.3.1 (NEW)

G74–09/10
[F] 415.3.2, [F]415.5, 508.1

Proponent: Larry Fluer, Fluer, Inc. and Patrick McLaughlin, McLaughlin & Associates, representing the Compressed Gas Association

THIS PROPOSAL IS ON THE AGENDA FOR THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENATIVE HEARING ORDER FOR THE IFC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[F] 415.3.2 Group H-1 and H-2 or H-3 detached buildings. The storage or use of hazardous materials in excess of those amounts listed in Table 415.3.2 shall be in accordance with the applicable provisions of Sections 415.4 and 415.5.

[F] 415.3.2.1 Wall and opening protection. Where a detached building is required by Table 415.3.2, there are no requirements for wall and opening protection based on fire separation distance.

[F] 415.5 Special provisions for Group H-2 and H-3 occupancies. Group H-2 and H-3 occupancies containing quantities of hazardous materials in excess of those set forth in Table 415.3.2 shall be in detached buildings used for ~~no other purpose~~ manufacturing, processing, dispensing, use or storage of hazardous materials. ~~shall not exceed one story in height and shall be without basements, crawl spaces or other under-floor spaces.~~

Exception: The quantity of materials listed in Section 307.3 shall not exceed the maximum allowable quantity per control area in Table 307.1.(1).

[F] 415.5.1 Detached buildings. Detached buildings shall not exceed one story in height and shall be without basements, crawl spaces or other under-floor spaces.

[F] 415.5.2 Multiple hazards. Group H-2 or H-3 occupancies containing materials which are in themselves both physical and health hazards in quantities exceeding the maximum allowable quantities per control area in Table 307.1(2) shall comply with requirements for Group H-2, H-3 or H-4 occupancies as applicable.

[F] 415.5.3 Separation of incompatible materials. Hazardous materials other than those listed in Table 415.3.2 shall be allowed in manufacturing, processing, dispensing, use or storage areas when separated from incompatible materials in accordance with the provisions of the *International Fire Code*.

[F] 415.5.4 Water Reactives. Group H-2 and H-3 occupancies containing water-reactive materials shall be resistant to water penetration. Piping for conveying liquids shall not be over or through areas containing water reactives, unless isolated by approved liquid-tight construction.

Exception: Fire protection piping shall be permitted over or through areas containing water reactives without isolating it with liquid tight construction.

(Renumber subsequent sections)

508.1 General. Each portion of a building shall be individually classified in accordance with Section 302.1. Where a building contains more than one occupancy group, the building or portion thereof shall comply with the applicable provisions of Section 508.2, 508.3 or 508.4, or a combination of these sections.

Exceptions:

1. Occupancies separated in accordance with Section 509.
2. Where required by Table 415.3.2, areas of Group H-1, H-2 and H-3 occupancies shall be located in a ~~separate and~~ detached building or structure.
3. Uses within live/work units, complying with Section 419, are not considered separate occupancies.

Reason: (**Regarding changes to Sec**. **415.3.2)** The quantity of materials in use are also considered in the application of Table 415.3.2 as it is common to have process operations or manufacturing operations where the quantities of regulated materials exceeds the tabular limits. The revision to create a subsection to set the requirements for wall and opening protection in detached buildings apart from the fundamental requirement to provide detached buildings is editorial. There is no change in technical content.

(Regarding changes to Sec. 415.5) A *Detached Building* is defined by Section 307.2 as follows:

DETACHED BUILDING. A separate single-story building, without a basement or crawl space, used for the storage or use of hazardous materials and located an approved distance from all structures.

Section 414.1 establishes the scope of operations addressed by the IBC to include the manufacturing, processing, dispensing, use or storage of hazardous materials. The requirements for detached buildings are triggered when the detached building threshold limits imposed by Table 415.3 are exceeded. This is done in order to limit the risk to other buildings or structures imposed by large quantities of various materials, and to prohibit the use of mixed occupancy buildings that contain offices, lunchrooms or occupancies other than those in Group H.

It is common to have mixed uses involving H-2, H-3 and H-4 materials which are stored or processed in the same building. In some cases flammable materials may be located in the same area as are toxic or highly toxic materials as well as those that may be oxidizing or otherwise reactive. Process areas typically limit the quantities of reactive and possibly incompatible materials in process operations with storage of these same materials isolated to individual storage rooms. It is not unusual for a process area to be classified as an H-2 Occupancy which may be used to mix, blend or process H-3 or H-4 materials which otherwise may be located in independent storage or manufacturing operations that are classified as either H-3 or H-4 Occupancies.

This concept was accepted by the IFC Code Development Committee with modifications to the requirements for detached buildings as contained in Chapter 27 of the IFC under code change Item F134-00. In addition revisions to the table title and the first row of Table 2703.8.2 and Table 415.3.2 (when coordinated) were accepted as changes by the IFC Code Development Committee under F134-00. Although the 2003 through 2009 Editions of the IFC and IBC don't reflect the change, the changes to the table titles have been included by erratum. The reason statement published by the Code Development Committee regarding the use of detached buildings is as follows:

> The manufacture and storage of hazardous materials are frequently integrated into a single building where storage is contained in the same building in which the material is manufactured. Additionally, it is not unusual for certain manufacturing buildings to contain multiple Group H uses where the threshold quantities are exceeded. The existing provisions imply that the only function that can occur within a detached building is storage to the exclusion of manufacturing, although in many cases the quantities used in manufacturing may also exceed the threshold levels where detached buildings would otherwise be required. Limiting the uses of identified hazardous materials to separate buildings containing only Group H uses maintains the intent of the code which is to isolate large quantities of certain physical hazard materials from uses other than those in Group H. The changes offered clarify rather than change the intent of the code.

Section 415.5 has been revised and reorganized to clarify the requirements and to create subsections that focus on the controls that may be applied while maintaining the concept addressed by the IFC Code Development Committee on code changes that were adopted into the IFC. The reasons for each of the subsections follow:

415.5 Exception (New). Materials listed in Section 307.3 are required to be in a Group H-1 occupancy when the MAQ is exceeded. These same materials are allowed in buildings of H-2 or H-3 character when contained in quantities not exceeding the MAQ.

415.5.1 Relocated text from existing 415.5 that separates limits on height, basements and under-floor spaces from the fundamental requirement addressing the activities that can be conducted in detached buildings.

415.5.2 (New). Requires that materials with both a physical and a health hazard comply with the requirements of either the Group H-2 or H-3 occupancy as well as the requirements that recognize the health hazard nature of a material. Similar language is found in paragraph two of Section 415.4. For example one could have nondetonable Class 3 Unstable Reactive materials that are also highly toxic. The area should be required to meet the requirements of a Group H-2 occupancy based on the physical hazards of these materials as well as the requirements of a Group H-4 occupancy to address the health hazards of these same materials. From a construction standpoint, the more restrictive provisions of the H-2 Occupancy will govern. In addition, the requirements for elements such as emergency power, ventilation and/or secondary containment imposed by the H-4 Occupancy will be imposed.

415.5.3 (New). Chemical process areas may contain a wide variety of hazardous materials including those that appear in Table 415.3.2. For example, it is not uncommon to mix toxic gases with pyrophoric gases, or to process or store flammable gases in areas where acetylene (Unstable Reactive Class 2) is present. Similar activities are conducted with various materials used throughout the chemical industry.

Accepting this code change will clarify the intent of the use of detached buildings that are used for manufacturing, processing, dispensing, using or storing hazardous materials which may be stored in various portions of the building which may have hazardous materials of different character. By limiting the building "solely" to hazardous materials operations it is intended that other uses be excluded. The revisions to Section 415.5 do not affect buildings of Group H-1 Occupancy as addressed by Section 415.4.

(Regarding changes to Sec. 508.1) The revision to delete the term "and separate" from Exception 2 to Section 508.1 is to clarify that a "detached building" be used when the detached threshold quantity limits of Table 415.3.2 have been exceeded. The requirements for detached H-1, H-2 or H-3 buildings are found in Sections 414.4 and 414.5 respectively. Revisions made to Section 415.5 recognize that a detached H-2 building can contain materials that would trigger the use of an H-3 occupancy when the maximum allowable quantity (MAQ) imposed by Table 307.1.(1) are exceeded. Literally interpreted an H-2 type of material that is comprised of H-2 and H-3 materials could not be manufactured in the same building. Changes to the IFC made under F134-00 recognize the unique character of detached buildings. Companion changes have been submitted to modify Section 414.5 for clarity.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Fluer-Mclaughlin-G1-415.3.doc

G75–09/10
[F] 415.8.5.2.2

Proponent: Joe Holland and Dave Bueche, Hoover Treated Wood Products

Revise as follows:

[F] 415.8.5.2.2 Liquid storage rooms. Liquid storage rooms shall be constructed in accordance with the following requirements:

1. Rooms in excess of 500 square feet (46.5 m^2) shall have at least one exterior door *approved* for the department access.
2. Rooms shall be separated from other areas by *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 712, or both. The *fire-resistance rating* shall be not less than 1 hour for rooms up to 150 square feet (13.9 m^2) in area and not less than 2 hours where the room is more than 150 square feet (13.9 m^2) in area.
3. Shelving, racks, and wainscoting in such areas shall be of noncombustible construction of wood of not less than 1 inch (25 mm) nominal thickness of fire-retardant-treated wood complying with Section 2303.2.
4. Rooms used for the storage of Class I flammable liquids shall not be located in a basement.

Reason: The purpose of using FRTW in this application is to recognize it ability to prevent the spread of fire. This ability is not dependent on a specific thickness. The span and the load placed on the shelf will dictate the thickness.

FRTW responds to a fire differently than untreated wood. It has a flame spread index significantly lower than untreated wood.

Depending on the species, untreated wood has an index of more than 70 to over 190. FRTW is required to have a flame spread index of 25 or less. The products in the market place have indexes of 15 or less. FRTW will produce significantly less smoke than untreated wood. It won't spread the fire and because of the treatment it will char and produce less heat than untreated wood.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOLLAND-BUECHE-G1-415.8.5.2.2.doc

G76–09/10
419.1, 419.1.1

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division

Revise as follows:

419.1 General. A live/work unit is a dwelling unit or sleeping unit ~~in~~ which ~~a significant portion of the space~~ includes a nonresidential use that is operated by the tenant. Live/work units ~~and~~ shall comply with Sections 419.1 through 419.8.

> **~~Exception:~~** ~~Dwelling or sleeping units that include an office that is less than 10 percent of the area of the dwelling unit shall not be classified as a live/work unit.~~

419.1.1 Nonresidental use limitations. ~~The following shall apply to all live/work areas~~ The nonresidential use portion of a live/work unit shall comply with all of the following:

1. ~~The live/work unit is permitted to be a maximum of 3,000 square feet (279 m2)~~ The nonresidential area shall be not less than 10 percent of the total area of the live/work unit;
2. The nonresidential area ~~is permitted to be a maximum 50 percent of the area of each live/work~~ shall not exceed 1,500 square feet (140 m^2) or shall not be more than 50 percent of the total area of the live/work unit, whichever is less;
3. The nonresidential area ~~function~~ shall be ~~limited to the first or main floor only of the live/work unit~~ located on an accessible route; and
4. A maximum of five nonresidential workers or employees ~~are~~ shall be allowed to occupy the nonresidential area at any one time.

Reason: The modifications to Sections 419.1 and 419.1.1 are related to establishing the size of the nonresidential area of the unit. The modification to Item 1 essentially relocates the deleted exception and establishes the minimum size of the nonresidential area required in order to be considered a live/work unit. Item 2 establishes a maximum size of the nonresidential area without regard to the residential portion of the unit. The modification to Item 2 is reasonable as it maintains the existing maximum size of the business use but does not limit the size of the residential portion of the unit as the residential portion of the unit is irrelevant to the intent of the section.

The modification to Item 3 allows the nonresidential use to be located on floors other than the main floor. While providing an accessible route via elevator or lift is costly, as is accessible means of egress per Section 419.3, the option should be available to the tenant.

The modification to Item 4 is editorial to provide consistent language throughout the section.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WIEHLE-G1-419.1

G77–09/10
419.1.1

Proponent: John England, MCO, England Enterprises Inc., representing the Cities of Beaufort, Hardeeville

Revise as follows:

419.1.1 Limitations. The following shall apply to all live/work areas:

1. The live/work unit is permitted to be a maximum of 3,000 square feet (279 m^2);
2. The nonresidential area is permitted to be a maximum 50 percent of the area of each live/work unit;
3. The nonresidential area function shall be limited to the first or main floor only of the live/work unit; and
4. A maximum of five nonresidential workers or employees are allowed to occupy the nonresidential area at any one time.
5. The work unit is limited to B or M occupancy.

Reason: Any other occupancy may increase the hazardous conditions to the sleeping occupants. If the limit this to Group B and M ,and storage incidental to the Groups B and M; there is still provisions to have a small restaurant (under 50) on the premises

If there is no limits then the provisions are endless --

> Hazardous chemicals next to a dwelling unit.

> Commercial Garages would not have to be separated from dwelling units
> Warehouse with who know what next to a dwelling unit.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: ENGLAND-G3-419.1.1.doc

G78–09/10
419.1.1

Proponent: Tom Rubottom, City of Westminster, representing the Colorado Chapter of ICC

Revise text as follows:

419.1.1 Limitations. The following shall apply to all live/work areas:

1. The live/work unit is permitted to be a maximum of 3,000 square feet (279 m^2);
2. The nonresidential area is permitted to be a maximum 50 percent of the area of each live/work unit;
3. The nonresidential area function shall be limited to the first or main floor only of the live/work unit; and
4. A maximum of five nonresidential workers or employees are allowed to occupy the non-residential area at any one time.
5. The nonresidential area is limited to a maximum occupant load of 49 as determined by Section 1004.

Reason: Section 419 does not include the provisions for the higher occupant loads such as door swing, number of exits, exit signs, emergency egress illumination and panic hardware.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: RUBOTTOM-G1-419.1.1

G79–09/10
419.3, 419.7

Proponent: Gregory Mahoney, City of Davis Community Development Department, representing Sacramento Valley Association of Building Officials

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

419.3 Means of egress. Except as modified by this section, ~~the provisions for R-2 occupancies in Chapter 10 shall apply to the entire live/work unit~~ the means of egress components for a live/work unit shall be designed in accordance with Chapter 10 for the function served.

419.3.1 Egress capacity. The egress capacity for each element of the live/work unit shall be based on the occupant load for the function served in accordance with Table 1004.1.1.

~~**419.3.2 Sliding doors.** Where doors in a means of egress are of the horizontal sliding type, the force to slide the door to its fully open position shall not exceed 50 pounds (220 N) with a perpendicular force against the door of 50 pounds (220 N).~~

~~**419.3.3**~~ **419.3.2 Spiral stairways.** Spiral stairways that conform to the requirements of Section 1009.9 shall be permitted.

~~**419.3.4 Locks.** Egress doors shall be permitted to be locked in accordance with Exception 4 of Section 1008.1.9.3.~~

419.7 Accessibility. Accessibility shall be designed in accordance with Chapter 11 for the function served.

Reason: There were a number of issues that were brought up in Palm Springs regarding the code change which introduced live/work units into the IBC. The concern was that Section 419 as written had major flaws and creates more problems than it solves for the following reasons.

Example: A 3,000 square foot live/work unit could contain a 1,500 square foot restaurant containing a 500 square foot kitchen and a 1,000 square foot dining area. Restaurants of this size would probably not require more than 5 employees.

The occupant load of the space would be Kitchen 500/200 = 3; Dining 1,000/15 = 67.

Section 419.2 would classify this area as Group R-2, rather than Group A-2.

Section 419.3 would require the means of egress to comply as a Group R-2 except for specific modifications made by Section 419.

Section 419 would not require panic hardware, egress illumination provided with emergency power, posting of occupant load, exits signs and enclosed stairways.

This same restaurant across the street or next door that did not have a dwelling unit connected would be required to comply.

This proposed change is relatively minor and would address these issues by requiring that the building comply with the means of egress and accessibility requirements for the function served, with some minor exceptions.

The sections allowing sliding doors and locks per exception #4 of 1008.1.9.3 were removed because they would not be consistent with the requirement to comply with means of egress for the function served.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAHONEY-G1-419.3

G80–09/10

419.9 (New)

Proponent: Tom Rubottom City of Westminster, Colorado representing the Colorado Chapter of ICC

Add new text as follows:

419.9 Plumbing facilities. The nonresidential area of the live/work unit shall be provided with minimum plumbing facilities as specified by Chapter 29, based on the function of the nonresidential area.

Reason: The current code requirements do not require toilet facilities for the work area of a live/work unit. Live/work units are classified as Group R-2 occupancies. The only toilet facilities now required are those for the dwelling unit which could be located on the upper floors and therefore there would be no requirements for any plumbing fixtures on the main level work area. The toilet room in the dwelling unit will not be accessible to the same standards as required for an accessible public toilet room in business and commercial occupancies. This code change would add language to make sure the work area would have the same minimum plumbing facilities (both for number of fixtures and for meeting accessibility requirements) as a typical commercial project.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RUBOTTOM-G2-419.1

G81–09/10

420.2, Table 503, Table 508.4, 509.5, 509.6, 705.11, 707.3.10 (New), 709.3, 709.4, 717.3.2, 717.4.2

Proponent: Jason Thompson, National Concrete Masonry Association, representing the Masonry Alliance for Codes and Standards

1. Revise as follows:

420.2 Separation walls. Walls separating dwelling units in the same building, walls separating sleeping units in the same building, and walls separating dwelling units or sleeping units in the same building shall be constructed as fire ~~partitions~~ barriers in accordance with Section ~~709~~ 707.

Exception: In Group R-3 occupancies, walls separating dwelling units in the same building, walls separating sleeping units in the same building, and walls separating dwelling units or sleeping units in the same building shall be constructed as fire partitions in accordance with Section 709.

TABLE 503
ALLOWABLE BUILDING HEIGHT AREAS[a]
Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane
Building area limitations shown in square feet as determined by the definition of "Area, building", per floor.

		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
	Hgt (ft)	UL	160	65	55	65	55	65	50	40
Group		STORIES (S) AREA (A)								
I-1	S	UL	9	4	3	~~4~~ NP	~~3~~ NP	~~4~~ NP	~~3~~ NP	~~2~~ NP
	A	UL	55,000	19,000	10,000	~~16,500~~ NP	~~10,000~~ NP	~~18,000~~ NP	~~10,500~~ NP	~~4,500~~ NP
R-1	S	UL	11	4	4	~~4~~ NP	~~4~~ NP	~~4~~ NP	~~3~~ NP	~~2~~ NP
	A	UL	UL	24,000	16,000	~~24,000~~ NP	~~16,000~~ NP	~~20,500~~ NP	~~12,000~~ NP	~~7,000~~ NP
R-2	S	UL	11	4	4	~~4~~ NP	~~4~~ NP	~~4~~ NP	~~3~~ NP	~~2~~ NP
	A	UL	UL	24,000	16,000	~~24,000~~ NP	~~16,000~~ NP	~~20,500~~ NP	~~12,000~~ NP	~~7,000~~ NP

(Portions of table not shown remain unchanged)

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

	A[d], E		I-1, R-1, R-2		~~I-1~~, I-3, I-4		I-2		R-3, R-4		F-2, S-2[b], U		B, F-1, M,S-1		H-1		H-2		H-3, H-4, H-5	
OCCUPANCY	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A[d], E	N	N	2	NP	1	2	2	NP	1	~~2~~ NP	N	1	1	2	NP	NP	3	4	2	3[a]
I-1, R-1, R-2			2	NP	2	2	2	NP	1	NP	2	NP	2	NP	NP	NP	3	NP	2	NP
~~I-1~~, I-3, I-4					N	N	2	NP	1	NP	1	~~2~~ NP	1	~~2~~ NP	NP	NP	3	NP	2	NP
I-2							N	N	2	NP	2[e]	NP	2	NP	NP	NP	3	NP	2	NP
R-3, R-4									N	N	1[c]	~~2~~[e] NP	1	~~2~~ NP	NP	NP	3	NP	2	NP
F-2, S-2[b], U											N	N	1	2	NP	NP	3	4	2	3[a]
B, F-1, M, S-1													N	N	NP	NP	2	3	1	2[a]
H-1															N	NP	NP	NP	NP	NP
H-2																	N	NP	1	NP
H-3, H-4, H-5																			1[ef]	NP

(Footnotes not shown are unchanged.)

2. Delete without substitution as follows:

~~**509.5 Groups R-1 and R-2 buildings of Type IIIA construction.** The height limitation for buildings of Type IIIA construction in Groups R-1 and R-2 shall be increased to six stories and 75 feet (22 860 mm) where the first floor assembly above the basement has a fire-resistance rating of not less than 3 hours and the floor area is subdivided by 2-hour fire-resistance-rated fire walls into areas of not more than 3,000 square feet (279 m^2).~~

~~**509.6 Groups R-1 and R-2 buildings of Type IIA construction.** The height limitation for buildings of Type IIA construction in Groups R-1 and R-2 shall be increased to nine stories and 100 feet (30 480 mm) where the building is separated by not less than 50 feet (15 240 mm) from any other building on the lot and from lot lines, the exits are segregated in an area enclosed by a 2-hour fire-resistance-rated fire wall and the first floor assembly has a fire-resistance rating of not less than $1^1/_2$ hours.~~

3. Revise as follows:

705.11 Parapets. Parapets shall be provided on *exterior walls* of buildings.

Exceptions:

1. through 4. (No change to current text)

5. In Groups ~~R-2 and~~ R-3 where the entire building is provided with a Class C roof covering, the exterior wall shall be permitted to terminate at the underside of the roof sheathing or deck in Type III, IV and V construction, provided:
   5.1. The roof sheathing or deck is constructed of *approved* noncombustible materials or of *fire-retardant-treated wood* for a distance of 4 feet (1220 mm); or
   5.2. The roof is protected with 0.625-inch (16 mm) Type X gypsum board directly beneath the underside of the roof sheathing or deck, supported by a minimum of nominal 2-inch (51 mm) ledgers attached to the sides of the roof framing members for a minimum distance of 4 feet (1220 mm).
6. (No change to current text)

3. Add new text as follows:

707.3.10 Separation of dwelling units and sleeping units. The fire-resistance rating of the separation between individual dwelling units and sleeping units, and between dwelling units and sleeping units and other spaces in the building shall comply with Table 707.3.9.

Exception: In Group R-3 occupancies, walls separating dwelling units in the same building, walls separating sleeping units in the same building, and walls separating dwelling units or sleeping units in the same building shall be a fire-resistance-rating in accordance with Section 709.3.

4. Revise as follows:

709.3 Fire-resistance rating. Fire partitions shall have a fire-resistance rating of not less than 1 hour.

Exceptions~~:~~

~~1.~~ Corridor walls permitted to have a $^1/_2$ hour fire-resistance rating by Table 1018.1.
~~2. Dwelling unit and sleeping unit separations in buildings of Type IIB, IIIB and VB construction shall have fire-resistance ratings of not less than $^1/_2$ hour in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.~~

709.4 Continuity. Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above or to the fire-resistance-rated floor/ceiling or roof/ceiling assembly above, and shall be securely attached thereto. If the partitions are not continuous to the sheathing, deck or slab, and where constructed of combustible construction, the space between the ceiling and the sheathing, deck or slab above shall be fireblocked or draftstopped in accordance with Sections 717.2 and 717.3 at the partition line. The supporting construction shall be protected to afford the required fire-resistance rating of the wall supported, except for walls separating tenant spaces in covered mall buildings, ~~walls separating dwelling units, walls separating sleeping units~~ and corridor walls in buildings of Type IIB, IIIB and VB construction.

Exceptions:

1. through 4. (No change to current text)
~~5. Fireblocking or draftstopping is not required at the partition line in Group R-2 buildings that do not exceed four stories above grade plane, provided the attic space is subdivided by draftstopping into areas not exceeding 3,000 square feet (279 m^2) or above every two dwelling units, whichever is smaller.~~
5. ~~6.~~ (No change to current text)

717.3.2 Groups ~~R-1, R-2~~, R-3 and R-4. Draftstopping shall be provided in floor/ceiling spaces ~~in Group R-1 buildings, in Group R-2 buildings with three or more dwelling units,~~ in Group R-3 buildings with two dwelling units and in Group R-4 buildings. Draftstopping shall be located above and in line with the dwelling unit and sleeping unit separations.

Exceptions:

1. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Draftstopping is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.2, provided that automatic sprinklers are also installed in the combustible concealed spaces.

5. Delete without substitution:

~~**717.4.2 Groups R-1 and R-2.** Draftstopping shall be provided in *attics*, mansards, overhangs or other concealed roof spaces of Group R-2 buildings with three or more *dwelling units* and in all Group R-1 buildings. Draftstopping shall be installed above, and in line with, *sleeping unit* and *dwelling unit* separation walls that do not extend to the underside of the roof sheathing above.~~

~~**Exceptions:**~~

1. ~~Where *corridor* walls provide a *sleeping unit* or *dwelling unit* separation, draftstopping shall only be required above one of the *corridor* walls.~~
2. ~~Draftstopping is not required in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.~~
3. ~~In occupancies in Group R-2 that do not exceed four *stories above grade plane*, the *attic* space shall be subdivided by draftstops into areas not exceeding 3,000 square feet (279 m_2) or above every two *dwelling units*, whichever is smaller.~~
4. ~~Draftstopping is not required in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.2, provided that automatic sprinklers are also installed in the combustible concealed spaces.~~

Reason: Though the loss of life from fires affecting Group I-1, R-1 and R-2 occupancies is not high the amount of property damage continues to remain high. To reduce this loss this proposal modifies the requirements for Group I-1, R-1and R-2 occupancies to require that all buildings constructed for these occupancies shall be constructed of non-combustible construction and the fire rated separations between sleeping and dwelling units shall be a minimum of 2-hour fire resistance rating. The removal of combustible materials from the building construction and the increase in the fire resistance provides a much higher degree of protection to property in the event of a fire. In addition, when occupants in these types of buildings are sleeping they are less likely to be aware of conditions around them. Fires occurring during these times pose a high risk to the occupants. This increase in the fire resistance provides a higher degree of protection to sleeping occupants in reducing the spread of fire.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Thompson-G4-419

G82–09/10
424 (New)

Proponent: Mike Ashley CBO, representing: The Alliance for Fire & Smoke Containment & Control, Inc. (AFSCC)

1. Add new section as follows:

SECTION 424
TENANT SEPARATIONS

424.1 General. Buildings containing multiple tenants shall comply with the provisions of Sections 424.1 through 424.3 and other applicable provisions of this code.

Exception. Tenant spaces located in covered mall or open mall buildings shall comply with Section 402.7.2

424.2 Tenant separation walls. Walls separating tenant spaces required to have two or more exits or exit access doorways by Section 1015.1 shall be constructed as fire partitions in accordance with Section 709.

424.3 Automatic sprinkler system modifications. In buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the walls required by Section 424.2 shall be permitted to be constructed as smoke partitions in accordance with Section 711.

424.3.1 Doors. Doors protecting openings in the smoke partitions shall comply with Sections 711.5.2, 711.5.3, and 715.4.8.1

424.3.2 Air transfer openings. Air transfer openings in the smoke partitions shall not be required to be protected with a smoke damper where a fire damper is provided in accordance with Section 716.5.4.

2. Revise text as follows:

709.1 General. The following wall assemblies shall comply with this section.

1. Walls separating dwelling units in the same building as required by Section 420.2.
2. Walls separating sleeping units in the same building as required by Section 420.2.
3. Walls separating tenant spaces in covered mall buildings as required by Section 402.7.2.
4. Corridor walls as required by Section 1018.1.
5. Elevator lobby separation as required by Section 708.14.1.
6. Walls separating tenant spaces as required by Section 424.2.

709.4 Continuity. Fire partitions shall extend from the top of the foundation or floor/ceiling assembly below to the underside of the floor or roof sheathing, slab or deck above or to the fire-resistance-rated floor/ceiling or roof/ceiling assembly above, and shall be securely attached thereto. If the partitions are not continuous to the sheathing, deck or slab, and where constructed of combustible construction, the space between the ceiling and the sheathing, deck or slab above shall be fireblocked or draftstopped in accordance with Sections 717.2 and 717.3 at the partition line. The supporting construction shall be protected to afford the required fire-resistance rating of the wall supported, except for walls separating tenant spaces, ~~in covered mall buildings, walls separating~~ dwelling units, ~~walls separating~~ sleeping units and corridors ~~walls~~ in buildings of Type IIB, IIIB, and VB construction.

Exceptions:

1. The wall need not be extended into the crawl space below where the floor above the crawl space has a minimum 1-hour fire-resistance rating.
2. Where the room-side fire-resistance-rated membrane of the corridor wall is carried through to the underside of the floor or roof sheathing, deck or slab of a fire-resistance-rated floor or roof above, the ceiling of the corridor shall be permitted to be protected by the use of ceiling materials as required for a 1-hour fire-resistance-rated floor or roof system.
3. Where the corridor ceiling is constructed as required for the corridor walls, the walls shall be permitted to terminate at the upper membrane of such ceiling assembly.
4. The fire partitions separating tenant spaces in a covered mall building~~,~~ complying with Section 402.7.2~~,~~ are not required to extend beyond the underside of a ceiling that is not part of a fire-resistance-rated assembly. A wall is not required in attic or ceiling spaces above tenant separation walls in covered mall buildings.
5. Fireblocking or draftstopping is not required at the partition line in Group R-2 buildings that do not exceed four stories above grade plane, provided the attic space is subdivided by draftstopping into areas not exceeding 3,000 square feet (279 m^2) or above every two dwelling units, whichever is smaller.
6. Fireblocking or draftstopping is not required at the partition line in buildings equipped with an automatic sprinkler system installed throughout in accordance with Section 903.3.1.1 or 903.3.1.2, provided that automatic sprinklers are installed in combustible floor/ceiling and roof/ceiling spaces.

Reason: This proposed code change is a follow up to Code Change FS71-07/08 which was submitted by the Alliance for Fire and Smoke Containment and Control (AFSCC). A Public Comment was also submitted by the AFSCC for approval as submitted but it did not achieve the necessary two-thirds affirmative vote of the Class A voting members at the Final Action Hearings in Minneapolis. So it was disapproved.

This version takes a slightly different approach to the 1-hour tenant separation requirement by allowing for a reduction in the tenant separation construction from a 1-hour fire partition to a non-rated smoke partition in accordance with Section 711 when the building is protected throughout with an NFPA 13 sprinkler system. However, it does require the doors in the smoke partition to be smoke- and draft-control type doors with self-closing or automatic-closing devices and latches. These need to be specified for smoke partitions where they are desired since Section 711 does not contain these specific requirements. That's because Section 711 defers to other sections of the code to specify them. Also, a fire damper is allowed to be substituted for the more expensive smoke damper required for air transfer openings in these smoke partitions as a part of the sprinkler modifications. It should also be noted that fire and/or smoke dampers are not specifically required by Section 711 for duct penetrations of smoke partition walls. Since individual tenants are generally served by "express" ducts which serve that tenant only and have no openings into adjacent tenant spaces, in a sprinklered building it would not be necessary to provide a smoke damper or fire damper in a duct penetration of a tenant separation wall.

Section 709.4 Continuity has also been revised to allow for the supporting construction for these 1-hour tenant separation walls to not be fire-resistance-rated when the building is constructed of Types IIB, IIIB, or VB construction. This is consistent with the requirements for walls separating tenant spaces in covered mall buildings, dwelling and sleeping unit separation walls in Group I-1 and R occupancies, and 1-hour corridor walls.

Basically, the intent of the 1-hour tenant separation wall is to provide some minimal built-in fire-resistive protection between tenants in the early stages of fire development to protect the tenants until the fire department can arrive and suppress the fire. This provides additional life safety to the occupants of the tenant spaces adjacent to the tenant space on fire by giving them more time to react and evacuate. It also provides for property protection of the adjacent tenants so that a fire in a neighboring tenant will not necessarily put the adjacent tenants out of business.

One-hour tenant separation walls will also assist the responding fire department in fighting fires in multi-tenant buildings. Fire fighters can focus on containing a fire within the individual tenant space utilizing the 1-hour tenant separation walls to assist them in their fire fighting activities. This can also help them with their rescue and evacuation efforts as well, by providing additional time for the fire fighters to do their search and rescue operations while the fire is contained within the individual tenant space. And the 1-hour tenant separations can also provide for a temporary area of refuge for fire fighters. Should a fire get out of control, they can retreat into an adjacent tenant space if they cannot get direct access to the exterior.

Then they can set up a defensive position in an effort to prevent the fire from spreading to other tenants by relying on the 1-hour tenant separation to help contain the fire or at least slow down its rate of spread throughout the floor.

This code change triggers the requirement for the 1-hour tenant separation based on a tenant space requiring at least two means of egress or exits. For example, in Group B office buildings this would be triggered when a tenant space is greater than 5,000 sq ft in area. For a Group M Mercantile occupancy on the first floor or basement levels, the 1-hour tenant separation would be triggered once the space was greater than 1,500 sq ft. For all other levels in a Group M building, the tenant separation requirement would be triggered at 3,000 sq ft.

This tenant separation approach is consistent with the tenant separation requirements for covered mall buildings, as well as for the dwelling and sleeping unit separations in Group I-1, R-1, R-2, and R-3 occupancies. It is also consistent with the 1-hour corridor wall requirements in Section 1018. It makes sense that if 1-hour corridors are required to serve occupant loads greater than 30 for most occupancies in nonsprinklered buildings, then the tenant separations between adjacent enclosed tenant spaces requiring two exits or means of egress doorways out of the tenant spaces should also be provided with 1-hour fire-resistance ratings for those tenant separations. Obviously, the corridor also provides a tenant separation for the tenants on opposite sides of the corridor.

This code change also clarifies that it only applies to enclosed tenant spaces so it does not impact conditions where there is a large open space with multiple tenants utilizing that space, such as in the front of a Costco or in a food court in a covered mall.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: If approved, this section would be located following Section 420 which provides requirements for dwelling and sleeping unit separations.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ASHLEY-G1-424

G83–09/10
424 (New), Chapter 35

Proponent: Edward L. Repic, Architectural Refuse Solutions, LLC, representing self

Add new text as follows:

SECTION 424
RUBBISH CHUTES, RUBBISH COMPACTORS & LAUNDRY CHUTES

424.1 General. Rubbish and laundry chutes and rubbish compactors shall comply with the provisions of Section 424.1 through 424.7 and other applicable provisions of this code. Rubbish and laundry chutes shall comply with Sections 5.1 and 5.2 of NFPA-82, Rubbish compactors shall comply with Chapter 7 of NFPA-82.

424.2 Chute diameter. Chutes shall have a diameter of not less than 24 inches (610 mm). The diameter of the chute shall be maintained for the entire length of the chute,

424.3 Chute materials. The chute shall be constructed of aluminized steel, stainless steel, or galvanized steel of not less than 16 gage, (0.060 inches). The use of thinner materials shall be prohibited.

424.4 Vent. Chutes shall be provided with a vent of the same diameter of the chute. The vent shall extend through the roof. Reduced diameter vents shall be prohibited.

Exception. Subject to the approval of the building official, where the building configuration constrains the continuation of a round vent, a round-to-rectangular transition shall be used above the highest intake allowing the use of a rectangular vent of equivalent, clear cross-sectional area of the round chute being vented. The rectangular vent may either extend to the top of the vent, or where allowed by the building configuration, the vent shall transition from rectangular-to-round before penetrating the roof to create the vent.

424.5 Shaft enclosure at rubbish and laundry chutes. The shaft enclosure containing a rubbish or laundry chute shall comply with Sections 424.5.1 through 424.5.3.

424.5.1 Single sided construction. The chute shaft enclosure shall be of a listed construction that can be fully assembled in accordance with its approved design, including all required drywall taping when required by the design, from one side after the chute has been installed, regardless of the presence of bearing walls supporting floor framing.

424.5.2 Identical floor and wall ratings. A chute shaft enclosure shall provide the required fire protection rating over its entire length. Fire ratings shall not be lower at floor, ceiling or roof framing intersections.

424.5.3 Extend shaft enclosure to roof. The shaft enclosure shall extend to the underside of the roof. Structural framing members supporting the roof shall be outside of the chute shaft enclosure and shall not be permitted inside the shaft enclosure.

424.6 Electric interlocks. Where used, electric interlocks shall be normally engaged. They shall disengage at the door which is signaled to be open. In the event of loss of power, all interlocks shall be in the engaged position.

424.6.1 Safety switch. Electric interlock safety switch shall be provided in the discharge room to permit maintenance of the chute or chute accessories.

424.6.2 Interconnection. Electric interlocks where used with a rubbish compactor shall be interconnected to the power pack of the rubbish compactor to go off line in the event of an alarm notification from the compactor. Such required notifications shall include: container away, emergency shutoff engaged, pressure overload, motor overheating

424.7. Rubbish compactors. Rubbish compactor provisions included in Section 424.6.2 shall apply to all apartment style compactors.

424.6.1 Power pack. Power packs for apartment-style rubbish compactors shall be UL approved.

2. Add new standard to Chapter 35 as follows:

NFPA
82-2004 Gravity Waste or Linen Chutes

Reason: This submittal is part of four such proposals submitted as independent documents with the intent of adequately addressing Trash Chutes (which can include "recycling" chutes that simply redirect parts of the trash waste stream to locations other than a landfill) and Linen (or Laundry) Chutes. These proposals individually address Life Safety, Sprinkler Placement, Accessibility in new and existing facilities, and actual Chute Construction and a related component to Rubbish Chutes: Compactors . Codes generally address the shaft enclosure but ignore the actual chute being enclosed or the compactor it is feeding.

To quote from an authoritative source:

> *"Internationally, code officials recognize the need for a modern, up-to-date building code addressing the design and installation of building systems through requirements emphasizing performance. The International Building Code®, in this 2009 edition, is designed to meet these needs through model code regulations that safeguard the public health and safety in all communities, large and small. This comprehensive building code establishes minimum regulations for building systems using prescriptive and performance-related provisions. It is founded on broad-based principles that make possible the use of new materials and new building designs."*

The following information seeks to address the design and installation of a two specific building systems, Rubbish & Laundry Chutes and Rubbish Compactors, to enhance the comprehensive aspects of this code in the full spirit of this quoted material from the Preface of your document. As manufacturers of Chutes and Compactors, with distributors throughout the United States, we see the problems a lack of minimum regulation creates on a daily basis for design professionals. Without regulation design professionals resort to the talent they know best: Design. The problem lies in the fact that they undertake that design function without the benefit of knowing what the industry has learned over the last 90 or so years.

This is not to say that guidelines do not exist. In fact, they do. However, the NFPA-82 document is not a referenced standard to this Code. We are not qualified to recommend the adoption of that entire document as the document addresses items other than chutes and compactors (incinerators, for instance) that are beyond our areas of expertise. We can, however, comment upon and even improve upon the basics included in NFPA-82.

We recommend the addition of certain portions of NFPA-82, namely:
Sections: 5.1 General.
5.2 Gravity Waste or Linen Chutes
Chapter 7 Waste Compactors
(Please note that the words "waste" and "linen" in NFPA-82 correspond to the words "rubbish" and "laundry" in the IBC)
These sections cover several chute-related topics: Design, materials, intakes, discharges, offsets, and vents

Per the "Editor's Note" in section 424.1 These sections should be augmented in two ways:
First, we recommend the addition of certain provisions to NFPA-82 already presented/reasoned under separate proposals and obliquely referenced in Section 424.1, namely:
The Accessibility features outlined in our proposal for
1103.1, 1103.1.1 (new), 1103.1.2 (new);
The Latching and Closing features outlined in our proposal for
708.3.1 (new), 708.3.1.1 (new), 708.3.1.2 (new), 708.3.1.3 (new), 708.13.1, 708.13.3, 715.4.1 Exception (new), 715.4.2, 715.4.8, 715.4.8.1, and 715.4.8.3

Secondly, we recommend other modifications outlined in provisions 424.2 through 424.7. Our reasons for these are as follows:

424.2: Diameter lays the foundation for a common problem in chute design: vent diameter which becomes the subject of the paragraph that follows: 424.3.

424.3: Addresses a problem created by some industry participants who publicly claim adherence to the provisions of NFPA-82 and falsely advertise their material thickness as 16 gage material while actually using 18 gage material. The problem most commonly occurs in Spiral Chute construction. Lighter gage material is used on the premise that 18 gage material is stronger than non-spiraled 16 gage material. This is probably true, but the reasoning is, nonetheless, fallacious. At issue are the burn-through properties of the materials. Physical strength of the material is meaningless beyond the ability of the chute to be supported as chutes convey waste materials; they do not "hold" anything. Again, the issues are Life Safety and Fire Prevention, not Structural Strength.

424.4: Presented are an option (the rectangular-equivalent concept) to permit chutes and their enclosing walls to be installed without structural interference. The importance of venting cannot be over estimated as it provides rapid relief of steam buildup in the event of sprinkler activation during a fire. This prevents the intake doors from being blown open, thereby exposing other smoke protection zones from becoming engaged in the fire.

424.5 and subparagraphs: The proposed additions are designed to overcome common mistakes that most commonly, but not exclusively, occur in wood frame structures. The single side construction concept is crucial as most fire wall designs require full fire taping on both sides of the wall. It is impossible to properly install all required fire taping on the inside surface of a chute enclosure because the chute is in place, as is the chute intake door. Wood framing also commonly creates problems with fire ratings at wall and floor intersection as well as at roof framing interferences.

424.6 and sub paragraphs: Electric interlocks are an extremely popular chute accessory that permits all doors to lock when one door is opened to avoid rubbish from above falling on a depositor below if two or more people are depositing waste at the same time. This is a pretty common occurrence as people tend to throw out their garbage after feeding times, causing back-ups at the intake doors. Some interlocks are manufactured in such a way that they actually energize a downward moving locking mechanism to engage when a door is opened. Said another way the interlocks are held in a retracted position by a spring and then forced down to close all the doors not in use. The problem is that these doors are not protected by the electric interlocks when power drops as it does in a fire emergency. Other manufacturers utilize a common power source ... gravity ... to engage their interlocks and retract a single interlock when the system is activated for a deposit at a specific location. In the power loss scenario, these interlocks are engaged and act as a back up system that protects the firewall penetration from unnecessary exposure in the event of the latch failure scenario described in an another proposal submitted as part of this whole chute discussion. The provisions of Section 424.6.2 is designed to provide protection to maintenance personnel in the event of compactor trouble and during the correction of that trouble.

424.7 and sub paragraph: Rubbish compactor provisions establishes the need to interconnect the electric interlock system and this common piece of equipment for the protection of both the equipment and the personnel involved. The UL standardization is a simple protective feature for building owners, residents, and maintenance personnel.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, NFPA 82, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: REPIC-G1-424 New

G84–09/10
424 (New)

Proponent: Gary Lewis, Chair, ICC Ad Hoc Committee on Terrorism-Resistant Buildings

Add new text as follows:

SECTION 424
BUILDINGS REQUIRING A VULNERABILITY ASSESSMENT

424.1 General. In addition to the other requirements of this code, the following buildings and other structures shall have vulnerabilities assessed and mitigated in accordance with Sections 424.2 through 424.4.

1. Buildings more than 420 feet in building height.
2. Buildings and other structures containing Group A occupancies with an occupant load greater than 10,000.
3. Buildings and other structures with an occupant load greater than 20,000.

424.2 Vulnerability assessment. A vulnerability assessment shall be performed by an approved agency with expertise in vulnerability analysis, and a report shall be provided to the building official for review and approval by the authority having jurisdiction. The analysis shall conform to the generally accepted principles and industry practices for the buildings in Section 424.1. The analysis shall assess risks under intentional threats. Documentation of the analysis shall include scope of analysis, information sources, analytic calculations and methods, findings, referenced guidelines, and suggested mitigation methods. Following acceptance by the building official, the reports and documentation shall be returned to the building owner. Retention of these documents by the building official shall not be required.

424.3 Peer review. The building official is authorized to seek an independent peer review of the vulnerability analysis, findings and proposed mitigation methods. The review shall be at the owner's expense. Upon completion, the reviewer shall submit a report to the building official, indicating the scope of the review performed and the findings of that review.

424.4 Mitigation. Risks identified in the vulnerability analysis shall be mitigated in an approved manner.

Reason: This proposal, if adopted, would add new text to the code for certain buildings of iconic classification. As the potential loads posed to these buildings by the threat of terrorist acts is generally non-quantifiable, normal design thresholds cannot be applied.

The ICC and the code community at large have been struggling since the tragic events of 9/11 to develop an appropriate response to the prospect of terrorism and terror-related events within the built environment. The ICC formulated an Ad Hoc Committee on Terrorism Resistant Buildings to deal with the issue, and assigned another standing committee, the Code Technology Committee, to review the National Institute of Standards and Technology's (NIST) Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers.

Throughout that process, it has become apparent that the model building and fire codes do contain some vulnerabilities that had not previously been anticipated, and the codes are currently being amended. Moreso, however, that process has made clear that the solution to terrorism prevention in vulnerable buildings and facilities lies not exclusively within the model codes, but rather in a deliberate, thorough vulnerability analysis of each iconic structure *individually*, with mitigation measures tailored to the level of threat determined by the analysis in each case.

This is not a new concept (References 1 to 9). The federal government has been conducting such analyses on select federal facilities for years now, as have a number of private developers of signature projects such as arenas, malls and super high-rise buildings. It is important to note that this provision does not change anything required of construction under the IBC, nor does it require that the building official become an expert in homeland security matters. A project developer of a new building under the very limited scope of this proposal --- 420 feet represents about 38 stories, or very large assembly arenas or super malls --- would simply have to engage an additional expert as part of their design team to conduct a vulnerability analysis. We would suggest to the membership that such a review is already being conducted now anyway in many cases, driven by the private sector.

It is anticipated that the building code official would engage a peer reviewer, one with the same or similar qualifications as the entity which completed the initial assessment analysis, at the owner's expense, to review the report and documentation and issue a response, ultimately resulting in consensus between the experts as to the risk and the appropriate mitigation measures to be taken during the project and post-occupancy.

The structural engineering community brought forth this proposal in Palm Springs, among other reasons because the load or threat to be considered and designed for in the realm of terrorism is not readily quantifiable, thereby making the solution impossible on a broad brush basis. We believe that a very limited, judicious approach to threat assessment and vulnerability analysis is the overall best response to the threat of terrorism.

Interested parties can find additional resources on this subject via the following links:

http://www.dhs.gov/index.shtm
http://www.tswg.gov/
http://www.fema.gov/pdf/plan/prevent/rms/155/e155_unit_iv.pdf
http://www.fema.gov/library/viewRecord.do?id=1939
http://www.fema.gov/plan/prevent/rms/rmsp452.shtm
http://www.fema.gov/rebuild/mat/index.shtm
http://www.fema.gov/about/regions/regionii/toolkit_risk.shtm

References:

1. FEMA 426, Reference manual to Mitigate Terrorist Attacks Against Buildings, http://www.fema.gov/plan/prevent/rms/rmsp426
2. FEMA 427, Primer for Design of Commercial Buildings to Mitigate Terrorist Attacks, http://www.fema.gov/plan/prevent/rms/rmsp427
3. FEMA 459, Incremental Protection for Existing Commercial Buildings from Terrorist Attack, http://www.fema.gov/library/viewRecord.do?id=3270
4. Facilities Standards for the Public Building Service, http://www.gsa.gov/gsa/cm_attachments/GSA_DOCUMENT/p100-2003c8_R2E-qD-b_0Z5RDZ-i34K-pR.pdf
5. Homeland Security Centers of Excellence, http://www.dhs.gov/xres/programs/editorial_0498.shtm
6. Infrastructure and Geophysical Projects, http://www.dhs.gov/xres/programs/gc_1218480826191.shtm#9
7. FEMA 427, "Primer for Design of Commercial Buildings to Mitigate Terrorist Attacks," http://www.fema.gov/plan/prevent/rms/rmsp427
8. Recommended Security Guidelines for Airport Planning, Design and Construction, http://www.tsa.gov/assets/pdf/airport_security_design_guidelines.pdf
9. USDOJ, A Method to Assess the Vulnerability of U.S. Chemical Facilities, http://www.fas.org/sgp/crs/RL32670.pdf

Cost Impact: The code change proposal will not increase the cost of construction. The Committee recognizes that the provision for additional expertise in the preliminary design stage will result in some additional expense; the requirement is, therefore, very targeted in scope and applies to a very small subset of structures in the built environment.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LEWIS-G2-424.doc

G85–09/10
503.1, Table 503, 507.1

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing self

Revise as follows:

503.1 General. The building height and area shall not exceed the limits specified in Table 503 based on the type of construction as determined by Section 602 and the occupancies as determined by Section 302 except as modified ~~hereafter~~ by Sections 503.1.1 through 503.1.5 and Sections 504, 506.2 and 506.3. Each portion of a building separated by one or more fire walls complying with Section 706 shall be considered to be a separate building.

503.1.1 Special industrial occupancies. Buildings and structures designed to house special industrial processes that require large areas and unusual building heights to accommodate craneways or special machinery and equipment, including, among others, rolling mills; structural metal fabrication shops and foundries; or the production and distribution of electric, gas or steam power, shall be exempt from the building height and area limitations of Table 503.

503.1.2 Buildings on same lot. Two or more buildings on the same lot shall be regulated as separate buildings or shall be considered as portions of one building if the building height of each building and the aggregate building area of the buildings are within the limitations of Table 503 as modified by Section 504 and 506. The provisions of this code applicable to the aggregate building shall be applicable to each building.

503.1.3 Type I construction. Buildings of Type I construction permitted to be of unlimited tabular building heights and areas are not subject to the special requirements that allow unlimited area buildings in Section 507 or unlimited building height in Sections 503.1.1 and 504.3 or increased building heights and areas for other types of construction.

503.1.4 Unlimited area buildings. The area of buildings complying with Section 507 shall not be limited by Table 503.

503.1.5 Special provisions. The height and area of buildings complying with Section 509, as applicable, shall not be limited by Table 503.

TABLE 503
ALLOWABLE BUILDING HEIGHTS AND AREAS[a]

(Portions of table not shown remain unchanged)

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929 m^2

A = building area per story. S= stories above grade plane, UL = Unlimited, NP = Not permitted.

~~a. See the following sections for general exceptions to Table 503:~~
~~1. Section 504.2, Allowable building height and story increase due to automatic sprinkler system installation.~~
~~2. Section 506.2, Allowable building area increase due to street frontage.~~
~~3. Section 506.3, Allowable building area increase due to automatic sprinkler system installation.~~
~~4. Section 507, Unlimited area buildings.~~
~~b.~~ a. For open parking structures, see Section 406.3.
~~c.~~ b. For private garages, see Section 406.1.
~~d.~~ c. See Section 415.5 for limitations.

507.1 General. The area of buildings of the occupancies and configurations specified herein shall not be limited by Table 503.

Reason: This code change proposal is editorial. Basically, it deletes Footnote a from Table 503 and incorporates it into the text of the code. We believe that code requirements are better addressed in the body of the code rather than as footnotes to a table unless the footnotes are very specific to the table and not general in nature. However, Footnote a is somewhat broad and can be better handled, in our opinion, by relocating the text to Section 503.1 and making a clarification to Section 507.1. And in order to make Section 503.1 more comprehensive regarding how Table 503 is intended to regulate the allowable building heights and areas, we have incorporated new Subsection 503.1.4 addressing unlimited area buildings regulated by Section 507 and Subsection 503.1.5 Special Provisions regulating heights and areas of buildings complying with Section 509. Thus, the user of the code can find all he or she needs to know regarding the determination of building height and area limitations based on the application of Table 503 and the cases where modifications and/or exceptions are made to that table in accordance with the applicable provisions of the sections referenced in Section 503.1 including its subsections.

The proposed revision to Section 507.1 merely correlates with the revisions made to Section 503.1 to indicate that the building area is not limited by Table 503 for these unlimited area buildings.

In conclusion, we believe that these editorial revisions will provide for better code interpretation, application, and enforcement.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Thornberry-G1-503

G86–09/10
503.1.4 (New)

Proponent: Sarah A. Rice, CBO, representing self

Add new text as follows:

503.1.4 Occupancies on roofs. Open-air roofs occupied by an occupancy different than the primary occupancy of the building shall not be required to be taken into account when determining the minimum type of construction for the building when the means of egress system from the open-air roof complies with Chapter 10.

> **Exception:** Open-air roofs of buildings of Groups A, B, E, F-2, I, M, R and S-2 occupancies shall not be occupied by Group S-1, F-1 or H occupancies.

Reason: Occupied roof gardens, pool levels and similar uses are literally classified as Group A-3 occupancies but the hazard they present to the building is minimal. So this change proposes that even though their occupancy is Group A-3 (assembly) for determining the minimum level of means of egress from that level, the building not be penalized for their location.

Should a fire incident occur, the very openness of the space will provide venting of any smoke or hot gases that may be generated, in other words it will offer the perfect smoke control system.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-G6-503.1.4.doc

G87–09/10
503.1.4 (New)

Proponent: Ken Kraus, Los Angeles, CA Fire Department

Add new text as follows:

503.1.4 Occupancy location. An occupancy shall not be located above the story or height limit set forth in Table 503. Where Section 504.2 allows modifications to limits of Table 503, occupancies shall not located above the additional story or increased height limit.

Reason: This proposed addition to the Code is intended to clearly disallow the occupancy of roof areas and stories above the height and story limits prescribed in Table 503 and Section 504.2.

As written, the code can be misapplied if areas above the floor level of the highest story allowed (roof and floor surfaces) are considered part of the highest story allowed for occupant use.

This is due to misinterpretation of the definition of Story which states, in part “The portion of a building included between the upper surface of a floor and the upper surface of the floor or roof next above”.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KRAUS-G1-503.1.4

G88–09/10
Table 503

Proponent: Daniel E. Nichols, PE, New York State Dept. of State, Div. of Code Enforcement and Administration, Ken Kraus, City of Los Angeles Fire Department

Revise table as follows:

TABLE 503
ALLOWABLE BUILDING HEIGHTS AND AREAS[a]
Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane.
Building area limitations shown in square feet, as determined by the definition of "Area, building," per story

		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
	HEIGHT (feet)	UL	160	65	55	65	55	65	50	40
GROUP		STORIES(S) AREA (A)								
H-2[d]	S	~~UL~~ 4	3	2	1	2	1	2	1	1
	A	21,000	16,500	11,000	7,000	9,500	7,000	10,500	7,500	3,000

(Portions of table not shown remain unchanged)

Reason: H-2 occupancies are defined as "Buildings and structures containing materials that pose a deflagration hazard or a hazard from accelerated burning." The principal difference between a Group H-1 and H-2 occupancy, by definition, is that the velocity of the spread of the fire. There is not a difference in the severity of fire in a Group H-2 when compared to a Group H-1, after the initial ignition. Examples of hazards that can be found within Group H-2 occupancies include pyrophoric materials, flammable gases, peroxides, and flammable cryogenic fluids.

This proposal limits the floor level of Group H-2 occupancies to four stories. The four story number is based on the limit of H-5 occupancies, where materials like pyrophoric materials and flammable gases are commonly used in a much more controlled atmosphere. The reason to place a limit on Group H-2 occupancies is recognizing the severe fire hazard and the adverse effect for firefighting purposes. An uncontrolled fire within a Group H-2 occupancy will be more than likely fought from the exterior of the building. Placing a Group H-2 occupancy at higher levels will impede safe firefighting operations.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: NICHOLS-G5-TABLE 503.doc

G89–09/10
Table 503

Proponent: Jason Thompson, National Concrete Masonry Association, representing the Masonry Alliance for Codes and Standards

Revise table as follows:

TABLE 503
ALLOWABLE HEIGHT AND BUILDING AREAS[a]

		TYPE OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
GROUP		A	B	A	B	A	B	HT	A	B
	HEIGHT (feet)	UL	160	65	55	65	55	65	50	40
	STORIES (S) AREA (A)									
R-1	S	UL	11	4	~~4~~ 3	4	~~4~~ 3	4	3	2
	A	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000
R-2	S	UL	11	4	~~4~~ 3	4	~~4~~ 3	4	3	2
	A	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000
R-4	S	UL	11	4	~~4~~ 3	4	~~4~~ 3	4	3	2
	A	UL	UL	24,000	16,000	24,000	16,000	20,500	12,000	7,000

(Portions of table and footnotes not shown remain unchanged)

Reason: One area of concern identified for study by the ICC Code Technology Committee's Height and Area Study Group was 4 and 5 story buildings of non-fire-resistance-rated types of construction. The table below shows the occupancies in the 2006 International Building Code (IBC) where that condition existed for sprinklered buildings of Types IIB and IIIB construction. In addition, the table shows the sprinklered height allowances for these occupancies in the legacy codes.

Type IIB and Type IIIB Construction
Story Comparison (w/ NFPA 13 Sprinkler System)

	SBC	NBC	UBC	2006 IBC
B	5	4	2	**5**
F-2	4	4	2	**4**
M	5	3	2	**5**
S-1	4	3	2	**4**
S-2	4	4	2	**5**
R* (NFPA 13)	5	4	4	**5**
R* (NFPA 13R)	4	4	3	**4**

* - Applies for R-1, R-2 and R-4 Use Groups

The Study Group noted that for Use Group B, M, S-1, and R buildings of Type IIB and Type IIIB construction, the allowance for 4 or 5 stories in the IBC was premised on the story heights allowed in the SBCCI Standard Building Code (SBC). In all these instances, the SBC sprinklered height allowance for those Use Groups was based on a multiple story sprinkler increase. For example, for Use Group R, the SBC allowed 2 stories for unsprinklered construction and 5 stories for sprinklered construction. This exceeded the consistent one story sprinkler height increase incorporated in the IBC height and area provisions. Based on this review, the Study Group identified two anomalies from what was permitted by the legacy codes. First, the story height allowance for S-2 use groups was not based on any of the legacy code allowances. Second, for Use Groups B, M, S-1, and R in Types IIB and IIIB construction, the IBC story height allowance for unsprinklered buildings exceeded what was allowed by any of the legacy codes. For example, the largest height allowed for an unsprinklered Type IIB construction apartment building (Group R-2 occupancy) in any of the legacy codes was the BOCA National Building Code (NBC) allowance for 3 stories. Currently, the IBC allows 4 stories for this condition. Rather than modify the sprinkler increase in the IBC, the Study Group suggested the following recommended story heights for Table 503:

Unsprinklered 2006 IBC Table 503 Values (Revised)

Use Group	IIB	IIIB
B	3	3
M	2	2
S-1	2	2
S-2	3	3
R*	3	3

* - Applies for R-1, R-2 and R-4 Use Groups

In essence, these reductions would eliminate the anomalies created by the multi-story SBC sprinkler increase and drop the IBC values back to the next least restrictive legacy code (in these cases, the NBC). It should be noted that during the ICC Final Action Hearings in Minneapolis for the last code cycle, all of the code changes submitted by the Study Group to reduce the allowable story heights were approved by the ICC Class A voting members with a greater than two-thirds majority vote except for one. That one was Code Change G118-07/08 which is identical to this code change proposal. Although the voting members were able to overturn the Committee's recommendation for disapproval, the code change was subsequently disapproved because the two-thirds (67%) majority vote could not be achieved. The final vote was 243 in favor and 163 opposed (60%). Since a significant majority of the Class A voters wanted to see that code change approved, the change is being resubmitted for reconsideration by the IBC General Committee.

Although the proposal will reduce the allowable height of Group R buildings of Types IIB and IIIB construction by one story, the maximum area (total of all stories) of the tallest building that will then be permitted will generally still be considerably greater than that permitted by any of the legacy codes (see table below). For example, consider a residential building (Group R occupancy) of Type IIB construction, which does not have an NFPA 13 sprinkler system, with a height of 3 stories; the tallest permitted by any of the legacy codes. If less than 20 feet of open space is provided around the building, the IBC permits the total area of all three stories to be 108% greater than the largest total area permitted by the legacy codes. If the width of the open space is increased to 40 feet, the IBC's total area allowed is still 27% greater than the largest area allowed by any of the legacy codes. If an NFPA 13 sprinkler system is provided in a Group R residential building of Type IIB construction, the height of the building can be increased to four stories. If the building has less than 20 feet of open space, the maximum area allowed by the IBC is 50% greater than the largest area allowed by any of the legacy codes. Although allowable heights are proposed to be reduced, the foregoing illustrates that residential buildings will still be able to have total areas that are comparable to or greater than that permitted by the largest areas allowed by any of the legacy codes.

It should be noted that this proposal has no impact on residential buildings equipped with NFPA 13R or NFPA 13D sprinklers since they are not currently allowed to use the height increase for sprinklers.

Occupancy Group	Type of Construction	NFPA 13 Sprinklers – Yes/No	Width of Open Space (ft.)[a, b]	Ratio of IBC Maximum Building Area to the Largest Maximum Building Area Permitted by Legacy Codes				
				Number of Stories				
				1	2	3	4	5
R-1 R-2 R-4	IIB	No	< 20	1.33	1.33	2.08	NPLC	NP
			40	1.17	1.17	1.27	NPLC	NP
		Yes	< 20	1.78	1.67	2.00	1.50	1.20
			40	1.39	1.39	1.67	1.25	1.00
	IIIB	No	< 20	1.33	1.33	2.08	NPLC	NP
			40	1.17	1.17	1.27	NPLC	NP
		Yes	< 20	1.78	1.67	2.00	1.50	1.20
			40	1.39	1.39	1.67	1.25	1.00

NPLC means not permitted by any of the legacy codes, but permitted by the IBC.
NP means not permitted by any of the legacy codes or the IBC.
If this code change is approved, building heights represented by shaded cells will not be permitted by the IBC.

a. Width of open space around 100% of building perimeter.
b. 40 feet was used because the ICBO Uniform Building Code (UBC) required a minimum 40 feet of open space on all sides of the building in order to qualify for a 100% area increase; the maximum permitted by that code. The NBC and SBC permitted maximum open space increases of 150% and 100%, respectively, at 30 feet.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: THOMPSON-G2-T503

G90–09/10
Table 503

Proponent: A. Hal Key, PE, Mesa, AZ Fire Department

Revise as follows:

TABLE 503
ALLOWABLE BUILDING HEIGHTS AND AREAS[a]
Building height limitations shown in feet above grade plane. Story limitations shown as stories above grade plane.
Building area limitations shown in square feet, as determined by the definition of "Area, building," per story

		TYPES OF CONSTRUCTION								
		TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
		A	B	A	B	A	B	HT	A	B
	Height(feet)	UL	160	65	55	65	55	65	50	40
GROUP		STORIE(S) AREA (A)								
S-1[e]	S	UL	11	4	2	3	2	4	3	1
	A	UL	48,000	26,000	17,500	26,000	17,500	25,500	14,000	9,000

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929m2.
A = building area per story, S = stories above grade plane, UL = Unlimited, NP = Not permitted.

a. See the following sections for general exceptions to Table 503:
   1. Section 504.2, Allowable building height and story increase due to automatic sprinkler system installation.
   2. Section 506.2, Allowable building area increase due to street frontage.
   3. Section 506.3, Allowable building area increase due to automatic sprinkler system installation.
   4. Section 507, Unlimited area buildings.
b. For open parking structures, see Section 406.3.
c. For private garages, see Section 406.1.
d. See Section 415.5 for limitations.
e. For aircraft hangars, see Section 412.2.

(Portions of table not shown remain unchanged)

Reason: During the last cycle, changes were made to Section 412.2 classifying aircraft hangars by the NFPA 409 classifications to determine the fire suppression requirements. These changes created area limitations that a user of the Building Code may not find without going to Section 412.2. The addition of footnote "e" sends the user of the Building Code to this section similarly to other footnotes found in this table.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: KEY-G1-TABLE 503.doc

G91–09/10
504.2

Proponent: Jason Thompson, National Concrete Masonry Association, representing the Masonry Alliance for Codes and Standards

Revise as follows:

504.2 Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one story. These increases are permitted in addition to the area increase in accordance with Sections 506.2 and 506.3. ~~For Group R buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one story, but shall not exceed four stories or 60 feet (19 288 mm), respectively.~~

Exceptions:

1. Buildings, or portions of buildings, classified as a Group I-2 occupancy of Type IIB, III, IV or V construction.
2. Buildings, or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.
3. *Fire-resistance rating* substitution in accordance with Table 601, Note d.

Reason: This code change proposes to eliminate the special allowances given for Group R occupancy buildings that are protected with an NFPA 13R automatic sprinkler system as specified in Section 903.3.1.2. Currently, Section 504.2 will allow an increase in the building height of one story and 20 feet where an NFPA 13R sprinkler system is provided, as long as the building does not exceed a total height of four stories or 60 feet. Furthermore, Section 506.4 allows an area increase for the installation of an NFPA 13R sprinkler system for Group R buildings that are greater than three stories in height. It is not appropriate to provide for both an allowance of an area increase and height increase for the types of construction. Where an NFPA 13R sprinkler system is installed the net result in the overall level of safety is a lessening of the passive built-in fire resistance that would be required if one of the NFPA 13R reductions (area or height) were not permitted.

NFPA 13R sprinkler systems primarily provide for life safety in buildings. They were developed for that purpose as clearly stated in Section 1.2 of the 2002 edition of the standard. It is interesting to note the Annex A discussion of the purpose of NFPA 13R which states: "Various levels of sprinkler protection are available to provide life safety and property protection. This standard is designed to provide a high, but not absolute, level of life safety and a lesser level of property protection. Greater protection to both life and property could be achieved by sprinklering all areas in accordance with NFPA 13… it should be recognized that the omission of sprinklers from certain areas could result in the development of untenable conditions in adjacent spaces. Where evacuation times could be delayed, additional sprinkler protection and other fire protection features, such as detection and compartmentation, could be necessary." That statement says it all about an NFPA 13R sprinkler system.

The intent of the IBC as expressed in Section 101.3 Intent is as follows: "The purpose of this code is to establish the minimum requirements to safeguard the public health, safety, and general welfare… and safety to life and property from fire and other hazards attributed to the built environment and to provide safety to fire fighters and emergency responders during emergency operations." Allowing the use of an NFPA 13R sprinkler system to increase the size of a building is counter to the intent and purpose of the IBC. Types of construction are designed to limit the height and area of buildings based on the occupancy and the degree of built-in fire-resistive protection and use of combustible or noncombustible construction materials. Buildings are allowed to get larger in area and taller in height with more fire-resistance built in and the reduced use of combustible construction for the building's structural elements. Therefore, property protection is a primary outcome of the types of construction used. Of course, type of construction also plays a role in life safety, especially in multi-story buildings, and has an impact on fire fighter safety as well. But an NFPA 13R sprinkler system is basically a partial sprinkler system because the standard does not require sprinklers in many concealed combustible areas including attics. So why should a building protected with an NFPA 13R sprinkler system be given the same credit for a building with more complete protection based on NFPA 13 sprinkler system?

Within the last few years there have been many fires involving buildings protected with NFPA 13R sprinkler systems which have burned to the ground. In most of those cases, the fire was able to get into the unprotected combustible attic space and spread throughout the building and then burn downward, overpowering the sprinkler system. It is not logical to allow increases in height and area for sprinkler systems that can not reduce the risk of a building being burned to the ground.

There have been several code changes in the recent two cycles to eliminate this height increase for NFPA 13R sprinkler systems. Though not previously approved the Masonry Alliance for Codes and Standards (MACS) still agrees with the previous proponents' supporting statements on why this reduction is not warranted. The issues have been clearly stated and adequate reasons given to support this particular code change proposal. Therefore, we respectfully request the Committee approve this code change proposal as submitted for the reasons stated.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THOMPSON-G6-504.2

G92–09/10
504.2, 506.3

Proponent: Robert J Davidson, Code Consultant, Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Revise as follows:

504.2 Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one. These increases are permitted in addition to the area increase in accordance with Section~~s~~ 506.2 ~~and 506.3~~. For Group R buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.2, the value specified in Table 503 for maximum height is increased by 20 feet (6096 mm) and the maximum number of stories is increased by one, but shall not exceed 60 feet (18 288 mm) or four stories, respectively.

Exceptions~~:~~ The use of an automatic sprinkler system to increase building heights shall not be permitted for the following conditions:

1. Buildings, or portions of buildings, classified as a Group I-2 occupancy of Type IIB, III, IV or V construction.
2. Buildings, or portions of buildings, classified as a Group H-1, H-2, H-3 or H-5 occupancy.
3. ~~Fire-resistance rating substitution~~ Buildings where an automatic sprinkler system is substituted for fire-resistance rated construction in accordance with Table 601, Note d.
4. Buildings where an automatic sprinkler system is used to increase the building height or number of stories accordance with Section 506.3.

506.3 Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the area limitation in Table 503 is permitted to be increased by an additional 200 percent (I_s = 2) for buildings with more than one story above grade plane and an additional 300 percent (I_s = 3) for buildings with no more than one story above grade plane. ~~These increases are permitted in addition to the height and story increases in accordance with Section 504.2.~~

Exception: The use of an automatic sprinkler system to increase the building area limitation ~~increases~~ shall not be permitted for the following conditions:

1. ~~The automatic sprinkler system increase shall not apply to Buildings with an occupancy in Group H-1~~. Buildings classified as a Group H-1 occupancy.
2. ~~The automatic sprinkler system increase shall not apply to the building area of an occupancy in Group H-2 or H-3~~. Buildings, or portions of buildings, classified as either a Group H-2 or H-3 occupancy. For buildings containing such occupancies, the allowable area shall be determined in accordance with Section 508.4.2, with the sprinkler system increase applicable only to the portions of the building not classified as Group H-2 or H-3.
3. Buildings where an automatic sprinkler system is substituted for fire-resistance rated construction ~~Fire-resistance rating substitution~~ in accordance with Table 601, Note d.
4. Buildings where an automatic sprinkler system is used to increase the building height or number of stories in accordance with Section 504.2.

Reason: In reviewing this comment we ask that you keep in mind that when the IBC was created, there was a policy decision made that when merging the three legacy codes into one, any conflict between legacy code provisions would default to the lesser requirement. This reportedly was done to avoid adoption problems for jurisdictions when moving to the IBC from a legacy code, i.e., if the new code was more restrictive there could be opposition to adoption. The concept of balance is constantly bandied about when examining specific code provisions in that when looking at the code as a whole, one requirement balances out the other. This concept is spoken of specifically when dealing with automatic sprinkler system trade offs. If we accept the fact that the three separate legacy codes were balanced, i.e., they had some requirements less restrictive than the same topic in another legacy code but they had other topics that were more restrictive, what happened when we merged the three codes? We went through and took the lowest requirement from each code without taking the more restrictive. What happened to the balancing effect that each legacy code had developed over the years? It does not exist in the IBC.

Another way to look at this issue is that in many jurisdictions the building code is the minimum standard to apply, in some it is the minimum and the maximum standard, (mini-max code). In any jurisdiction that previously applied one of the legacy codes, at the time they had a legacy code effective, the current IBC provisions would be less than that applicable code permitted. In other words, application of many of the provisions in the IBC would be illegal. It is for that reason we seek to reduce the size of some of the buildings permitted to be built under the IBC to start to bring balance back to the code.

Those of us that have been proposing to modify some of the height and area requirements have been asked by opponents why we are so focused on this issue, what is so wrong with the height and areas. To be honest, we are not focused on this one issue. We have been active in many areas of the code we felt need clarification or tightening of requirements. But our specific interest in the height and area is because of the cumulative effect of the process we describe in the first two paragraphs of this reasoning statement.

We not only get bigger buildings under the IBC as compared to various legacy codes, we get them with less protective features and a reduced ability to withstand attack by fire. In much of the country Type 1A construction required 4 hour protection. Now it only requires 3 hour protection. So the buildings are bigger and when attacked by fire they may come down quicker.

The size of the buildings directly relates to how much area a responding fire department must deal with and possibly how much area must be searched. No one checked with the fire service to see if their manning levels could handle the increased size allowance coupled with the reduction in protection features. Take a look at the legacy codes and compared the restrictions on communicating floor levels with what the IBC allows now. So not only are the buildings bigger with reduced fire resistance requirements, we now allow the smoke and heat to travel to more of the building.

The answer we get on this topic is that the buildings in question will have an automatic fire suppression system and that takes care of all of your concerns. Though we are strong believers in the installation of automatic sprinkler systems and we would like to eventually see them installed in all buildings and structures, we also believe in striking a balance. Being safe means not relying on a single method of protection, or in this case a single protective system.

This position is supported by the recent NFPA report, "U.S. Experience with Sprinklers and Other Automatic Fire Extinguishing Equipment", http://www.nfpa.org/assets/files//PDF/OSsprinklers.pdf . Though overall sprinklers operate in 95% of all reported structure fires and are effective 96% of that time, resulting in a combined overall effectiveness of 91%. The actual percentage changes based upon occupancy with warehouses at the 78% level.

They are out of service for maintenance, construction, (tenant improvements), unintentional human error. There is also a vulnerability factor-besides seismic, we have experience where systems were taken out by vehicle crash or explosion. In instances of improper design/use or arson, the system can be overcome. Most sprinkler systems as designed don't extinguish the fire, they only control it and there can be tremendous smoke generation and spread (particularly smoldering or shielded fires, etc). In fact, sprinklers drive the smoke lower and impede visibility, building size becomes more of an issue to both rescue (panic) and firefighting.

To balance this out we seek buildings to have increased fire-resistive design and they get larger. The larger the building the more time the fire service needs to deal with rescue and fire extinguishment. The more time the fire service needs to be in the building during adverse conditions, the better protected the building needs to be.

This proposal seeks to strike a balance. An increase would still be permitted based upon the presence of the automatic sprinkler protection, but a choice would have to be made to take either an area increase or a height increase, not both.

This proposal does not stop larger buildings from being constructed, what it does is change the trigger for the use of non-combustible versus combustible types of construction and changes the trigger of when protected types of construction would be required and at what fire resistance rating to building a larger building.

As already stressed fire departments suffer through wave after wave of cut backs in staff, equipment and fire stations, this issue increases in importance every day.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-G4-504.2.doc

G93–09/10
505.1 through 505.5.3

Proponent: Sarah A. Rice, CBO, representing self

Revise as follows:

SECTION 505
MEZZANINES AND EQUIPMENT PLATFORMS

505.1 General. Mezzanines shall comply with Section 505.2. Equipment platforms shall comply with Section 505.3.

505.2 Mezzanines. A mezzanine or mezzanines in compliance with Section ~~505~~ 505.2 shall be considered a portion of the story below. Such mezzanines shall not contribute to either the building area or number of stories as regulated by Section 503.1. The area of the mezzanine shall be included in determining the fire area defined in Section 702. The clear height above and below the mezzanine floor construction shall not be less than 7 feet (2134 mm).

505.2.1 Area limitation. The aggregate area of a mezzanine or mezzanines within a room shall not exceed one-third of the floor area of that room or space in which they are located. The enclosed portion of a room shall not be included in a determination of the floor area of the room in which the mezzanine is located. In determining the allowable mezzanine area, the area of the mezzanine shall not be included in the floor area of the room.

Where a room contains both a mezzanine and an equipment platform the aggregate area of the two raised floor levels shall not exceed two thirds of the floor area of that room or space in which they are located with neither occupying more than one-third of the floor area of the room..

Exceptions:

1. The aggregate area of mezzanines in buildings and structures of Type I or II construction for special industrial occupancies in accordance with Section 503.1.1 shall not exceed two-thirds of the area of the room.
2. The aggregate area of mezzanines in buildings and structures of Type I or II construction shall not exceed one-half of the area of the room in buildings and structures equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 and an approved emergency voice/alarm communication system in accordance with Section 907.2.12.2.

~~505.3~~ **505.2.2 Egress.** Each occupant of a mezzanine shall have access to at least two independent means of egress where the common path of egress travel exceeds the limitations of Section 1014.3. Where a stairway provides a means of exit access from a mezzanine, the maximum travel distance includes the distance traveled on the stairway measured in the plane of the tread nosing. Accessible means of egress shall be provided in accordance with Section 1007.

Exception: A single means of egress shall be permitted in accordance with Section 1015.1.

~~505.4~~ **505.2.3 Openness.** A mezzanine shall be open and unobstructed to the room in which such mezzanine is located except for walls not more than 42 inches (1067 mm) high, columns and posts.

Exceptions:

1. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the occupant load of the aggregate area of the enclosed space does not exceed 10.
2. A mezzanine having two or more means of egress is not required to be open to the room in which the mezzanine is located if at least one of the means of egress provides direct access to an exit from the mezzanine level.
3. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the aggregate floor area of the enclosed space does not exceed 10 percent of the mezzanine area.
4. In industrial facilities, mezzanines used for control equipment are permitted to be glazed on all sides.
5. In other than Groups H and I occupancies no more than two stories in height above grade plane and equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, a mezzanine having two or more means of egress shall not be required to be open to the room in which the mezzanine is located.

~~505.5~~ **505.3 Equipment platforms.** Equipment platforms in buildings shall not be considered as a portion of the floor below. Such equipment platforms shall not contribute to either the building area or the number of stories as regulated by Section 503.1. The area of the equipment platform shall not be included in determining the fire area. Equipment platforms shall not be a part of any mezzanine and such platforms and the walkways, stairs and ladders providing access to an equipment platform shall not serve as a part of the means of egress from the building.

~~505.5.1~~ **505.3.1 Area limitations.** The aggregate area of all equipment platforms within a room shall not exceed two-thirds of the area of the room in which they are located. Where an equipment platform is located in the same room as a mezzanine, the area of the mezzanine shall be determined by Section ~~505.2~~ 505.2.1 and the combined aggregate area of the equipment platforms and mezzanines shall not exceed two-thirds of the room in which they are located.

Exception. Where a room contains both a mezzanine and an equipment platform the aggregate area of the two raised floor levels shall not exceed two thirds of the floor area of that room or space in which they are located.

[F] ~~505.5.2~~ **505.3.2 Fire suppression.** Where located in a building that is required to be protected by an automatic sprinkler system, equipment platforms shall be fully protected by sprinklers above and below the platform, where required by the standards referenced in Section 903.3.

~~505.5.3~~ **505.3.3 Guards.** Equipment platforms shall have guards where required by Section 1013.1.

Reason: To clarify which provisions apply to mezzanines and which ones apply to equipment platforms and to address when you have both types of raised platforms in one room.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-G8-505.doc

G94–09/10
505.2

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

505.2 ~~Area limitation~~ Limitations. Limitations on area and levels of mezzanines shall be in accordance with Sections 505.2.1 and 505.2.2.

505.2.1 Area. The aggregate area of a mezzanine or mezzanines within a room shall not exceed one-third of the floor area of that room or space in which they are located. The enclosed portion of a room shall not be included in a determination of the floor area of the room in which the mezzanine is located. In determining the allowable mezzanine area, the area of the mezzanine shall not be included in the floor area of the room.

Exceptions:

1. The aggregate area of mezzanines in buildings and structures of Type I or II construction for special industrial occupancies in accordance with Section 503.1.1 shall not exceed two-thirds of the floor area of the room.
2. The aggregate area of mezzanines in buildings and structures of Type I or II construction shall not exceed one-half of the floor area of the room in buildings and structures equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 and an approved emergency voice/alarm communication system in accordance with Section 907.2.12.2.

505.2.2 Levels. There shall not be more than two levels of mezzanines in a room.

Reason: This addition to the code is required in order to limit the number of levels that can be built in one room. By not having any limitations on the levels, a high-ceiling room with many levels can be created; hence, an atrium. Limiting to two levels, will be in conformance with Exception in Section 404.5 where smoke control system will be required when number of stories (or levels, in this case) exceed two. Since a mezzanine is located above the floor of which the mezzanine is considered a part of, untenable smoke concentrations and the associated loss of visibility due to smoke obscuration may affect the mezzanine level. The occupants of the mezzanine by means of sight, smell or hearing will have to be able to determine if there is some emergency or fire that takes place on other mezzanines or in the room in which the mezzanine is located. Allowing more than two levels of mezzanines could compromise this feature.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAIEL-G2-505.2

G95–09/10
505.3

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

505.3 Egress. The means of egress for mezzanines shall comply with the applicable provisions of Chapter 10. ~~Each occupant of a *mezzanine* shall have access to at least two independent *means of egress* where the *common path of egress travel* exceeds the limitations of Section 1014.3. Where an unenclosed *stairway* provides a means of *exit access* from a *mezzanine*, the maximum travel distance includes the distance traveled on the *stairway* measured in the plane of the tread nosing. *Accessible means of egress* shall be provided in accordance with Section 1007.~~

~~**Exception:** A single *means of egress* shall be permitted in accordance with Section 1015.1.~~

Reason: A review of current Section 505.3 mezzanine egress requirements reveals a restatement of some, but not all, means of egress design requirements. Such partial cross-references can be confusing for code users. Some practitioners might assume that those provisions (such as separation or arrangement of multiple exits or access to exits) that are not stated, do not apply. The current first sentence of Section 505.3 readdresses common path of egress travel requirements. The definition of "Common Path of Egress Travel," Section 1014.3 and Section 1015.1 all state or infer that common path of egress travel provisions apply to all portions of the exit access—to include mezzanines. The last sentence reinforces the concept of accounting for exit access travel distance on unenclosed interior stairways, a fundamental provision of Section 1016.1. Lastly, Section 1015.1 numbers of exit or exit access requirements stand on their own merit. They are universally applicable to all spaces in the exit access portion of the means of egress system, to include mezzanines.

In summary, means of egress requirements from a mezzanine are no different than from any other room, space or area within the exit access portion of the means of egress system. The incomplete restatement of certain means of egress design requirements erroneously alludes to the notion that there may be special means of egress requirements for mezzanines. It is felt that a simple and appropriate reference to applicable Chapter 10 provisions would clarify intent and lend to the more consistent design of means of egress from mezzanines.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KEITH-G2-505.3.doc

G96–09/10
506.2.1, 507.1

Proponent: Jerry R. Tepe, JRT-AIA Architect, representing American Institute of Architects

Revise as follows:

506.2.1 Width limits. The value of *W* shall be at least 20 feet (6096 mm). Where the value of *W* varies along the perimeter of the building, the calculation performed in accordance with Equation 5-2 shall be based on the weighted average of each portion of *exterior wall* and open space where the value of *W* is greater than or equal to 20 feet (6096 mm). Where the value of *W* exceeds 30 feet (9144 mm), a value of 30 feet (9144 mm) shall be used in calculating the weighted average, regardless of the actual width of the open space. *W* shall be measured perpendicular from the face of the building to the closest interior *lot line*. Where the building fronts on a *public way*, the entire width of the *public way* shall be used. Where two or more buildings are on the same lot, *W* shall be measured from the exterior face of a building to the exterior face of an opposing building, as applicable.

Exception: The value of *W* divided by 30 shall be permitted to be a maximum of 2 when the building meets all requirements of Section 507 except for compliance with the 60-foot (18 288 mm) *public way* or *yard* requirement, as applicable.

507.1 General. The area of buildings of the occupancies and configurations specified ~~herein~~ Sections 507.1 through 507.12 shall not be limited. Where Sections 507.2 through 507.12 require buildings to be surrounded and adjoined by public ways and yards, those open spaces shall be determined as follows:

1. Yards shall be measured from the building perimeter in all directions to the closest interior lot lines or to the exterior face of an opposing building located on the same lot, as applicable.
2. Where the building fronts on a public way, the entire width of the public way shall be used.

Reason: Section 506.2.1: The change provides further clarification on how to measure the value "W." The IBC currently does not provide this. The IBC does provide guidance on the fire separation distance (FSD) in Chapter 7, but is not the proper way to measure "W" and often is mistakenly used or enforced as the required method. The only real difference is in determining "W" the entire width of a public way is used, whereas when determining the FSD, the measurement is taken to the centerline of the public way as the other half belongs to the building(s) on the opposite side. Current text already addresses buildings on the same lot.

Section 507: This change provides clarification on how to measure the yards and public ways needed for buildings to qualify as unlimited area buildings. Each subsection of 507 except 507.8 requires the buildings to be surrounded and adjoined by yards and public ways but none speak to how to measure it. As 507 is about unlimited building area, it should be measured the same as the open spaces for determining area increases. This change is consistent with the commentary for these provisions published for the 2009 code. Because this applies throughout Section 507, the best place for the amendment is in 507.1 – General.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TEPE-G1-506.2.1

G97–09/10
506.2.1

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing self

Revise as follows:

506.2.1 Width limits. To apply this section the value of *W* shall be at least 20 feet (6096 mm). Where the value of *W* varies along the perimeter of the building, the calculation performed in accordance with Equation 5-2 shall be based on the weighted average of each portion of exterior wall and open space where the value of *W* is greater than or equal to 20 feet (6096 mm). Where the value of *W* exceeds 30 feet (9144 mm), a value of 30 feet (9144 mm) shall be used in calculating the weighted average, regardless of the actual width of the open space. Where two or more buildings are on the same lot, *W* shall be measured from the exterior face of ~~a~~ each building to the opposing exterior face of ~~an opposing~~ each adjacent building, as applicable.

Exception: ~~The value of *W* divided by 30 shall be permitted to be a maximum of 2 when~~ Where the building meets ~~all~~ the requirements of Section 507, as applicable, except for compliance with the 60-foot (18 288 mm) public way or yard requirement, and the value of *W* exceeds 30 feet (9144 mm), the value of *W* divided by 30 shall be limited to a maximum of 2~~, as applicable~~.

Reason: The purpose of this code change proposal is to clarify the Exception to the maximum allowable area increase that can be achieved to the allowable area in Table 503 with open space provided around a building. The intent of the Exception is to recognize the special requirements in Section 507 for unlimited area buildings by giving credit for the open space around such buildings where the open space is not sufficient to meet the minimum 60 ft separation specified to qualify as an unlimited area building but where the open space is greater than the 30 ft maximum allowed for the calculation of the frontage area increase under Section 506.2. We have seen the Exception interpreted to allow the value of W divided by 30 to be 2 even though W may be less than 60. Also, it has not been clear what is intended by this Exception regarding the application of the other provisions of Section 507 when those buildings do not qualify as unlimited area buildings.

We believe that this proposed editorial revision will improve the application of the Exception by clearly indicating that the value of W divided by 30 is allowed to exceed 1 for the purpose of this Exception but cannot exceed 2, with the actual value being the value of W divided by 30. So in other words, if 45 ft of open space is provided around the entire building perimeter, the value of W divided by 30 would be 1.5. This is 50% more than the maximum that would otherwise be allowed for buildings utilizing the open space frontage increase provisions. This should result in better interpretation, application, and enforcement of the frontage increase provisions of the IBC for determining the allowable area of a building based on Table 503.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THORNBERRY-G2-506.2.1

G98–09/10
506.2.1

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

506.2.1 Width limits. The value of W shall be at least 20 feet (6096 mm). Where the value of W varies along the perimeter of the building, the calculation performed in accordance with Equation 5-2 shall be based on the weighted average calculated in accordance with Equation 5-3 for portions of the exterior perimeter walls ~~of each portion of exterior wall and open space~~ where the value of W is greater than or equal to 20 feet (6096 mm). Where the value of W exceeds 30 feet (9144 mm), a value of 30 feet (9144 mm) shall be used in calculating the weighted average, regardless of the actual width of the open space. Where two or more buildings are on the same lot, W shall be measured from the exterior face of a building to the exterior face of an opposing building, as applicable.

Exception: The value of *W* divided by 30 shall be permitted to be a maximum of 2 when the building meets all requirements of Section 507 except for compliance with the 60-foot (18 288 mm) *public way* or *yard* requirement, as applicable.

Weighted average $W = (L_1 \times w_1 + L_2 \times w_2 + L_3 \times w_3 \ldots)/F.$ **(Equation 5-3)**

Where:

L_n = Length of a portion of the exterior perimeter wall,
w_n = Width of open space associated with that portion of the exterior perimeter wall.
F = Building perimeter that fronts on a public way or open space having 20 feet (6096 mm) minimum width.

Reason: The term "weighted average" is not defined in the code. Although common to engineers, to many others, (who need to use this section) it is not a term they are familiar with. This is essentially an editorial change.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAIEL-G3-506.2.1

G99–09/10
506.3

Proponent: Sam Francis, American Forest & Paper Association

Revise as follows:

506.3 Automatic sprinkler system increase. Where a building is equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, in addition to the height and story increases in accordance with Section 504.2, the building area limitation in Table 503 is permitted to be increased by the amounts specified in either Item 1 or Item 2 as follows: ~~the building area limitation in Table 503 is permitted to be increased by an additional 200 percent (I_s = 2) for buildings with more than one story above grade plane and an additional 300 percent (I_s = 3) for buildings with no more than one story above grade plane. These increases are permitted in addition to the height and story increases in accordance with Section 504.2,~~

1. An additional 200 percent (I_s = 2) for buildings with more than one story above grade plane and an additional 300 percent (I_s = 3) for buildings with no more than one story above grade plane.
2. An additional 100 percent (I_s = 1) for buildings up to four stories above grade plane when the automatic sprinkler system is omitted from the unoccupied attic space and the roof is sheathed with fire retardant treated wood structural panels,

Exception: ~~The~~ Building area limitation increases shall not be permitted for the following conditions:

1. The automatic sprinkler system increase shall not apply to buildings with an occupancy in Group H-1.
2. The automatic sprinkler system increase shall not apply to the building area of an occupancy in Group H-2 or H-3. For buildings containing such occupancies, the allowable building area shall be determined in accordance with Section 508.4.2, with the sprinkler system increase applicable only to the portions of the building not classified as Group H-2 or H-3.
3. Fire-resistance rating substitution in accordance with Table 601, Note d.

Reason: AF&PA commissioned testing of three roof attic assembly configurations[1]:

1) FRT wood trusses and FRT wood sheathing
2) Untreated wood trusses and untreated wood sheathing
3) Untreated wood trusses and FRT wood sheathing.

These tests were conducted to the same ad-hoc test protocol[2] used to modify sprinkler head spacing and water pressure requirements in NFPA 13.

AF&PA tests demonstrated that the fire performance of a roof assembly constructed with fire retardant treated (FRT) wood trusses and FRT wood sheathing (Configuration 1) resulted in no fire growth which is better performing than a roof assembly protected with a NFPA 13 sprinkler system. This configuration is exempt from attic sprinkler systems in NFPA 13.

Configuration 2, a roof assembly constructed with untreated wood trusses and untreated wood sheathing, had sustained fire growth when using the ad-hoc test protocol.

Configuration 3, a roof assembly constructed with untreated wood trusses and FRT wood sheathing, had similar results to Configuration 1 affording better protection than the NFPA 13 attic sprinkler system. This code change proposal recognizes the improved fire performance demonstrated by this configuration. The area limitation in Table 503 for buildings using this configuration and otherwise sprinklered throughout in accordance with NFPA 13 are permitted to be increased 100%.

1. "Flammability of Full Scale Roof Attic Assemblies by Ignition with 6 lb and 35 lb Wood Crib and Measurement of Heat Release," Omega Point Maboratories, Project 15475-117047, November 2004.
2. "Spray Sprinklers Installed in Sloped Combustible Concealed Spaces," Underwriters Laboratories Inc., Project 01NK32756, EX5985, September 2001

Cost Impact: The code change proposal will not increase the cost of construction. Will reduce cost of construction by approximately $3/sq.ft. of roof area.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME:FRANCIS-G1-506 3.doc

G100–09/10
506.4.1, 506.5.2

Proponent: Dennis Richardson PE, dbr Group Inc., representing self

Revise as follows:

506.4 Single occupancy buildings with more than one story. The total allowable *building area* of a single occupancy building with more than one *story above grade plane* shall be determined in accordance with this section. The actual aggregate *building area* at all *stories* in the building shall not exceed the total allowable *building area*.

Exception: A single basement need not be included in the total allowable *building area*, provided such basement does not exceed the area permitted for a building with no more than one *story above grade plane*.

506.4.1 Area determination. The total allowable *building area* of a single occupancy building with more than one *story above grade plane* shall be determined by multiplying the allowable *building area* per *story* (*Aa*), as determined in Section 506.1, by the number of *stories above grade plane* as listed below:

1. For buildings with two *stories above grade plane*, multiply by 2;
2. For buildings with three or more *stories above grade plane*, multiply by 3; and
3. No *story* shall exceed the allowable *building area* per *story* (A_a), as determined in Section 506.1, for the occupancies on that *story*.

Exceptions:

1. Unlimited area buildings in accordance with Section 507.
2. The maximum area of a building equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.2 shall be determined by multiplying the allowable area per *story (Aa),* as determined in Section 506.1, by the number of *stories above grade plane*.
3. The first story of a single occupancy building with more than one *story above grade plane* shall not exceed the allowable *building area* permitted for a building of the same occupancy with one *story above grade plane* when all of the following criteria are met:
   - 3.1. The allowable area (A_a) of the first *story above grade plane* shall be determined individually based on the provisions in Section 506.1 for a building with no more than one *story above grade plane*.
   - 3.2. Each additional *story* shall not exceed the allowable *building area* per *story* (A_a), as determined in Section 506.1 for the occupancies on that *story*.
   - 3.3. The total allowable *building area* shall comply with Items 1 or 2 of Section 506.4.1 computed based on a building with more than one story above grade plane.

506.5 Mixed occupancy area determination. The total allowable *building area* for buildings containing mixed occupancies shall be determined in accordance with the applicable provisions of this section. A single basement need not be included in the total allowable *building area*, provided such basement does not exceed the area permitted for a building with no more than one *story above grade plane*.

506.5.1 No more than one story above grade plane. For buildings with no more than one *story above grade plane* and containing mixed occupancies, the total *building area* shall be determined in accordance with the applicable provisions of Section 508.1.

506.5.2 More than one story above grade plane. For buildings with more than one *story above grade plane* and containing mixed occupancies, each *story* shall individually comply with the applicable requirements of Section 508.1. For buildings with more than three *stories above grade plane*, the total *building area* shall be such that the aggregate

sum of the ratios of the actual area of each *story* divided by the allowable area of such *stories* based on the applicable provisions of Section 508.1 shall not exceed 3.

Exception: The first story of a multi-story building shall not exceed the area permitted for a building with no more than one story above grade plane when all of the following criteria are met:

1. The allowable area of the first story above grade plane shall be determined individually in accordance with the applicable total building area provisions of Section 508.1 and comply with the building area provisions for a building with no more than one story above grade plane.
2. Each additional story shall individually comply with the applicable requirements of Section 508.1.
3. For buildings with two stories above grade plane, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such story, computed based on a building with more than one story above grade plane, based on the applicable provisions of Section 508.1, shall not exceed 2.
4. For buildings with three or more stories above grade plane, the total building area shall be such that the aggregate sum of the ratios of the actual area of each story divided by the allowable area of such story, computed based on a building with more than one story above grade plane, based on the applicable provisions of Section 508.1, shall not exceed 3.

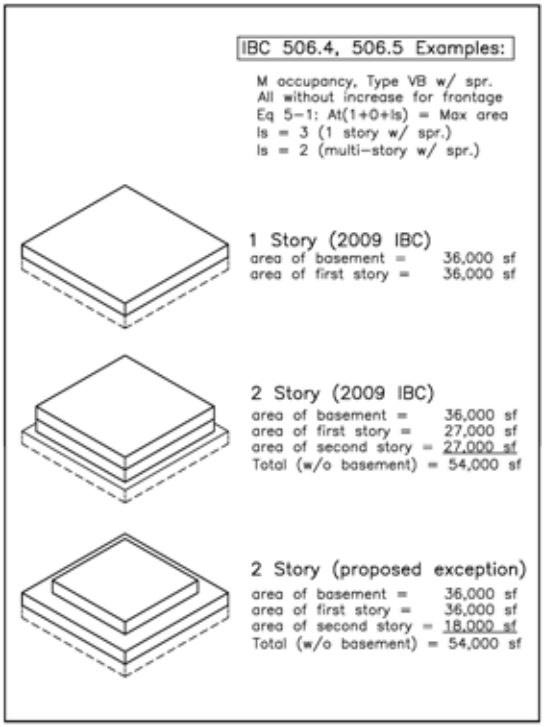
Reason: The proposed change would provide an exception allowing the first floor of a multi story building to be as large as a single story building which could be constructed on the same site as long as the total building area does not exceed the applicable code maximum allowable floor area.

Currently, based on Equation 5-1 and Section 506.3, a one story building with fire sprinklers throughout is permitted to be 4 times the Table 503 tabular area before considering any available area increase for frontage. However the first story of a multi-story building is limited to three times the tabular building area without consideration of any increase for frontage, even if the upper story levels are less than the maximum permitted area. The step function in the value of I_S between a one story building and all multistory buildings effectively limits the first story of multi-story buildings to 75% of the area allowed on that level for a one story building. This is true regardless of how small the second story is.

The current Section 506.4.1, item 3 indicates: No *story* shall exceed the allowable *building area* per *story* (Aa), as determined in Section 506.1 for occupancies on that *story*. This provision of the code encourages the construction of buildings that are box like in order to maximize building area with similar sized floors instead of allowing the flexibility for the designer to step back the upper floors giving the building the appearance of less mass and allowing more light to the street.

The exception to Section 506.4 and the last sentence in Section 506.5 each allow a single basement not to be included in the area calculation so long as the "basement area does not exceed the area permitted for a building with no more than one story above grade plane." Since a building with no more than one story above grade plane can be larger than the first floor of a similar multi-story building, this exception has the effect of allowing the basement to be larger in area than the area of first floor above it on a multi-story building.

The proposed code change is formatted as an exception so that it clear it does not change the existing code provisions unless utilized. When it is utilized it is intended to merely allow the first floor to be as large as it would otherwise be as a single story building without creating an increase in the total floor area of the entire building. As such the area of upper floors may have to be decreased from the maximum area that would otherwise be allowed so the total floor area is less than or equal to the total allowable building area. See attached example for a Group M occupancy, Type VB construction building. Similar examples would occur with other occupancies.



Cost Impact: The code change proposal will not increase the cost of construction. Because this exception does not have to be utilized by the designer and since it has the effect of allowing more construction to occur at grade where it is less expensive this proposed change would have the effect of decreasing construction cost if utilized by the designer.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICHARDSON-G1-506.4.1 AND 506.5.2

G101–09/10
507.1.1 (New)

Proponent: Sarah A. Rice, CBO, representing herself

Add new text as follows:

507.1.1 Accessory occupancies. Occupancies not specifically listed in Section 507 shall be allowed to be located in unlimited area buildings provided the occupancy complies with Section 508.2 for an accessory occupancy.

Reason: The current text of Section 507 has been interpreted that unless an occupancy is specifically listed in that section it cannot be located within an unlimited area building. Unlimited area buildings are subject to the same guidelines as other buildings when it comes to 'accessory occupancies'. If the occupancy is one that is allowed and the area it occupies meets the size limitations of 508.2 they are allowed to be in an unlimited area building. The proposed language makes clear that occupancies which are not specifically listed in Section 507 are not prohibited from being in an unlimited area building as long as they meet the accessory occupancy provisions (including the 10% area limit in Section 508.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-G10-507.1.1.doc

G102–09/10
507.3

Proponent: Dallas Dixon representing BRR Architecture INC.

Revise as follows:

507.3 Sprinklered, one story. The area of a Group B, F, M or S building no more than one story above grade plane of any construction type, or the area of a Group A-4 building no more than one story above grade plane of other than Type V construction, shall not be limited when the building is provided with an automatic sprinkler system throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by public ways or yards not less than 60 feet (I8 288 mm) in width.

Exceptions: (No change to current text)

Reason: The intent of this proposal is to provide clarity of which occupancy classifications design professionals are allowed to design as unlimited area buildings while choosing any construction type and to clarify which occupancy classification is restricted to construction types 1 through 4.

On many occasion design professionals come across jurisdictions that interpreted section 507.3 to disallow Type 5 construction for all occupancies listed. Many deny that unlimited area is applicable to Type 5 construction when they read the existing text. The code commentary clearly explains that only Group A-4 is restricted. All remaining listed occupancy classifications are permitted to qualify for unlimited area when the building is fully sprinkled and surrounded by 60 feet of open yard on all sides. The addition of the text "of any construction type" and "the area of" will provide greater clarity to the intention and understanding of the code section.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DIXON-G1-507.3

G103–09/10
507.3

Proponent: Tom Lariviere, Chairman, representing Joint Fire Service Review Committee

Revise as follows:

507.3 Sprinklered, one story. The area of a Group B, F, M or S building no more than one *story above grade plane*, or a Group A-4 building no more than one *story above grade plane* of other than Type V construction, shall not be limited when the building is provided with an *automatic sprinkler system* throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.

Exceptions~~:~~

~~1.~~ Buildings and structures of Type I and II construction for rack storage facilities that do not have access by the public shall not be limited in height, provided that such buildings conform to the requirements of Sections 507.3 and 903.3.1.1 and Chapter 23 of the *International Fire Code*.

~~2. The *automatic sprinkler system* shall not be required in areas occupied for indoor participant sports, such as tennis, skating, swimming and equestrian activities in occupancies in Group A-4, provided that:~~
~~2.1. *Exit* doors directly to the outside are provided for occupants of the participant sports areas; and~~
~~2.2. The building is equipped with a *fire alarm system* with *manual fire alarm boxes* installed in accordance with Section 907.~~

Reason: Code change F132-07/08 deleted the exception which allowed the elimination of a fire sprinkler system over participant sport areas in Group A-4 occupancies (See Section 903.2.1.4). However, when that code change was approved, a corresponding section in the IBC was overlooked. IBC 507.3 contains a similar exception to the item that was deleted in Chapter 9. Therefore, Exception 2 is proposed for deletion to be consistent with the action take last cycle in F132-07/08.

Section 507.3 allows for unlimited area buildings. Exception 2 would allow for an unlimited area Group A-4 occupancy and yet not require sprinklers over a major portion of the building.

The intention of the exception was for gymnasiums and similar areas where the probable occupant load was significantly less than what would be determined based on a square footage per occupant factor. However, these facilities have become multi-use and the occupant load is frequently higher than what was anticipated or expected when the exception was developed, and the fire load can vary based on the used to far exceed what would be expected for a sporting area.

For example, a community recreation center is constructed with no sprinklers over the gymnasium floor. The same area is also utilized for receptions and various community activities such as work fairs, rummage sale, art exhibits, emergency shelters for persons displaced by natural disasters, etc. Such uses could even include eating, sleeping, and fire loads far in excess of a few uniforms and leather volleyballs.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-G3-507.3

G104–09/10
507.8

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

507.8 Group H occupancies. Group H-2, H-3 and H-4 occupancies shall be permitted in unlimited areas buildings containing Group F and S occupancies~~,~~ in accordance with Sections 507.3 and 507.4 and the provisions ~~limitations~~ of ~~this section~~ Sections 507.8.1 through 507.8.3.

507.8.1 Allowable area. The aggregate floor area of ~~the~~ Group H occupancies located ~~at the perimeter of the~~ in an unlimited area building shall not exceed 10 percent of the area of the building nor the area limitations for the Group H occupancies as specified in Table 503 as modified by Section 506.2.

507.8.1.1 Located on building perimeter. Except as provided for in Section 507.8.1.2, Group H occupancies shall be located on the perimeter of the building. ~~,based upon the percentage of the perimeter of each Group H floor area that fronts~~ In Group H-2 and H-3 occupancies, not less than 25 percent of the perimeter of such occupancies shall front on a public way or open ~~street or other unoccupied~~ space.

507.8.1.2 Located within the building. The aggregate floor area of Group H occupancies not located at the perimeter of the building shall not exceed 25 percent of the area limitations for the Group H occupancies as specified in Table 503.

507.8.1.2.1 Liquid use, dispensing and mixing rooms. Liquid use, dispensing and mixing rooms having a floor area of not more than 500 square feet (46.5m^2) need not be located on the outer perimeter of the building where they are in accordance with the International Fire Code and NFPA 30.

507.8.1.2.2 Liquid storage rooms. Liquid storage rooms having a floor area of not more than 1,000 square feet (93 m^2) need not be located on the outer perimeter where they are in accordance with the *International Fire Code* and NFPA 30.

507.8.1.2.3 Spray paint booths. Spray paint booths that comply with the *International Fire Code* need not be located on the outer perimeter.

507.8.2 Occupancy separations. Group H occupancies shall be separated from the remainder ~~rest~~ of the unlimited area building and from each other in accordance with Table 508.4.

507.8.3 Height limitations. For two-story unlimited area buildings, ~~the~~ Group H occupancies shall not be located more than one story above grade plane unless permitted based on ~~by~~ the allowable height in stories and feet as set forth in Table 503 for ~~based on~~ the type of construction of the unlimited area building.

Reason: This proposal is intended to clarify the provisions governing the placement of Group H occupancies in certain unlimited area buildings. Currently, all requirements are placed within a single run-on paragraph that does not separate thoughts or provisions. In its present format, it is easy to attempt to overlay requirements that are intended to address different design conditions. Additionally, Section 507.8 contains a very vague provision in that it states that Group H occupancies shall be located on the perimeter of the building based upon the "percentage of the perimeter" of each Group H floor area. No percentage figure is provided. Presumably, that is an indirect reference to Section 415.3. For purposes of continuity, Section 415.3 requirements have been incorporated into Section 507.8, including allowances for certain interior spaces. The format and clarity provided in this proposal will assist code users in the proper identification of requirements in this fairly rare, but very important provision.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KEITH-G3-507.8.doc

G105–09/10
507.10

Proponent: Joe Holland and Dave Bueche, Hoover Treated Wood Products

Revise as follows:

507.10 Group E buildings. The area of a Group E building no more than one *story above grade plane*, of Type II, ~~IIA~~ III or IV construction, shall not be limited when all of the following criteria are met:

1. Each classroom shall have not less than two *means of egress*, with one of the *means of egress* being a direct *exit* to the outside of the building complying with Section 1020.
2. The building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1.
3. The building is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.

Reason: The exterior wall fire resistance required in Table 601 is greater for Type III than what is required for Type II and is equal to what is required for Type IV. The interior fire resistance in Type III construction is equivalent to Type II and therefore should be allowed. In addition, in Table 503 for E occupancies, the code recognizes that Type IIB and IIIB are equivalent in overall height, number of stories, and allowable area.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOLLAND-BUECHE-G2-507.10

G106–09/10
507.11

Proponent: Joe Holland and Dave Bueche, Hoover Treated Wood Products

Revise as follows:

507.11 Motion picture theaters. In buildings of Type II or III construction, the area of a motion picture theater located on the first *story above grade plane* shall not be limited when the building is provided with an *automatic sprinkler system* throughout in accordance with Section 903.3.1.1 and is surrounded and adjoined by *public ways* or *yards* not less than 60 feet (18 288 mm) in width.

Reason: This change recognizes that Type III offers equivalent or superior fire resistance to Type II construction. The exterior wall fire resistance required in Table 601 is greater for Type III than what is required for Type II (2 hours versus 1 hour or none). The interior fire resistance in Type III construction is equivalent to Type II. In Table 503 for Group A-1 occupancies, the code recognizes that Type IIB and IIIB are equivalent in overall height, number of stories, and allowable area.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOLLAND-BUECHE-G3-507.11

G107–09/10
508, 509 (New)

Proponent: Maureen Traxler, City of Seattle, WA, Seattle Dept of Planning & Development

Revise as follows:

SECTION 508
MIXED USE AND OCCUPANCY

508.1 General. Each portion of a building shall be individually classified in accordance with Section 302.1. Where a building contains more than one occupancy group, the building or portion thereof shall comply with the applicable provisions of Section 508.2, 508.3 or 508.4, or a combination of these sections.

Exceptions:

1. Occupancies separated in accordance with Section ~~509~~ 510.
2. Where required by Table 415.3.2, areas of Group H-1, H-2 and H-3 occupancies shall be located in a separate and detached building or structure.
3. Uses within live/work units, complying with Section 419, are not considered separate occupancies.

508.2 Accessory occupancies. Accessory occupancies are those occupancies that are ancillary to the main occupancy of the building or portion thereof. Accessory occupancies shall comply with the provisions of Sections 508.2.1 through 508.2.4 ~~508.2.5.3~~.

508.2.1 Area limitations. Aggregate accessory occupancies shall not occupy more than 10 percent of the *building area* of the *story* in which they are located and shall not exceed the tabular values in Table 503, without *building area* increases in accordance with Section 506 for such accessory occupancies.

508.2.2 Occupancy classification. Accessory occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space.

508.2.3 Allowable building area and height. The allowable *building area and height* of the building shall be based on the allowable *building area and height* for the main occupancy in accordance with Section 503.1. The height of each accessory occupancy shall not exceed the tabular values in Table 503, without increases in accordance with Section 504 for such accessory occupancies. The *building area* of the accessory occupancies shall be in accordance with Section 508.2.1.

508.2.4 Separation of occupancies. No separation is required between accessory occupancies and the main occupancy.

Exceptions:

1. Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4.
2. Incidental ~~accessory occupancies~~ uses required to be separated or protected by Section ~~508.2.5~~ 509.
3. Group I-1, R-1, R-2 and R-3 *dwelling units* and *sleeping units* shall be separated from other *dwelling* or *sleeping units* and from accessory occupancies contiguous to them in accordance with the requirements of Section 420.

(Relocate Section 508.2.5 through 508.2.5.3 to new Section 509)

508.3 Nonseparated occupancies. Buildings or portions of buildings that comply with the provisions of this section shall be considered as nonseparated occupancies.

508.3.1 Occupancy classification. Nonseparated occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space except that the most restrictive applicable provisions of Section 403 and Chapter 9 shall apply to the building or portion thereof in which the nonseparated occupancies are located.

508.3.2 Allowable building area and height. The allowable *building area and height* of the building or portion thereof shall be based on the most restrictive allowances for the occupancy groups under consideration for the type of construction of the building in accordance with Section 503.1.

508.3.3 Separation. No separation is required between nonseparated occupancies.

Exceptions:

1. Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4.
2. Group I-1, R-1, R-2 and R-3 *dwelling units* and *sleeping units* shall be separated from other *dwelling* or *sleeping units* and from other occupancies contiguous to them in accordance with the requirements of Section 420.

508.4 Separated occupancies. Buildings or portions of buildings that comply with the provisions of this section shall be considered as separated occupancies.

508.4.1 Occupancy classification. Separated occupancies shall be individually classified in accordance with Section 302.1. Each separated space shall comply with this code based on the occupancy classification of that portion of the building.

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

(No change to table contents)

508.4.2 Allowable building area. In each *story*, the *building area* shall be such that the sum of the ratios of the actual *building area* of each separated occupancy divided by the allowable *building area* of each separated occupancy shall not exceed 1.

508.4.3 Allowable height. Each separated occupancy shall comply with the *building height* limitations based on the type of construction of the building in accordance with Section 503.1.

Exception: Special provisions permitted by Section ~~509~~ 510.

508.4.4 Separation. Individual occupancies shall be separated from adjacent occupancies in accordance with Table 508.4.

508.4.4.1 Construction. Required separations shall be fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both, so as to completely separate adjacent occupancies.

SECTION 509
INCIDENTAL USES

~~508.2.5~~ 509.1 Separation of incidental uses ~~accessory occupancies~~. The incidental uses ~~accessory occupancies~~ listed in Table ~~508.2.5~~ 509.1 shall be separated from the remainder of the building or equipped with an automatic fire-extinguishing system, or both, in accordance with Table ~~508.2.5~~ 509.1.

Exception: Incidental uses ~~accessory occupancies~~ within and serving a *dwelling unit* are not required to comply with this section.

~~508.2.5.1~~ 509.2 Fire-resistance-rated separation. Where Table ~~508.2.5~~ 509.1 specifies a fire-resistance-rated separation, the incidental uses ~~accessory occupancies~~ shall be separated from the remainder of the *building* by a *fire barrier* constructed in accordance with Section 707 or a *horizontal assembly* constructed in accordance with Section 712, or both. Construction supporting 1-hour fire-resistance-rated *fire barriers* or *horizontal assemblies* used for incidental use ~~accessory occupancy~~ separations in buildings of Type IIB, IIIB and VB construction are not required to be fire-resistance rated unless required by other sections of this code.

TABLE ~~508.2.5~~ 509.1
INCIDENTAL ~~ACCESSORY OCCUPANCIES~~ USES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic fire-extinguishing system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic fire-extinguishing system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen cutoff rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic fire-extinguishing system
Laboratories and vocational shops, not classified as Group H, located in a Group E or I-2 occupancy	1 hour or provide automatic fire-extinguishing system
Laundry rooms over 100 square feet	1 hour or provide automatic fire-extinguishing system
Group I-3 cells equipped with padded surfaces	1 hour
Group I-2 waste and linen collection rooms	1 hour
Waste and linen collection rooms over 100 square feet	1 hour or provide automatic fire-extinguishing system
Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons, or a lithium-ion capacity of 1,000 pounds used for facility standby power, emergency power or uninterrupted power supplies	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Rooms containing fire pumps in nonhigh-rise buildings	2 hours; or 1 hour and provide automatic sprinkler system throughout the building
Rooms containing fire pumps in high-rise buildings	2 hours

For SI: 1 square foot = 0.0929 m2, 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L.

~~508.2.5.2~~ 509.2.1 Nonfire-resistance-rate separation and protection. Where Table ~~508.2.5~~ 509.1 permits an automatic fire-extinguishing system without a *fire barrier*, the incidental uses ~~accessory occupancies~~ shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The walls shall extend from the top of the foundation or floor assembly below to the underside of the ceiling that is a component of a fire-resistance-rated floor assembly or roof assembly above or to the underside of the floor or roof sheathing, deck

or slab above. Doors shall be self- or automatic closing upon detection of smoke in accordance with Section 715.4.8.3. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80. Walls surrounding the incidental use shall not have air transfer openings unless provided with smoke dampers in accordance with Section 711.7.

~~**508.2.5.3**~~ **509.2.2 Protection.** Except as specified in Table ~~508.2.5~~ 509.1 for certain incidental uses ~~accessory occupancies~~, where an automatic fire-extinguishing system or an *automatic sprinkler system* is provided in accordance with Table ~~508.2.5~~ 509.1, only the space occupied by the incidental use ~~accessory occupancy~~ need be equipped with such a system.

(Renumber subsequent sections)

Reason: A change occurred in the 2009 IBC that we believe has unintended consequences. As written, "incidental accessory occupancies" are only required to be separated when they are part of an accessory occupancy. They are mentioned only in Section 508.2.5, and, since it is a subsection of Section 508.2, it only applies where 508.2 applies.

This proposal creates a separate section so that the incidental use provisions will apply in all buildings, including single use buildings. The rooms and areas listed in the incidental use table present special hazards that require special protection. They should be separated from other occupancies and uses regardless of whether the other occupancies in the building are treated as separated or nonseparated occupancies.

We are also proposing to change the term to "incidental uses" instead of "incidental accessory occupancies". Many of the items listed in the table are not occupancies in themselves—they are special uses that don't fall neatly into any occupancy category. The use of this term should be changed throughout the code if this code change proposal is approved.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TRAXLER-G5-508.DOC

G108–09/10
508.1

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

508.1 General. Each portion of a building shall be individually classified in accordance with Section 302.1. Where a building contains more than one occupancy group, the building or portion thereof shall comply with the applicable provisions of Section 508.2, 508.3 or 508.4, or a combination of these sections. Under all circumstances, where a building contains a use listed in Table 508.2.5, the applicable provisions of Section 508.2.5 shall apply.

Exceptions:

1. Occupancies separated in accordance with Section 509.
2. Where required by Table 415.3.2, areas of Group H-1, H-2 and H-3 occupancies shall be located in a separate and detached building or structure.
3. Uses within live/work units, complying with Section 419, are not considered separate occupancies.

Reason: This proposal is intended to clarify that incidental accessory occupancy provisions apply to all building occupancy configurations. Section 508.1 currently states, "…the building or portion thereof shall comply with the applicable provisions of Section 508.2, 508.3 or 508.4, or a combination of these sections." Although Section 508.2.5 states, "The incidental accessory occupancies listed in Table 508.2.5 shall be separated from the remainder of the building or equipped with an automatic fire-extinguishing system, or both, in accordance with Table 508.2.5," there is a concern that all code practitioners may not make the legislative tie between Section 508.1 and Section 508.2.5. The added provision makes it very clear that incidental occupancy requirements apply regardless of the building occupancy condition. Approval of this proposal will result in more consistent application of IBC occupancy provisions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KEITH-G4-508.1.doc

G109–09/10
508.2, 508.2.1, 508.2.2, 508.2.3, 508.2.4

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

508.2 Accessory occupancies. Buildings or portions of buildings that comply with the provisions of this section shall be considered as accessory occupancies. Accessory occupancies are those occupancies that are ancillary to the main occupancy of the building or portion thereof. Accessory occupancies shall comply with the provisions of Section 508.2.1 through ~~508.2.5.3~~ 508.2.4.3.

~~**508.2.1 Area limitations.** Aggregate accessory occupancies shall not occupy more than 10 percent of the area of the story in which they are located and shall not exceed the tabular values in Table 503, without area increases in accordance with Section 506 for such accessory occupancies.~~

~~**508.2.2**~~ **508.2.1 Occupancy classification.** Accessory occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space.

~~**508.2.3**~~ **508.2.2 Allowable area and height.** The allowable area and height of the building shall be based on the allowable area and height for the main occupancy in accordance with Section 503.1. Aggregate accessory occupancies shall not occupy more than 10 percent of the area of the story in which they are located and shall not exceed the tabular values in Table 503, without area increases in accordance with Section 506 for such accessory occupancies. The height of each accessory occupancy shall not exceed the tabular values in Table 503, without increases in accordance with Section 504 for such accessory occupancies. ~~The area of the accessory occupancies shall be in accordance with Section 508.2.1~~

~~**508.2.4**~~ **508.2.3 Separation of occupancies.** No separation is required between accessory occupancies and the main occupancy or each other.

Exceptions:

1. Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4.
2. Incidental accessory occupancies required to be separated or protected by Section ~~508.2.5~~.508.2.4.
3. Group I-1, R-1, R-2 and R-3 dwelling units and sleeping units shall be separated from other dwelling or sleeping units and from accessory occupancies contiguous to them in accordance with the requirements of Section 420.

~~**508.2.5**~~ **508.2.4 Separation of incidental accessory occupancies.**

(The text of this and following sections are not changed, renumbering is shown for context of number changes in preceding sections.)

Table ~~508.2.5~~ 508.2.4 Incidental Accessory Occupancies
~~508.2.5.1~~ 508.2.4.1 Fire-resistance-rated separation.
~~508.2.5.2~~ 508.2.4.2 Nonfire-resistance-rated separation and protection.
~~508.2.5.3~~ 508.2.4.3 Protection.

Reason: This proposal is intended to clarify accessory occupancy mixed occupancy provisions. Charging language has been added to Section 508.2 to duplicate that contained in Sections 508.3 and 508.4 for purposes of editorial and legal consistency. The area provisions in current Section 508.2.1 have been placed in context in proposed Section 508.2.2, "Allowable area and height." Having accessory occupancy allowable area provisions in two different sections could result in oversight. Proposed Section 508.2.3 clarifies that no occupancy separation is required between adjacent accessory occupancies, the exceptions notwithstanding. Approval of this proposal will result in more consistent application of IBC accessory occupancy provisions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KEITH-G5-508.2.doc

G110–09/10
508.2.1

Proponent: Lee J. Kranz, CBO, City of Bellevue, representing Washington Association of Building Officials Technical Code Development Committee.

Revise as follows:

508.2.1 Area limitations. Aggregate accessory occupancies shall not occupy more than 10 percent of the building area of the story in which they are located and shall not exceed the tabular values in Table 503, without building area increases in accordance with Section 506 for such accessory occupancies. In multi-tenant buildings, aggregate accessory occupancies within each tenant space shall be limited to 10 percent of the area of each story of the tenant space.

Reason: In multi-tenant buildings, it is not reasonable to penalize one tenant because another tenant has exceeded 10% of their tenant space with an accessory use. The code currently allows a single tenant to exceed 10% of their space with an accessory use as long as the aggregate areas stay within the 10% limit. It is also impractical for many large multi-tenant commercial buildings to provide an up-to-date ratio inventory of accessory spaces in order to obtain a tenant improvement permit. The accessory occupancy limit should be on a tenant-by-tenant basis in multi-tenant buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KRANZ-GI-508.2.1.DOC

G111–09/10
508.2.3

Proponent: Todd Andersen, representing self

Revise as follows:

508.2.3. Allowable building area and height.. The allowable building area and height of the building containing accessory occupancies shall be based on the allowable building area and height for the main occupancy in accordance with Section 503.1. ~~The height of any accessory occupancy shall not exceed the tabular values in Table 503, without height and area increases in accordance with Sections 504 and 506 for such accessory occupancies. The building area of the accessory occupancies shall be in accordance with Section 508.2.1.~~

Reason: The current text would limit the location of an accessory occupancy within a building such that it could not be located any higher in a building than the building area and height limits of Table 503 for the accessory would allow. From the Reason statement and testimony by the proponent this was never the intent. Code Change G14-04/05 relocated and rewrote the provisions for Mixed Occupancies in the 2006 IBC to move from Section 302 to new Section 508.

In the Reason statement the proponent wrote – "The purpose of this proposal is to organize and clarify the requirements for the various mixed occupancy and use design options recognized in the International Building Code…The various technical requirements for each design option have been articulated using consistent terminology and style. These requirements generally parallel current intent."

As stated in the Reason statement to Code Change G14-04/05, the intent of code change was to relocate the provisions in Section 302.2 of the 2003 IBC and put their requirements in a consistent format, not to make technical changes. Therefore to understand that the current language was never part of the requirements we need to look at the language in Section 302.2 of the 2003 IBC – it reads:

> **302.2 Accessory use areas.** A fire barrier shall be required to separate accessory use areas classified as Group H in accordance with Section 302.3.1, and incidental use areas in accordance with Section 302.1.1. Any other accessory use area shall not be required to be separated by a fire barrier provided the accessory use area occupies an area not more than 10 percent of the area of the story in which it is located and does not exceed the tabular values in Table 503 for the allowable height or area for such use.
> **302.2.1 Assembly areas.** Accessory assembly areas are not considered separate occupancies if the floor area is equal to or less than 750 square feet (69.7 m2). Assembly areas that are accessory to Group E are not considered separate occupancies. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.

Nowhere in Section 302.2 (2006 IBC) was there ever a limit on the location of an accessory use area within a building, and it was not the intent of the proponents of Code Change G14-04/05 to ever impose one in the 2006 IBC nor to carry over to the 2009 IBC.

Without this code change building design as we know it today would literally not be allowed.

Without this code change a conference room would never be allowed to be located on the top story in a office building (Group B) of Type IIA construction because the building height limit (in stories) for a Group A-3 occupancies is 3 stories, where the Group B building would be allowed to be 5 stories in building height (or 6 stories if sprinklered). The current language would limit the location of any conference room to not more than the 3rd story.

Another example would be storage rooms (Group S-1). Based on Table 503 the building height limit (in stories) for a Group S-1 occupancy is 4 stories, again where the Group B building would be allowed to be 5 stories in building height (or 6 stories if sprinklered). The current language would limit the location of any store rooms to not more than the 4th story.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ANDERSEN G-1(FORMER RICE-G9)-508.2.3.DOC

G112–09/10
508.2.5, Table 508.2.5

Proponent: David S. Collins, FAIA, The Preview Group, Inc., representing The American Institute of Architects

Revise as follows:

508.2.5 Separation of incidental accessory occupancies. The incidental accessory occupancies listed in Table 508.2.5 shall be separated from the remainder of the building or equipped with an automatic fire-extinguishing system or both, in accordance with Table 508.2.5.

Exceptions:

1. Incidental accessory occupancies within and serving a dwelling unit are not required to comply with this section.
2. In other than Group I-2 occupancies, where incidental accessory occupancies listed in Table 508.2.5.2 conform to the requirements of Sections 508.3 or 508.4, using the occupancy indicated in Table 508.2.5, Section 508.2.5 shall not apply.

Table 508.2.5
INCIDENTAL, ACCESSORY OCCUPANCIES

ROOM OR AREA	SEPARATION AND/OR PROTECTION	OCCUPANCY
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic fire-extinguishing system.	F-1
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic fire-extinguishing system.	F-2,
Refrigeration machinery room	1 hour or provide automatic fire-extinguishing system.	F-1
Hydrogen cutoff-rooms, not classified as H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.	NA
Incinerator rooms	2 hours and automatic sprinkler system	F-1
Paint shops, not classified as Group H, located in occupancies other than F	2 hours; or 1 hour and provide automatic fire-extinguishing system	F-1
Laboratories and vocational shops, not classified as Group H, located in a Group E or I-2 occupancy	1 hour or provide automatic fire-extinguishing system	B, where no gas is piped to, or stored in the laboratory room or space
Laundry rooms over 100 square feet	1 hour or provide automatic fire-extinguishing system	F-2
Group I-3 cells equipped with padded surfaces	1 hour	I-2
Group I-2 waste and linen collection rooms	1 hour or provide automatic fire-extinguishing system	NA
Waste and linen collection rooms over 100 square feet	1-hour in Group B, F, M, S and U occupancies. 2-hour in Group A, E, I and R occupancies.	S-1
Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons, or a lithium-ion capacity of 1,000 pounds used for facility standby power, emergency power or uninterrupted power supplies	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A	NA
~~Rooms containing fire pumps in high-rise buildings~~	~~2 hours; or 1 hour and provide automatic sprinkler system throughout~~	
~~Rooms containing fire pumps in nonhigh-rise buildings~~	~~2 hours~~	

NA – Not applicable
For SI: 1 square foot = 0.0929 m2, 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L

Reason: Currently Section 508.1 allows the option to use "the applicable provisions of Section 508.2, 508.3 or 508.4, or a combination of these sections" when the occupancies are mixed. However, Section 508.2.5 does not designate what occupancy is anticipated when the listed occupancies are to be considered either separated or nonseparated mixed use and occupancy. This change indicates which occupancies these areas are to be considered a part of for such purposes.

"Incidental accessory" is not a defined term in the IBC. Several sections include the term incidental, and Section 508.2 describes what constitutes an accessory condition. Using the code's prescribed limits, larger areas for waste and linen collection could be built exceeding the 10% limit requiring that these occupancies be dealt with as mixed use separated or nonseparated. Without an occupancy designation the designer and the code official are unable to determine the means for compliance.

The criteria for rooms containing fire pumps is to be removed as this duplicates the criteria in Section 913 of the IBC and isn't an appropriate classification of an incidental accessory occupancy.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COLLINS-G3-508.2.5.doc

G113–09/10
Table 508.2.5

Proponent: Paul K. Heilstedt, PE, Chair, representing ICC Code Technology Committee (CTC)

Revise table as follows:

TABLE 508.2.5
INCIDENTAL ACCESSORY OCCUPANCIES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Group I-2 waste and linen collection rooms	1 hour
Waste and linen collection rooms over 100 square feet	1 hour or provide automatic fire extinguishing system
Ambulatory Care Facility Waste and linen collection rooms	1 hour

(Portions of table not shown remain unchanged)

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as “areas of study”. Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC’s investigation of the area of study entitled “Care Facilities”. The scope of the activity is noted as:

> Study issues associated with Day Care/Adult Care, Ambulatory Health Care and Assisted Living facilities with an emphasis on the number of occupants in relation to the supervision, and the determination of the resident's capability of responding to an emergency situation without physical assistance from the facility's supervision.

The Code Technology Committee Study Group on Care Facilities has conducted a comprehensive review of current building and fire codes, federal regulations and prior code change proposals dealing with the provision of “care”. “Care” as it relates to the scope of this work relates to an occupant of a building who is compromised (mentally or physically) and receives some type of support (care). These facilities encompass a full spectrum of acuity and span a wide range of occupancy types including Groups B, E, I and R. On the lower end of the spectrum, occupants may be aged and receive occasional day living assistance such as cooking and cleaning. On the opposite end of the spectrum, occupants may be completely bedridden and dependant on medical gases and emergency power to maintain life.

The proposed changes provide clear direction for design and construction by using terms and concepts consistently and clearly identifying thresholds related to the condition of an occupant. Federal regulations and state licensing provisions were considered, but primarily in terms of avoiding conflicting requirements. It is not the intent of these changes to address licensing or operational issues. We do believe that the proposed changes will provide consistent and correlated language between these multiple sources of regulations that will help design and code professionals address the needs of care recipients in the many different types of facilities.

A major goal is to provide clarity and consistency of terminology. New definitions are added to specifically describe each type of care or facility and identify the distinct differences in these. Some terms are consolidated to be more descriptive of a group of occupants, yet generic enough to be used interchangeably. For example: a “Patient” is now identified as a “care recipient” and “nurse” is now “care provider”. People receive care of varying types but they are not always referred to as “patients”. They receive care from a wide range of persons with different technical abilities, not just a “nurse” or “staff”. Other definitions address existing terms not defined within current code. The study group believes that these changes bring a practical response to the recent developments within the healthcare delivery system.

Ambulatory Care Facility - Waste and Linen Collection Room

The code currently requires waste and linen collection rooms in Group I-2 facilities to have a 1 hour separation. The Care Facilities committee proposals for Ambulatory Care Facilities are intended to make this type of facility consistent with a higher level of protection required when some occupants rely on staff for assisted evacuation, similar to nursing homes and hospitals; therefore, it is consistent to protect these types of rooms in a similar manner.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HEILSTEDT-G9-TABLE 508.2.5.doc

G114–09/10
508.3.3

Proponent: Jody Hilton, Sunrise Engineering, Utah Chapter of International Code Council (ICC)

Revise as follows:

508.3 Nonseparated occupancies. Buildings or portions of buildings that comply with the provisions of this section shall be considered as nonseparated occupancies.

508.3.1 Occupancy classification. Nonseparated occupancies shall be individually classified in accordance with Section 302.1. The requirements of this code shall apply to each portion of the building based on the occupancy classification of that space except that the most restrictive applicable provisions of Section 403 and Chapter 9 shall apply to the building or portion thereof in which the nonseparated occupancies are located.

508.3.2 Allowable building area and height. The allowable *building area and height* of the building or portion thereof shall be based on the most restrictive allowances for the occupancy groups under consideration for the type of construction of the building in accordance with Section 503.1.

508.3.3 Separation. No separation is required between nonseparated occupancies.

Exceptions:

1. Group H-2, H-3, H-4 and H-5 occupancies shall be separated from all other occupancies in accordance with Section 508.4.
2. Group I-1, R-1, R-2 and R-3 *dwelling units* and *sleeping units* shall be separated from other *dwelling* or *sleeping units* and from other occupancies contiguous to them in accordance with the requirements of Section 420.
3. Group S-2 parking garages shall be separated from all other occupancies in accordance with footnote b of Table 508.4.

Reason: When G163-07/08 was passed and included in the 2009 I.B.C to require a minimum of a one-hour separation from parking garages and all other uses it was intended that the minimal separation of one-hour fire-resistance rated construction apply in all cases. Since parking garages were deleted from the incidental use Table 508.2.5 which would have required a two-hour separation between a nonsprinkled six story B occupancy and an S-2 open parking garage uses which are side- by- side there needs to be some safeguard in the code to not allow this. Since the uses could be nonseparated they could be entirely open to each other allowing products of combustion to spread throughout the building as well as carbon monoxide and nitrogen dioxide emissions. Even though these uses are inherently separated it is still necessary to insure that there will always be a separation in all instances.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis. Would it be preferable to place the requirement in the body of the code rather than its current location in a footnote to a table? With a location within the code text, the footnote of the table would instead refer to a requirement in the code text.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HILTON-G1-508.3.3

G115–09/10
508.4

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

508.4 ~~Separated~~ Calculated occupancies. Buildings or portions of buildings that comply with the provisions of this section shall be considered as ~~separated~~ calculated occupancies.

508.4.1 Occupancy classification. ~~Separated~~ Calculated occupancies shall be individually classified in accordance with Section 302.1. Each ~~separated~~ individual space shall comply with this code based on the occupancy classification of that portion of the building.

508.4.2 Allowable area. In each story, the building area shall be such that the sum of the ratios of the actual building area of each ~~separated~~ individual occupancy divided by the allowable area of each ~~separated~~ such occupancy shall not exceed one.

508.4.3 Allowable height. Each ~~separated~~ individual occupancy shall comply with the height limitations based on the type of construction of the building in accordance with Section 503.1.

Exception: Special provisions permitted by Section 509.

508.4.4 Separation. Individual occupancies shall be separated from adjacent occupancies in accordance with Table 508.4.

508.4.4.1 Construction. Required separations shall be fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both, so as to completely separate adjacent occupancies.

Reason: This proposal is intended to clarify separated occupancy mixed occupancy provisions. First, "separated" occupancy is a misnomer. This is due to the fact that Table 508.4 does not necessarily require an occupancy separation based on similar risk of the occupancies under consideration. Section 508.4.2, however, always requires the performance of the sum of the ratios calculation. Given that this calculation is a common denominator of all Section 508.4 mixed occupancy design option applications, the term "calculated occupancies" has been chosen as the appropriate section title. The reference to "separated" occupancies in several locations has been changed to use an appropriate, less confusing term. Approval of this proposal will result in more consistent application of IBC mixed occupancy provisions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KEITH-G6B-508.4

G116–09/10
508.4

Proponent: John England, MCO, England Enterprises Inc., representing the Cities of Beaufort and Hardeeville, SC

Revise as follows:

508.4 Separated occupancies. Buildings or portions of buildings that comply with the provisions of this section shall be considered separated occupancies.

Exception: Covered mall and open mall buildings complying with Section 402 shall not be required to separate occupancies.

Reason: Since retails malls (open and enclosed) are unique. Reference should be given to the correct code sections when doing separation of spaces.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENGLAND-G4-508.4.5.doc

G117–09/10
508.4.4

Proponent: Mike Ashley, CBO, representing: The Alliance for Fire and Smoke Containment and Control (AFSCC)

Revise as follows:

508.4.4 Separation. ~~Individual occupancies~~ Uses classified as different occupancy groups in accordance with Section 302.1 shall be separated from ~~adjacent occupancies~~ each other in accordance with Table 508.4.

Reason: This is an editorial clarification of this charging paragraph which implements the separation of occupancies option for buildings containing multiple occupancies of different occupancy groups. Currently, this section indicates that individual occupancies (which may be the same) are required to be separated from adjacent occupancies. However, that is not the case since this section deals with different occupancies located in the same building requiring fire barrier or horizontal assembly separations with fire-resistance ratings as specified in Table 508.4 to implement the separated occupancies option. Approving this code change proposal should result in better code interpretation and enforcement regarding the separation of mixed occupancies in buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: ASHLEY-G3-508.4.4

G118–09/10
Table 508.4

Proponent: Tony Crimi, A.C., Consulting Solutions Inc., representing North American Insulation Manufacturers Association

Delete the entire Table 508.4 and substitute as follows:

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

Use	A-1	A-2[e]	A-3	A-4	A-5	B[b]	E	F-1	F-2	H-1	H-2	H-3	H-4	H-5	I-1	I-2	I-3	I-4	M[b]	R-1	R-2	R-3, R-4	S-1	S-2[c]	U
A-1	--	2	2	2	2	2	2	3	2	NP	4	3	2	4	2	2	2	2	2	2	2	2	3	2	1
A-2[e]		--	2	2	2	2	2	3	2	NP	4	3	2	4	2	2	2	2	2	2	2	2	3	2	1
A-3			--	2	2	2	2	3	2	NP	4	3	2	4	2	2	2	2	2	2	2	2	3	2	1
A-4				--	2	2	2	3	2	NP	4	3	2	4	2	2	2	2	2	2	2	2	3	2	1
A-5					--	2	2	3	2	NP	4	3	2	4	2	2	2	2	2	2	2	2	3	2	1
B[b]						--	2	3	2	NP	2	1	1	1	2	2	2	2	2	2	2	2	3	2	1
E							--	3	2	NP	4	3	2	4	2	2	2	2	2	2	2	2	3	2	1
F-1								--	3	NP	2	1	1	1	3	3	3	3	3	3	3	3	3	3	3
F-2									--	NP	2	1	1	1	2	2	2	2	2	2	2	2	3	2	2
H-1										--	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP
H-2											--	1	2	2	4	4	4	4	2	4	4	4	2	2	1
H-3												--	1	1	4	3	3	3	1	3	3	3	1	1	1
H-4													--	1	4	4	4	4	1	4	4	4	1	1	1
H-5														--	4	4	4	3	1	4	4	4	1	1	3
I-1															--	2	2	2	2	2	2	2	4	3	2
I-2																--	2	2	2	2	2	2	3	2	1
I-3																	--	2	2	2	2	2	3	2	1
1-4																		--	2	2	2	2	3	2	1
M[b]																			--	2	2	2	3	2	1
R-1																				--	2	2	3	2	1
R-2																					--	2	3	2	1
R-3, R-4																						--	3	2[d]	1[d]
S-1																							--	3	3
S-2[c]																									1
U																									--

For SI: 1 square foot = 0.0929 m^2.
NP = Not permitted.

a. Except for Group H and I-2 occupancies, where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1, the fire-resistance ratings shall be reduced by 1 hour but to not less than 1 hour and to not less than the required floor construction according to the type of construction.
b. Occupancy separation need not be provided for storage areas within Groups B and M if the:
   1. Area is less than 10 percent of the floor area;
   2. Area is provided with an automatic sprinkler system and is less than 3,000 square feet; or
   3. Area is less than 1,000 square feet.

c. Areas used only for private or pleasure vehicles shall be allowed to reduce separation by 1 hour.
d. See Section 406.1.4. for private garages and carports.
e. Commercial kitchens need not be separated from the restaurant seating areas that they serve.

Reason: This proposal aims to restore the previous Table 302.3.2 from the 2003 IBC, but retain the modified text of section 508 on Mixed Use & Occupancy. In addition to restoring the separated uses (occupancies) concept previously prescribed in Section 302 of the 2003 IBC (and 2003 Supp), the proposal clarifies the distinction between separated uses and the non-separated use options. During the 2006 cycle the separated uses section of the IBC was changed based on public proposal G32-04/05 on the basis that it presented no significant technical changes. To the contrary, there are more than 100 changes in fire resistance ratings resulting from this proposal, most without justification or supporting rationale. The result of this Code change is to reduce the level of protection provided by the IBC over any of the previous Legacy Codes.

Approximately 40% of the jurisdictions who have adopted the IBC are now using the 2006 (or later) edition. In contrast, when this Code change was first accepted in the 2006 IBC, few jurisdictions had any history with the lack of fire resistance rated construction between occupancies which the 2006 and 2009 IBC now permits. As a result, there is a growing level of concern with the reductions in fire resistance ratings between separated occupancies in mixed occupancy buildings in the 2006 IBC. The adoption of this Code change in the 2006 and 2009 IBC arbitrarily reduced fire resistance ratings to levels significantly below most of the Legacy Codes, without providing any compensating safety measures. The full impact of this change has not yet been felt. This change needs to be corrected, and a selective process of review, consideration, and justification undertaken to determine which, if any, of these changes are desirable and justifiable.

The concept of separation of major occupancies exists in Building regulations throughout the world. Certainly, those occupancy separations requirements used in the separated occupancies option have stood the test of time. There continues to be a critical need to separate adjacent major occupancies of dissimilar use, with fire-resistance rated construction. This proposal would delete the current Table 508.4 in its entirety and substitute the previous Table 302.3.2 which was replaced in Code Change G32-04/05. The previous Table 302.3.2 had been is use for the three plus years it existed in the 2000 and 2003 editions of the IBC. Furthermore, the occupancy separation fire resistance ratings from this predecessor table were taken directly from the BOCA National Building Code, along with the entire concept of the non-separated and separated occupancies in mixed occupancy buildings. The occupancy separation Table had existed in the BOCA National Building Code for a very long time, and was incorporated into the first edition of the IBC. The concept of separation of major occupancies exists in Building regulations throughout the world. Certainly, those occupancy separations requirements used in the separated occupancies option have stood the test of time. There continues to be a

In the published "Report of the Public Hearing on the 2003 editions of the International Building Code", the committee's published reason for recommending adoption of G32-04/05 is reported as follows: "The proposal does not have any significant technical changes from the current requirements." In reality, this code change proposals has lead to over 100 changes to required fire resistance ratings for occupancy separation, in both sprinklered and unsprinklered occupancies, without providing individual justifications of any kind.

To illustrate some specific examples, this change has unilaterally reduced the fire separation between a mixed use office and a moderate hazard warehouse from the previously existing 3-hour minimum fire separation to zero, while providing no technical justification or compensating measures. Table 302.3.2 of the 2003 IBC, as well as the Exception to Section 302.2.3 (IBC 2003 Supplement), specified a minimum fire resistance for every occupancy separation and did not permit a fire resistance rating to be less than one hour, even when an automatic sprinkler system was provided. In contrast, the new Table 302.3.2 allows numerous instances where the fire resistance ratings are waived entirely. Further, while Exception 1 of the old section 302.3.2 did not apply to Group H and I-2 areas, the revised Table in the new section 508 shows a reduction of 1-h in fire resistance rating between all I occupancies and for F-2, S-2, U, B, F-1, M, and S-1 without any justification or compensation. While it has been argued that a number of these separated use combinations are unrealistic, an equal number are very realistic and represent an unjustified reduction from current code requirements for fire-resistant construction. To unilaterally propose that a mixed use office and moderate hazard warehouse be reduced from the current 3-hour minimum fire separation to a zero separation is unjustifiable.

Bibliography & References:
[1] 2003 IBC, International Codes Council, Table 302.3.2
[2] 1996 BOCA National Building Code, BOCA
[3] 1997 Standard Building Code, SBCCI
[4] 1997 Uniform Building Code, ICBO

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: Alternative locations for allowance in the footnotes to the table would be as exceptions to Sections 508.3.3 and 508.4.4.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRIMI-G3-TABLE 508.4.doc

G119–09/10
Table 508.4

Proponent: William E. Koffel, Koffel Associates, Inc, representing Firestop Contractors International Association

Revise table as follows:

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

	A[d], E		I-1,I-3, I-4		I-2		R		F-2, S-2[b], U		B, F-1,M, S-1		H-1		H-2		H-3, H-4, H-5	
OCCUPANCY	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**
A[d], E	N	N	1	2	2	NP	1	2	N	1	1	2	NP	NP	3	4	2	3[a]
I-1, I-3, I-4			N	N	2	NP	1	NP	1	2	1	2	NP	NP	3	NP	2	NP
I-2					N	N	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP
R							N	N	1[c]	2[c]	1	2	NP	NP	3	NP	2	NP
F-2, S-2[b], U									N	N	1	2	NP	NP	3	4	2	3[a]
B, F-1, M, S-1											N	N	NP	NP	2	3	1	2[a]
H-1													N	NP	NP	NP	NP	NP
H-2															N	NP	1	NP
H-3, H-4, H-5																	1[e,f]	NP

For SI: 1 square foot = 0.0929 m^2.

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.
a. For Group H-5 occupancies, see Section 903.2.4.2.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than one hour.
c. See Section 406.1.4, 709.1, and 712.3.
d. Commercial kitchens need not be separated from the restaurant seating areas that they serve.
e. Separation is not required between occupancies of the same classification.
f. For H-5 occupancies, see Section 415.8.2.2.

Reason: Confusion has existed as to why there is for fire partitions to separate dwelling units and sleeping units in Groups R-1 and R-2 when there is no need to separate Group R occupancies. Similar to the required separation between the dwelling unit and a garage, the additional language will clarify that the requirements of Sections 709.1 and 712.3 still apply.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: KOFFELL-G1-TABLE 508.3.3

G120–09/10
Table 508.4

Proponent: Stephen Thomas, Colorado Code Consulting, LLC, representing The Colorado Chapter ICC

Revise table notes as follows:

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

(Portions of table not shown are unchanged)

For SI: 1 square foot = 0.0929 m^2.
S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.

a. For Group H-5 occupancies, see Section 903.2.4.2.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than one hour.
c. See Section 406.1.4.
d. Commercial kitchens need not be separated from the ~~restaurant seating~~ dining areas that they serve.
e. Separation is not required between occupancies of the same classification.
f. For H-5 occupancies, see Section 415.8.2.2.

Reason: Even though footnote e is included with the E occupancies in Table 508.4, a code official has interpreted that this footnote does not apply to the cafeteria in a school. In my opinion there is no difference in the two uses. However, it can be argued that a cafeteria in a school is not a "restaurant" which is specifically stated in the footnote. This change clarifies the intent that the footnote applies to any type of dining area that is adjacent to a commercial kitchen.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THOMAS-G2-T508.4

G121–09/10
Table 508.4

Proponent: Lou Malattia representing Washington Association of Building Officials

Revise table notes as follows:

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

(Portions of table not shown are unchanged)

For SI: 1 square foot = 0.0929 m^2.
S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.

a. For Group H-5 occupancies, see Section 903.2.4.2.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour.
c. See Section 406.1.4.
d. Commercial kitchens need not be separated from the ~~restaurant~~ seating areas that they serve.
e. Separation is not required between occupancies of the same classification.
f. For H-5 occupancies, see Section 415.8.2.2.

Reason: There has been some confusion regarding school cafeterias and whether or not an occupancy separation is required between the dining area and the kitchen. By eliminating the word "restaurant", it makes it clearer that all dining areas are not required to be separated from the kitchen which serves it.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MALATTIA-G4-TABLE 508.4

G122–09/10
Table 508.4, 303.1 (IFC [B] 202)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise table as follows:

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

	A[d], E		I-1, I-3, I-4		I-2		R		F-2, S-2[b], U		B, F-1, M, S-1		H-1		H-2		H-3, H-4, H-5	
OCCUPANCY	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**
A[d], E	N	N	1	2	2	NP	1	2	N	1	1	2	NP	NP	3	4	2	3[a]
I-1, I-3, I-4	—	—	N	N	2	NP	1	NP	1	2	1	2	NP	NP	3	NP	2	NP
I-2	—	—	—	—	N	N	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP
R	—	—	—	—	—	—	N	N	1[c]	2[c]	1	2	NP	NP	3	NP	2	NP
F-2, S-2[b], U	—	—	—	—	—	—	—	—	N	N	1	2	NP	NP	3	4	2	3[a]
B, F-1, M, S-1	—	—	—	—	—	—	—	—	—	—	N	N	NP	NP	2	3	1	2[a]
H-1	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	NP	NP	NP	NP
H-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	1	NP
H-3, H-4, H-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1 [d,e,f]	NP

For SI: 1 square foot = 0.0929 m^2.
S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.

a. For Group H-5 occupancies, see Section 903.2.4.2.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than 1 hour.
c. See Section 406.1.4.
~~d. Commercial kitchens need not be separated from the restaurant seating areas that they serve.~~
~~e~~ d. Separation is not required between occupancies of the same classification.
~~f~~ e. For Group H-5 occupancies, see Section 415.8.2.2.

303.1 (IFC [B] 202) Assembly Group A. Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption or awaiting transportation.

A-2 Assembly uses intended for food and/or drink consumption including, but not limited to:

Banquet halls
Nightclubs
Restaurants (including associated commercial kitchens)
Taverns and bars

(Portions of text not shown remain unchanged)

Reason: This proposal deletes a somewhat confusing and unnecessary commercial kitchen exception from Table 508.4 in favor of clarifying that the restaurant and associated kitchen are the same Group A-2 occupancy in Section 303.1. The current footnote reference d is shown as applicable to Group A occupancies. Occupancy separations are not required within Group A occupancies, therefore the footnote is extraneous and moot. Approval of this proposal will place the commercial kitchen provision in the proper context of occupancy classification as opposed to mixed occupancy.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Because the code requires buildings containing either Group I or R occupancies to be fully sprinkler protected, the Code Correlation Committee has replaced all numeric values in cells indicating a NS (non sprinklered) Group I or R occupancy building with NP for not permitted.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: KEITH-G6A-508.4

G123–09/10
Table 508.4

Proponent: Carroll Lee Pruitt, FAIA, NCARB, Pruitt Consulting, Inc.

Revise table as follows:

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)[g]

	A[d], E		I-1,I-3, I-4		I-2		R		F-2, S-2[b], U		B, F-1,M, S-1		H-1		H-2		H-3, H-4, H-5	
OCCUPANCY	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**
A[d], E	N	N	1	2	2	NP	1	2	N	1	1	2	NP	NP	3	4	2	3[a]
I-1, I-3, I-4			N	N	2	NP	1	NP	1	2	1	2	NP	NP	3	NP	2	NP
I-2					N	N	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP
R							N	N	1[c]	2[c]	1	2	NP	NP	3	NP	2	NP
F-2, S-2[b], U									N	N	1	2	NP	NP	3	4	2	3[a]
B, F-1, M, S-1											N	N	NP	NP	2	3	1	2[a]
H-1													N	NP	NP	NP	NP	NP
H-2															N	NP	1	NP
H-3, H-4, H-5																	1[e,f]	NP

a. For Group H-5 occupancies, see Section 903.2.4.2.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than one hour.
c. See Section 406.1.4.
d. Commercial kitchens need not be separated from the restaurant seating areas that they serve.
e. Separation is not required between occupancies of the same classification.
f. For H-5 occupancies, see Section 415.8.2.2.
g. Where this table does not require a separation between individual occupancies, such occupancies must be separated by full height partitions (floor to ceiling), fire partitions, fire barriers, smoke barriers, smoke partitions, fire walls, rated or non-rated horizontal assemblies or other approved means.

Reason: Unless the area of these occupancies not requiring separation is clearly delineated on the plans, there is no way to determine compliance with Section 508.4.2 (mixed area ratio). The issue here is that the building area limitations in Table 503 are not the same for each of the occupancies that are not required to be separated, thus if the areas of each separated occupancy are not clearly delineated, there is no way to establish the area of each of occupancy and the mixed area ratio. For example, a Group B occupancy is not required to be separated from a Group M occupancy; however, a Group B occupancy of Type IIB Construction has a base area of 23,000 s.f. where a Group M occupancy has a base area of 12,500 s.f.

Cost Impact: The code change proposal may increase the cost of construction.

Analysis: The reference to footnote g is placed at the end of the title of the table. Because the code requires buildings containing either Group I or R occupancies to be fully sprinkler protected, the Code Correlation Committee has replaced all numeric values in cells indicating a NS (non sprinklered) Group I or R occupancy building with NP for not permitted.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: PRUITT-G3-TABLE 508.4.doc

G124–09/10
Table 508.4

Proponent: Jason Thompson, National Concrete Masonry Association, representing the Masonry Alliance for Codes and Standards

Revise table as follows:

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

	A[d], E		I-1, I-3, I-4		I-2,		R		F-2, S-2[b], U		B, F-1, M, S-1		H-1		H-2		H-3,H-4, H-5	
OCCUPANCY	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**
A[d], E	N	N	1	2	2	NP	~~1~~ 2	~~2~~NP	N	1	1	2	NP	NP	3	4	2	3[a]
I-1, I-3, I-4	—	—	N	N	2	NP	~~1~~ 2	NP	1	~~2~~NP	1	2	NP	NP	3	NP	2	NP
I-2	—	—	—	—	N	N	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP
R	—	—	—	—	—	—	N	N	~~1~~[c] 2	~~2~~[e]NP	~~1~~ 2	2	NP	NP	3	NP	2	NP
F-2, S-2[b], U	—	—	—	—	—	—	—	—	N	N	1	2	NP	NP	3	4	2	3[a]
B, F-1, M, S-1	—	—	—	—	—	—	—	—	—	—	N	N	NP	NP	2	3	1	2[a]
H-1	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	NP	NP	NP	NP
H-2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	N	NP	1	NP
H-3, H-4, H-5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1[e,f]	NP

For SI: 1 square foot = 0.0929 m^2.

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.

a. For Group H-5 occupancies, see Section 903.2.5.2.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than 1 hour.
c. See Section 406.1.4.
d. Commercial kitchens need not be separated from the restaurant seating areas that they serve.
e. Separation is not required between occupancies of the same classification.
f. For H-5 occupancies, see Section 415.8.2.2.

Reason: Group R occupancies involve a living environment that has persons sleeping and who may not be aware of their surroundings should an emergency due to fire begin to develop. Because of this there is need to provide a higher degree of fire resistive separation than might normally be provided between occupancies where the persons in the buildings are alert to their surroundings such as Group A, B, E, F, M or S . This proposal increases the fire resistance between Group R occupancies and all other occupancies to 2-hours to reduce the risk of fire spreading while the occupants are sleeping.

The code change also corrects several cells in the table where the table implies you can have fire separation between an unsprinklered Group I-1, I-3, I-4 and R occupancies and other occupancy groups. All Group I-1, I-3, I-4 and R occupancies are required to be fully sprinklered.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: A question is how this proposed change would coordinate with the separation requirements in Section 406.1.4, which is referenced in note c.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: THOMPSON-G1-T508.4

G125–09/10
Table 508.4

Proponent: Maureen Traxler, City of Seattle, WA, Seattle Dept of Planning & Development

Revise table as follows:

Table 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

Occupancy	A[d], E		I-1, I-3, I-4		I-2		R		F-2, S-2[b], U		B, F-1, M, S-1		H-1		H-2		H-3, H-4, H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A[d], E	N	N	1	2	2	NP	1	2	N	1	1	2	NP	NP	3	4	2	3[a]
I-1, I-3, I-4	-	-	N	N	2	NP	1	NP	1	2	1	2	NP	NP	3	NP	2	NP
I-2	-	-	-	-	N	N	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP
R	-	-	-	-	-	-	N	N	1[c]	2[c]	1	2	NP	NP	3	NP	2	NP
F-2, S-2[b], U	-	-	-	-	-	-	-	-	N	N	~~1~~N	~~2~~N	NP	NP	3	4	2	3[a]
B, F-1, M, S-1	-	-	-	-	-	-	-	-	-	-	N	N	NP	NP	2	3	1	2[a]
H-1	-	-	-	-	-	-	-	-	-	-	-	-	N	NP	NP	NP	NP	NP
H-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	NP	1	NP
H-3, H-4, H-5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1[e,f]	NP

(Notes to the table remain unchanged)

Reason: Table 508.4 allows an unrated separation between Groups B/M/U occupancies and Group F-1/S-1 (moderate-hazard) occupancies yet requires a 2-hr separation between Groups B/M/U occupancies and Group F-2/S-2 (low-hazard) occupancies. It is not appropriate to require a higher level of separation from an occupancy of lower hazard. This proposal amends the separation requirements so the low-hazard occupancies Group F-2 and S-2 no longer require a level of separation higher than that of the moderate-hazard occupancies Groups F-1 and S-1.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Because the code requires buildings containing either Group I or R occupancies to be fully sprinkler protected, the Code Correlation Committee has replaced all numeric values in cells indicating a NS (non sprinklered) Group I or R occupancy building with NP for not permitted.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: TRAXLER-G4-T508.4.doc

G126–09/10
Table 508.4

Proponent: Patrick Vandergriff, Vandergriff Code Consulting Services, representing himself

Revise table as follows:

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

OCCUPANCY	A[d], E		I-1, I-3, I-4		I-2		R		F-2, S-2[b], U		M[g]		B[g]		~~B, M,~~ S-1, F-1		H-1		H-2		H-3, H-4, H-5	
	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A[d], E	N	N	1	2	2	NP	1	2	N	1	1	2	1	2	1	2	NP	NP	3	4	2	3[a]
I-1, I-3, I-4			N	N	2	NP	1	NP	1	2	1	NP	1	NP	1	2	NP	NP	3	NP	2	NP
I-2					N	N	2	NP	2	NP	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP
R							N	N	1[c]	2[c]	1	NP	1	NP	1	2	NP	NP	3	NP	2	NP
F-2, S-2[b], U									N	N	1	2	1	2	1	2	NP	NP	3	4	2	3[a]
M[g]											N	N	1	2	1	2	NP	NP	2	3	1	2[a]
B[g]													N	N	1	2	NP	NP	2	3	1	2[a]
~~B, M~~, S-1, F-1															N	N	NP	NP	2	3	1	2[a]
H-1																	N	NP	NP	NP	NP	NP
H-2																			N	NP	1	NP
H-3, H-4, H-5																					1[e,f]	NP

For SI: 1 square foot = 0.0929 m^2.

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.

a. For Group H-5 occupancies, see Section 903.2.4.2.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than one hour.
c. See Section 406.1.4.
d. Commercial kitchens need not be separated from the restaurant seating areas that they serve.
e. Separation is not required between occupancies of the same classification.
f. For H-5 occupancies, see Section 415.8.2.2.
g. Occupancy separation need not be provided for storage areas within Groups B and M occupancies if the:
   1. Area is less than 10 percent of the floor area;
   2. Area is provided with an automatic sprinkler system and is less than 3,000 square feet; or
   3. Area is less than 1,000 square feet.

Reason: There change provides for separation of the B and M occupancies into their own position within the chart and corresponds to a chart that is in the proposed adoption of the 2009 IBC for the state of New York. The purpose is to provide for closer correlation within the codes in an effort to have fewer amendments in various jurisdictions.

Cost Impact: The code change proposal will not increase the cost of construction. Increase in a small percentage of projects.

Analysis: Alternative locations for this allowance rather than as a footnote to a table would be as exceptions to Sections 508.3.3 and 508.4.4. Because the code requires buildings containing either Group I or R occupancies to be fully sprinkler protected, the Code Correlation Committee has replaced all numeric values in cells indicating a NS (non sprinklered) Group I or R occupancy building with NP for not permitted.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: VANDERGRIFF-G1-TABLE 508.4.doc

G127–09/10
Table 508.4

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., representing International Firestop Council

Revise table as follows:

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

	A[d], E		I-1, I-3, I-4		I-2		R		F-2, S-2[b], U		~~B,~~ F-1, M, S-1		B		H-1		H-2		H-3, H-4, H-5	
OCCUPANCY	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**
A[d], E	N	N	1	2	2	NP	1	2	N	1	1	2	1	2	NP	NP	3	4	2	3[a]
I-1, I-3, I-4			N	N	2	NP	1	NP	1	2	1	2	1	NP	NP	NP	3	NP	2	NP
I-2					N	N	2	NP	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP
R							N	N	1[c]	2[c]	1	2	1	NP	NP	NP	3	NP	2	NP
F-2, S-2[b], U									N	N	1	2	1[g]	2[g]	NP	NP	3	4	2	3[a]
~~B,~~ F-1, M, S-1											N	N	1[g]	2[g]	NP	NP	2	3	1	2[a]
B													N	N	NP	NP	2	3	1	2[a]
H-1															N	NP	NP	NP	NP	NP
H-2																	N	NP	1	NP
H-3, H-4, H-5																			1[e,f]	NP

For SI: 1 square foot = 0.0929 m^2.

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.

a. For Group H-5 occupancies, see Section 903.2.5.2.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than 1 hour.
c. See Section 406.1.4.
d. Commercial kitchens need not be separated from the restaurant seating areas that they serve.
e. Separation is not required between occupancies of the same classification.
f. For H-5 occupancies, see Section 415.8.2.2.
g. Occupancy separation need not be provided for storage areas associated with a Group B occupancy if the:
   1. Area is less than 10 percent of the floor areas;
   2. Area is provided with an automatic sprinkler system and is less than 3,000 square feet; or
   3. Area is less than 1,000 square feet.

Reason: The purpose of this Code change is to break out the Group B Occupancies from Groups F-1, M, and S-1 since the current grouping in Table 508.4 does not represent similar hazards, and results in no fire separations being required between these.

This proposal aims to restore a portion of the level of protection afforded in the 2003 IBC and many of the Legacy Codes. While the current Table 508.4 was first revised for the 2006 IBC, few jurisdictions had any history with the lack of fire resistance rated separations between occupancies which the 2006 IBC would now permit.

As the table is currently formatted for required separation of occupancies under the separated occupancies option of Section 508.4, there is no occupancy separation required between any of the occupancies in the B, F-1, M, and S-1 Grouping, as indicated by the letter "N" contained in the table for those occupancy groups. However, a Group B occupancy generally has a significantly lower fire load than the Group F-1, M, and S-1 occupancies, and the occupancy hazard is different as well.

If Table 508.4 truly implements the separated occupancies option which mandates occupancy separations as compared to the nonseparated occupancies option in Section 508.3 which does not, it follows that there should be occupancy separations required between occupancies with different hazard characteristics. Group B occupancies generally have combustible fire loads less than 10 pounds per sq ft, as compared to the Group F-1, M, and S-1 occupancies which could have fire loads as much as 20 to 30 pounds per sq ft or more. Therefore, we have proposed a minimum 2-hour occupancy separation between the Group B occupancies and the Group F-1, M, and S-1 occupancies in nonsprinklered buildings and a minimum 1-hour fire-resistance rating in sprinklered buildings. This is consistent with the other occupancy classifications requiring occupancy separations between them and the Group F-1, M, and S-1 occupancies.

It should also be noted that this is consistent with the required occupancy separation for Group B/M mixed occupancies in former Table 302.3.2 of the 2003 IBC which Table 508.4 replaced in the 2006 IBC. And it is actually less restrictive than former Table 302.3.2 for the Group B/F-1 and Group B/S-1 mixed occupancies separations.

The concept of separation of major occupancies exists in Building regulations throughout the world. Certainly, those occupancy separations requirements used in the separated occupancies option have stood the test of time. There continues to be a critical need to separate adjacent major occupancies of dissimilar use, with fire-resistance rated construction. The previous Table 302.3.2 had been is use for the three plus years it existed in the 2000 and 2003 editions of the IBC. Furthermore, the occupancy separation fire resistance ratings from this predecessor table were taken directly from the BOCA National Building Code, along with the entire concept of the non-separated and separated occupancies in mixed occupancy buildings.

As currently published, the 2009 Code provisions in Section 508 blur the distinction between separated uses and the non-separated use options previously prescribed in Section 302.3.1. The full impact of this change has not yet been felt.

The proposal also adds a footnote g which is essentially the footnote that was provided for storage associated both Group B and M occupancies in Table 508.3.3 of the 2006 IBC. Based on the limited separations between the B, M and S occupancies, the footnote was determined unneeded and removed for the 2009 edition. With the reestablishment of separations between Group B and the S occupancies, this previous footnote should be re-established.

Bibliography & References:

[1] 2003 IBC, International Codes Council, Table 302.3.2
[2] 1996 BOCA National Building Code, BOCA
[3] 1997 Standard Building Code, SBCCI
[4] 1997 Uniform Building Code, ICBO

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: Alternative locations for this allowance rather than as a footnote to a table would be as exceptions to Sections 508.3.3 and 508.4.4. Because the code requires buildings containing either Group I or R occupancies to be fully sprinkler protected, the Code Correlation Committee has replaced all numeric values in cells indicating a NS (non sprinklered) Group I or R occupancy building with NP for not permitted.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CRIMI-G1-TABLE 508.4.doc

G128–09/10
Table 508.4

Proponent: Mike Ashley C.B.O. /Representing The Alliance for Fire & Smoke Containment & Control, Inc. (AFSCC)

Revise table as follows:

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

	A[d], E		I-1, I-3, I-4		I-2		R		F-2, S-2[b], U		B, F-1, ~~M,~~ S-1		M		H-1		H-2		H-3, H-4, H-5	
OCCUPANCY	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**
A[d], E	N	N	1	2	2	NP	1	2	N	1	1	2	1	2	NP	NP	3	4	2	3[a]
I-1, I-3, I-4			N	N	2	NP	1	NP	1	2	1	2	1	NP	NP	NP	3	NP	2	NP
I-2					N	N	2	NP	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP
R							N	N	1[c]	2[c]	1	2	1	NP	NP	NP	3	NP	2	NP
F-2, S-2[b], U									N	N	1	2	1[g]	2[g]	NP	NP	3	4	2	3[a]
B, F-1, ~~M,~~ S-1											N	N	1[g]	2[g]	NP	NP	2	3	1	2[a]
M													N	N	NP	NP	2	3	1	2[a]
H-1															N	NP	NP	NP	NP	NP
H-2																	N	NP	1	NP
H-3, H-4, H-5																			1[e,f]	NP

For SI: 1 square foot = 0.0929 m^2.

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.

a. For Group H-5 occupancies, see Section 903.2.5.2.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than 1 hour.
c. See Section 406.1.4.
d. Commercial kitchens need not be separated from the restaurant seating areas that they serve.
e. Separation is not required between occupancies of the same classification.
f. For H-5 occupancies, see Section 415.8.2.2.
g. Occupancy separation need not be provided for storage areas associated with a Group M occupancy if the:
   1. Area is less than 10 percent of the floor areas;
   2. Area is provided with an automatic sprinkler system and is less than 3,000 square feet; or
   3. Area is less than 1,000 square feet.

Reason: In this code change we propose to separate out the Group M occupancies from the grouping of occupancies which includes Groups B, F-1, M, and S-1 as is currently the case in Table 508.4 which is used for implementing the separated occupancies option of Section 508.4. It should be noted that the separated occupancies option requires different occupancies in the same building to be separated from each other based on the fire-resistance ratings specified in Table 508.4, as compared to the nonseparated occupancies option in Section 508.3 which does not require any fire-resistance-rated separation between occupancies. However, no occupancy separations are required between any of the occupancies in the grouping containing Group B, F-1, M, and S-1 occupancies since the letter "N" is entered in the table for those occupancy groups. This means that there is no separation requirement whatsoever.

By removing the Group M occupancies from that grouping and creating a separate entry for them, we have achieved a required separation of occupancies for the Group M occupancy from any of the Group B, F-1, or S-1 occupancies. We believe Group M occupancies should be separated from these other occupancies because of the relative hazard of a Group M occupancy as compared to the other occupancies both in terms of fire load and occupant life safety. Group M occupancies can contain fire loads as much as 20 pounds per sq ft or more depending upon the type of retail operations and, of course, they can contain high densities and numbers of people, especially during holiday seasons and special sales events, as compared to the other occupancies. Group B occupancies generally contain fire loads less than 10 pounds per sq ft so they should be separated in order to protect that occupancy from the higher fire exposure of the Group M occupancies. The Group F-1 and S-1 occupancies should be separated from the Group M occupancies mainly because of the occupant life safety hazard exposures from those occupancies to the occupants of the Group M occupancy. In this code change we are proposing a 2-hour occupancy separation for fire barrier walls and horizontal assemblies in nonsprinklered buildings and 1-hour for sprinklered buildings. This is consistent with the occupancy separations contained in the current table between the Group B, F-1, M, and S-1 occupancies and all other occupancies except Group H-2. We believe that those occupancy combinations represent similar relative hazards in terms of fire and life safety.

The proposal also adds a footnote g which is essentially the footnote that was provided for storage associated both Group B and M occupancies in Table 508.3.3 of the 2006 IBC. Based on the limited separations between the B, M and S occupancies, the footnote was determined unneeded and removed for the 2009 edition. With the reestablishment of separations between Group M and the S occupancies, this previous footnote should be re-established.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: Alternative locations for this allowance rather than as a footnote to a table would be as exceptions to Sections 508.3.3 and 508.4.4. Because the code requires buildings containing either Group I or R occupancies to be fully sprinkler protected, the Code Correlation Committee has replaced all numeric values in cells indicating a NS (non sprinklered) Group I or R occupancy building with NP for not permitted.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ASHLEY-G2-TABLE 508.4

G129–09/10
Table 508.4

Proponent: Jason Thompson, National Concrete Masonry Association, representing the Masonry Alliance for Codes and Standards

Revise table as follows:

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

	A[d], E		I-1, ~~I-3,~~ I-4		I-2, I-3		R		F-2, S-2[b], U		B, F-1, M, S-1		H-1		H-2		H-3,H-4, H-5	
OCCUPANCY	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS	S	NS
A[d], E	N	N	1	2	2	NP	1	2	N	1	1	2	NP	NP	3	4	2	3[a]
I-1, ~~I-3,~~ I-4	__	__	~~N~~ 1[e]	NP	2	NP	1	NP	1	~~2~~NP	1	~~2~~NP	NP	NP	3	NP	2	NP
I-2, I-3	__	__	__	__	~~N~~ 2[e]	NP	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP
R	__	__	__	__	__	__	N	N	1[c]	2[c]	1	2	NP	NP	3	NP	2	NP
F-2, S-2[b], U	__	__	__	__	__	__	__	__	N	N	1	2	NP	NP	3	4	2	3[a]
B, F-1, M, S-1	__	__	__	__	__	__	__	__	__	__	N	N	NP	NP	2	3	1	2[a]
H-1	__	__	__	__	__	__	__	__	__	__	__	__	N	NP	NP	NP	NP	NP
H-2	__	__	__	__	__	__	__	__	__	__	__	__	__	__	N	NP	1	NP
H-3, H-4, H-5	__	__	__	__	__	__	__	__	__	__	__	__	__	__	__	__	1[e,f]	NP

For SI: 1 square foot = 0.0929 m^2.

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.

a. For Group H-5 occupancies, see Section 903.2.5.2.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than 1 hour.
c. See Section 406.1.4.
d. Commercial kitchens need not be separated from the restaurant seating areas that they serve.
e. Separation is not required between occupancies of the same classification.
f. For H-5 occupancies, see Section 415.8.2.2.

Reason: This proposed code change accomplishes several things. First, it relocates the Group I-3 occupancies to the same cells as the Group I-2 occupancies. Second, it requires that the Group I-1 and Group I-4 occupancies be separated from each other with a minimum 1-hour fire-resistance rating. Third, it also clarifies the table regarding the Group I occupancies for the NS columns where some of the individual cell entries have been changed to "NP." This recognizes the fact that the entire building containing a Group I occupancy is required to be protected with an automatic sprinkler system throughout even where there are other mixed occupancies that may be separated with fire barriers or horizontal assemblies that would otherwise not be required to be sprinklered.

Group I-3 occupancies should be treated the same as the Group I-2 occupancy when the separated occupancies option of Section 508.4 is used since they have similar relative hazards. This is also consistent with the 2009 NFPA 101 Life Safety Code which requires a minimum 2-hour fire-resistance rating for all occupancy separations involving detention and correctional facilities and other occupancies in the same building as specified in Tables 6.1.14.4.1(a) and (b) Required Separation of Occupancies (hours), Part 1 and Part 2. The separated occupancies option section in Section 508.4 of the 2009 IBC, refers to Table 508.4 Required Separation of Occupancies (hours) for determining the fire-resistance rating of the occupancy separation depending upon the occupancies being separated. However, the way the table is currently structured, a Group I-3 occupancy would not be required to be separated from a Group I-1 or I-4 occupancy because they are grouped together.

As indicated previously, this amendment will also require that a Group I-1 occupancy be separated from a Group I-4 occupancy with a minimum 1-hour fire-resistance-rated separation. This would be consistent with the Table 508.4 requirement that these occupancies be separated from Group R occupancies with a minimum 1-hour fire-resistance rating.

Also Footnote e has been added to the 1-hour rating for the I-1/I-4 occupancies to indicate that where the occupancy classification is the same, then there is no separation required. In other words, this would not require, as is currently the case, an occupancy separation for a Group I-1 occupancy and an adjacent Group I-1 occupancy in the same building, or similarly for a Group I-4 occupancy adjacent to another Group I-4 occupancy in the same building. And, a footnote has been added for the Group I-2 and I-3 occupancies for the same reason.

Finally, for the Group I-1 occupancies, this amendment is consistent with Exception 3 to Section 508.2.4 Separation of Occupancies for accessory occupancies, Exception 2 to Section 508.3.3 Separation for nonseparated occupancies, and Section 420.2 Separation Walls for Group I-1 sleeping/dwelling units.

The code change also corrects several cells in the table where the table implies you can have fire separation between an unsprinklered Group 1-1, I-3, I-4 occupancies and other occupancy groups. All Group I and R occupancies are required to be fully sprinklered.

In conclusion, this amendment will clarify where the required occupancy separations are to be provided under the separated occupancies option of the 2009 IBC for all Group I occupancies while making the code internally consistent.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: Because the code requires buildings containing either Group I or R occupancies to be fully sprinkler protected, the Code Correlation Committee has replaced all numeric values in cells indicating a NS (non sprinklered) Group I or R occupancy building with NP for not permitted.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: THOMPSON-G3-T508.4

G130–09/10
Table 508.4

Proponent: Stephen V. Skalko, P.E., Portland Cement Association

Revise table as follows:

TABLE 508.4
REQUIRED SEPARATION OF OCCUPANCIES (HOURS)

	A[d], E		I-1, I-3, I-4		I-2		R		F-2, S-2[b], U		B, ~~F-1,~~ M~~, S-1~~		F-1, S-1		H-1		H-2		H-3, H-4, H-5	
OCCUPANCY	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**	**S**	**NS**
A[d], E	N	N	1	2	2	NP	1	2	N	1	1	2	2	3	NP	NP	3	4	2	3[a]
I-1, I-3, I-4			N	N	2	NP	1	NP	1	2	1	~~2~~NP	2	NP	NP	NP	3	NP	2	NP
I-2					N	N	2	NP	2	NP	2	NP	2	NP	NP	NP	3	NP	2	NP
R							N	N	1[c]	2[c]	1	~~2~~NP	2	NP	NP	NP	3	NP	2	NP
F-2, S-2[b], U									N	N	1	2	2	3	NP	NP	3	4	2	3[a]
B, ~~F-1~~, M~~, S-1~~											N	N	2	3	NP	NP	2	3	1	2[a]
F-1, S-1													N	N	NP	NP	2	3	1	2[a]
H-1															N	NP	NP	NP	NP	NP
H-2																	N	NP	1	NP
H-3, H-4, H-5																			1[e,f]	NP

For SI: 1 square foot = 0.0929 m^2.

S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
NS = Buildings not equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
N = No separation requirement.
NP = Not permitted.

a. For Group H-5 occupancies, see Section 903.2.5.2.
b. The required separation from areas used only for private or pleasure vehicles shall be reduced by 1 hour but to not less than 1 hour.
c. See Section 406.1.4.
d. Commercial kitchens need not be separated from the restaurant seating areas that they serve.
e. Separation is not required between occupancies of the same classification.
f. For H-5 occupancies, see Section 415.8.2.2.

Reason: In this code change Group F-1 and S-1 occupancies are proposed to be separated out from the grouping of occupancies which includes Groups B, F-1, M, and S-1 as is currently the case in Table 508.4 which is used for implementing the separated occupancies option of Section 508.4. It should be noted that the separated occupancies option requires different occupancies in the same building to be separated from each other based on the fire-resistance ratings specified in Table 508.4 as compared to the nonseparated occupancies option in Section 508.3 which does not require any fire-resistance-rated separation between different occupancies. However, no occupancy separations are required between any of the occupancies in the grouping containing Group B, F-1, M, and S-1 occupancies since the letter "N" is entered in the table for those occupancy groups. This means that there is no separation requirement whatsoever even though the Group F-1 and S-1 occupancies may contain significantly greater fire loads than the Group B and M occupancies.

If Table 508.4 truly implements the separated occupancies option which mandates occupancy separations between mixed occupancies in the same building as compared to the nonseparated occupancies option in Section 508.3 which does not, it follows that there should be occupancy separations required between occupancies with different hazard characteristics. By removing the Group F-1 and S-1 occupancies from the grouping of the Group B, F-1, M, and S-1 occupancies and creating a separate entry for them in the table, a required separation of occupancies for the Group F-1 and S-1 occupancies from any of the Group B and M occupancies is achieved. This is based on the premise that the Group F-1 and S-1 occupancies should be separated from these occupancies because of the relative hazard of the Group F-1 and S-1 occupancy as compared to the Group B and M occupancies both in terms of the fire load and occupant life safety. Group F-1 and S-1 occupancies can contain fire loads as much as 20 to 30 pounds per sq ft or more. This can represent a significant fire exposure to the adjacent Group B and/or M occupancies in the same building which may also have significant numbers of occupants representing a potential life safety hazard.

Therefore, this proposal requires a minimum 3-hour occupancy separation for fire barrier walls and horizontal assemblies in nonsprinklered buildings and 2-hours for sprinklered buildings. This is consistent with the occupancy separations contained in the current table between the Group B, F-1, M, and S-1 occupancies and the Group H-2 occupancies. This occupancy usually has an occupancy combination that represents a similar relative hazard in terms of fire and life safety. This is also consistent with Table 707.3.9 for the separation of fire areas and Table 706.4 Fire Wall Fire-Resistance Ratings. It should also be noted that these proposed occupancy separations are consistent with the required occupancy separations for Group F-1 and S-1 mixed occupancies in former Table 302.3.2 of the 2003 IBC which Table 508.4 replaced in the 2006 IBC.

The code change also corrects several cells in the table where the table implies you can have fire separation between an unsprinklered Group I-1, I-3, I-4 and R occupancies and other occupancy groups. All Group I-1, I-3, I-4 and R occupancies are required to be fully sprinklered.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: Because the code requires buildings containing either Group I or R occupancies to be fully sprinkler protected, the Code Correlation Committee has replaced all numeric values in cells indicating a NS (non sprinklered) Group I or R occupancy building with NP for not permitted.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SKALKO-G1-T508.4

G131–09/10
509.2

Proponent: Lou Malattia representing Washington Association of Building Officials

Revise as follows:

509.2 Horizontal building separation allowance. A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of *fire walls,* limitation of number of stories and type of construction where all of the following conditions are met:

1. The buildings are separated with a horizontal assembly having a minimum 3-hour fire-resistance rating.
2. The building below the horizontal assembly is no more than one story above grade plane.
3. The building below the horizontal assembly is of Type IA construction.
4. Shaft, stairway, ramp and escalator enclosures through the horizontal assembly shall have not less than a 2-hour fire-resistance rating with opening protectives in accordance with Section 715.4.

   Exception: Where the enclosure walls below the horizontal assembly have not less than a 3-hour fire resistance rating with opening protectives in accordance with Section 715.4, the enclosure walls extending above the horizontal assembly shall be permitted to have a 1-hour fire-resistance rating, provided:

   1. The building above the horizontal assembly is not required to be of Type I construction;
   2. The enclosure connects less than four stories above the horizontal assembly; and
   3. The enclosure opening protectives above the horizontal assembly have a minimum 1-hour fire protection rating.

5. The building or buildings above the horizontal assembly shall be permitted to have multiple Group A occupancy uses, each with an occupant load of less than 300, or Group B, M, R or S occupancies.
6. The building below the horizontal assembly shall be protected throughout by an approved automatic sprinkler system in accordance with Section 903.3.1.1, and shall be permitted to be any of the following occupancies:
   6.1. Group S-2 parking garage used for the parking and storage of private motor vehicles;

6.2. Multiple Group A, each with an occupant load of less than 300;
6.3. Group B;
6.4. Group M;
6.5. Group R; and
6.6. Uses incidental to the operation of the building (including entry lobbies, mechanical rooms, storage areas and similar uses).

7. The maximum building height in feet shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from the grade plane.

Reason: To provide clarification of this exception. There has been some conflicting code opinions and this exception. Section 509.2, Condition #4, the exception Item 4.2, which reads, "The enclosure connects less than four stories;", has been interpreted by some jurisdictions to mean that the Group S-2 level below the 3-hour separation is considered to be a level for the purposes of this exception, and therefore only permitting two stories above the horizontal separation.

The intent of the code is to permit Group A occupancies less than 300, Groups B or M occupancies to be considered separate buildings for the purpose of determining area limitations, continuity of fire wall, limitation of number of stories and type of construction. A typical building type using this provision is a three story wood framing apartment building above an enclosed concrete parking level.

The exception to condition #4 permits the two hour shaft to be reduced to one hour provided that the enclosure walls below the horizontal assembly is increased to a three hour fire-resistance rating. This additional protection permits three levels above the horizontal assembly to be protected with one hour shafts instead of the two- hour assembly.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MALATTIA-G3-509.2

G132–09/10
509.2

Proponent: David Maret, New World Plan Review, LLC

Revise as follows:

509.2 Horizontal building separation allowance. A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of *fire walls,* limitation of number of stories and type of construction where all of the following conditions are met:

1. The buildings are separated with a *horizontal assembly* having a minimum 3-hour *fire-resistance rating*.
2. The building below the *horizontal assembly* is no more than one *story above grade plane*.
3. The building below the *horizontal assembly* is of Type IA construction.
4. Shaft, *stairway*, ramp and escalator enclosures through the *horizontal assembly* shall have not less than a 2-hour *fire-resistance rating* with opening protectives in accordance with Section 715.4.

   Exception: Where the enclosure walls below the *horizontal assembly* have not less than a 3-hour *fire-resistance rating* with opening protectives in accordance with Section 715.4, the enclosure walls extending above the *horizontal assembly* shall be permitted to have a 1-hour *fire-resistance rating*, provided:

   1. The building above the *horizontal assembly* is not required to be of Type I construction;
   2. The enclosure connects less than four *stories* measured from above the 3-hour horizontal assembly; and
   3. The enclosure opening protectives above the *horizontal assembly* have a minimum 1-hour *fire protection rating*.

5. The building or buildings above the *horizontal assembly* shall be permitted to have multiple Group A occupancy uses, each with an *occupant load* of less than 300, or Group B, M, R or S occupancies.
6. The building below the *horizontal assembly* shall be protected throughout by an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, and shall be permitted to be any of the following occupancies:
   6.1. Group S-2 parking garage used for the parking and storage of private motor vehicles;
   6.2. Multiple Group A, each with an *occupant load* of less than 300;
   6.3. Group B;
   6.4. Group M;
   6.5. Group R; and
   6.6. Uses incidental to the operation of the building (including entry lobbies, mechanical rooms, storage areas and similar uses).

7. The maximum *building height* in feet shall not exceed the limits set forth in Section 503 for the building having the smaller allowable height as measured from the *grade plane*.

Reason: To provide clarification and remain consistent with model code language of exception.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: MARET-G1-509.2

G133–09/10
509.9

Proponent: Marshall Klein PE, Marshall A. Klein & Associates Inc.

Revise as follows:

509.9 Multiple buildings above ~~Group S-2 parking garage~~ a horizontal assembly. Where two or more buildings are provided above the horizontal assembly separating a Group S-2 ~~open or closed~~ parking ~~garage~~ or building below from the buildings above in accordance with the special provisions in Sections 509.2, 509.3 or 509.8, the buildings above the horizontal assembly shall be regarded as separate and distinct buildings from each other and shall comply with all other provisions of this code as applicable to each separate and distinct building.

Reason: Code proposal is strictly editorial with no intent to change the requirements under the Code.

Revision of the title to Section 509.9 is editorial to correlate with Sections 509.2 and 509.3 to which this section references because Sections 509.2 permit other occupancies (See Section 509.2(6) for listing of other occupancies) below the horizontal assembly.

The addition of the words "or building below" to the body of this section is editorial to correlate with Section 509.2 that lists under its Section 509.2(6) other occupancies besides a S-2 parking garage that are permitted below the horizontal assembly.

The deletion of "open or enclosed" is editorial because a parking garage under Sections 509.2 can be either opened or enclosed, and Section 509.3 spells out that its requirement is applicable to an enclosed garage under an open parking garage. Therefore, "open or enclosed" are not required in Section 509.9 because the referenced code sections provide the parking garage's open or enclosed criteria.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: KLEIN-G2-509.9

G134–09/10
Table 601

Proponent: Jeff Hugo, CBO, National Fire Sprinkler Association

Revise table as follows:

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (hours)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A[d]	B	A[d]	B	HT	A[d]	B
Primary structural frame[g] (see Section 202)	3[a]	2[a]	1	0	1	0	HT	1	0
Bearing walls									
Exterior[f, g,]	3	2	1	0	2	2	2	1	0
Interior	3[a]	2[a]	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior[e]	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor construction and secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and secondary members (see Section 202)	1½[b]	1[b, c]	1[b, c]	0[c]	1[b, c]	0	HT	1[b, c]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
b. Except in Groups F-1, H, M and S-1 occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.
c. In all occupancies, heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.
d. ~~An approved automatic sprinkler system in accordance with Section 903.3.1.1 shall be allowed to be substituted for 1-hour fire-resistance-rated construction, provided such system is not otherwise required by other provisions of the code or used for an allowable area increase in accordance with Section 506.3 or an allowable height increase in accordance with Section 504.2. The 1-hour substitution for the fire resistance of exterior walls shall not be permitted.~~ An approved automatic sprinkler system in accordance with Section 903.3.1.1 shall be allowed to be substituted for 1-hour fire resistive construction of all one and two story buildings. The 1-hour substitution for the fire resistance of exterior walls shall not be permitted.
e. Not less than the fire-resistance rating required by other sections of this code.
f. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
g. Not less than the fire-resistance rating as referenced in Section 704.10

Reason: Footnote d is contradictory to the ability to enlarge buildings by height and area with fire sprinklers and no fire statistics show that the requirements of this subsection to be beneficial to the structure, the firefighter's approach to the fire, and is cooled by the fire sprinklers regardless. This change is limited to one and two story buildings.

One and two story unlimited area buildings are subjected to the proposed eliminated portion of footnote d., " *provided such system is not otherwise required by other provisions of the code".* Fire sprinklers are very effective in controlling fires in such buildings.

Footnote c. will still apply to roof construction, including supporting beams and joists less than 20 feet, which was applicable even in the legacy codes.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: HUGO-G1-TABLE 601.doc

G135–09/10
Table 601

Proponent: Catherine Heeb, City of Portland Bureau of Development Services

Revise table as follows:

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (HOURS)

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
	A	B	A[d]	B	A[d]	B	HT	A[d]	B
Primary structural frame[g] (see Section 202)	3[a]	2[a]	1	0	1[h]	0[h]	HT	1	0
Bearing walls									
Exterior[f, g]	3	2	1	0	2	2	2	1	0
Interior	3[a]	2[a]	1	0	1	0	1/HT	1	0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior[e]	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor construction and secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and secondary members (see Section 202)	1½[b]	1[b, c]	1[b, c]	0 c	1[b, c]	0	HT	1[b, c]	0

For SI: 1 foot = 304.8 mm.

a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.
b. Except in Groups F-1, H, M and S-1 occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above

any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

c. In all occupancies, heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.

d. An approved automatic sprinkler system in accordance with Section 903.3.1.1 shall be allowed to be substituted for 1-hour fire-resistance-rated construction, provided such system is not otherwise required by other provisions of the code or used for an allowable area increase in accordance with Section 506.3 or an allowable height increase in accordance with Section 504.2. The 1-hour substitution for the fire resistance of exterior walls shall not be permitted.

e. Not less than the fire-resistance rating required by other sections of this code.

f. Not less than the fire-resistance rating based on fire separation distance (see Table 602).

g. Not less than the fire-resistance rating as referenced in Section 704.10

h. Where the exterior wall is not load bearing, the primary structural frame members that form the outermost perimeter bearing frame shall be protected as for exterior bearing walls.

Reason: The purpose of this added footnote is to clarify construction requirements in buildings of Type III construction that do not utilize bearing exterior walls. Traditionally, Type III buildings have been constructed with interior wood structure protected by exterior masonry bearing walls.

The current code language does not sufficiently address protection of exposed structural frame members in Type III construction where there is no exterior bearing wall, such as in curtain wall construction. This amendment would require protection of the outer perimeter of the structural frame in situations where this frame is not engaged in, or protected by, an exterior rated wall.

Protection of the outermost structural frame members provides an equivalent level of protection as construction that utilizes a rated exterior bearing wall.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: HEEB-G1-T601

G136–09/10
Table 601

Proponent: Mike Ennis, Single Ply Roofing Industry (SPRI), representing the Single Ply Roofing Industry (SPRI)

Revise table as follows:

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (hours)

	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
BUILDING ELEMENT	**A**	**B**	**A[d]**	**B**	**A[d]**	**B**	**HT**	**A[d]**	**B**
Primary structural frame[g] (see Section 202)	3[a]	2[a]	1	0	1	0	HT	1	0
Bearing walls Exterior[f, g] Interior	 3 3[a]	 2 2[a]	 1 1	 0 0	 1	 2 0	 2 1/HT	 1 1	 0 0
Nonbearing walls and partitions Exterior	See Table 602								
Nonbearing walls and partitions Interior[e]	0	0	0	0	0	0	See Section 602.4.6	0	0
Floor construction and secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0
Roof construction and secondary members[h] (see Section 202)	1½[b]	1[b, c]	1[b, c]	0 c	1[b, c]	0	HT	1[b, c]	0

For SI: 1 foot = 304.8 mm.

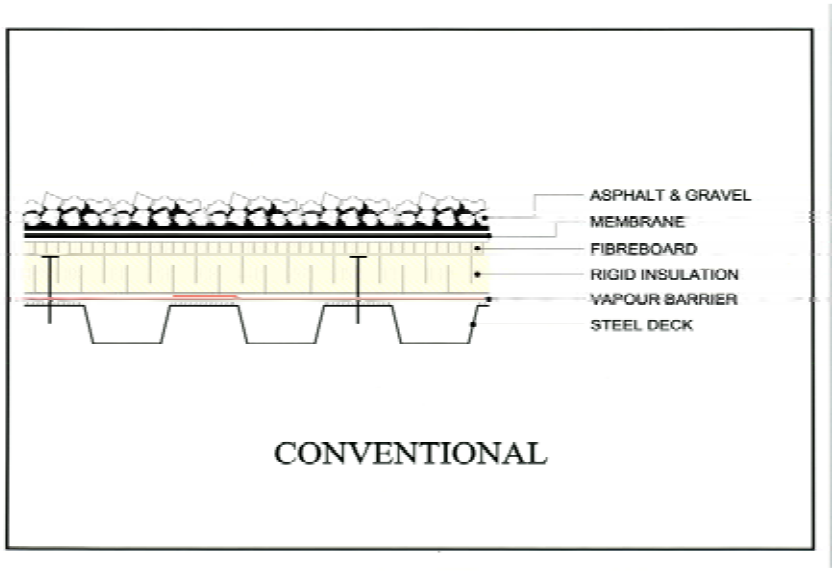
a. Roof supports: Fire-resistance ratings of primary structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only.

b. Except in Groups F-1, H, M and S-1 occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction is 20 feet or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members.

c. In all occupancies, heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.

d. An approved automatic sprinkler system in accordance with Section 903.3.1.1 shall be allowed to be substituted for 1-hour fire-resistance-rated construction, provided such system is not otherwise required by other provisions of the code or used for an allowable area increase in accordance with Section 506.3 or an allowable height increase in accordance with Section 504.2. The 1-hour substitution for the fire resistance of exterior walls shall not be permitted.
e. Not less than the fire-resistance rating required by other sections of this code.
f. Not less than the fire-resistance rating based on fire separation distance (see Table 602).
g. Not less than the fire-resistance rating as referenced in Section 704.10
h. The requirements of this table for roof construction are not applicable to above deck components. For construction Types I and II, the materials used in above deck components shall meet the requirements of Section 603.1.

Reason: Table 601 contains footnote b which states, "Except in Group F-1, H, M and S-1 occupancies, fire protection of structural members shall not be required, including protection of roof framing and decking where every part of the roof construction or more above any floor immediately below. Fire-retardant-treated wood members shall be allowed to be used for such unprotected members." This footnote is referenced for all Types (I through V) of roof construction where a rated assembly is required. In many cases this footnote is being interpreted as meaning that fire-retardant-treated wood is required whenever wood is used in a roof assembly that requires an hourly rating.
A typical roofing assembly contains the components shown below:



The roof deck is typically steel, concrete or wood. On top of the roof deck is a layer of insulation, in may cases a coverboard and them a waterproofing system. The waterproofing system may be a asphalt/gravel system as shown above, a single ply roof membrane, or for steeper slope applications shingles or tile. The current footnote b references structural members, components installed above the roof deck are not structural, they are supported by the structure.

Insulation suppliers to the roofing industry manufacture a nailable insulation product (see included Atlas Nailbase Datasheet). This product consists of foam plastic insulation with a layer of wood (OSB, Plywood, or fire-retardant-treated wood) laminated to it, thus combining two of the components shown above (insulation and fiberboard) into one product This product is installed on top of the roof deck and is used as the nailable substrate for various roofing materials such as shingles, shakes and tile.

In many instances designers feel that footnote b of Table 601 requires that fire-retardant-treated wood be used as the nailable component of this product when a rated assembly is required. While this product can be made with fire-retardant-treated wood as the nailable component this unnecessarily increases the cost of construction.

The proposed footnote h would provide clarifying language while maintaining important fire safety requirements. For example, this footnote is no way removes the hourly rating requirements of the roof assembly. Hourly ratings can be achieved with OSB as the nailable substrate on this product. It also retains the requirement that the product meet the requirements of Section 603 COMBUSTIBLE MATERIALS IN TYPE I AND II CONSTRUCTION.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENNIS-G1-Table 601

G137–09/10
Table 602

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise table as follows:

TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR
EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE[a,e,i]

FIRE SEPARATION DISTANCE = x (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H[f]	OCCUPANCY GROUP F-1,M, S-1[g]	OCCUPANCY GROUP A, B, E, F-2, I, R[h], S-2[g], U[b,h]
X < 5[c]	All	3	2	1
5 ≤ X < 10	IA Others	3 2	2 1	1 1
10 ≤ X < 30	IA, IB, IIB, VB Others	2 1 1	1 0 1	1[d] 0 1[d]
X ≥ 30	All	0	0	0

For SI: 1 foot = 304.8 mm.

a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
b. For special requirements for Group U occupancies see Section 406.1.2
c. See Section 705.1.1 for party walls.
d. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
e. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.
f. For special requirements for Group H Occupancies, see Section 415.3.
g. For special requirements for Group S Occupancies, see Section 412.4.1.
h. Group R-3, and Group U when used as accessory to Group R-3, shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet or more.
i. When work is exempt from a permit as listed in Section 105.2, Item1, there are no requirements for wall and opening protection based on location on property.

Reason: Footnote h: The addition of this footnote is necessary to be consistent with footnote "f" in Table 705.8 and Section 406.1.2 Item #2. In accordance with Table 705.8, when an R-3 occupancy has a fire separation distance of 5 feet or greater, unprotected openings are unlimited. Consequently if the entire exterior wall area can consist of unprotected windows, the current Table 602 requirement for one hour exterior walls at 5 feet or greater should be exempted for an R-3 occupancy. Similarly in Section 406.1.2 Item #2, the exterior wall of a Group U occupancy used for storage of pleasure-type motor vehicles is not required to have a fire-resistance rating when the fire separation distance is 5 feet or more. Therefore to be consistent, a Group U structure accessory to Group R-3 should also be granted this allowance in Table 602.

Footnote i: The beginning of Section 105.2 states" Exemptions from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction." Addition of this footnote assures that small detached accessories such as tool sheds which are not over 120 square feet and are exempt from permit requirements do not become subject to requirements of Table 602.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: MAIEL-G1-TABLE 602

G138–09/10
Table 602

Proponent: Joe Holland or Dave Bueche, Hoover Treated Wood Products

Revise table as follows:

TABLE 602
FIRE-RESISTANCE RATING REQUIREMENTS FOR ECTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE[a, e]

FIRE SEPARATION DISTANCE = X (feet)	TYPE OF CONSTRUCTION	OCCUPANCY GROUP H[f]	OCCUPANCY GROUP F-1, M S-1[g]	OCCUPANCY GROUP A, B, E, F-2, I, R, S-2[g], U[b]
X < 5[c]	All	3	2	1
5 ≤ X <10	IA	3	2	1
	Others	2	1	1
10 ≤ X 30	IA, IB	2	1	1[c]
	IIB, IIIB, VB	1	0	0
	Others	1	1	1[c]
X ≤ 30	All	0	0	0

For SI: 1 foot = 304.8 mm.

a. Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
b. For special requirements for Group U occupancies, see Section 406.1.2.
c. See Section 706.1.1 for party walls.
d. Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
e. The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.
f. For special requirements for Group H occupancies, see Section 415.3.
g. For special requirements for Group S aircraft hangars, see Section 412.4.1.

Reason: The exterior wall fire resistance required in Table 601 is greater for Type IIIB than what is required for either Type IIB or VB. The interior fire resistance in Type IIIB construction is equivalent to Type IIB and Type VB and therefore should be allowed in the same category.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: HOLLAND-BUECHE-G6-T602.doc

G139–09/10
602.3

Proponent: Katherine Bang, representing self.

Revise as follows:

602.3 Type III. Type III construction is that type of construction in which the exterior walls are of solid, noncombustible materials and the interior building elements are of any material permitted by this code. ~~*Fire-retardant-treated wood* framing complying with Section 2303.2 shall be permitted within *exterior wall* assemblies of a 2-hour rating or less.~~

Exception: Ungrouted cells, fully enclosed within masonry construction, are permitted.

Reason: Type III construction was common in the past and referred almost exclusively to brick buildings. In recent years the brick has been replaced by concrete or CMU materials. In some parts of the country, the past building codes did not allow framed exterior wall construction for this type of building construction.

Table 503 allows significantly more floor area and height if a building is Type III construction. For instance, an apartment building can be 2 stories higher and 9000 SF larger if it is Type III-B construction in lieu of Type V-B construction.

The jurisdiction I work in has seen a large increase in Type III construction, but the exterior walls of these buildings are framed construction instead of concrete or CMU. The fire retardant diminishes the structural capacity of the wood and so there have been many appeals to not treat the wood. These appeal requests are routinely granted with only minimal additions to provide equivalent life safety.

The framed exterior walls have significant detailing problems at the intersection of the horizontal assemblies and the exterior walls. It is hard to maintain the fire rating of the exterior bearing wall with platform framing. Framed exterior walls should be categorized as Type II or Type V construction. This code change proposal is an effort to return to the original type of construction that was intended as Type III construction.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BANG-G1-602.3.DOC

G140–09/10
602.3, 602.4

Proponent: Jason Thompson, National Concrete Masonry Association (NCMA), representing Masonry Alliance for Codes and Standards (MACS)

Revise as follows:

602.3 Type III. Type III construction is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of any material permitted by this code. Fire-retardant-treated wood framing complying with Section 2303.2 shall be permitted within exterior wall assemblies ~~of~~ having not greater than a 2-hour fire-resistance rating ~~or less~~ where the exposed outer and inner faces of such walls are of noncombustible materials.

602.4 Type IV. Type IV construction (Heavy Timber, HT) is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of solid or laminated wood without concealed spaces. The details of Type IV construction shall comply with the provisions of this section. Fire-retardant-treated wood framing complying with Section 2303.2 shall be permitted within exterior wall assemblies ~~with~~ having not greater than a 2-hour fire-resistance rating ~~or less~~ where the exposed outer and inner faces of such walls are of noncombustible materials.

Reason: This code change adds to the provision for exterior walls using fire-retardant-treated wood framing in buildings of Types III and IV construction by requiring that the framing be covered on the outer and inner faces with noncombustible materials. This additional provision when fire-retardant-treated wood is used in exterior walls otherwise required to be constructed of noncombustible materials is taken from the 1997 ICBO Uniform Building Code (UBC) Section 503.4.3 Fire-Retardant-Treated Wood Framing. That section was the source for the justification in the IBC to allow fire-retardant-treated wood in these exterior wall assemblies where the fire-resistance rating did not exceed 2-hours.

A significant number of Type III construction buildings have taken advantage of this provision to allow the exterior wall to be framed of wood rather than constructed entirely of noncombustible materials, while also taking advantage of Section 1406.2.2. Section 1406.2.2 allows combustible exterior wall coverings to be installed on the exterior faces of these walls. That application does not meet the code intent for limiting the combustible materials in the exterior walls of Type III construction which is a basic fire safety component of that type of construction. Since the legacy code provision was used to justify the use of fire-retardant-treated wood, then the other requirements applicable thereto in that legacy code should also be incorporated into the IBC to achieve the intended level of fire safety.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THOMPSON-G5-602.3

G141–09/10
603.1

Proponent: Katherine Bang representing the City of Portland, Bureau of Development Services

Revise as follows:

603.1 Allowable Materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. Fire retardant wood shall be permitted in:
   - 1.1. Nonbearing partitions where the required fire-resistive reating is 2 hours or less.
   - 1.2. Nonbearing exterior walls where no fire rating is required.
   - 1.3. Exterior walls required to be fire-resistance rated where fire blocking is used in concealed spaces occurring at the intersection of the exterior wall and each floor and roof assembly.
   - 1.4. Roof construction, including girders, trusses, framing and decking.

Exception. In buildings of Type IA construction exceeding two stories above grade plane, fire-retardant-treated wood is not permitted in roof construction when the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).

2. through 25. (No change to current text)

Reason: This revision eliminates a conflict in the model code that is created by another proposed revision to Section 705.5. This revision is necessary if the other revision is to be adopted since the model building code does not allow combustible blocking in fire-resistive exterior walls of non-combustible construction.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: For the first 2 printings of the 2009 IBC, Item 1 of Section 603.1 was shown as Item 25.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BANG-G2-603.1.DOC

G142–09/10
Table 601, 603.1

Proponent: Joe Holland or Dave Bueche, Hoover Treated Wood Products

Revise as follows:

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* shall be permitted in:

1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less.
1.2. Nonbearing *exterior walls* where no fire rating is required.
1.3. Roof construction, including girders, trusses, framing and decking.
1.4. Floor construction where the required *fire-resistance rating* is 1-hour or less including girders, trusses, framing and sheathing.

Exception: In buildings of Type IA construction exceeding two stories above grade plane, fire-retardant-treated wood is not permitted in roof construction when the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).

2. through 25. (No change to current text)

TABLE 601
FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS (hours)

	TYPE I		TYPE II		TYPE III		TYPE IV	TYPE V	
BUILDING ELEMENT	A	B	A[d]	B	A[d]	B	HT	A[d]	B
Floor construction and secondary members (see Section 202)	2	2	1[c]	0[c]	1[c]	0	HT	1[c]	0
Roof construction and secondary members (see Section 202)	1 ½ [b]	1 [b,c]	1 [b,c]	0[c]	1 [b,c]	0	HT	1 [b,c]	0

c. In all occupancies, heavy timber shall be allowed where a 1-hour or less fire-resistance rating is required.

(Portions of table and notes not shown remain unchanged)

Reason: Whether a material is combustible or noncombustible should be a secondary consideration in building construction. Of primary importance is how it will behave structurally and how it will perform in a fire. In some instances, the code currently requires noncombustible materials. The code requires the material be protected or no protection. Although FRTW and heavy timber are combustible materials they offer protection against fire: FRTW because it has been pressure treated to modify how it responds to fire. Both noncombustible materials and FRTW reduce fire spread. Heavy timber offers protection because of the required minimum sizes. In an exposed unprotected fire scenario wood can actually remain in place supporting design loads longer than some noncombustible materials.

In rated construction, both noncombustible materials and combustibles are tested using the same ASTM Standard, E119. A fire rating is not material specific. Therefore, the expectation is whether noncombustible or fire-retardant-treated wood, protected or unprotected, the response of the assembly to fire is equivalent

Cost Impact: The code change proposal will not increase the cost of construction.

Staff Note: In the first 2 editions of the 2009 IBC, Item 1 of Section 603.1 was shown as Item 25.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOLLAND-BUECHE-G5-603.1-2

G143–09/10
603.1

Proponent: Joe Holland and Dave Bueche, Hoover Treated Wood Products

Revise as follows:

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. Fire-retardant-treated wood shall be permitted in:
   - 1.1. Nonbearing partitions where the required fire-resistance rating is 2 hours or less.
   - 1.2. Nonbearing exterior walls where no fire rating is required.
   - 1.3. Roof construction, including girders, trusses, framing and decking.
   - 1.4. Blocking such as for handrails, millwork, cabinets and window and door frames.

   Exception: In buildings of Type IA construction exceeding two stories above grade plane, fire-retardant-treated wood is not permitted in roof construction when the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).

2. through 13. (No change to current text)
~~14. Blocking such as for handrails, millwork, cabinets and window and door frames.~~
15. through 25. (No change to current text)

Reason: The primary members of partitions in Type I and Type II construction must be noncombustible or fire-retardant-treated wood. To allow untreated wood in the partitions for blocking is inconsistent with Type I and Type II construction. In some cases it can be flush mounted exposed with the wallboard behind cabinets or millwork. It certainly is not prudent. Two of the three legacy codes did not allow.

Cost Impact: The code change proposal will increase the cost of construction.

Staff Note: In the first 2 editions of the 2009 IBC, Item 1 of Section 603.1 was shown as Item 25.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOLLAND-BUECHE-G4-603.1

G144–09/10
1202, 1203.2.2 (New)

Proponent: Joseph Lstiburek, Building Science Corporation, representing self

Add new text as follows:

1202.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

AIR-IMPERMEABLE INSULATION. An insulation having an air permeance equal to or less than 0.02 l/s-m^2 at 75 pa pressure differential tested according to ASTM E 2178 or E 283.

1203.2.2 Unvented attic and unvented enclosed rafter assemblies. Unvented attic assemblies (spaces between the ceiling joists of the top story and the roof rafters) and unvented enclosed rafter assemblies (spaces between ceilings that are applied directly to the underside of roof framing members/rafters and the structural roof sheathing at the top of the roof framing members/rafters) shall be permitted where all of the following are met:

1. The unvented attic space is completely within the building thermal barrier.
2. No interior Class I vapor retarders are installed on the ceiling side (attic floor) of the unvented attic assembly or on the ceiling side of the unvented enclosed rafter assembly.
3. Where wood shingles or shakes are used, a minimum 1/4 inch (6 mm) vented air space separates the shingles or shakes and the roofing underlayment above the structural sheathing.
4. In climate zones 5, 6, 7 and 8 as specified in the *International Energy Conservation Code*, any air-impermeable insulation shall be a Class II vapor retarder, or shall have a Class II vapor retarder coating or covering in direct contact with the underside of the insulation.
5. Either items 5.1, 5.2 or 5.3 shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing.
   5.1. Air-impermeable insulation only. Insulation shall be applied in direct contact with the underside of the structural roof sheathing.
   5.2. Air-permeable insulation only. In addition to the air-permeable insulation installed directly below the structural sheathing, rigid board or sheet insulation shall be installed directly above the structural roof sheathing as specified in Table 1203.2.2 for condensation control.
   5.3. Air-impermeable and air-permeable insulation. The air-impermeable insulation shall be applied in direct contact with the underside of the structural roof sheathing as specified in Table 1203.2.2 for condensation control. The air-permeable insulation shall be installed directly under the air-impermeable insulation.
6. Where preformed insulation board is used as the air-impermeable insulation layer, it shall be sealed with tape, caulking, foam sealant or equivalent material at the inner most perimeter of each individual sheet interior surface to form a continuous layer.
7. This section does not apply in climate zones 5 or higher for special use structures or enclosures such as swimming pool enclosures, data processing centers, hospitals, or art galleries, where the structure or enclosure is humidified beyond 35 percent during the three coldest months.

TABLE 1203.2.2
INSULATION FOR CONDENSATION CONTROL

CLIMATE ZONE	MINIMUM RIGID BOARD ON AIR-IMPERMEABLE INSULATION R-VALUE[a, b]
2B and 3B - tile roof only	0 (none required)
1, 2A, 2B, 3A, 3B, 3C	R-5
4C	R-10
4A, 4B	R-15
5	R-20
6	R-25
7	R-30
8	R-35

a. Contributes to, but does not supersede, thermal resistance requirements for attic and roof assemblies.
b. Alternatively, sufficient rigid board or sheet insulation shall be installed directly above the structural roof sheathing to maintain the monthly average temperature of the underside of the structural roof sheathing above 45 degrees F (7 degrees C). For calculation purposes, an interior air temperature of 68 degrees F (20 degrees C) is assumed and the exterior air temperature is assumed to be the monthly average outside air temperature of the three coldest months.

Reason: Unvented roof assemblies - both attic and cathedral ceiling - are a proven technology. They give the designer significant flexibility in locating mechanical equipment and ductwork inside of conditioned spaces thereby saving energy. They significantly improve the air tightness of the building enclosure thereby saving energy. They reduce wind uplift forces and reduce the risk of wildfire damage. They eliminate the problems associated with wind driven rain entering roof vents during hurricanes. The language in this proposed section is modeled on the existing language in the IRC Section 806.4.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: LSTIBUREK-G1-1202 DEFINITION-Revised

G145–09/10
1203.2; IRC R806.2

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC GENERAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Lee Kranz representing Washington Association of Building Officials (WABO), Technical Code Development Committee

PART I – IBC GENERAL

Revise as follows:

1203.2 Attic Spaces. Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof framing members shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain and snow. Blocking and bridging shall be arranged so as not to interfere with the movement of air. A minimum of 1 inch of airspace shall be provided between the insulation and the roof sheathing. The net free ventilating area shall not be less than ~~1/300~~th 1/150th of the area of the space ventilated.

Exceptions:

1. The net free cross-ventilation area shall be permitted to be reduced to 1/300 provided that ~~with~~ at least 50 percent and not more than 80 percent of the required ventilating area is provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above the eave or cornice vents with the balance of the required ventilation provided by eave or cornice vents.
2. The net free cross-ventilation area shall be permitted to be reduced to 1/300 when Class I or II vapor barrier is installed on the warm-in-winter side of the ceiling.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R806.2 Minimum area. The total net free ventilating area shall not be less than $^{1}/_{150}$ of the area of the space ventilated. ~~except that reduction of the total area~~

Exceptions:

1. The net free-cross ventilation area shall be permitted to be reduced to $^{1}/_{300}$ ~~is permitted~~ provided that at least 50 percent and not more than 80 percent of the required ventilating area is provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above the eave or cornice vents with the balance of the required ventilation provided by eave or cornice vents.
2. ~~As an alternative,~~ The net free cross-ventilation area ~~may~~ shall be permitted to be reduced to $^{1}/_{300}$ when a Class I or II vapor barrier is installed on the warm-in-winter side of the ceiling.

Reason: IBC 1203.2. Current attic ventilation provisions do not address ventilation of low slopped or flat roof attics. It is appropriate to require more ventilation area (i.e. 1/150th) when 3' of vertical separation between the upper and lower vent areas is not possible. A reduction of required vent area (i.e. 1/300th) is appropriate when vertical separation of the vents is provided as natural convection provides additional air movement within the attic space. It is also appropriate to reduce the vent area when a vapor barrier is installed on the ceiling to reduce moisture transmission from the occupied space into the attic. This change also creates consistency with Section 806.2 of the 2009 IRC.

IRC R806.2. The current language found in IRC Section 806.2 includes two exceptions within the charging text. The proposal reformats the section to be consistent with the typical grammatical format found elsewhere in the codes. The change creates consistency with Section 1203.2 of the IBC.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KRANZ-G2-1203.2

G146–09/10
1203.2; IRC R806.1

Proponent: Ali M. Fattah, City of San Diego, San Diego Area Chapter ICC Code Committee

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC GENERAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

Revise as follows:

1203.2 Attic spaces. Where determined necessary by the building official due to atmospheric or climatic conditions, ~~Enclosed~~ enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof framing members shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain and snow. Blocking and bridging shall be arranged so as not to interfere with the movement of air. A minimum of 1 inch (25 mm) of airspace shall be provided between the insulation and the roof sheathing. The net free ventilating area shall not be less than 1/300 of the area of the space ventilated, with 50 percent of the required ventilating area provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above eave or cornice vents with the balance of the required ventilation provided by eave or cornice vents.

PART II – IRC BUILDING AND ENERGY

Revise as follows:

R806.1 Ventilation required. Where determined necessary by the building official due to atmospheric or climatic conditions, ~~Enclosed~~ enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain or snow. Ventilation openings shall have a least dimension of $^{1}/_{16}$ inch (1.6 mm) minimum and ¼ inch (6.4 mm) maximum. Ventilation openings having a least dimension larger than ¼ inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth, or similar material with openings having a least dimension of $^{1}/_{16}$ inch (1.6 mm) minimum and ¼ inch (6.4 mm) maximum. Openings in roof framing members shall conform to the requirements of Section R802.7.

Reason: The proposed code change deletes a current requirement. There are many conditions that can preclude providing attic ventilation where climactic conditions do not warrant attic ventilation, for example the installation of solar photovoltaics. Additionally, it is very impractical or not possible to ventilate occupied roof decks, low slope (flat) roofs or vaulted ceilings using rafters with drywall attached to directly to the underside of the solid combination rafter-ceiling joist. In many cases it is not possible to provide the 3 ft elevation difference between the high and low vents on low slope roofs and where low slope roofs include parapets and therefore no eave vents. The proposed change will not preclude applicants from providing attic ventilation to satisfy manufacturer's installation instructions for roof covering and therefore preserving the roof warranty. The language existed in the Uniform Building Code (Section 1505.3). That legacy building code was enforced in climates ranging from cold winter regions to hot desert regions in the southwest and had been in effect for more than 20 years. We are not aware of any moisture damage issues in attic spaces within jurisdictions that did not require attic ventilation, for example the City of San Diego and many surrounding jurisdictions.

This section can conflict with required one hour protection for projections such at eaves, as well as eave protection required by the International Wildland Urban interface Code.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING AND ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FATTAH-G2.doc

G147–09/10
1207.1, 1207.4 (New); IRC AK101.1, AK 104 (New)

Proponent: Louis Mraw, State of New Jersey, Department of Community Affairs

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC GENERAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

1. Revise as follows:

1207.1 Scope. This section shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent *dwelling units* or between *dwelling units* and adjacent public areas such as halls, *corridors*, *stairs* or service areas. Windows, doors, walls and roof/ceiling assemblies within buildings containing dwelling units that are exposed to aircraft noise shall provide air-borne sound insulation in accordance with Section 1207.4.

2. Add new section as follows:

1207.4 Aviation noise-resistant construction. Buildings subject to aircraft noise shall be constructed to provide noise level reduction according to the following:

1. Buildings exposed to a day-night average sound level of at least 65 dB but less than 70 dB shall be constructed to provide a 25 dB noise level reduction.
2. Buildings exposed to a day-night average sound level of at least 70 db but less than 75 dB shall be constructed to provide a 30 dB noise level reduction.
3. Buildings exposed to a day-night average sound level of at least 75 dB shall be constructed to provide a 35 dB noise level reduction.

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

AK101.1 Scope. This section shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent *dwelling units* or between *dwelling units* and adjacent public areas such as halls, *corridors*, *stairs* or service areas. Windows, doors, walls and roof ceiling assemblies within buildings containing dwelling units that are exposed to aircraft noise shall provide air-borne sound insulation in accordance with Section AK 104.1.

2. Add new section as follows:

SECTION AK104
AVIATION NOISE-RESISTANT CONSTRUCTION

AK104.1 Aviation noise-resistant construction. Buildings subject to aircraft noise shall be constructed to provide noise level reduction according to the following:

1. Buildings exposed to a day-night average sound level of at least 65 dB but less than 70 dB shall be constructed to provide a 25 dB noise level reduction.
2. Buildings exposed to a day-night average sound level of at least 70 db but less than 75 dB shall be constructed to provide a 30 dB noise level reduction.
3. Buildings exposed to a day-night average sound level of at least 75 dB shall be constructed to provide a 35 dB noise level reduction.

Reason: The U.S. Department of Navy and the United State Air Force have established land use compatibility standards for exposure to aviation noise. Noise levels in these areas are expressed in terms of "Day-Night Average Sound Level", which is abbreviated by "DNL". DNL is the average measure of all aircraft flights occurring in a 24-hour period. The land use compatibility standards state that residential uses are discouraged in 65-69 dB DNL zones and strongly discouraged in 70-74 dB DNL zones. This proposed code change establishes Noise Level Reduction (NLR) criteria for homes exposed to this type of aviation noise.

Typically, noise level reduction has been based on a single-number rating system (STC ratings), however, the use of STC ratings is inappropriate for transportation noises such as aircraft as stated in ASTM E413 section 4.1. It is for this reason we have chosen to provide this performance based criteria.

Cost Impact: The code change proposal will not increase the cost of construction. The proposed code change will increase the cost of construction in area located in the vicinity of airports and military installations.

PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MRAW-G1-1207.4

G148–09/10
1208.3

Proponent: Maureen Traxler, City of Seattle, WA, representing Washington Association of Building Officials Technical Code Development Committee

Revise as follows:

1208.3 Room area. Every dwelling unit shall have at least one room that shall have not less than 120 square feet (13.9 m^2) of net floor area. Other habitable rooms shall have a net floor area of not less than 70 square feet (6.5 m^2).

Exception: ~~Every kitchen~~ Kitchens in ~~a~~ one-and two-family ~~dwelling~~ dwellings ~~shall have not less than 50 square feet (4.64 m^2) of gross floor area~~.

Reason: Minimum room size is an amenity that, especially for kitchens, is not related to life safety or health. This proposal coordinates the IBC and IRC provisions for the minimum size of kitchens. While the IBC requires kitchens to be at least 50 square feet, the IRC has no minimum size. IRC Section R304.2 states:

"Other habitable rooms shall have a floor area of not less than 70 square feet (6.5 m2).
Exception: Kitchens."

IBC Section 1208.1 provides minimum maneuvering room in kitchens. It requires kitchens to have at least 3 feet of space between counter and appliances, and between counter fronts and walls.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TRAXLER-G2-1208.3

G149–09/10
1210.2

Proponent: Bruce D. Dimmig, representing the Arizona Building Officials

Revise as follows:

1210.2 Walls. Walls within 2 feet (610 mm) of service sinks, urinals and water closets shall have a smooth, hard, nonabsorbent surface, to a height of 4 feet (1219 mm) above the floor and except for structural elements, the materials used in such walls shall be of a type that is not adversely affected by moisture.

Exceptions:

1. *Dwelling units* and *sleeping units*.
2. Toilet rooms that are not accessible to the public and which have not more than one water closet.

Accessories such as grab bars, towel bars, paper dispensers and soap dishes, provided on or within walls, shall be installed and sealed to protect structural elements from moisture. For walls and partitions also see Section 2903.

Reason: The areas around service sinks are as susceptible to moisture as the urinals and water closets as splattering of water and other liquids is common place. Also, with the use of cleaning chemicals and other items that can and will be used at the service sinks makes the walls as subject to the effects experienced at the urinals and water closets.

Cost Impact: The code change proposal will have a minimal effect on the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DIMMIG-G1-1210.2

G150–09/10
1210.1.1 (New)

Proponent: Timothy Kyle Hantz, PE, General Services Administration, representing self

Add new text as follows:

1210.1.1 Diaper changing station. In assembly occupancies where a toilet room has two or more water closets, a diaper changing station shall be provided in the toilet room. Diaper changing stations shall comply with the work surface requirements of ICC A117.1.

Reason: IBC 101. 3 states that the intent of the code is to provide minimum standards for public health, safety and general welfare. I have noticed diaper changing stations in restaurants, trains, airports, convention centers, etc. It is hard to believe that in 2009, we still have to change our children's diapers on a toilet room floor. This is very unsanitary for the baby and the changer. This proposal would also help people who have trouble bending over, or getting on their hands and knees to change diapers.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: The Code Correlation Committee approved an editorial combining of Sections 1210 and 2903 of the 2009 IBC into a single section 1210 on Toilet and Bathroom requirements. This proposal, if approved would be located as Section 1210.1.1 of the new combined section.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HANTZ-G1-1211.1.DOC

G151–09/10
2703 (New)

Proponent: John England, MCO, England Enterprises Inc., representing Cities of Beaufort, Hardeeville SC

Add new section as follows:

SECTION 2703
EMERGENCY DISCONNECT OF POWER

2703.1 Emergency disconnect of power. All buildings shall be provided with a means of disconnecting electrical power from the building by emergency personnel without requiring entry into the building. Metering devices and disconnecting means by utility companies are not considered a means of disconnect. The building official or fire code official have the discretion of waiving this requirement with just cause.

2703.2 Emergency and standby power. Emergency and standby power generation systems shall have a means of disconnecting power by emergency personnel without requiring entry into the building.

Reason: Emergency (fire) personal have requested external disconnecting means on building for years.—the building, fire, or electrical code have not required it. Since fighting fires in building with electrical systems on is an ever growing danger to the fire department, they should have the option of cutting the power to the building. This can be done with disconnects or shut trip breakers.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENGLAND-G6-2703.doc

G152–09/10
3001.2, Chapter 35

Proponent: Victor D. Azzi, PhD, PE, Consulting Engineer, representing the Lift Manufacturers Product Section (LMPS), a division of the Material Handling Industry of America (MHIA)

1. Revise as follows:

3001.2 Referenced standards. Except as otherwise provided for in this code, the design, construction, installation, alteration, repair and maintenance of elevators and conveying systems and their components shall conform to ASME A17.l/CSA B44, ASME A90.l, ASME B20.1, ANSI MH29.1, ALI ALCTV, and ASCE 24 for construction in flood hazard areas established in Section 1612.3.

2. Add standard to Chapter 35 as follows:

ANSI
MH29.1-2003 Safety Requirements for Industrial Scissors Lifts

Reason: The proposed addition to Section 3001 is intended to add industrial scissors lifts, a common and industry-wide accepted vertical conveyance used in buildings since the early 1950's. This addition will help avoid the possibility of confusion by using the appropriate standard to define these types of lifting devises.

As one example of the confusion that currently exists, the Minnesota State Building Code follows the 2006 IBC A City of Minneapolis building inspector in March 2008 was inspecting a new installation of a scissor- type dock lift. The only referenced standard in IBC Chapter 30 (Elevators and Conveying Systems) that seemed to be applicable was ASME B20.1, so he applied that standard. The other referenced standards in IBC 3001.2 were elevators (A17.1), belt manlifts (A90.1), and automotive lifts (ALI ALCTV). The inspector rationalized that because the Minnesota state building code does not recognize industrial scissor lifts they are prohibited unless the manufacturer could show that they meet the intended safety requirements of the code he chose for the conveyance. The IBC is the minimum requirement for safety in that state. In order to gain approval, the manufacturer's scissors lift must meet or exceed the level of safety that was intended for a completely different devise - a conveyor as defined and regulated by ASME B20.1.

ANSI MH29.1 is a stand alone, nationally accepted ANSI standard. It is the only standard that applies to industrial scissors lifts in exactly the same way that ASME H20.I applies to conveyors, AI7.I applies to elevators, A90.I applies to belt manlifts, or ALI ALCTV applies to automotive lifts.


• Scissors lift in 3-sided pit at loading dock # I


• Scissors lift in 3-sided pit at loading dock # 2


• Scissors lift in front of loading dock


• Two scissors lifts at a loading dock

Cost Impact: This addition to the code will not increase the cost of construction

Analysis: A review of the standard proposed for inclusion in the code, ANSI-MH29.1, for compliance with ICC criteria for referenced standard given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: AZZI-G1-3001.2.doc

G153–09/10
3001.2.1 (New); IFC 607.4 (New); IPMC 606.1

Proponent: Philip M. Chandler representing New York State, Department of State, Office of Fire Prevention & Control.

THIS IS A 3 PART CODE CHANGE. ALL PARTS WILL BE HEARD BY THE IBC GENERAL CODE COMMITTEE AS 3 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE GENERAL CODE COMMITTEE.

PART I – IBC GENERAL

Add new text as follows:

3001.2 Referenced standards. Except as otherwise provided for in this code, the design, construction, installation, *alteration*, repair and maintenance of elevators and conveying systems and their components shall conform to ASME A17.1/CSA B44, ASME A90.1, ASME B20.1, ALI ALCTV, and ASCE 24 for construction in flood hazard areas established in Section 1612.3.

3001.2.1 Certificate of inspection. The most current certificate of inspection shall be on display at all times within the elevator or attached to the escalator or dumbwaiter, be available for public inspection in the office of the building *operator* or be posted in a publicly conspicuous location *approved* by the *building official*. The inspection and witnessing of tests required by ASME A17.1 shall be performed by an impartial, third-party inspector that meets the minimum qualifications as set forth in the referenced standard. The inspection and tests shall be performed at not less than the periodic intervals listed in ASME A17.1, Appendix N, except where otherwise specified by the authority having jurisdiction.

PART II – IFC

Add new text as follows:

607.4 Maintenance. Elevators, dumbwaiters and escalators shall be maintained in compliance with ASME A17.1. The most current certificate of inspection shall be on display at all times within the elevator or attached to the escalator or dumbwaiter, be available for public inspection in the office of the building *operator* or be posted in a publicly conspicuous location *approved* by the *code official*. The inspection and witnessing of tests required by ASME A17.1 shall be performed by an impartial, third-party inspector that meets the minimum qualifications as set forth in the referenced standard. The inspection and tests shall be performed at not less than the periodic intervals listed in ASME A17.1, Appendix N, except where otherwise specified by the authority having jurisdiction.

PART III – IPMC

Revise as follows:

606.1 General. Elevators, dumbwaiters and escalators shall be maintained in compliance with ASME A17.1. The most current certificate of inspection shall be on display at all times within the elevator or attached to the escalator or dumbwaiter, be available for public inspection in the office of the building *operator* or be posted in a publicly conspicuous location *approved* by the *code official*. The inspection and witnessing of tests required by ASME A17.1 shall be performed by an impartial, third-party inspector that meets the minimum qualifications as set forth in the referenced standard. The inspection and tests shall be performed at not less than the periodic intervals listed in ASME A17.1, Appendix N, except where otherwise specified by the authority having jurisdiction.

Reason: These three companion proposals will provide consistent provisions in the IBC, IFC and IPMC regarding elevator inspection and posting the appropriate certificate.

IBC Section 3001.2: As 3001.2 pertains to maintenance as well as to design, construction and installation, it is appropriate to use the same language found in IPMC here. Additionally, it is helpful to reiterate the qualifications needed by elevator inspectors and the importance of their impartiality.

IFC Section 607.4: Elevators, dumbwaiters and escalators have a significant impact on a building's overall fire safety. Accordingly, this new text will coordinate IFC requirements with those of the IBC and IPMC and at the same time, reiterate the qualifications needed by elevator inspectors and the importance of their impartiality.

IPMC Section 606.1: This eliminates much confusion surrounding the minimum qualifications of elevator inspectors explicit in the referenced standard and the need for impartiality implicit in the requirements for QEI-1certification. The need for impartiality is fundamental to the QEI process.

Cost Impact: The code change proposal will not increase the cost of construction

PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – IPMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CHANDLER-G1-3001.2.1.doc

G154–09/10
3002.3

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry, Inc. (NEII)

Revise as follows:

3002.3 Emergency signs. An approved pictorial sign of a standardized design shall be posted adjacent to each elevator call station on all floors instructing occupants to use the exit stairways and not to use the elevators in case of fire. The sign shall ~~read: IN FIRE EMERGENCY, DO NOT USE ELEVATOR. USE EXIT STAIRS~~ comply with ASME A17.1/CSA B44.

Exceptions:

1. The emergency sign shall not be required for elevators that are part of an *accessible means of egress* complying with Section 1007.4.
2. The emergency sign shall not be required for elevators that are used for occupant self-evacuation in accordance with Section 3008.

Reason: The message for these elevator signs is already addressed in the referenced standard:

ASME A17,1/CSA B44, Section 2.27.9 Elevator Corridor Call Station Pictograph. When the building code requires a sign be posted adjacent to hall call fixtures instructing occupants not to use the elevator in case of fire, the sign shown in Fig. 2.27.9 shall be provided. The sign shall include only the wording and graphics shown in Fig. 2.27.9. When the building code specifies a different design, 2.27.9 shall not apply.

(The Figure 2.27.9 uses the text “IN CASE OF FIRE ELEVATORS ARE OUT OF SERVICE. USE EXIT”.)

ASME A17,1/CSA B44 already provides the “standardized design” required by IBC Section 3002.3 but provides non-standardized text to accompany the pictograph. This is essentially a harmonization between the IBC requirement and the code referenced in 3001.2.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BLACK-G2-3002.3.doc

G155–09/10
3003.3 (New), 3007.3

Proponent: Dave Frable, U.S. General Services Administration

Revise as follows:

3003. 3 Hoistway lighting. When firefighters' emergency operation is active, the entire height of the hoistway shall be illuminated at not less than 1 foot-candle (11 lux) as measured from the top of the car of each elevator.

~~**3007.3 Hoistway lighting.** When firefighters' emergency operation is active, the entire height of the hoistway shall be illuminated at not less than 1 foot-candle (11 lux) as measured from the top of the car of each fire service access elevator.~~

(Renumber subsequent sections)

Reason: The intent of this code change is to provide illumination within elevator hoistways when firefighter's emergency operation has been enabled. It relocates the provisions currently only applicable to fire service access elevators applicable to high-rise buildings, to be a requirement for all elevator hoistways regardless of height or whether the elevator is designated for a specific use or not.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FRABLE-G3-3003.3

G156–09/10
3003.3 (New)

Proponent: Dave Frable, U.S. General Services Administration

Add new text as follows:

3003.3 Elevator identification. Each elevator shall be individually marked with an approved identification at each elevator landing and elevator control operating panel.

Reason: The intent of this code change is to provide a means for each elevator to be indentified consistently throughout the building.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FRABLE-G5-3003.4

G157–09/10
3007.1. 3007.1.1(New)

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry, Inc. (NEII); Sean DeCrane, representing International Association of Fire Fighters (IAFF); Jack Murphy, representing Fire Safety Directors of Greater New York (FSDAGNY)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3007.1 General. Where required by Section 403.6.1, every floor of the building shall be served by ~~a~~ fire service access ~~elevator~~ elevators. Except as modified in ~~this section, the~~ Sections 3007.1 through 3007.7, fire service access ~~elevator~~ elevators shall be installed in accordance with this chapter and ASME A17.1/CSA B44.

3007.1.1. Ambulance stretcher. Each fire service access elevator shall be sized to accommodate a stretcher in conformance with Section 3002.4.

Reason: A fire service access elevator has to be large enough to accommodate firefighters and their equipment as they ascend to a fire floor and also be large enough to accommodate injured building occupants or persons with disabilities being evacuated from the building. This proposal simply correlates with the existing requirement in Section 3002.4 to provide a 3500+ lb elevator car in buildings four or more stories above/below grade plane that can accommodate a stretcher, ensuring that this car, which may be larger than the other elevators in the building, will also be the fire service access elevator.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BLACK-G6-3007.1.doc

G158–09/10
3007.2 (New), 3007.3 (New)

Proponent: Dave Frable, U.S. General Services Administration

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3007.2 Automatic sprinkler system. The building shall be equipped throughout by an automatic sprinkler system in accordance with Section 903.3.1.1, except as otherwise permitted by Section 903.3.1.1.1 and as prohibited by Section 3007.2.1.

3007.2.1 Prohibited locations. Automatic sprinklers shall not be installed in elevator machine rooms, elevator machine spaces, and elevator hoistways of fire service access elevators.

3007.2.2 Sprinkler system monitoring. The sprinkler system shall have a sprinkler control valve supervisory switch and waterflow-initiating device provided for each floor that is monitored by the building's fire alarm system.

3007.3 Shunt trip. Means for elevator shutdown in accordance with Section 3006.5 shall not be installed on elevator systems used for fire service access elevators.

(Renumber subsequent sections)

Reason: 3007.2: The intent of this code change is to provide further clarification in meeting the original intent of Section 3007 regarding prohibiting the installation of automatic sprinklers in the associated elevator machine rooms and elevator machine spaces for fire service access elevators. . The subject proposed language is similar to the language in Section 3008.6 for occupant evacuation elevators.

3007.3: The intent of this code change is to provide further clarification in meeting the original intent of Section 3007 regarding prohibiting the installation of shunt trip for fire service access elevators. The subject proposed language is similar to the language in Section 3008.8 for occupant evacuation elevators.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Would this requirement take precedence over Sections 403.2 and 903.2.11.3 which allow certain portions of a high-rise building not to be provided with sprinkler protection?

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FRABLE-G9-3007.2

G159–09/10
3007.2 (New)

Proponent: Dave Frable, U.S. General Services Administration

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3007.2 Phase I Emergency recall operation. An independent, three-position, key-operated "Fire Recall" switch shall be provided at the designated level for each fire service access elevator or for each group of fire service access elevators in accordance with the requirements in ASME A17.1/CSA B44. In addition, actuation of any building fire alarm initiating device shall initiate Phase I emergency recall operation on all fire service access elevators in accordance with the requirements in ASME A17.1/CSA B44. All other elevators shall remain in normal service unless Phase I emergency recall operation is manually initiated by a separate, required three-position key-operated "Fire Recall" switch or automatically initiated by the associated elevator lobby and elevator machine room smoke detectors.

(Renumber subsequent sections)

Reason: The intent of this code change is to provide further clarification in meeting the original intent regarding the design and operation of fire service access elevators. This code change will also ensure the subject elevators can be recalled quickly at the designated level by the responding firefighters.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FRABLE-G7-3007.2

G160–09/10
3007.2, 3007.2.1(New)

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing: California Fire Safety Advisory Council (CFSAC)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3007.2 Hoistway enclosures protection. The fire service access elevator hoistway shall be located in a shaft enclosure complying with Section 708.

3007.2.1 Structural integrity of hoistway enclosures. The fire service access elevator hoistway shaft enclosure shall comply with Section 403.2.3.

Reason: This proposed code change is a follow up to the Cal Chiefs Code Change G194-07/08 which was disapproved in Minneapolis.

That code change was disapproved mainly because it was based on a reference to the hose stream test in ASTM E119 for determining the structural integrity of the shaft enclosure. However, Code Change G65-07/08 by the Gypsum Association, which also addressed the issue of structural integrity of exit stairway and elevator hoistway shaft enclosures, was approved as modified in Minneapolis by Public Comment #2. That code change provided for another means for assessing the structural integrity of shaft enclosures, specifically for buildings known as super high-rise buildings (those greater than 420 ft in height). And it was supported by a NIST representative in response to one of the recommendations made in the NIST World Trade Center Report. Since it was approved for those conditions, it also seems appropriate that such structural integrity criteria should also be provided for the protection of fire service access elevator hoistways. These hoistways perform a very critical function protecting the responding fire fighters while the elevator assists them in gaining access to the fire floor in buildings generally more than 120 ft in height.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: Does the reference to Section 403.2.3 in the proposal result in requiring 'hardening' of the hoistway shaft at the 120 foot threshold for fire service access elevators or the 420 foot threshold provided in Section 403.2.3?

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THORNBERRY-G3-3007.2

G161–09/10
3007.3 (New)

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry, Inc. (NEII); Sean DeCrane, representing International Association of Fire Fighters (IAFF); Jack Murphy, representing Fire Safety Directors of Greater New York (FSDAGNY)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3007.3 Pressurization system. Hoistways for fire service access elevators and fire service access elevator lobbies required to be enclosed in accordance with 3007.4.2 shall be pressurized in accordance with Section 708.14.2.

(Renumber subsequent sections)

Reason: The Fire Service Access Elevators (FSAE) need to be protected from smoke entering either the hoistway directly or through the lobby or stair system that adjoins the FSAE. The current requirements for a Fire Service Access Elevator include elevator lobbies constructed as smoke barriers; however the Hazard Analysis done by the ASME Task Group on Use of Elevators by Firefighters determined that providing lobbies alone that are not pressurized is insufficient due to the likelihood that the lobby and stairwell doors would be open continuously to permit firefighting operations.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BLACK-G7-3007.3.doc

G162–09/10
3007.4 (New)

Proponent: Dave Frable, U.S. General Services Administration

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3007.4 Water protection. An *approved* method to prevent water from infiltrating into the hoistway enclosure from the operation of the automatic sprinkler system outside the enclosed fire service access elevator lobby shall be provided.

(Renumber subsequent sections)

Reason: The intent of this code change is to provide performance language that will permit alternate design options to provide a means to prevent water from an operating sprinkler system from infiltrating into the hoistway enclosure. For example, such approved means could include: drains, sloping floor, etc. The subject proposed language is similar to the proposed language in Section 3008.10 for occupant evacuation elevators.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FRABLE-G10-3007.4

G163–09/10
3007.4.2

Proponent: Dave Frable, U.S. General Services Administration

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3007.4.2 Lobby enclosure. The fire service access elevator lobby shall be enclosed with a *smoke barrier* having a minimum 1-hour *fire-resistance rating*, except that lobby doorways shall comply with Section 3007.4.3.

Exception: Enclosed fire service access elevator lobbies are not required at the levels of exit discharge ~~street floor~~.

Reason: The intent of this code change is to only replace the undefined term “street floor” with the defined term “level of exit discharge”. The subject text is similar to the wording in the requirement in Section 3008.11.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FRABLE-G4-3007.4.2

G164–09/10
3007.5.1 (New)

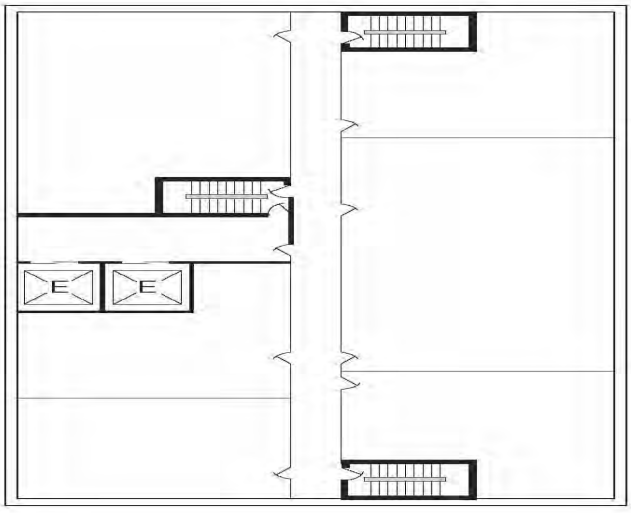
Proponent: Richard Bukowski, PE, FSFPE, Rolf Jensen & Associates, representing self

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3007.5.1 Access. The *exit enclosure* containing the standpipe shall have access to the floor without passing through the fire service access elevator lobby.

Reason: Access from the exit enclosure containing the standpipe to the floor is necessary so that the fire department can advance their attack hose onto the fire floor without opening the door between the lobby and the floor which could permit smoke contamination of the lobby and cause recall of the elevator(s). This access to the floor could be direct or through an access corridor or vestibule between the elevator lobby and the exit enclosure as long as there is a smoke barrier enclosing the elevator lobby.



Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BUKOWSKI-G1-3007.5.1.doc

G165–09/10
3007.7.1, 3008.15.1

Proponent: Brian Black BDBlack Codes, Inc., representing National Elevator Industry, Inc. (NEII); Sean DeCrane, representing, International Association of Fire Fighters (IAFF); Jack Murphy, representing Fire Safety Directors Association of Greater New York (FSDAGNY)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3007.7.1 Protection of wiring or cables. Wires or cables that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to fire service access elevators shall be protected by construction having a minimum ~~1~~ 2-hour fire-resistance rating or shall be circuit integrity cable having a minimum ~~1~~ 2-hour fire resistance rating.

3008.15.1 Protection of wiring or cables. Wires or cables that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to fire service access elevators shall be protected by construction having a minimum ~~1~~ 2-hour fire-resistance rating or shall be circuit integrity cable having a minimum ~~1~~ 2-hour fire resistance rating.

Reason: RE: 3007.7.1: The safety of firefighters during their firefighting operations is dependent upon the life safety support systems listed in Section 3007 being maintained during the critical first 2 hours of their efforts. Locating, surrounding, confining and extinguishing the fire, as well as removing those whose lives are in jeopardy, will take time. If the fire is not under control by 2 hours into the effort, then it is probably time to evacuate. Providing the 2 hour protection will provide the necessary safety factor for firefighters to undertake the firefighting and rescue operations without increased concern for system failure. The 2-hour rating is consistent with the hoistway fire rating and fire pump feeder enclosure rating. This request has the full support of the firefighting community and is not unreasonable when it is considered that this will allow for more time to ensure the full evacuation of the building.

RE: 3008.15.1: The safety of building occupants evacuating a building is dependent upon the life safety support systems listed in Section 3008 being maintained during the critical hours of evacuation. The 2-hour rating is consistent with the hoistway fire rating and fire pump feeder enclosure rating. This request has the full support of the firefighting community and is not unreasonable when it is considered that this will allow for more time to ensure the full evacuation of a building.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BLACK-G8-10-3008.15.1.doc

G166–09/10
3007.7.1, 3008.15.1

Proponent: Brian Black BDBlack Codes, Inc., representing National Elevator Industry, Inc. (NEII); Sean DeCrane, representing, International Association of Fire Fighters (IAFF); Jack Murphy, representing Fire Safety Directors Association of Greater New York (FSDAGNY)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3007.7.1 Protection of wiring or cables. Wires or cables that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to fire service access elevators shall be protected by construction having a minimum 1-hour fire-resistance rating or shall be circuit integrity cable having a minimum 1-hour fire resistance rating.

Exception: Wiring and cables to control signals are not required to be protected provided that wiring and cables do not serve Phase II emergency in-car operation.

3008.15.1 Protection of wiring or cables. Wires or cables that provide normal or standby power, control signals, communication with the car, lighting, heating, air conditioning, ventilation and fire-detecting systems to fire service access elevators shall be protected by construction having a minimum 1-hour fire-resistance rating or shall be circuit integrity cable having a minimum 1-hour fire resistance rating.

Exception: Wiring and cables to control signals are not required to be protected provided that wiring and cables do not serve Phase II emergency in-car operation.

Reason: The safety of building occupants evacuating a building is dependent upon the life safety support systems listed in Sections 3007 and 3008 being maintained during the critical hours of evacuation. Elevator landing fixtures that provide control signals such as hall call buttons and hall lanterns do not require a 1-hour fire resistance rating to ensure the viability of the system and protection of firefighters using the fire service access elevator during Phase II operation. The industry generally does not submit fixtures for testing to obtain a fire-resistance rating.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BLACK-G9-11-3007.7.1

G167–09/10
3007.8 (New)

Proponent: Dave Frable, U.S. General Services Administration

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3007.8 Fire service access elevator symbol. A pictorial symbol of a standardized design designating which elevators are fire service access elevators shall be installed on each side of the hoistway door frame on the portion of the frame at right angles to the fire service access elevator lobby. The fire service access elevator symbol shall be designed as shown in Figure 3007.8 and shall comply with the following:

1. The fire service access elevator symbol shall be a minimum of 3 inches (76 mm) in height.
2. The vertical center line of the fire service access elevator symbol shall be centered on the hoistway door frame. Each symbol shall not be less than 78 inches (1981 mm), and not more than 84 (2134 mm) inches above the finished floor at the threshold.

FIGURE 3007.8
FIRE SERVICE ACCESS ELEVATOR SYMBOL

Reason: The intent of this code change is to provide a means to designate which elevators in a building have been designated as fire service access elevators via a standardized pictorial symbol to be installed on each side of the door frame of each designated elevator. The subject symbol is based on the fire fighters hat referenced in ASME A17.1/CSA B44.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FRABLE-G1-3007.8

G168–09/10
3008.1, 3008.3 (New)

Proponent: Matthew Davy, P.E., Schirmer Engineering Corporation, representing self

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3008.1 General. Where elevators are to be used for occupant self-evacuation during fires, all passenger elevators for general public use shall comply with this section. Where other elevators are used for occupant self-evacuation, they shall also comply with ~~this section~~.Sections 3008.1 through 3008.16.

3008.1.1 Alternative compliance. Where approved by the building official, occupant evacuation elevators shall comply with ASME A17.1/CSA B44 and shall be permitted to comply with standards alternative to Sections 3008.4 through 3008.16 provided such alternative standards are supported by an approved engineering analysis.

3008.2 Fire safety and evacuation plans. (No change to current text)

3008.3 Engineering analysis. An engineering analysis shall be conducted and approved for an occupant evacuation elevator.

3008.3.1 Analysis. The engineering analysis of the occupant evacuation elevator shall include a risk analysis, hazard analysis, or equivalent analysis. The analysis shall consider, as a minimum, the items indicated in Sections 3008.4 through 3008.16.

3008.3.2 Construction documents. The engineering analysis supporting the occupant evacuation elevators, their method of operation, systems supporting them, and methods of construction to be used shall accompany the submitted construction documents.

(Renumber subsequent sections)

Reason: An engineering analysis must be required for occupant evacuation elevator systems. These systems have many dynamic components and human interface aspects, which need to be reviewed, analyzed, and documented prior to acceptance by the code official or authority having jurisdiction. Occupant evacuation elevator systems are a life safety system that demands a rigorous analysis, such as a risk analysis or hazard analysis, for each building configuration and occupancy. The documentation requirement is consistent with the analysis for smoke control systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVY-G1-3008.3

G169–09/10
3008.1.1 (New)

Proponent: Bill Ziegert, Smoke Guard, Inc.

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3008.1.1 Occupant evacuation elevators permitted. Occupant evacuation elevators shall be permitted only when the elevator code (ASME A17.1/CSA B44 or other) adopted by the jurisdiction contains specific requirements for the design, operation and maintenance of emergency evacuation operation (EEO).

Reason: Occupant Evacuation Elevators require many special operational / design requirements not found in the Building Code, and currently not included in any edition issued or under development of the ASME A17.1/CSA B44 Elevator Code. The proper operation and sequencing of the elevators to efficiently move occupants from the affected floors is the most important part of the occupant evacuation system and incorporation of this functionality currently allowed under the building code should not be allowed until the Elevator systems are designed with this additional functionality adequately addressed.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ZIEGERT-G2-3008.1.1

G170–09/10
3008.1

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing: California Fire Safety Advisory Council (CFSAC)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3008.1 General. Where elevators are to be used for occupant self-evacuation during fires, all passenger elevators for general public use shall comply with this section. Where other elevators are used for occupant self-evacuation, they shall also comply with this section. Also see Section 1003.7.

Reason: This code change provides a simple cross-reference to Section 1003.7 Elevators, Escalators, and Moving Walks in order to make sure the user of the code realizes that elevators are not allowed to be used as a component of a required means of egress from any other part of the building. Currently, this new technology utilizing elevators for occupant self-evacuation is still in its infancy. It needs to be further assessed by the voluntary use of occupant elevators for evacuation without reducing the current requirements for means of egress until such time as they have been proven to be safe, reliable, and effective. Therefore, this cross-reference reminder is important for the proper application of the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THORNBERRY-G4-3008.1

G171–09/10
3008.4 (New)

Proponent: Dave Frable, U.S. General Services Administration

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3008.4 Phase I Emergency recall operation. An independent, three-position, key-operated "Fire Recall" switch shall be provided at the designated level for each occupant evacuation elevator in accordance with the requirements in ASME A17.1/CSA B44.

(Renumber subsequent sections)

Reason: The intent of this code change is to provide further clarification in meeting the original intent regarding the design and operation of fire service access elevators. This code change will also ensure the subject (as specific) elevators can be recalled quickly at the designated level by the responding firefighters.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FRABLE-G8-3008.4

G172–09/10
3008.7 (New)

Proponent: Matthew Davy, P.E., Schirmer Engineering Corporation, representing self

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

3008.7 Activation. Occupant evacuation elevator systems shall be activated by any of the following:

1. The operation an automatic sprinkler system complying with Section 3008.6;
2. Smoke detectors required by another provision of the code; or required as an alternative standard complying with Section 3008.1.1.
3. Approved manual controls.

(Renumber subsequent sections)

Reason: The current occupant evacuation elevator requirements do not contain a means for system activation. This new section provides a minimum set of initiating devices to activate the automatic operation. An example of smoke detectors required by another section of this code includes smokeproof enclosures for the mechanical ventilation or stair pressurization alternative. An engineering analysis should be required for occupant evacuation elevators that includes a section on system activation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVY-G2-3008.7

G173–09/10
3008.9, 3008.9.1 (New)

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing: California Fire Safety Advisory Council (CFSAC)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3008.9 Hoistway enclosure protection. ~~The~~ Occupant evacuation elevator~~s~~ hoistways shall be located in ~~a hoistway~~ shaft enclosure~~(s)~~ complying with Section 708.

3008.9.1 Structural integrity of hoistway enclosures. Occupant evacuation elevator hoistway shaft enclosures shall comply with Section 403.2.3.

Reason: This code change is a follow up to Code Change G65-07/08 by the Gypsum Association which also addressed the issue of structural integrity of exit stairway and elevator hoistway shaft enclosures in super high-rise buildings (those greater than 420 ft in height). It was approved as revised by Public Comment #2 at the ICC Final Action Hearings held in Minneapolis, MN.

In our opinion, it follows that the structural integrity requirements for super high-rise building exit stairway and elevator hoistway shaft enclosures should also apply to elevator hoistway shaft enclosures provided for occupant evacuation elevators which are just as critical for life safety protection. Such new technology for evacuation of occupants should be provided with the highest level of fire protection that is reasonably possible in order to assure that the elevators will be available during a fire emergency to serve their intended purpose of evacuating the occupants. Certainly, the structural integrity of the elevator hoistway shaft enclosures should be required to have some reasonable degree of physical protection to assure that the hoistway shaft enclosures will remain in place when needed during a fire or other emergency.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THORNBERRY-G5-3008.9

G174–09/10
3008.10

Proponent: Dave Frable, U.S. General Services Administration

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3008.10 Water protection. ~~The occupant evacuation elevator hoistway shall be designed utilizing~~ An *approved* method to prevent water from infiltrating into the hoistway enclosure from the operation of the automatic sprinkler system ~~from infiltrating into the hoistway enclosure.~~ outside the enclosed occupant evacuation elevator lobby shall be provided.

Reason: The intent of this code change is to clarify the performance language in meeting the original intent of this section regarding providing a means to prevent water from an operating sprinkler system from infiltrating into the hoistway enclosure. The subject proposed language is similar to the proposed language in Section 3007.4 for fire service access elevators.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FRABLE-G2-3008.10

G175–09/10
3008.10.1 (New)

Proponent: Gregory J. Cahanin, Cahanin Fire & Code Consulting, representing the Smoke Safety Council

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3008.10 Water protection. The occupant evacuation elevator hoistway shall be designed utilizing an approved method to prevent water from the operation of the automatic sprinkler system from infiltrating into the hoistway enclosure.

3008.10.1. Water Intrusion. For elevators serving four or more stories in buildings equipped throughout with an automatic sprinkler system, hoistways and equipment shall be protected from the effects of water intrusion from openings into the hoistway. Protection shall comply with one of the following;

1. A 1 ½ inch raised threshold in front of the elevator opening with a slope of 2 percent or less;
2. Automatic dams or barriers that prevent the intrusion of water into the elevator shaft and are approved by the building official; or
3. Drains or grates across the elevator hoistway opening capable of removing water generated by a minimum of four fire sprinklers for the building.

Reason: This is a revised proposal from last cycle which generated multiple discussions on the actual design of solutions indicating that there is a problem with water intrusion and there needs to be a definitive requirement in the code. Proposals by others also addressed this issue for the new classifications of elevators. The committee suggested an exception for buildings or elevators serving 3 or few levels and it is carried over with revised and more specific requirements.

Water intrusion into the elevator hoistway damages the electrical equipment that operates the elevator and potentially traps emergency personnel and occupants in the process of egressing.

This change recognizes three primary methods of protecting the opening. First, raising the threshold by 1.5 inches will direct the water to other lower areas of the floor. Setting the benchmark at 1.5 inches above the surrounding areas make a subtle rise in the floor possible while meeting the slope requirements found in Section 1010 while helping to direct water away from the opening.

Second, there are several commercially available automatic dams or barriers that can stop water intrusion. The qualifier that the AHJ must accept these systems that now have no definitive testing criteria allows for development of newer methods.

Third, the design of floor drains at the entrance to elevator hoistways is a viable method of controlling waterflow into buildings. The 4 sprinkler flow requirement is twice the expected flow based upon sprinkler operation data.

This change is submitted in three areas of Chapter 30-an overall general requirement or failing that then a requirement for newly established occupant evacuation elevators and fire service access elevators.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CAHANIN-G1-3008.10.doc

G176–09/10
3007.4.3, 3008.11.3

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry, Inc. (NEII)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3007.4.3 Lobby doorways. Other than the door to the hoistway, each doorway to a fire service access elevator lobby shall be provided with a ~~doorway that is protected with a~~ $^3/_4$-hour *fire door assembly* complying with Section 715.4. The *fire door assembly* shall also comply with the smoke and draft control door assembly requirements of Section 715.4.3.1 with the UL 1784 test conducted without the artificial bottom seal.

3008.11.3 Lobby doorways. Other than the door to the hoistway, each doorway to an occupant evacuation elevator lobby shall be provided with a ~~doorway that is protected with a~~ $^3/_4$-hour *fire door assembly* complying with Section 715.4. The fire door assembly shall also comply with the smoke and draft control assembly requirements of Section 715.4 3 1 with the UL 1784 test conducted without the artificial bottom seal.

Reason: The proposed new sentence to Section 3008.11.3 correlates with the lobby doorway requirements for fire service access elevators in Section 3007.4.3. The integrity and tenability of elevator lobbies used for occupant evacuation is just as critical as that provided for fire service access. The revision to the first sentence in both sections clarifies that the requirement for the rated doors applies to all doors into the lobby, except for the hoistway door. As currently written, the code could be interpreted to only require one door into the lobby to be a rated assembly, while any other door could be unrated.

Cost Impact: This code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BLACK-G3-3008.11.3.doc

G177–09/10
3008.11.5, 1110.3

Proponent: Manny Muniz, California Deputy State Fire Marshal (Ret.), representing self

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3008.11.5 Signage. An approved sign ~~indicating elevators are suitable for occupant self-evacuation~~ stating **PROTECTED ELEVATOR – USABLE IN EMERGENCIES** shall be posted on all floors adjacent to each elevator call station serving occupant evacuation elevators. Signage shall comply with visual character requirements in ICC A117.1 and include the International Symbol of Accessibility. Where exit sign illumination is required by Section 1011.2, the signs shall be illuminated.

1110.3 Other signs. Signage indicating special accessibility provisions shall be provided as shown:

1. through 6. (No change to current text)
7. At occupant evacuation elevators, signage shall be provided in accordance with Section 3008.11.5.

Reason: Exit signage should be consistent in all buildings that have protected elevators. 3008.11.5 requires such a sign but does not specify that wording for the sign. All required life safety signs that require words should clearly state the words, should be accessible in accordance with ICC A117.1, and should have illumination as required for exit signs. The proposed language is similar to 1007.9 for **AREA OF REFUGE** signs. The words **PROTECTED ELEVATOR – USABLE IN EMERGENCIES** is the same as recommended in the NFPA 101 Life Safety Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MUNIZ-G1-3008.11.5

G178–09/10
707.5.1, 712.4, 3104.5

Proponent: Kaitlin McGillvray, Code Consultants Professional Engineers, PC

Revise as follows:

3104.5 Fire Barriers between pedestrian walkways and buildings. Walkways shall be separated from the interior of the building by not less than 2 hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. This protection shall extend vertically from a point 10 feet (3048 mm) above the walkway roof surface or the connected building roof line, whichever is lower, down to a point 10 feet (3048 mm) below the walkway and horizontally 10 feet (3048 mm) from each side of the pedestrian walkway. Openings within the l0-foot (3048 mm) horizontal extension of the protected walls beyond the walkway shall be equipped with devices providing a 3/4-hour fire protection rating in accordance with Section 715.

Exception: The walls separating the pedestrian walkway from a connected building and the openings within the 10 foot horizontal and vertical extension of the protected walls beyond the walkway are not required to have a fire-resistance rating by this section where any of the following conditions exist:

1. The distance between the connected buildings is more than 10 feet (3048 mm), the pedestrian walkway and the connected buildings, except for open parking garages, are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. The wall is capable of resisting the passage of smoke or is constructed of tempered, wired, or laminated glass walls and doors and subject to the following:
   1.1. The wall or glass separating the interior of the building from the pedestrian walkway shall be protected by an automatic sprinkler system in accordance with Section 903.3.1.1 and the sprinkler system shall completely wet the entire surface of interior sides of the glass wall when actuated.
   1.2. The glass shall be in a gasketed frame and installed in such a manner that the framing system will deflect without breaking (loading) the glass before the sprinkler operates.
   1.3. Obstructions shall not be installed between the sprinkler heads and the wall or glass.
2. The distance between the connected buildings is more than 10 feet (3048 mm) and both sidewalls of the pedestrian walkway are at least 50 percent open with the open area uniformly distributed to prevent the accumulation of smoke and toxic gases.
3. Buildings are on the same lot in accordance with Section 503.1.2.
4. Where exterior walls of connected buildings are required by Section 704 to have a fire-resistance rating greater than 2 hours, the walkway shall be equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

707.5.1 Supporting construction. The supporting construction for a *fire barrier* shall be protected to afford the required *fire-resistance rating* of the *fire barrier* supported. Hollow vertical spaces within a *fire barrier* shall be fireblocked in accordance with Section 717.2 at every floor level.

Exceptions:

1. The maximum required *fire-resistance rating* for assemblies supporting *fire barriers* separating tank storage as provided for in Section 415.6.2.1 shall be 2 hours, but not less than required by Table 601 for the building construction type.
2. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 708.12.
3. Supporting construction for 1-hour *fire barriers* required by Table 508.2.5 in buildings of Type IIB, IIIB and VB construction is not required to be fire-resistance rated unless required by other sections of this code.
4. Supporting construction for fire barriers required by Section 3104.5 is not required to be fire-resistance rated unless required by other sections of this code.

712.4 Continuity. Assemblies shall be continuous without openings, penetrations or joints except as permitted by this section and Section 708.2, 713.4, 714 and 1022.1. Skylights and other penetrations though a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated roof assembly is maintained. Unprotected skylights shall not be permitted in roof assemblies required to be fire-resistance rated in accordance with Section 704.10. The supporting construction shall be protected to afford the required *fire-resistance rating* of the *horizontal assembly* supported.

Exception: In buildings of Type IIB, IIIB or VB construction, the construction supporting the *horizontal assembly* is not required to be fire-resistance-rated at the following:

1. Horizontal assemblies at the separations of incidental uses as specified by Table 508.2.5, provided the required *fire-resistance rating* does not exceed 1 hour.
2. Horizontal assemblies at the separations of *dwelling units* and *sleeping units* as required by Section 420.3.
3. Horizontal assemblies at *smoke barriers* construction in accordance with Section 710.
4. Supporting construction for horizontal assemblies required by Section 3104.5 is not required to be fire-resistance rated unless required by other sections of this code.

Reason: The additional wording in the exception is intended to be editorial in order to clarify the application of the exception to the base requirements of Section 3104.5. As determined during the 06/07 code change cycle, the intent of the Section 3104.5 exception is that application of any of the four listed design alternatives under the exception will apply to all of the base requirements. Therefore, the exceptions apply to the interior walls between the walkway and the connected buildings and the horizontal *and* vertical extensions of the connected buildings.

In conjunction with the required fire barriers between pedestrian walkways and buildings, Section 707.5.1 and Section 712.4 were modified. The exception added to Section 707.5.1 is intended to clarify the extent of the protection between the pedestrian walkway and the buildings. Fire barriers are intended to prevent the interior spread of fire; not to prevent the exterior spread of fire. Section 707.4 supports this intent by requiring exterior walls that serve as a part of a shaft or exit enclosure (required to be constructed as fire barriers) to comply with Section 705 for exterior walls and not Section 707 for fire barriers. By requiring a fire barrier between the pedestrian walkway and buildings, the supporting construction must also be protected to afford the required fire-resistance rating of the fire barrier supported. This would mean that the rated construction must be extended from the pedestrian walkway connection to grade, which is contradictory to the 10 foot extension required below the connection in the base requirement.

The exception added to Section 712.4 is also intended to clarify the extent of the protection between the pedestrian walkway and the buildings. Where pedestrian walkways are separated from the interior of the building by horizontal assemblies, the supporting construction must be protected to afford the required fire-resistance rating of the horizontal assembly supported. This would also mean that the rated construction must be extended from the pedestrian walkway connection to grade, which is contradictory to the 10 foot extension required below the connection in the base requirement.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCGILLVRAY-G1-3104.5.DOC

G179–09/10
3104.5. 3104.8, 3104.9 (New)

Proponent: David S. Collins, FAIA, The Preview Group, Inc., The American Institute of Architects

1. Revise as follows:

3104.5 Fire barriers between pedestrian walkways and buildings. Walkways shall be separated from the interior of the building by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 712, or both. This protection shall extend vertically from a point 10 feet (3048 mm) above the walkway roof surface or the connected building roof line, whichever is lower, down to a point 10 feet (3048 mm) below the walkway and horizontally 10 feet (3048 mm) from each side of the *pedestrian walkway*. Openings within the l0-foot (3048 mm) horizontal extension of the protected walls beyond the walkway shall be equipped with devices providing a 3/4-hour *fire protection rating* in accordance with Section 715. Openings connecting the building to the pedestrian walkway shall not be considered openings for the purpose of determining allowable area of openings in Section 705.8, nor are openings connecting the building to the pedestrian walkway required to be protected except as required by this section.

Exception: The walls separating the *pedestrian walkway* from a connected building and the openings within the 10- foot (3048 mm) horizontal extension of the protected walls beyond the walkway are not required to have a *fire-resistance rating* by this section where any of the following conditions exist:

1. The distance between the connected buildings is more than 10 feet (3048 mm). The *pedestrian walkway* and connected buildings, except for *open parking garages*, are equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. The wall is capable of resisting the passage of smoke or is constructed of a tempered, wired or laminated glass wall and doors subject to the following:
   1.1. The wall or glass separating the interior of the building from the *pedestrian walkway* shall be protected by an *automatic sprinkler system* in accordance with Section 903.3.1.1 and the sprinkler system shall completely wet the entire surface of interior sides of the wall or glass when actuated;
   1.2. The glass shall be in a gasketed frame and installed in such a manner that the framing system will deflect without breaking (loading) the glass before the sprinkler operates; and
   1.3. Obstructions shall not be installed between the sprinkler heads and the wall or glass.
2. The distance between the connected buildings is more than 10 feet (3048 mm) and both sidewalls of the *pedestrian walkway* are at least 50 percent open with the open area uniformly distributed to prevent the accumulation of smoke and *toxic* gases.
3. Buildings are on the same lot in accordance with Section 503.1.2.
4. Where *exterior walls* of connected buildings are required by Section 705 to have a *fire-resistance rating* greater than 2 hours, the walkway shall be equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1.

The previous exception shall apply to *pedestrian walkways* having a maximum height above grade of three *stories* or 40 feet (12 192 mm), or five *stories* or 55 feet (16 764 mm) where sprinklered.

3104.8 Width. The unobstructed width of *pedestrian walkways* shall not be less than 36 inches (914 mm). The total width <u>of each walkway</u> shall not exceed 30 feet (9144 mm).

2. Add new text as follows:

<u>3104.9 Multiple walkways and spacing.</u> <u>Pedestrian walkways located on multiple floors shall be permitted. For the purpose of determining wall and opening protection of multiple pedestrian walkways, where walkways are located adjacent to each other or adjacent and within one floor of each other, the requirements of Section 3104.5 shall apply to the walkway.</u>

> **<u>Exception:</u>** <u>Pedestrian walkways which are stacked directly over each other shall be permitted without protection specified in Section 3104.5</u>

Reason: Protection of openings in this section provides the necessary protection for separation from the building and the pedestrian walkway. No additional requirement for protection of these openings is necessary in Section 602. Nothing in the code prohibits the construction of more than one walkway between buildings. This change clarifies that the 30 foot width is for each walkway, not cumulatively. The new Section 3104.9 specifies that multiple walkways are to be stacked one above the other, or must be separated from each other as prescribed by Table 602

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COLLINS-G6-3104.8

G180–09/10
3104.7

Proponent: David S. Collins, FAIA, The Preview Group, Inc., representing The American Institute of Architects

Revise as follows:

3104.7 ~~Egress~~ <u>Entrance and exit.</u> <u>Pedestrian walkways shall be permitted to provide access to enter or exit a building.</u> Access shall be provided at all times to a pedestrian walkway that serves as a required exit.

Reason: The pedestrian walkway may be used as an exit under 3104.7, therefore it should be permitted to be an entrance as well.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COLLINS-G2-3104.7.doc

G181–09/10
3108.1

Proponent: Kevin Moore, P.E., S.E., SECB and Edwin Huston, P.E., S.E., SECB, representing National Council of Structural Engineers Associations

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3108.1 General. Towers shall be designed and constructed in accordance with the provisions of TIA-222. Towers shall be designed for seismic loads; exceptions related to seismic design listed in Section 2.7.3 of TIA-222 shall not apply.

Exception: Single free-standing poles used to support antennas not greater than 75 feet (22 860 mm), measured from the top of the pole to grade, shall not be required to be noncombustible.

Reason: Seismic design of Communications Towers has been required by the IBC up through the 2003 edition. For many years, the Legacy Code (UBC) required seismic design of these towers.

An exemption for seismic design of towers was developed within the 2009 IBC, via reference to Standard TIA 222 (the latest edition of TIA 222 is referred to as 222-G). Without the IBC's reference to Standard TIA 222, ASCE 7-05 requires seismic design of towers, TIA 222-G caries exemptions to seismic design in certain conditions.

The exemptions provided in TIA 222-G are flawed because of the following:

1) Requirements for Standards

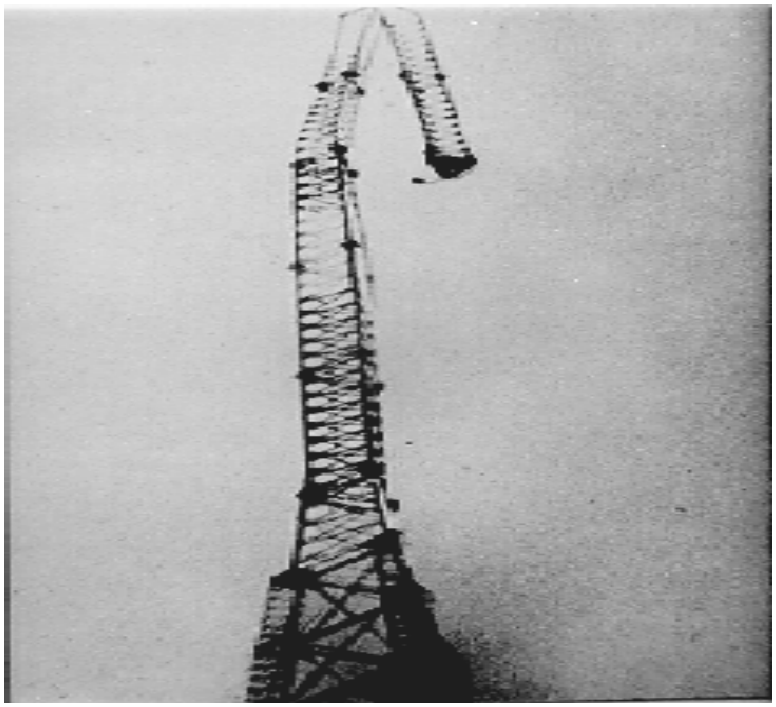
A Standard is required to provide the same basic level of public safety as the IBC. ASCE 7 Section 11.1.2 Scope, states that "Every structure, and portion thereof, including non-structural components, shall be designed and constructed to resist the effects of earthquake motions as prescribed by the seismic requirements of this standard. Certain nonbuilding structures, as described in Chapter 15, are also within the scope and shall be designed and constructed in accordance with the requirements of Chapter 15."

Chapter 15 gives specific requirements for design of communications towers. No exemptions are provided. TIA-222 is not listed as a referenced standard within the ICC Codes for seismic design, so seismic design requirements should be governed by ASCE 7 (222-F did not include a seismic design chapter)

TIA 222-G, because of exemptions to seismic design requirements, does not meet the minimum standard of care for design established by the IBC and ASCE 7.

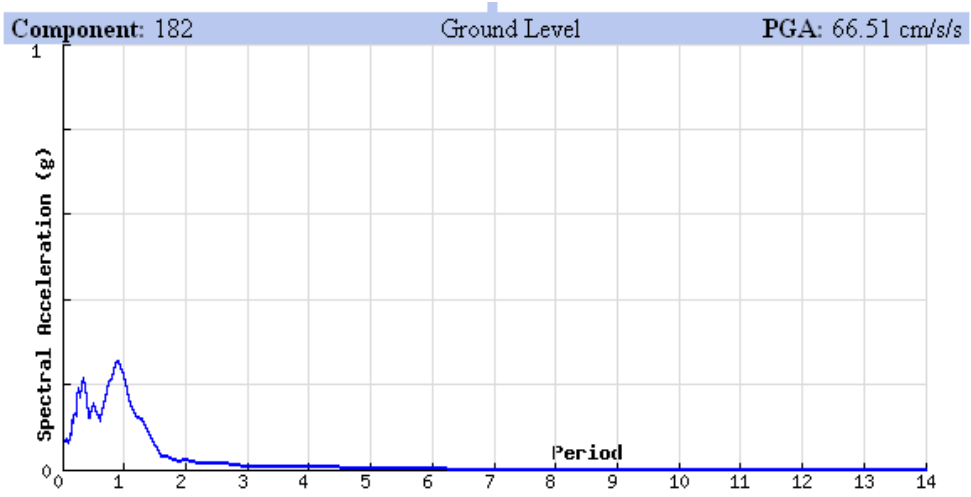
2) Historical Example

Areas that have been subjected to significant seismic ground motion recently have all affected towers that were designed to resist seismic forces Legacy Code. One must refer to historic examples to understand the effects of seismic forces on towers designed for wind only. One representative example is the KJR Radio Tower in Seattle, WA, that collapsed during the 1949 earthquake.



KJR Tower Collapse, 1949, Seattle, WA

It is instructive to look at the magnitude of earth motion at the tower location. While the 1949 earthquake was a significant earthquake, the KJR tower was located some distance away from the epicenter – about 48 miles. A ground motion record was recorded near the tower, at an army base on Marginal Way in Seattle:



The peak Spectral Acceleration was 0.13 g, as compared to a design level event of 1.05 g for Seattle.

TIA 222-G exempts seismic design of all towers located in areas where Ss is less than 1.0g. The ground motion that failed the KJR Radio Tower was equivalent to an Ss of 0.13g.

3) Analytical Example

TIA 222-G provides exemptions for seismic design for towers in areas where Ss < 1.0 and if the seismic base shear is less than ½ the wind base shear, regardless of seismicity.

Communications towers are typically flexible. Higher order dynamic effects usually dominate the structural fundamental response, usually necessitating some form of modal analysis. Because of the higher order modal effects, critical forces occur high up in the structure resulting in failures toward the top of the structure (as evinced with the KJR Radio tower failure).

Because of the higher order response of tower structures, exceptions based on base shear values are not warranted.

The following example using RISA Tower (provided by the City of Tacoma Building Department) elucidates some of the challenges associated with the existing code provision.

Assumptions:
Wind speed 85 mph, Exp B, Kzt=1.0
Essential Facility
Soil Class D

Analytical Results:

Site	Seismic Factor	Seismic Base Shear/ Wind Base Shear	Seismic Moment/ Wind Mom. (max)
Tacoma, WA	Ss=1.212 S1=0.418 Sds=0.822 Sd1=0.433	0.46	1.83
Site	Seismic Factors	Seismic Base Shear/ Wind Base Shear	Seismic Moment/ Wind Mom. (max)
Centralia, WA	Ss=1.000 S1=0.396 Sds=0.739 Sd1=0.424	0.44	1.65
Mid-western Oregon	Ss=0.600 S1=0.255 Sds=0.517 Sd1=0.321	0.33	1.16

For the tower located in Mid-western Oregon, having an Ss value of 0.6, (Ss<= 1.0), still produced seismic forces (in this case moments) 16% greater than wind loading. This maximum loading occurs near the top of the tower structure. The analysis also indicates that the ration between seismic base shear and wind base shear = 0.33, well below the exemption trigger of 0.50. However, seismic forces still produce higher forces than those developed from wind.

For a tower located in Centralia, WA (Ss=1.0), we see that seismic moments are approximately 65% greater than moments developed from wind forces.

Even in Tacoma, the seismic base shear/wind base shear < 0.50, which would have exempted this example tower from being designed for seismic forces (however, seismic forces generate moments that are 83% greater than moments resulting from wind forces).

Cost Impact: The code change proposal will not increase the cost of construction. The code change proposal will return cost of construction to levels commensurate with construction executed under designs compliant with the 2003 IBC.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MOORE-HUSTON-G1-3108.1

G182–09/10
3109, Chapter 35

Proponent: Lorraine Ross, Intech Consulting Inc., representing Association of Pool and Spa Professionals

1. Revise as follows:

SECTION 3109
SWIMMING POOLS, SPAS AND AQUATIC RECREATIONAL FACILITIES
~~ENCLOSURES AND SAFETY DEVICES~~

3109.1 General. Swimming pools shall comply with the requirements of this section and other applicable sections of this code.

3109.1.1 Public swimming pools. Public swimming pools shall be designed and constructed in accordance with ANSI/NSPI -1.

3109.1.2 Public spas. Public spas shall be designed and constructed in accordance with ANSI/NSPI -2.

3109.1.3 Aquatic recreational facilities. Aquatic recreational facilities shall be designed and constructed in accordance with ANSI/IAF-9.

2. Add new definition as follows:

3109.2 Definitions. The following ~~word and term~~ words and terms shall, for the purposes of this section and used elsewhere in the code, have the meaning shown herein.

AQUATIC RECREATIONAL FACILITIES Facilities containing pools for free-form aquatic play and recreation such as waterparks, wave action pools; activity pools; catch pools; leisure rivers; vortex pools; interactive play attractions.

3. Revise as follows:

3109.3 Enclosures for public swimming pools. Public swimming pools shall be completely enclosed by a fence at least 4 feet (1290 mm) in height or a screen enclosure. Openings in the fence shall not *permit* the passage of a 4-inch-diameter (102 mm) sphere. The fence or screen enclosure shall be equipped with self-closing and self-latching gates.

3109.4 Enclosures for residential swimming pools. Residential swimming pools shall comply with Sections 3109.4.1 through 3109.4.3.

Exception: A swimming pool with a power safety cover or a spa with a safety cover comply with ASTM F 1346.

4. Add new standards to Chapter 35 as follows:

ANSI

ANSI/NSPI -1 2003	Public Pools Swimming Pools
ANSI/NSPI -2 1999	Public Spas
ANSI/IAF-9 2005	American National Standard for Aquatic Recreational Facilities

Reason: This code change proposal fills a gap in the International Building Code (IBC) regarding the design and construction of public swimming pools, public spas and aquatic recreational facilities by adding national consensus standards for these items. The ICC code development process recognizes the importance of credible construction and safety standards. Furthermore, these proposed standards were developed and are maintained through ANSI as required by ICC "Council Policy CP# 28-05 CODE DEVELOPMENT Section 3.6.3.2 The standard shall be developed and maintained through a consensus process such as ASTM or ANSI".

Revisions to Sections 3109.3 and 3109.4 clarify that these sections specifically address enclosures for swimming pools.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standards proposed for inclusion in the code, ANSI/NSPI-1, -2 and ANSI/IAF-9, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: ROSS-G1-3109

G183–09/10
3202.2.1

Proponent: Katherine Bang, representing the City of Portland, Bureau of Development Services

Revise as follows:

3202.2.1. ~~Steps~~ Handrails. ~~Steps~~ Handrails shall not project more than 12 inches (305 mm). ~~and~~ Handrails shall be guarded by approved devices no less than 3 feet (914 mm) high~~,~~ or shall be located between columns or pilasters. The extension of handrails shall be in the same direction of the stair flights at stairways and the ramp runs at ramps.

Reason: The code already requires handrails, regardless of the number of steps, and the code also requires handrail extensions. If steps are permitted to project into the public right of way, it suggests that handrails would be permitted to extend 12" beyond that. I don't think it was the intention of the code to allow handrails to extend 24" into the public right of way so I have eliminated steps from this section and replaced it with handrails. The last sentence is the current language for handrail extensions in Section 1012.6.

Cost Impact: None - this is a clarification of code intent.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: BANG-G4-3202.2.1

G184–09/10
3302.1.1 (New) [IEBC [B] 1401.3.1 (New)]

Proponent: Randy Ohler, RA, Littlestown PA, representing City of Gaithersburg, MD.

Add new text as follows:

3302.1.1 (IEBC [B] 1401.3.1) Maintaining existing occupied areas while under construction. Separation between existing occupied and proposed work areas must be maintained during construction by means of temporary construction barriers. Areas under alteration or demolition are work zones. Work areas shall be separated from public occupied areas by a solid, noncombustible wall having a minimum one-hour fire resistance rating. In non-sprinklered buildings, the required separation shall be from floor to ceiling or from floor to the underside of the next deck above, floor or roof. In a sprinklered building, with an operational automatic sprinkler system in both the occupied space and the work zone, the barrier shall be a solid, limited combustible wall, at least 6 feet in height, with a limited combustible, non-solid dust/smoke barrier (such as fire retardant plastic sheeting) extending to the ceiling or from floor to the underside of the next deck above, floor or roof. In both cases, openings for workers to access construction areas shall be through self-closing gates, constructed of material similar or equal to the walls. Worker openings shall be posted with signage notifying occupants they are not permitted to enter the construction area. All required means of egress elements that serve the occupied area shall remain open, free from obstruction or construction related hazards, at the full required width, to a public way, in compliance with this code. Any altered or temporary egress route shall be approved by the building official prior to commencement of the construction activity.

Reason: Some jurisdictions do not adopt any code other than the single IBC and IRC. Current language in Section 3302.1 does not adequately define any specific requirements for safety, leaving it up to the building official to decide proper protection, but no specific concrete section for which to quote from when questioned by others. This new paragraph would help address the safety of persons within those jurisdictions, whom adopt the single code, subjected to any proposed construction activity while in an occupied building currently under construction. Construction activities can present additional fire and life safety risks that may include increased fuel loads, altered egress routes, hot work activities, and compromised fire suppression, detection and alarm systems. Fire potential during construction, alteration, or demolition operations is inherently high and can produce rapid fire spread and devastating results. Isolating the occupants from construction activities will allow additional time to escape from the consequences, and assist in compartmentalization of any fire or emergency event.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: OHLER-G1-3302.1.1

G185-09/10
IBC 3302.3 (New) [IEBC 1401.5 (New)], 3303.7 (New); IFC 1404.5

Proponent: Marshall Klein, PE, Marshall A. Klein & Associates, Inc., representing National Multi Housing Council (NMHC)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC GENERAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE IBC GENERAL CODE COMMITTEE.

PART I – IBC GENERAL

Add new text as follows:

3302.3 (IEBC [B] 1401.5) Fire safety during construction. Fire safety during construction shall comply with the applicable requirements of this code and the applicable provisions of Chapter 14 of the *International Fire Code*.

3303.7 Fire safety during demolition. Fire safety during demolition shall comply with the applicable requirements of this code and the applicable provisions of Chapter 14 of the *International Fire Code.*

PART II – IFC

Revise as follows:

IFC 1404.5 Fire watch. When required by the fire code official for building demolition, or building construction during working hours, that is hazardous in nature, qualified personnel shall be provided to serve as an on-site fire watch. Fire watch personnel shall be provided with at least one approved means for notification of the fire department and their sole duty shall be to perform constant patrols and watch for the occurrence of fire.

Reason: Intent of Part 1 of this code proposal is to correlate the IBC Section 3302, "Construction Safeguards", and the IFC requirements on fire safety during construction and demolition. IFC Chapter 14, "Fire Safety During Construction and Demolition" has all the fire safety requirements provided in one place for the fire safe operations during construction and demolition. The intent of Part II to IFC is to address the times when a fire watch is appropriate at a construction site during working hours and this code proposal will address such a need.

Cost Impact: The code change will not increase the cost of construction.

PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KLEIN-G3 3302.3

G186–09/10
3306.10 (New), Chapter 35

Proponent: Eli P. Howard, III, Sheet Metal and Air Conditioning Contractor's National Association, Inc.

1. Add new text as follows:

3306.10 Occupant Protection During Construction. An indoor air quality (IAQ) management plan shall be developed and implemented for the construction and preoccupancy phases of the building as follows:

1. During construction, the recommended control measures of Chapter 3 of ANSI/SMACNA 008 shall be met or exceeded.
2. Stored on-site and installed absorptive materials shall be protected from moisture damage.
3. Temporary space conditioning equipment shall be installed during construction

2. Add new standard to Chapter 35 as follows:

SMACNA
ANSI/SMACNA 008-2008 IAQ Guidelines for Occupied Buildings Under Construction.

Reason: Currently there is insufficient guidance of how to address air quality in buildings that are under construction but partially or entirely occupied. This situation can occur both in existing buildings that are being renovated or new buildings where portions of the building that are completed are being occupied while construction continue on uncompleted portions.

Cost Impact: The code change proposal will increase the cost of construction. Minor costs may be incurred but if the movement of pollutants into occupied spaces is controlled well the savings in clean up costs and the benefit of full length equipment warranties to the owner will likely provide an overall cost savings.

Analysis: A review of the standard proposed for inclusion in the code, ANSI/SMACNA 008, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOWARD-G1-3306.10 NEW

G187–09/10
3401.1 (IEBC [B] 301.1)

Proponent: Patrick Vandergriff, Vandergriff Code Consulting Services, representing Modular Building Institute

Revise as follows:

3401.1 (IEBC [B] 301.1) Scope. The provisions of this chapter shall control the alteration, repair, addition, ~~and~~ change of occupancy, and relocation of existing structures.

Exception: Existing bleachers, grandstands and folding and telescopic seating shall comply with ICC 300.

Reason: This recommended language picks up the code philosophy that the code applies to relocated structures and standardizes it throughout the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: VANDERGRIFF-G2-3401.1.doc

G188–09/10
3401.3 (IEBC [B] 301.1.1)

Proponent: Patrick Vandergriff, Vandergriff Code Consulting Services, representing Modular Building Institute

Revise as follows:

3401.3 (IEBC [B] 301.1.1) Compliance. Alterations, repairs, additions and changes of occupancy to, or relocation of, existing structures shall comply with the provisions for alterations, repairs, additions and changes of occupancy in the *International Fire Code, International Fuel Gas Code, International Mechanical Code, International Plumbing Code, International Property Maintenance Code, International Private Sewage Disposal Code*, *International Residential Code* and NFPA 70.

Reason: This recommended language picks up the code philosophy that the code applies to relocated structures and standardizes it throughout the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: VANDERGRIFF-G5-3401.3.doc

G189–09/10
3401.3

Proponent: David Bonowitz, S.E., National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

Revise as follows:

3401.3 Compliance. Alterations, repairs, additions and changes of occupancy to existing structures shall comply with the provisions for alterations, repairs, additions and changes of occupancy, respectively, in the *International Fire Code, International Fuel Gas Code, International Mechanical Code, International Plumbing Code, International Property Maintenance Code, International Private Sewage Disposal Code, International Residential Code* and NFPA 70. Where provisions of the other codes conflict with provisions of this Chapter, the provisions of this Chapter shall take precedence.

Reason: The proposal clarifies and confirms the intent of Section 3401.3.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-G5-3401.3.DOC

G190–09/10
3401.4, 3401.4.3 (New), 3403.4.1, 3404.4.1, 3405.2.1, 3408.4; (IEBC [B] 301.2, 301.2.3 (New), 302.4.1, 303.4.1, 304.2.1, 307.4)

Proponent: David Bonowitz, David Bonowitz, S.E., National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

1. Revise as follows:

3401.4 (IEBC [B] 301.2) Building materials and systems. Building materials and systems shall comply with the requirements of this section.

3401.4.1 (IEBC [B] 301.2.1) Existing materials. Materials already in use in a building in compliance with requirements or approvals in effect at the time of their erection or installation shall be permitted to remain in use unless determined by the building code official to be dangerous to life, health or safety. Where such conditions are determined to be dangerous to life, health or safety, they shall be mitigated or made safe.

3401.4.2 (IEBC [B] 301.2.2) New and replacement materials. Except as otherwise required or permitted by this code, materials permitted by the applicable code for new construction shall be used. Like materials shall be permitted for repairs and alterations, provided no hazard to life, health or property is created. Hazardous materials shall not be used where the code for new construction would not *permit* their use in buildings of similar occupancy, purpose and location.

3401.4.3 (IEBC [B] 301.2.3) Existing seismic force-resisting systems. Where the existing seismic force-resisting system is a type that can be designated ordinary, values of R, Ω_0, and C_d for the existing seismic force-resisting system shall be those specified by this code for an ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of a detailed, intermediate or special system.

2. Delete without substitution as follows:

~~**3403.4.1 (IEBC [B] 302.4.1)Seismic.** Seismic requirements for additions shall be in accordance with this section. Where the existing seismic force-resisting system is a type that can be designated ordinary, values of R, Ω_0 and C_d for the existing seismic force-resisting system shall be those specified by this code for an ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of a detailed, intermediate or special system.~~

~~**3404.4.1 (IEBC [B] 303.4.1) Seismic.** Seismic requirements for alterations shall be in accordance with this section. Where the existing seismic force-resisting system is a type that can be designated ordinary, values of R, Ω_0 and C_d for the existing seismic force-resisting system shall be those specified by this code for an ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of a detailed, intermediate or special system.~~

3. Revise as follows:

3405.2.1 (IEBC [B] 304.2.1) Evaluation. The building shall be evaluated by a *registered design professional*, and the evaluation findings shall be submitted to the code official. The evaluation shall establish whether the damaged building, if repaired to its predamage state, would comply with the provisions of this code for wind and earthquake loads. Evaluation for earthquake loads shall be required if the substantial structural damage was caused by or related to earthquake effects or if the building is in Seismic Design Category C, D, E or F.

Wind loads for this evaluation shall be those prescribed in Section 1609. Earthquake loads for this evaluation, if required, shall be permitted to be 75 percent of those prescribed in Section 1613. ~~Values of R, Ω_0 and C_d for the existing seismic force-resisting system shall be those specified by this code for an ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of an intermediate or special system.~~

3408.4 (IEBC [B] 307.4) Change of occupancy. When a change of occupancy results in a structure being reclassified to a higher occupancy category, the structure shall conform to the seismic requirements for a new structure of the higher occupancy category. ~~Where the existing seismic force-resisting system is a type that can be designated ordinary, values of R, Ω_0 and C_d for the existing seismic force-resisting system shall be those specified by this code for an ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of a detailed, intermediate or special system.~~

Exceptions:

1. Specific seismic detailing requirements of Section 1613 for a new structure shall not be required to be met where it can be shown that the level of performance and seismic safety is equivalent to that of a new structure. Such analysis shall consider the regularity, over strength, redundancy and ductility of the structure within the context of the existing and retrofit (if any) detailing provided.
2. When a change of use results in a structure being reclassified from Occupancy Category I or II to Occupancy Category III and the structure is located in a seismic map area where $S_{DS} < 0.33$, compliance with the seismic requirements of Section 1613 is not required.

Reason: This is an editorial change for clarity and simplicity. Currently the same provision appears in four separate locations. This proposal would simply replace those four occurrences with a single identical provision in an appropriate location at the top of the chapter. Specifically, the proposal does the following:

3401.4	Change the title and text of the section to suit the proposed new subsection 3401.4.3.
3401.4.3	Add this new subsection with text relocated from the other locations.
3403.4.1	Delete. New section 3401.4.3 will replace this provision.
3404.4.1	Delete. New section 3401.4.3 will replace this provision.
3405.2.1	Delete the sentence as shown. New section 3401.4.3 will replace this provision.
3408.4	Delete the sentence as shown. New section 3401.4.3 will replace this provision.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-GBONOWITZ-G9-3401.4.3.DOC

G191–09/10
3401.4.1 (IEBC [B] 301.2.1)

Proponent: David Bonowitz, S.E., National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3401.4.1 (IEBC [B] 301.2.1) Existing materials. Materials already in use in a building in conformance with requirements or approvals in effect at the time of their erection or installation shall be permitted to remain in use unless determined by the building code official to be ~~dangerous to life, health or safety~~ unsafe per Section 116. ~~Where such conditions are determined to be dangerous to life, health or safety, they shall be mitigated or made safe.~~

Reason: This proposal reflects the intent of approved proposal G203-07/08 and further improves the section by referencing a relevant section elsewhere.

The word "dangerous" should not be used, as it is a defined term in 2009 I-codes per G205-07/08, and its use here represents a substantive change contrary to the intent of this section. When this section was revised for 2009, the word "dangerous" was not used. Instead, the word "detrimental" was in proposal G203 because it was the already-approved term from approved with proposal S30-06/07. In the final editing process to assemble a variety of changes to Chapter 34 the word "dangerous," was substituted for 'detrimental', changing the meaning and scope of the provision.

The defined term that most closely matches the intent of the section (and probably what ICC intended with its substitution) is "unsafe" as used in section 116.

As for the last sentence, it also was not in the G203-07/08 proposal and should not have been added by ICC. While rational, it is not necessary because of the general requirement in section 116 for dealing with unsafe and dangerous conditions. Even if it is retained, it now uses the terms "dangerous" and "safe" improperly. The best correction is to simply delete the sentence.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The revision to Section 3401.4.1 (IEBC [B] 301.2.1) was Code Correlation Committee (CCC) Item CC08-IBC-27. The item was as follows:

3401.4.1 Existing materials. Materials already in use in a building in conformance with requirements or approvals in effect at the time of their erection or installation shall be permitted to remain in use unless determined by the code official to be ~~detrimental~~ dangerous to life, health or safety. Where such conditions are determined to be dangerous to life, health or safety, they shall be mitigated or made safe.

Reason: G205-07/08 makes changes to a 2006 section that has been revised by the reformatting of G203-07/08. This location is the best fit for the language. Note that G205-07/08 also adds a definition for dangerous to correlate with the IEBC as follows:

DANGEROUS. Any building or structure or portion thereof that meets any of the conditions described below shall be deemed dangerous:

1. The building or structure has collapsed, partially collapsed, moved off its foundation, or lacks the support of ground necessary to support it.
2. There exists a significant risk of collapse, detachment, or dislodgment of any portion, member, appurtenance, or ornamentation of the building or structure under service loads.

CCC Committee Actions: Editorial and Approved

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-G8-3401.4.1.DOC

G192–09/10
3401.5 (New), 3405.1.1 (IEBC [B] 301.3 (New), 304.1.1)

Proponent: David Bonowitz, S.E., National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

1. Add new text as follows:

3401.5 (IEBC [B] 301.3) Dangerous conditions. The building official shall have the authority to require the elimination of conditions deemed dangerous.

(Renumber subsequent sections in IBC)

2. Delete without substitution:

~~**3405.1.1 (IEBC 304.1.1) Dangerous conditions.** Regardless of the extent of structural or nonstructural damage, the building code official shall have the authority to require the elimination of conditions deemed dangerous.~~

Reason: This proposal relocates a provision from Section 3405.1.1 to Section 3401. This provision, dealing with the elimination of dangerous conditions, should be at the top of the chapter, as proposed, because it has broad applicability throughout Chapter 34, not just in the Repairs subsection.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-G10-3401.6.doc

G193–09/10
IBC 3402.1, 3405.2, 3405.2.1, 3405.2.2, 3405.2.3, 3405.3, 3405.4 (IEBC [B] 304.2, 304.2.1, 304.2.2, 304.2.3, 304.3, 304.4)

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc.

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

1. Delete without substitution:

3402.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in the code, have the meanings shown herein.

~~**SUBSTANTIAL STRUCTURAL DAMAGE.** A condition where:~~

~~1. In any story, the vertical elements of the lateral force-resisting system have suffered damage such that the lateral load-carrying capacity of the structure in any horizontal direction has been reduced by more than 20 percent from its pre-damage condition; or~~
~~2. The capacity of any vertical gravity load-carrying component, or any group of such components, that supports more than 30 percent of the total area of the structure's floor(s) and roof(s) has been reduced more than 20 percent from its pre-damage condition and the remaining capacity of such affected elements, with respect to all dead and live loads, is less than 75 percent of that required by this code for new buildings of similar structure, purpose and location.~~

~~**3405.2 (IEBC [B] 304.2) Substantial structural damage to vertical elements of the lateral-force-resisting system.** A building that has sustained substantial structural damage to the vertical elements of its lateral-force-resisting system shall be evaluated and repaired in accordance with the applicable provisions of Sections 3405.2.1 through 3405.2.3.~~

~~**3405.2.1 (IEBC [B] 304.2.1) Evaluation.** The building shall be evaluated by a registered design professional, and the evaluation findings shall be submitted to the code official. The evaluation shall establish whether the damaged building, if repaired to its pre-damage state, would comply with the provisions of this code for wind and earthquake loads. Evaluation for earthquake loads shall be required if the substantial structural damage was caused by or related to earthquake effects or if the building is in Seismic Design Category C, D, E, or F.~~

~~Wind loads for this evaluation shall be those prescribed in Section 1609. Earthquake loads for this evaluation, if required, shall be permitted to be 75 percent of those prescribed in Section 1613. Values of R, Ω_0, and C_d for the existing seismic force-resisting system shall be those specified by this code for an ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of an intermediate or special system.~~

~~**3405.2.2 (IEBC [B] 304.2.2) Extent of repair for compliant buildings.** If the evaluation establishes compliance of the pre-damage building in accordance with Section 3405.2.1, then repairs shall be permitted that restore the building to its pre-damage state using materials and strengths that existed prior to the damage.~~

~~**3405.2.3 (IEBC [B] 304.2.3) Extent of repair for noncompliant buildings**. If the evaluation does not establish compliance of the pre-damage building in accordance with Section 3405.2.1, then the building shall be rehabilitated to comply with applicable provisions of this code for load combinations including wind or seismic loads. The wind loads for the repair shall be as required by the building code in effect at the time of original construction, unless the damage was caused by wind, in which case the wind loads shall be as required by the code in effect at the time of original construction or as required by this code, whichever are greater. Earthquake loads for this rehabilitation design shall be those required for the design of the pre-damage building, but not less than seventy-five percent of those prescribed in Section 1613. New structural members and connections required by this rehabilitation design shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.~~

~~**3405.3 (IEBC [B] 304.3) Substantial structural damage to gravity load-carrying components**. Gravity load-carrying components that have sustained substantial structural damage shall be rehabilitated to comply with the applicable provisions of this code for dead and live loads. Snow loads shall be considered if the substantial structural damage was caused by or related to snow load effects. Existing gravity load-carrying structural elements shall be permitted to be designed for live loads approved prior to the damage. Nondamaged gravity load-carrying components that receive dead, live, or snow loads from rehabilitated components shall also be rehabilitated or shown to have the capacity to carry the design loads of the rehabilitation design. New structural members and connections required by this rehabilitation design shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.~~

~~**3405.3.1 (IEBC [B] 304.3.1) Lateral force-resisting elements.** Regardless of the level of damage to vertical elements of the lateral force-resisting system, if substantial structural damage to gravity load-carrying components was caused primarily by wind or earthquake effects, then the building shall be evaluated in accordance with Section 3405.2.1 and, if noncompliant, rehabilitated in accordance with Section 3405.2.3.~~

~~**3405.4 (IEBC [B] 304.4) Less than substantial structural damage.** For damage less than substantial structural damage, repairs shall be allowed that restore the building to its pre-damage state using materials and strengths that existed prior to the damage. New structural members and connections used for this repair shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.~~

2. Add new text as follows:

3405.2 (IEBC [B] 304.2) Substantial damage. A building that has sustained substantial damage, as defined in Chapter 16, shall be brought into compliance with Chapter 16, except as modified as follows:

1. Existing gravity load-carrying structural elements shall be permitted to be designed for live loads approved prior to the damage.
2. The wind loads for the rehabilitation shall be as required by the building code in effect at the time of original construction, unless the damage was caused by wind, in which case the wind loads shall be as required by this code.
3. Earthquake loads for this rehabilitation design shall be those required for the design of the pre-damage building, but not less than seventy-five percent of those prescribed in Section 1613.
4. New structural members and connections required as part of the rehabilitation shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.

3405.3 (IEBC [B] 304.3) Less than substantial damage. For less than substantial damage, repairs shall be allowed that restore the building to its pre-damage state using materials and strengths that existed prior to the damage. New structural members and connections used for this repair shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.

3. Revise as follows:

3405.4 ~~3405.5~~ (IEBC [B] 304.4 ~~304.5~~) Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3, any repair that constitutes substantial improvement of the existing structure, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the existing structure shall be brought into compliance with the requirements for new construction for flood design.

For buildings and structures in flood hazard areas established in Section 1612.3, any repairs that do not constitute substantial improvement ~~or substantial damage~~ of the existing structure, as defined in Section 1612.2, are not required to comply with the flood design requirements for new construction.

Reason: This proposal is intended to reduce the dramatic and significant upgrade triggers that were introduced into Chapter 34 of the IBC during the last code cycle where none existed before. According to the *Handbook to the Uniform Building Code: An Illustrative Commentary,* upgrade triggers that add to the cost of repairs provide a disincentive to performing repairs and have been found to contribute to deterioration and net loss of existing building stock. Furthermore, requiring upgrades in order to repair a building adversely affects building owners, who must fund not only the repair but also the upgrade, which can cost many times the cost of repair-only. In a study of San Francisco's upgrade triggers, which are very similar to the language in G206 and to the language in the IEBC, the Structural Engineers Association of Northern California (SEAONC) concluded that "It is the opinion of the Study Group that these requirements probably encourage repair of damage without building permits and inspection controls to avoid the seismic trigger."

The specific wording of the upgrade triggers that were recently adopted into Chapter 34 has not really been tested in a high seismic zone; however, the City of Oakland, California adopted very similar upgrade triggers after the 1989 Loma Prieta earthquake. Although well intentioned, the Oakland upgrade triggers resulted in striking increases in the cost to repair (and upgrade) damaged buildings and had a number of unanticipated and unintended consequences: in a study of eight large buildings affected by the Oakland Earthquake Ordinance, costs to upgrade and repair averaged more than six times the cost of repair-only; engineers were unable to accurately determine "loss of structural capacity"; multi-year litigation ensued regarding two of the eight buildings studied; buildings were demolished (including a historic building); and the ordinance contributed to a major economic downturn, where damaged buildings remained vacant and unrepaired for more than a decade.

The current upgrade triggers relating to repairs in Chapter 34 are governed by the term "loss of structural capacity", but no commonly accepted definition of "loss of structural capacity" generally exists and can mean many different things to many different engineers. Linking upgrade requirements to an undefined term will necessarily increase the likelihood of disagreement between building owners, building officials, engineers, FEMA, and insurance companies; will result in difficulty in determining standard-of-care; and will dramatically increase structural engineering fees. In their study of San Francisco's upgrade triggers, which are similar to the language in Chapter 34, SEAONC concluded that "There is no consensus methodology to calculate loss of capacity. This uncertainty causes controversy and delays in critical post-earthquake situations. Experience in past earthquakes has shown that engineers can often get 'under' or 'over' any trigger set in this way as the situation demands."

There is also a lack of rationality in the current upgrade triggers. If upgrading costs only a small percentage of the repair-only scope, upgrading at a time when significant repairs are being performed makes economic sense. However, since there are no cut-offs, rational tests, or economic considerations for the additional upgrade costs, the upgrade triggers can result in wildly disproportionate upgrade costs when compared to repair-only, as shown in the Oakland Earthquake Damage Ordinance study.

Furthermore, there is no cause-and-effect relationship between the damage and the required seismic upgrades. The current language requires seismic upgrades of structures damaged by any and all causes if the substantial structural damage trigger is exceeded in moderate or high seismic zones, but this makes little if any sense. For example, assume that a building is significantly damaged by termites. Is it logical to require an engineering analysis, much less a seismic upgrade of the structure, in order to get a permit to repair the termite damage? Yet according to the current upgrade triggers, there is no necessary relationship between the cause of the damage and the requirement to seismically strengthen the damaged structure. The current structural upgrade triggers depart dramatically from the requirements to repair the electrical, mechanical, plumbing, accessibility, and fire protection systems. Given that damage to structures typically results from decay and deterioration, vehicle impact, and fires -- and typically not earthquake -- and given that fires kill many more people per year than earthquakes, the preoccupation of the current triggers with forcing seismic upgrades is completely unwarranted. In their study of upgrade triggers, SEAONC concluded, "Damage from fire is typically much different from earthquake damage and enforcement of the same repair standards seldom makes sense. Certainly fire damage is no indicator of basic seismic risk and there is no philosophical justification for triggering seismic upgrade on the same basis" and "Experience in San Francisco has shown these requirements often to be onerous and essentially unenforceable."

Even when considering earthquake hazards, the existing upgrade triggers fail the logic test: suppose that a large, design-level earthquake (the "big one") occurs in a major city. On the basis even of today's IBC design criteria, it is reasonable to expect that large numbers of buildings will experience significant damage as a result of the earthquake, even to buildings that conform or nearly conform to current code. Yet despite these damaged buildings all performing within the expectation of the current code, the proposed upgrade triggers would require further potentially massive and costly upgrades beyond the repairs already needed, because the proposed upgrade triggers do not permit any consideration of the intensity of the earthquake shaking responsible for the damage. Why would any engineer conclude that a city full of buildings that went through a major earthquake but protected life safety should be seismically upgraded? Why would any community want to mandate those upgrades? Why should the federal government, insurance companies, building owners, or taxpayers pay for those upgrades? Regarding this scenario, in their study of upgrade triggers, SEAONC concluded, "Requirements to upgrade such a large stock of buildings could put an undue economic burden on the private sector and delay regional recovery."

What this proposal does:

This proposal requires structural upgrades of existing structures only when the costs of repair-only are substantial; i.e. at least half the market value of the building. This brings the structural repair requirements into conformance with the provisions relating to repair of flood damage and helps ensure that the cost of the upgrades are not wildly disproportionate to the cost of repair-only. The proposal also helps ensure that trigger of wholesale structural upgrades is rare.

For copies of articles dealing with the problems with the Oakland Earthquake Ordinance or with the "substantial structural damage" trigger, please email me at gsearer@wje.com.

Bibliography:

"Evaluation of the Effects of Oakland's Earthquake Damage Repair Ordinance" by Gary R. Searer, Terrence F. Paret, Sigmund A. Freeman, and Una M. Gilmartin, 8th US Conference on Earthquake Engineering, San Francisco, April 2006.

Handbook to the Uniform Building Code: An Illustrative Commentary, International Conference of Building Officials (ICBO), 1998, Whittier, CA.

"Repair of Existing Structures and the International Existing Building Code" by Gary R. Searer and Terrence F. Paret, 8th US Conference on Earthquake Engineering, San Francisco, April 2006.

"Repercussions of the International Existing Building Code on the Repair of Existing Structures" by Terrence F. Paret and Gary R. Searer, ASCE Structures Congress, Forensics Congress, April 2005.

"SEAONC's SFBC Structural Damage Repair Study Group Report and Recommendations" by the Structural Engineers Association of Northern California (SEAONC), April 3, 2008.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SEARER-G1-3405.2

G194–09/10
3405.2, 3405.4 (IEBC [B] 304.2, 304.4)

Proponent: Gary J. Ehrlich, P.E., representing National Association of Home Builders

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3405.2 (IEBC [B] 304.2) Substantial structural damage to vertical elements of the lateral-force-resisting system. A building that has sustained substantial structural damage to the vertical elements of its lateral-force-resisting system shall be evaluated and repaired in accordance with the applicable provisions of Sections 3404.2.1 through 3404.2.3.

3405.2.1 (IEBC [B] 304.2.1) Evaluation. The building shall be evaluated by a registered design professional, and the evaluation findings shall be submitted to the building official. The evaluation shall establish whether the damaged building, if repaired to its pre-damage state, would comply with the provisions of this code for wind and earthquake loads. Evaluation for earthquake loads shall be required if the substantial structural damage was caused by or related to earthquake effects or if the building is in Seismic Design Category ~~C,~~ D, E, or F.

Wind loads for this evaluation shall be those prescribed in Section 1609. Earthquake loads for this evaluation, if required, shall be permitted to be seventy-five percent of those prescribed in Section 1613. Where the existing seismic force-resisting system is a type that can be designated ordinary, values of R, Ω_0, and C_d for the existing seismic force-resisting system shall be those specified by this code for an ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of a detailed, ~~an~~ intermediate or special system.

3405.2.2 (IEBC [B] 304.2.2) Extent of repair for compliant buildings. If the evaluation establishes compliance of the pre-damage building in accordance with Section 3404.2.1, then repairs shall be permitted that restore the building to its pre-damage state ~~using materials and strengths that existed prior to the damage.~~ , based on material properties and design strengths applicable at the time of original construction.

3405.2.3 (IEBC [B] 304.2.3) Extent of repair for noncompliant buildings. If the evaluation does not establish compliance of the pre-damage building in accordance with Section 3404.2.1, then the building shall be rehabilitated to comply with applicable provisions of this code for load combinations, including wind or seismic loads. The wind loads for the repair shall be as required by the building code in effect at the time of original construction, unless the damage was caused by wind, in which case the wind loads shall be as required ~~by the code in effect at the time of original construction or as required~~ by this code~~, whichever are greater~~. Earthquake loads for this rehabilitation design shall be those required for the design of the pre-damage building, but not less than seventy-five percent of those prescribed in Section 1613. New structural members and connections required by this rehabilitation design shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.

3405.4 (IEBC [B] 304.4) Less than substantial structural damage. For damage less than substantial structural damage, repairs shall be allowed that restore the building to its pre-damage state ~~using materials and strengths that existed prior to the damage~~, based on material properties and design strengths applicable at the time of original construction. New structural members and connections used for this repair shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.

Reason: The purpose of this proposal is to clarify new language added to Chapter 34 for the evaluation of existing buildings. Despite concerns raised by NAHB and Gary Searer, as well as the IBC-Structural Committee, proposal G206-07/08 was approved at the Final Action Hearings in Minneapolis. We believe this language needs revising in order to be both enforceable by building officials and cost-effective to apply by engineers and building owners. The proposed changes are as follows:

1. Modify the seismic requirements of Section 3405.2.1. The current language can be taken to imply that only a lateral-force-resisting system which has been broken down into Ordinary, Detailed, Special and Intermediate classifications per ASCE 7 is permissible under these requirements. This would exclude light-frame shear walls, buckling-restrained braces, and a number of other systems. A similar issue with other language proposed for the IBC and the IEBC was fixed by public comments from the NCSEA Existing Building Committee. This proposal implements the change here.
2. The application of the seismic evaluation in Section 3405.2.1 is limited to SDC D through F. The original proposal includes SDC C, thus going beyond current FEMA requirements. The NCSEA EBC proposed this change as a public comment to address concerns raised by the IEBC code committee in Palm Springs in recommending the proposal for disapproval. However, they opted not to bring it forward in Minneapolis. The concerns have not gone away; in fact with the current economic climate they have gained in importance.
3. The language in Sections 3405.2 and 3405.4 is clarified. We have no idea what "using materials and strengths that existed prior to the damage" to repair a building means. However, designing a repair using the known material properties of the existing damaged element and using the codified design strengths at the time of construction makes sense from an economic standpoint. The proposed new language is consistent with similar requirements in Section 3404.2.3 for wind loads and Section 3404.3 for live loads.
4. The provision of Section 3405.2.3 specifying the wind loads to be used is revised. As building codes and design standards such as ASCE 7 are modified, some design requirements increase relative to previous editions, and some decrease. The reasons for these changes include improved wind speed modeling, new design provisions for low-rise buildings, better understanding of overall building performance, and new provisions to address specific concerns (such as overhangs, parapets, or rooftop equipment). If improved wind maps and more accurate design provisions give a reduction in wind loads under a new standard, it makes no sense to force a designer to use older provisions which may use obsolete science or implement conservative minimum design loads. This does not serve what should be the desire of all stakeholders to make the repair and rehabilitation of existing buildings economical for the owner, while at the same time doing what is needed to achieve life safety.

In summary, these changes will provide needed clarification for the building officials who must enforce this section, and enhance the ability of designers and building owners to provide cost-effective building repair and rehabilitation. In the current economic climate this is more critical than ever before. Furthermore, encouraging the repair and rehabilitation of existing structures rather than their demolition and replacement addresses "green building" concerns.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EHRLICH-G1-3405.2.1

G195–09/10
3405.2.3 (IEBC [B] 304.2.3)

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc.

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3405.2.3 (IEBC [B] 304.2.3) Extent of repair for noncompliant buildings. If the evaluation does not establish compliance of the pre-damage building in accordance with Section 3405.2.1, then the building shall be rehabilitated to comply with applicable provisions of this code for load combinations including wind or seismic loads. The wind loads for the repair shall be as required by the building code in effect at the time of original construction, unless the damage was caused by wind, in which case the wind loads shall be as required by the code in effect at the time of original construction or as required by this code, whichever are greater.

Where the damage was caused by earthquake and the Instrumental Intensity of the earthquake at the site of the building as determined using data from the United States Geological Survey was VII or greater, the seismic design forces for the repair shall be those required for the design of the pre-damage building. Where the damage was not caused by earthquake or if the damage caused by an earthquake with an Instrumental Intensity of less than VII at the site of the building, the seismic design forces for the rehabilitation shall be those required for the design of the pre-damage building, but not less than seventy-five percent of those prescribed in Section 1613.

~~Earthquake loads for this rehabilitation design shall be those required for the design of the pre-damage building, but not less than seventy-five percent of those prescribed in Section 1613.~~ New structural members and connections required by this rehabilitation design shall comply with the detailing provisions of this code for new buildings of similar structure, purpose and location.

Reason: This change is intended to make seismic upgrades of the lateral force resisting system after a large earthquake logical. Suppose that a large, design-level earthquake (the "big one") occurs in a major city. On the basis even of today's IBC design criteria, it is reasonable to expect that large numbers of buildings will experience significant damage as a result of the earthquake, even to buildings that conform or nearly conform to current code. Yet despite these damaged buildings all performing within the expectation of the current code, the proposed upgrade triggers would require further potentially massive and costly upgrades beyond the repairs already needed, because the proposed upgrade triggers do not permit any consideration of the intensity of the earthquake shaking responsible for the damage. Why would any engineer conclude that a city full of buildings that went through a major earthquake but protected life safety should be seismically upgraded? Why would any community want to mandate those upgrades? Why should the federal government, insurance companies, building owners, or taxpayers pay for those upgrades? Regarding this scenario, in their study of upgrade triggers, SEAONC concluded, "Requirements to upgrade such a large stock of buildings could put an undue economic burden on the private sector and delay regional recovery."

What this proposal does:
This proposal requires seismic upgrades of existing structures if the damage was not the result of earthquake activity or if the damage was caused by earthquake but was disproportionate to the intensity of the earthquake (i.e. significant structural damage when the Instrumental Intensity of the earthquake at the site was less than VII, as measured by the United States Geological Survey).

If an earthquake had a moderate or heavy damage potential at a particular site (Instrumental Intensity of VII or greater) and a structure at that site experienced substantial structural damage, this would not necessarily be unexpected even for a new building and seismic upgrade of the whole building to current code (or close to current code) would generally not be warranted. If, on the other hand, the Instrumental Intensity of say V or VI (very light or light potential damage) and significant structural damage occurred, then the structure may be overly susceptible to earthquake damage and strengthening is arguably prudent.

For copies of articles dealing with the problems with the Oakland Earthquake Ordinance or with the "substantial structural damage" trigger, please email me at gsearer@wje.com.

Bibliography:

"Evaluation of the Effects of Oakland's Earthquake Damage Repair Ordinance" by Gary R. Searer, Terrence F. Paret, Sigmund A. Freeman, and Una M. Gilmartin, 8th US Conference on Earthquake Engineering, San Francisco, April 2006.

Handbook to the Uniform Building Code: An Illustrative Commentary, International Conference of Building Officials (ICBO), 1998, Whittier, CA.

"Repair of Existing Structures and the International Existing Building Code" by Gary R. Searer and Terrence F. Paret, 8th US Conference on Earthquake Engineering, San Francisco, April 2006.

"Repercussions of the International Existing Building Code on the Repair of Existing Structures" by Terrence F. Paret and Gary R. Searer, ASCE Structures Congress, Forensics Congress, April 2005.

"SEAONC's SFBC Structural Damage Repair Study Group Report and Recommendations" by the Structural Engineers Association of Northern California (SEAONC), April 3, 2008.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SEARER-G2-3405.2.3

G196–09/10
3405.5 (IEBC [B] 304.5)

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3405.5 (IEBC [B] 304.5) Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3, any repair that constitutes substantial improvement of the *existing structure*, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the *existing structure* shall be brought into compliance with the requirements for new construction for flood design.

For buildings and structures in flood hazard areas established in Section 1612.3, any repairs that do not constitute substantial improvement ~~or substantial damage~~ of the *existing structure*, as defined in Section 1612.2, are not required to comply with the flood design requirements for new construction.

Reason: ICC added the words "or substantial damage" in the course of editing 2006 section 3403.1.2 per proposal G203-07/08. G203 split section 3403 into three sections, so the flood provision now occur three times, each slightly different. But the words "or substantial damage" need not be added. The Code Correlation Committee has removed the text from Sections 3403.2 and 3404.2.

- 3405.5. ICC should not have added the words "or substantial damage," which make no sense in this context. Repairs do not constitute damage.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The Code Correlation Committee editorially corrected Section 3405.5 of the IBC (304.5 IEBC) to read as follows:

3405.5 (IEBC [B] 304.5) Flood hazard areas. For buildings and structures in flood hazard areas established in Section 1612.3, any repair that constitutes substantial improvement of the *existing structure*, as defined in Section 1612.2, shall comply with the flood design requirements for new construction, and all aspects of the *existing structure* shall be brought into compliance with the requirements for new construction for flood design.

For buildings and structures in flood hazard areas established in Section 1612.3, any repairs that do not constitute substantial improvement or repair of substantial damage of the *existing structure*, as defined in Section 1612.2, are not required to comply with the flood design requirements for new construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: BONOWITZ-G2-3403.2.DOC

G197–09/10
3408.4 (IEBC [B] 307.4)

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3408.4 (IEBC [B] 307.4) ~~Change of occupancy~~ Seismic (IEBC Structural). When a change of occupancy results in a structure being reclassified to a higher occupancy category, the structure shall conform to the seismic requirements for a new structure of the higher occupancy category. Where the existing seismic force-resisting system is a type that can be designated ordinary, values of R,Ω_0 and C_d for the existing seismic force-resisting system shall be those specified by this code for an ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of a detailed, intermediate or special system.

Exceptions:

1. Specific seismic detailing requirements of Section 1613 for a new structure shall not be required to be met where ~~it can be shown that the level of performance and seismic safety is~~ the seismic performance is shown to be equivalent to that of a new structure. ~~Such analysis~~ A demonstration of equivalence shall consider the regularity, overstrength, redundancy and ductility of the structure ~~within the context of the existing and retrofit (if any) detailing provided~~.
2. When a change of use results in a structure being reclassified from Occupancy Category I or II to Occupancy Category III and the structure is located in a seismic map area where $S_{DS} < 0.33$, compliance with the seismic requirements of Section 1613 is not required.

Reason: This proposal is editorial, for consistency. The Code Correlation Committee approved other editorial revisions to related provisions in Chapter 34 (Chapter 3 of the IEBC). This change to section 3408.4 has two elements:

1. The title change is an editorial revision proposed so that the name of the subsection is more appropriate and does not duplicate the name of the larger section.
2. The revision to the text of Exception 1 is an editorial clarification.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: BONOWITZ-G1B-CHPT 34.doc

G198–09/10
3410.1 (IEBC [B] 309.1)

Proponent: Patrick Vandergriff, Vandergriff Code Consulting Services, representing Modular Building Institute

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC GENERAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE IBC GENERAL CODE COMMITTEE.

PART I – IBC GENERAL

Revise as follows:

3410.1 Conformance. Structures moved into or within the jurisdiction shall comply with the provisions of this code for new structures or Chapter 12 of the *International Existing Building Code*.

PART II – IEBC

Revise as follows:

[B] 309.1 Conformance. Structures moved into or within the jurisdiction shall comply with the *International Building Code* for new structures or with Chapter 12 of this code.

Reason: Several proposed code changes deal with the issues relative to modular construction in relation to the relocation of other structures or the use of temporary structures defined as tents, membrane structures and similar structures. The proposed language states compliance with the code and thereby requires compliance but allows for other language to be applied that may be specific to temporary and modular buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: These two code sections are typically linked such that changes to Sec. 3410.1 of the IBC would automatically change Sec. 309.1, but the nature of the proposed change, it was felt it would be clearer to show how each code would appear as the result of this proposal.

PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: VANDERGRIFF-G6-3410.1.doc

G199–09/10
3410.1(IEBC [B] 309.1), 3410.2 through 3410.8 (New)

Proponent: Patrick Vandergriff, Vandergriff Code Consulting Services, representing Modular Building Institute

1. Delete without substitution:

~~**3410.1 (IEBC [B] 309.1) Conformance.** Structures moved into or within the jurisdiction shall comply with the provisions of this code for new structures.~~

2. Add new text as follows:

3410.1 General. The relocation of any building to another location where the effects of wind, snow, flood or seismic provisions is greater than the percentage of increased loads allowed by this section relocated buildings shall comply with the requirements of Sections 3410.2 and Section 3410.8.

3410.2 Location on the lot. The building shall be located on the lot in accordance with the requirements of this code, or the *International Residential Code,* as applicable.

3410.3 Foundation. The foundation system of relocated buildings shall comply with Chapter 18, or the *International Residential Code* as applicable.

Exception: Foundations for modular structures are permitted to be of any materials allowed by the code and installed in accordance with either:

1. The manufacturers design requirements; or
2. An approved engineered design.

3410.3.1 Connection to the foundation. The connection of the relocated building to the foundation shall comply with Chapter 18, or the *International Residential Code,* as applicable.

3410.4 Wind loads. Buildings shall comply with Section 1609, or *International Residential Code* wind provisions, as applicable.

Exceptions:

1. Detached one- and two-family dwellings and Group U occupancies where wind loads at the new location are not higher than those at the previous location.
2. Structural elements whose stress is not increased by more than 5 percent.

3410.5 Seismic loads. Buildings shall comply with Section 1613, or *International Residential Code* seismic provisions, as applicable, to the new location.

Exceptions:

1. Structures in Seismic Design Categories A and B and detached one- and two-family dwellings in Seismic Design Categories A, B, and C where the seismic loads at the new location are not higher than those at the previous location.
2. Structural elements whose stress is not increased by more than 5 percent.

3410.6 Snow loads. Structures shall comply with Section 1608, or *International Residential Code* snow loads, as applicable, where snow loads at the new location are higher than those at the previous location.

Exception: Structural elements whose stress is not increased by more than 5 percent.

3410.7 Flood hazard areas. If relocated or moved into a *flood hazard area*, structures shall comply with Section 1612.

3410.8 Required inspection and repairs. The building official shall be authorized to inspect, or to require approved professionals to inspect at the expense of the owner, the various structural parts of a relocated building to verify that structural components and connections have not sustained structural damage. Any repairs required by the building official as a result of such inspection shall be made prior to the final approval.

Reason: This corresponds to several code change proposals establishing more clear definition and use issue with modular construction. This language provides the same language of the International Existing Building Code, Chapter 12 provisions dealing with the relocation of structures.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: This text is a copy of IEBC Chapter 12. If this proposal is approved, the Code Correlation Committee will decide if IEBC or IBC will control these provisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: VANDERGRIFF-G7-3410.1 NEW.doc

G200–09/10
3411.8.8 (IEBC [B] 310.8.8)

Proponent: Karen L. Braitmayer, FAIA, Studio Pacifica, Ltd, representing self

THIS PROPOSAL IS ON THE AGENDA OF THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC MEANS OF EGRESS CODE DEVELOPMENT COMMITTEE.

Revise as follows:

3411.8.8 (IEBC [B] 310.8.8) Type A dwelling or sleeping units. Where more than 20 Group R-2 *dwelling* or sleeping units are being altered or added, the requirements for Section 1107 for Type A units apply only to the quantity of spaces being altered or added.

Reason: This proposal retains language that has been in the IBC since 2003. Loss of this language in the 2009 reduces the percentage of Type A housing stock required by IBC.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: The correlative text in the International Existing Building Code is in Sections 605.1.9 and 706.4.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BRAITMAYER-G1-3411.8.8

G201–09/10
3412.6.2.1(IEBC [B] 1301.6.2.1)

Proponent: Maureen Traxler representing City of Seattle, WA, Seattle Dept of Planning & Development

Revise as follows:

3412.6.2.1 (IEBC [B] 1301.6.2.1) Allowable area formula. The following formula shall be used in computing allowable area:

~~$A_a = (1 + I_f + I_s) \times A_t$~~

$A_a = \{A_t + [A_t \times I_f] + [A_t \times I_s]\}$ **(Equation 34-2) (IEBC Equation 13-3)**

where:

A_a = Allowable building area per story (square feet).
A_t = Tabular building area per story in accordance with Table 503 (square feet) of the *International Building Code*.
I_s = Area increase factor due to for sprinklers protection as calculated in accordance with (Section 506.3)
I_f = Area increase factor due to for frontage as calculated in accordance with (Section 506.2).

Reason: The purpose of the proposal is to coordinate the equations used to calculate area in the IEBC with the IBC. Both equations are intended to result in the same answer, and the definitions for the IEBC equation reference the IBC. However, the two codes use different characters, adding confusion.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TRAXLER-G1.1-1301.6.2.1

G202–09/10
3412.6.14, 3412.6.14.1 (IEBC [B] 1301.6.14, 1301.6.14.1)

Proponent: Brian Black, BDBlack Codes, Inc., representing National Elevator Industry, Inc. (NEII)

Revise as follows:

3412.6.14 (IEBC [B] 1301.6.14) Elevator control. Evaluate the passenger elevator equipment and controls that are available to the fire department to reach all occupied floors. Emergency recall and in-car operation of elevators ~~recall controls~~ shall be provided in accordance with the *International Fire Code*. Under the categories and occupancies in Table 3412.6.14, determine the appropriate value and enter that value into Table 3412.7 under Safety Parameter 3412.6.14, Elevator Control, for fire safety, means of egress and general safety. The values shall be zero for a single-story building.

TABLE 3412.6.14 (IEBC [B] TABLE 1301.6.14)
ELEVATOR CONTROL VALUES

ELEVATOR TRAVEL	CATAGORIES			
	a	b	c	d
Less than 25 feet of travel above or below the primary level of elevator access for emergency fire-fighting or rescue personnel	-2	0	0	+2
Travel of 25 feet or more above or below the primary level of elevator access for emergency fire-fighting or rescue personnel	-4	NP	0	+4

For SI: 1 foot = 304.8 mm.

3412.6.14.1 (IEBC [B] 1301.6.14.1) Categories. The categories for elevator controls are:

1. Category a — No elevator.
2. Category b—Any elevator without Phase I emergency recall operation and Phase II ~~recall~~ emergency in-car operation.
3. Category c — All elevators with Phase I emergency recall operation and Phase II ~~recall~~ emergency in-car operation as required by the *International Fire Code*.
4. Category d—All meet Category c; or Category b where permitted to be without Phase I emergency recall operation and Phase II emergency in-car operation ~~recall~~; and at least one elevator that complies with new construction requirements serves all occupied floors.

Reason: Correct terminology to correspond with Section 3003.2 and ASME A17.1/CSA B44.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: BLACK-G4-3412.6.14.doc

G203–09/10
3412.6.19 (IEBC [B] 1301.6.19)

Proponent: David S. Collins, FAIA, The Preview Group, Inc., The American Institute of Architects

Revise as follows:

3412.6.19 (IEBC [B] 1301.6.19) Incidental accessory occupancy. Evaluate the protection of incidental accessory occupancies in accordance with Section 508.2.5. Do not include those occupancies where this code requires suppression throughout the buildings, including covered mall buildings, high-rise buildings, public garages and unlimited area buildings, or where Section 508.1 of the code allows the occupancies to be an accessory use, or mixed use separated or nonseparated. Assign the lowest score from Table 3412.6.19 for the building or floor area being evaluated and enter that value into Table 3412.7 under Safety Parameter 3412.6.19, Incidental Accessory Occupancy, for fire safety, *means of egress* and general safety. If there are no specific occupancy areas in the building or floor area being evaluated, the value shall be zero.

Reason: The application of the incidental accessory occupancy section of the code was not intended to be applied to accessory or mixed use conditions. This change will clarify that when considering a mixed use condition, Chapter 34 applies Section 3412.6 to such conditions, not Section 3412.6.19. Section 508.1 allows uses to be either considered an accessory use, mixed use or incidental accessory.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: COLLINS-G7-3412.6.19

G204–09/10
Appendix L (New); IRC Appendix L

Proponent: John England, MCO, England Enterprises Inc., representing Cities of Beaufort and Hardeeville, SC.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC GENERAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC GENERAL

Add new appendix as follows:

APPENDIX L
PERMIT FEES

(The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.)

L101.1 Schedule of permit fees. On buildings, structures, signs, pools, electrical, gas, mechanical and plumbing systems or alterations requiring a permit, a fee for each permit shall be paid as required, in accordance with Table L101.1.

TABLE L101.1
PERMIT FEE SCHEDULE

TOTAL VALUATION	FEE
$1 to $ 500	$50.00
$501 to $2,000	$50 for the first $500; plus $3 for each additional $ 100 or fraction thereof, to and including $2,000.
$2,001 to $40,000	$69 for the first $2,000; plus $11 for each additional $1,000 or fraction thereof, to and including $40,000
$40,001 to $100,000	$487 for the first $40,000; plus $9 for each additional $1,000 or fraction thereof, to and including $100,000
$100,001 to $500,000	$1,027 for the first $100,000; plus $7 for each additional $1,000 or fraction thereof, to and including $500,000
$500,001 to $1,000,000	$3,827 for the first $500,000; plus $5 for each additional $1,000 or fraction thereof, to and including $1,000,000
$1,000,001 to $5,000,000	$6,327 for the first $1,000,000; plus $3 for each additional $1,000 or fraction thereof, to and including $5,000,000
$5,000,001 and over	$18,327 for the first $ 5,000,000; plus $1 for each additional $1,000 or fraction thereof

L101.2 Plan review fees: One half of the require permit fee per Table L101.1, $75.00 minimum, shall be paid at time of submission of plans and specifications.

Exception: When no plan review is required by the building official, no fee shall be charged.

L101.3 Electrical, plumbing, mechanical, and gas permits fees. Electrical, plumbing, mechanical, and gas permit fees shall be based on Table L101.1.

Exception: Where the value of the electrical, plumbing, mechanical, and gas trades are included in the total construction cost as stated in Section 109.3, there shall be no additional charge for the permit.

L101.4 Re-inspection fees. $50.00 per trade per visit shall be charged to the contractor or homeowner. Re-inspection fees shall be paid in advance prior to the re-inspection. It shall be at the determination of the Building Official to waive re-inspection fees under certain condition.

L101.5 Building permit valuations. The applicant for a permit shall provide an estimated permit value at time of application. Permit valuations shall include total value of work, including materials and labor, for which the permit is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. If, in the opinion of the building official, the valuation is underestimated on the application, the permit shall be denied, unless the applicant can show detailed estimates to meet the approval of the building official. Final building permit valuation shall be set by the building official. The BVD (Building Valuation Data) published every 6 months by ICC (International Code Council) shall be used in help determining the construction value.

L101.6 Work commencing before permit issuance. Any person who commences any work on a building, structure, electrical, gas, mechanical or plumbing system before obtaining the necessary permits the fees shall be doubled in accordance with Section 109.4

PART II – IRC BUILDING AND ENERGY

Add new appendix as follows:

APPENDIX L
PERMIT FEES

(The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.)

L101.1 Schedule of permit fees. On buildings, structures, signs, pools, electrical, gas, mechanical and plumbing systems or alterations requiring a permit, a fee for each permit shall be paid as required, in accordance with Table L101.1.

L101.2 Plan review fees:
One half of the require permit fee per Table L101.1, $75.00 minimum, shall be paid at time of submission of plans and specs.

Exception: When no plan review is required by the building official, no fee shall be charged.

L101.3 Electrical, plumbing, mechanical, and gas permits fees. Electrical, plumbing, mechanical, and gas permit fees shall be based on Table L101.1

Exception: Where the value of the electrical, plumbing, mechanical, and gas trades are included in the total construction cost as stated in sections R108.3, there shall be no additional charge for the permit.

L101.4 Re-inspection Fees. $50.00 per trade per visit shall be charged to the contractor or homeowner. Re-inspection fees shall be paid in advance prior to the re-inspection. It shall be at the determination of the Building Official to wave re-inspection fees under certain condition.

L101.5 Building permit valuations. The applicant for a permit shall provide an estimated permit value at time of application. Permit valuations shall include total value of work, including materials and labor, for which the permit is being issued, such as electrical, gas, mechanical, plumbing equipment and permanent systems. If, in the opinion of the building official, the valuation is underestimated on the application, the permit shall be denied, unless the applicant can

show detailed estimates to meet the approval of the building official. Final building permit valuation shall be set by the building official. The BVD (Building Valuation Data) published every 6 months by ICC (International Code Council) shall be used in help determining the construction value.

L101.6 Work commencing before permit issuance. Any person who commences any work on a building, structure, electrical, gas, mechanical or plumbing system before obtaining the necessary permits the fees shall be doubled in accordance with Section R108.6.

TABLE L101.1
PERMIT FEE SCHEDULE

TOTAL VALUATION	FEE
$1 to $ 500	$50.00 ~~$24.00~~
$501 to $2,000	$50 ~~$24~~ for the first $500; plus $3 for each additional $ 100 or fraction thereof, to and including $2,000.
$2,001 to $40,000	$69 for the first $2,000; plus $11 for each additional $1,000 or fraction thereof, to and including $40,000
$40,001 to $100,000	$487 for the first $40,000; plus $9 for each additional $1,000 or fraction thereof, to and including $100,000
$100,001 to $500,000	$1,027 for the first $100,000; plus $7 for each additional $1,000 or fraction thereof, to and including $500,000
$500,001 to $1,000,000	$3,827 for the first $500,000; plus $5 for each additional $1,000 or fraction thereof, to and including $1,000,000
$1,000,001 to $5,000,000	$6,327 for the first $1,000,000; plus $3 for each additional $1,000 or fraction thereof, to and including $5,000,000
$5,000,001 and over	$18,327 for the first $ 5,000,000; plus $1 for each additional $1,000 or fraction thereof

Reason: Many new jurisdictions coming on line need some help in determining permit fees. The table was in the IRC and should also be in the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC R/E

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENGLAND-G7-APPENDIX L and (ENGLAND-RB1 APPENDIX L).doc

G205–09/10
Appendix L (New); Chapter 35

Proponent: Steve Ferguson, American Society of Heating, Refrigerating, and Air-Conditioning Engineers, representing American Society of Heating, Refrigeration, Heating & Air-Conditioning (ASHRAE)

Add new appendix as follows:

APPENDIX L
HIGH-PERFORMANCE GREEN BUILDINGS

The provisions in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION L101
GENERAL

L101.1 Scope. The provisions of this appendix are applicable to all buildings except those within the scope of the IRC and Group R-2, R-3 and R-4 buildings three stories or less in building height above grade plane.

L101.2 Intent. The intent of this appendix is to provide mandatory requirements for the construction, alteration and renovation of and addition to buildings within its scope. Such requirements are intended to conserve energy and natural resources and lessen, overall, the negative impact on the environment from buildings and the occupation and use of buildings.

L101.3 Requirements. The construction, alteration, and renovation of and addition to buildings shall comply with this code, ASHRAE/IES/USGBC 189.1, the *International Fire Code, International Wildland Urban Interface Code, International Zoning Code, International Mechanical Code, International Fuel Gas Code, International Plumbing Code, International Private Sewage Disposal code, International Property Maintenance Code, International Energy Conservation Code, International Existing Buildings Code* and NFPA 70.

SECTION L102 (Chapter 35)
REFERENCED STANDARDS

ASHRAE 189.1–200X	Standard for the Design of High-Performance, Green Buildings Except Low-Rise Residential Buildings

Reason: The purpose of this proposed change is to add a new appendix to the IBC.

The proposed appendix will reference ASHRAE/USGBC/IESNA Standard 189.1 for High-Performance Green Buildings Except Low-Rise Residential Buildings and this will provide jurisdictions with a newly-developed, consensus-based standard that can be used to develop local code requirements specific to green buildings or that could be applied to all buildings covered by the standard.

Green buildings are currently being designed and constructed nationwide using different programs guidelines, rating systems, and standards that are not develop using consensus-based methods. ASHRAE's standard was developed under the direction of ASHRAE members and in conjunction with representatives from other nationally-recognized organizations with experience and expertise in this field. This standard will provide a publicly-reviewed resource for local jurisdictions to use in the administration of green building construction. Several state and local jurisdictions already require, or are considering a requirement, that building projects within their jurisdiction be designed and constructed according to "green building" principles. In many cases, limited guidance is given as to the criteria to be used to determine if the building project meets the expectations. Standard 189.1 provides a publicly-reviewed resource for local jurisdictions to adopt and use in the administration of green building construction.

More information to come after the SPC 189.1 meeting on June 24, 2009.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASHRAE 189.1, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FERGUSON-G1-APPENDIX L NEW

G206–09/10
Appendix L (New)

Proponent: Dwayne Garriss, Georgia State Fire Marshal's Office – Centers for Medicare and Medicaid Services Life Safety Administration

Add new appendix as follows:

APPENDIX L
CMS FORMS

The provisions contained in this appendix are not mandatory unless specifically adopted or referenced in an adopting ordinance.

SECTION L101
GENERAL

L101.1 Scope. The provisions of this appendix apply to all facilities where a provider or supplier has voluntarily applied for certification or accreditation in the Medicare/Medicaid program meeting the requirements of and approved by CMS as specified in 42 CFR. The survey forms in this appendix are used for all Life Safety Compliance surveys (initial and recertification) of facilities subject to Survey and Certification inspections for Medicare/Medicaid certification. This includes, but is not limited to, Skilled Nursing Facilities (SNFs), Nursing Facilities (NFs) whether freestanding, distinct parts, or dually certified, Intermediate Care Facilities for Mentally Retarded (ICFs/MR), Ambulatory Surgical Centers (ASC), inpatient Hospice facilities, Program for All inclusive Care for the Elderly (PACE) facilities, Critical Access Hospitals (CAH), Psychiatric and General Hospitals, including validation surveys of accredited facilities. These survey forms also apply to complaint investigations.

L101.2 Purpose. Certification is a recommendation made by the State survey agency on the compliance of providers and suppliers with the conditions of participation, requirements for Skilled Nursing Facilities (SNFs), Nursing Facilities (NFs) whether freestanding, distinct parts, or dually certified, Intermediate Care Facilities for Mentally Retarded (ICFs/MR), Ambulatory Surgical Centers (ASC), inpatient Hospice facilities, Program for All inclusive Care for the Elderly (PACE) facilities, Critical Access Hospitals (CAH), Psychiatric and General Hospitals. In order to safeguard the health, welfare and safety of individuals served within a facility, it is imperative that a facility not only attain substantial compliance in each area of identified deficiencies, but that it maintain/remain in continuous compliance. The provisions established in this appendix provided the minimum standards for new facilities which voluntarily seek certification or accreditation in the Medicare/Medicaid program. These minimum standards do exceed some of the minimum occupancy requirements established within the body of this Code which are necessary to meet the requirements of the Centers for Medicare and Medicaid Services as specified in 42 CFR.

SECTION L102
DEFINITIONS AND EQUIVALENCIES

L102.1 Definitions. For the purposes of this appendix chapter, the terms, phrases and words listed in this section and their derivatives shall have the indicated meanings.

ACCREDITED PROVIDER or SUPPLIER. A provider or supplier that has voluntarily applied for and has been accredited by a national accreditation program meeting the requirements of and approved by CMS in accordance with Section 488.5 or Section 488.6.

CMS. The Centers for Medicare & Medicaid Services. Formerly known as the Health Care Financing Administration (HCFA), which is the federal agency responsible for administering the Medicare and Medicaid programs.

L102.2 Construction type equivalencies. For the purposes of this appendix chapter, Table L102.2 shall be utilized for cross referencing the various construction types for use in the applicable CMS forms which are in the terms of the NFPA 220, entitled, "Standard on Types of Building Construction."

TABLE L102.2
CONVERSION TO NFPA 220 CONSTRUCTION TYPES USED ON CMS FORMS

Conversion Table to NFPA 220 Construction Types for CMS Forms										
NFPA 220	Type I 443	Type I 332	Type II 222	Type II 111	Type II 000	Type III 211	Type III 200	Type IV 2HH	Type V 111	Type V 000
SBC	I	II	----	IV 1HR	IV UNP	V 1HR	V UNP	III	VI 1HR	VI UNP
UBC	---	I FR	II FR	II-1HR	II N	III-1HR	III N	IV HT	V 1HR	V-N
B/NBC	1A	1B	2A	2B	2C	3A	3B	4	5A	5B
IBC	---	IA	IB	IIA	IIB	IIIA	IIIB	IV	VA	VB

SECTION L103
APPLICATION FORMS

L103.1 Application. The following forms shall be used to verify substantial compliance with regards to Life Safety for the Department of Health and Human Services Centers for Medicare and Medicaid Services.

1. Form CMS-2786M entitled, Worksheet for Rating Residents.

2. Form CMS-2786R entitled, "FIRE SAFETY SURVEY REPORT 2000 CODE – HEALTH CARE Medicare – Medicaid"

3. Form CMS-2786S entitled, "FIRE SAFETY SURVEY REPORT SHORT FORM Medicare – Medicaid"

4. Form CMS-2786T entitled, "FIRE/SMOKE ZONE* EVALUATION WORKSHEET FOR HEALTH CARE FACILITIES"

5. Form CMS-2786U entitled, "FIRE SAFETY SURVEY REPORT – AMBULATORY SURGICAL CENTERS Medicare"

6. Form CMS-2786V entitled, "FIRE SAFETY SURVEY REPORT - 2000 LIFE SAFETY CODE Intermediate Care Facilities for the Mentally Retarded – SMALL"

7. Form CMS-2786W entitled, "FIRE SAFETY SURVEY REPORT - 2000 LIFE SAFETY CODE Intermediate Care Facilities for the Mentally Retarded – LARGE"

8. Form CMS-2786X entitled, "FIRE SAFETY SURVEY REPORT - 2000 LIFE SAFETY CODE Intermediate Care Facilities for the Mentally Retarded - APARTMENT HOUSE"

9. Form CMS-2786Y entitled, "FIRE SAFETY SURVEY REPORT - 2000 LIFE SAFETY CODE Intermediate Care Facilities for the Mentally Retarded - SMALL FSES"

FIRE SAFETY SURVEY — 2000 LIFE SAFETY CODE

F-1 SIDE 1

Worksheet for Rating Residents

Complete one Worksheet for each resident.
Read Instruction Manual before filling out this form.
Base ratings on commonly observed examples of poor performance.

Resident's Name	Rater
Facility	Date

Write any explanatory remarks you may wish to make here:

Surveyor *(Signature)*	Title	Date
Surveyor ID		
Fire Authority Official *(Signature)*	Title	Date

COMPLETE OTHER SIDE FIRST

F-1 SIDE 2 Worksheet for Rating Residents

Read Instruction Manual before filling out this form.
Base ratings on commonly observed examples of poor performance.

F-1A Rating the Resident on the Risk Factors

Rating the resident on each of the factors below by checking the one circle in each risk factor that best describes the resident. For the first six factors, write the scores for the circles you checked in the appropriate score boxes in the far right column. For "response to fire drills," write the three checked scores in the large circles. Write the sum of the 3 scores in the large box on the right.

					SCORE BOXES
I. Risk of Resistance *(Check only one)*	Minimal Risk ○ score = 0	Risk of Mild Resistance ○ score = 6	Risk of Strong Resistance ○ score = 20		
II. Impaired Mobility *(Check only one)*	Self-Starting ○ score = 0	Slow ○ score = 3	Needs Limited Assistance ○ score = 6	Needs Full Assistance or Very Slow ○ score = 20	
III. Impaired Consciousness *(Check only one)*	No Significant Risk ○ score = 0	Partially Impaired ○ score = 6	Totally Impaired ○ score = 20		
IV. Need for Extra Help *(Check only one)*	Needs at Most One Staff ○ score = 0	Needs Limited Assistance from 2 Staff ○ score = 30	Needs Full Assistance from 2 Staff ○ score = 40		
V. Response to Instructions *(Check only one)*	Follows Instructions ○ score = 1	Requires Supervision ○ score = 3	Requires Considerable Attention/May Not Respond ○ score = 10		
VI. Waking Response to Alarm *(Check only one)*	Response Probable ○ score = 0	Response Not Probable ○ score = 6			
VII. Response to Fire Drills (Without Guidance or Advice from Staff)	Initiates and Completes Evacuation Promptly	Yes ○ score = 0	No ○ score = 8	○	
	Chooses and Completes Back-up Strategy	Yes ○ score = 0	No ○ score = 4	+ ○	
	Stays at Designated Location	Yes ○ score = 0	No ○ score = 6	+ ○	

SUM OF THESE THREE ITEMS

F-1B Finding the Resident's Overall Need For Assistance

Compare the numbers in the 7 score boxes you have filled in.
Take the one highest score from the score boxes and write it in this box:

EVACUATION ASSISTANCE SCORE

FIRE SAFETY SURVEY REPORT
CRUCIAL DATA EXTRACT
(TO BE USED WITH CMS-2786 FORMS)

PROVIDER NUMBER K1	FACILITY NAME	SURVEY DATE * K4

K6 DATE OF PLAN APPROVAL

K3 MULTIPLE CONSTRUCTION

TOTAL NUMBER OF BUILDINGS _____

NUMBER OF THIS BUILDING _____

☐

A BUILDING
B WING
C FLOOR
D APARTMENT UNIT

LSC FORM INDICATOR

Health Care Form		
12	2786R	2000 EXISTING
13	2786R	2000 NEW

ASC Form		
14	2786U	2000 EXISTING
15	2786U	2000 NEW

ICF/MR Form		
16	2786V, W, X	2000 EXISTING
17	2786V, W, X	2000 NEW

* K7 ☐ SELECT NUMBER OF FORM USED FROM ABOVE

COMPLETE IF ICF/MR IS SURVEYED UNDER CHAPTER 21

SMALL (16 BEDS OR LESS)

K8: ☐ 1 PROMPT 2 SLOW 3 IMPRACTICAL

LARGE

K8: ☐ 4 PROMPT 5 SLOW 6 IMPRACTICAL

APARTMENT HOUSE

K8: ☐ 7 PROMPT 8 SLOW 9 IMPRACTICAL

(Check if K29 or K56 are marked as not applicable in the 2786 M, R, T, U, V, W, X and Y.)

K29: ☐ K56: ☐

ENTER E – SCORE HERE

K5: ☐ e.g. 2.5

*K9: FACILITY MEETS LSC BASED ON *(Check all that apply)*

A1. ☐ (COMP. WITH ALL PROVISIONS)
A2. ☐ (ACCEPTABLE POC)
A3. ☐ (WAIVERS)
A4. ☐ (FSES)
A5. ☐ (PERFORMANCE BASED DESIGN)

FACILITY DOES NOT MEET LSC

B. ☐

K0180

A. ☐ FULLY SPRINKLERED (All required areas are sprinklered)
B. ☐ PARTIALLY SPRINKLERED (Not all required areas are sprinklered)
C. ☐ NONE (No sprinkler system)

* MANDATORY

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR MEDICARE & MEDICAID SERVICES

2000 CODE

Form Approved
OMB No. 0938-0242

FIRE SAFETY SURVEY REPORT 2000 CODE - HEALTH CARE
Medicare – Medicaid

1. (A) PROVIDER NUMBER	1. (B) MEDICAID I.D. NO.
K1	K2

PART I — Life & Safety Code, New and Existing
PART IV — Waiver Recommendation Form

Identifying information as shown in applicable records. Enter changes, if any, alongside each item, giving date of change.

2. NAME OF FACILITY	2. (A) MULTIPLE CONSTRUCTION (BLDGS)	2. (B) ADDRESS OF FACILITY (STREET, CITY, STATE, ZIP CODE)	
	A. BUILDING _____ B. WING _____ C. FLOOR _____ K3		A. ☐ Fully Sprinklered (All required areas are sprinklered) B. ☐ Partially Sprinklered (Not all required areas are sprinklered) C. ☐ None (No sprinkler system) K3180

3. SURVEY FOR	4. DATE OF SURVEY	DATE OF PLAN APPROVAL	SURVEY UNDER
☐ MEDICARE ☐ MEDICAID	K4	K5	5. ☐ 2000 EXISTING 6. ☐ 2000 NEW K7

5. SURVEY FOR CERTIFICATION OF

1. ☐ HOSPITAL 2. ☐ SKILLED/NURSING FACILITY 4. ☐ ICF/MR UNDER HEALTH CARE 5. ☐ HOSPICE

IF "2" OR "5" ABOVE IS MARKED, CHECK APPROPRIATE ITEM(S) BELOW	3. ☐ IF DISTINCT PART OF HOSPITAL, IS HOSPITAL ACCREDITED BY JCAHO/ACA?
1. ☐ ENTIRE FACILITY 2. ☐ DISTINCT PART OF (SPECIFY)_____	a. ☐ YES b. ☐ NO

6. BED COMPOSITION a. TOTAL NO. OF BEDS IN THE FACILITY _____	b. NUMBER OF HOSPITAL BEDS CERTIFIED FOR MEDICARE ____	c. NUMBER OF SKILLED BEDS CERTIFIED FOR MEDICARE _____	d. NUMBER OF SKILLED BEDS CERTIFIED FOR MEDICAID _____	e. NUMBER OF NF or ICF/MR BEDS CERTIFIED FOR MEDICAID _____

7. A. ☐ THE FACILITY MEETS, BASED UPON (CHECK ALL APPROPRIATE BOXES)

1. ☐ COMPLIANCE WITH ALL PROVISIONS 2. ☐ ACCEPTANCE OF A PLAN OF CORRECTION 3. ☐ RECOMMENDED WAIVERS 4. ☐ FSES 5. ☐ PERFORMANCE BASED DESIGN

B. ☐ THE FACILITY DOES NOT MEET THE STANDARD

K9

SURVEYOR *(Signature)*	TITLE	OFFICE	DATE
SURVEYOR ID K10			
FIRE AUTHORITY OFFICIAL *(Signature)*	TITLE	OFFICE	DATE

Name of Facility 2000 CODE

ID PREFIX					MET	NOT MET	N/A	REMARKS
	PART I - LSC REQUIREMENTS - Items in italics relate to the FSES							
	BUILDING CONSTRUCTION							
K11	If the building has a common wall with a nonconforming building, the common wall is a fire barrier having at least a two hour fire resistance rating constructed of materials as required for the addition. Communicating openings occur only in corridors and shall be protected by approved self-closing fire doors. 18.1.1.4.1, 18.1.1.4.2, 19.1.1.4.1, 19.1.1.4.2							
K12	2000 EXISTING Building construction type and height meets one of the following: 19.1.6.2, 19.1.6.3, 19.1.6.4, 19.3.5.1							
	1		I (443), I (332), II (222)	Any Height				
	2		II (111)	One story only (non-sprinklered).				
	3		II (111)	Not over three stories with complete automatic sprinkler system.				
	4		III (211)	Not over two stories with complete automatic sprinkler system.				
	5		V (111)					
	6		IV (2HH)					
	7		II (000)					
	8		III (200)	Not over one story with complete automatic sprinkler system.				
	9		V (000)					
	☐ Building contains fire treated wood. *Give a brief description, in REMARKS, of the construction, the number of stories, including basements, floors on which patients are located, location of smoke or fire barriers and dates of approval. Complete sketch or attach small floor plan of the building as appropriate.*							

Form CMS-2786R (xx/xx) Previous Versions Obsolete Page 2

ID PREFIX					MET	NOT MET	N/A	REMARKS
K12	2000 NEW Building construction type and height meets one of the following: 18.1.6.2, 18.1.6.3, 18.2.5.1							
	1		I (443), I (332), II (222)	Any height with complete automatic sprinkler system				
	2		II (111)	Not over three stories with complete automatic sprinkler system				
	3		III (211)	Not over one story with complete automatic sprinkler system.				
	4		V (111)					
	5		IV (2HH)					
	6		II (000)					
	7		III (200)	Not Permitted				
	8		V (000)					
	☐ Building contains fire treated wood. *Give a brief description, in REMARKS, of the construction, the number of stories, including basements, floors on which patients are located, location of smoke or fire barriers and dates of approval. Complete sketch or attach small floor plan of the building as appropriate.*							
K103	Interior walls and partitions in buildings of Type I or Type II construction shall be noncombustible or limited-combustible materials. 18.1.6.3, 19.1.6.3 (Indicate N/A for existing buildings using listed fire retardant treated wood studs within non-load bearing one-hour rated partitions.)							

Name of Facility | 2000 CODE

ID PREFIX		MET	NOT MET	N/A	REMARKS
	INTERIOR FINISH				
K14	2000 EXISTING Interior finish for corridors and exitways, including exposed interior surfaces of buildings such as fixed or movable walls, partitions, columns, and ceilings has a flame spread rating of Class A or Class B. 19.3.3.1, 19.3.3.2 *Indicate flame spread rating's*_____				
	2000 NEW Interior finish for corridors and exitways, including exposed interior surfaces of buildings such as fixed or movable walls, partitions, columns, and ceilings has a flame spread rating of Class A or Class B. Lower portion of corridor walls can be Class C. 18.3.3.1, 18.3.3.2 *Indicate flame spread rating's*_____				
K15	2000 EXISTING Interior finish for rooms and spaces not used for corridors or exitways, including exposed interior surfaces of buildings such as fixed or movable walls, partitions, columns, and ceilings has a flame spread rating of Class A or Class B. (In fully-sprinklered buildings, flame spread rating of Class A, Class B, or Class C may be continued in use within rooms separated in accordance with 19.3.6 from the access corridors.) 19.3.3.1, 19.3.3.2 *Indicate flame spread rating's*_____				
	2000 NEW Interior finish for rooms and spaces not used for corridors or exitways, including exposed interior surfaces of buildings such as fixed or movable walls, partitions, columns, and ceilings has a flame spread rating of Class A or Class B. (Rooms not over 4 persons in capacity may have a flame spread rating of Class A, Class B, or Class C). 18.3.3.1, 18.3.3.2. *Indicate flame spread rating's*_____				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K16	Newly installed interior floor finish complying with 10.2.7 shall be permitted in corridors and exits if Class I. 18.3.3.3, 19.3.3.3 (Indicate N/A for existing interior floor finish.) In smoke compartments protected throughout by an approved, supervised automatic sprinkler system in accordance with 19.3.5.2, no interior floor finish requirements shall apply.				
	CORRIDOR WALLS AND DOORS				
K17	2000 EXISTING Corridors are separated from use areas by walls constructed with at least 1/2 hour fire resistance rating. In fully sprinklered smoke compartments, partitions are only required to resist the passage of smoke. In non-sprinklered buildings, walls properly extend above the ceiling. (Corridor walls may terminate at the underside of ceilings where specifically permitted by Code. Charting and clerical stations, waiting areas, dining rooms, and activity spaces may be open to corridor under certain conditions specified in the Code. Gift shops may be separated from corridors by non-fire rated walls if the gift shop is fully sprinklered.) 19.3.6.1, 19.3.6.2.1, 19.3.6.5 *If the walls have a fire resistance rating, give rating_____* *if the walls terminate at the underside of a ceiling, give a brief description in REMARKS, of the ceiling describing the ceiling throughout the floor area.*				
	2000 NEW Corridor walls shall form a barrier to limit the transfer of smoke. Such walls shall be permitted to terminate at the ceiling where the ceiling is constructed to limit the transfer of smoke. No fire resistance rating is required for the corridor walls. 18.3.6.1, 18.3.6.2, 18.3.6.5				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K18	2000 EXISTING Doors protecting corridor openings in other than required enclosures of vertical openings, exits, or hazardous areas shall be substantial doors, such as those constructed of 1¾ inch solid-bonded core wood, or capable of resisting fire for at least 20 minutes. Doors in fully sprinklered smoke compartments are only required to resist the passage of smoke. There is no impediment to the closing of the doors. Doors shall be provided with a means suitable for keeping the door closed. Dutch doors meeting 19.3.6.3.6 are permitted. 19.3.6.3 Roller latches are prohibited by CMS regulations in all health care facilities.				
	Show in REMARKS, details of doors, such as fire protection ratings, automatic closing devices, etc.				
	2000 New Doors protecting corridor openings shall be constructed to resist the passage of smoke. Doors shall be provided with positive latching hardware. Dutch doors meeting 18.3.6.3.6 are permitted. Roller latches shall be prohibited. 18.3.6.3				
	Show in REMARKS, details of doors, such as fire protection ratings, automatic closing devices, etc.				
K19	Vision panels in corridor walls or doors shall be fixed window assemblies in approved frames. (In fully sprinklered smoke compartments, there are no restrictions in the area and fire resistance of glass and frames.) 18.3.6.5, 18.3.6.3.1, 19.3.6.2.3, 19.3.6.3.8, 19.3.6.5				
K22	Access to exits shall be marked by approved, readily visible signs in all cases where the exit or way to reach exit is not readily apparent to the occupants. 7.10.1.4				
	VERTICAL OPENINGS				
K20	2000 EXISTING Stairways, elevator shafts, light and ventilation shafts, chutes, and other vertical openings between floors are enclosed with construction having a fire resistance rating of at least one hour. An atrium may be used in accordance with 8.2.5.6, 19.3.1.1				

ID PREFIX		MET	NOT MET	N/A	REMARKS
	If all vertical openings are properly enclosed with construction providing at least a two hour fire resistance rating, also check this box. □				
	If enclosures are less than required, give a brief description and specific location in REMARKS.				
	2000 NEW Stairways, elevator shafts, light and ventilation shafts, chutes, and other vertical openings between floors are enclosed with construction having a fire resistance rating of at least two hours connecting four stories or more. (One hour for single story building and sprinklered buildings up to three stories in height.) 18.3.1.1. An atrium may be used in accordance with 8.2.2.3.5.				
	If enclosures are less than required, give a brief description and specific location in REMARKS.				
K21	Any door in an exit passageway, stairway enclosure, horizontal exit, smoke barrier or hazardous area enclosure shall be permitted to be held open only by devices arranged to automatically close all such doors by zone or throughout the facility upon activation of: □ (a) The required manual fire alarm system and □ (b) Local smoke detectors designed to detect smoke passing through the opening or a required smoke detection system and □ (c) The automatic sprinkler system, if installed 18.2.2.2.6, 19.2.2.2.6, 7.2.1.8.2				
	Describe method used in REMARKS				
K33	2000 EXISTING Exit components (such as stairways) are enclosed with construction having a fire resistance rating of at least one hour, are arranged to provide a continuous path of escape, and provide protection against fire or smoke from other parts of the building. 8.2.5.2, 19.3.1.1				

ID PREFIX		MET	NOT MET	N/A	REMARKS
	If all vertical openings are properly enclosed with construction providing at least a two hour fire resistance rating, also check this box. ☐				
	If enclosures are less than required, give a brief description and specific location in REMARKS.				
	2000 NEW Exit components (such as stairways) in buildings four stories or more are enclosed with construction having a fire resistance rating of at least two hours, are arranged to provide a continuous path of escape, and provide a protection against fire and smoke from other parts of the building. In all buildings less than four stories, the enclosure is at least one hour. 8.2.5.4, 18.3.1.1				
	If enclosures are less than required, give a brief description and specific location in REMARKS.				
	SMOKE COMPARTMENTATION AND CONTROL				
K23	2000 EXISTING Smoke barriers shall be provided to form at least two smoke compartments on every sleeping room floor for more than 30 patients. 19.3.7.1, 19.3.7.2				
	2000 NEW Smoke barriers shall be provided to form at least two smoke compartments on every floor used by inpatients for sleeping or treatment, and on every floor with an occupant load of 50 or more persons, regardless of use. Smoke barriers shall also be provided on floors that are usable, but unoccupied. 18.3.7.1, 18.3.7.2				
K24	The smoke compartments shall not exceed 22,500 square feet and the travel distance to and from any point to reach a door in the required smoke barrier shall not exceed 200 feet. 18.3.7.1, 19.3.7.1				
	Detail in REMARKS zone dimensions including length of zones and dead end corridors.				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K25	2000 EXISTING Smoke barriers shall be constructed to provide at least a one-half hour fire resistance rating and constructed in accordance with 8.3. Smoke barriers shall be permitted to terminate at an atrium wall. Windows shall be protected by fire-rated glazing or by wired glass panels and steel frames. A minimum of two separate compartments shall be provided on each floor. Dampers shall not be required in duct penetrations of smoke barriers in fully ducted heating, ventilating, and air conditioning systems.19.3.7.3, 19.3.7.5, 19.1.6.3, 19.1.6.4				
	2000 NEW Smoke barriers shall be constructed to provide at least a one-hour fire resistance rating and constructed in accordance with 8.3. Smoke barriers shall be permitted to terminate at an atrium wall. Windows shall be protected by fire-rated glazing or by wired glass panels in approved frames. A minimum of two separate compartments shall be provided on each floor. Dampers shall not be required in duct penetrations of smoke barriers in fully ducted heating, ventilating, and air conditioning systems. 18.3.7.3, 18.3.7.5, 18.1.6.3				
K26	Space shall be provided on each side of smoke barriers to adequately accommodate those occupants served. 18.3.7.4, 19.3.7.4				
K27	2000 EXISTING Door openings in smoke barriers have at least a 20 minute fire protection rating or are at least 1¾ inch thick solid bonded core wood. Non-rated protective plates that do not exceed 48 inches from the bottom of the door are permitted. Horizontal sliding doors comply with 7.2.1.14. Doors shall be self-closing or automatic-closing in accordance with 19.2.2.2.6. Swinging doors are not required to swing with egress and positive latching is not required. 19.3.7.5, 19.3.7.6, 19.3.7.7				
	2000 NEW Door openings in smoke barriers have at least a 20 minute fire protection rating or are at least 1¾ inch thick solid bonded core wood. Non-rated protective plates that do not exceed 48 inches from the bottom of the door are permitted. Horizontal sliding doors comply with 7.2.1.14. Swinging doors shall be arranged so that each door swings in an opposite direction. Doors shall be self-closing and rabbets, bevels or astragals are required at the meeting edges. Positive latching is not required. 18.3.7.5, 18.3.7.6, 18.3.7.8				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K28	2000 EXISTING Door openings in smoke barriers shall provide a minimum clear width of 32 inches (81 cm) for swinging or horizontal doors. Vision panels are of fire-rated glazing or wired glass panels and steel frames. 19.3.7.5, 19.3.7.7				
	2000 NEW Door openings in smoke barriers are installed as swinging or horizontal doors shall provide a minimum clear width as follows: Provider Type / Swinging Doors / Horizontal Sliding Doors Hospitals and Nursing Facilities: 41.5 inches (105 cm) / 83 inches (211 cm) Psychiatric Hospitals and Limited Care Facilities: 32 inches (81 cm) / 64 inches (163 cm) Vision panels of fire-rated glazing or wired panels in approved frames are provided for each door. 18.3.7.5, 18.3.7.7				
K104	Penetrations of smoke barriers by ducts are protected in accordance with 8.3.6.				
	Describe any mechanical smoke control system in REMARKS.				
	HAZARDOUS AREA				
K29	2000 EXISTING One hour fire rated construction (with ¾ hour fire-rated doors) or an approved automatic fire extinguishing system in accordance with 8.4.1 and/or 19.3.5.4 protects hazardous areas. When the approved automatic fire extinguishing system option is used, the areas shall be separated from other spaces by smoke resisting partitions and doors. Doors shall be self-closing and non-rated or field-applied protective plates that do not exceed 48 inches from the bottom of the door are permitted. 19.3.2.1 Area / Automatic Sprinkler / Separation / N/A a. Boiler and Fuel-Fired Heater Rooms c. Laundries (greater than 100 sq feet) d. Repair Shops and Paint Shops e. Laboratories (if classified a Severe Hazard - see K31) f. Combustible Storage Rooms/Spaces (over 50 sq feet) g. Trash Collection Rooms i. Soiled Linen Rooms *Describe the floor and zone locations of hazardous areas that are deficient in REMARKS.*				

ID PREFIX		MET	NOT MET	N/A	REMARKS
	2000 NEW Hazardous areas are protected in accordance with 8.4. The areas shall be enclosed with a one hour fire-rated barrier, with a ¾ hour fire-rated door, without windows (in accordance with 8.4). Doors shall be self-closing or automatic closing in accordance with 7.2.1.8. 18.3.2.1				

Area	Automatic Sprinkler	Separation	N/A
a. Boiler and Fuel-Fired Heater Rooms			
c. Laundries (greater than 100 sq feet)			
d. Repair, Maintenance and Paint Shops			
e. Laboratories (if classified a Severe Hazard - see K31)			
f. Combustible Storage Rooms/Spaces (over 50 and less than 100 sq feet)			
g. Trash Collection Rooms			
i. Soiled Linen Rooms			
m. Combustible Storage Rooms/Spaces (over 100 sq feet)			

Describe the floor and zone locations of hazardous areas that are deficient in REMARKS.

K30	Gift shops shall be protected as hazardous areas when used for storage or display of combustibles in quantities considered hazardous. Non-rated walls may separate gift shops that are not considered hazardous, have separate protected storage and that are completely sprinkled. Gift shops may be open to the corridor if they are not considered hazardous, have separate protected storage, are completely sprinklered and do not exceed 500 square °feet. 18.3.2.5, 19.3.2.5				

Area	Automatic Sprinkler	Separation	N/A
L. Gift Shop storing hazardous quantities of combustibles			

K211	2000 EXISTING Where Alcohol Based Hand Rub (ABHR) dispensers are installed: ❑ The corridor is at least 6 feet wide ❑ The maximum individual fluid dispenser capacity shall be 1.2 liters (2 liters in suites of rooms) ❑ The dispensers shall have a minimum spacing of 4 ft from each other ❑ Not more than 10 gallons are used in a single smoke compartment outside a storage cabinet. ❑ Dispensers are not installed over or adjacent to an ignition source. ❑ If the floor is carpeted, the building is fully sprinklered. 19.3.2.7, CFR 403.744, 418.100, 460.72, 482.41, 483.70, 483.623, 485.623				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K211	2000 NEW Where Alcohol Based Hand Rub (ABHR) dispensers are installed: ❑ The corridor is at least 6 feet wide ❑ The maximum individual fluid dispenser capacity shall be 1.2 liters (2 liters in suites of rooms) ❑ The dispensers shall have a minimum spacing of 4 ft from each other ❑ Not more than 10 gallons are used in a single smoke compartment outside a storage cabinet. ❑ Dispensers are not installed over or adjacent to an ignition source. ❑ If the floor is carpeted, the building is fully sprinklered. 18.3.2.7, CFR 403.744, 418.100, 460.72, 482.41, 483.70, 483.623, 485.623				
	EXIT AND EXIT ACCESS				
K32	Not less than two exits, remote from each other, are provided for each floor or fire section of the building. Only one of these two exits may be a horizontal exit. 18.2.4.1, 18.2.4.2, 19.2.4.1, 19.2.4.2				
	EXITS AND EGRESS				
K34	Stairways and smokeproof towers used as exits are in accordance with 7.2. 18.2.2.4, 19.2.2.3, 19.2.2.4				
K35	Capacity of exits in number of persons per unit of exit width is in accordance with 7.3. 18.2.3.1, 19.2.3.1				
K36	Travel distance (exit access) to exits are in accordance with 7.6. 18.2.6, 19.2.6				
K37	2000 EXISTING Existing dead-end corridors shall be permitted to be continued to be used if it is impractical and unfeasible to alter them so that exists are accessible in not less than two different directions from all points in aisles, passageways, and corridors. 19.2.5.10				

ID PREFIX		MET	NOT MET	N/A	REMARKS
	2000 NEW Every exit and exit access shall be arranged so that no corridor, aisle or passageway has a pocket or dead-end exceeding 30 feet. 18.2.5.10				
K38	Exit access is so arranged that exits are readily accessible at all times in accordance with 7.1. 18.2.1, 19.2.1				
K39	2000 EXISTING Width of aisles or corridors (clear and unobstructed) serving as exit access shall be at least 4 feet. 19.2.3.3				
	2000 NEW Width of aisles or corridors (clear and unobstructed) serving as exit access in hospitals and nursing homes shall be at least 8 feet. In limited care facility and psychiatric hospitals, width of aisles or corridors shall be at least 6 feet. 18.2.3.3, 18.2.3.4				
K40	2000 EXISTING Exit access doors and exit doors used by health care occupants are of the swinging type and are at least 32 inches in clear width. 19.2.3.5				
	2000 NEW Exit access doors and exit doors used by health care occupants are of the swinging type, with openings of at least 41.5 inches wide. Doors in exit stairway enclosures shall be no less than 32 inches in clear width. In ICFs/MR, doors are at least 32 inches wide. 18.2.3.5				
K41	All sleeping rooms have a door leading to a corridor providing access to an exit or have a door leading directly to grade. One room may intervene in accordance with 18.2.5.1, 19.2.5.1, 18.2.5.9, 19.2.5.9 *If doors lead directly to grade from each room, check this box.* ☐				
K42	Any room or suite of rooms of more than 1,000 sq. ft. has at least 2 exit access doors remote from each other. 18.2.5.2, 19.2.5.2				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K43	Patient room doors are arranged such that the patients can open the door from inside without using a key.				
	Special door locking arrangements are permitted in facilities. 18.2.2.2.4, 18.2.2.2.5 *If door locking arrangement without delay egress is used indicate in REMARKS* 18.2.2.2.2, 19.2.2.2.2				
K44	Horizontal exits, if used, are in accordance with 7.2.4. 18.2.2.5, 19.2.2.5				
	ILLUMINATION AND EMERGENCY POWER				
K45	Illumination of means of egress, including exit discharge, is arranged so that failure of any single lighting fixture (bulb) will not leave the area in darkness. 18.2.8, 19.2.8, 7.8				
K46	Emergency lighting of at least 1½ hour duration is provided in accordance with 7.9. 18.2.9.1, 19.2.9.1.				
K47	2000 EXISTING Exit and directional signs are displayed in accordance with 7.10 with continuous illumination also served by the emergency lighting system. 19.2.10.1 (Indicate N/A in one story buildings with less than 30 occupants where the line of exit travel is obvious.)				
	2000 NEW Exit and directional signs are displayed with continuous illumination also served by the emergency lighting, system in accordance with 7.10. 18.2.10.1				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K105	2000 NEW (INDICATE N/A FOR EXISTING) Buildings equipped with or requiring the use of life support systems (electro-mechanical or inhalation anesthetics) have illumination of means of egress, emergency lighting equipment, exit, and directional signs supplied by the Life Safety Branch of the electrical system described in NFPA 99. 18.2.9.2., 18.2.10.2, 18.5.1.1, 18.5.1.2 (Indicate N/A if life support equipment is for emergency purposes only).				
K107	2000 NEW (INDICATE N/A FOR EXISTING) Required alarm and detection systems are provided with an alternative power supply in accordance with NFPA 72. 9.6.1, 18.3.4.1.3				
K108	2000 NEW (INDICATE N/A FOR EXISTING) Alarms, emergency communication systems, and illumination of generator set locations are in accordance with NFPA 70. 9.1.2				
	EMERGENCY PLAN AND FIRE DRILLS				
K48	There is a written plan for the protection of all patients and for their evacuation in the event of an emergency. 18.7.1.1, 19.7.1.1				
K50	Fire drills are held at unexpected times under varying conditions, at least quarterly on each shift. The staff is familiar with procedures and is aware that drills are part of established routine. Responsibility for planning and conducting drills is assigned only to competent persons who are qualified to exercise leadership. Where drills are conducted between 9:00 PM and 6:00 AM a coded announcement may be used instead of audible alarms. 18.7.1.2, 19.7.1.2				

ID PREFIX		MET	NOT MET	N/A	REMARKS
	FIRE ALARM SYSTEMS				
K51	2000 EXISTING A fire alarm system with approved component, devices or equipment installed according to NFPA 72, National Fire Alarm Code to provide effective warning of fire in any part of the building. Activation of the complete fire alarm system shall be by manual fire alarm initiation, automatic detection or extinguishing system operation. Pull stations in patient sleeping areas, may be omitted provided that manual pull stations are within 200 ft of nurse's stations. Pull stations are located in the path of egress. Electronic or written records of tests shall be available. A reliable second source of power must be provided. Fire alarm systems shall be in accordance with NFPA72, and records of maintenance kept readily available. There shall be annunciation of the fire alarm system to an approved central station. 19.3.4, 9.6				
	2000 NEW A fire alarm system with approved component, devices or equipment installed according to NFPA 72, to provide effective warning of fire in any part of the building. Activation of the complete fire alarm system shall be by manual fire alarm initiation, automatic detection or extinguishing system operation. Pull stations are located in the path of egress. Electronic or written records of tests shall be available. A reliable second source of power must be provided. Fire alarm systems shall be maintained in accordance with NFPA72, and records of maintenance kept readily available. There shall be remote annunciation of the fire alarm system to an approved central station. 18.3.4, 9.6				
K52	A fire alarm system required for life safety shall be installed, tested, and maintained in accordance with NFPA 70 National Electrical Code and NFPA 72. The system shall have an approved maintenance and testing program complying with applicable requirement of NFPA 70 and 72. 9.6.1.4				
K155	Where a required fire alarm system is out of service for more than 4 hours in a 24-hour period, the authority having jurisdiction shall be notified, and the building shall be evacuated or an approved fire watch shall be provided for all parties left unprotected by the shutdown until the fire alarm system has been returned to service. 9.6.1.8				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K53	2000 EXISTING (INDICATE N/A FOR HOSPITAL AND FULLY SPRINKLERED NURSING HOMES) In an existing nursing home, not fully sprinklered, the resident sleeping rooms and public areas (dining rooms, activity rooms, resident meeting rooms, etc) are to be equipped with single station battery-operated smoke detectors. There will be a testing, maintenance and battery replacement program to ensure proper operation. CFR 483.70				
	2000 NEW (NURSING HOME AND EXISTING LIMITED CARE FACILITIES) An automatic smoke detection system is installed in all corridors. (As an alternative to the corridor smoke detection system on patient sleeping room floors, smoke detectors may be installed in each patient sleeping room and at smoke barrier or horizontal exit doors in the corridor.) Such detectors are electrically interconnected to the fire alarm system. 18.3.4.5.3				
K109	2000 EXISTING LIMITED CARE FACILITIES (INDICATE N/A FOR HOSPITALS OR NURSING HOMES) An automatic smoke detection system is installed in all corridors with detector spacing no further apart than 30 ft on center in accordance with NFPA 72. (As an alternative to the corridor smoke detection system on patient sleeping room floors, smoke detectors may be installed in each patient sleeping room and at smoke barrier or horizontal exit doors in the corridors.) Such detectors are electrically interconnected to the fire alarm system. 19.3.4.5.1 Smoke Detection System ❑ Corridors ❑ Rooms ❑ Bath				
K54	All required smoke detectors, including those activating door hold-open devices, are approved, maintained, inspected and tested in accordance with the manufacturer's specifications. 9.6.1.3				
	Give a brief description, in REMARKS of any smoke detection system which may be installed				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K55	2000 EXISTING Every patient sleeping room shall have an outside window or outside door. Except for newborn nurseries and rooms intended for occupancy for less than 24 hours. 19.3.8				
	2000 NEW Every patient sleeping room shall have an outside window or outside door. The allowable sill height shall not exceed 36 inches (91 cm) above the floor. Windows are not required for recovery rooms, newborn nurseries, emergency rooms, and similar rooms intended for occupancy for less than 24 hours. Window sill height for limited care facilities shall not exceed 44 inches (112 cm) above the floor. 18.3.8				
	AUTOMATIC SPRINKLER SYSTEMS				
K56	2000 EXISTING Where required by section 19.1.6, Health care facilities shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with section 9.7. Required sprinkler systems are equipped with water flow and tamper switches which are electrically interconnected to the building fire alarm. 19.3.5, NPFA 13				
	2000 NEW There is an automatic sprinkler system installed in accordance with NFPA13, Standard for the Installation of Sprinkler Systems, with approved components, device and equipment, to provide complete coverage of all portions of the facility. Systems are equipped with waterflow and tamper switches, which are connected to the fire alarm system. 18.3.5.				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K154	Where a required automatic sprinkler system is out of service for more than 4 hours in a 24-hour period, the authority having jurisdiction shall be notified, and the building shall be evacuated or an approved fire watch system be provided for all parties left unprotected by the shutdown until the sprinkler system has been returned to service. 9.7.6.1.				
	A. Date sprinkler system last checked and necessary maintenance provided. _____				
	B. Show who provided the service. _____				
	C. Note the source of water supply for the automatic sprinkler system. _____				
	(Provide, in REMARKS, information on coverage for any non-required or partial automatic sprinkler system.)				
K60	Initiation of the required fire alarm systems shall be by manual means in accordance with 9.6.2 and by means of any required sprinkler system waterflow alarms, detection devices, or detection systems. 18.3.4.2, 19.3.4.2, 9.6.2.1				
K61	Required automatic sprinkler systems shall have valves supervised so that at least a local alarm will sound when the valves are closed. 9.7.2.1, NFPA 72				
K62	Automatic sprinkler systems are continuously maintained in reliable operating condition and are inspected and tested periodically. 18.7.6, 19.7.6, 4.6.12, NFPA 13, NFPA 25, 9.7.5				
K63	Required automatic sprinkler systems have an adequate and reliable water supply which provides continuous and automatic pressure. 9.7.1.1, NFPA 13				
K64	Portable fire extinguishers shall be provided in all health care occupancies in accordance with 9.7.4.1, NFPA 10. 18.3.5.6, 19.3.5.6				

Name of Facility 2000 CODE

ID PREFIX		MET	NOT MET	N/A	REMARKS
	SMOKING REGULATIONS				
K66	Smoking regulations shall be adopted and shall include not less than the following provisions: 18.7.4, 19.7.4 ☐ (1) Smoking shall be prohibited in any room, ward, or compartment where flammable liquids, combustible gases, or oxygen is used or stored in any other hazardous location, and such area shall be posted with signs that read NO SMOKING or shall be posted with the international symbol for no smoking. ☐ (2) Smoking by patients classified as not responsible shall be prohibited, except when under direct supervision. ☐ (3) Ashtrays of noncombustible material and safe design shall be provided in all areas where smoking is permitted. ☐ (4) Metal containers with self-closing cover devices into which ashtrays can be emptied shall be readily available to all areas where smoking is permitted.				
	BUILDING SERVICE EQUIPMENT				
K67	Heating, ventilating, and air conditioning shall comply with 9.2 and shall be installed in accordance with the manufacturer's specifications. 18.5.2.1, 19.5.2.1, 9.2, NFPA 90A, 18.5.2.2, 19.5.2.2				
K68	Combustion and ventilation air for boiler, incinerator and heater rooms is taken from and discharged to the outside air. 18.5.2.2, 19.5.2.2.				
K69	Cooking facilities shall be protected in accordance with 9.2.3. 18.3.2.6, 19.3.2.6, NFPA 96				
K70	Portable space heating devices shall be prohibited in all health care occupancies. Except it shall be permitted to be used in non-sleeping staff and employee areas where the heating elements of such devices do not exceed 212°F (100°C). 18.7.8, 19.7.8				

Form CMS-2786R (xx/xx) Previous Versions Obsolete Page 20

ID PREFIX		MET	NOT MET	N/A	REMARKS
K71	Rubbish Chutes, Incinerators and Laundry Chutes. 18.5.4, 19.5.4, 9.5, 8.4, NFPA 82				
	☐ (1) Any existing linen and trash chute, including pneumatic rubbish and linen systems, that opens directly onto any corridor shall be sealed by fire resistive construction to prevent further use or shall be provided with a fire door assembly having a fire protection rating of 1 hour. All new chutes shall comply with 9.5.				
	☐ (2) Any rubbish chute or linen chute, including pneumatic rubbish and linen systems, shall be provided with automatic extinguishing protection in accordance with 9.7.				
	☐ (3) Any trash chute shall discharge into a trash collection room used for no other purpose and protected in accordance with 8.4.				
	☐ (4) Existing flue-fed incinerators shall be sealed by fire resistive construction to prevent further use.				
K160	2000 EXISTING All existing elevators, having a travel distance of 25 ft or more above or below the level that best serves the needs of emergency personnel for fire fighting purposes, conform with Firefighter's Service Requirements of ASME/ ANSI A17.3, *Safety Code for Existing Elevators and Escalators.* 19.5.3, 9.4.3.2				
	ANSI A17.1 states 25 ft or more above or below the designated level and defines "designated level" as the main floor or other floor level that best serves the needs of emergency personnel for fire fighting purposes or rescue purposes identified by the building code or fire authority. Depending on floor slab thickness and heights this would generally apply to a three-story building, and almost certainly to a four-story building.				
	Includes firefighters service phase I key recall and smoke detector automatic recall, firefighters service phase II emergency in-car key operation, machine room smoke detectors, and elevator lobby smoke detectors. 19.5.3, 9.4.3.2				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K161	2000 EXISTING All existing escalators, dumbwaiters, and moving walks conform to the requirements of ASME/ ANSI A17.3, *Safety Code for Existing Elevators and Escalators*. 19.5.3, 9.4.2.2 Includes escalator emergency stop buttons and automatic skirt obstruction stop. For power dumbwaiters includes hoistway door locking to keep doors closed except for floor where car is being loaded or unloaded.				
	2000 NEW All elevators, escalators, and conveyors comply with ASME/ ANSI A17.1, *Safety Code for Elevators and Escalators* (Includes car emergency signaling, firefighters service phase I key and smoke detector automatic recall, firefighters service phase II emergency in-car operation, machine room smoke detectors, elevator lobby smoke detectors). 18.5.3, 9.4				
	FURNISHINGS AND DECORATIONS				
K72	Means of egress shall be continuously maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency. No furnishings, decorations, or other objects shall obstruct exits, access thereto, egress there from, or visibility thereof shall be in accordance with 7.1.10				
K73	No furnishings or decorations of highly flammable character shall be used. 18.7.5.2, 18.7.5.3, 18.7.5.4, 19.7.5.2, 19.7.5.3, 19.7.5.4				
K74	Draperies, curtains, including cubicle curtains, and other loosely hanging fabrics and films serving as furnishings or decorations in health care occupancies shall be in accordance with provisions of 10.3.1 and NFPA 13 Standard for the Installation of Sprinkler Systems. Except shower curtains shall be in accordance with NFPA 701. ☐ Newly introduced upholstered furniture shall meet the criteria specified when tested in accordance with the methods cited in 10.3.2 (2) and 10.3.1. 18.3.5.3 and NFPA 13 ☐ Newly introduced mattresses shall meet the criteria specified when tested in accordance with the method cited in 10.3.2 (3) and 10.3.4. 18.7.5.3, 19.7.5.3 Newly introduced upholstered furniture and mattresses means purchased since March, 2003.				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K75	Soiled linen or trash collection receptacles shall not exceed 32 gal (121 L) in capacity. The average density of container capacity in a room or space shall not exceed .5 gal/ft² (20.4 L/m²). A capacity of 32 gal (121 L) shall not be exceeded within any 64-ft² (5.9-m²) area. Mobile soiled linen or trash collection receptacles with capacities greater than 32 gal (121 L) shall be located in a room protected as a hazardous area when not attended. 18.7.5.5, 19.7.5.5				
	LABORATORIES				
K31	Laboratories employing quantities of flammable, combustible, or hazardous materials that are considered a severe hazard shall be protected in accordance with NFPA 99. (Laboratories that are not considered to be severe hazard shall meet the provision of K29.) Laboratories in Health Care occupancies and medical and dental offices shall be in accordance with NFPA 99, Standard for Health Care Facilities 10.5.1.				
K136	Procedures for laboratory emergencies shall be developed. Such procedures shall include alarm actuation, evacuation, and equipment shutdown procedures, and provisions for control of emergencies that could occur in the laboratory, including specific detailed plans for control operations by an emergency control group within the organization or a public fire department in accordance with NFPA 99, 10.2.1.3.1, 18.3.2.2., 19.3.2.1				
K131	Emergency procedures shall be established for controlling chemical spills in accordance with NFPA 99. 10.2.1.3.2				
K132	Continuing safety education and supervision shall be provided, incidents shall be reviewed monthly, and procedures reviewed annually shall be in accordance with NFPA 99. 10.2.1.4.2				
K133	Fume hoods shall be in accordance with NFPA 99. 5.4.3, 5.6.2				
K134	Emergency Shower: Where the eyes or body of any person can be exposed to injurious corrosive materials, suitable fixed facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use. Fixed eye baths designed and installed to avoid injurious water pressure shall be in accordance with NFPA 99, 10.6.				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K135	Flammable and combustible liquids shall be used from and stored in approved containers in accordance with NFPA 30, Flammable and Combustible Liquids Code, and NFPA 45, Standard on Fire Protection for Laboratories Using Chemicals. Storage cabinets for flammable and combustible liquids shall be constructed in accordance with NFPA 30, Flammable and Combustible liquids Code NFPA 99, 4.3, 10.7.2.1.				
	MEDICAL GASES AND ANESTHETIZING AREAS				
K76	Medical gas storage and administration areas shall be protected in accordance with NFPA 99, Standard for Health Care Facilities. (a) Oxygen storage locations of greater than 3,000 cu.ft. are enclosed by a one-hour separation. (b) Locations for supply systems of greater than 3,000 cu.ft. are vented to the outside. NFPA 99, 4.3.1.1.2, 18.3.2.4, 19.3.2.4				
K77	Piped in medical gas systems comply with NFPA 99, Chapter 4.				
K78	Anesthetizing locations shall be protected in accordance with NFPA 99, Standard for Health Care Facilities. (a) Shutoff valves are located outside each anesthetizing location and arranged so that shutting off one room or location will not affect others. (b) Relative humidity is maintained equal to or great than 35% NFPA 99 4.3.1.2.3(n) and 5.4.1.1, 18.3.2.3, 19.3.2.3				
K140	(a) Master alarm panels are in two separate locations and have audible and visible signals. (b) There are high/low alarms for +/- 20% operating pressure. This section shall be in accordance with NFPA 99, 4.3.1.2.2 (c) Where a level 2 gas system is used, one alarm panel that complies with 4.3.1.2.2(b) 3 a, b, c and d and with 4.3.1.2.2(c) 2 and 5 shall be permitted. (4.4.1 exception No. 4).				
K141	Non-smoking and no smoking signs in areas where oxygen is used or stored shall be in accordance with 18.3.2.4, 19.3.2.4, NFPA 99, 8.6.4.2				
K142	All occupancies containing hyperbaric facilities shall comply with NFPA 99, Standard for Health Care Facilities, Chapter 19.				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K143	Transferring of oxygen shall be: (a) separated from any portion of a facility wherein patients are housed, examined, or treated by a separation of a fire barrier of 1-hour fire-resistive construction; and (b) the area that is mechanically ventilated, sprinklered, and has ceramic or concrete flooring; and (c) in an area that is posted with signs indicating that transferring is occurring, and that smoking in the immediate area is not permitted in accordance with NFPA 99 and Compressed Gas Association. 8.6.2.5.2				
	ELECTRICAL				
K106	The hospital and all nursing homes and hospices with life support equipment has a Type I Essential Electrical System powered by a generator with a transfer switch and separate power supply. The EES is in accordance with NFPA 99, 3.4.2.2, 3.4.2.1.4				
K144	Generators inspected weekly and exercised under load for 30 minutes per month and shall be in accordance with NFPA 99, 3.4.4.1, NFPA 110, 8.4.2				
K145	The Type I EES is divided into the critical branch, life safety branch and the emergency system and shall be in accordance with NFPA 99, 3.4.2.2.2				
K146	The nursing home/hospice with no life support equipment shall have an alternate source of power separate and independent from the normal source that will be effective for minimum of 1½ hour after loss of the normal source NFPA 99, 3.6.				
K147	Electrical wiring and equipment shall be in accordance with NFPA 70, National Electrical Code. 9.1.2				
K130	Miscellaneous List in the REMARKS sections, any items that are not listed previously, but are deficient. This information, along with the applicable Life Safety Code or NFPA standard citation, should be included on Form CMS-2567.				

Name of Facility	2000 CODE

PART IV RECOMMENDATION FOR WAIVER OF SPECIFIC LIFE SAFETY CODE PROVISIONS

For each item of the Life Safety code recommended for waiver, list the survey report form item number and state the reason for the conclusion that: (a) the specific provisions of the code, if rigidly applied, would result in unreasonable hardship on the facility, and (b) the waiver of such unmet provisions will not adversely affect the health and safety of the patients. If additional space is required, attach additional sheet(s).

PROVISION NUMBER(S)	JUSTIFICATION
K84	

Surveyor *(Signature)*	Title	Office	Date
Fire Authority Official *(Signature)*	Title	Office	Date

FIRE SAFETY SURVEY REPORT
CRUCIAL DATA EXTRACT
(TO BE USED WITH CMS-2786 FORMS)

PROVIDER NUMBER	FACILITY NAME	SURVEY DATE
K1		* K4

K6 DATE OF PLAN APPROVAL

K3 MULTIPLE CONSTRUCTION

TOTAL NUMBER OF BUILDINGS _____

NUMBER OF THIS BUILDING _____

☐ A BUILDING
B WING
C FLOOR
D APARTMENT UNIT

LSC FORM INDICATOR

Health Care Form		
12	2786R	2000 EXISTING
13	2786R	2000 NEW

ASC Form		
14	2786U	2000 EXISTING
15	2786U	2000 NEW

ICF/MR Form		
16	2786V, W, X	2000 EXISTING
17	2786V, W, X	2000 NEW

* K7 ☐ SELECT NUMBER OF FORM USED FROM ABOVE

COMPLETE IF ICF/MR IS SURVEYED UNDER CHAPTER 21

SMALL (16 BEDS OR LESS)

K8 ☐ 1 PROMPT
2 SLOW
3 IMPRACTICAL

LARGE

K8: ☐ 4 PROMPT
5 SLOW
6 IMPRACTICAL

APARTMENT HOUSE

K8: ☐ 7 PROMPT
8 SLOW
9 IMPRACTICAL

(Check if K29 or K56 are marked as not applicable in the 2786 M, R, T, U, V, W, X and Y.)

K29 ☐ K56: ☐

ENTER E – SCORE HERE

K5: ☐ e.g. 2.5

*K9: FACILITY MEETS LSC BASED ON *(Check all that apply)*

A1. ☐ (COMP. WITH ALL PROVISIONS)
A2. ☐ (ACCEPTABLE POC)
A3. ☐ (WAIVERS)
A4. ☐ (FSES)
A5. ☐ (PERFORMANCE BASED DESIGN)

FACILITY DOES NOT MEET LSC

B. ☐

K0180

A. ☐ FULLY SPRINKLERED (All required areas are sprinklered)
B. ☐ PARTIALLY SPRINKLERED (Not all required areas are sprinklered)
C. ☐ NONE (No sprinkler system)

* MANDATORY

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR MEDICARE & MEDICAID SERVICES

2000 CODE

Form Approved
OMB No. 0938-0242

FIRE SAFETY SURVEY REPORT SHORT FORM
Medicare – Medicaid

1. (A) PROVIDER NUMBER K1	1. (B) MEDICAID I.D. NO. K2

Identifying information as shown in applicable records. Enter changes, if any, alongside each item, giving date of change.

2. NAME OF FACILITY	2. (A) MULTIPLE CONSTRUCTION (BLDGS) K3 A. BUILDING _____ B. WING _____ C. FLOOR _____	2. (B) ADDRESS OF FACILITY (STREET, CITY, STATE, ZIP CODE)	A. ☐ Fully Sprinklered (All required areas are sprinklered) B. ☐ Partially Sprinklered (Not all required areas are sprinklered) C. ☐ None (No sprinkler system) K3180

3. SURVEY FOR	4. DATE OF SURVEY	SHORT FORM	SURVEY UNDER
☐ MEDICARE ☐ MEDICAID	K4	CHECK HERE ☐ K5	5. ☐ 2000 EXISTING ☐ 2000 NEW

5. SURVEY FOR CERTIFICATION OF

1. ☐ HOSPITAL 2. ☐ SKILLED/NURSING FACILITY

K6

IF "2" OR "3" ABOVE IS MARKED, CHECK APPROPRIATE ITEM(S) BELOW

1. ☐ ENTIRE FACILITY 2. ☐ DISTINCT PART OF (SPECIFY)_____

3. ☐ IF DISTINCT PART OF HOSPITAL, IS HOSPITAL ACCREDITED BY JCAHO/AOA? a. ☐ YES b. ☐ NO

6. BED COMPOSITION

a. TOTAL NO. OF BEDS IN THE FACILITY	b. NUMBER OF HOSPITAL BEDS CERTIFIED FOR MEDICARE	c. NUMBER OF SKILLED BEDS CERTIFIED FOR MEDICARE	d. NUMBER OF SKILLED BEDS CERTIFIED FOR MEDICAID	e. NUMBER OF ICF BEDS CERTIFIED FOR MEDICAID

I HAVE CONDUCTED A FIRE SAFETY SCREENING USING THE SHORT FORM:

A. ☐ The facility meets all of the items on the form.
B. ☐ The facility does not meet all of the items on the form.
C. ☐ A complete fire safety survey is recommended.

K7

K9: FOR STATE AGENCY USE ONLY

A. ☐ The facility MEETS based upon:
1. ☐ Compliance with all provisions
2. ☐ Acceptance of a Plan of Correction
3. ☐ Recommended waivers.
B. ☐ The facility DOES NOT MEET THE STANDARD.

SURVEYOR *(Signature)*	TITLE	OFFICE	DATE
8. SURVEYOR I.D. NO K10			
REVIEW AUTHORITY OFFICIAL *(Signature)*			

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0938-0242. The time required to complete this information collection is estimated to average 5 minutes per response, including the time to review instructions, search existing data resources, gather the data needed, and complete and review the information collection. If you have any comments concerning the accuracy of the time estimate(s) or suggestions for improving this form, please write to CMS, Attn: PRA Reports Clearance Officer, 7500 Security Boulevard, Baltimore, Maryland 21244-1850.

Name of Facility					2000 CODE
ID PREFIX		MET	NOT MET	N/A	REMARKS
	CORRIDOR WALLS AND DOORS				
K18	2000 EXISTING Doors protecting corridor openings in other than required enclosures of vertical openings, exits, or hazardous areas shall be substantial doors, such as those constructed of 1¾ inch solid-bonded core wood, or capable of resisting fire for at least 20 minutes. Doors in fully sprinklered smoke compartments are only required to resist the passage of smoke. There is no impediment to the closing of the doors. Doors shall be provided with a means suitable for keeping the door closed. Dutch doors meeting 19.3.6.3.6 are permitted. 19.3.6.3 Roller latches are prohibited by CMS regulations in all health care facilities.				
	Show in REMARKS, details of doors, such as fire protection ratings, automatic closing devices, etc.				
	2000 New Doors protecting corridor openings shall be constructed to resist the passage of smoke. Doors shall be provided with positive latching hardware. Dutch doors meeting 18.3.6.3.6 are permitted. Roller latches shall be prohibited. 18.3.6.3				
	Show in REMARKS, details of doors, such as fire protection ratings, automatic closing devices, etc.				
K22	Access to exits shall be marked by approved, readily visible signs in all cases where the exit or way to reach exit is not readily apparent to the occupants. 7.10.1.4				
	VERTICAL OPENINGS				
K20	2000 EXISTING Stairways, elevator shafts, light and ventilation shafts, chutes, and other vertical openings between floors are enclosed with construction having a fire resistance rating of at least one hour. An atrium may be used in accordance with 8.2.5.6, 19.3.1.1. *If all vertical openings are properly enclosed with construction providing at least a two hour fire resistance rating, also check this box.* ☐				

Name of Facility					2000 CODE
ID PREFIX		MET	NOT MET	N/A	REMARKS
	If enclosures are less than required, give a brief description and specific location in REMARKS.				
	2000 NEW Stairways, elevator shafts, light and ventilation shafts, chutes, and other vertical openings between floors are enclosed with construction having a fire resistance rating of at least two hours connecting four stories or more. (One hour for single story building and sprinklered buildings up to three stories in height.) 18.3.1.1. An atrium may be used in accordance with 8.2.2.3.5.				
	If enclosures are less than required, give a brief description and specific location in REMARKS.				
	SMOKE COMPARTMENTATION AND CONTROL				
K23	2000 EXISTING Smoke barriers shall be provided to form at least two smoke compartments on every sleeping room floor for more than 30 patients. 19.3.7.1, 19.3.7.2				
	2000 NEW Smoke barriers shall be provided to form at least two smoke compartments on every floor used by inpatients for sleeping or treatment, and on every floor with an occupant load of 50 or more persons, regardless of use. Smoke barriers shall also be provided on floors that are usable, but unoccupied. 18.3.7.1, 18.3.7.2				
K28	2000 EXISTING Door openings in smoke barriers shall provide a minimum clear width of 32 inches (81 cm) for swinging or horizontal doors. Vision panels are of fire-rated glazing or wired glass panels and steel frames. 19.3.7.5, 19.3.7.7				

ID PREFIX		MET	NO MET	N/A	REMARKS
	2000 NEW Door openings in smoke barriers are installed as swinging or horizontal doors shall provide a minimum clear width as follows: Provider Type / Swinging Doors / Horizontal Sliding Doors Hospitals and Nursing Facilities: 41.5 inches (105 cm) / 83 inches (211 cm) Psychiatric Hospitals and Limited Care Facilities: 32 inches (81 cm) / 64 inches (163 cm) Vision panels of fire-rated glazing or wired panels in approved frames are provided for each door. 18.3.7.5, 18.3.7.7				
	HAZARDOUS AREA				
K29	2000 EXISTING One hour fire rated construction (with ¾ hour fire-rated doors) or an approved automatic fire extinguishing system in accordance with 8.4.1 and/or 19.3.5.4 protects hazardous areas. When the approved automatic fire extinguishing system option is used, the areas shall be separated from other spaces by smoke resisting partitions and doors. Doors shall be self-closing and non-rated or field-applied protective plates that do not exceed 48 inches from the bottom of the door are permitted. 19.3.2.1 Area / Automatic Sprinkler / Separation / N/A a. Boiler and Fuel-Fired Heater Rooms c. Laundries (greater than 100 sq feet) d. Repair Shops and Paint Shops e. Laboratories (if classified a Severe Hazard - see K31) f. Combustible Storage Rooms/Spaces (over 50 sq feet) g. Trash Collection Rooms i. Soiled Linen Rooms *Describe the floor and zone locations of hazardous areas that are deficient in REMARKS.*				

ID PREFIX		MET	NOT MET	N/A	REMARKS
	2000 NEW Hazardous areas are protected in accordance with 8.4. The areas shall be enclosed with a one hour fire-rated barrier, with a ¾ hour fire-rated door, without windows (in accordance with 8.4). Doors shall be self-closing or automatic closing in accordance with 7.2.1.8. 18.3.2.1				

Area	Automatic Sprinkler	Separation	N/A
a. Boiler and Fuel-Fired Heater Rooms			
c. Laundries (greater than 100 sq feet)			
d. Repair, Maintenance and Paint Shops			
e. Laboratories (if classified a Severe Hazard - see K21)			
f. Combustible Storage Rooms/Spaces (over 50 and less than 100 sq feet)			
g. Trash Collection Rooms			
i. Soiled Linen Rooms			
m.Combustible Storage Rooms/Spaces (over 100 sq feet)			

Describe the floor and zone locations of hazardous areas that are deficient in REMARKS.

K30	Gift shops shall be protected as hazardous areas when used for storage or display of combustibles in quantities considered hazardous. Non-rated walls may separate gift shops that are not considered hazardous, have separate protected storage and that are completely sprinkled. Gift shops may be open to the corridor if they are not considered hazardous, have separate protected storage, are completely sprinklered and do not exceed 500 square feet. 18.3.2.5, 19.3.2.5				

Area	Automatic Sprinkler	Separation	N/A
L. Gift Shop storing hazardous quantities of combustibles			

18.2.6, 19.2.6

K211	2000 EXISTING Where Alcohol Based Hand Rub (ABHR) dispensers are installed: ❑ The corridor is at least 6 feet wide ❑ The maximum individual fluid dispenser capacity shall be 1.2 liters (2 liters in suites of rooms) ❑ The dispensers shall have a minimum spacing of 4 ft from each other ❑ Not more than 10 gallons are used in a single smoke compartment outside a storage cabinet. ❑ Dispensers are not installed over or adjacent to an ignition source. ❑ If the floor is carpeted, the building is fully sprinklered. 19.3.2.7, CFR 482.41, 483.70, 483.623				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K211	2000 NEW Where Alcohol Based Hand Rub (ABHR) dispensers are installed: ❑ The corridor is at least 6 feet wide ❑ The maximum individual fluid dispenser capacity shall be 1.2 liters (2 liters in suites of rooms) ❑ The dispensers shall have a minimum spacing of 4 ft from each other ❑ Not more than 10 gallons are used in a single smoke compartment outside a storage cabinet. ❑ Dispensers are not installed over or adjacent to an ignition source. ❑ If the floor is carpeted, the building is fully sprinklered. 18.3.2.7, CFR 482.41, 483.70, 483.623				
	EXISTS AND EGRESS				
K38	Exit access is so arranged that exits are readily accessible at all times in accordance with 7.1. 18.2.1, 19.2.1				
K39	2000 EXISTING Width of aisles or corridors (clear and unobstructed) serving as exit access shall be at least 4 feet. 19.2.3.3				
	2000 NEW Width of aisles or corridors (clear and unobstructed) serving as exit access in hospitals and nursing homes shall be at least 8 feet. In limited care facility and psychiatric hospitals, width of aisles or corridors shall be at least 6 feet. 18.2.3.3, 18.2.3.4				
K40	2000 EXISTING Exit access doors and exit doors used by health care occupants are of the swinging type and are at least 32 inches in clear width. 19.2.3.5				
	2000 NEW Exit access doors and exit doors used by health care occupants are of the swinging type, with openings of at least 41.5 inches wide. Doors in exit stairway enclosures shall be no less than 32 inches in clear width. In ICFs/MR, doors are at least 32 inches wide. 18.2.3.5				

ID PREFIX		MET	NO MET	N/A	REMARKS
K43	Patient room doors are arranged such that the patients can open the door from inside without using a key. Special door locking arrangements are permitted in health facilities. 18.2.2.2.4, 18.2.2.2.5 *If door locking arrangement without delay egress is used indicate in REMARKS* 18.2.2.2.2, 19.2.2.2.2				
	ILLUMINATION AND EMERGENCY POWER				
K45	Illumination of means of egress, including exit discharge, is arranged so that failure of any single lighting fixture (bulb) will not leave the area in darkness. 18.2.8, 19.2.8, 7.8				
K47	2000 EXISTING Exit and directional signs are displayed in accordance with 7.10 with continuous illumination also served by the emergency lighting system. 19.2.10.1 (Indicate N/A in one story buildings with less than 30 occupants where the line of exit travel is obvious.)				
	2000 NEW Exit and directional signs are displayed with continuous illumination also served by the emergency lighting, system in accordance with 7.10. 18.2.10.1				
K105	2000 NEW (INDICATE N/A FOR EXISTING) Buildings equipped with or requiring the use of life support systems (electro-mechanical or inhalation anesthetics) have illumination of means of egress, emergency lighting equipment, exit, and directional signs supplied by the Life Safety Branch of the electrical system described in NFPA 99. 18.2.9.2., 18.2.10.2, 18.5.1.1, 18.5.1.2 (Indicate N/A if life support equipment is for emergency purposes only).				

ID PREFIX		MET	NOT MET	N/A	REMARKS
	EMERGENCY PLAN AND FIRE DRILLS				
K48	There is a written plan for the protection of all patients and for their evacuation in the event of an emergency. 18.7.1.1, 19.7.1.1				
K50	Fire drills are held at unexpected times under varying conditions, at least quarterly on each shift. The staff is familiar with procedures and is aware that drills are part of established routine. Responsibility for planning and conducting drills is assigned only to competent persons who are qualified to exercise leadership. Where drills are conducted between 9:00 PM and 6:00 AM a coded announcement may be used instead of audible alarms. 18.7.1.2, 19.7.1.2				
	FIRE ALARM SYSTEMS				
K51	2000 EXISTING A fire alarm system with approved component, devices or equipment installed according to NFPA 72, National Fire Alarm Code to provide effective warning of fire in any part of the building. Activation of the complete fire alarm system shall be by manual fire alarm initiation, automatic detection or extinguishing system operation. Pull stations in patient sleeping areas, may be omitted provided that manual pull stations are within 200 ft of nurse's stations. Pull stations are located in the path of egress. Electronic or written records of tests shall be available. A reliable second source of power must be provided. Fire alarm systems shall be in accordance with NFPA 72, and records of maintenance kept readily available. There shall be annunciation of the fire alarm system to an approved central station. 19.3.4, 9.6				
	2000 NEW A fire alarm system with approved component, devices or equipment installed according to NFPA 72, to provide effective warning of fire in any part of the building. Activation of the complete fire alarm system shall be by manual fire alarm initiation, automatic detection or extinguishing system operation. Pull stations are located in the path of egress. Electronic or written records of tests shall be available. A reliable second source of power must be provided. Fire alarm systems shall be maintained in accordance with NFPA72, and records of maintenance kept readily available. There shall be remote annunciation of the fire alarm system to an approved central station. 18.3.4, 9.6				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K52	A fire alarm system required for life safety shall be installed, tested, and maintained in accordance with NFPA 70 National Electrical Code and NFPA 72. The system shall have an approved maintenance and testing program complying with applicable requirement of NFPA 70 and 72. 9.6.1.4				
K155	Where a required fires alarm system is out of service for more than 4 hours in a 24-hour period, the authority having jurisdiction shall be notified, and the building shall be evacuated or an approved fire watch shall be provided for all parties left unprotected by the shutdown until the fire alarm system has been returned to service. 9.6.1.8				
K53	2000 EXISTING (INDICATE N/A FOR HOSPITALS AND FULLY SPRINKLERED NURSING HOMES) In an existing nursing home, not fully sprinklered, the resident sleeping rooms and public areas (dining rooms, activity rooms, resident meeting rooms, etc) are to be equipped with single station battery-operated smoke detectors. There will be a testing, maintenance and battery replacement program to ensure proper operation. CFR 483.70				
	2000 NEW (NURSING HOME AND EXISTING LIMITED CARE FACILITIES) An automatic smoke detection system is installed in all corridors. (As an alternative to the corridor smoke detection system on patient sleeping room floors, smoke detectors may be installed in each patient sleeping room and at smoke barrier or horizontal exit doors in the corridor.) Such detectors are electrically interconnected to the fire alarm system. 18.3.4.5.3				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K109	2000 EXISTING LIMITED CARE FACILITIES (INDICATE N/A FOR HOSPITALS OR NURSING HOMES) An automatic smoke detection system is installed in all corridors, with detector spacing no further apart than 30 ft on center in accordance with NFPA 72. (As an alternative to the corridor smoke detection system on patient sleeping room floors, smoke detectors may be installed in each patient sleeping room and at smoke barrier or horizontal exit doors in the corridors.) Such detectors are electrically interconnected to the fire alarm system. 19.3.4.5.1 Smoke Detection System ❑ Corridors ❑ Rooms ❑ Bath				
	AUTOMATIC SPRINKLER SYSTEMS				
K56	2000 EXISTING Where required by section 19.1.6, Health care facilities shall be protected throughout by an approved, supervised automatic sprinkler system in accordance with section 9.7. Required sprinkler systems are equipped with water flow and tamper switches which are electrically interconnected to the building fire alarm. 19.3.5, NPFA 13				
	2000 NEW When required by construction type, there is an automatic sprinkler system installed in accordance with NFPA13, Standard for the Installation of Sprinkler Systems, with approved components, device and equipment, to provide complete coverage of all portions of the facility. Systems are equipped with waterflow and tamper switches, which are connected to the fire alarm system. 18.3.5.				
	A. Date sprinkler system last checked and necessary maintenance provided. _____ B. Show who provided the service. _____				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K154	Where a required automatic sprinkler system is out of service for more than 4 hours in a 24-hour period, the authority having jurisdiction shall be notified, and the building shall be evacuated or an approved fire watch system be provided for all parties left unprotected by the shutdown until the sprinkler system has been returned to service. 9.7.6.1				
K62	Automatic sprinkler systems are continuously maintained in reliable operating condition and are inspected and tested periodically. 18.7.6, 19.7.6, 4.6.12, NFPA 13, NFPA 25, 9.7.5				
K64	Portable fire extinguishers shall be provided in all health care occupancies in accordance with 9.7.4.1, NFPA 10. 18.3.5.6, 19.3.5.6				
	SMOKING REGULATIONS				
K66	Smoking regulations shall be adopted and shall include not less than the following provisions: 18.7.4, 19.7.4 ☐ (1) Smoking shall be prohibited in any room, ward, or compartment where flammable liquids, combustible gases, or oxygen is used or stored in any other hazardous location, and such area shall be posted with signs that read NO SMOKING or shall be posted with the international symbol for no smoking. ☐ (2) Smoking by patients classified as not responsible shall be prohibited, except when under direct supervision. ☐ (3) Ashtrays of noncombustible material and safe design shall be provided in all areas where smoking is permitted. ☐ (4) Metal containers with self-closing cover devices into which ashtrays can be emptied shall be readily available to all areas where smoking is permitted.				

ID PREFIX		MET	NOT MET	N/A	REMARKS
	BUILDING SERVICE EQUIPMENT				
K70	Portable space heating devices shall be prohibited in all health care occupancies. Except it shall be permitted to be used in non-sleeping staff and employee areas where the heating elements of such devices do not exceed 212°F (100°C). 18.7.8, 19.7.8				
	FURNISHINGS AND DECORATIONS				
K72	Means of egress shall be continuously maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency. No furnishings, decorations, or other objects shall obstruct exits, access thereto, egress there from, or visibility thereof shall be in accordance with 7.1.10				
K74	Draperies, curtains, including cubicle curtains, and other loosely hanging fabrics and films serving as furnishings or decorations in health care occupancies shall be in accordance with provisions of 10.3.1 and NFPA 13 Standard for the Installation of Sprinkler Systems. Except shower curtains shall be in accordance with NFPA 701. ☐ Newly introduced upholstered furniture shall meet the criteria specified when tested in accordance with the methods cited in 10.3.2 (2) and 10.3.1. 18.3.5.3 and NFPA 13				
	LABORATORIES				
K31	Laboratories employing quantities of flammable, combustible, or hazardous materials that are considered a severe hazard shall be protected in accordance with NFPA 99. (Laboratories that are not considered to be severe hazard shall meet the provision of K29.) Laboratories in Health Care occupancies and medical and dental offices shall be in accordance with NFPA 99, Standard for Health Care Facilities 10.5.1.				

ID PREFIX		MET	NO MET	N/A	REMARKS
K134	Emergency Shower: Where the eyes or body of any person can be exposed to injurious corrosive materials, suitable fixed facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use. Fixed eye baths designed and installed to avoid injurious water pressure shall be in accordance with NFPA 99, 10.6.				
K135	Flammable and combustible liquids shall be used from and stored in approved containers in accordance with NFPA 30, Flammable and Combustible Liquids Code, and NFPA 45, Standard on Fire Protection for Laboratories Using Chemicals. Storage cabinets for flammable and combustible liquids shall be constructed in accordance with NFPA 30, Flammable and Combustible liquids Code NFPA 99, 4.3, 10.7.2.1.				
	MEDICAL GASES AND ANESTHETIZING AREAS				
K76	Medical gas storage and administration areas shall be protected in accordance with NFPA 99, Standard for Health Care Facilities. (a) Oxygen storage locations of greater than 3,000 cu.ft. are enclosed by a one-hour separation. (b) Locations for supply systems of greater than 3,000 cu.ft. are vented to the outside. NFPA 99, 4.3.1.1.2, 18.3.2.4, 19.3.2.4				
K141	Non-smoking and no smoking signs in areas where oxygen is used or stored shall be in accordance with 18.3.2.4, 19.3.2.4, NFPA 99, 8.6.4.2				
K143	Transferring of oxygen shall be: (a) separated from any portion of a facility wherein patients are housed, examined, or treated by a separation of a fire barrier of 1-hour fire-resistive construction; and (b) the area that is mechanically ventilated, sprinklered, and has ceramic or concrete flooring; and (c) in an area that is posted with signs indicating that transferring is occurring, and that smoking in the immediate area is not permitted in accordance with NFPA 99 and Compressed Gas Association. 8.6.2.5.2				

ID PREFIX		MET	NOT MET	N/A	REMARKS
	ELECTRICAL				
K144	Generators inspected weekly and exercised under load for 30 minutes per month and shall be in accordance with NFPA 99, 3.4.4.1, NFPA 110, 8.4.2.				
K146	The nursing home/hospice with no life support equipment shall have an alternate source of power separate and independent from the normal source that will be effective for minimum of 1½ hour after loss of the normal source NFPA 99, 3.6				
K130	Miscellaneous List in the REMARKS sections, any items that are not listed previously, but are deficient. This information, along with the applicable Life Safety Code or NFPA standard citation, should be included on Form CMS-2567.				

FIRE SAFETY SURVEY REPORT
CRUCIAL DATA EXTRACT
(TO BE USED WITH CMS-2786 FORMS)

PROVIDER NUMBER	FACILITY NAME	SURVEY DATE * K4

* K4 MULTIPLE CONSTRUCTION	TOTAL NUMBER OF BUILDINGS _____ NUMBER OF THIS BUILDING _____	☐ A BUILDING B WING C FLOOR D APARTMENT UNIT

LSC FORM INDICATOR

1	2786	A-67	EXISTING
2		A-67	NEW
3		B-73	EXISTING
4		B-73	NEW
5		F-81	EXISTING
6		F-81	NEW
7		C-SHORT	
8		H-ASC	
9		J, K, L	85-CHAPTER 21 (ICFs/MR ONLY)
10		P-85	EXISTING
11		P-85	NEW

*K7 ☐ SELECT NUMBER OF FORM USED FROM ABOVE

(Check if not applicable)

K29 ☐ K56: ☐

COMPLETE IF ICF/MR IS SURVEYED UNDER CHAPTER 21

SMALL (16 BEDS OR LESS)

K8 ☐ 1 PROMPT, 2 SLOW, 3 IMPRACTICAL

LARGE

K8 ☐ 4 PROMPT, 5 SLOW, 6 IMPRACTICAL

APARTMENT HOUSE

K8: ☐ 7 PROMPT, 8 SLOW, 9 IMPRACTICAL

ENTER E – SCORE HERE

K5: ☐ e.g. 2.5

*K9: FACILITY MEETS LSC BASED ON: *(Check all that apply)*

A1. ☐ (COMP. WITH ALL PROVISIONS) A2. ☐ (ACCEPTABLE POC) A3. ☐ (WAIVERS) A4. ☐ (FSES)

FACILITY DOES NOT MEET LSC:

B. ☐

K0180 A. ☐ FULLY SPRINKLERED (All required areas are sprinklered) B. ☐ PARTIALLY SPRINKLERED (Not all required areas are sprinklered) C. ☐ NONE (No sprinkler system)

* MANDATORY

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR MEDICARE & MEDICAID SERVICES

Form Approved
OMB No. 0938-0242

ZONE _____ OF _____ ZONES

FIRE/SMOKE ZONE* EVALUATION WORKSHEET FOR HEALTH CARE FACILITIES

2000 LIFE SAFETY CODE

FACILITY	BUILDING
ZONE(S) EVALUATED	
PROVIDER/VENDOR NO.	DATE OF SURVEY

COMPLETE THIS WORKSHEET FOR EACH ZONE. WHERE CONDITIONS ARE THE SAME IN SEVERAL ZONES, ONE WORKSHEET CAN BE USED FOR THOSE ZONES.

Step 1: Determine Occupancy Risk Parameter Factors - Use Table 1.
A. For each Risk Parameter in Table 1, select and circle the appropriate risk factor value. Choose only one for each of the five Risk Parameters.

TABLE 1. OCCUPANCY RISK PARAMETER FACTORS

Risk Parameters	Risk Factors Values					
1. Patient Mobility *(M)*	Mobility Status	Mobile	Limited Mobility	Not Mobile	Not Movable	
	Risk Factor	1.0	1.6	3.2	4.5	
2. Patient Density *(D)*	No. of Patients	1–5	6–10	11–30	>30	
	Risk Factor	1.0	1.2	1.5	2.0	
3. Zone Location *(L)*	Floor	1st	2nd or 3rd	4th to 6th	7th and Above	Basements
	Risk Factor	1.1	1.2	1.4	1.6	1.6
4. Ratio of Patients to Attendants *(T)*	Patients / Attendant	1–2 / 1	3–5 / 1	6–10 / 1	>10 / 1	One or More / None
	Risk Factor	1.0	1.1	1.2	1.5	4.0
5. Patient Average Age *(A)*	Age	Under 65 Years and Over 1 year		65 Years and Over 1 Year and Younger		
	Risk Factor	1.0		1.2		

Step 2: Compute Occupancy Risk Factor (F) - Use Table 2.
A. Transfer the circled risk factor values from Table 1 to the corresponding blocks in Table 2.
B. Compute F by multiplying the risk factor values as indicated in Table 2.

TABLE 2. OCCUPANCY RISK FACTOR CALCULATION

	M		D		L		T		A		F
OCCUPANCY RISK		X		X		X		X		=	

Step 3: Compute Adjusted Building Status (R) - Use Table 2.
A. If building is classified as "NEW" use Table 3A. If building is classified as "Existing" use Table 3B.
B. Transfer the value of F from Table 2 to Table 3A or Table 3B as appropriate. Calculate R.
C. Transfer R to the block labeled R in Table 7 on page 4 of the work sheet.

TABLE 3A. (NEW BUILDINGS)

	F		R
1.0 X		=	

TABLE 3B. (EXISTING BUILDINGS)

	F		R
0.6 X		=	

*** FIRE/SMOKE ZONE is a space separated from all other spaces by floors, horizontal exits, or smoke barriers.**

SURVEYOR SIGNATURE	TITLE	DATE
FIRE AUTHORITY SIGNATURE	TITLE	DATE

Step 4: Determine Safety Parameter Values - Use Table 4.

A. Select and circle the safety value for each safety parameter in Table 4 that best describes the conditions in the zone. Choose only one value for each of the 13 parameters. If two or more appear to apply, choose the one with the lowest point value.

TABLE 4.

Safety Parameters	Safety Parameters Values						
1. Construction	Combustible Types III, IV, and V				NonCombustible Types I and II		
Floor or Zone	000	111	200	211 + 2HH	000	111	222, 322, 433
First	-2	0	-2	0	0	2	2
Second	-7	-2	-4	-2	-2	2	4
Third	-9	-7	-9	-7	-7	2	4
4th and Above	-13	-7	-13	-7	-9	-7	4
2. Interior Finish (Corridors and Exits)	Class C	Class B	Class A				
	-5(0)[f]	0(3)[f]	3				
3. Interior Finish (Rooms)	Class C	Class B	Class A				
	-3(1)[f]	1(3)[f]	3				
4. Corridor Partitions/Walls	None or Incomplete	<½ hour	≥½ to <1 hour	≥1 hour			
	-10(0)[a]	0	1(0)[a]	2(0)[a]			
5. Doors to Corridor	No Door	<20 min FPR	≥20 min FPR	≥20 min FPR and Auto Clos.			
	-10	0	1(0)[d]	2(0)[d]			
6. Zone Dimensions	Dead End			No Dead Ends >30 ft and Zone Length Is			
	>100 ft	>50 ft to 100 ft	30 ft to 50 ft	>150 ft	100 ft to 150 ft	<100 ft	
	-6(0)[b]	-4(0)[b]	-2(0)[b]	-2(0)[c]	0	1	
7. Vertical Openings	Open 4 or More Floors	Open 2 or 3 Floors	Enclosed with Indicated Fire Resist.				
			<1 hr	≥1 hr to <2 hr	≥2 hr		
	-14	-10	0	2(0)[a]	3(0)[a]		
8. Hazardous Areas	Double Deficiency		Single Deficiency		No Deficiencies		
	In Zone	Outside Zone	In Zone	In Adjacent Zone			
	-11	-5	-6	-2	0		
9. Smoke Control	No Control	Smoke Barrier Serves Zone	Mech. Assisted Systems by Zone				
	-5(0)[c]	0	3				
10. Emergency Movement Routes	<2 Routes	Multiple Routes					
		Deficient	W/O Horizontal Exit(s)	Horizontal Exit(s)	Direct Exit(s)		
	-8	-2	0	1	5		
11. Manual Fire Alarm	No Manual Fire Alarm		Manual Fire Alarm				
			W/O F.D. Conn.	W/F.D. Conn			
	-4		1	2			
12. Smoke Detection and Alarm	None	Corridor Only	Rooms Only	Corridor and Habit. Spaces	Total Spaces In Zone		
	0(3)[g]	2(3)[g]	3(3)[g]	4	5		
13. Automatic Sprinklers	None	Corridor and Habit. Space	Entire Building				
	0	8	10				

NOTE:
[a] Use (0) where parameter 5 is -10.
[b] Use (0) where parameter 10 is -8.
[c] Use (0) on floor with fewer than 31 patients (existing buildings only)
[d] Use (0) where parameter 4 is -10.

For SI units: 1 ft = 0.3048 m

[e] Use (0) where Parameter 1 is based on first floor zone or on an unprotected type of construction (columns marked "000" or "200")
[f] Use ( ) if the area of Class B or C interior finish in the corridor and exit or room is protected by automatic sprinklers and Parameter 13 is 0; use ( ) if the room with existing Class C interior finish is protected by automatic sprinklers, Parameter 4 is greater than or equal to 1, and Parameter 13 is 0.
[g] Use this value in addition to Parameter 13 if the entire zone is protected with quick-response automatic sprinklers.

Step 5: Compute Individual Safety Evaluations – Use Table 5.

A. Transfer each of the 13 circled Safety Parameter Values from Table 4 to every unshaded block in the line with the corresponding Safety Parameter in Table 5. For Safety Parameter 13 (Sprinklers) the value entered in the People Movement Safety column is recorded in Table 5 as ½ the corresponding value circled in Table 4.

B. Add the four columns, keeping in mind that any negative numbers deduct.

C. Transfer the resulting total values for S_1, S_2, S_3, S_4 to blocks labeled S_1, S_2, S_3, S_4 in Table 7 on page 4 of this sheet.

TABLE 5. INDIVIDUAL SAFETY EVALUATIONS

Safety Parameters	Containment Safety (S_1)	Extinguishment Safety (S_2)	People Movement Safety (S_3)	General Safety (S_4)
1. Construction				
2. Interior Finish (Corr. and Exit)				
3. Interior Finish (Rooms)				
4. Corridor Partitions/Walls				
5. Doors to Corridor				
6. Zone Dimensions				
7. Vertical Openings				
8. Hazardous Areas				
9. Smoke Control				
10. Emergency Movement Routes				
11. Manual Fire Alarm				
12. Smoke Detection and Alarm				
13. Automatic Sprinklers			÷ 2 =	
Total Value	S_1=	S_2=	S_3=	S_4=

TABLE 6.
MANDATORY SAFETY REQUIREMENTS (FOR USE IN HOSPITALS OR NURSING HOMES)

Zone Location	Containment (S_a)		Extinguishment (S_b)		People Movement (S_c)	
	New	Exist.	New	Exist.	New	Exist.
1st story	11	5	15(12)[a]	4	8(5)[a]	1
2nd or 3rd story[b]	15	9	17(14)[a]	6	10(7)[a]	3
4th story or higher	18	9	19(16)[a]	6	11(8)[a]	3

a. Use ( ) in zones that do not contain patient sleeping rooms.

b. For a 2nd story zone location in a sprinklered EXISTING facility, as an alternative to the mandatory safety requirement values set specified in the table, the following mandatory values *set* shall be permitted to be used: S_a=7, S_b=10, and S_c=7

Step 6: Determine Mandatory Safety Requirement Values - Use Table 6.

A. Using the classification of the building (i.e., New or Existing) and the floor where the zone is located circle the appropriate value in each of the three columns in Table 6.

B. Transfer the three circled values from Table 6 to the blocks marked S_a, S_b, and S_c in Table 7.

C. For each row check "Yes" if the value in the answer block is zero or greater. Check "No" if the value in the answer block is a negative number.

TABLE 7. ZONE FIRE SAFETY EQUIVALENCY EVALUATION								Yes	No
Containment Safety (S_1)	minus	Mandatory Containment (S_a)	≥ 0	S_1	−	S_a	= C		
Extinguishment Safety (S_2)	minus	Mandatory Extinguishment (S_b)	≥ 0	S_2	−	S_b	= E		
People Movement Safety (S_3)	minus	Mandatory People Movement (S_c)	≥ 0	S_3	−	S_c	= P		
General Safety (S_4)	minus	Occupancy Risk (R)	≥ 0	S_4	−	R	= G		

TABLE 8. FACILITY FIRE SAFETY REQUIREMENTS WORKSHEET				
Complete one copy of this worksheet for each facility. For each consideration, select and mark the appropriate column.		Met	Not Met	Not Applic.
A.	Building utilities conform to the requirements of Section 9.1.			
B.	In new facilities only, life-support systems, alarms, emergency communication systems, and illumination of generator set locations are powered as prescribed by 18.5.1.2 and 18.5.1.3.			
C.	Heating and air conditioning systems conform with the air conditioning, heating, and ventilating systems requirements within Section 9.2, except for enclosure of vertical openings, which have been considered in Safety Parameter 7 of Worksheet 4.7.6.			
D.	Fuel-burning space heaters and portable electrical space heaters are not used.			
E.	There are no flue-fed incinerators.			
F.	An evacuation plan is provided and fire drills conducted in accordance with 18.7.1/18.7.2 and 19.7.1/19.7.2.			
G.	Smoking regulations have been adopted and implemented in accordance with 18.7.4 and 19.7.4.			
H.	Draperies, upholstered furniture, mattresses, furnishings, and decoration combustibility is limited in accordance with 18.7.5 and 19.7.5.			
I.	Fire extinguishers are provided in accordance with the requirements of 18.3.5.4 and 19.3.5.6.			
J.	Exit signs are provided in accordance with the requirements of 18.2.10.1 and 19.2.10.			
K.	Emergency lighting is provided in accordance with 18.2.9.1 or 19.2.9.			
L.	Standpipes are provided in all new high rise buildings as required by 18.4.2.			

CONCLUSIONS

1. ☐ All of the checks in Table 7 are in the "Yes" column. The level of fire safety is at least equivalent to that prescribed by the *Life Safety Code*.*

2. ☐ One of more of the checks in Table 7 are in the "No" column. The level of fire safety is not shown by this system to be equivalent to that prescribed by the *Life Safety Code*.*

*The equivalency covered by this worksheet includes the majority of considerations covered by the *Life Safety Code*. There are a few considerations that are not evaluated by this method. These must be considered separately. These additional considerations are covered in Table 8, the "Facility Fire Safety Requirements Worksheet." One copy of this separate worksheet is to be completed for each facility.

FIRE SAFETY SURVEY REPORT
CRUCIAL DATA EXTRACT
(TO BE USED WITH CMS-2786 FORMS)

PROVIDER NUMBER	FACILITY NAME	SURVEY DATE
K1		* K4

K6 DATE OF PLAN APPROVAL

K3 MULTIPLE CONSTRUCTION

TOTAL NUMBER OF BUILDINGS _____

NUMBER OF THIS BUILDING _____

☐

A BUILDING
B WING
C FLOOR
D APARTMENT UNIT

LSC FORM INDICATOR

Health Care Form		
12	2786R	2000 EXISTING
13	2786R	2000 NEW

ASC Form		
14	2786U	2000 EXISTING
15	2786U	2000 NEW

ICF/MR Form		
16	2786V, W, X	2000 EXISTING
17	2786V, W, X	2000 NEW

* K7 ☐ SELECT NUMBER OF FORM USED FROM ABOVE

COMPLETE IF ICF/MR IS SURVEYED UNDER CHAPTER 21

SMALL (16 BEDS OR LESS)

K8: ☐ 1 PROMPT 2 SLOW 3 IMPRACTICAL

LARGE

K8: ☐ 4 PROMPT 5 SLOW 6 IMPRACTICAL

APARTMENT HOUSE

K8: ☐ 7 PROMPT 8 SLOW 9 IMPRACTICAL

(Check if K29 or K56 are marked as not applicable in the 2786 M, R, T, U, V, W, X and Y.)

K29: ☐ K56: ☐

ENTER E – SCORE HERE

K5: ☐ e.g. 2.5

*K9: FACILITY MEETS LSC BASED ON *(Check all that apply)*

A1. ☐ (COMP. WITH ALL PROVISIONS)

A2. ☐ (ACCEPTABLE POC)

A3. ☐ (WAIVERS)

A4. ☐ (FSES)

A5. ☐ (PERFORMANCE BASED DESIGN)

FACILITY DOES NOT MEET LSC

B. ☐

K0180 A. ☐ FULLY SPRINKLERED (All required areas are sprinklered)

B. ☐ PARTIALLY SPRINKLERED (Not all required areas are sprinklered)

C. ☐ NONE (No sprinkler system)

* MANDATORY

DEPARTMENT OF HEALTH & HUMAN SERVICES
CENTERS FOR MEDICARE & MEDICAID SERVICES

2000 CODE

Form Approved
OMB No. 0938-0942

FIRE SAFETY SURVEY REPORT - AMBULATORY SURGICAL CENTERS
Medicare

1. (A) PROVIDER NUMBER	1. (B) MEDICAID I.D. NO.
K1	K2

Identifying information as shown in applicable records. Enter changes, if any, alongside each item, giving date of change.

2. NAME OF FACILITY	2. (A) MULTIPLE CONSTRUCTION (BLDGS.)	2. (B) ADDRESS OF FACILITY (STREET, CITY, STATE, ZIP CODE)	A. ☐ Fully Sprinklered (All required areas are sprinklered)
	A. BUILDING _____		B. ☐ Partially Sprinklered (Not all required areas are sprinklered)
	B. WING _____		C. ☐ None (No sprinkler system)
	C. FLOOR _____		K2193
	K3		

☐ Initial Survey ☐ Resurvey	3. DATE OF SURVEY	☐ New ☐ Existing
	K4	

CHECK ONE
Facility is:
- ☐ Physically located in a hospital
- ☐ Free-standing: only occupancy in building
- ☐ Located in an Office Occupancy
- ☐ Located in a Mercantile/Business Occupancy
  Indicate Occupancy _____
- ☐ Other (specify) _____

- ☐ Accredited by _____
- ☐ Non Accredited

DATE OF BLDG. PERMIT OR PLAN APPROVAL:	DATE FIRST OCCUPIED AS AMBULATORY SURGICAL CTR.
K5	

If facility is located in a hospital or hospital owned/operated, was facility surveyed as part of Hospital LSC Survey?

☐ YES ☐ NO

A. ☐ The facility MEETS based upon:
1. ☐ Compliance with all provisions
2. ☐ Acceptance of a Plan of Correction
3. ☐ Recommended waivers
5. ☐ Performance Based Design

B. ☐ The facility DOES NOT MEET THE STANDARD.

K9

SURVEYOR (SIGNATURE)	TITLE	OFFICE	DATE
SURVEYOR ID K10			
REVIEW AUTHORITY OFFICIAL (SIGNATURE)	TITLE	OFFICE	DATE

ID PREFIX		MET	NOT MET	N/A	REMARKS	2000 CODE
	CONSTRUCTION					
K12	Buildings two or more stories in height and of Type II(000),III (200) V (000) construction are equipped throughout with a supervised approved automatic sprinkler system in accordance with section 9.7. 20.1.6.3, 21.1.6.3					
	Number of stories in the building _____					
K13	Construction Type _____					
	EXITS					
K32	At least two exits, located remote from each other are provided for each floor or fire section of the building. 20.2.4.1, 21.2.4.1					
K42	Rooms or suites of rooms of more than 2,500 sq. ft. have at least two exit access doors located remote from each other. 20.2.4.2, 21.2.4.2					
K37	Dead-end corridors do not exceed 50 ft. (Note: A common path of travel for the first 25 ft. is permitted.) 39.2.5.1, 39.2.5.2, 39.2.5.3					
K36	Travel distance between any room door required as exit access and an exit does not exceed 100 ft. The travel distance between any point in a room and an exit does not exceed 150 ft. (Note: In approved automatic sprinklered buildings, the travel distances may be increased by 50 ft.). 20.2.6.2, 21.2.6.2					
K112	At least 50 percent of the required exit capacity from upper floors discharges directly to the exterior of the building in accordance with section 7.7, 38.2.7, 39.2.7, 21.1.6.1, 20.1.6.1					
K113	Designated aisles, corridors, passageways, and exitways are provided with illumination in accordance with section 7.8. 20.2.8, 21.2.8					
K46	Emergency illumination is provided in accordance with section 7.9. 20.2.9.1, 21.2.9.1					
K47	Exits and ways of travel thereto are marked in accordance with section 7.10. 20.2.10, 21.2.10					
K43	Doors of patient treatment, diagnostic, or recovery rooms arranged to provide a clear width of not less than 32 inches and existing 34 inch door. 20.2.3.3, 21.2.3.3					
K40	Exit and exit access doors are at least 34 inches wide. 20.2.3.3, 21.2.3.3					

ID PREFIX		MET	NOT MET	N/A	REMARKS	2000 CODE
	LABORATORIES					
K31	Laboratories employing quantities of flammable, combustible, or hazardous materials that are considered a severe hazard shall be protected in accordance with NFPA 99. (Laboratories that are not considered to be a severe hazard shall meet the provision of K29.) Laboratories in health care occupancies and medical and dental offices shall be in accordance with NFPA 99, Standard for Health Care Facilities and NFPA101. Ventilating Systems shall comply with NFPA 101. 20.3.2.1, 21.3.2.1, 8.4.4, 9.2.4					
K136	Procedures for laboratory emergencies shall be developed. Such procedures shall include alarm actuation, evacuation, and equipment shutdown procedures, and provisions for control of emergencies that could occur in the laboratory, including specific detailed plans for control operations by an emergency control group within the organization or a public fire department in accordance with NFPA 99 and NFPA 101. 10.2.1.3.1, 20.3.2.1, 21.3.2.1					
K131	Emergency procedures established for controlling chemical spills shall be in accordance with NFPA 99. 10.2.1.3.2					
K132	Continuing safety education and supervision shall be provided, incidents shall be reviewed monthly, and procedures reviewed annually shall be in accordance with NFPA 99. 10.2.1.4.2					
K133	Fume hoods shall be in accordance with NFPA 99. 5.4.3, 5.6.2					
K134	Emergency Shower: Where the eyes or body of any person can be exposed to injurious corrosive materials, suitable fixed facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use. Fixed eye baths shall be designed and installed to avoid injurious water pressure shall be in accordance with NFPA 99. 10.6					
K135	Flammable and combustible liquids used from and stored in approved containers shall be in accordance with NFPA 30, Flammable and Combustible Liquids Code, and NFPA 45, Standard on Fire Protection for Laboratories Using Chemicals. Storage cabinets for flammable and combustible liquids shall be constructed in accordance with NFPA 30, Flammable and Combustible Liquids Code, NFPA 99. 4.3, 10.7.2.1					
K39	Corridors for exit access are at least 44 inches wide. 20.2.3.2, 21.2.3.2					

ID PREFIX		MET	NOT MET	N/A	REMARKS	2000 CODE
	EMERGENCY POWER					
K105	Where general anesthesia or life support equipment is used, an emergency power system is provided in accordance with NFPA 99. 20.2.9.2, 21.2.9.2 Indicate type_____					
	VERTICAL OPENING PROTECTION					
K20	Vertical openings such as stairways, elevator shaftways, escalators, and building service shaftways are enclosed in accordance with section 8.2.5, 8.2.5.2, 38.3.1, 39.3.1 (Note: Some exceptions are permitted in 38.3.1.)					
K21	Any door with a required fire protection rating, such as stairways, exit passageways, horizontal exits, smoke barriers, or hazardous areas enclosures, if held open, is arranged to close automatically by the actuation of the manual fire alarm system and either smoke detectors arranged to detect smoke on either side of the opening or a complete automatic sprinkler system. 20.2.2.3, 21.2.2.3					
	HAZARDOUS AREA PROTECTION					
K29	Hazardous areas separated from other parts of the building by fire barriers have at least one hour fire resistance rating or such areas are enclosed with partitions and doors and the area is provided with an automatic sprinkler system. High hazard areas are provided with both fire barriers and sprinkler systems 38.3.2, 39.3.2					

Area	Automatic Sprinkler	Separation	N/A
General Storage			
Boiler Rooms			
Furnace Rooms			
Storage Rooms			
Maintenance Shops			
Paint Shops			
Laundries (over 100 square feet)			

ID PREFIX		MET	NOT MET	N/A	REMARKS	2000 CODE
K211	2000 EXISTING Where Alcohol Based Hand Rub (ABHR) dispensers are installed: ❑ The corridor is at least 6 feet wide ❑ The maximum individual fluid dispenser capacity shall be 1.2 liters (2 liters in suites of rooms) ❑ The dispensers shall have a minimum spacing of 4 ft from each other ❑ Not more than 10 gallons are used in a single smoke compartment outside a storage cabinet. ❑ Dispensers are not installed over or adjacent to an ignition source. ❑ If the floor is carpeted, the building is fully sprinklered. 19.3.2.7, CFR 416.44					
	2000 NEW Where Alcohol Based Hand Rub (ABHR) dispensers are installed: ❑ The corridor is at least 6 feet wide ❑ The maximum individual fluid dispenser capacity shall be 1.2 liters (2 liters in suites of rooms) ❑ The dispensers shall have a minimum spacing of 4 ft from each other ❑ Not more than 10 gallons are used in a single smoke compartment outside a storage cabinet. ❑ Dispensers are not installed over or adjacent to an ignition source. ❑ If the floor is carpeted, the building is fully sprinklered. 18.3.2.7, CFR 416.44					
	MEDICAL GASES, AND ANESTHETIZING AREAS					
K76	Medical gas storage and administration areas shall be protected in accordance with NFPA 99, Standards for Health Care Facilities, and NFPA 101. (a) Oxygen storage locations of greater than 3,000 cu. ft. are enclosed by a one hour separation. (b) Locations for supply systems of greater than 3,000 cu. ft. are vented to the outside. 4.3.1.1.2, 20.3.2.4, 21.3.2.4					
K77	Piped in medical gas systems comply with NFPA 99.					

ID PREFIX		MET	NOT MET	N/A	REMARKS	2000 CODE
K78	Anesthetizing locations shall be protected in accordance with NFPA 99, Standard for Health Care Facilities and NFPA 101. (a) Shutoff valves are located outside each anesthetizing location and arranged so that shutting off one room or location will not affect others. (b) Relative humidity is maintained equal to or greater than 35%. NFPA 99 4.3.1.2.3(n) and 5.4.1.1, 18.3.2.3, 19.3.2.3					
K140	(a) Master alarm panels are in two separate locations and have audible and visible signals. (b) There are high/low alarms for +/- 20% operating pressure. This section shall be in accordance with NFPA 99, 4.3.1.2.2 (c) Where a level 1 gas system is used, one alarm panel that complies with 4.3.1.2.2(b) 3 a, b, c and d and with 4.3.1.2.2(c) 2 and 5 shall be permitted. (4.4.1 exception No. 4).					
K141	Non-smoking and no smoking signs in areas where oxygen is used or stored shall be in accordance with NFPA 99. 8.6.4.2					
K142	All occupancies containing hyperbaric facilities shall comply with NFPA 99, Standard for Health Care Facilities, Chapter 19.					
K143	Transferring of oxygen shall be: ❑ (a) separated from any portion of a facility wherein patients are housed, examined, or treated by a separation of a fire barrier of one hour fire-resistive construction; and ❑ (b) the area that is mechanically ventilated, sprinklered, and has ceramic or concrete flooring; and ❑ (c) in an area that is posted with signs indicating that transferring is occurring, and that smoking in the immediate area is not permitted in accordance with NFPA 99 and Compressed Gas Association. 8.6.2.5.2					
	ELECTRICAL					
K106	The ASC with life support equipment has a Type I Essential Electrical System powered by a generator with a transfer switch and separate power supply. The EES is in accordance with NFPA 99. 3.4.2.2, 3.4.2.1.4					
K144	Generators are inspected weekly and exercised under load for 30 minutes per month and shall be in accordance with NFPA 99. 3.4.4.1, NFPA110, 8.4.2					

ID PREFIX		MET	NOT MET	N/A	REMARKS	2000 CODE
K145	The Type I EES is divided into the critical branch, life safety branch and the emergency system and shall be in accordance with NFPA 99. 3.4.2.2.2					
K146	The ASC with no life support equipment shall have an alternate source of power separate and independent from the normal source that will be effective for minimum of 11/2 hour after loss of normal source NFPA 99. 3.6					
K147	Electrical wiring and equipment shall be in accordance with NFPA 70, National Electrical Code 9.1.2, 20.5.1					
	INTERIOR FINISH					
K14	Interior finish on walls and ceilings of exits, enclosed corridors, and exit access furnishing shall be Class A or B (offices Class A, B, or C) 38.3.3.2, 39.3.3.2					
	FIRE ALARM SYSTEMS					
K51	A manual fire alarm system, not a pre-signal type, is provided to automatically warn the building occupants. Fire alarm system has initiation notification and control function. The fire alarm system is arranged to automatically transmit an alarm to summon the fire department. 20.3.4.1, 21.3.4.1					
	CORRIDOR SEPARATION					
K17	Corridors used as access to exit are separated from use areas by partitions with a fire resistance rating of at least one hour. Fire resistance rating not required if building fully sprinklered. Doors have at least one 20 minute fire protection rating and are equipped with a positive latch and closing device. Vision panels, if provided, in partitions or doors therein are not to exceed 20 inches and install at or below half distance from floor to room ceiling. 20.3.6.2, 38.3.6.1 (Indicate N/A for existing occupancies, open floor areas with available exits, corridors in a space occupied by a single tenant, and buildings provided with complete automatic sprinkler systems.)					
	OCCUPANCY SEPARATION					
K114	Ambulatory health care occupancies are separated from other tenants and occupancies by fire barriers with at least a 1 hour fire resistance rating. Doors in such barriers are solid bonded core wood of 1¾ inches or equivalent and are equipped with a positive latch and closing device. Vision panels, if provided in fire barriers or doors shall be of fixed fire window assemblies in accordance with 8.2.3.2.2.					

ID PREFIX		MET	NOT MET	N/A	REMARKS	2000 CODE
	SMOKE BARRIERS					
K115	Ambulatory health care facilities are divided into at least two smoke compartments with smoke barriers having at least 1 hour fire resistance rating. Doors in smoke barriers are equipped with positive latcher. Doors shall be constructed of not less than 1¾ inch thick solid bonded core wood or equivalent. Vision panels are provided and are of fixed wire glass limited to 1,296 sq. inch per panel. (Indicate N/A for facilities of less than 5,000 sq. ft. with an approved smoke detection system, and less than 10,000 sq. ft. with an approved supervicsed sprinkler system in accordance with 9.7.) 20.3.7.1, 20.3.7.2, 20.3.7.3, 21.3.7.1, 21.3.7.2, 21.3.7.2					
	PORTABLE FIRE EXTINGUISHERS					
K64	Portable fire extinguishers are provided. 20.3.5.2, 21.3.5.2					
	HIGH RISE BUILDINGS					
K116	Buildings over 75 ft. in height housing ambulatory health care facilities are provided with a complete approved automatic sprinkler system shall be in accordance with 11.8.					
	BUILDING SERVICES					
K117	Utilities shall comply with section 9.1 Electrical Wiring and Equipment and shall be in accordance with NFPA 70. National Electrical Code. Required Emergency Generators shall be tested and maintained in accordance with NFPA 110, Standard for Emergency and Standby Power Systems.					
K67	Heating, ventilating, and air-conditioning shall comply with the manufacturer's specifications and section 9.2. 20,5.2.1, 21.5.2.1					
K70	Portable space heating devices are prohibited except portable space heating devices shall be permitted to be used in non-sleeping staff and employee areas where the heating elements of such devices do not exceed 212°F (100°C). 20.7.8, 21.7.8					
K118	Elevators, dumbwaiters, and vertical conveyors shall comply with section 9.4. 20.5.3, 21.5.3					
K71	Rubbish chutes, incinerators, and laundry chutes shall comply with section 7.5. 20.5.4, 21.5.4					

ID PREFIX		MET	NOT MET	N/A	REMARKS	2000 CODE
	EMERGENCY PLAN, FIRE DRILLS					
K48	There is a written plan for the protection of all patients and for their evacuation in the event of an emergency. 20.7.1.1, 21.7.1.1					
K50	Fire drills are held at unexpected times under varying conditions, at least quarterly on each shift. The staff is familiar with procedures and is aware that drills are part of established routine. 20.7.1.2, 21.7.1.2					
	SMOKING REGULATIONS					
K66	Smoking regulations are adopted, and include the posting of "NO SMOKING" signs or shall be posted with the international symbol for no smoking in any room, ward, or compartment where flammable liquids, combustible gases or oxygen are used or stored, and in any other hazardous location. 20.7.4, 21.7.4					
	FURNISHINGS AND DECORATIONS					
K72	Draperies, curtains and other loosely hanging fabrics and films serving as furnishings, except curtains at shower, shall be in accordance with NFPA 701. 20.7.5.1, 21.7.5.1					
K73	Newly introduced upholstered furniture shall be in accordance with NFPA 260, 261 unless building is fully sprinklered. 20.7.5.2, 21.7.5.2 Newly introduced mattresses shall meet NFPA 267. 20.7.5.3, 21.7.5.3					
K74	Combustible decorations shall be flame retardant. 20.7.5.4, 21.7.5.4					
K75	Solid linen or trash collection receptacles shall not exceed 32 gallons (121L) in capacity.					
	Mobile soiled linen or trash collection receptacles with capacity greater than 32 gallons (121L) shall be located in a room protected as a hazardous area. 20.7.5.3, 21.7.5.5					
	MISCELLANEOUS					
K130	List in the REMARKS section, any items that are not listed previously, but are deficient. This information along with the applicable Life Safety Code or NFPA Standard citation, should be included on Form CMS-2567.					

RECOMMENDATION FOR WAIVER OF SPECIFIC LIFE SAFETY CODE PROVISIONS

For each item of the Life Safety Code recommended for waiver, list the survey report form item number and state the reason for the conclusion that: (a) the specific provision of the code, if rigidly applied, would result in unreasonable hardship on the facility, and (b) the waiver of such unmet provisions will not adversely affect the health and safety of the patients. (If additional space is required, use additional sheet.)

PROVISION NUMBER(S)	JUSTIFICATION

Surveyor *(Signature)*	Title	Office	Date
Fire Authority Official *(Signature)*	Title	Office	Date

Form CMS-2786U (xx/xx) Previous Versions Obsolete

Page 10

FIRE SAFETY SURVEY REPORT
CRUCIAL DATA EXTRACT
(TO BE USED WITH CMS-2786 FORMS)

PROVIDER NUMBER	FACILITY NAME	SURVEY DATE
K1		* K4

K6 DATE OF PLAN APPROVAL

K3 MULTIPLE CONSTRUCTION

TOTAL NUMBER OF BUILDINGS _____

NUMBER OF THIS BUILDING _____

☐

A BUILDING
B WING
C FLOOR
D APARTMENT UNIT

LSC FORM INDICATOR

Health Care Form		
12	2786R	2000 EXISTING
13	2786R	2000 NEW

ASC Form		
14	2786U	2000 EXISTING
15	2786U	2000 NEW

ICF/MR Form		
16	2786V, W, X	2000 EXISTING
17	2786V, W, X	2000 NEW

* K7 ☐ SELECT NUMBER OF FORM USED FROM ABOVE

COMPLETE IF ICF/MR IS SURVEYED UNDER CHAPTER 21

SMALL (16 BEDS OR LESS)

K8 ☐ 1 PROMPT, 2 SLOW, 3 IMPRACTICAL

LARGE

K8: ☐ 4 PROMPT, 5 SLOW, 6 IMPRACTICAL

APARTMENT HOUSE

K8: ☐ 7 PROMPT, 8 SLOW, 9 IMPRACTICAL

(Check if K29 or K56 are marked as not applicable in the 2786 M, R, T, U, V, W, X and Y.)

K29 ☐ K56: ☐

ENTER E – SCORE HERE

K5: ☐ e.g. 2.5

*K9: FACILITY MEETS LSC BASED ON *(Check all that apply)*

A1. ☐ (COMP. WITH ALL PROVISIONS)
A2. ☐ (ACCEPTABLE POC)
A3. ☐ (WAIVERS)
A4. ☐ (FSES)
A5. ☐ (PERFORMANCE BASED DESIGN)

FACILITY DOES NOT MEET LSC

B. ☐

K0180

A. ☐ FULLY SPRINKLERED (All required areas are sprinklered)
B. ☐ PARTIALLY SPRINKLERED (Not all required areas are sprinklered)
C. ☐ NONE (No sprinkler system)

* MANDATORY

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR MEDICARE & MEDICAID SERVICES

2000 CODE ICFs/MR

Form Approved
OMB No. 0938-0242

FIRE SAFETY SURVEY REPORT - 2000 LIFE SAFETY CODE
Intermediate Care Facilities for the Mentally Retarded
SMALL

1. (A) PROVIDER NO. K1	1. (B) MEDICAID I.D. NO. K2

PART I – Chapter 6 – NFPA 101A – A Procedure for Determining Evacuation Capability
PART II – Chapter 32 & 33 – Residential Board & Care Occupancies – Requirements
PART III – Chapter 7-101A Fire Safety Evaluation System for Board & Care (Optional) – CMS-2786Y

Identifying information as shown in applicable records. Enter changes, if any, alongside each item, giving date of change.

2. NAME OF FACILITY	2. (A) MULTIPLE CONSTRUCTION (BLDGS) K3	2. (B) ADDRESS OF FACILITY (STREET, CITY, STATE, ZIP CODE)	A. ☐ Fully Sprinklered (All required areas are sprinklered) B. ☐ Partially Sprinklered (Not all required areas are sprinklered) C. ☐ None (No sprinkler system) K0160
	A. BUILDING _____ B. WING _____ C. FLOOR _____		

3. SURVEY FOR	4. DATE OF SURVEY	DATE OF PLAN APPROVAL	SURVEY UNDER:
☐ MEDICARE ☐ MEDICAID	K4	K5	5. ☐ 2000 EXISTING 6. ☐ 2000 NEW K7

E-SCORE

E-Score	Level of Evacuation Difficulty
≤ 1.5	Prompt
> 1.5 ≤ 5.0	Slow
> 5.0	Impractical

K5

5. SURVEY FOR CERTIFICATION OF: SMALL FACILITY - LEVEL OF EVACUATION DIFFICULTY *(Check one)*

1. ☐ Prompt 2. ☐ Slow 3. ☐ Impractical

K8

6. BED COMPOSITION

a. TOTAL NO. OF BEDS IN THE FACILITY	b. NUMBER OF ICF/MR BEDS CERTIFIED FOR MEDICAID

7. A. ☐ THE FACILITY MEETS, BASED UPON *(check all appropriate boxes)*:

1. ☐ COMPLIANCE WITH ALL PROVISIONS 2. ☐ ACCEPTANCE OF A PLAN OF CORRECTION 4. ☐ FSES 5. ☐ PERFORMANCE BASED DESIGN

B. ☐ THE FACILITY DOES NOT MEET THE STANDARD

K9

SURVEYOR *(Signature)*	TITLE	OFFICE	DATE
SURVEYOR ID K10			
FIRE AUTHORITY OFFICIAL *(Signature)*	TITLE	OFFICE	DATE

INSTRUCTIONS FOR COMPLETING THE FORM (CMS-2786V)
SMALL FACILITIES —16 BEDS OR LESS

1. **Complete a Worksheet for Rating Residents** (CMS-2786M) for each resident in the facility.

2. **Complete the first few pages of this form, a Worksheet for Calculating Evacuation Difficulty Score (Chapter 6 NFPA 101A, 2001 Edition).**
   Note: This is the ONLY method permitted to determine Level of Evacuation Difficulty in SMALL facilities.

3. **Transfer the E-Score** obtained in Scoresheet F2 C (Page 5) to the E-SCORE block on Page 1 of this form.

4. **Complete either Chapter 31 or 32** Requirements or the FSES/BC Appendix G - Rating the Building.

   A. **If completing Chapter 31 or 32** Requirements:

      1. PROMPT - Complete ONLY the PROMPT section of this form.
      2. SLOW - Complete both PROMPT and SLOW sections of this form.
      3. IMPRACTICAL - Complete all three sections of this form PROMPT, SLOW and IMPRACTICAL.

   B. **If completing the FSES/BC - Appendix G** - Rating The Building

      1. You **must** also complete the Chapter 31 or 32 requirements. An FSES building evaluation cannot be done without completing the usual survey form pages for these Chapters.
      2. You may use the FSES Health Care to evaluate the building (Form CMS-2786T), but if you choose to do so, you must also use the LSC Survey Report for Health Care Form CMS-2786R.

Worksheet for Calculating Evacuation Difficulty Score (E-Score)

F-2

BEFORE FILLING OUT THIS WORKSHEET:

- Please read the Instruction Manual.
- Make sure you have the completed "Worksheets for Rating Residents" (CMS-2786M) for each resident.
- Determine whether the requirements for using the Evacuation Difficulty Index have been satisfied by checking the one box to the left of each question below that shows whether the answer to the question is "YES" or "NO."

☐ Yes ☐ No 1. Has a protection plan been developed and written and have all staff members counted in the calculation of E-Scores been trained in its implementation?

☐ Yes ☐ No 2. Is the total available staff at any given time able to handle the individual evacuation needs of each resident who may be in the residence?

☐ Yes ☐ No 3. Can every staff member counted in the calculation of E-Scores meaningfully participate in the evacuation of every resident?

☐ Yes ☐ No 4. Are all staff members counted in the calculation of E-Scores required to remain in the residence with only the exceptions listed in the Instruction Manual?

☐ Yes ☐ No 5. Were at least twelve fire drills conducted during the year?

This worksheet is filled out for the staff "Shift"

From _____ To _____

(You must fill out this worksheet for the time of day, week, etc., when the ratings for the combination of staff and residents yields the highest E-Score. This period of time will usually be late at night. When it is not obvious which time period has the highest E-Score, complete a separate worksheet for all candidate time periods and use the one having the highest E-Score.)

F-2A Finding the Total Resident Score

1. List each resident's name in the scoresheet below. (Scoresheet F-2A)
2. For each resident, transfer the Evacuation Assistance Score (Part F-1B) from his/her Worksheet for Rating Residents (Step 1).
3. Add the Evacuation Assistance Score for all the residents and write the answer in the appropriate space at the bottom of Scoresheet F-2A.

Scoresheet F-2A RESIDENT SCORES					
Resident's Name	Evacuation Assistance Score	Resident's Name	Evacuation Assistance Score	Resident's Name	Evacuation Assistance Score
				Evacuation Assistance TOTAL	

F-2B Finding the Staff Shift Score

1. In Scoresheet F-2B (below), list the names of staff members who are required to remain in the group home during the time period (shift) specified on the front page of this worksheet.
2. Determine whether the effectiveness of the alarm system is rated as "assured" or "not assured" as explained in the Instruction Manual.
3. Using the appropriate "assured" or "not assured" column in the table below, find each staff member's Promptness of Response Score for the time period specified. Write each staff member's score in the appropriate space in Scoresheet F-2B.
4. Add the staff members' Promptness of Response Scores and write the total in the appropriate space in Scoresheet F-2B.

Scoresheet F-2B STAFF SCORES			
Staff's Name	Promptness of Response Score	Staff's Name	Promptness of Response Score
		Staff Shift TOTAL	

PROMPTNESS OF RESPONSE SCORES		
Staff Availability	Alarm Effectiveness	
	Assured	Not Assured
Standby or asleep	16	2
Immediately available	20	2
Immediately available & close by	20	10

NOTE: If the facility is a large residential facility, staff members may be responsible for assisting the residents in a fire/smoke zone, but may also have responsibilities for residents in other fire/smoke zones. See the glossary for Step 2 for the special procedure for assigning Promptness of Response Scores.

F-2C Finding the Home's Evacuation Difficulty Score

1. Rate the home on the factor below by checking the circle that best describes the home.

	Vertical Distance From Bedrooms to Exits		
	All BR on floor with direct exits	Any BR one floor from exit	Any BR two or more floors from exit
Small Facility	○ score = 0.8	○ score = 1.0	○ score = 1.2
Large Facility or Apartment	○ score = 1.0		

2. Write the score for the category you checked in the appropriate box in Scoresheet F-2C below.
3. Compute the E-Score as show in Scoresheet F-2C:
   a. Multiply the Resident Score Total by the score for Vertical Distance from Bedrooms to Exits.
   b. Divide the answer by the Staff Shift Score Total to find the Evacuation Difficulty Score (E-Score).

Scoresheet F-2C CALCULATION OF E-SCORE

Resident Score Total [ ] X Vertical Distance from Bedrooms to Exits [ ]

Staff Shift Score Total [ ] = ENTER THIS SCORE on COVER of THIS FORM — E-SCORE [ ]

4. Determine and record Level of Evacuation Difficulty appropriate to the Calculated E-Score; use Scoresheet F-2D.

Scoresheet F-2D

E-Score	Level of Evacuation Difficulty
≤ 1.5	Prompt
> 1.5 ≤ 5.0	Slow
> 5.0	Impractical

Level of Evacuation Difficulty [ ]

ID PREFIX	SMALL FACILITY PROMPT EVACUATION	MET	NO MET	N/A	REMARKS
	BUILDING CONSTRUCTION				
	No Requirements				
	HAZARDOUS AREAS				
K29	2000 EXISTING Any hazardous area that is on the same floor as, and is in or abut, a primary means of escape or a sleeping room shall be protected by one of the following means. (a) Protection shall be an enclosure with a fire resistance rating of not less than 1 hour, with a self-closing or automatic closing fire door in accordance with 7.2.1.8 that has a fire protection rating of not less than ¾ hour. (b) Protection shall be automatic sprinkler protection, in accordance with 33.2.3.5, and a smoke partition, in accordance with 8.2.4, located between the hazardous area and the sleeping area or primary escape route. Any doors in such separation shall be self-closing or automatic closing in accordance with 7.2.1.8. 33.2.3.2.2.				
	2000 NEW Any hazardous area that is on the same floor as, and is in or abut, a primary means of escape or a sleeping room shall be protected by one of the following means: (a) Protection shall be an enclosure with a fire resistance rating of not less than 1 hour, with a self-closing or automatic closing fire door in accordance with 7.2.18 that has a fire protection rating of not less than ¾ hour. The enclosure shall be protected by an automatic fire detection system connected to the fire alarm system provided in 32.2.3.4.1. (b) Protection shall be automatic sprinkler protection, in accordance with 32.2.3.5, and a smoke partition, in accordance with 8.2.4, located between the hazardous area and the sleeping area or primary escape route. Any doors in such separation shall be self-closing or automatic closing in accordance with 7.2.1.8, 32.2.3.2.2.				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K211	2000 EXISTING Where Alcohol Based Hand Rub (ABHR) dispensers are installed: ❑ The corridor is at least 6 feet wide ❑ The maximum individual fluid dispenser capacity shall be 1.2 liters (2 liters in suites of rooms) ❑ The dispensers shall have a minimum spacing of 4 ft from each other ❑ Not more than 10 gallons are used in a single smoke compartment outside a storage cabinet. ❑ Dispensers are not installed over or adjacent to an ignition source. ❑ If the floor is carpeted, the building is fully sprinklered. 19.3.2.7, CFR 483.70				
	2000 NEW Where Alcohol Based Hand Rub (ABHR) dispensers are installed: ❑ The corridor is at least 6 feet wide ❑ The maximum individual fluid dispenser capacity shall be 1.2 liters (2 liters in suites of rooms) ❑ The dispensers shall have a minimum spacing of 4 ft from each other ❑ Not more than 10 gallons are used in a single smoke compartment outside a storage cabinet. ❑ Dispensers are not installed over or adjacent to an ignition source. ❑ If the floor is carpeted, the building is fully sprinklered. 18.3.2.7, CFR 483.470				
K119	2000 EXISTING Other hazardous areas shall be protected in accordance with 33.2.3.2.3 by one of the following: (1) An enclosure having a fire resistance rating of not less than ½ hour, with a self-closing or automatic-closing door in accordance with 7.2.1.8 that is equivalent to not less than a 1¾ inch (4.4 cm) thick, solid-bonded wood core construction. (2) Automatic sprinkler protection in accordance with 33.2.3.5, regardless of enclosure.				

ID PREFIX		MET	NO MET	N/A	REMARKS
	2000 NEW Other hazardous areas shall be protected in accordance with 32.2.3.2.3 by one of the following: (1) An enclosure having a fire resistance rating of not less than ½ hour, with a self-closing or automatic closing door in accordance with 7.2.1.8 that is equivalent of not less than 1¾ inch (4.4 cm) thick, solid-bonded wood core construction and is protected by an automatic fire detection system connected to the fire alarm system provided in 32.2.3.1. (2) Automatic sprinkler protection in accordance with 32.2.3.5, regardless of enclosure.				
	FIRE ALARM SYSTEMS				
K51	2000 EXISTING A manual fire alarm system shall be provided in accordance with Section 9.6, 33.2.3.4.1. ❑ *Exception No 1: Where there are interconnected smoke detectors meeting the requirements of 33.2.3.4.3 and there is not less than one manual fire alarm box per floor arranged to continuously sound the smoke detector alarms.* ❑ *Exception No. 2: Other manually activated continuously sounding alarms acceptable to the authority having jurisdiction.*				
	2000 NEW A manual fire alarm system shall be provided in accordance with Section 9.6, 32.2.3.4.1.				
K155	Where a required fire alarm system is out of service for more than 4 hours in a 24-hour period, the authority having jurisdiction shall be notified, and the building shall be evacuated or an approved fire watch shall be provided for all parties left unprotected by the shut-down until the fire alarm system has been returned to service. 9.6.1.8				

ID PREFIX		MET	NO MET	N/A	REMARKS
	SMOKE SYSTEMS				
K53	2000 EXISTING Approved smoke alarms shall be provided in accordance with 9.6.2.10. These alarms shall be powered from the building electrical system and when activated, shall initiate an alarm that is audible in all sleeping areas. Smoke alarms shall be installed on all levels, including basement but excluding crawl spaces and unfinished attics. Additional smoke alarms shall be installed for living rooms, dens, day rooms, and similar spaces. 33.2.3.4.3. ❑ *Exception No 1: Buildings protected throughout by an approved automatic sprinkler system, in accordance with 33.2.3.5, that uses quick response or residential sprinklers, and protected with approved smoke alarms installed in each sleeping room in accordance with 9.6.2.10, that are powered by the building electrical system.* ❑ *Exception No. 2: Where buildings are protected throughout by an approved automatic sprinkler system, in accordance with 33.3.2.5, that uses quick-response or residential sprinklers, with existing battery-powered smoke alarms in each sleeping room, and where, in the opinion of the authority having jurisdiction, the facility has demonstrated that testing, maintenance, and a battery replacement program ensure the reliability of power to smoke alarms.*				
	2000 NEW Approved smoke alarms shall be provided in accordance with 9.6.2.10, 32.2.3.4.3.1. Smoke alarms shall be installed on all levels, including basements but excluding crawl spaces and unfinished attics. Additional smoke alarms shall be installed for all living areas as defined in 3.3.119. ❑ *Exception: Smoke alarms shall not be required in buildings protected throughout by an approved automatic sprinkler system in accordance with 32.2.3.5.*				
K56	2000 EXISTING Where an automatic sprinkler system is installed, for either total or partial building coverage, the system shall be in accordance with Section 9.7, 33.2.3.5.2 and shall activate the fire alarm system in accordance with 33.2.3.4.1. The adequacy of the water supply shall be documented to the authority having jurisdiction.				

ID PREFIX		MET	NO MET	N/A	REMARKS
	❑ *Exception No. 1: In prompt evacuation facilities, an automatic sprinkler system in accordance with NFPA 13D, Standard for the Installation of Sprinkler Systems in One and two Family Dwellings and Manufactured Homes, shall be permitted. Automatic sprinklers shall not be required in closets not exceeding 24 sq. ft. and in bathrooms not exceeding 55 sq. ft., provided that such spaces are finished with lath and plaster or materials providing a 15 minute thermal barrier.* ❑ *Exception No. 2: Not applicable* ❑ *Exception No. 3: In prompt and slow evacuation capability facilities where an automatic sprinkler system is in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems, automatic sprinklers shall not be required in closets not exceeding 24 sq. ft and in bathrooms not exceeding 55 sq. ft., provided that such spaces are finished with lath and plaster or material providing a 15 minute thermal barrier.* ❑ *Exception No. 4: In prompt and slow evacuation capability facilities up to and including four stories in height, systems in accordance with NFPA 13R, Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height, shall be permitted.* ❑ *Exception No. 5: Not applicable* ❑ *Exception No. 6: Initiation of the fire alarm system shall not be required for existing installations in accordance with 33.2.3.5.5.*				
	2000 NEW Where an automatic sprinkler system is installed, for either total or partial building coverage, the system shall be in accordance with Section 9.7 and shall initiate the fire alarm system in accordance with 32.2.3.4.1, 32.2.3.5.2. The adequacy of the water supply shall be documented to the authority having jurisdiction. ❑ *Exception No. 1: In prompt evacuation facilities, an automatic sprinkler system in accordance with NFPA 13D, Standard for the Installation of Sprinkler Systems in One and Two Family Dwellings and Manufactured Homes, shall be permitted. Facilities with more than eight residents shall be permitted. Facilities with more than eight residents shall be treated as two-family dwellings with regard to water supply. Additionally entrance foyers shall be sprinklered.*				

ID PREFIX		MET	NOT MET	N/A	REMARKS
	❑ *Exception No. 2: Not applicable* ❑ *Exception No. 3: In prompt and slow evacuation capability facilities where an automatic sprinkler system is in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems, automatic sprinklers shall not be required in closets not exceeding 24 sq. ft and in bathrooms not exceeding 55 sq. ft., provided that such spaces are finished with lath and plaster or material providing a 15 minute thermal barrier.* ❑ *Exception No. 4: In prompt and slow evacuation capability facilities up to and including four stories in height, systems in accordance with NFPA 13R, Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height, shall be permitted.* ❑ *Exception No. 5: Not applicable* ❑ *Exception No. 6: Initiation of the fire alarm system shall not be required for existing installations in accordance with 32.2.3.5.5.*				
K154	Where a required automatic sprinkler system is out of service for more than 4 hours in a 24-hour period, the authority having jurisdiction shall be notified, and the building shall be evacuated or an approved fire watch system be provided for all parties left unprotected by the shutdown until the sprinkler system has been returned to service. 9.7.6.1				
	A. Date sprinkler system last checked and necessary maintenance provided. _____				
	B. Show who provided the service. _____				
	C. Note the source of the water supply for the automatic sprinkler system._____				
	(Provide, in REMARKS, information on coverage for any non-required or partial automatic sprinkler system.)				
K144	2000 NEW All facilities shall be protected throughout by an approved automatic sprinkler system in accordance with 32.2.3.5.2, 32.2.3.5.1. Quick response or residential sprinklers shall be provided. ❑ *Exception No. 1: In conversions, sprinklers shall not be required in small board and care homes with a rating of prompt evacuation capability and serving eight or fewer residents.* ❑ *Exception No. 2: Standard response sprinklers shall be permitted for use in hazardous areas in accordance with 32.2.3.2.*				

ID PREFIX		MET	NO MET	N/A	REMARKS
	INTERIOR FINISH				
K14	2000 EXISTING Interior wall and ceiling finish shall be Class A or Class B in accordance with section 10.2, 33.2.3.3. There shall be no requirements for interior floor finish. ❑ *Exception: Class C interior wall and ceiling finish shall be permitted in prompt evacuation capability facilities.*				
	2000 NEW Interior wall and ceiling finish materials complying with 10.2.3 shall be Class A or Class B. 32.2.3.3.2. ❑ *Exception: Class C interior wall and ceiling finish shall be permitted in prompt evacuation capability facilities.*				
	SEPARATION OF SLEEPING ROOMS				
K17	2000 EXISTING The separation walls of sleeping rooms shall be capable of resisting fire for not less than ½ hour, which is considered to be achieved if the partitioning is finished on both sides with lath and plaster or materials providing a 15 minute thermal barrier. Sleeping room doors shall be substantial doors, such as those of 1¾ inch thick, solid-bonded wood core construction or other construction of equal or greater stability and fire integrity. Any vision panels shall be fixed fire window assemblies in accordance with 8.2.3.2.2 or shall be wired glass not exceeding 1296 sq. in. each in area and installed in approved frames. 33.2.3.6.1, 33.2.3.6.2. ❑ *Exception No. 1: In prompt evacuation facilities, all sleeping rooms shall be separated from the escape route by smoke partitions in accordance with 8.2.4. Door closing shall be regulated by 33.2.3.6.4.* ❑ *Exception No. 2: This requirement shall not apply to corridor walls that are smoke partitions in accordance with 8.2.4 and that are protected by automatic sprinklers in accordance with 33.2.3.5 on both sides of the wall and door. In such instances, there shall be no limitation on the type or size of glass panels. Door closing shall be regulated by 33.2.3.6.4.* ❑ *Exception No. 3: Sleeping arrangements that are not located in sleeping rooms shall be permitted for nonresident staff members, provided that the audibility of the alarm in the sleeping area is sufficient to awaken staff that might be sleeping.*				

ID PREFIX		MET	NOT MET	N/A	REMARKS
	❑ *Exception No. 4: In previously approved facilities, where the group achieves an E-score of three or less using the board and care methodology of NFPA 101A, Guide on Alternative Approaches to Life Safety, sleeping rooms shall be separated from escape routes by walls and doors that are smoke resistant.* No louvers or operable transoms or other air passages shall penetrate the wall, except properly installed heating and utility installations other than transfer grilles. Transfer grilles shall be prohibited.				
	2000 NEW The separation walls of sleeping rooms shall be capable of resisting fire for not less than ½ hour, which is considered to be achieved if the partitioning is finished on both sides with lath and plaster or materials providing a 15 minute thermal barrier. Sleeping room doors shall be substantial doors, such as those of 1¾ inch thick, solid-bonded wood core construction or other construction of equal or greater stability and fire integrity. Any vision panels shall be fixed fire window assemblies in accordance with 8.2.3.2.2. or shall be wired glass not exceeding 1296 sq. in. each in area and installed in approved frames. 32.2.3.6.1 and 32.2.3.6.2. ❑ *Exception No. 1: In prompt evacuation capability facilities, all sleeping rooms shall be separated from the escape route by smoke partitions in accordance with 8.2.4. Door closing shall be regulated by 32.2.3.6.4.* ❑ *Exception No. 2: This requirement shall not apply to corridor walls that are smoke partitions in accordance with 8.2.4 and that are protected by automatic sprinklers in accordance with 32.2.3.5 on both sides of the wall and door. In such instances, there shall be no limitation on the type or size of glass panels. Door closing shall be regulated by 32.2.3.6.4.* ❑ *Exception No. 3: Sleeping arrangements that are not located in sleeping rooms shall be permitted for nonresident staff members, provided that the audibility of the alarm in the sleeping area is sufficient to awaken staff that might be sleeping.* No louvers or operable transoms or other air passages shall penetrate the wall, except properly installed heating and utility installations other than transfer grilles. Transfer grilles shall be prohibited.				

ID PREFIX		MET	NO MET	N/A	REMARKS
K18	Doors shall be provided with latches or other mechanisms suitable for keeping the doors closed. No doors shall be arranged to prevent the occupant from closing the door. 32.2.3.6.3, 32.2.3.6.4, 33.2.3.6.3, 33.2.3.6.4 Doors shall be self-closing or automatic closing in accordance with 7.2.1.8 ❑ *Exception: Door closing devices shall not be required in buildings protected throughout by an approved automatic sprinkler system in accordance with 32.2.3.5.1 and 33.2.3.5.2.*				
	EGRESS				
K41	Every sleeping room and living area shall have access to a primary means of escape located to provide a safe path of travel to the outside. 33.2.2.2.1. Where sleeping rooms or living areas are above or below the level of exit discharge, the primary means of escape shall be an interior stair in accordance with 32.2.2.4 and 33.2.2.4, an exterior stair, a horizontal exit, or a fire escape stair. 32.2.2.2.				
K120	2000 EXISTING In addition to the primary route, each sleeping room shall have a second means of escape that consists of one of the following: (a) It shall be a door, stairway, passage, or hall providing a way of unobstructed travel to the outside of the dwelling at street or ground level that is independent of and remotely located from the primary means of escape. (b) It shall be a passage through an adjacent nonlockable space, independent of and remotely located from the primary means of escape, to approved means of escape. (c) It shall be an outside window or door operable from the inside without the use of tools, keys, or special effort that provides a clear opening of not less than 5.7 sq. ft. The width shall be not less than 20 inches. The height shall be not less than 24 inches. The bottom of the opening shall be not more than 44 inches above the floor. Such means of escape shall be acceptable where one of the following criteria are met:				

ID PREFIX		MET	NO MET	N/A	REMARKS
	(1) The window shall be within 20 ft of grade. (2) The window shall be directly accessible to fire department rescue apparatus as approved by the authority having jurisdiction. (3) The window or door shall open onto an exterior balcony. 33.2.2.3 ❑ *Exception No. 1: If the sleeping room has a door leading directly to the outside of the building with access to grade or to a stairway that meets the requirements of exterior stairs in 33.2.3.1.2, that means of escape shall be considered as meeting all the escape requirements for the sleeping room.* ❑ *Exception No. 2: A second means of escape from each sleeping room shall not be required where the facility is protected throughout by approved automatic sprinkler system in accordance with 33.2.3.5.* ❑ *Exception No. 3: Existing approved means of escape shall be permitted to continue to be used.*				
	2000 NEW In addition to the primary route, each sleeping room in facilities that use Exception No. 1 to 32.2.3.5.1 shall have a second means of escape that consists of one of the following: (d) It shall be a door, stairway, passage, or hall providing a way of unobstructed travel to the outside of the dwelling at street or ground level that is independent of and remotely located from the primary means of escape. (e) It shall be a passage through an adjacent nonlockable space, independent of and remotely located from the primary means of escape, to approved means of escape. (f) It shall be an outside window or door operable from the inside without the use of tools, keys, or special effort that provides a clear opening of not less than 5.7 sq. ft. The width shall be not less than 20 inches. The height shall be not less than 24 inches. The bottom of the opening shall be not more than 44 inches above the floor. Such means of escape shall be acceptable where one of the following criteria are met: (1) The window shall be within 20 ft of grade. (2) The window shall be directly accessible to fire department rescue apparatus as approved by the authority having jurisdiction.				

ID PREFIX		MET	NO MET	N/A	REMARKS
	(3) The window or door shall open onto an exterior balcony. 33.2.2.3 ❑ *Exception: If the sleeping room has a door leading directly to the outside of the building with access to grade or to a stairway that meets the requirements of exterior stairs in 32.2.3.1.2, that means of escape shall be considered as meeting all the escape requirements for the sleeping room.*				
K20	2000 EXISTING Interior stairs used as a primary means or escape shall be enclosed with ½ hour fire barriers, with all openings equipped with smoke-actuated automatic closing or self-closing doors having a fire protection rating comparable to that required for the enclosure. Stairs shall comply with 7.2.2.5.3. The entire primary means of escape shall be arranged so that it is not necessary for the occupants to pass through a portion of a lower story unless that route is separated from all spaces on that story by construction having not less than a ½ hour fire resistance rating. In buildings of construction other than Type II (000), Type III (200), or Type V (000), the supporting construction shall be protected to afford the required fire resistance rating of the supported wall. 33.2.2.4. ❑ *Exception No. 1: Stairs that connect a story at street level to only one other story shall be permitted to be open to the story that is not at street level.* ❑ *Exception No. 2: Stair enclosures shall not be required in buildings of three or fewer stories that house prompt or slow evacuation capability facilities protected through out by an approved automatic sprinkler system in accordance with 33.2.3.5 that uses quick response or residential sprinklers. This exception shall be permitted only if a primary means of escape from each sleeping area still exists that does not pass through a portion of a lower floor, unless that route is separated from all spaces on that floor by construction having a ½ hour fire resistance rating.* ❑ *Exception No. 3: Stair enclosures shall not be required in buildings of two or fewer stories that house prompt evacuation capability facilities with not more than eight residents and are protected by an approved automatic sprinkler system in accordance with 33.2.3.5 that uses quick-response or residential sprinklers. Exception No. 2 to 33.2.2.3 shall not be used in conjunction with this exception. The exceptions to 33.2.3.4.3 shall not be used in conjunction with this exception.*				

ID PREFIX		MET	NO MET	N/A	REMARKS
	❑ *Exception No. 4: In buildings of three or fewer stories that house prompt or slow evacuation capability facilities protected by an approved automatic sprinkler system in accordance with 33.2.3.5 stairs shall be permitted to be open at the topmost story only. The entire primary means of escape of which the stairs are a part shall be separated from all portions of lower stories.*				
	2000 NEW 32.2.2.4 Interior stairs shall be enclosed with ½ hour fire barriers, with all openings equipped with smoke-actuated automatic closing or self-closing doors having a fire protection rating comparable to that required for the enclosure. Stairs shall comply with 7.2.2.5.3. The entire primary means of escape shall be arranged so that it is not necessary for the occupants to pass from all spaces on that story by construction having not less than a ½ hour fire resistance rating. In buildings of construction other than Type II (000), Type III (200), or Type V (000), the supporting construction shall be protected to afford the required fire resistance rating of the supported wall. ❑ *Exception No. 1: Stairs that connect a story at street level to only one other story shall be permitted to be open to the story that is not at street level.* ❑ *Exception No. 2: Stair enclosures shall not be required for prompt and slow evacuation capability facilities in buildings of three or fewer stories that are protected with an approved automatic sprinkler system in accordance with 32.2.3.5. This exception shall be permitted only if a primary means of escape from each sleeping area still exists that does not pass through a portion of a lower floor, unless that route is separate from all spaces on that floor by construction having a ½ hour fire resistance rating.* ❑ *Exception No. 3: Stair enclosures shall not be required in buildings of two or fewer stories that house prompt evacuation capability facilities with not more than eight residents. The exception to 32.2.3.4.3.1 shall not be used in conjunction with this exception. Exception No. 1 to 32.2.3.5.1 shall not be used in conjunction with this exception.*				

ID PREFIX		MET	NOT MET	N/A	REMARKS
K21	32.2.3.1.1, 33.2.3.1.1 Vertical openings shall be protected so as not to expose a primary means of escape. Vertical openings shall be considered protected if separated by smoke partitions in accordance with 8.2.4 that prevent the passage of smoke from one story to any primary means of escape on another story. Smoke partitions shall have a fire resistance rating on not less than ½ hour. Any doors or openings to the vertical opening shall be capable of resisting fire for not less than 20 minutes. ❑ *Exception: Stairs shall be permitted to be open where complying with Exception no. 2 or Exception No. 3 to 32.2.2.4, 33.2.2.4.*				
K40	2000 EXISTING 33.2.2.5.1 Doors or paths of travel to a means of escape shall not be less than 28 inches. ❑ *Exception: Bathroom doors shall not be less than 24 inches.*				
	2000 NEW 32.2.2.5.1 Doors or paths of travel to means of escape shall be not less than 32 inches. ❑ *Exception No. 1: Bathroom doors shall be not less than 24 inches.* ❑ *Exception No. 2: In conversions (see 32.1.1.3), 28 inch doors shall be permitted to continue in use.*				
K121	Winders complying with 7.2.2.2.4 shall be permitted 32.2.2.6.2., 33.2.2.6.2				
K122	Every closet door latch shall be readily opened from the inside in case of an emergency. 32.2.2.5, 33.2.2.5.3				
K123	Every bathroom door shall be designed to allow opening from the outside during an emergency when locked. 32.2.2.5.4, 33.2.2.5.4				
K43	No door in any means of escape shall be locked against egress when the building is occupied. ❑ *Exception: Delayed egress locks complying with 7.2.1.6.1 shall be permitted on exterior doors. 32.2.2.5.5, 33.2.2.5.5.* **If the level of evacuation difficulty is PROMPT, stop here.**				

ID PREFIX		MET	NO MET	N/A	REMARKS
	SMALL FACILITY – SLOW EVACUATION BUILDING CONSTRUCTION				
K11	2000 EXISTING 33.2.1.3.2 The facility shall be housed in a building where the interior is fully sheathed with lath and plaster or other material providing a 15 minute thermal barrier, including all portions of bearing walls, bearing partitions, floor construction, and roofs. All columns, beams, girders, and trusses shall be similarly encased or otherwise shall provide not less than a ½ hour fire resistance rating. 33.2.1.3.2. ❑ *Exception No. 1: Exposed steel or wood columns, girders, and beams (but not joists) located in the basement.* ❑ *Exception No. 2: Buildings of Type I, Type II (2,2,2), Type II (1,1,1), Type III (2,1,1), Type IV, Type V (1,1,1) construction (See 8.2.1)* ❑ *Exception No. 3: Areas protected by approved automatic sprinkler systems in accordance with 33.2.3.5.* ❑ *Exception No. 4: Unfinished, unused, and essentially inaccessible loft, attic, or crawl space.* ❑ *Exception No. 5: Where the facility achieves an E-score of three or less using the board and care occupancies evacuation capability determination methodology of NFPA 101A, Guide on Alternative Approaches to Life Safety.* *Note: No requirement for New - Chapter 32*				
	INTERIOR FINISH				
K16	Interior wall and ceiling finish materials in accordance with 10.2 and 10.2.3 shall be Class A or Class B. 32.2.3.3.2, 33.2.3.3				

ID PREFIX		MET	NOT MET	N/A	REMARKS
	AUTOMATIC SPRINKLER SYSTEM				
K145	2000 NEW 32.2.3.5.1 All facilities shall be protected throughout by an approved automatic sprinkler system in accordance with 32.2.3.5.2. Quick response or residential sprinklers shall be provided. ❑ *Exception No. 1: In conversions, sprinklers shall not be required in small board and care homes with a rating of prompt evacuation capability and serving eight or fewer residents.* ❑ *Exception No. 2: Standard response sprinklers shall be permitted for use in hazardous areas in accordance with 32.2.3.2.*				
K56	2000 EXISTING 33.2.3.5.2 Where an automatic sprinkler system is installed, for either total or partial building coverage, the system shall be in accordance with Section 9.7 and shall activate the fire alarm system in accordance with 33.2.3.4.1. The adequacy of the water supply shall be documented to the authority having jurisdiction. ❑ *Exception No. 1: Not Applicable* ❑ *Exception No. 2: In slow and impractical evacuation capability facilities, an automatic sprinkler system in accordance with NFPA 13D, Standard for the Installation of Sprinkler Systems in one-and-two-Family Dwellings and Manufactured Homes, with a 30 minute water supply, shall be permitted. All habitable areas and closets shall be sprinklered. Automatic Sprinklers shall not be required in bathrooms not exceeding 55 ft² (5.1 m²), provided that such spaces are finished with bath and plaster or materials provided a 15 minute thermal barrier.* ❑ *Exception No. 3: In prompt and slow evacuation capability facilities where an automatic sprinkler system is in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems, automatic sprinklers shall not be required in closets not exceeding 24 sq. ft. and in bathrooms not exceeding 55 sq. ft., provided that such spaces are finished with lath and plaster or material providing a 15 minute thermal barrier.* ❑ *Exception No. 4: In prompt and slow evacuation capability facilities up to and including four stories in height, systems in accordance with NFPA 13R, Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height, shall be permitted.* ❑ *Exception No. 5: Not Applicable*				

ID PREFIX		MET	NO MET	N/A	REMARKS
	❑ *Exception No. 6: Initiation of the fire alarm system shall not be required for existing installations in accordance with 33.2.3.5.5.*				
	2000 NEW 32.2.3.5.2 Where an automatic sprinkler system is installed, for either total or partial building coverage, the system shall be in accordance with Section 9.7 and shall initiate the fire alarm system in accordance with 32.2.3.4.1. The adequacy of the water supply shall be documented to the authority having jurisdiction. ❑ *Exception No. 2: In slow and impractical evacuation capability facilities, an automatic sprinkler system in accordance with NFPA 13D, Standard for the Installation of Sprinkler Systems in one-and-two Family Dwellings and Manufactured Homes, with a 30 minute water supply, shall be permitted. All habitable areas and closets shall be sprinklered. Facilities with more than eight residents shall be treated as two family dwellings with regard to water supply.* ❑ *Exception No. 3: In prompt and slow evacuation capability facilities where an automatic sprinkler system is in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems, automatic sprinklers shall not be required in closets not exceeding 24 sq. ft. and in bathrooms not exceeding 55 sq. ft., provided that such spaces are finished with lath and plaster or material providing a 15 minute thermal barrier.* ❑ *Exception No. 4: In prompt and slow evacuation capability facilities up to and including four stories in height, systems in accordance with NFPA 13R, Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height, shall be permitted.* ❑ *Exception No. 5: Not Applicable* ❑ *Exception No. 6: Initiation of the fire alarm system shall not be required for existing installations in accordance with 32.2.3.5.5.*				
	EGRESS				
K32	2000 EXISTING (Only) 33.2.2.2.2 In slow and impractical evacuation capability facilities, the primary means of escape for each sleeping room shall not be exposed to living areas and kitchens. ❑ *Exception: Buildings equipped with quick-response or residential sprinklers throughout. Standard response sprinklers shall be permitted for use in hazardous areas in accordance with 33.2.3.2.* **If the level or evacuation capability is SLOW, stop here.**				

ID PREFIX		MET	NO MET	N/A	REMARKS
	SMALL FACILITY IMPRACTICAL EVACUATION CAPABILITY				
	BUILDING CONSTRUCTION				
K12	2000 EXISTING Buildings shall be of any construction type in accordance with 8.2.1 other than Type II (000), Type III (200), or Type V (000) construction. 33.2.1.3.3. ❑ *Exception: Buildings protected throughout by an approved, supervised automatic sprinkler system in accordance with 33.2.3.5 shall be permitted to be of any type of construction.*				
	AUTOMATIC SPRINKLER SYSTEM				
K56	2000 EXISTING Where an automatic sprinkler system is installed, for either total or partial building coverage, the system shall be in accordance with Section 9.7 and shall activate the fire alarm system in accordance with 33.2.3.4.1. The adequacy of the water supply shall be documented to the authority having jurisdiction. 33.2.3.5.2. ❑ *Exception No. 1: Not Applicable.* ❑ *Exception No. 2: In slow and impractical evacuation capability facilities, an automatic sprinkler system in accordance with NFPA 13D, Standard for the Installation of Sprinkler Systems in One and Two Family Dwellings and Manufactured Homes, with a 30 minute water supply, shall be permitted. All habitable areas and closets shall be sprinklered. Automatic sprinklers shall not be required in bathrooms not exceeding 55 sq. ft., provided that such spaces are finished with lath and plaster or materials providing a 15 minute thermal barrier.* ❑ *Exception No. 3: Not Applicable.* ❑ *Exception No. 4: Not Applicable.* ❑ *Exception No. 5: In impractical evacuation capability facilities up to and including four stories in height, systems in accordance with NFPA 13R, Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height, shall be permitted. All habitable areas and closets shall be sprinklered. Automatic sprinklers shall not be required in bathrooms not exceeding 55 sq. ft., provided that such spaces are finished with lath and plaster or materials providing a 15 minute thermal barrier.* ❑ *Exception No. 6: Initiation of the fire alarm system shall not be required for existing installations in accordance with 33.2.3.5.5.*				

ID PREFIX		MET	NO MET	N/A	REMARKS
	2000 NEW Where an automatic sprinkler system is installed, for either total or partial building coverage, the system shall be in accordance with Section 9.7 and shall initiate the fire alarm system in accordance with 32.2.3.4.1. The adequacy of the water supply shall be documented to the authority having jurisdiction. 32.2.3.5.2. ❑ *Exception No. 1: Not Applicable.* ❑ *Exception No. 2: In slow and impractical evacuation capability facilities, an automatic sprinkler system in accordance with NFPA 13D, Standard for the Installation of Sprinkler Systems in One and Two Family Dwellings and Manufactured Homes, with a 30 minute water supply, shall be permitted. All habitable areas and closets shall be sprinklered. Facilities with more than eight residents shall be treated as two family dwellings with regard to water supply.* ❑ *Exception No. 3: Not Applicable.* ❑ *Exception No. 4: Not Applicable.* ❑ *Exception No. 5: In impractical evacuation capability facilities up to and including four stores in height, systems in accordance with NFPA 13R, Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stores in Height, shall be permitted. All habitable areas and closets shall be sprinklered.* ❑ *Exception No. 6: Initiation of the fire alarm system shall not be required for existing installations in accordance with 32.2.3.5.5.*				
	VERTICAL OPENINGS				
K20	Vertical openings shall be protected so as not to expose a primary means of escape. Vertical openings shall be considered protected if separated by smoke partitions in accordance with 8.2.4 that prevent the passage of smoke from one story to any primary means of escape on another story. Smoke partitions shall have a fire resistance rating of not less than a ½ hour. Any doors or openings to the vertical opening shall be capable of resisting fire for not less than 20 minutes. 32.2.3.1.1, 33.2.3.1.1 ❑ *Exception: Stairs shall be permitted to be open where complying with Exception No. 2 or Exception No. 3 to 32.2.2.4 and 33.2.2.4.* **Note: Make sure you have completed PROMPT and SLOW as well as this section.**				

ID PREFIX		MET	NOT MET	N/A	REMARKS
	OPERATING FEATURES FOR ALL FACILITIES				
K46	Utilities shall comply with Section 9.1. 32.2.5.1, 33.2.5.1				
K147	The administration of every resident board and care facility shall have in effect and available to all supervisory personnel written copies of a plan for protecting all persons in the event of fire, for keeping persons in place, for evacuating persons to areas of refuge, and for evacuating person from the building when necessary. The plan shall include special staff response, including fire protection procedures needed to ensure the safety of any resident, and shall be amended or revised whenever any resident with unusual needs is admitted to the home. All employees shall be periodically instructed and kept informed with respect to their duties and responsibilities under the plan. Such instruction shall be reviewed by the staff not less than every 2 months. A copy of the plan shall be readily available at all times within the facility. 32.7.1, 33.7.1				
K148	Smoking regulations shall be adopted by the administration of board and care occupancies. 32.7.4.1, 33.7.4.1				
K149	Where smoking is permitted, noncombustible safety type ashtrays or receptacles shall be provided in convenient locations. 32.7.4.2, 33.7.4.2				
K150	New draperies, curtains, and other similar loosely hanging furnishings and decorations in board and care facilities shall be in accordance with provisions of 10.3.1. 32.7.5.1, 33.7.5.1				
K151	New upholstered furniture within board and care facilities shall be tested in accordance with the provisions of 10.3.2(1) and 10.3.3. ❑ *Exception: Upholstered furniture belonging to the resident in sleeping rooms, provided that a smoke alarm is installed in such rooms. Battery-powered single-station smoke alarms shall be permitted. 32.7.5.2, 33.7.5.2*				
K152	CFR-42-483.470(i) Evacuation Drills (1) The facility must hold evacuation drills at least quarterly for each shift of personnel and under varied conditions to – ❑ *(i) Ensure that all personnel on all shifts are trained to per form assigned tasks:* ❑ *(ii) Ensure that all personnel on all shifts are familiar with the use of the facility's emergency and disaster plans and procedures.*				

ID PREFIX		MET	NOT MET	N/A	REMARKS
	(2) The facility must – ❑ *(i) Actually evacuate clients during at least one drill each year on each shift;* ❑ *(ii) Make special provisions for the evacuation of clients with physical disabilities:* ❑ *(iii) File a report and evaluation on each drill:* ❑ *(iv) Investigate all problems with evacuation drills, including accidents and take corrective action: and* ❑ *(v) During fire drills, clients may be evacuated to a safe area in facilities certified under the Health Care Occupancies Chapter of the Life Safety Code.* (3) Facilities must meet the requirements of paragraphs (i) (1) and (2) of this section for any live-in and relief staff that they utilize.				

FIRE SAFETY SURVEY REPORT
CRUCIAL DATA EXTRACT
(TO BE USED WITH CMS-2786 FORMS)

PROVIDER NUMBER K1	FACILITY NAME	SURVEY DATE * K4

K6 DATE OF PLAN APPROVAL

K3 MULTIPLE CONSTRUCTION
TOTAL NUMBER OF BUILDINGS _____
NUMBER OF THIS BUILDING _____

[ ]
A BUILDING
B WING
C FLOOR
D APARTMENT UNIT

LSC FORM INDICATOR

Health Care Form		
12	2786R	2000 EXISTING
13	2786R	2000 NEW

ASC Form		
14	2786U	2000 EXISTING
15	2786U	2000 NEW

ICF/MR Form		
16	2786V, W, X	2000 EXISTING
17	2786V, W, X	2000 NEW

* K7 [ ] SELECT NUMBER OF FORM USED FROM ABOVE

COMPLETE IF ICF/MR IS SURVEYED UNDER CHAPTER 21

SMALL (16 BEDS OR LESS)
K8 [ ]
1 PROMPT
2 SLOW
3 IMPRACTICAL

LARGE
K8: [ ]
4 PROMPT
5 SLOW
6 IMPRACTICAL

APARTMENT HOUSE
K8: [ ]
7 PROMPT
8 SLOW
9 IMPRACTICAL

(Check if K29 or K56 are marked as not applicable in the 2786 M, R, T, U, V, W, X and Y.)

K29 [ ] K56: [ ]

ENTER E – SCORE HERE

K5: [ ] e.g. 2.5

*K9: FACILITY MEETS LSC BASED ON *(Check all that apply)*

A1. [ ] (COMP. WITH ALL PROVISIONS)
A2. [ ] (ACCEPTABLE POC)
A3. [ ] (WAIVERS)
A4. [ ] (FSES)
A5. [ ] (PERFORMANCE BASED DESIGN)

FACILITY DOES NOT MEET LSC
B. [ ]

K0180
A. [ ] FULLY SPRINKLERED (All required areas are sprinklered)
B. [ ] PARTIALLY SPRINKLERED (Not all required areas are sprinklered)
C. [ ] NONE (No sprinkler system)

* MANDATORY

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR MEDICARE & MEDICAID SERVICES

2000 CODE ICFs/MR — Form Approved OMB No. 0938-0242

FIRE SAFETY SURVEY REPORT - 2000 LIFE SAFETY CODE
Intermediate Care Facilities for the Mentally Retarded
LARGE

1. (A) PROVIDER NO. K1	1. (B) MEDICAID I.D. NO. K2

PART I — Figure 6.8 — A Procedure for Determining Evacuation Capability
PART II — Chapters 32 & 33 — Residential Board & Care Occupancies — Requirements
PART III — Figure 7.5 — Fire Safety Evaluation System for Board & Care (Optional) — CMS-2786T

Identifying information as shown in applicable records. Enter changes, if any, alongside each item, giving date of change.

2. NAME OF FACILITY	2. (A) MULTIPLE CONSTRUCTION K3	2. (B) ADDRESS OF FACILITY (STREET, CITY, STATE, ZIP CODE	A. ☐ Fully Sprinklered (All required areas are sprinklered) B. ☐ Partially Sprinklered (Not all required areas are sprinklered) C. ☐ None (No sprinkler system) K3160
	A. BUILDING _____ B. WING _____ C. FLOOR _____		

	4. DATE OF SURVEY K4	DATE OF PLAN APPROVAL K6	SURVEY UNDER: 9. ☐ 2000 ☐ Chapter 32 New ☐ Chapter 33 Existing K7

E–Score K5

E–Score	Level of Evacuation Difficulty
≤ 1.5	Prompt
> 1.5 ≤ 5.0	Slow
> 5.0	Impractical

5. SURVEY FOR CERTIFICATION OF: SMALL FACILITY
LEVEL OF EVACUATION DIFFICULTY (check one) K8

☐ 4. Prompt ☐ 5. Slow ☐ 6. Impractical

6. BED COMPOSITION A. TOTAL NO. OF BEDS IN THE FACILITY	E. NUMBER OF BEDS CERTIFIED FOR MEDICAID

7. ☐ A. THE FACILITY MEETS, BASED UPON (CHECK ALL APPROPRIATE BOXES)
1. ☐ COMPLIANCE WITH ALL PROVISIONS 2. ☐ ACCEPTANCE OF A PLAN OF CORRECTION 4. ☐ FSES 5. ☐ PERFORMANCE BASED DESIGN
☐ B. THE FACILITY DOES NOT MEET THE STANDARDS K9

SURVEYOR (SIGNATURE)	TITLE	OFFICE	DATE
SURVEYOR ID K10			
FIRE AUTHORITY OFFICIAL (SIGNATURE)	TITLE	OFFICE	DATE

INSTRUCTIONS FOR COMPLETING THE FORM (CMS-2786K)
LARGE FACILITIES — 17 BEDS OR MORE

1. **Determine the Level of Evacuation Capability** of the facility.
2. **Transfer the E-Score** obtained in Fig. 6.8 of page 1 of this form.
3. **Complete either LSC Chapter 32 for (new) or LSC Chapter 33 for (existing)** requirements of this form, or Fig. 7.5 — Rating the Building.

   A. **If completing Chapter 32 or 33** Requirements:

      1. PROMPT OR SLOW - Complete sections for PROMPT and SLOW
      2. Impractical - Complete a CMS-2786R (Health Care) or FSES/Health Care (Optional) — see page 13.

   B. **If completing the FSES/BC — Chapter 32 or 33** — Rating the Building

      1. You **MUST** also complete the Chapter 32 or 33 requirements. An FSES building evacuation cannot be done without completing the usual survey form pages for Chapter 32 or 33
      2. You may use the FSES/Health Care to evaluate the building (Form CMS-2786T Chapter 4 & Fig. 4.7), but if you choose to do so, you must use the LSC Survey Report for Health Care (CMS-2786R)

*Figures for FSES/HC are taken from NFPA 101 A 2001 Edition

Worksheet for Calculating Evacuation Difficulty Score (E-Score)

F-2

BEFORE FILLING OUT THIS WORKSHEET:

- Please read the Instruction Manual.
- Make sure you have the completed "Worksheets for Rating Residents" (figure 6.8) for each resident.
- Determine whether the requirements for using the Evacuation Difficulty Index have been satisfied by checking the one box to the left of each question below that shows whether the answer to the question is "YES" or "NO."

❑ YES ❑ NO 1. Has a protection plan been developed and written and have all staff members counted in the calculation of E-Scores been trained in its implementation?

❑ YES ❑ NO 2. Is the total available staff at any given time able to handle the individual evacuation needs of each resident who may be in the residence?

❑ YES ❑ NO 3. Can every staff member counted in the calculation of E-Scores meaningfully participate in the evacuation of every resident?

❑ YES ❑ NO 4. Are all staff members counted in the calculation of E-Scores required to remain in the residence with only the exceptions listed in the Instruction Manual?

❑ YES ❑ NO 5. Were at least twelve fire drills conducted during the year?

This worksheet is filled out for the staff "Shift"

From _____ To _____

(You must fill out this worksheet for the time of day, week, etc. when the ratings for the combination of staff and residents yields the highest E-Score. This period of time will usually be late at night. When it is not obvious which time period has the highest E-Score, complete a separate worksheet for all candidate time periods and use the one having the highest E-Score.)

EVALUATOR'S NAME_____ DATE _____
(if other than Fire Authority Surveyor)

Worksheet 6.8.1 Cover Sheet

Resident's name _____

Evaluator _____

Facility _____

Date _____

Zone _____

Write any explanatory remarks here:

Worksheet 6.8.2 Rating the Resident on the Risk Factors

Rate the resident on each of the factors below by checking the one circle for each risk factor that best describes the resident. For the first six factors, write the scores for the circles checked in the appropriate score boxes in the far right column. For "Response to Fire Drills," write the three checked scores in the large circles. Write the sum of the three scores in the large box on the right.

					Score Boxes
I. Risk of Resistance (Check only one)	Minimal Risk ○ score = 0	Risk of Mild Resistance ○ score = 6	Risk of Strong Resistance ○ score = 20		☐
II. Impaired Mobility (Check only one)	Self-Starting ○ score = 0	Slow ○ score = 3	Needs Limited Assistance ○ score = 6	Needs Full Assistance or Very Slow ○ score = 20	☐
III. Impaired Consciousness (Check only one)	No Significant Risk ○ score = 0	Partially Impaired ○ score = 6	Totally Impaired ○ score = 20		☐
IV. Need for Extra Help (Check only one)	Needs at Most One Staff ○ score = 0	Needs Limited Assistance from 2 Staff ○ score = 30	Needs Full Assistance from 2 Staff ○ score = 40		☐
V. Response to Instructions (Check only one)	Follows Instructions ○ score = 1	Requires Supervision ○ score = 3	Requires Considerable Attention/Might Not Respond ○ score = 10		☐
VI. Waking Response to Alarm (Check only one)	Response Probable ○ score = 0	Response Not Probable ○ score = 6			☐

VII. Response to Fire Drills (Without guidance or advice from staff)	Initiates and Completes Evacuation Promptly	Yes ○ score = 0	No ○ score = 8	○ +	
	Chooses and Completes Back-up Strategy	Yes ○ score = 0	No ○ score = 4	○ +	
	Remains at Designated Location	Yes ○ score = 0	No ○ score = 6	○ = Sum of These Three Scores	☐

Worksheet 6.8.3 Determining the Resident's Overall Need for Assistance

Compare the numbers in the seven score boxes filled in. Take the highest score from the score boxes (Worksheet 6.8.2.) and write it in the box at the right.

Notes:

Evacuation Assistance Score

Worksheet 6.8.4 Resident Scores

Resident's Name	Evac. Assist. Score	Resident's Name	Evac. Assist. Score
Evacuation Assistance Score Total		Evacuation Assistance Score Total	

Worksheet 6.8.5 Cover Sheet

Staff Shift Score

Facility _____ Zone _____

Evaluator _____ Date _____

Staff Shift: From _____ To _____

Worksheet 6.8.6 Staff Response and Training

	YES	NO
A protection plan has been promulgated and all staff members considered in this rating have been trained in its implementation. (*See* 6.5.2.1)		
The total available staff at any given time is able to handle the individual evacuation needs of each resident who is in the facility. (*See* 6.5.2.2. and *Exception*)		
Every staff member considered in this rating can meaningfully participate in the evacuation of each resident. (*See* 6.5.2.3)		
All staff members considered in this rating are required to be in the facility when on duty, except as permitted. (*See* 6.5.2.4 and *Exceptions*)		
At least 12 fire drills were conducted during the previous year. (*See* 6.5.2.5 and *Exception*)		

All items must score "Yes" before proceeding.

Worksheet 6.8.7 Promptness of Response Scores

Staff Availability	Alarm Effectiveness	
	Assured	Not Assured
Standby or asleep	16	2
Immediately available	20	2
Immediately available and close by	20	10

Worksheet 6.8.8 Staff Scores

Resident's Name	Promptness of Response Score		Resident's Name	Promptness of Response Score
Staff Shift Score Total			Staff Shift Score Total	

Worksheet 6.8.9 Rating the Facility

	Vertical Distance from Sleeping Rooms to Exits		
	All SR on Floors with Direct Exit	Any SR One Floor from Exit	Any SR Two or More Floors from Exit
Small Facility	◯ Score 0.8	◯ Score 1.0	◯ Score 1.2
Large Facility or Apartment		◯ Score 1.0	

NOTE: Small facilities have 16 or fewer residents. See 6.6.6 for apartments.

Worksheet 6.8.10 Calculation of Evacuation Capability Score

Total Resident Evacuation Assistance Score (Worksheet 6.8.4) [ ] X Vertical Distance from Sleeping Room to Exit (Worksheet 6.8.9) [ ]

Staff Shift Score (Worksheet 6.8.8) [ ]

= Evacuation Capability Score [ ]

(Go to Worksheet 6.8.11)

Worksheet 6.8.11 Evacuation Capability Score

Evacuation Capability Score	Level of Evacuation Capability	Evacuation Capability for this Facility or Zone
≤1.5	Prompt	
>1. to ≤5.0	Slow	
>5.0	Impractical	

ID PREFIX	LARGE FACILITY PROMPT AND SLOW EVACUATION CAPABILITIES	MET	NOT MET	N/A	REMARKS	LARGE PROMPT & SLOW
	BUILDING CONSTRUCTION (NEW & EXISTING)					
K12	Minimum Construction Requirements: Based on highest story normally used by residents One and Two Story ☐ Any construction type of one-hour or greater fire rating, or ☐ Type IV (2HH), or ☐ Fully sheathed, or ☐ With automatic sprinkler system throughout, in accordance with 32.3.3.5, 33.3.3.5. ☐ Exception: One story any construction type and no more than 30 residents capable of prompt evacuation.					
	Three to Six Stories ☐ Type I, II or III construction of one-hour or greater fire resistance rating, or ☐ Type IV construction with automatic sprinkler system throughout in accordance with 32.3.3.5 or 33.3.3.5. ☐ Exception: Three or four story facilities of Type V (000), sheathed and with automatic sprinkler system throughout, in accordance with 32.3.3.5, 33.3.3.5.					
	More than Six Stories ☐ Type I or II (222) construction, or ☐ Type II (111) construction, or ☐ Type III (211) construction, or ☐ Type IV (2HH) with automatic sprinkler system throughout in accordance with 32.3.3.5, 33.3.3.5. 32.3.1.3, 33.1.3.1					
	OCCUPANT LOAD ☐ Not less than two exits shall be accessible from every floor and in at least two different directions. The occupant load, in number of persons for who means of egress and other provisions are required, shall be determined on the basis of the occupant load factors or Table 7.3.1.2 that are characteristic of the use of the space or shall be determined as the maximum probable population of the space under consideration, whichever is greater. 33.3.1.4, 32.3.1.4					

ID PREFIX	LARGE FACILITY PROMPT AND SLOW EVACUATION CAPABILITIES	MET	NOT MET	N/A	REMARKS	LARGE PROMPT & SLOW
	HAZARDOUS AREAS					
K124	Any room containing high-pressure boilers, refrigerating machinery, transformers, or other service equipment subject to possible explosion shall not be located under or adjacent to exits. All such rooms shall be effectively separated from other parts of the building as specified in section 8.4. 32.3.3.2.1, 33.3.2.1					
K29	All hazardous areas shall be separated with construction of a minimum of one-hour fire resistance or automatic extinguishment system with openings protected with self-closing fire doors. ☐ *Exception: Existing buildings may have hazardous areas separated from other parts of the building by a smoke partition in accordance with section 8.2.4.* Hazardous areas shall include but not be limited to the following: boiler or heating rooms, laundries, repair shop, spaces storing combustibles in quantities deemed hazardous by the authority having jurisdiction. 32.3.3.2.2, 33.3.3.2.2					
K211	2000 EXISTING Where Alcohol Based Hand Rub (ABHR) dispensers are installed: ❑ The corridor is at least 6 feet wide ❑ The maximum individual fluid dispenser capacity shall be 1.2 liters (2 liters in suites of rooms) ❑ The dispensers shall have a minimum spacing of 4 ft from each other ❑ Not more than 10 gallons are used in a single smoke compartment outside a storage cabinet. ❑ Dispensers are not installed over or adjacent to an ignition source. ❑ If the floor is carpeted, the building is fully sprinklered. 19.3.2.7, CFR 483.470					

ID PREFIX	LARGE FACILITY PROMPT AND SLOW EVACUATION CAPABILITIES	MET	NOT MET	N/A	REMARKS	LARGE PROMPT & SLOW
K211	2000 NEW Where Alcohol Based Hand Rub (ABHR) dispensers are installed: ❑ The corridor is at least 6 feet wide ❑ The maximum individual fluid dispenser capacity shall be 1.2 liters (2 liters in suites of rooms) ❑ The dispensers shall have a minimum spacing of 4 ft from each other ❑ Not more than 10 gallons are used in a single smoke compartment outside a storage cabinet. ❑ Dispensers are not installed over or adjacent to an ignition source. ❑ If the floor is carpeted, the building is fully sprinklered. 18.3.2.7, CFR 483.470					
	DETECTION ALARM & COMMUNICATIONS SYSTEMS					
K51	A manual fire alarm system with approved component devices or equipment, shall be installed in accordance with section 9.6. ❑ *Exception: Where each bedroom has an exterior exit access in accordance with 7.5.3 and the building is not greater than three stories.* INITIATION The required fire alarm system shall be initiated by the following means: (1) Manual means in accordance with 9.6.2 ❑ *Exception: A manual means, as specified in 9.6.2, in excess of the manual fire alarm box at a constantly attended location per 33.3.3.4.2(2) below shall not be required where there are other effective means (such as a complete automatic sprinkler or automatic detection system) for notification of fire as required.* (2) A manual fire alarm box located at a convenient central control point under continuous supervision of responsible employees. (3) The automatic sprinkler system.					

ID PREFIX	LARGE FACILITY PROMPT AND SLOW EVACUATION CAPABILITIES	MET	NOT MET	N/A	REMARKS	LARGE PROMPT & SLOW
	☐ *Exception: Automatic sprinkler systems that are not required by another section of this Code shall not be required to initiate the fire alarm system.* (4) Any required detection system. ☐ *Exception: Sleeping room smoke alarms shall not be required to initiate the building fire alarm system.* 32.3.3.4, 33.3.3.4					
	ANNUNCIATOR PANEL ☐ An annunciator panel connected with the fire alarm system shall be provided. The location of the annunciator shall be approved by the authority having jurisdiction. ☐ *Exception: Buildings not more than two stories in height and with not more than 50 sleeping rooms.* 32.3.3.4.3					
	OCCUPANT NOTIFICATION 2000 EXISTING ☐ Occupant notification shall be provided automatically, without delay, by internal audible alarm in accordance with 9.6.3. 33.3.3.4.4					
	2000 NEW ☐ Occupant notification shall be provided automatically, without delay, in accordance with 9.6.3. 32.3.3.4.4					
	FIRE DEPARTMENT NOTIFICATION ☐ In case of a fire, provisions shall be made for the immediate notification of the public fire department by either telephone or other means. Where there is no public fire department, this notification shall be made to the private fire brigade. 32.3.3.4.6, 33.3.3.4.6					
K155	Where a required fire alarm system is out of service for more than 4 hours in a 24-hour period, the authority having jurisdiction shall be notified, and the building shall be evacuated or an approved fire watch shall be provided for all parties left unprotected by the shutdown until the fire alarm system has been returned to service. 9.6.1.8					

ID PREFIX	LARGE FACILITY PROMPT AND SLOW EVACUATION CAPABILITIES	MET	NOT MET	N/A	REMARKS	LARGE PROMPT & SLOW
	SMOKE DETECTION AND ALARM					
K109	SMOKE DETECTION 2000 EXISTING Each sleeping room shall be provided with an approved smoke alarm in accordance with 9.6.2.10 that is powered from the building electrical system. ☐ *Exception No. 1: Existing battery-powered smoke alarms, rather than building electrical service-powered smoke alarms, shall be accepted where, in the opinion of the authority having jurisdiction, the facility has demonstrated that testing, maintenance, and battery replacement programs ensure the reliability of power to the smoke alarms.* ☐ *Exception No. 2: Facilities having an existing corridor smoke detection system in accordance with Section 9.6 that is connected to the building fire alarm system.* 33.3.3.4.7					
	2000 NEW Each sleeping room shall be provided with an approved smoke alarm in accordance with 9.6.2.10 that is powered from the building electrical system. 32.3.3.4.7 ☐ All living areas as defined in 3.3.119 and corridors shall be provided with smoke detectors in accordance NFPA 72, *National Fire Alarm Code*, that are arranged to initiate an alarm that is audible in all sleeping areas. ☐ *Exception No. 1: Detectors shall not be required in living areas and kitchens in facilities protected throughout by an approved automatic sprinkler system installed in accordance with 33.3.3.5.* ☐ *Exception No. 2: Unenclosed corridors, passageways, balconies, colonnades, or other arrangements with one or more sides along the long dimension fully or extensively open to the exterior at all times.* 32.3.3.4.8, 33.3.3.4.8					

ID PREFIX	LARGE FACILITY PROMPT AND SLOW EVACUATION CAPABILITIES	MET	NOT MET	N/A	REMARKS	LARGE PROMPT & SLOW
	AUTOMATIC SPRINKLERS					
K56	2000 EXISTING Where an automatic sprinkler system is installed for total or partial building coverage, the system shall be in accordance with Section 9.7. ☐ *Exception No. 1: In buildings not more than four stories in height, a sprinkler system complying with NFPA 13R, Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height, shall be permitted.* ☐ *Exception No. 2: Automatic sprinklers shall not be required in small clothes closets where the smallest dimension does not exceed 3 ft (0.9m), the area does not exceed 24ft² (2.2m²), and the walls and ceilings are finished with noncombustible or limited-combustible material.* ☐ *Exception No. 3: Initiation of the fire alarm system shall not be required for existing installations in accordance with 33.3.3.5.4.* Automatic sprinkler systems shall be supervised in accordance with Section 9.7. Waterflow alarms shall not be required to be transmitted off-site. Sprinkler piping serving not more than six sprinklers for any isolated hazardous area in accordance with 9.7.1.2 shall be permitted. In new installations where more than two sprinklers are installed in a single area, waterflow detection shall be provided to initiate the fire alarm system required by 33.3.3.4.1. 33.3.3.5.1, 33.3.3.5.2, 33.3.3.5.3, 33.3.3.5.4					
	2000 NEW All buildings shall be protected throughout by an approved automatic sprinkler system in accordance with Section 9.7. Quick-response or residential sprinklers shall be provided throughout. ☐ *Exception No. 1: In buildings not more than four stories in height, a sprinkler system complying with NFPA 13R, Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height, shall be permitted*					

ID PREFIX	LARGE FACILITY PROMPT AND SLOW EVACUATION CAPABILITIES	MET	NOT MET	N/A	REMARKS	LARGE PROMPT & SLOW
	☐ *Exception No. 2: Automatic sprinklers shall not be required in small clothes closets where the smallest dimension does not exceed 24 ft (2.2m²), and the walls and ceilings are finished with noncombustible or limited-combustible materials.* ☐ *Exception No. 3: Standard response sprinklers shall be permitted for use in hazardous areas in accordance with 32.3.3.2.* Automatic sprinkler systems shall be supervised in accordance with Section 9.7. 32.3.3.5.1, 32.3.3.5.3					
K154	Where a required automatic sprinkler system is out of service for more than 4 hours in a 24-hour period, the authority having jurisdiction shall be notified, and the building shall be evacuated or an approved fire watch system be provided for all parties left unprotected by the shutdown until the sprinkler system has been returned to service. 9.7.6.1					
	A. Date sprinkler system last checked and necessary maintenance provided. _____					
	B. Show who provided the service._____					
	C. Note the source of the water supply for the automatic sprinkler system. _____					
	(Provide, in REMARKS, information on coverage for any non-required or partial automatic sprinkler system.)					
	PORTABLE FIRE EXTINGUISHERS					
K64	Portable fire extinguishers shall be provided near hazardous areas in accordance with 9.7.4.1. 33.3.3.5.5, 32.3.3.5.5					
	SEPARATION OF SLEEPING ROOMS FROM EXIT ACCESS					
K17	2000 EXISTING Access shall be provided from every resident use area to not less than one means of egress that is separated from all other rooms or spaces by walls complying with 33.3.3.6.3 through 33.3.3.6.6.					

ID PREFIX	LARGE FACILITY PROMPT AND SLOW EVACUATION CAPABILITIES	MET	NOT MET	N/A	REMARKS	LARGE PROMPT & SLOW
	☐ *Exception No. 1: Rooms or spaces, other than sleeping rooms, protected throughout by an approved automatic sprinkler system in accordance with 33.3.3.5.* ☐ *Exception No. 2: Prompt evacuation capability facilities in buildings not over two stories in height where not less than one required means of egress from each sleeping room provides a path of travel to the outside without traversing any corridor or other spaces exposed to unprotected vertical openings, living areas, and kitchens.* ☐ *Exception No. 3: Rooms or spaces, other than sleeping rooms, provided with a smoke detection and alarm system connected to activate the building evacuation alarm. Furnishings, finishes, and furniture, in combination with all other combustibles within the spaces, shall be of minimum quantity and arranged so that a fully developed fire is unlikely to occur.* Sleeping rooms shall be separated from corridors, living areas, and kitchens by walls complying with 33.3.3.6.3 through 33.3.3.6.6. Walls required by 33.3.3.6.1 or 33.3.3.6.2 shall have a fire resistance rating of not less than ½ hour. ☐ *Exception No. 1: In buildings protected throughout by an approved automatic sprinkler system in accordance with 33.3.3.5, walls shall be smoke partitions in accordance with 8.2.4. The provisions of 8.2.4.3.5 shall not apply.* ☐ *Exception No. 2: In buildings not more than two stories in height that are classified as prompt evacuation capability and that house not more than 30 residents, walls shall be smoke partitions in accordance with 8.2.4. The provisions of 8.2.4.3.5 shall not apply.* Doors in walls required by 33.3.3.6.1 or 33.3.3.6.2 shall have a fire protection rating of not less than 20 minutes. ☐ *Exception No. 1: Solid-bonded wood core doors of not less than 1¾ in. (4.4cm) thickness shall be permitted to continue to be used.* ☐ *Exception No. 2: In buildings protected throughout by an approved automatic sprinkler system in accordance with 33.3.3.5, doors that are nonrated shall be permitted to continue to be used.*					

ID PREFIX	LARGE FACILITY PROMPT AND SLOW EVACUATION CAPABILITIES	MET	NOT MET	N/A	REMARKS	LARGE PROMPT & SLOW
	☐ *Exception No. 3: Where automatic sprinkler protection is provided in the corridor with 31.3.5.2 through 31.3.5.4, doors shall not be required to have a fire protection rating but shall be in accordance with 8.2.4.3. The provisions of 8.2.4.3.5 shall not apply. Doors shall be equipped with latches for keeping the doors tightly closed.* Walls and doors required by 33.3.3.6.1 and 33.3.3.6.2 shall be constructed as smoke partitions in accordance with 8.2.4. The provisions of 8.2.4.3.5 shall not apply. No louvers, transfer grilles, operable transoms, or other air passages shall penetrate such walls or doors, except properly installed heating and utility installations. Doors in walls required by 33.3.3.6.1 and 33.3.3.6.2 shall be self-closing or automatic-closing in accordance with 7.2.1.8. Doors in walls separating sleeping rooms from corridors shall be automatic-closing in accordance with 7.2.1.8. ☐ *Exception No. 1: Doors to sleeping rooms that have occupant-control locks such that access is normally restricted to the occupants or staff personnel shall be permitted to be self-closing.* ☐ *Exception No. 2: In buildings protected throughout by an approved automatic sprinkler system installed in accordance with 33.3.3.5, doors, other than doors to hazardous areas, vertical openings, and exit enclosures, shall not be required to be self-closing or automatic-closing.* 33.3.3.6.6					
	2000 NEW Access shall be provided from every resident use area to not less than one means of egress that is separated from all sleeping rooms by walls complying with 32.3.3.6.3 through 32.3.3.6.6. Sleeping rooms shall be separated from corridors, living areas, and kitchens by walls complying with 32.3.3.6.3 through 32.3.3.6.6. Walls required by 32.3.3.6.1 or 32.3.3.6.2 shall have a fire resistance rating of not less than ½ hour. ☐ *Exception: In conversions (see 32.1.1.3), no fire resistance rating shall be required, but the wall shall be a smoke partition in accordance with 8.2.4. The provisions of 8.2.4.3.5 shall not apply.*					

ID PREFIX	LARGE FACILITY PROMPT AND SLOW EVACUATION CAPABILITIES	MET	NOT MET	N/A	REMARKS	LARGE PROMPT & SLOW
	Doors in walls required by 32.3.3.6.1 or 32.3.3.6.2 shall have a fire protection rating of not less than 20 minutes. □ *Exception: Doors in renovations and conversions (see 32.1.1.3) that are nonrated doors that resist the passage of smoke shall be permitted to continue to be used.* Doors to hazardous areas, vertical openings, exits, and exit passageways shall be self-closing or automatic-closing. 32.3.3.6.6					
K18	Doors in walls separating sleeping rooms from corridors shall have a fire protection rating of not less than 20 minutes. Doors shall be equipped with latches for keeping the doors tightly closed. □ *Exception No. 1: Existing 1¾ inch solid bonded wood core doors shall be permitted.* □ *Exception No. 2: Where walls are only required to resist the passage of smoke, doors without fire rating and which resist the passage of smoke are permitted.* □ *Exception No. 3: Where automatic sprinkler protection is provided in the corridor in accordance with 31.3.5.3 through 31.3.5.4, doors shall not be required to have a fire protection rating but shall be in accordance with 8.2.4.3. The provisions of 8.2.4.3.5 shall not apply. Doors shall be equipped with latches for keeping the doors tightly closed.* 32.3.3.6.4, 33.3.3.6.4					
	Walls and doors required by 32.3.3.6.1 and 32.3.3.6.2. shall be constructed as smoke partitions in accordance with 8.2.4. The provisions of 8.2.4.3.5 shall not apply. No louvers, transfer grilles, operable transoms, or other air passages shall penetrate such walls or doors, except properly installed heating and utility installations. 32.3.3.6.5, 33.3.3.6.5					

ID PREFIX	LARGE FACILITY PROMPT AND SLOW EVACUATION CAPABILITIES	MET	NOT MET	N/A	REMARKS	LARGE PROMPT & SLOW
	EXIT SYSTEM					
K34	Exits or exit components, arranged in accordance with Chapter 7, shall be of types in accordance with 32.3.2 or 33.3.2.					
K35	Capacity of means of egress shall be in accordance with 7.3.					
K38	Access to all required exits shall be in accordance with 7.3. 32.3.2.5.1, 33.3.2.5.1					
K43	DOORS 2000 Existing Doors in means of egress shall be as follows: (1) Doors complying with 7.2.1 shall be permitted. (2) Doors within individual rooms and suites of rooms shall be permitted to be swinging or sliding. (3) No door in any means of egress shall be locked against egress when the building is occupied. □ *Exception No. 1: The requirement of 33.3.2.2.2(3) shall not apply to delayed-egress locks in accordance with 7.2.1.6.1, provided that not more than one device exists in a means of egress.* □ *Exception No. 2: The requirement of 33.3.2.2.2(3) shall not apply to access-controlled egress doors in accordance with 7.2.1.6.2.* (4) Revolving doors complying with 7.2.1.10 shall be permitted. 33.3.2.2.2, 32.3.2.2.2					
	2000 NEW (5) Every bathroom door shall be designed to allow opening from the outside during an emergency when locked. 32.3.2.2.2					
K32	Not less than two exits shall be accessible from every story, including floors below the level of exit discharge and floors occupied from public purposes. 33.3.2.4, 32.3.2.4					

ID PREFIX	LARGE FACILITY PROMPT AND SLOW EVACUATION CAPABILITIES	MET	NOT MET	N/A	REMARKS	LARGE PROMPT & SLOW
	The width of corridors shall be sufficient for the occupant load served but shall be not less than 44 in. (112cm). ☐ *Exception: Corridors serving an occupant load fewer than 50 shall be not less than 36 in. (91cm) wide.* 33.3.2.3.3, 32.3.2.3.3					
	Stairs complying with 7.2.2 shall be permitted. 33.3.2.2.3, 32.3.2.2.3					
	ARRANGEMENT OF MEANS OF EGRESS					
K40	2000 EXISTING Common paths of travel shall not exceed 110 ft (33.5m) ☐ *Exception: In buildings protected throughout by automatic sprinkler systems in accordance with 33.3.3.5, common path of travel shall not exceed 160ft (48.8m).* Dead-end corridors shall not exceed 50 ft (15m). 33.3.2.5					
	2000 NEW Common paths of travel shall not exceed 125ft (38.1m). Dead end corridor shall not exceed 50ft (15m). 32.3.2.5.2					
	SUBDIVISION OF BUILDING SPACES					
K120	Every sleeping room floor shall be divided into not less than two smoke compartments of approximately the same size, with smoke barriers in accordance with 8.3. Smoke dampers shall not be required. Additional smoke barriers shall be provided such that the travel distance from a sleeping room corridor door to a smoke barrier shall not exceed 150 ft (45m). ☐ *Exception No. 1: Buildings protected throughout by an approved automatic sprinkler system installed in accordance with 33.3.3.5.* ☐ *Exception No. 2: Where each sleeping room is provided with exterior ways of exit access arranged in accordance with 7.5.3.*					

ID PREFIX	LARGE FACILITY IMPRACTICAL EVACUATION	MET	NOT MET	N/A	REMARKS	LARGE IMPRACTICAL
	☐ *Exception No. 3: Smoke barriers shall to be required where the aggregate corridor length on each floor is not more than 150 ft (45m). 33.3.3.7*					
K36	2000 EXISTING Travel distance from the corridor door of any room to nearest exit shall be a maximum of 100 feet. 33.3.2.6.2					
	2000 NEW Travel distance from the corridor door of any room to the nearest exit, measured in accordance with 7.6, shall not exceed 200 feet (60m). 32.3.2.6.2					
	2000 EXISTING Travel distance from the door or most remote room in a suite or apartment to the corridor shall not exceed 75 feet (23m). ☐ *Exception: Travel distance may be 125ft (48m) in building protected throughout by an approved automatic sprinkler system in accordance with 33.3.3.5.* 33.3.2.6.1					
	2000 NEW Travel distance within a room, suite, or living unit to a corridor door shall not exceed 125 ft (38.1m) 32.3.2.6.1.					
	INTERIOR FINISH					
K14	2000 EXISTING Interior wall and ceiling finish shall be Class A or Class B in accordance with Section 10.2. Interior floor finish in accordance with 10.2.7 shall be Class I or Class II in corridors and exits. ☐ *Exception: Previously installed fibor coverings, subject to the approval of the authority having jurisdiction.* 33.3.3.3					

ID PREFIX	LARGE FACILITY IMPRACTICAL EVACUATION	MET	NOT MET	N/A	REMARKS	LARGE IMPRACTICAL
	2000 NEW Interior finish shall be in accordance with10.2. 10.2, 32.3.3.3.1.					
K15	Interior wall and ceiling finish materials complying with 10.2.3 shall be permitted as follows: (1) Exit enclosures - Class A (2) Lobbies and corridors - Class A or Class B (3) Other spaces - Class A or Class B 32.3.3.3.2					
K16	Interior floor finish in corridors and exits shall be class I or II in accordance with 10.2.7, 32.3.3.3.3.					
K20	2000 EXISTING Any vertical opening shall be enclosed or protected in accordance with 8.2.5. ☐ *Exception No. 1: Unprotected vertical openings not part of required egress shall be permitted to be waived by the authority having jurisdiction where such openings do not endanger required means of egress. This exception shall apply only in buildings protected throughout by an approved automatic sprinkler system in accordance with 33.3.3.5.1 and in which exits and required ways of travel thereto are adequately safeguarded against fire and smoke within the building, or in which every individual room has direct access to an exterior exit without passing through a public corridor.* ☐ *Exception No. 2: In buildings not more than two stories in height, unprotected vertical openings shall be permitted by the authority having jurisdiction if the building is protected throughout by an approved automatic sprinkler system in accordance with 33.3.3.5.1* No floor below the level of exit discharge used only for storage, heating equipment, or purposes other than residential occupancy shall have unprotected openings to floors used for residential occupancy. 32.3.3.1.1, 32.3.3.1.2, 33.3.3.1.1, 33.3.3.1.2					

ID PREFIX	LARGE FACILITY IMPRACTICAL EVACUATION	MET	NOT MET	N/A	REMARKS	LARGE IMPRACTICAL
K21	Building Services 2000 EXISTING Utilities shall comply with the provisions of 9.1. Heating, ventilating, and air conditioning equipment shall comply with the provisions of 9.2. No stove or combustion heater shall be located to block escape in case of fire caused by the malfunction of the stove or heater. Unvented fuel-fired heaters shall not be used in any board and care occupancy. Elevators, dumbwaiters, and vertical conveyors shall comply with the provisions of 9.4. Rubbish chutes, incinerators, and laundry chutes shall comply with the provisions of 9.5. 33.3.6.1, 33.3.6.2, 33.3.6.2.1, 33.3.6.2.2, 33.3.6.2.3. 33.3.6.3, 33.3.6.4					
	2000 NEW In high-rise buildings, one elevator shall be provided with a protected power supply and shall be available for use by the fire department in case of emergency. 32.3.6.1, 32.3.6.2, 32.3.6.2.1, 32.3.6.2.2, 32.3.6.2.3, 32.3.6.3.1, 32.3.6.3.2, 32.3.6.4 **Facilities housing groups of persons classed as IMPRACTICAL TO EVACUATE shall meet the requirements for custodial care facilities, Chapter 18 or 19 as appropriate.** ☐ *Exception: Facilities found to have equivalent safety. Example 7.5 Using the applicable mandatory safety requirement.* 32.3.1.2.2 See CMS-2786R					

Fire Safety Evaluation Worksheet for a Large Facility

Fig. 7.5

Facility Identification _____

Evaluator _____ Date _____

(Complete one worksheet for each large facility. This normally means a capacity for more than 16 residents.)

First complete Fig. 7.5.1. Continue with Fig. 7.5.2, 7.5.3, 7.5.4A, 7.5.4B, 7.5.5. Then return to this page to obtain the Equivalency Conclusions.

TURN TO NEXT PAGE

Part 2E. Equivalency Conclusions

Complete Fig. 7.5.1 through 7.5.5 before doing this part.

1. All of the checks in Fig. 7.5.5 are in the "YES" column. The level of fire safety is at least equivalent to that prescribed for large residentail facilities.*

2. One or more of the checks in Fig. 7.5.5 is in the "NO" column. The level of fire safety is not shown by this system to be equivalent to that prescribed by the Life Safety Code for large residential facilities.

*The equivalency covered by this worksheet includes the majority of considerations covered by the Life Safety Code. There are a few considerations that are not evaluated by this method. These must be considered separately. These additional considerations are covered in the "Facility Fire Safety Requirements Worksheet." One copy of this separate worksheet is to be completed for each facility.

Facility Fire Safety Requirements Worksheet

Considerations	Met	Not Met	Not Applicable
A. Utilities comply with provisions of 9.1.			
B. Heating, ventilating, and air conditioning equipment comply with provisions of 9.2.			
C. Elevators, dumbwaiters, and vertical conveyors comply with the provisions of 9.4.			
D. Rubbish chutes, incinerators, and laundry chutes comply with the provisions of 9.5.			
E. Complies with the applicable requirements of Sections 32.7 and/or 33.7.			

FIRE SAFETY SURVEY REPORT
CRUCIAL DATA EXTRACT
(TO BE USED WITH CMS-2786 FORMS)

PROVIDER NUMBER	FACILITY NAME	SURVEY DATE
K1		* K4

K6 DATE OF PLAN APPROVAL

K3 MULTIPLE CONSTRUCTION
TOTAL NUMBER OF BUILDINGS _____
NUMBER OF THIS BUILDING _____

☐
A BUILDING
B WING
C FLOOR
D APARTMENT UNIT

LSC FORM INDICATOR

Health Care Form		
12	2786R	2000 EXISTING
13	2786R	2000 NEW

ASC Form		
14	2786U	2000 EXISTING
15	2786U	2000 NEW

ICF/MR Form		
16	2786V, W, X	2000 EXISTING
17	2786V, W, X	2000 NEW

* K7 ☐ SELECT NUMBER OF FORM USED FROM ABOVE

(Check if K29 or K56 are marked as not applicable in the 2786 M, R, T, U, V, W, X and Y.)

K29 ☐ K56 ☐

COMPLETE IF ICF/MR IS SURVEYED UNDER CHAPTER 21

SMALL (16 BEDS OR LESS)
K8 ☐
1 PROMPT
2 SLOW
3 IMPRACTICAL

LARGE
K8: ☐
4 PROMPT
5 SLOW
6 IMPRACTICAL

APARTMENT HOUSE
K8: ☐
7 PROMPT
8 SLOW
9 IMPRACTICAL

ENTER E – SCORE HERE
K5: ☐ e.g. 2.5

*K9: FACILITY MEETS LSC BASED ON *(Check all that apply)*

A1. ☐ (COMP. WITH ALL PROVISIONS)
A2. ☐ (ACCEPTABLE POC)
A3. ☐ (WAIVERS)
A4. ☐ (FSES)
A5. ☐ (PERFORMANCE BASED DESIGN)

FACILITY DOES NOT MEET LSC
B. ☐

K0180
A. ☐ FULLY SPRINKLERED (All required areas are sprinklered)
B. ☐ PARTIALLY SPRINKLERED (Not all required areas are sprinklered)
C. ☐ NONE (No sprinkler system)

* MANDATORY

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR MEDICARE & MEDICAID SERVICES

2000 CODE ICFs/MR

Form Approved
OMB No. 0938-0242

FIRE SAFETY SURVEY REPORT - 2000 LIFE SAFETY CODE
Intermediate Care Facilities for the Mentally Retarded
APARTMENT HOUSE

1. (A) PROVIDER NO.	1. (B) MEDICAID I.D. NO.
K1	K2

PART I — 32 or 33 — Residential Board & Care Occupancies — Requirements
PART II — 7.7 (101A, 2001) — Fire Safety Evaluation System for Board & Care (Optional)

Identifying information as shown in applicable records. Enter changes, if any, alongside each item, giving date of change.

2. NAME OF FACILITY	2. (A) MULTIPLE CONSTRUCTION (BLDGS)	2. (B) ADDRESS OF FACILITY (STREET, CITY, STATE, ZIP CODE)	
	A. BUILDING _____ B. WING _____ C. FLOOR _____ K3		A. ☐ Fully Sprinklered (All required areas are sprinklered) B. ☐ Partially Sprinklered (Not all required areas are sprinklered) C. ☐ None (No sprinkler system) K3180

	4. DATE OF SURVEY	DATE OF PLAN APPROVAL	SURVEY UNDER:
	K4	K6	0. ☐ 2000 ☐ Chapter 32 New ☐ Chapter 33 Existing K7

E-SCORE

E-Score	Level of Evacuation Difficulty
≤ 1.5	Prompt
> 1.5 ≤ 5.0	Slow
> 5.0	Impractical

K5

5. SURVEY FOR CERTIFICATION OF: APARTMENT HOUSE - LEVEL OF EVACUATION DIFFICULTY *(check one)*

7. ☐ Prompt 8. ☐ Slow 9. ☐ Impractical

K8

6. BED COMPOSITION

a. TOTAL NO. OF BEDS IN THE FACILITY	e. NUMBER OF ICF/MR BEDS CERTIFIED FOR MEDICAID	e. NUMBER OF ICF/MR BEDS CERTIFIED FOR MEDICAID

7. A. ☐ THE FACILITY MEETS, BASED UPON *(check all appropriate boxes)*:

1. ☐ COMPLIANCE WITH ALL PROVISIONS 2. ☐ ACCEPTANCE OF A PLAN OF CORRECTION 4. ☐ FSES 5. ☐ PERFORMANCE BASED DESIGN

B. ☐ THE FACILITY DOES NOT MEET THE STANDARD

K9

SURVEYOR *(Signature)*	TITLE	OFFICE	DATE
SURVEYOR ID K10			
FIRE AUTHORITY OFFICIAL *(Signature)*	TITLE	OFFICE	DATE

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0938-0242. The time required to complete this information collection is estimated to average 5 minutes per response, including the time to review instructions, search existing data resources, gather the data needed, and complete and review the information collection. If you have any comments concerning the accuracy of the time estimate(s) or suggestions for improving this form, please write to CMS, Attn: PRA Reports Clearance Officer, 7500 Security Boulevard, Baltimore, Maryland 21244-1850.

FORM CMS-2786X (xx/xx) Previous Versions Obsolete

Page 1

INSTRUCTIONS FOR COMPLETING THIS FORM (CMS-2786X)
SUITABILITY OF AN APARTMENT BUILDING TO HOUSE A BOARD AND CARE OCCUPANCY

1. **FIRST** complete FORM CMS-2786Y *(Small Facility Survey Report)*

2. **NEXT** complete **THIS** form, to rate the suitability of the Apartment Building to House a Board and Care Occupancy.
   NOTE: The items on this form refer to the part of the building the Board and Care Occupancy (Apartment).

3. If using NFPA 101A Figure 7.7 — FSES/BC — Rating the Building, complete Part I of this form FIRST.
   NOTE: When using this form, you must also complete a CMS 2786Y.

ID PREFIX	SUITABILITY OF AN APARTMENT BUILDING TO HOUSE A BOARD AND CARE OCCUPANCY	MET	NOT MET	N/A	REMARKS	APARTMENT HOUSE
	NOTE: You must complete a CMS-2786Y for each Apartment unit with a Board & Care Occupancy.					
	BUILDING CONSTRUCTION					
K12	Minimum Construction Requirements: (Based on highest story normally used by residents) PROMPT and SLOW One and Two Story ❑ Any construction type of one-hour or greater fire rating or, ❑ Type IV (2HH) or, ❑ Fully sheathed or, ❑ With automatic sprinkler system throughout, in accordance with Section 9.6 and 9.7. ❑ *Exception: One story any construction type and no more than 30 residents capable of prompt evacuation.* Three to Six Stories ❑ Type I, II or III construction of one-hour or greater fire rating or, ❑ Type IV construction with automatic sprinkler system throughout in accordance with Section 9.6 or 9.7. ❑ *Exception: Three or four story facilities of type V (000), sheathed and with automatic sprinkler system throughout, in accordance with Sections 9.6 and 9.7.* More than Six Stories ❑ Type I or II (222) construction or, ❑ Type II (111) construction or, ❑ Type III (211) construction or, ❑ Type IV (2HH) with automatic sprinkler system throughout in accordance with Sections 9.6 and 9.7. Minimum Construction Requirements: (Based on highest story normally used by residents) PROMPT and SLOW ❑ Type I or II (222) construction, beyond 75 feet in height with automatic sprinkler protection throughout in accordance with Section 9.6 and 9.7. ❑ Type II (111) construction, limited to three stories with automatic sprinkler protection throughout in accordance with Sections 9.6 and 9.7 ❑ Type II (000), III (211), IV (2HH), V (111) limited to one story with automatic sprinkler protection throughout in accordance with Section 9.6 and 9.7. 32.3.1.3, 33.3.1.3					

ID PREFIX	SUITABILITY OF AN APARTMENT BUILDING TO HOUSE A BOARD AND CARE OCCUPANCY	MET	NOT MET	N/A	REMARKS	APARTMENT HOUSE
	HAZARDOUS AREAS (Outside B & C Units)					
K29	Where buildings are without suppression or detection *systems*, or have total automatic detection or partial sprinkler protection every hazardous area shall be separated by construction of one-hour fire rating. Openings shall be protected by smoke-actuated automatic or self-closing fire doors, with a ¾ hour fire rating or the area is equipped with an automatic sprinkler *system*. Hazardous areas include, but are not limited to: ❑ Boiler and heater rooms ❑ Laundries ❑ Repair shop ❑ Rooms or spaces used for storage of combustibles or equipment deemed hazardous by the authority having jurisdiction. Where buildings have an automatic extinguishment *system* installed in accordance with NFPA 13, areas may be smoke-resisting construction. 30.3.2, 31.3.2, 8.4					
K211	2000 EXISTING Where Alcohol Based Hand Rub (ABHR) dispensers are installed: ❑ The corridor is at least 6 feet wide ❑ The maximum individual fluid dispenser capacity shall be 1.2 liters (2 liters in suites of rooms) ❑ The dispensers shall have a minimum spacing of 4 ft from each other ❑ Not more than 10 gallons are used in a single smoke compartment outside a storage cabinet. ❑ Dispensers are not installed over or adjacent to an ignition source. ❑ If the floor is carpeted, the building is fully sprinklered. 19.3.2.7, CFR 483.470					

ID PREFIX	SUITABILITY OF AN APARTMENT BUILDING TO HOUSE A BOARD AND CARE OCCUPANCY	MET	NOT MET	N/A	REMARKS	APARTMENT HOUSE
K211	2000 NEW Where Alcohol Based Hand Rub (ABHR) dispensers are installed: ❑ The corridor is at least 6 feet wide ❑ The maximum individual fluid dispenser capacity shall be 1.2 liters (2 liters in suites of rooms) ❑ The dispensers shall have a minimum spacing of 4 ft from each other ❑ Not more than 10 gallons are used in a single smoke compartment outside a storage cabinet. ❑ Dispensers are not installed over or adjacent to an ignition source. ❑ If the floor is carpeted, the building is fully sprinklered. 18.3.2.7, CFR 483.470					
	MANUAL FIRE ALARM					
K51	Apartment buildings with more than three stories or more than eleven units shall have a fire alarm system, not a presignal type, with occupant notification accomplished automatically and without delay in accordance with Section 9.6, 30.3.4, 31.3.4. An annunciator panel shall be provided. 31.3.4.3.2.					
K155	Where a required fire alarm system is out of service for more than 4 hours in a 24-hour period, the authority having jurisdiction shall be notified, and the building shall be evacuated or an approved fire watch shall be provided for all parties left unprotected by the shutdown untilt e fire alarm system has been returned to service. 9.6.1.8					
	SMOKE DETECTION AND ALARM (Outside B & C)					
K109	Every living unit within the apartment building regardless of number of stories, number of apartments, sprinkler system or other detection system shall have approved single or multiple station smoke detectors installed, powered by house electrical service. ❑ *Exception: Where the building is equipped with a total automatic smoke detection system throughout.* 30.3.5, 31.3.4.4					

ID PREFIX	SUITABILITY OF AN APARTMENT BUILDING TO HOUSE A BOARD AND CARE OCCUPANCY	MET	NOT MET	N/A	REMARKS	APARTMENT HOUSE
	AUTOMATIC SPRINKLER (Outside B & C)					
K56	Where buildings are required to be protected throughout by an approved automatic sprinkler system and where a partial system is required, the system shall be in accordance with Section 9.7. 30.3.5					
K64	Portable fire extinguishers shall be provided in hazardous areas in accordance with Section 9.7.4.1 unless the building is provided with an appropriate supervised automatic sprinkler system. 30.3.5.7					
K154	Where a required automatic sprinkler system is out of service for more than 4 hours in a 24-hour period, the authority having jurisdiction shall be notified, and the building shall be evacuated or an approved fire watch system be provided for all parties left unprotected by the shutdown until the sprinkler system has been returned to service. 9.7.6.1					
	A. Date sprinkler system last checked and necessary maintenance provided. _____					
	B. Show who provided the service. _____					
	C. Note the source of the water supply for the automatic sprinkler system. _____					
	(Provide, in REMARKS, information on coverage for any non-required or partial automatic sprinkler system.)					
	SEPARATION OF B. C. UNIT AND ITS EXIT ROUTES					
K38	2000 EXISTING Exit access corridors shall be protected as follows: ❑ 1. Where buildings do not have an automatic sprinkler or detection system, corridor walls shall have one-hour fire rating. ❑ 2. Where buildings have a partial sprinkler or detection system, corridor walls shall have ¾ hour fire rating. ❑ 3. Where buildings have an automatic sprinkler system through, corridor walls shall have ½ hour fire ratings. 31.3.6					

ID PREFIX	SUITABILITY OF AN APARTMENT BUILDING TO HOUSE A BOARD AND CARE OCCUPANCY	MET	NOT MET	N/A	REMARKS	APARTMENT HOUSE
	2000 New Exit access corridor walls shall consist of fire barriers in accordance with 8.2.3 that have no less than ½ hour fire resistance rating. Exception: In buildings protected throughout by an approved automatic sprinkler *system* in accordance with 29.3.5, no fire resistance rating shall be required, but the walls and all openings therein shall resist the passage of smoke. 30.3.6, 32.4.2, 31.3.6					
K18	Doors between apartments and corridors shall be self-closing and have a minimum 20 minute fire rating. 30.3.6.2, 31.3.6.2					
	EXIT SYSTEM					
K32	At least two acceptable exits, remote from each other, are provided for each floor or fire section. At least half of the required number of units of exit width shall lead directly to the street. ❑ Exception No. 1: A living unit with direct exit to street at ground level or an outside stairway or an enclosed stairway, of one hour fire rating, serving that unit only, *may* have a single exit. ❑ Exception No. 2: Where there are a maximum of four living units per floor with no more than 20 feet from each unit's entrance door to an exit, *may* have a single exit of a smokeproof tower or outside stair in accordance with 5.2.3. ❑ Exception No. 3: Where there is no more than three stories and living units are separated, vertically and horizontally by 3/4 hour fire rating, *may* have a single exit if the stairway is of one hour construction, serving as access with a maximum of 35 feet from each unit's entrance door to exit. 7.3, 30.2.4, 31.2.4, 32.3.2.4					
K35	Capacity of exits in number of persons per unit of exit width is in accordance with 7.3. 30.2.3.1, 31.2.3.1					
	EXIT ACCESS					
K36	Travel distance from the door of a room in a living unit to a corridor door and a living unit entrance door to the nearest exit are in accordance with Table A.31.1. 30.2.6.					

ID PREFIX	SUITABILITY OF AN APARTMENT BUILDING TO HOUSE A BOARD AND CARE OCCUPANCY	MET	NOT MET	N/A	REMARKS	APARTMENT HOUSE
	INTERIOR FINISH					
K14	Interior finish on walls, ceilings and floors are in accordance with and shall apply to the parts of means of egress serving the apartments used as a residential board and care occupancy. 30.3.3, 31.3.3.					
	VERTICAL OPENINGS					
K20	Stairways, elevator shafts and other vertical openings are in accordance with 30.3.1, 29.3.1, 31.3.1					
	SMOKE CONTROL					
K24	Exit access corridors shall be provided with smoke barriers in accordance with Section 8.3. The maximum length of each smoke compartment shall be 200 feet. Smoke dampers are not required. ❑ *Exception No. 1: Where buildings have an automatic sprinkler system throughout.* ❑ *Exception No. 2: Where exit access is through an atrium 8.2.5.6.* ❑ *Exception No. 3: Where exterior exit access provides access to two exits 7.5.3.* ❑ *Exception No. 4: Buildings complying with 31.3.7, Exceptions 1,2, and 3.* ❑ *Exception No. 5: Buildings with exits maximum 50 feet apart.* ❑ *Exception No. 6: Where each dwelling unit has direct access to exterior at grade. 31.3.7, 33.4.3.3.*					
K44	Horizontal exits required to limit maximum gross area shall be as specified in 7.2.4.2. 31.2.2.5					
	SPECIAL FEATURES					
K126	Where buildings are greater than six stories with 1 total automatic fire detection system per N.F.P.A. 72E, but without an automatic sprinkler system, the interior exit access corridors shall be continuously pressurized at a minimum of 0.01 inches water, measured at any living unit door. 31.2.11, 7.2.3					

ID PREFIX	SUITABILITY OF AN APARTMENT BUILDING TO HOUSE A BOARD AND CARE OCCUPANCY	MET	NOT MET	N/A	REMARKS	APARTMENT HOUSE
	BUILDING SERVICES EQUIPMENT					
K117	Utilities shall comply with provision of Section 9.1. 32.3.6.1, 33.3.6.1.					
K67	Heating, ventilating and air conditioning equipment shall comply with the provisions of Section 9.2. 32.3.6.2, 33.3.6.2					
K118	Elevators, dumbwaiters and vertical conveyors shall comply with the provisions of Section 9.4. 32.3.6.3, 32.3.6.3.2, 33.3.6.3					
K71	Rubbish chutes, incinerators and laundry chutes shall comply with the provisions of Section 9.5. 32.3.6.4, 33.3.6.4					
	OPERATING FEATURES					
K127	Every required automatic sprinkler *system*, fire detection and alarm system, smoke control *system*, exit lighting, fire door and other item of equipment required by this code shall be continuously maintained in proper operating condition. 4.6.12					
K72	No furnishings, decorations or other objects are placed to obstruct exits or visibility of exits. 7.5.2.2 32.7.5					
K73	No furnishings or decorations of an explosive or highly flammable character are used. 18.7.5.4, 19.7.5.4					
	EMERGENCY PLAN, FIRE DRILLS					
K48	There is a written plan for the protection of all persons and for their evacuation in the event of an emergency. All employees shall be instructed and reviewed as to their duties and responsibilities under the plan. 32.7.1, 33.7.1					

ID PREFIX	SUITABILITY OF AN APARTMENT BUILDING TO HOUSE A BOARD AND CARE OCCUPANCY	MET	NOT MET	N/A	REMARKS	APARTMENT HOUSE
K128	All residents capable of assisting in their evacuation shall be trained in the proper actions to take in the event of a fire. 32.7.2, 33.7.2					
K50	Fire exit drills shall be conducted twelve times per year, quarterly on each shift. Drills shall involve actual evacuation to a selected assembly point and provide experience in exiting through all exits. Exits not used in any fire drill shall not be credited in meeting the requirements of the code. 42 CFR 483.470 Subpart L					
K66	Where smoking is permitted, noncombustible safety-type ash trays or receptacles shall be provided in convenient locations. 32.7.4, 33.7.4					
	ILLUMINATION AND EMERGENCY POWER					
K45	Every public space, hallway, stairway and other means of egress shall have illumination in accordance with Section 7.8. 30.2.8, 31.2.8					
K46	Any apartment building with more than twelve living units or greater than three stories shall have emergency lighting in accordance with Section 7.8. ❑ *Exception: Where every living unit has a direct exit to the outside at grade level.*					
K47	Signs marking means of egress shall be in accordance with section 7.10 and provided in all apartment buildings requiring more than one exit. 30.2.10, 31.2.10					

FIRE SAFETY EVALUATION WORKSHEET FOR AN APARTMENT BUILDING WITH BOARD AND CARE OCCUPANCIES

G3

Building Identification _____

Evaluator_____Date _____

(Complete one worksheet for each apartment house containing one or more apartment units with a board and care occupancy.)

First complete Table 7.7. Continue with Fig. 7.7.1 through 7.7.5. Then return to this page to obtain the Equivalency Conclusions.

TURN TO NEXT PAGE

Part 3E. Equivalency Conclusions

Complete Tables 7.7.2 through 7.7.7 before doing this part.

1. ❑ All of the checks in Table 7.7.7 are in the "YES" column. The level of fire safety is at least equivalent to that prescribed for apartments.*

2. ❑ One or more of the checks in Table 7.7.7 is in the "NO" column. The level of fire safety is not shown by this system to be equivalent to that prescribed by the Life Safety Code for apartments.

*The equivalency covered by this worksheet includes the majority of considerations covered by the Life Safety Code. There are a few considerations that are not evaluated by this method. These must be considered separately. These additional considerations are covered in the "Facility Fire Safety Requirements Worksheet." One copy of this separate worksheet is to be completed for each facility.

FACILITY FIRE SAFETY REQUIREMENTS WORKSHEET

CONSIDERATIONS	MET	NOT MET	N/A
A. Utilities comply with provisions of 9.1			
B. Heating, ventilating, and air conditioning equipment comply with provisions of 9.2.			
C. Elevators, dumbwaiters, and vertical conveyors comply with the provisions of 9.4.			
D. Rubbish chutes, incinerators, and laundry chutes comply with the provisions of 9.5.			
E. Complies with the applicable requires of 32.7, 33.7 (Operating Features).			

Table G-3A
Worksheets for evaluating fire safety for an apartment building with board and care occupancies.

WORKSHEET 7.7.1 COVER SHEET

Fire Safety Evaluation Worksheet for an Apartment Building with Board and Care Occupancies

Building Identification _____

Evaluator _____ Date _____

WORKSHEET 7.7.2 SAFETY PARAMETER VALUES — APARTMENT BUILDING

Safety Parameters	Parameter Values							
1. Construction	Combustible					Noncombustible		
Building Height	Type V (000)	Type V (111)	Type III (200)	Type III (211)	Type IV (2HH)	Type II (000)	Type II (111)	Type II (222) & Type I
1 Story	-2( )[a]	0	-2( )[a]	0	0	0	2	2
2 Stories	-6( )[a]	0	-6( )[a]	0	0	-5( )[a]	2	2
3-4 Stories	-8( )[a]	-2(0)[a]	-8( )[a]	0	-2(0)	-6( )[a]	2	2
5-6 Stories	-8	-2(0)[a]	-8( )[a]	0	-2(0)[a]	-6( )[a]	2	2
Over 6 Stories	-10	-4	-10	-2(0)[a]	-4(0)	-8	0	2

2. Hazardous Areas (outside board & care home units)	Double Deficiency	Single Deficiency	None or No Deficiency
	-4(-7)[a,c]	0(-4)[c]	0

3. Manual Fire Alarm	None or Incomplete	Manual Alarm	
		w/o F.D. Notification	w/F.D. Notification
	0(2)[a]	2	3

4. Smoke Detection and Alarm (outside board & care home units)				Interconnected System		
	None or Incomplete	Single Station Living Units Only		Corrs. & Common Spaces	Corrs., Common Spaces, & Living Units	Total Building
		Single Level	Every Level			
	-4(0)[a]	0	-2(0)[a]	-3(0)[a]	4	6

5. Automatic Sprinklers (outside board & care home units)	None or Incomplete	Corrs., Public Space	Living Units Only	Corrs., Hub., & Public Spaces	Total Building
	0	2(0)[a]	4(0)[a]	6	8

6. Separation of Board & Care Home Unit and Its Exit Route from Other Spaces		Walls <30 min		Walls>30 min to <1 hr		Walls>1 hr	
	None or Incomplete	Doors <20 min w/o Closer	Doors≥20 min w/o Closer	Doors<20 min w/Closer	Doors≥20 min w/Closer	Doors<20 min w/Closer	Doors≥20 min w/Closer
	-6	-2	0(-2)[a]	1(-2)[a]	2(-2)[a]	1(-2)[a]	4(-2)[a]

7. Exit System (serving board & care home units)	<2 Standard Routes	Multiple Routes				
		Deficient	w/o Horiz.Exit	w/Horiz. Exit	Smokeproof Enclosure	Direct Exit
	-6	-2	0	2	2	4

8. Exit Access (serving board & care home units)	Max. Dead End Is		No Dead End >50 ft and				
	>100 ft	>50 ft or corridor common path>35 ft	>200 ft	>150 ft to ≤200 ft	>100 ft to ≤150 ft	>50 ft to ≤100 ft	<50 ft
	-6(0)[a]	-4(0)[a]	-2	-1	0	1	2

9. Interior Finish (egress routes serving board & care home units)	Flame-Spread Rating		
	>75 to ≤200	>25 to ≤75	≤25
	-3	-1	0

Table G-3A

WORKSHEET 7.7.2 *(continued)*

10. Vertical Openings	Open or Incomplete Enclosure			Enclosed[h]	
	Thru 5 or More Floors	3-4 Floors	2 Floors	<1 hr[f]	≥1hr[f]
	-10	-7	-2	0	10[g]

11. Smoke Control (serving floors having board & care home units)		Smoke	Mechanically Assisted Systems		
	None	Barriers	By Zone	By Unit	By Corridor
	0(2)[i]	2	3	3	4

NOTES:

[a] Use (-1X height in stories) if building is fully sheathed with plaster, gypsum board, or similar materials but not <-2 if parameter 5 is 8.

[b] Use ( ) if Parameter 1 is based on Type V(000), Type III(200), or Type II(000), if Note [a] does not apply, and if parameter 5 is ≤4.

[c] Use ( ) if Parameter 1 is based on Type V(000), Type III(200), or Type II(000).

[d] Use ( ) if Parameter 7 is -6.

[e] Use ( ) if Parameter 6 is based on "None or Incomplete," or "Walls or Doors are 1/2 hour walls /20 minute doors and Parameter 5 is <4.

[f] ≥30 min in existing building.

[g] Use ( ) if hazardous area is on exit route or in refuge area serving group home unit.

[h] Use 0 in 1 story building.

[i] Use (2) in 1-3 story buildings with <12 living units.

[j] Use ( ) if Parameter 5 is ≥6

[k] Use (0) if Parameter 5 is 8.

[l] Use ( ) where exceptions to 31.3.7 (NFPA *101*) apply.

For SI units: 1 ft = 0.348m.

Part 3B. Complete Individual Safety Evaluations – Use Worksheet 7.7.3

1. Transfer each of the 8 circled safety parameter values from Table G-3A to every unshaded block in the line with the corresponding safety parameter in Table G-3B. Where the block is indicated (-(2) enter only one half the value shown in Table G-3A.
2. Add the four columns, keeping in mind that any negative numbers deduct.

Transfer the resulting values for S_1, S_2, S_3 and S_4 to Table G-3D.

WORKSHEET 7.7.3 INDIVIDUAL INSERT SAFETY EVALUATIONS — APARTMENT BUILDINGS

Safety Parameters	Fire Control (S_1)	Egress Provided (S_2)	Refuge Provided (S_3)	General Fire Safety Provided (S_4)
1. Construction				
2. Hazardous Areas		÷ 2 =		
3. Manual Fire Alarm	÷ 2 =			
4. Smoke Detection and Alarm	÷ 2 =			
5. Automatic Sprinklers		÷ 2 =	÷ 2 = (See note)	
6. Separation of Living Units		÷ 2 =		
7. Exit system			÷ 2 =	
8. Exit Access				
9. Interior Finish				
10. Vertical Openings	÷ 2 =			
11. Smoke Control				
Total	S_1 =	S_2 =	S_3 =	S_4 =

NOTE: Use full value if Safety Parameter 1 is based on Type V (000), Type III (200), or Type II(000) construction. Divide by 2 (÷2) in all other cases.

Determine Mandatory Requirements — Use Figure 7.7.4

1. Using the level of requirement based on evacuation capability (see 21-1.3) to select the proper row of Figure 7.7.4. Circle the appropriate values.
2. Transfer the circled values from Table 7.74A to the blocks marked for Sa, Sb, Sc and Sd to Table G-3D.

WORKSHEET 7.7.4A MANDATORY REQUIREMENTS — SPRINKLERED AND NONSPRINKLERED APARTMENT BUILDINGS

		Control Requirements (Sa)		Egress Requirements (Sb)		Refuge Requirements (Sc)		General Fire Safety Requirements (Sd)	
Building Height	Level of Evacuation Difficulty	New	Exist.	New	Exist.	New	Exist.	New	Exist.
1 Story	Prompt/Slow	10	3	4.5	6	8	3	8	6
	Impractical	11	6	4.5	6	5	6	9	9
2–6 Stories	Prompt/Slow	10.5	4.5	6	7	9	5	9	8
	Impractical	14.5	6.5	6	7	9	7	13	10
>6 Stories	Prompt/Slow	12.5	11.5	6	7.5	7	8	11	10
	Impractical	14.5	13.5	6	7.5	9	10	13	14

WORKSHEET 7.7.4B MANDATORY REQUIREMENTS — NEW NONSPRINKLERED APARTMENT BUILDINGS MEETING EXCEPTION TO 30.3.5.2 (NFPA 101)

Building Height	Level of Evacuation Difficulty	Control Requirements (Sa)	Egress Requirements (Sb)	Refuge Requirements (Sc)	General Fire Safety Requirements (Sd)
1 Story	Prompt/Slow	5	10	5	11
2 Stories	Prompt/Slow	2.5	8	3	7
3–6 Stories	Prompt/Slow	6.5	11	7	13
>6 Stories	Prompt/Slow	8.5	11	9	15

WORKSHEET 7.7.4C MANDATORY REQUIREMENTS — NEW FACILITIES LOCATED IN EXISTING NONSPRINKLERED APARTMENT BUILDINGS

Building Height	Level of Evacuation Difficulty	Control Requirements (Sa)	Egress Requirements (Sb)	Refuge Requirements (Sc)	General Fire Safety Requirements (Sd)
1 Story	Prompt ≤30 residents	4	6	2	6
	Prompt >30 residents or slow	5	6	3	7
2 Stories	Prompt/Slow	4.5	7	3	7
3–6 Stories	Prompt/Slow	6.5	11	7	13

WORKSHEET 7.7.4D MANDATORY REQUIREMENTS — NEW FACILITIES LOCATED IN EXISTING NONSPRINKLERED APARTMENT BUILDINGS

Building Height	Level of Evacuation Difficulty	Control Requirements (Sa)	Egress Requirements (Sb)	Refuge Requirements (Sc)	General Fire Safety Requirements (Sd)
1 Story	Prompt/Slow/Impractical	9	4.5	3	7
2 Stories	Prompt/Slow	10.5	6	5	9
	Impractical	12.5	6	7	11
3–6 Stories	Prompt/Slow	10.5	6	9	9
	Impractical	14.5	6	9	13
>6 Stories	Prompt/Slow	12.5	6	7	11
	Impractical	14.5	6	9	13

(For use with NFPA 101A-2001/NFPA 101-2000, B & C Apts.)

WORKSHEET 7.7.5 EQUIVALENCY EVALUATION

1. Perform the indicated subtractions in Table G-2D. Enter the differences in the appropriate answer blocks.
2. For each row check "YES" if the value in the answer block is zero or greater. Check "NO" if the value in the answer block is a negative number.

					YES	NO
Control Provided (S_1)	minus	Required Control (S_a)	≥ 0	S_1 ☐ − S_a ☐ = ☐		
Egress Provided (S_2)	minus	Required Egress (S_b)	≥ 0	S_2 ☐ − S_b ☐ = ☐		
Refuge Provided (S_3)	minus	Required Refuge (S_c)	≥ 0	S_3 ☐ − S_c ☐ = ☐		
General Fire Safety (S_4)	minus	Required General Fire Safety (S_d)	≥ 0	S_4 ☐ − S_d ☐ = ☐		

WORKSHEET 7.7.6 FACILITY FIRE SAFETY REQUIREMENTS WORKSHEET

	CONSIDERATIONS	MET	NOT MET	N/A
A.	Utilities comply with the provisions of 32.3.6.1 and 33.3.6.1.			
B.	Heating, ventilating, and air conditioning equipment comply with the provisions of 32.3.6.2 and 33.3.6.2, except for enclosure of vertical openings, which have been considered in Safety Parameter 10 of Worksheet 7.7.2.			
C.	Elevators, dumbwaiters, and vertical conveyors comply with the provisions of 32.3.6.3 and 33.3.6.3.			
D.	Rubbish chutes, incinerators, and laundry chutes comply with the provisions of 32.3.6.4 and 33.3.6.5.			
E.	Complies with the applicable requirements of Sections 32.7 and 33.7.			

All references are to NFPA *101, Life Safety Code*

WORKSHEET 7.7.7 CONCLUSIONS

1. ☐ All of the checks in Worksheet 7.7.5 are in the "YES" column. The level of fire safety is at least equivalent to that prescribed by NFPA *101, Life Safety Code*, for apartments to house a board and care occupancy.*
2. ☐ One or more of the checks in Worksheet 7.7.5 are in the "NO" column. The level of fire safety is not shown by this system to be equivalent to that prescribed by NFPA *101* for apartments to house board and care occupancy.

*The equivalency covered by this worksheet includes the majority of considerations covered by NFPA *101, Life Safety Code*. There are some considerations that are not evaluated by this method. These must be considered separately. These additional considerations are covered in Worksheet 7.7.6, "Facility Fire Safety Requirements Worksheet." One copy of this worksheet is to be completed for each facility.

FIRE SAFETY SURVEY REPORT
CRUCIAL DATA EXTRACT
(TO BE USED WITH CMS-2786 FORMS)

PROVIDER NUMBER	FACILITY NAME	SURVEY DATE
K1		* K4

K6 DATE OF PLAN APPROVAL

K3 MULTIPLE CONSTRUCTION
TOTAL NUMBER OF BUILDINGS _____
NUMBER OF THIS BUILDING _____

A BUILDING
B WING
C FLOOR
D APARTMENT UNIT

LSC FORM INDICATOR

Health Care Form		
12	2786R	2000 EXISTING
13	2786R	2000 NEW

ASC Form		
14	2786U	2000 EXISTING
15	2786U	2000 NEW

ICF/MR Form		
16	2786V, W, X	2000 EXISTING
17	2786V, W, X	2000 NEW

* K7 SELECT NUMBER OF FORM USED FROM ABOVE

COMPLETE IF ICF/MR IS SURVEYED UNDER CHAPTER 21

SMALL (16 BEDS OR LESS)
K8
1 PROMPT
2 SLOW
3 IMPRACTICAL

LARGE
K8:
4 PROMPT
5 SLOW
6 IMPRACTICAL

APARTMENT HOUSE
K8:
7 PROMPT
8 SLOW
9 IMPRACTICAL

(Check if K29 or K56 are marked as not applicable in the 2786 M, R, T, U, V, W, X and Y.)

K29 K56:

ENTER E – SCORE HERE
K5: e.g. 2.5

*K9: FACILITY MEETS LSC BASED ON *(Check all that apply)*

A1. (COMP. WITH ALL PROVISIONS)
A2. (ACCEPTABLE POC)
A3. (WAIVERS)
A4. (FSES)
A5. (PERFORMANCE BASED DESIGN)

FACILITY DOES NOT MEET LSC
B.

K0180
A. FULLY SPRINKLERED (All required areas are sprinklered)
B. PARTIALLY SPRINKLERED (Not all required areas are sprinklered)
C. NONE (No sprinkler system)

* MANDATORY

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR MEDICARE & MEDICAID SERVICES

2000 CODE ICFs/MR

Form Approved
OMB No. 0938-0242

FIRE SAFETY SURVEY REPORT - 2000 LIFE SAFETY CODE
Intermediate Care Facilities for the Mentally Retarded
SMALL FSES

1. (A) PROVIDER NO.	1. (B) MEDICAID I.D. NO.
K1	K2

PART III — Chapter 7-101A Fire Safety Evaluation System for Board & Care (Optional)

Identifying information as shown in applicable records. Enter changes, if any, alongside each item, giving date of change.

2. NAME OF FACILITY	2. (A) MULTIPLE CONSTRUCTION (BLDGS)	2. (B) ADDRESS OF FACILITY (STREET, CITY, STATE, ZIP CODE)	
	A. BUILDING _____ B. WING _____ C. FLOOR _____ K3		A. ☐ Fully Sprinklered (All required areas are sprinklered) B. ☐ Partially Sprinklered (Not all required areas are sprinklered) C. ☐ None (No sprinkler system) K3 (a)(b)

3. SURVEY FOR	4. DATE OF SURVEY	DATE OF PLAN APPROVAL	SURVEY UNDER:
☐ MEDICARE ☐ MEDICAID	K4	K6	5. ☐ 2000 EXISTING 6. ☐ 2000 NEW K7

E-SCORE

E-Score	Level of Evacuation Difficulty
≤ 1.5	Prompt
> 1.5 ≤ 5.0	Slow
> 5.0	Impractical

K5

5. SURVEY FOR CERTIFICATION OF: SMALL FACILITY - LEVEL OF EVACUATION DIFFICULTY *(Check one)*

1. ☐ Prompt 2. ☐ Slow 3. ☐ Impractical

K8

6. BED COMPOSITION

a. TOTAL NO. OF BEDS IN THE FACILITY	e. NUMBER OF ICF/MR BEDS CERTIFIED FOR MEDICAID

7. A. ☐ THE FACILITY MEETS, BASED UPON *(Check all appropriate boxes)*:

1. ☐ COMPLIANCE WITH ALL PROVISIONS 2. ☐ ACCEPTANCE OF A PLAN OF CORRECTION 4. ☐ FSES 5. ☐ PERFORMANCE BASED DESIGN

B. ☐ THE FACILITY DOES NOT MEET THE STANDARD

K9

SURVEYOR *(Signature)*	TITLE	OFFICE	DATE
SURVEYOR ID K10			
FIRE AUTHORITY OFFICIAL *(Signature)*	TITLE	OFFICE	DATE

Fire Safety Evaluation Worksheet for a Small Facility

Facility Identification _____

Evaluator _____ Date _____

(Complete one worksheet for each individual residence or apartment used as a board and care home. A small facility normally means a capacity for 16 or fewer residents.)

First complete Worksheet 7.3.1. Continue with Worksheets 7.3.3, 7.3.4, 7.3.5 and 7.3.6. Then return to this page to obtain the Equivalency Conclusions.

TURN TO NEXT PAGE

Part 1E. Equivalency Conclusions.

Complete Worksheets 7.3.1 through 7.3.6 before doing this part.

1. ☐ All of the checks in Worksheet 7.3.7 are in the "YES" column. The level of fire safety is at least equivalent to that prescribed by the Life Safety Code.*

2. ☐ One or more of the checks in Worksheet 7.3.7 is in the "NO" column. The level of fire safety is not shown by this system to be equivalent to that prescribed for small dwelling units.

* The equivalency covered by this worksheet includes the majority of considerations covered by the Life Safety Code. There are a few considerations that are not evaluated by this method. These must be considered separately. These additional considerations are covered in the "Facility Fire Safety Requirements Worksheet." One copy of this separate worksheet is to be completed for each facility.

Figure 7.3 Worksheets for evaluating fire safety in a small facility.

WORKSHEET 7.3.1 COVER SHEET

Fire Safety Evaluation Worksheet for Small Facility

Building Identification _____

Evaluator _____ Date _____

WORKSHEET 7.3.2 SAFETY PARAMETER VALUES — SMALL FACILITY

Safety Parameters		Parameter Values								
1. Construction/ Fire Resistance		Exposed Structural Members			Protected 15 min			Protected 1 hr		
		0			1			3		
2. Hazardous Areas		Double Deficiency			Single Deficiency			None or No Deficiency		
		-7			-4			0		
3. Manual Fire Alarm		None or Incomplete			w/o F.D. Notification			w/ F.D. Notification		
		0			1			2		
4. Smoke Detection and Alarm		None or Incomplete	Single Lev. Det./ Limited Warning		Warning to All Bedrooms: Every Lev. Det.[e]		Warning to All Bedrooms: Every Lev. Plus Det. in Each Bdrm.	Total Coverage System		
		-4	0		2		3(4)[f]	4		
5. Automatic Sprinklers		Nonsprinklered			Standard Sprinklers			Quick-Response or Residential Sprinklers		
		0			8			10		
6. Interior Finish		Flame-Spread Ratings								
		>75 to ≤200			>25 to ≤75			≤25		
		-3			-1			0		
7. Separation of Sleeping Rooms (from other levels and from corridors)		Unprotected Vertical Openings			Protected Vertical Openings[d]					
		None or Incomp.	Smoke Resisting w/o Closer	Smoke Resisting w/ Closer	None or Incomp.	Smoke Resisting	1/2 hr.	1/2 hr Auto Closing	Smoke Res. w/ Door Closer	1/2 hr w/ Door Closer
		-6	-4	0(0)[c]	-2	0	1(0)[b]	2(0)[b]	1	2(1)[b]
8. Means of Escape	Means of Escape on All Sleeping Levels	<2 Remote Routes: w/o Alt. Means	<2 Remote Routes: w/ Alt. Means		2 Remote Routes Unseparated		2 Remote Routes Separated	Direct Exit from Each Bdrm.		
		-1	0		1(0)[b]		2(0)[b]	3(0)[b]		
	Means of Escape Not on All Sleeping Levels	Primary Route Not Protected: <2 Remote Routes: w/o Alt. Means	Primary Route Not Protected: <2 Remote Routes: w/ Alt. Means	Primary Route Not Protected: 2 Remote Routes	Primary Route Protected: <2 Remote Routes: w/o Alt. Means	Primary Route Protected: <2 Remote Routes: w/ Alt. Means	Primary Route Protected: 2 Remote Routes			
		-4	-3	0	-1	0	2(0)[b]			

NOTES:

[a] Use ( ) if Parameter 1 is 0 and Parameter 5 is 0.

[b] use (0) if Parameter 7 is based on a "none or incomplete" situation.

[c] Use (0) if door is 20 minute and has automatic closer.

[d] Consider a single level building as having protected vertical openings.

[e] Every level detection is permitted to be omitted with a quick-response automatic sprinklers throughout; however, detection in each bedroom is required.

[f] Use (4) in existing buildings if detection in each bedroom and quick-response automatic sprinklers throughout.

(For use with NFPA 101A-2001/NFPA 101-2000, II & C Small)

Form CMS-2788Y (03/04) Previous Versions Obsolete Page 3

Figure 7.3 Continued

WORKSHEET 7.3.3 INDIVIDUAL SAFETY EVALUATIONS — SMALL FACILITY

Safety Parameters	Fire Control (S_1)	Egress (S_2)	Refuge (S_3)	General Fire Safety (S_4)
1. Construction				
2. Hazardous Areas		÷ 2 =		
3. Manual Fire Alarm	÷ 2 =	*(See note)*		
4. Smoke Detection and Alarm	÷ 2 =		÷ 2 =	
5. Automatic Sprinklers		÷ 2 =		
6. Interior Finish	÷ 2 =			
7. Separation of Sleeping Rooms				
8. Means of Escape				
Total	S_1 =	S_2 =	S_3 =	S_4 =

NOTE: Maximum value of manual fire alarm for means of escape is 1.

WORKSHEET 7.3.4 MANDATORY SAFETY REQUIREMENTS

Level of Evacuation Difficulty	Control Requirements (S_1)		Egress Requirements (S_2)		Refuge Requirements (S_3)		General Fire Safety Requirements (S_4)	
	New	Exist.	New	Exist.	New	Exist.	New	Exist.
Prompt	10(½)[a]	0	5(5)[a]	4	11(2½)[a]	2	7(2)[a]	1
Slow	10	2	9	7	11	4	11	7
Slow[b]		1		6		2		5
Impractical	10	8	10	9	11	9	12	10

[a] Use ( ) for small board and care facility conversion serving eight or fewer residents with an evacuation capability rating of "prompt."

[b] In existing buildings only, use these mandatory safety requirements if evacuation time is 8 minutes or less or if the evacuation capability score is 3 or less as determined by Chapter 6.

(For use with NFPA 101A-2001/NFPA 101-2000, B & C Small)

Figure 7.3 Continued

WORKSHEET 7.3.5 EQUIVALENCY EVALUATION

					YES	NO
Control Provided (S_1)	minus	Required Control (S_A)	$\geq$ 0	S_1 ☐ – S_A ☐ = ☐		
Egress Provided (S_2)	minus	Required Egress (S_B)	$\geq$ 0	S_2 ☐ – S_B ☐ = ☐		
Refuge Provided (S_3)	minus	Required Refuge (S_C)	$\geq$ 0	S_3 ☐ – S_C ☐ = ☐		
General Fire Safety (S_4)	minus	Required General Fire Safety (S_4)	$\geq$ 0	S_4 ☐ – S_4 ☐ = ☐		

WORKSHEET 7.3.6 FACILITY FIRE SAFETY REQUIREMENTS WORKSHEET

CONSIDERATIONS	MET	NOT MET
A. Complies with the applicable requirements of Sections 32.7 and 33.7. (NFPA *101*).		

WORKSHEET 7.3.7 CONCLUSIONS

1. ☐ All of the checks in Worksheet 7.3.5 are in the "YES" column. The level of fire safety is at least equivalent to that prescribed by NFPA *101, Life Safety Code.**

2. ☐ One or more of the checks in Worksheet 7.3.5 are in the "NO" column. The level of fire safety is not shown by this system to be equivalent to that prescribed by NFPA *101* for small dwelling units.

*The equivalency covered by this worksheet includes the majority of considerations covered by NFPA *101, Life Safety Code*. There are some considerations that are not evaluated by this method. These must be considered separately. These additional considerations are covered in Worksheet 7.3.6, "Facility Fire Safety Requirements Worksheet." One copy of this worksheet is to be completed for each facility.

(For use with NFPA IO1A-2001/NFPA *101*-2000, B & C Small)

FIRE SAFETY SURVEY REPORT
CRUCIAL DATA EXTRACT
(TO BE USED WITH CMS-2786 FORMS)

PROVIDER NUMBER	FACILITY NAME	SURVEY DATE
K1		* K4

K5 DATE OF PLAN APPROVAL

K3 MULTIPLE CONSTRUCTION
TOTAL NUMBER OF BUILDINGS _____
NUMBER OF THIS BUILDING _____

☐
A BUILDING
B WING
C FLOOR
D APARTMENT UNIT

LSC FORM INDICATOR

Health Care Form		
12	2786R	2000 EXISTING
13	2786R	2000 NEW

ASC Form		
14	2786U	2000 EXISTING
15	2786U	2000 NEW

ICF/MR Form		
16	2786V, W, X	2000 EXISTING
17	2786V, W, X	2000 NEW

* K7 ☐ SELECT NUMBER OF FORM USED FROM ABOVE

(Check if K29 or K56 are marked as not applicable in the 2786 M, R, T, U, V, W, X and Y.)

K29 ☐ K56 ☐

COMPLETE IF ICF/MR IS SURVEYED UNDER CHAPTER 21

SMALL (16 BEDS OR LESS)
K8 ☐ 1 PROMPT 2 SLOW 3 IMPRACTICAL

LARGE
K8: ☐ 4 PROMPT 5 SLOW 6 IMPRACTICAL

APARTMENT HOUSE
K8: ☐ 7 PROMPT 8 SLOW 9 IMPRACTICAL

ENTER E – SCORE HERE
K5: ☐ e.g. 2.5

*K9: FACILITY MEETS LSC BASED ON *(Check all that apply)*

A1. ☐ (COMP. WITH ALL PROVISIONS)
A2. ☐ (ACCEPTABLE POC)
A3. ☐ (WAIVERS)
A4. ☐ (FSES)
A5. ☐ (PERFORMANCE BASED DESIGN)

FACILITY DOES NOT MEET LSC
B. ☐

K0180
A. ☐ FULLY SPRINKLERED (All required areas are sprinklered)
B. ☐ PARTIALLY SPRINKLERED (Not all required areas are sprinklered)
C. ☐ NONE (No sprinkler system)

* MANDATORY

Reason: The provisions established in this appendix will provided the minimum standards for new facilities which voluntarily seek certification or accreditation in the Medicare/Medicaid program. These minimum standards **do exceed** some of the minimum occupancy requirements established within the body of this Code **but are** necessary to meet the requirements of the Centers for Medicare and Medicaid Services as specified in 42 CFR.

It is absolutely absurd to have a new facility to be permitted and constructed in compliance with the body of the IBC and then be immediately cited as ineligible for certification or accreditation in the Medicare/Medicaid program because the body of the IBC did not take into account all the requirements of the Centers for Medicare and Medicaid Services as specified in 42 CFR. This will allow for those states and jurisdictions that adopt the International Codes to also adopt this appendix if desired to help deliver and administer the federal CMS programs utilizing the IBC. The construction type conversion Table 1 was placed in the appendix to assist code officials in all parts of the county in assessing the appropriate construction type for use in the CMS forms.

This appendix will allow states to adopt the additional requirements of the Centers for Medicare and Medicaid Services as specified in 42 CFR so that compliance with this appendix can allow for the certification recommendation to be made by the State survey agency on the compliance of providers and suppliers with the conditions of participation, requirements for Skilled Nursing Facilities (SNFs), Nursing Facilities (NFs) whether freestanding, distinct parts, or dually certified, Intermediate Care Facilities for Mentally Retarded (ICFs/MR), Ambulatory Surgical Centers (ASC), inpatient Hospice facilities, Program for All inclusive Care for the Elderly (PACE) facilities, Critical Access Hospitals (CAH), Psychiatric and General Hospitals.

No additional cost for those facilities desiring to seek voluntarily certification or accreditation in the Medicare/Medicaid program since they are already required to meet these minimum provisions and requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GARRISS-G1-APPENDIX L.doc

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE C MEANS OF EGRESS

MEANS OF EGRESS CODE COMMITTEE

Stephen Thomas, CBO - ***Chair***
President
Colorado Code Consulting
Denver, CO

Jim Budzinski – *Vice Chair*
Fire Chief (Retired)
Tamarac, FL

Bart Alspaugh, MCP
Building Inspector II
City of Lake Saint Louis
Lake St. Louis, MO

Jason Averill
Group Leader
National Institute of Standards and Technology
Gaithersburg, MD

Tom Barrs
Senior Plans Examiner
City of Scottsdale
Scottsdale, AZ

Neil Burning, CBO
Manager, Plans Examination
Clark County Development Services-Bldg Div.
Las Vegas, NV

James Dawson
Fire Marshal
Chesterfield County Fire and EMS
Chesterfield, VA

David Frable
Senior Fire Protection Engineer
U.S. General Services Administration,
Bldg Services
Geneva, IL

Jeffrey Heiss
Construction Official
Township of Warren
Warren, NJ

James Hodgens
Deputy Chief
New York City Fire Department
Brooklyn, NY

Gary Lampella
Building Official
City of Redmond
Redmond, OR

Larry Lehman
Building Division Chief
State of Michigan
Department of Energy, Labor & Economic Growth
Bureau of Construction Codes
Lansing, MI

Paul Martin
Rep: National Association of State Fire Marshals
Acting Chief - Bureau of Fire Prevention
New York State Office of Fire Prevention and Control
Albany, NY

Brad Schiffer, AIA
Architect
Brad Schiffer/TAXIS Inc.
Naples, FL

John Stovall
Rep: National Association of Home Builders
NSArchitects
Rockville, MD

Staff Secretariat:
Kimberly Paarlberg, RA
Senior Staff Architect
International Code Council

TENTATIVE ORDER OF DISCUSSION

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE

MEANS OF EGRESS

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation **does not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair. Note that some AIBC-E@ code change proposals are not included on this list, as they are being heard by other committees. Please consult the Cross Index of Proposed Changes.

E1-09/10
E2-09/10
E3-09/10
E4-09/10
    E194-09/10, Part I
E7-09/10
E8-09/10 Part I
    G79-09/10
    G95-09/10
E9-09/10
E10-09/10
E11-09/10
E12-09/10
E13-09/10
E14-09/10
E15-09/10
E16-09/10
E17-09/10
E18-09/10
E19-09/10
E20-09/10, Part I
E20-09/10, Part II
E21-09/10, Part I
E21-09/10, Part II
E22-09/10
E23-09/10
E24-09/10
E25-09/10
E26-09/10
E27-09/10
E28-09/10
E29-09/10
E30-09/10
E31-09/10
E32-09/10
E33-09/10
E34-09/10
E35-09/10
E36-09/10
E37-09/10
E38-09/10
E39-09/10
E40-09/10
E41-09/10
E42-09/10
E43-09/10
E44-09/10
E45-09/10
E46-09/10
E47-09/10
E48-09/10
E49-09/10
E50-09/10
E51-09/10
E52-09/10
E53-09/10
E54-09/10
E55-09/10
E56-09/10
E57-09/10
E58-09/10, Part I
E59-09/10
E60-09/10, Part I
E60-09/10, Part II
E61-09/10
E62-09/10
E63-09/10
E64-09/10
E65-09/10
E66-09/10
    E5-09/10, Part I
    E5-09/10, Part II
E67-09/10
E68-09/10
E69-09/10
E70-09/10, Part I
E71-09/10, Part I
E72-09/10, Part I
E73-09/10
E74-09/10, Part I
E75-09/10, Part I
E76-09/10
E77-09/10
E78-09/10
E79-09/10
E80-09/10
E81-09/10
E82-09/10
E83-09/10
E84-09/10
E85-09/10
E86-09/10
E87-09/10
E88-09/10
E89-09/10
E90-09/10
E91-09/10
E92-09/10
E93-09/10, Part I
E93-09/10, Part II
E94-09/10
E95-09/10
E96-09/10
E97-09/10, Part I
E98-09/10
E99-09/10
E100-09/10, Part I
E101-09/10
E102-09/10
E103-09/10
E104-09/10
E105-09/10
E106-09/10
    E6-09/10
E107-09/10
    G67-09/10
E108-09/10
E109-09/10
E110-09/10
E111-09/10
E112-09/10
E113-09/10
E114-09/10
E115-09/10
E116-09/10
E117-09/10
E118-09/10
    G46-09/10
    G47-09/10
    G48-09/10
    G49-09/10
    G157-09/10
    G158-09/10
    G159-09/10
    G160-09/10
    G161-09/10
    G162-09/10
    G163-09/10
    G164-09/10
    G165-09/10
    G166-09/10
    G167-09/10
    G168-09/10
    G169-09/10
    G170-09/10
    G171-09/10
    G172-09/10
    G173-09/10
    G174-09/10
    G175-09/10
    G176-09/10
    G177-09/10
E119-09/10
E120-09/10
E121-09/10
E122-09/10, Part I
E123-09/10
    G52-09/10
E124-09/10
E125-09/10
E126-09/10
E127-09/10
E128-09/10
E129-09/10
E130-09/10
E131-09/10
E132-09/10
E133-09/10
E134-09/10
E135-09/10
E136-09/10
E137-09/10
E138-09/10
E139-09/10
E140-09/10
E141-09/10
E142-09/10
E143-09/10
E144-09/10
E145-09/10
E146-09/10
E147-09/10
E148-09/10
E149-09/10
E150-09/10, Part I
E151-09/10, Part I
E151-09/10, Part II
E151-09/10, Part III
E151-09/10, Part IV
E152-09/10, Part I
E152-09/10, Part II
E153-09/10

E154-09/10
E155-09/10
E156-09/10, Part I
E156-09/10, Part II
E157-09/10
E158-09/10
E159-09/10
E160-09/10
E161-09/10
E162-09/10
E163-09/10
E164-09/10
E165-09/10
E166-09/10
E167-09/10
E168-09/10
E169-09/10
E170-09/10
G200-09/10
E171-09/10
E172-09/10
E173-09/10
E174-09/10
E175-09/10
E176-09/10
E178-09/10
E179-09/10
E180-09/10
E181-09/10
E182-09/10
E183-09/10
E184-09/10
E185-09/10
E186-09/10
E187-09/10
E188-09/10
E189-09/10
E190-09/10
E191-09/10
E192-09/10
E193-09/10

E1–09/10
1001.4 (New) (IFC [B] 1001.4 (New))

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC)

Add new text as follows:

1001.4 Fire safety and evacuation plans: Fire safety and evacuation plans shall be provided for all occupancies and buildings where required by the *International Fire Code*. Such fire safety and evacuation plans shall comply with the applicable provisions of Sections 401.2 and 404 of the *International Fire Code*.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Review of NIST WTC Recommendations". The scope of the activity is noted as:

> Review the recommendations issued by NIST in its report entitled "Final Report on the Collapse of the World Trade Center Towers", issued September 2005, for applicability to the building environment as regulated by the I-Codes. To evaluate the necessity of developing code changes in response to the NIST report.

This proposal is similar to E3-07/08 last cycle. However, based on fire service input, it has been expanded to include the reference to Section 401.2 of the IFC which states:

> 401.2 Approval. Where required by this code, fire safety plans, emergency procedures and employee traing programs shall be approved by the fire code official.

This added reference identifies the scope of responsibility of the evaluation of the plans.

The purpose of this code change proposal is to provide consistent requirements for jurisdictions regarding requirements for fire safety and evacuation plans. We feel fire safety and evacuation plans are important issues that impact occupant egress during an emergency and therefore meets the intent of the IBC and needs to be addressed. In addition, many jurisdictions across the country currently have adopted the IBC, however many of these same jurisdictions have not adopted the IFC. This reference will ensure that at least the fire safety and evacuation plans of the IFC are adopted by reference. Enforcement of the provisions is not an issue based on the reference to Section 401.2. The provisions are clearly within the scope of the IFC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Heilstedt-E2-1001.4

E2–09/10
1002.1 (IFC [B] 1002.1)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

CORRIDOR. An enclosed exit access component that defines and provides a path of egress travel ~~to an exit~~.

Reason: The current definition of "CORRIDOR" is somewhat misleading. Obviously, there are two types of corridors: Fire-resistance rated and non-fire-resistance rated. Section 1018.6 states, "Fire-resistance-rated corridors shall be continuous from the point of entry to an exit…" This provision supports the philosophy that once a given level of protection is achieved, such level of protection shall not be reduced until arrival at the exit discharge. With the non-fire-resistance rated corridor, however, there is no inherent level of protection. It is not uncommon in building design for non-rated corridors to connect open office areas without leading to an exit. The proposed language will correlate with the definition of 'aisle" in declaring that unprotected exit access components provide a path of egress travel, but not necessarily directly to an exit. This proposal eliminates potential confusion created by the current definition and lets the technical requirements of Section 1018.6 stand on their own merit. Approval of this proposal will resolve a potential conflict in stated intent for commonly used corridor provisions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Keith-E2-1002.1-Corridor

E3–09/10
1002.1 (IFC [B] 1002.1)

Proponent: David S. Collins, FAIA, The Preview Group, Inc., representing The American Institute of Architects

Revise as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

EXIT. That portion of a means of egress system ~~which is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives as required to provide a protected path of egress travel~~ between the exit access and the exit discharge or public way. ~~Exits include exterior exit doors at the level of exit discharge, vertical exit enclosures, exit passageways, horizontal exits, exterior exit stairways, exterior exit ramps and horizontal exits.~~

Reason: The current definition of "EXIT" contains several technical inaccuracies. The definition of exit includes absolute, universal criteria for an exit that describe protection and fire resistance that isn't required on all exit components. Obviously, exterior exit stairways and exterior exit ramps are not interior spaces nor are they necessarily constructed with fire-resistance rated construction and opening protectives. This proposal also acknowledges that some exit components (i.e. an exterior exit door at the level of discharge) may lead directly to the public way.This change simplifies the definition by removing the absolutes and limiting it to describing what part an exit plays in the more general term and application of "means of egress."

The laundry list of "exterior exit doors at the level of exit discharge, vertical exit enclosures, exit passageways, horizontal exits, exterior exit stairways, and exterior exit ramps and horizontal exits" should also be removed, as they are not a definition, but a list of elements that the code includes as part of the "exit." Specific sections elsewhere in the code determine that the "components" are or are not acceptable as exits, such as the allowance for exit access on open stairways in exceptions 3 and 4 in Section 1016.1, which are permitted to be counted as exits from a floor by exceptions in Section 1021.1. This is already a convoluted procedure for determining what is an exit. Additional confusion caused by a list that is not inclusive is only an added burden to understanding exits. This list in the definition is at least incomplete or incorrect since it doesn't include the allowed exceptions. The proposed language will eliminate confusion and misunderstanding of what the code intends.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Collins-E5-1002.1

E4–09/10
1002.1 (IFC [B] 1002.1)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

EXIT. That portion of a means of egress system ~~which is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives as required to provide a protected path of egress travel~~ between the exit access and the exit discharge or public way. Exit~~s~~ components include exterior exit doors at the level of exit discharge, ~~vertical~~ exit enclosures, exit passageways, horizontal exits, exterior exit stairways~~,~~ and exterior exit ramps ~~and horizontal exits~~.

Reason: The current definition of "EXIT" contains several technical inaccuracies. It contains some absolute information that is not necessarily applicable to all exit components. Obviously, exterior exit stairways and exterior exit ramps are not interior spaces nor are they necessarily constructed of fire-resistance rated construction and opening protectives. Accordingly, this specific language has been removed from the definition. This proposal also acknowledges that some exit components (i.e. an exterior exit door at the level of discharge) may lead directly to the public way. The term exit "component" was added to the definition of exit so as to be consistent with numerous other means of egress provisions. (Please see the definition of "EXIT ENCLOSURE" and "EXIT PASSAGEWAY.") Additionally, the title of Section 1022 was changed from "vertical exit enclosures" to "exit enclosures" in the 2009 Edition of the IBC. The term "vertical" has been removed from the proposed definition so as to be consistent with current terminology. The definition of "EXIT" is fundamental to proper means of egress system design. It is imperative that it be informative and precise. The proposed language will eliminate confusion and misunderstanding as to what the IBC intends.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Keith-E1-1001.1-Exit

E5–09/10

403, 408, 410, 414, 415, 705, 707, 708, 709, 712, 715, 716, 803, 804, [F]909, 1002, 1006, 1007, 1009, 1010, 1015, 1016, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1110, 2606, 3007, 3008; (IFC 909, 914.3.1.1, [B]1002, [B]1006, [B]1007, [B]1009, [B]1010, [B]1015, [B]1016, [B]1021, [B]1022, [B]1023, [B]1024, [B]1025, [B]1026, [B]1027, [B]1028, 1803.12.1.2, 2705.4.4); (IMC [F] 513.5)

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC MEANS OF EGRESS COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

PART I – IBC MEANS OF EGRESS

Revise as follows:

SECTION 1002 (IFC [B] 1002)
DEFINITIONS

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

EXIT. That portion of a means of egress system ~~which is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives as required to provide a protected path of egress travel~~ between the exit access and the exit discharge. Exit~~s~~ components include exterior exit doors at the level of exit discharge, ~~vertical exit enclosures~~ interior exit stairways, interior exit ramps, exit passageways, horizontal exits, exterior exit stairways~~,~~ and exterior exit ramps ~~and horizontal exits~~.

EXIT ACCESS DOORWAY. A door or access point along the path of egress travel from an occupied room, area or space where the path of egress enters an intervening room, corridor, ~~unenclosed~~ exit access stair or ~~unenclosed~~ exit access ramp.

EXIT ACCESS RAMP. An interior ramp that is not a required interior exit ramp.

EXIT ACCESS STAIRWAY. An interior stairway that is not a required interior exit stairway.

~~**EXIT ENCLOSURE.** An exit component that is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives, and provides for a protected path of egress travel in a vertical or horizontal direction to the exit discharge or the public way.~~

INTERIOR EXIT RAMP. An exit component that serves to meet one or more means of egress design requirements, such as required number of exits or exit access travel distance, and provides for a protected path of egress travel to the exit discharge or public way.

INTERIOR EXIT STAIRWAY. An exit component that serves to meet one or more means of egress design requirements, such as required number of exits or exit access travel distance, and provides for a protected path of egress travel to the exit discharge or public way.

SECTION 1009 (IFC [B] 1009)
STAIRWAYS

1009.1 (IFC [B] 1009.1)General. Stairways serving occupied portions of a building shall comply with the requirements of this section.

1009.2 (IFC [B] 1009.2) Interior exit stairways. Interior exit stairways shall lead directly to the exterior of the building or shall be extended to the exterior of the building with an exit passageway conforming to the requirements of Section 1023, except as permitted in Section 1027.1.

1009.2.1 (IFC [B] 1009.2.1) Where required. Interior exit stairways shall be included, as necessary, to meet one or more means of egress design requirements, such as required number of exits or exit access travel distance.

1009.2.2 (IFC [B] 1009.2.2) Enclosure. All interior exit stairways shall be enclosed in accordance with the provisions of Section 1022.

1009.3 (IFC [B] 1009.3) Exit access stairways. Floor openings between stories created by exit access stairways shall be enclosed.

Exceptions:

1. In other than Group I-2 and I-3 occupancies, exit access stairways that serve, or atmospherically communicate between, only two stories, are not required to be enclosed.
2. Exit access stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.
3. In buildings with only Group B or M occupancies, exit access stairway openings are not required to be enclosed provided that the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the area of the floor opening between stories does not exceed twice the horizontal projected area of the exit access stairway, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13.
4. In other than Groups B and M occupancies, exit access stairway openings are not required to be enclosed provided that the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the floor opening does not connect more than four stories, the area of the floor opening between stories does not exceed twice the horizontal projected area of the exit access stairway, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13.
5. Exit access stairways within an atrium complying with the provisions of Section 404 are not required to be enclosed.
6. Exit access stairways and ramps in open parking garages that serve only the parking garage are not required to be enclosed.
7. Stairways serving outdoor facilities where all portions of the means of egress are essentially open to the outside are not required to be enclosed.
8. Exit access stairways serving stages complying with Section 410.5.3.1 and 1015.6 are not required to be enclosed.
9. Stairways are permitted to be open between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, places of religious worship, auditoriums and sports facilities.
10. In Group I-3 occupancies, exit access stairways constructed in accordance with Section 408.5 are not required to be enclosed.

1009.3.1 (IFC [B] 1009.3.1) Construction. Where required, enclosures for exit access stairways shall be constructed in accordance with this section. Exit access stairway enclosures shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies in accordance with Section 712, or both.

1009.3.1.1 (IFC [B] 1009.3.1.1) Materials. Exit access stairway enclosures shall be of materials permitted by the building type of construction.

1009.3.1.2 (IFC [B] 1009.3.1.2) Fire-resistance rating. Exit access stairway enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more, and not less than 1 hour where connecting less than four stories. The number of stories connected by the exit access stairway enclosures shall include any basements, but not any mezzanines. Exit access stairway enclosures shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours.

1009.3.1.3 (IFC [B] 1009.3.1.3) Continuity. Exit access stairway enclosures shall have continuity in accordance with Section 707.5 for fire barriers or Section 712.4 for horizontal assemblies as applicable.

1009.3.1.4 (IFC [B] 1009.3.1.4) Openings. Openings in an exit access stairway enclosure shall be protected in accordance with Section 715 as required for fire barriers. Doors shall be self- or automatic-closing by smoke detection in accordance with Section 715.4.8.3.

1009.3.1.4.1 (IFC [B] 1009.3.1.4.1) Prohibited openings. Openings other than those necessary for the purpose of the exit access stairway enclosure shall not be permitted in exit access stairway enclosures.

1009.3.1.5 (IFC [B] 1009.3.1.5) Penetrations. Penetrations in an exit access stairway enclosure shall be protected in accordance with Section 713 as required for fire barriers.

1009.3.1.5.1 (IFC [B] 1009.3.1.5.1) Prohibited penetrations. Penetrations other than those necessary for the purpose of the exit access stairway enclosure shall not be permitted in exit access stairway enclosures.

1009.3.1.6 (IFC [B] 1009.3.1.6) Joints. Joints in an exit access stairway enclosure shall comply with Section 714.

1009.3.1.7 (IFC [B] 1009.3.1.7) Ducts and air transfer openings. Penetrations of an exit access stairway enclosure by ducts and air transfer openings shall comply with Section 716.

1009.3.1.8 (IFC [B] 1009.3.1.8) Exterior walls. Where exterior walls serve as a part of an exit access stairway enclosure, such walls shall comply with the requirements of Section 705 for exterior walls and the fire-resistance-rated enclosure requirements shall not apply.

1009.4 ~~1009.1~~ (IFC [B] 1009.4 ~~1009.1~~) Stairway width. *(No change to text)*

(Renumber subsequent sections)

SECTION 1010
RAMPS

1010.2 (IFC [B] 1010.2) Enclosure. All interior exit ramps shall be enclosed in accordance with the applicable provisions of Section 1022. Exit access ramps shall be enclosed in accordance with the provisions of Section 1009.3 for enclosure of stairways.

(Renumber subsequent sections)

~~1010.7~~ 1010.8 (IFC [B] ~~1010.7~~ 1010.8) Ramp construction. All ramps shall be built of materials consistent with the types permitted for the type of construction of the building, except that wood handrails shall be permitted for all types of construction. ~~Ramps used as an exit shall conform to the applicable requirements of Sections 1022.1 through 1022.6 for exit enclosures.~~

SECTION 1016 (IFC [B] 1016)
EXIT ACCESS TRAVEL DISTANCE

1016.1 (IFC [B] 1016.1) General ~~Travel distance limitations~~. Travel distance within the exit access portion of the means of egress system shall be in accordance with this section. ~~Exits shall be so located on each story such that the maximum length of exit access travel, measured from the most remote point within a story along the natural and unobstructed path of egress travel to an exterior exit door at the level of exit discharge, an entrance to a vertical exit enclosure, an exit passageway, a horizontal exit, an exterior exit stairway or an exterior exit ramp shall not exceed the distances given in Table 1016.1.~~

~~Exceptions:~~

1. ~~Travel distance in open parking garages is permitted to be measured to the closest riser of open exit stairways.~~
2. ~~In outdoor facilities with open exit access components and open exterior exit stairways or exit ramps, travel distance is permitted to be measured to the closest riser of an exit stairway or the closest slope of the exit ramp.~~
3. ~~In other than occupancy Groups H and I, the exit access travel distance to a maximum of 50 percent of the exits is permitted to be measured from the most remote point within a building to an exit using unenclosed exit access stairways or ramps when connecting a maximum of two stories. The two connected stories shall be provided with at least two means of egress. Such interconnected stories shall not be open to other stories.~~
4. ~~In other than occupancy Groups H and I, exit access travel distance is permitted to be measured from the most remote point within a building to an exit using unenclosed exit access stairways or ramps in the first and second stories above grade plane in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. The first and second stories above grade plane shall be provided with at least two means of egress. Such interconnected stories shall not be open to other stories.~~

~~5. Where applicable, travel distance on unenclosed exit access stairways or ramps and on connecting stories shall also be included in the travel distance measurement. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stairway.~~

1016.2 (IFC [B] 1016.2) Limitations. Exit access travel distance shall not exceed the values given in Table 1016.2.

TABLE ~~1016.1~~ 1016.2 (IFC [B] TABLE ~~1016.1~~ 1016.2)
EXIT ACCESS TRAVEL DISTANCE[a]
(Portions of table not shown remain unchanged)

~~1016.2~~ 1016.2.1 (IFC [B] ~~1016.2~~ 1016.2.1) Exterior egress balcony increase. Exit access travel distances specified in ~~Section 1016.1~~ Table 1016.2 shall be increased up to an additional 100 feet (30 480 mm) provided the last portion of the exit access leading to the exit occurs on an exterior egress balcony constructed in accordance with Section 1019. The length of such balcony shall not be less than the amount of the increase taken.

1016.3 (IFC [B] 1016.3) Measurement. Exit access travel distance shall be measured from the most remote point within a story along the natural and unobstructed path of horizontal and vertical egress travel to the entrance to an exit.

Exceptions:

1. In open parking garages, exit access travel distance is permitted to be measured to the closest riser of an exit access stairway or the closest slope of an exit access ramp.
2. In outdoor facilities with open exit access components, exit access travel distance is permitted to be measured to the closest riser of an exit access stairway or the closest slope of an exit access ramp.

1016.3.1 (IFC [B] 1016.3.1) Exit access stairways and ramps. Travel distance on exit access stairways or ramps shall be included in the exit access travel distance measurement. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stair and landings. The measurement along ramps shall be made on the walking surface in the center of the ramp and landings.

SECTION 1021(IFC [B] 1021)
NUMBER OF EXITS AND ~~CONTINUITY~~ EXIT CONFIGURATION

1021.1 (IFC [B] 1021.1) General. Each story and occupied roof shall have the minimum number of exits, or access to exits, as specified in this section. The required number of exits, or exit access stairways or ramps providing access to exits, from any story shall be maintained until arrival at grade or a public way. Exits or access to exits from any story shall be configured in accordance with this section. Each story above the second story of a building shall have a minimum of one interior or exterior exit stairway, or interior or exterior exit ramp. At each story above the second story that requires a minimum of three or more exits, or access to exits, a minimum of 50% of the required exits shall be interior or exterior exit stairways, or interior or exterior exit ramps.

Exceptions:

1. Interior exit stairways and interior exit ramps are not required in open parking garages where the means of egress serves only the open parking garage.
2. Interior exit stairways and interior exit ramps are not required in outdoor facilities where all portions of the means of egress are essentially open to the outside.

~~**1021.1 (IFC [B] 1021.1) Exits from stories.** All spaces within each story shall have access to the minimum number of approved independent exits as specified in Table 1021.1 based on the occupant load of the story. For the purposes of this chapter, occupied roofs shall be provided with exits as required for stories.~~

~~**Exceptions:**~~

~~1. As modified by Section 403.15 (Additional exit stairway).~~
~~2. As modified by Section 1021.2.~~
~~3. Exit access stairways and ramps that comply with Exception 3 or 4 of Section 1016.1 shall be permitted to provide the minimum number of approved independent exits required by Table 1021 on each story.~~
~~4. In Groups R-2 and R-3 occupancies, one means of egress is permitted within and from individual dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.~~

5. Within a story, rooms and spaces complying with Section 1015.1 with exits that discharge directly to the exterior at the level of exit discharge, are permitted to have one exit.

The required number of exits from any story shall be maintained until arrival at grade or the public way.

TABLE 1021.1 (IFC [B] TABLE 1021.1)
MINIMUM NUMBER OF EXITS FOR OCCUPANT LOAD

OCCUPANT LOAD (persons per story)	MINIMUM NUMBER OF EXITS (per story)
1-500	2
501-1,000	3
More than 1,000	4

1021.1.2 (IFC [B] 1021.1.2) Parking structures. Parking structures shall not have less than two exits from each parking tier, except that only one exit is required where vehicles are mechanically parked. Unenclosed vehicle ramps shall not be considered as required exits unless pedestrian facilities are provided.

1021.1.3 (IFC [B] 1021.1.3) Helistops. The means of egress from helistops shall comply with the provisions of this chapter, provided that landing areas located on buildings or structures shall have two or more exits. For landing platforms or roof areas less than 60 feet (18 288 mm) long, or less than 2,000 square feet (186 m^2) in area, the second means of egress is permitted to be a fire escape, alternating tread device or ladder leading to the floor below.

1021.2 (IFC [B] 1021.2) Number of exits Single exits. Only one exit shall be required from Group R-3 occupancy buildings or from stories of other buildings as indicated in Table 1021.2. Occupancies shall be permitted to have a single exit in buildings otherwise required to have more than one exit if the areas served by the single exit do not exceed the limitations of Table 1021.2. Mixed occupancies shall be permitted to be served by single exits provided each individual occupancy complies with the applicable requirements of Table 1021.2 for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1. Basements with a single exit shall not be located more than one story below grade plane. Two exits, or exit access stairways or ramps providing access to exits, from any story or occupied roof shall be provided where one of the following conditions exists:

1. The occupant load exceeds one of the values in Table 1021.2.
2. The exit access travel distance exceeds that specified in Table 1021.2 as determined in accordance with the provisions of Section 1016.1.
3. Helistop landing areas located on buildings or structures shall be provided with two exits, or exit access stairways or ramps providing access to exits.

Exceptions:

1. Rooms, areas and spaces complying with Section 1015.1 with exits that discharge directly to the exterior at the level of exit discharge, are permitted to have one exit.
2. Group R-3 occupancy buildings shall be permitted to have a one exit.
3. Parking garages where vehicles are mechanically parked shall be permitted to have one exit,
4. Air traffic control towers shall be provided with the minimum number of exits specified in Section 412.3.
5. Individual dwelling units with a maximum occupant load of 20 in Group R-2 and R-3 occupancies shall be permitted to one exit.
6. Group R-3 and R-4 congregate residences shall be permitted to have one exit.

Where one exit, or exit access stairway or ramp providing access to exits at other stories, is permitted to serve individual stories, mixed occupancies shall be permitted to be served by single exits provided each individual occupancy complies with the applicable requirements of Table 1021.2 for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1. Basements with one exit shall not be located more than one story below grade plane.

TABLE 1021.2 (IFC [B] TABLE 1021.2)
STORIES WITH ONE EXIT OR ACCESS TO ONE EXIT

STORY	OCCUPANCY	MAXIMUM OCCUPANTS (OR DWELLING UNITS) PER ~~FLOOR~~ STORY	~~AND~~ MAXIMUM EXIT ACCESS TRAVEL DISTANCE
First story or basement	A, B[b,d], E[c,e], F[b,d], M, U, S[b,d]	49 occupants ~~and~~	75 feet
	H-2, H-3	3 occupants ~~and~~	25 feet
	H-4, H-5, I, R	10 occupants ~~and~~	75 feet
	S	29 occupants ~~and~~	100 feet
Second story	B[b], F, M, S[a]	29 occupants ~~and~~	75 feet
	R-2	4 dwelling units ~~and~~	50 feet
Third story	R-2[a,c]	4 dwelling units ~~and~~	50 feet
Fourth story and above	NP	NA	NA

For SI: 1 foot = 3048.mm

NP – Not Permitted

NA – Not Applicable

~~a. For the required number of exits for parking structures, see Section 1021.1.2.~~

~~b. For the required number of exits for air traffic control towers, see Section 412.3.~~

~~c.~~ a. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1026.

~~d.~~ b. Group B, F and S occupancies in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall have a maximum travel distance of 100 feet.

~~e.~~ c. Day care occupancies shall have a maximum occupant load of 10.

1021.2.1 (IFC [B] 1021.2.1) Three or more exits. Three exits, or exit access stairways or ramps providing access to exits at other stories, shall be provided from any story or occupied roof with an occupant load of 501-1,000. Four exits, or exit access stairways or ramps providing access to exits at other stories, shall be provided from any story or occupied roof with an occupant load greater than 1,000.

1021.2.2 (IFC [B] 1021.2.2) Additional exits. In buildings over 420 feet in height, additional exits shall be provided in accordance with Section 403.5.2.

1021.3 (IFC [B] 1021.3) Exit configuration ~~continuity~~. Exits, or exit access stairways or ramps providing access to exits at other stories, shall be arranged in accordance with the provisions of Section 1015.2 through 1015.2.2. Exits shall be continuous from the point of entry into the exit to the exit discharge.

1021.3.1 (IFC [B] 1021.3.1) Access to exits at adjacent levels. Access to exits at other levels shall be by stairways or ramps. Where access to exits occurs from adjacent building levels, the horizontal and vertical exit access travel distance to the closest exit shall not exceed that specified in Section 1016.1. Access to exits at other levels shall be from an adjacent story.

Exception: Landing platforms or roof areas for helistops that are less than 60 feet (18 288 mm) long, or less than 2,000 square feet (186 m^2) in area, shall be permitted to access the second exit by a fire escape, alternating tread device or ladder leading to the story or level below.

1021.4 (IFC [B] 1021.4) Vehicular ramps. Vehicular ramps shall not be considered as an exit access ramp unless pedestrian facilities are provided.

~~**1021.4 (IFC [B] 1021.4) Exit door arrangement.** Exit door arrangement shall meet the requirements of Sections 1015.2 through 1015.2.2.~~

SECTION 1022 (IFC [B] 1022)
~~EXIT ENCLOSURES~~ INTERIOR EXIT STAIRWAYS AND RAMPS

1022.1 (IFC [B] 1022.1) General. Interior exit stairways and interior exit ramps serving as an exit component in a means of egress system shall comply with the requirements of this section. Interior exit stairways and ramps shall lead directly to the exterior of the building or shall be extended to the exterior of the building with an exit passageway conforming to the requirements of Section 1023, except as permitted in Section 1027.1. An interior exit stairway or ramp shall not be used for any purpose other than as a means of egress.

~~1022.1~~ **1022.2 (IFC [B] ~~1022.1~~ 1022.2) ~~Enclosures required~~ Construction.** Enclosures for interior exit stairways and ~~interior exit~~ ramps shall be ~~enclosed with~~ constructed as fire barriers in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. Interior exit stairway and ramp ~~Exit~~ enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the interior exit stairways or ramps ~~exit enclosure~~ shall include any basements, but not any mezzanines. Interior exit stairways and ramps ~~exit enclosures~~ shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours. ~~Exit enclosures shall lead directly to the exterior of the building or shall be extended to the exterior of the building with an exit passageway conforming to the requirements of Section 1023, except as permitted in Section 1027.1. An exit enclosure shall not be used for any purpose other than means of egress.~~

~~Exceptions~~ **Exception:** Interior exit stairways and ramps in Group I-3 occupancies in accordance with the provisions of Section 408.3.8.

1. ~~In all occupancies, other than Groups H and I occupancies, a stairway is not required to be enclosed when the stairway serves an occupant load of less than 10 and the stairway complies with either Item 1.1 or 1.2. In all cases, the maximum number of connecting open stories shall not exceed two.~~
   - ~~1.1 The stairway is open to not more than one story above its level of exit discharge; or~~
   - ~~1.2 The stairway is open to not more than one story below its level of exit discharge.~~
2. ~~Exits in buildings of Group A-5 where all portions of the means of egress are essentially open to the outside need not be enclosed.~~
3. ~~Stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.~~
4. ~~Stairways in open parking structures that serve only the parking structure are not required to be enclosed.~~
5. ~~Stairways in Group I-3 occupancies, as provided for in Section 408.3.8, are not required to be enclosed.~~
6. ~~Means of egress stairways as required by Sections 410.5.3 and 1015.6.1 are not required to be enclosed.~~
7. ~~Means of egress stairways from balconies, galleries and press boxes as provided for in Section 1028.5.1, are not required to be enclosed.~~

~~1022.2~~ **1022.3 (IFC [B] ~~1022.2~~ 1022.3) Termination.** ~~Exit enclosures~~ Interior exit stairways and ramps shall terminate at an exit discharge or a public way.

Exception: ~~An exit enclosures~~ Interior exit stairways and ramps shall be permitted to terminate at an exit passageway complying with Section 1023, provided the exit passageway terminates at an exit discharge or a public way.

~~1022.2.1~~ **1022.3.1 (IFC [B] ~~1022.2.1~~ 1022.3.1) Extension.** Where ~~an exit enclosures~~ interior exit stairways and ramps are ~~is~~ extended to an exit discharge or a public way by an exit passageway, the ~~exit enclosure~~ interior exit stairway and ramp shall be separated from the exit passageway by a fire barrier constructed in accordance with Section 707 or a horizontal assembly constructed in accordance with Section 712, or both. The fire-resistance rating shall be at least equal to that required for the ~~exit enclosure~~ interior exit stairway and ramp. A fire door assembly complying with Section 715.4 shall be installed in the fire barrier to provide a means of egress from the ~~exit enclosure~~ interior exit stairway and ramp to the exit passageway. Openings in the fire barrier other than the fire door assembly are prohibited. Penetrations of the fire barrier are prohibited.

Exception: Penetrations of the fire barrier in accordance with Section 1022.4 shall be permitted.

~~1022.3~~ **1022.4 (IFC [B] ~~1022.3~~ 1022.4) Openings and penetrations**. ~~Exit enclosure~~ Interior exit stairway and ramp opening protectives shall be in accordance with the requirements of Section 715.

Openings ~~in exit enclosures~~ interior exit stairways and ramps other than unprotected exterior openings shall be limited to those necessary for exit access to the enclosure from normally occupied spaces and for egress from the enclosure.

Elevators shall not open into ~~an exit enclosures~~ Interior exit stairways and ramps.

~~1022.4~~ **1022.5 (IFC [B] ~~1022.4~~ 1022.5) Penetrations.** Penetrations into and openings through ~~an exit enclosure~~ Interior exit stairways and ramps are prohibited except for required exit doors, equipment and ductwork necessary for independent ventilation or pressurization, sprinkler piping, standpipes, electrical raceway for fire department communication systems and electrical raceway serving the ~~exit enclosure~~ interior exit stairway and ramp and terminating at a steel box not exceeding 16 square inches (0.010 m^2). Such penetrations shall be protected in

accordance with Section 713. There shall be no penetrations or communication openings, whether protected or not, between adjacent ~~exit enclosures~~ interior exit stairways and ramps.

~~1022.5~~ 1022.6 (IFC [B] ~~1022.5~~ 1022.6) Ventilation. Equipment and ductwork for ~~exit enclosure~~ interior exit stairway and ramp ventilation as permitted by Section 1022.4 shall comply with one of the following items:

1. Such equipment and ductwork shall be located exterior to the building and shall be directly connected to the ~~exit enclosure~~ interior exit stairway and ramp by ductwork enclosed in construction as required for shafts.
2. Where such equipment and ductwork is located within the ~~exit enclosure~~ interior exit stairway and ramp, the intake air shall be taken directly from the outdoors and the exhaust air shall be discharged directly to the outdoors, or such air shall be conveyed through ducts enclosed in construction as required for shafts.
3. Where located within the building, such equipment and ductwork shall be separated from the remainder of the building, including other mechanical equipment, with construction as required for shafts.

In each case, openings into the fire-resistance-rated construction shall be limited to those needed for maintenance and operation and shall be protected by opening protectives in accordance with Section 715 for shaft enclosures.

The ~~Exit enclosure~~ interior exit stairway and ramp ventilation systems shall be independent of other building ventilation systems.

~~1022.6~~ 1022.7 (IFC [B] ~~1022.6~~ 1022.7) ~~Exit enclosure~~ Interior exit stairway and ramp exterior walls. Exterior walls of the ~~an exit enclosure~~ interior exit stairway and ramp shall comply with the requirements of Section 705 for exterior walls. Where nonrated walls or unprotected openings enclose the exterior of the stairway and the walls or openings are exposed by other parts of the building at an angle of less than 180 degrees (3.14 rad), the building exterior walls within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening shall have a fire-resistance rating of not less than 1 hour. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than ¾ hour. This construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the topmost landing of the stairway or to the roof line, whichever is lower.

~~1022.7~~ 1022.8 (IFC [B] ~~1022.7~~ 1022.8) Discharge identification. ~~A stairway in an exit enclosure An~~ interior exit stairway and ramp shall not continue below its level of exit discharge unless an approved barrier is provided at the level of exit discharge to prevent persons from unintentionally continuing into levels below. Directional exit signs shall be provided as specified in Section 1011.

~~1022.8~~ 1022.9 (IFC [B] ~~1022.8~~ 1022.9) Floor identification signs. A sign shall be provided at each floor landing in ~~exit enclosures~~ an interior exit stairway and ramp connecting more than three stories designating the floor level, the terminus of the top and bottom of the ~~exit enclosure~~ interior exit stairway and ramp and the identification of the stair or ramp. The signage shall also state the story of, and the direction to, the exit discharge and the availability of roof access from the ~~enclosure~~ interior exit stairway and ramp for the fire department. The sign shall be located 5 feet (1524 mm) above the floor landing in a position that is readily visible when the doors are in the open and closed positions. Floor level identification signs in tactile characters complying with ICC A117.1 shall be located at each floor level landing adjacent to the door leading from the ~~enclosure~~ interior exit stairway and ramp into the corridor to identify the floor level.

~~1022.8.1~~ 1022.9.1 (IFC [B] ~~1022.8.1~~ 1022.9.1) Signage requirements. Stairway identification signs shall comply with all of the following requirements:

1. The signs shall be a minimum size of 18 inches (457 mm) by 12 inches (305 mm).
2. The letters designating the identification of the ~~stair enclosure~~ interior exit stairway and ramp shall be a minimum of 11/2 inches (38 mm) in height.
3. The number designating the floor level shall be a minimum of 5 inches (127 mm) in height and located in the center of the sign.
4. All other lettering and numbers shall be a minimum of 1 inch (25 mm) in height.
5. Characters and their background shall have a nonglare finish. Characters shall contrast with their background, with either light characters on a dark background or dark characters on a light background.
6. When signs required by Section 1022.8 are installed in ~~interior exit enclosures~~ the interior exit stairways and ramps of buildings subject to Section 1024, the signs shall be made of the same materials as required by Section 1024.4.

~~1022.9~~ 1022.10 (IFC [B] ~~1022.9~~ 1022.10) Smokeproof enclosures and pressurized stairways and ramps. In buildings required to comply with Section 403 or 405, each of the ~~exit enclosures~~ interior exit stairways and ramps

serving a story with a floor surface located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access or more than 30 feet (9144 mm) below the finished floor of a level of exit discharge serving such stories shall be a smokeproof enclosure or pressurized stairway or ramp in accordance with Section 909.20.

SECTION 403
HIGH-RISE BUILDINGS

403.2.3 Structural integrity of interior exit stairways ~~exit enclosures~~ and elevator hoistway enclosures. For high-rise buildings of occupancy category III or IV in accordance with Section 1604.5, and for all buildings that are more than 420 feet (128 000 mm) in building height, enclosures for interior exit stairways ~~exit enclosures~~ and elevator hoistway enclosures shall comply with Sections 403.2.3.1 through 403.2.3.4.

403.2.3.1 Wall assembly. The wall assemblies making up the enclosures for interior exit stairways ~~exit enclosures~~ and elevator hoistway enclosures shall meet or exceed Soft Body Impact Classification Level 2 as measured by the test method described in ASTM C 1629/C 1629M.

403.2.3.2 Wall assembly materials. The face of the wall assemblies making up the enclosures for interior exit stairways ~~exit enclosures~~ and elevator hoistway enclosures that are not exposed to the interior of the enclosures for interior exit stairways ~~exit enclosures~~ or elevator hoistway enclosure shall be constructed in accordance with one of the following methods:

1. The wall assembly shall incorporate not less than two layers of impact-resistant construction board each of which meets or exceeds Hard Body Impact Classification Level 2 as measured by the test method described in ASTM C 1629/C 1629M.
2. The wall assembly shall incorporate not less than one layer of impact-resistant construction material that meets or exceeds Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C 1629/C 1629M.
3. The wall assembly incorporates multiple layers of any material, tested in tandem, that meet or exceed Hard Body Impact Classification Level 3 as measured by the test method described in ASTM C 1629/C 1629M.

403.5.1 Remoteness of interior exit stairways ~~enclosures~~. ~~The~~ Required interior exit ~~stairway~~ stairways ~~enclosures~~ shall be separated by a distance not less than 30 feet (9144 mm) or not less than one-fourth of the length of the maximum overall diagonal dimension of the building or area to be served, whichever is less. The distance shall be measured in a straight line between the nearest points of the ~~exit stairway enclosures~~ interior exit stairways. In buildings with three or more interior exit stairway ~~enclosures~~, at least two of the interior exit stairway ~~enclosures~~ shall comply with this section. Interlocking or scissor stairs shall be counted as one interior exit stairway.

403.5.4 Smokeproof ~~exit~~ enclosures. Every required exit stairway serving floors more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access shall comply with Sections 909.20 and 1022.9.

SECTION 408
GROUP I-3

408.3.8 Interior exit stairway and ramp construction ~~enclosures~~. One ~~of the required~~ interior exit stairway or ramp ~~exit enclosures~~ in each building shall be permitted to have glazing installed in doors and interior walls at each landing level providing access to the ~~enclosure~~ interior exit stairway or ramp, provided that the following conditions are met:

1. The interior exit stairway or ramp ~~exit enclosures~~ shall not serve more than four floor levels.
2. Exit doors shall not be less than 3/4-hour fire door assemblies complying with Section 715.4
3. The total area of glazing at each floor level shall not exceed 5,000 square inches ($3m^2$) and individual panels of glazing shall not exceed 1,296 square inches ($0.84\ m^2$).
4. The glazing shall be protected on both sides by an automatic sprinkler system. The sprinkler system shall be designed to wet completely the entire surface of any glazing affected by fire when actuated.
5. The glazing shall be in a gasketed frame and installed in such a manner that the framing system will deflect without breaking (loading) the glass before the sprinkler system operates.
6. Obstructions, such as curtain rods, drapery traverse rods, curtains, drapes or similar materials shall not be installed between the automatic sprinklers and the glazing.

SECTION 410
STAGES AND PLATFORMS

410.5.3.1 Stairway and ramp enclosure. Exit access stairways and ramps serving the stage are not required to be enclosed. Exit access stairways serving the lighting and access catwalks, galleries and gridirons are not required to be enclosed.

SECTION 705
EXTERIOR WALLS

705.2 Projections. Cornices, eave overhangs, exterior balconies and similar projections extending beyond the exterior wall shall conform to the requirements of this section and Section 1406. Exterior egress balconies and exterior exit stairways and ramps shall also comply with Sections 1019 and 1026, respectively. Projections shall not extend beyond the distance determined by the following three methods, whichever results in the lesser projection:

1. A point one-third the distance from the exterior face of the wall to the lot line where protected openings or a combination of protected and unprotected openings are required in the exterior wall.
2. A point one-half the distance from the exterior face of the wall to the lot line where all openings in the exterior wall are permitted to be unprotected or the building is equipped throughout with an automatic sprinkler system installed under the provisions of Section 705.8.2.
3. More than 12 inches (305 mm) into areas where openings are prohibited.

Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with this section.

SECTION 707
FIRE BARRIERS

707.3.2 Interior exit stairway and ramp construction ~~enclosures~~. The fire-resistance rating of the fire barrier separating building areas from an interior exit stairway or ramp shall comply with Section 1022.1.

707.3.3 Enclosures for exit access stairways. The fire-resistance rating of the fire barrier separating building areas from an exit access stairway or ramp shall comply with Section 1009.3.1.2.

707.4 Exterior walls. Where exterior walls serve as a part of a required fire-resistance-rated shaft or stairway or ramp ~~exit~~ enclosure, or separation, such walls shall comply with the requirements of Section 705 for exterior walls and the fire-resistance-rated enclosure or separation requirements shall not apply.

Exception: Exterior walls required to be fire-resistance rated in accordance with Section 1019 for exterior egress balconies, Section ~~1022.6~~ 1022.7 for interior exit stairways and ramps ~~enclosures~~ and Section 1026.6 for exterior exit stairways and ramps ~~and stairways~~.

707.5.1 Supporting construction. The supporting construction for fire barriers shall be protected to afford the required fire-resistance rating of the fire barrier supported. Hollow vertical spaces within a fire barrier shall be fireblocked in accordance with Section 717.2 at every floor level.

Exceptions:

1. The maximum required fire-resistance rating for assemblies supporting fire barriers separating tank storage as provided in Section 415.6.2.1 shall be 2 hours, but not less than required by Table 601 for the building construction type.
2. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 707.12.
3. Supporting construction for 1-hour fire barriers required by Table 508.2.5 in buildings of Type IIB, IIIB and VB construction is not required to be fire-resistance rated unless required by other sections of this code.
4. Interior exit stairway and ramp enclosures required by Section 1022.2 and exit access stairway and ramp enclosures required by Section 1009.3 shall be permitted to terminate at a top enclosure complying with Section 707.12.

707.6 Openings. Openings in a fire barrier shall be protected in accordance with Section 715. Openings shall be limited to a maximum aggregate width of 25 percent of the length of the wall, and the maximum area of any single opening shall not exceed 156 square feet (15 m^2). Openings in enclosures for exit access stairways and ramps, interior

exit stairways and ramps ~~exit enclosures~~ and exit passageways shall also comply with Sections 1022.3 and 1023.5, respectively.

Exceptions:

1. Openings shall not be limited to 156 square feet (15 m^2) where adjoining floor areas are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
2. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a fire door serving ~~an~~ enclosures for exit access stairways, exit access ramps, interior exit stairways and interior exit ramps ~~exit enclosures~~.
3. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective has been tested in accordance with ASTME 119 orUL263 and has a minimum fire-resistance rating not less than the fire-resistance rating of the wall.
4. Fire window assemblies permitted in atrium separation walls shall not be limited to a maximum aggregate width of 25 percent of the length of the wall.
5. Openings shall not be limited to 156 square feet (15 m^2) or an aggregate width of 25 percent of the length of the wall where the opening protective is a fire door assembly in a fire barrier separating an enclosures for exit access stairways, exit access ramps, interior exit stairways and interior exit ramps ~~exit enclosures~~ from an exit passageway in accordance with Section 1022.2.1.

707.7.1 Prohibited penetrations. Penetrations into ~~an~~ enclosures for exit access stairways, exit access ramps, interior exit stairways, interior exit ramps ~~exit enclosures~~ or an exit passageway shall be allowed only when permitted by Section 1009.3.1.5, ~~1022.4~~ 1022.5 or 1023.6, respectively.

SECTION 708
SHAFT ENCLOSURES

708.1 General. The provisions of this section shall apply to shafts required to protect openings and penetrations through floor/ceiling and roof/ceiling assemblies. Exit access stairways and exit access ramps shall be protected in accordance with the applicable provisions of Section 1009. Interior exit stairways and interior exit ramps shall be protected in accordance with the requirements of Section 1022. ~~Shaft enclosures shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies in accordance with Section 712, or both.~~

708.2 Shaft enclosure required. Openings through a floor/ceiling assembly shall be protected by a shaft enclosure ~~complying with this section~~.

Exceptions:

1. A shaft enclosure is not required for openings totally within an individual residential dwelling unit and connecting four stories or less.
2. A shaft enclosure is not required in a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 for an escalator opening ~~or stairway that is not a portion of the means of egress~~ protected according to Item 2.1 or 2.2.
   2.1. Where the area of the floor opening between stories does not exceed twice the horizontal projected area of the escalator ~~or stairway~~ and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Groups B and M, this application is limited to openings that do not connect more than four stories.
   2.2. Where the opening is protected by approved power-operated automatic shutters at every penetrated floor. The shutters shall be of noncombustible construction and have a fire-resistance rating of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.3 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release therefrom.
3. A shaft enclosure is not required for penetrations by pipe, tube, conduit, wire, cable and vents protected in accordance with Section 713.4.
4. A shaft enclosure is not required for penetrations by ducts protected in accordance with Section 716.6. Grease ducts shall be protected in accordance with the International Mechanical Code.
5. In other than Group H occupancies, a shaft enclosure is not required for floor openings complying with the provisions for atriums in Section 404.

6. A shaft enclosure is not required for approved masonry chimneys where annular space is fireblocked at each floor level in accordance with Section 717.2.5.
7. In other than Groups I-2 and I-3, a shaft enclosure is not required for a floor opening or an air transfer opening that complies with the following:
   7.1. Does not connect more than two stories.
   ~~7.2. Is not part of the required means of egress system.~~
   7.3. Is not concealed within the construction of a wall or a floor/ceiling assembly.
   7.4. Is not open to a corridor in Group I and R occupancies.
   7.5. Is not open to a corridor on nonsprinklered floors in any occupancy.
   7.6. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures.
   7.7. Is limited to the same smoke compartment.
8. A shaft enclosure is not required for automobile ramps in open and enclosed parking garages constructed in accordance with Sections 406.3 and 406.4, respectively.
9. A shaft enclosure is not required for floor openings between a mezzanine and the floor below.
10. A shaft enclosure is not required for joints protected by a fire-resistant joint system in accordance with Section 714.
~~11. A shaft enclosure shall not be required for floor openings created by unenclosed stairs or ramps in accordance with Exception 3 or 4 in Section 1016.1.~~
11~~12~~. Floor openings protected by floor fire doors in accordance with Section 712.8.
~~13. In Group I-3 occupancies, a shaft enclosure is not required for floor openings in accordance with Section 408.5.~~
12~~14~~. A shaft enclosure is not required for elevator hoistways in open or enclosed parking garages that serve only the parking garage.
13~~15~~. In open or enclosed parking garages a shaft enclosure is not required to enclose mechanical exhaust or supply duct systems when such duct system is contained within and serves only the parking garage.
14~~16~~. Where permitted by other sections of this code.

708.3 Construction. Shaft enclosures shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies in accordance with Section 712, or both.

~~**708.3**~~ **708.4 Materials.** *(No change to text)*

~~**708.4**~~ **708.5 Fire-resistance rating.** *(No change to text)*

~~**708.5**~~ **708.6 Continuity.** *(No change to text)*

~~**708.6**~~ **708.7Exterior walls.** Where exterior walls serve as a part of a required shaft enclosure, such walls shall comply with the requirements of Section 705 for exterior walls and the fire-resistance-rated enclosure requirements shall not apply.

Exception: Exterior walls required to be fire-resistance rated in accordance with Section 1019.2 for exterior egress balconies, Section ~~1022.6~~ 1022.7 for interior exit stairways and ramps ~~exit enclosures~~ and Section 1026.6 for exterior exit stairways and ramps ~~and stairways~~.

(Renumber subsequent sections)

SECTION 709
FIRE PARTITIONS

709.5 Exterior walls. Where exterior walls serve as a part of a required fire-resistance-rated separation, such walls shall comply with the requirements of Section 705 for exterior walls, and the fire-resistance-rated separation requirements shall not apply.

Exception: Exterior walls required to be fire-resistance rated in accordance with Section 1019.2 for exterior egress balconies, Section 1022.6 for interior exit stairways and ramps ~~exit enclosures~~ and Section 1026.6 for exterior exit stairways and ramps ~~and stairways~~.

SECTION 712
HORIZONTAL ASSEMBLIES

712.4 Continuity. Assemblies shall be continuous without openings, penetrations or joints except as permitted by this section and Sections 708.2, 713.4, 714, 1009.3 and 1022.1. Skylights and other penetrations through a fire-resistance-rated roof deck or slab are permitted to be unprotected, provided that the structural integrity of the fire-resistance-rated roof assembly is maintained. Unprotected skylights shall not be permitted in roof assemblies required to be fire-resistance rated in accordance with Section 704.10. The supporting construction shall be protected to afford the required fire-resistance rating of the horizontal assembly supported.

Exception: In buildings of Type IIB, IIIB or VB construction, the construction supporting the horizontal assembly is not required to be fire-resistance-rated at the following:

1. Horizontal assemblies at the separations of incidental uses as specified by Table 508.2.5, provided the required fire-resistance rating does not exceed 1 hour.
2. Horizontal assemblies at the separations of dwelling units and sleeping units as required by Section 420.3.
3. Horizontal assemblies at smoke barriers constructed in accordance with Section 710.

SECTION 715
OPENING PROTECTIVES

TABLE 715.4
FIRE DOOR AND FIRE SHUTTER FIRE PROTECTION RATINGS

TYPE OF ASSEMBLY	REQUIRED ASSEMBLY RATING (hours)	MINIMUM FIRE DOOR AND FIRE SHUTTER ASSEMBLY RATING (hours)
Fire barriers having a required fire-resistance rating of 1 hour: ~~Shaft, exit~~ Enclosures for shafts, exit access stairways, exit access ramps, interior exit stairways, interior exit ramps and exit passageway walls	1	1
Other fire barriers	1	3/4

(Portions of table not shown remain unchanged)

715.4.4 Doors in ~~exit enclosures~~ interior exit stairways and ramps and exit passageways. Fire door assemblies in interior exit stairways and ramps ~~exit enclosures~~ and exit passageways shall have a maximum transmitted temperature end point of not more than 450ºF (250ºC) above ambient at the end of 30 minutes of standard fire test exposure.

Exception: The maximum transmitted temperature rise is not required in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

715.4.6.1 Fire door labeling requirements. Fire doors shall be labeled showing the name of the manufacturer or other identification readily traceable back to the manufacturer, the name or trademark of the third-party inspection agency, the fire protection rating and, where required for fire doors in interior exit stairways and ramps ~~exit enclosures~~ and exit passageways by Section 715.4.4, the maximum transmitted temperature end point. Smoke and draft control doors complying with UL 1784 shall be labeled as such and shall also comply with Section 715.4.6.3. Labels shall be approved and permanently affixed. The label shall be applied at the factory or location where fabrication and assembly are performed.

715.4.7.2 ~~Exit and~~ Elevator, stairway and ramp protectives. Approved fire-protection-rated glazing used in fire door assemblies in elevator, stairways and ramps ~~exit~~ enclosures shall be so located as to furnish clear vision of the passageway or approach to the elevator, ~~ramp or~~ stairway or ramp.

SECTION 716
DUCT AND TRANSFER OPENINGS

716.5.2 Fire barriers. Ducts and air transfer openings of fire barriers shall be protected with approved fire dampers installed in accordance with their listing. Ducts and air transfer openings shall not penetrate enclosures for stairways ramps ~~exit enclosures~~ and exit passageways except as permitted by Sections 1022.4 and 1023.6, respectively.

Exception: Fire dampers are not required at penetrations of fire barriers where any of the following apply:

1. Penetrations are tested in accordance with ASTM E119 or UL 263 as part of the fire-resistance-rated assembly.
2. Ducts are used as part of an approved smoke control system in accordance with Section 909 and where the use of a fire damper would interfere with the operation of a smoke control system.
3. Such walls are penetrated by ducted HVAC systems, have a required fire-resistance rating of 1 hour or less, are in areas of other than Group Hand are in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. For the purposes of this exception, a ducted HVAC system shall be a duct system for conveying supply, return or exhaust air as part of the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than No. 26 gage thickness and shall be continuous from the air-handling appliance or equipment to the air outlet and inlet terminals.

SECTION 803
WALL AND CEILING FINISHES

TABLE 803.9
INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY[k]

GROUP	SPRINKLERED[l]			NONSPRINKLERED		
	Interior exit stairways, interior exit ramps ~~exit enclosures~~ and exit passageways [a, b]	Corridors and enclosure for exit access stairways and exit access ramps	Rooms and enclosed spaces[c]	Interior exit stairways, interior exit ramps ~~exit enclosures~~ and exit passageways [a, b]	Corridors and enclosure for exit access stairways and exit access ramps	Rooms and enclosed spaces[c]

(Portions of table not shown remain unchanged)

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929m^2.

a. Class C interior finish materials shall be permitted for wainscotting or paneling of not more than 1,000 square feet of applied surface area in the grade lobby where applied directly to a noncombustible base or over furring strips applied to a noncombustible base and fireblocked as required by Section 803.11.1.

b. In other than Group I-3 occupancies ,~~exit enclosures of~~ in buildings less than three stories above grade plane ~~of other than Group I-3~~, Class B interior finish for nonsprinklered buildings and Class C interior finish for sprinklered buildings shall be permitted in interior exit stairways and ramps.

c. Requirements for rooms and enclosed spaces shall be based upon spaces enclosed by partitions. Where a fire-resistance rating is required for structural elements, the enclosing partitions shall extend from the floor to the ceiling. Partitions that do not comply with this shall be considered enclosing spaces and the rooms or spaces on both sides shall be considered one. In determining the applicable requirements for rooms and enclosed spaces, the specific occupancy thereof shall be the governing factor regardless of the group classification of the building or structure.

d. Lobby areas in Group A-1, A-2 and A-3 occupancies shall not be less than Class B materials.

e. Class C interior finish materials shall be permitted in places of assembly with an occupant load of 300 persons or less.

f. For places of religious worship, wood used for ornamental purposes, trusses, paneling or chancel furnishing shall be permitted.

g. Class B material is required where the building exceeds two stories.

h. Class C interior finish materials shall be permitted in administrative spaces.

i. Class C interior finish materials shall be permitted in rooms with a capacity of four persons or less.

j. Class B materials shall be permitted as wainscotting extending not more than 48 inches above the finished floor in corridors and exit access stairways and ramps.

k. Finish materials as provided for in other sections of this code.

l. Applies when ~~the exit enclosures, exit passageways, corridors or rooms and enclosed spaces are~~ protected by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

SECTION 804
INTERIOR FLOOR FINISH

804.4 Interior floor finish requirements. In all occupancies, interior floor finish and floor covering materials for interior exit stairways and ramps ~~exit enclosures~~, exit passageways, corridors and rooms or spaces not separated from

corridors by full-height partitions extending from the floor to the underside of the ceiling shall withstand a minimum critical radiant flux as specified in Section 804.4.1.

804.4.1 Minimum critical radiant flux. Interior floor finish and floor covering materials in enclosures for stairways and ramp ~~exit enclosures~~, exit passageways and corridors shall not be less than Class I in Groups I-1, I-2 and I-3 and not less than Class II in Groups A, B, E, H, I-4, M, R-1, R-2 and S. In all areas, floor covering materials shall comply with the DOCFF-1 "pill test" (CPSC 16 CFR, Part 1630).

Exception: Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, Class II materials are permitted in any area where Class I materials are required, and materials complying with the DOC FF-1 "pill test" (CPSC 16 CFR, Part 1630) are permitted in any area where Class II Materials are required.

SECTION 1006 (IFC [B] 1006)
MEANS OF EGRESS ILLUMINATION

1006.3 (IFC [B] 1006.3) Illumination emergency power. The power supply for means of egress illumination shall normally be provided by the premises' electrical supply.

In the event of power supply failure, an emergency electrical system shall automatically illuminate all of the following areas:

1. Aisles and unenclosed egress stairways in rooms and spaces that require two or more means of egress.
2. Corridors, interior exit stairways and ramps ~~exit enclosures~~ and exit passageways in buildings required to have two or more exits.
3. Exterior egress components at other than their levels of exit discharge until exit discharge is accomplished for buildings required to have two or more exits.
4. Interior exit discharge elements, as permitted in Section 1027.1, in buildings required to have two or more exits.
5. Exterior landings as required by Section 1008.1.6 for exit discharge doorways in buildings required to have two or more exits.

The emergency power system shall provide power for a duration of not less than 90 minutes and shall consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Chapter 27.

SECTION 1007 (IFC [B] 1007)
ACCESSIBLE MEANS OF EGRESS

1007.2 (IFC [B] 1007.2) Continuity and components. Each required accessible means of egress shall be continuous to a public way and shall consist of one or more of the following components:

1. Accessible routes complying with Section 1104.
2. Interior exit stairways complying with Sections 1007.3 and 1022.
3. Interior exit access stairways between two stories complying with Sections 1007.3 and 1009.3.
~~3.~~4. Exterior exit stairways complying with Sections 1007.3 and 1026.
~~4.~~5. Elevators complying with Section 1007.4.
~~5.~~6. Platform lifts complying with Section 1007.5.
~~6.~~7. Horizontal exits complying with Section 1025.
~~7.~~8. Ramps complying with Section 1010.
~~8.~~9. Areas of refuge complying with Section 1007.6.

Exceptions:

1. Where the exit discharge is not accessible, an exterior area for assisted rescue shall be provided in accordance with Section 1007.7.
2. Where the exit stairway is open to the exterior, the accessible means of egress shall include either an area of refuge in accordance with Section 1007.6 or an exterior area for assisted rescue in accordance with Section 1007.7.

1007.3 (IFC [B] 1007.3) Stairways. In order to be considered part of an accessible means of egress, ~~an exit access stairway as permitted by Section 1016.1 or exit~~ a stairway between stories shall have a clear width of 48 inches (1219 mm) minimum between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit. Exit access stairways that connect levels in the same story are not permitted as part an accessible means of egress.

Exceptions:

1. ~~The area of refuge is not required at open exit access or exit stairways as permitted by Sections 1016.1 and 1022.1 in buildings that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.~~
1. ~~2.~~ The clear width of 48 inches (1219 mm) between handrails is not required ~~at exit access stairways as permitted by Section 1016.1or exit stairways~~ in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
2. ~~3.~~ Areas of refuge are not required at ~~exit~~ stairways in buildings equipped throughout by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. ~~4.~~ The clear width of 48 inches (1219 mm) between handrails is not required for ~~exit~~ stairways accessed from a horizontal exit.
4. ~~5.~~ Areas of refuge are not required at ~~exit~~ stairways serving open parking garages.
5. ~~6.~~ Areas of refuge are not required for smoke protected seating areas complying with Section 1028.6.2.
6. ~~7.~~ The areas of refuge are not required in Group R-2 occupancies.

1007.6 (IFC [B] 1007.6) Areas of refuge. Every required area of refuge shall be accessible from the space it serves by an accessible means of egress. The maximum travel distance from any accessible space to an area of refuge shall not exceed the travel distance permitted for the occupancy in accordance with Section 1016.1. Every required area of refuge shall have direct access to a stairway ~~within an exit enclosure~~ complying with Sections 1007.3 ~~and 1022~~ or an elevator complying with Section 1007.4. Where an elevator lobby is used as an area of refuge, the shaft and lobby shall comply with Section 1022.9 for smokeproof enclosures except where the elevators are in an area of refuge formed by a horizontal exit or smoke barrier.

~~Exceptions:~~

1. ~~A stairway serving an area of refuge is not required to be enclosed where permitted in Sections 1016.1 and 1022.1.~~
2. ~~A smokeproof enclosure is not required for an elevator lobby used as an area of refuge where the elevator is not required to be enclosed.~~

1007.6.2 (IFC [B] 1007.6.2) Separation. Each area of refuge shall be separated from the remainder of the story by a smoke barrier complying with Section 710 or a horizontal exit complying with Section 1025. Each area of refuge shall be designed to minimize the intrusion of smoke.

Exception: Areas of refuge located within an ~~exit~~ enclosure for exit access stairways or interior exit stairways.

1007.7.2 (IFC [B] 1007.7.2) Exterior ~~exit~~ stairway. Exterior ~~exit~~ stairways that are part of the means of egress for the exterior area for assisted rescue shall provide a clear width of 48 inches (1219 mm) between handrails.

1007.8 (IFC [B] 1007.8) Two-way communication. A two-way communication system shall be provided at the elevator landing on each accessible floor that is one or more stories above or below the story of exit discharge complying with Sections 1007.8.1 and 1007.8.2.

Exceptions:

1. Two-way communication systems are not required at the elevator landing where the two-way communication system is provided within areas of refuge in accordance with Section 1007.6.3.
2. Two-way communication systems are not required on floors provided with ~~exit~~ ramps conforming to the provisions of Section 1010.

SECTION 1015 (IFC [B] 1015)
EXIT AND EXIT ACCESS DOORWAYS

1015.2.1 (IFC [B] 1015.2.1) Two exits or exit access doorways. Where two exits or exit access doorways are required from any portion of the exit access, the exit doors or exit access doorways shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between exit doors or exit access doorways. Interlocking or scissor stairs shall be counted as one ~~exit~~ stairway.

Exceptions:

1. Where ~~exit enclosures~~ interior exit stairways are ~~provided as a portion of the required exit and are~~ interconnected by a 1-hour fire-resistance-rated corridor conforming to the requirements of Section 1018, the required exit separation shall be measured along the shortest direct line of travel within the corridor.
2. Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance of the exit doors or exit access doorways shall not be less than one-third of the length of the maximum overall diagonal dimension of the area served.

SECTION 1023 (IFC [B] 1023)
EXIT PASSAGEWAYS

1023.3 (IFC [B] 1023.3) Construction. Exit passageway enclosures shall have walls, floors and ceilings of not less than 1-hour fire-resistance rating, and not less than that required for any connecting ~~exit enclosure~~ interior exit stairway or ramp. Exit passageways shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

1023.5 (IFC [B] 1023.5) Openings and penetrations. Exit passageway opening protectives shall be in accordance with the requirements of Section 715.

Except as permitted in Section 402.4.6, openings in exit passageways other than exterior openings shall be limited to those necessary for exit access to the exit passageway from normally occupied spaces and for egress from the exit passageway.

Where an ~~exit enclosure~~ interior exit stairway or ramp is extended to an exit discharge or a public way by an exit passageway, the exit passageway shall also comply with Section 1022.2.1.

Elevators shall not open into an exit passageway.

SECTION 1024 (IFC [B] 1024)
LUMINOUS EGRESS PATH MARKINGS

1024.2 (IFC [B] 1024.2) Markings within exit components ~~enclosures~~. Egress path markings shall be provided in ~~exit enclosures, including vertical exit enclosures~~ interior exit stairways, interior exit ramps and exit passageways, in accordance with Sections 1024.2.1 through 1024.2.6.

1024.2.4 (IFC [B] 1024.2.4) Perimeter demarcation lines. Stair landings and other floor areas within ~~exit enclosures~~ interior exit stairways, interior exit ramps and exit passageways, with the exception of the sides of steps, shall be provided with solid and continuous demarcation lines on the floor or on the walls or a combination of both. The stripes shall be 1 to 2 inches (25mm to 51 mm) wide with interruptions not exceeding 4 inches (102 mm).

Exception: The minimum width of 1 inch (25 mm) shall not apply to outlining stripes listed in accordance with UL 1994.

1024.2.4.1 (IFC [B] 1024.2.4.1) Floor-mounted demarcation lines. Perimeter demarcation lines shall be placed within 4 inches (102 mm) of the wall and shall extend to within 2 inches (51 mm) of the markings on the leading edge of landings. The demarcation lines shall continue across the floor in front of all doors.

Exception: Demarcation lines shall not extend in front of exit discharge doors that lead out of an exit ~~enclosure~~ and through which occupants must travel to complete the exit path.

1024.2.4.2 (IFC [B] 1024.2.4.2) Wall-mounted demarcation lines. Perimeter demarcation lines shall be placed on the wall with the bottom edge of the stripe no more than 4 inches (102 mm) above the finished floor. At the top or bottom of the stairs, demarcation lines shall drop vertically to the floor within 2 inches (51 mm) of the step or landing edge. Demarcation lines on walls shall transition vertically to the floor and then extend across the floor where a line on the floor is the only practical method of outlining the path. Where the wall line is broken by a door, demarcation lines on walls shall continue across the face of the door or transition to the floor and extend across the floor in front of such door.

Exception: Demarcation lines shall not extend in front of exit discharge doors that lead out of an exit ~~enclosure~~ and through which occupants must travel to complete the exit path.

1024.2.6 (IFC [B] 1024.2.6) Doors within the exit path ~~from exit enclosures~~. Doors through which occupants ~~within an exit enclosure~~ must pass in order to complete the exit path shall be provided with markings complying with Sections 1024.2.6.1 through 1024.2.6.3.

1024.3 (IFC [B] 1024.3) Uniformity. Placement and dimensions of markings shall be consistent and uniform throughout the same ~~exit~~ enclosure.

1024.5 (IFC [B] 1024.5) Illumination. ~~Exit enclosures~~ Where photoluminescent exit path markings are installed shall be provided with the minimum means of egress illumination required by Section 1006 for at least 60 minutes prior to periods when the building is occupied.

SECTION 1025 (IFC [B] 1025)
HORIZONTAL EXIT

1025.4 (IFC [B] 1025.4) Capacity of refuge area. The refuge area of a horizontal exit shall be a space occupied by the same tenant or a public area and each such refuge area shall be adequate to accommodate the original occupant load of the refuge area plus the occupant load anticipated from the adjoining compartment. The anticipated occupant load from the adjoining compartment shall be based on the capacity of the horizontal exit doors entering the refuge area. The capacity of the refuge area shall be computed based on a net floor area allowance of 3 square feet (0.2787 m^2) for each occupant to be accommodated therein.

Exception: The net floor area allowable per occupant shall be as follows for the indicated occupancies:

1. Six square feet (0.6 m^2) per occupant for occupancies in Group I-3.
2. Fifteen square feet (1.4 m^2) per occupant for ambulatory occupancies in Group I-2.
3. Thirty square feet (2.8 m^2) per occupant for nonambulatory occupancies in Group I-2.

The refuge area into which a horizontal exit leads shall be provided with exits adequate to meet the occupant requirements of this chapter, but not including the added occupant load imposed by persons entering it through horizontal exits from other areas. At least one refuge area exit shall lead directly to the exterior or to an interior exit stairway or ramp ~~exit enclosure~~.

Exception: The adjoining compartment shall not be required to have a stairway or door leading directly outside, provided the refuge area into which a horizontal exit leads as stairways or doors leading directly outside and are so arranged that egress shall not require the occupants to return through the compartment from which egress originates.

SECTION 1026 (IFC [B] 1026)
EXTERIOR EXIT ~~RAMPS AND~~ STAIRWAYS AND RAMPS

1026.6 (IFC [B] 1026.6) Exterior ~~ramps and~~ stairway and ramp protection. Exterior exit ~~ramps and~~ stairways and ramps shall be separated from the interior of the building as required in Section 1022.1. Openings shall be limited to those necessary for egress from normally occupied spaces.

Exceptions:

1. Separation from the interior of the building is not required for occupancies, other than those in Group R-1 or R-2, in buildings that are no more than two stories above grade plane where a level of exit discharge serving such occupancies is the first story above grade plane.

2. Separation from the interior of the building is not required where the exterior ~~ramp or~~ stairway or ramp is served by an exterior ramp or balcony that connects two remote exterior stairways or other approved exits, with a perimeter that is not less than 50 percent open. To be considered open, the opening shall be a minimum of 50 percent of the height of the enclosing wall, with the top of the openings no less than 7 feet (2134 mm) above the top of the balcony.
3. Separation from the interior of the building is not required for an exterior ~~ramp or~~ stairway or ramp located in a building or structure that is permitted to have unenclosed ~~interior~~ exit access stairways in accordance with Section 1009.3 ~~1022.1~~.
4. Separation from the interior of the building is not required for exterior ~~ramps or~~ stairways or ramps connected to open-ended corridors, provided that Items 4.1 through 4.4 are met:
   4.1 The building, including corridors, ~~ramps or~~ stairways or ramps, shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
   4.2 The open-ended corridors comply with Section 1018.
   4.3 The open-ended corridors are connected on each end to an exterior exit ~~ramp or~~ stairway or ramp complying with Section 1026.
5. At any location in an open-ended corridor where a change of direction exceeding 45 degrees 0.79 rad) occurs, a clear opening of not less than 35 square feet (3.3 m^2) or an exterior ~~ramp or~~ stairway or ramp shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

SECTION 1027 (IFC [B] 1027)
EXIT DISCHARGE

1027.1 (IFC [B] 1027.1) General. Exits shall discharge directly to the exterior of the building. The exit discharge shall be at grade or shall provide direct access to grade. The exit discharge shall not reenter a building. The combined use of Exceptions 1 and 2 below shall not exceed 50 percent of the number and capacity of the required exits.

Exceptions:

1. A maximum of 50 percent of the number and capacity of ~~the exit enclosures~~ interior exit stairways and ramps is permitted to egress through areas on the level of discharge provided all of the following are met:
   1.1 Such ~~exit~~ enclosures egress to a free and unobstructed path of travel to an exterior exit door and such exit is readily visible and identifiable from the point of termination of the ~~exit~~ enclosure.
   1.2 The entire area of the level of exit discharge is separated from areas below by construction conforming to the fire-resistance rating for the ~~exit~~ enclosure.
   1.3 The egress path from the ~~exit enclosure~~ interior exit stairway and ramp on the level of exit discharge is protected throughout by an approved automatic sprinkler system. All portions of the level of exit discharge with access to the egress path shall either be protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of ~~exits~~ interior exit stairways or ramps.
2. A maximum of 50 percent of the number and capacity of the ~~exit enclosures for~~ interior exit stairways and ramps is permitted to egress through a vestibule provided all of the following are met:
   2.1 The entire area of the vestibule is separated from areas below by construction conforming to the fire-resistance rating for the ~~exit~~ enclosure.
   2.2 The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).
   2.3 The area is separated from the remainder of the level of exit discharge by construction providing protection at least the equivalent of approved wired glass in steel frames.
   2.4 The area is used only for means of egress and exits directly to the outside.
3. ~~Stairways in open parking garages complying with Section 1022.1, Exception 4, are permitted to egress through the open parking garage at their levels of exit discharge.~~
4. Horizontal exits complying with Section 1025 shall not be required to discharge directly to the exterior of the building.

SECTION 1028 (IFC [B] 1028)
ASSEMBLY

~~**1028.5.1 (IFC [B] 1028.5.1) Enclosure of openings.** Interior stairways and other vertical openings shall be enclosed in an exit enclosure in accordance with Section 1009, as provided in Section 1022.1, except that stairways are permitted to be open between the balcony, gallery or press box and the main assembly floor in occupancies such as~~

~~theaters, places of religious worship, auditoriums and sports facilities. At least one accessible means of egress is required from a balcony, gallery or press box level containing accessible seating locations in accordance with Section 1007.3 or 1007.4.~~

SECTION 1110
SIGNAGE

1110.3 Other signs. Signage indicating special accessibility provisions shall be provided as shown:

1. Each assembly area required to comply with Section 1108.2.7 shall provide a sign notifying patrons of the availability of assistive listening systems.

   Exception: Where ticket offices or windows are provided, signs are not required at each assembly area provided that signs are displayed at each ticket office or window informing patrons of the availability of assistive listening systems.

2. At each door to an area of refuge, an exterior area for assisted rescue, an egress stairway, exit passageway and exit discharge, signage shall be provided in accordance with Section 1011.3.
3. At areas of refuge, signage shall be provided in accordance with Section 1007.11.
4. At exterior areas for assisted rescue, signage shall be provided in accordance with Section 1007.11.
5. At two-way communication systems, signage shall be provided in accordance with Section 1007.8.2.
6. Within ~~exit enclosures~~ interior exit stairways and ramps, signage shall be provided in accordance with Section 1022.8.

SECTION 2606
LIGHT-TRANSMITTING PLASTICS

2606.7 Light-diffusing systems. Unless the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, light-diffusing systems shall not be installed in the following occupancies and locations:

1. Group A with an occupant load of 1,000 or more.
2. Theaters with a stage and proscenium opening and an occupant load of 700 or more.
3. Group I-2.
4. Group I-3.
5. ~~Vertical exit enclosures~~ Interior exit stairways and ramps and exit passageways.

SECTION 3007
FIRE SERVICE ACCESS ELEVATOR

3007.4.1 Access. The fire service access elevator lobby shall have direct access to an ~~exit~~ enclosure for an interior exit stairway.

3007.5 Standpipe hose connection. A Class I standpipe hose connection in accordance with Section 905 shall be provided in the ~~exit enclosure~~ interior exit stairway and ramp having direct access from the fire service access elevator lobby.

SECTION 3008
OCCUPANT EVACUATION ELEVATORS

3008.11.1 Access. The occupant evacuation elevator lobby shall have direct access to an ~~exit enclosure~~ interior exit stairway or ramp.

PART II – IFC

SECTION 403
HIGH-RISE BUILDINGS

[F] 403.3.1.1 (IFC 914.3.1.1.1) Riser location. Sprinkler risers shall be placed in interior exit stairways and ramps ~~exit enclosures~~ that are remotely located in accordance with Section 1015.2.

SECTION 414
HAZARDOUS MATERIALS

[F] 414.7.2 (IFC 2705.4.4) Dispensing, use and handling. Where hazardous materials having a hazard ranking of 3 or 4 in accordance with NFPA 704 are transported through corridors ~~or exit enclosures~~, interior exit stairways or ramps or exit passageways there shall be an emergency telephone system, a local manual alarm station or an approved alarm-initiating device at not more than 150-foot (45 720 mm) intervals and at each exit and exit access doorway throughout the transport route. The signal shall be relayed to an approved central, proprietary or remote station service or constantly attended on-site location and shall also initiate a local audible alarm.

SECTION 415
GROUPS H-1, H-2, H-3, H-4 AND H-5

[F] 415.8.4.6.2 (IFC 1803.12.1.2) ~~Exit access~~ Corridors and interior exit stairways and ~~exit~~ ramps ~~enclosures~~. Emergency alarms for ~~exit access~~ corridors ~~and exit enclosures~~ interior exit stairways and ramps and exit passageways shall comply with Section 414.7.2.

SECTION 909
SMOKE CONTROL SYSTEMS

[F] 909.5 (IFC 909.5, IMC [F] 513.5) Smoke barrier construction. Smoke barriers shall comply with Section 710, and shall be constructed and sealed to limit leakage areas exclusive of protected openings. The maximum allowable leakage area shall be the aggregate area calculated using the following leakage area ratios:

1. Walls: $A/A_w = 0.00100$
2. Interior exit ~~enclosures~~ stairways and ramps and exit passageways: $A/A_w = 0.00035$
3. Enclosed exit access stairways and ramps and all other shafts: $A/A_w = 0.00150$
4. Floors and roofs: $A/A_F = 0.00050$

where:

A = Total leakage area, square feet (m^2).
A_F = Unit floor or roof area of barrier, square feet (m^2).
A_w = Unit wall area of barrier, square feet (m^2).

The leakage area ratios shown do not include openings due to doors, operable windows or similar gaps. These shall be included in calculating the total leakage area.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Unenclosed Interior Stairways". The scope of the activity is noted as:

Scope: The current code allows limited use of unenclosed exit stairs. During the previous code development cycles, numerous code changes have been submitted to clarify the intent and application of the code provisions relative to issues such as: exit versus exit access; travel distance measurements; contribution to the minimum number of required exits; etc. Due to the inter-relationship of code provisions, this requires a comprehensive analysis in order to clarify the code requirements.

Objectives:

A. The Unenclosed Interior Stairway Work Group will answer the following questions based on the current Means of Egress system that is composed of exit, exit access and exit discharge components:
   1. Can an unenclosed interior stairway qualify as an exit?
   2. If an un-enclosed interior stairway can qualify as an exit what is the entrance to the exit (where does the exit begin)?
   3. If an un-enclosed interior stairway can qualify as an exit where does the exit discharge begin (where does the exit end)?
   4. How is travel distance measured when an un-enclosed interior stairway is used as an element in a means of egress?
   5. Does the Minimum Number of Exits Section (1019.1 in the 2006 IBC) require entry to the required exits on each story?
B. The Unenclosed Interior Stairway Work Group will draft recommend code changes, as determined necessary, to effectively communicate the code requirements based on the answers to the above questions.

(Note that all references to stairs in this reason statement are inclusive of ramps)

Preface: Over that last several code development cycles, there have been numerous proposals intended to address the technical relationships between unenclosed interior stairways, travel distance and the required numbers and location of exits. Through these various proposals, it became evident that there was considerable confusion and disagreement as to what the IBC actually requires or implies. Although some minor changes were approved over time, cumulatively, they did little to resolve the underlying technical question being what part of the three part means of egress system is an unenclosed stair between stories. More specifically: Are stairs that are required to meet means of egress design requirements such as number of exits or exit access travel distance but allowed to be unenclosed an exit or an exit access? Are stairs that are not required for means of egress and supplemental but required to be enclosed do to the number of stories connected required to be protected as a shaft or as an exit enclosure? How should travel distance be measured when unenclosed stairs are part of the path of travel? Can required exits per floor be on an adjacent floor and accessed through an open stair?

At the hearings in Palm Springs the ICC Means of Egress Code Development Committee determined that proper attention could not be provided to the issues in that forum and referred the dilemma to the ICC Code Technology Committee. The CTC agreed that the issue should be researched and assigned a study group to investigate the matter and develop a code change proposal to resolve the issues.

This proposal is based on the following concepts:

All stairs within a building are elements of the means of egress system and must comply with chapter 10

Unenclosed stairways are not exits

All Exit Stairways, to qualify as an exit, must be enclosed with a fire rated enclosure consisting of exit stair shafts and passageways based on current exit enclosure provisions

All stairways that are permitted to be open or are not required stairways for egress purposes are Exit Access Stairways

Exit access stairways must be enclosed with fire rated enclosures based on shaft provisions or may be open in accordance exceptions based on the current exceptions;

Exit access travel distance is measured to an entrance to an exit

Exit access travel distance includes the travel distance on Exit access stairways

Entrances to exits on each story are not mandatory and access to exits on other stories is permissible within certain limitations

The code change in general: All of the current exceptions that will allow for an unenclosed opening to accommodate a stairway in chapter 7 and 10 are being relocated to proposed section 1009.3 including current exceptions to sections 708,1016, and 1022. Section 708 for shaft enclosures is being modified to only address floor openings that do not contain a stairway. All enclosure requirements for stairways, exit or exit access, will originate in section 1009. All fire rated enclosure requirements for exit stairs will remain in chapter 10 and exit access stair enclosure requirements will be placed in proposed section 1009.3 based on current section 708 construction requirements. Ramps will be treated the same as stairways. The new formalized concept of Exit Access Stairway is codified in proposed section 1009.3. New definitions are proposed for Exit Access Stairway(ramp) and Interior Exit Stairway(Ramp).

Specific section change explanations:

Modifications to current section 1002- The definition of Exit is proposed to be modified to remove the fire rated construction provisions from the definition because the construction requirements belong in the code text of section 1022. The definition should be focused on what the exit is, which is simply the component that is between the exit access and the exit discharge. The list of components that qualify as exits has been retained. Additionally “Exit Enclosure” is proposed to be replaced with new terms “Interior Exit Stairway” and “Interior Exit Ramp”. This concept is that the exit stairway or ramp in its entirety comprises the exit component, not just the enclosure. New definitions are proposed for Exit Access Ramp and Stairway to support the new concept of their use in proposed section 1009.3. The concept is that all interior stairways and ramps that are not formal exits, whether they are required means of egress components or not, are exit access components.

Modifications to current section 1009-In general, the concept with the changes to 1009 and companion changes to other sections is that 1009 is the point source for all requirements relating to interior stair code requirements including opening protection requirements. Figuratively speaking all stairs lead to section 1009. New sections 1009.1 through 1009.4 have been proposed for addition to current section 1009. 1009.1 establishes that all stairways serving occupied portions of a building must comply with section 1009, whether the stairs are required or not. 1009.2 establishes that exit stairs must lead out of the building directly or through an exit passageway or exit discharge component as is currently required. Section 1009.2.1 establishes the general requirement for when an exit stairway is required. Section 1009.2.2 directs the code user to section 1022 for detailed requirements for construction of the exit stairway including the current enclosure requirements. Proposed section 1009.3 is the new section established to regulate enclosure of exit access stairs. The base line is that all exit access stairs must be enclosed with exceptions to follow. All of the current exceptions in sections 708,1016, and 1022 have been moved to this section, as exceptions to the baseline requirement for enclosure because all open stairs are exit access stairs per this proposal. The exceptions either in text or concept are in 1009.3 with every attempt made to keep them as they are currently applied. New section 1009.3.1 and sub-sections are the construction requirements for enclosure of exit access stairs with the exit access stair would not qualify for one of the exceptions that would allow the stairway to be unenclosed. These requirements have been copied from section 708 Shaft enclosures because current code allows stairways that are not used as exits to meet shaft enclosure requirements of current section 708; current exit enclosure requirements of 1022 are only applicable to required exit stairs.

New section 1010.2-This section is proposed as simply a cross reference for ramps so that they are designed for enclosure no differently than stairways.

Modifications to current section 1016.1-The section is proposed for re-organization based on separation general provisions from specific design provisions. Exceptions 1 and 2 to 1016.1 were moved to proposed section 1016.3 do to conversion of existing section 1016.1 into a general section. Exceptions 3 and 4 to 1016.1 were deleted because the intended use of those exceptions is now captured in proposed modifications to current section 1021.1 and 1021.3.1.

Modifications to current section 1016.1- Exit access added for consistency and the table reference was changed to 1016.2 because this proposal includes changing the table number and reference section.

New section 1016.3- New section 1016.3 is proposed to separate the measurement requirements of exit access travel distance into a stand alone section for better clarity and order.

Modifications to current section 1021.1-Changed the section to a general section. The first sentence proposed replacement is a mix of language clean and addition of the proposed new terms “exit and exit access stairways or ramps”. The added second underlined text that proposes to require at least one exit stairway serving each story above the section is the relocation of the concept intended by current exceptions 3 and 4 to 1016.1 that have been proposed for deletion. Exceptions for open parking garages and outdoor facilities were relocated to this section. All of the specific provisions regarding required number of exits were moved from the proposed general section 1021.1 to a new section 1021.2.

Modifications to current section 1021.2-The bulk of this sections changes are to improve the format and flow of the section in keeping with moving specific requirements out of the beginning General section and laying out the requirements for number of exits and configuration in a more logical format. Proposed section 1021.3.1 has a provision that limits the access of exits on another floor to an adjacent level.
Modifications to current section 1022-The section title is proposed to be changed to the new term Interior Exit Stairways and Ramps. Some minor editorial changes have been made to the section and the new terms have been inserted into the text. The deleted last two sentences of 1022.1 (proposed 1022.2) were relocated to proposed section 1009.2.
New Section 410.5.3.1- Based on deletion of current exception #6 to 1022.1 the allowance for open stairs serving stages and support areas has been relocated to chapter 4 under the current stage exit provisions in chapter 4. This is cross referenced in proposed 1009.3 Exception #7.
New exception #3 to Section 706-Added cross-reference to top of shaft enclosure allowance in current section 707.12 to allow use for exit and exit access stair termination. This was done in conjunction with adding exit access stair enclosure requirements, modeled after shaft enclosure requirements, into section 1009.
Modifications to current section 708-Added the sentence in general section 708.1 that removes stair openings from regulation by section 708 and directs the code user to section 1009 for all stair opening protection requirements. As a companion to the intent of that change current exceptions numbers 2 (stair part), 7.2, 11 and 13 that address permissible unenclosed floor openings for stairs have been proposed for deletion and to be moved to section 1009.3: current #2 to proposed 1009.3 Exception #3; current #7.2 and #11 to proposed 1009.3 Exception #1; current #13 to proposed 1009.3 Exception #9. See below for a comparison of the suggested revisions between the Open Stairway study group recommendations and the Vertical Openings committee.
Proposed new section 708.3-Shaft enclosure construction provisions were moved out of the general section in 708.1 and into a new section titled Construction.
Modifications to current section 708.3-In current sections 1002 and 1022 the term “Exit Enclosure” is proposed to be replaced with new terms “Interior Exit Stairway” and “Interior Exit Ramp”. This change is companion to that change in term.
Modification to Sections following the main proposal are correlative items to match the proposed revisions to terminology and are not intended to change the scope of the code. Sections that were also reviewed for correlation, but are not proposed to be revised include 403, 408, 410, 414, 415, 705, 707, 708, 709, 712, 715, 716. 803, 804, 909, 1006, 1007, 1015, 1023, 1024, 1025, 1026, 1027, 1028, 1110, 2606, 3007, 3008.

Comparison of CTC proposals for open stairway and vertical openings:
This is a comparison between the overlapping portions of the proposals from the Vertical opening study group and the Open stairway study group. The text in the columns is to compare requirements that may be addressing the same type of provisions. The CTC committee did not feel that there were conflicts in these two proposals, however, in the interest of providing complete information to those participating in the code change process, this matrices should make reviewing for potential conflicts much easier. The first half is the exceptions currently in 708.2 and Section 1022 (exit access stairways). The 2nd half is the construction requirements.

Open Stairway Proposals	Vertical opening Proposals
	~~Section 708~~ Section 712
	~~Shaft Enclosures~~ Vertical Openings
For Stairways – **1009.3 Exit access stairways.** Floor openings between stories created by exit access stairways shall be enclosed. **Exceptions:** (See below) *For Ramps –* **1010.2 Enclosure.** All interior exit ramps shall be enclosed in accordance with the applicable provisions of Section 1022. Exit access ramps shall be enclosed in accordance with the applicable provisions of Section 1009.3. **708.1 General.** The provisions of this section shall apply to shafts required to protect openings and penetrations through floor/ceiling and roof/ceiling assemblies. Exit access stairways and ramps shall be protected in accordance with the applicable provisions of Section 1009. Interior exit stairways and ramps shall be protected in accordance with the requirements of Section 1022. ~~Shaft enclosures shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies in accordance with Section 712, or both.~~	**~~708.1~~ 712.1 General.** The provisions of this section shall apply to the vertical opening applications listed in Sections 712.1.1 through 712.1.18. ~~shafts required to protect openings and penetrations through floor/ceiling and roof/ceiling assemblies. Shaft enclosures shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies in accordance with Section 712, or both.~~
	~~**708.2 Shaft enclosure required.** Openings through a floor/ceiling assembly shall be protected by a shaft enclosure complying with this Section.~~ ~~**Exceptions:**~~
	712.1.1 Smoke compartments. Vertical openings contained entirely within a shaft enclosure complying with Section 709 shall be permitted.
1009.3 - 2. Exit access stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.	~~**708.2 -1.**~~ **712.1.2 Individual dwelling unit.** ~~A shaft enclosure is not required for~~ Unconcealed vertical openings totally within an individual residential dwelling unit and connecting four stories or less shall be permitted.
708.2 – 2. A shaft enclosure is not required in a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 for an escalator opening ~~or stairway that is not a portion of the means of egress~~ protected according to Item 2.1 or 2.2;	~~**708.2 -2.**~~ **712.1.3 Escalator and Stairway Openings.** ~~A shaft enclosure is not required in~~ Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, ~~for~~ an escalator opening or stairway that is not a portion of the means of egress shall be protected according to Item ~~2.1 or 2.2~~ 712.1.3.1 or 712.1.3.2:
708.2 - 2.1. Where the area of the floor opening between stories does not exceed twice the horizontal projected area of the escalator ~~or~~	~~**708.2 - 2.1.**~~ **712.1.3.1 Opening size.** Where the area of the ~~floor~~ vertical opening between stories does not exceed twice the horizontal projected

Open Stairway Proposals	Vertical opening Proposals
~~stairway~~ and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Groups B and M, this application is limited to openings that do not connect more than four stories.	area of the escalator or stairway and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Groups B and M, this application is limited to openings that do not connect more than four stories.
	~~**708.2 - 2.2.**~~ **712.1.3.2 Automatic shutters**. Where the vertical opening is protected by approved power-operated automatic shutters at every penetrated floor. The shutters shall be of noncombustible construction and have a fire-resistance rating of not less than 1.5 hours. The shutter shall be so constructed as to close immediately upon the actuation of a smoke detector installed in accordance with Section 907.11 and shall completely shut off the well opening. Escalators shall cease operation when the shutter begins to close. The shutter shall operate at a speed of not more than 30 feet per minute (152.4 mm/s) and shall be equipped with a sensitive leading edge to arrest its progress where in contact with any obstacle, and to continue its progress on release there from.
	~~**708.2 - 3.**~~ **712.1.4 Penetrations.** ~~A shaft enclosure is not required for p~~Penetrations by pipe, tube, conduit, wire, cable and vents shall be protected in accordance with Section ~~713.4~~ 712.4.
	~~**708.2 - 4.**~~ **712.1.5 Ducts.** ~~A shaft enclosure is not required for~~ Penetrations by ducts shall be protected in accordance with Section 716.6. Grease ducts shall be protected in accordance with the *International Mechanical Code*.
1009.3 - 4. Exit access stairways within an atrium complying with the provisions of Section 404 need not be enclosed.	~~**708.2 - 5.**~~ **712.1.6 Atriums.** In other than Group H occupancies, ~~a shaft enclosure is not required for floor openings complying with the provisions for~~ atriums ~~in~~ complying with Section 404 shall be permitted.
	~~**708.2 - 6.**~~ **712.1.7 Masonry chimney.** ~~A shaft enclosure is not required for a~~Approved masonry chimneys shall be permitted where the annular space is fireblocked at each floor level in accordance with Section 717.2.5.
1009.3 - 1. In other than Group I-2 and I-3 occupancies, exit access stairways that serve, or atmospherically communicate between, only two stories, need not be enclosed. **708.2 - 7.** In other than Groups I-2 and I-3, a shaft enclosure is not required for a floor opening or an air transfer opening that complies with the following: 7.1. Does not connect more than two stories. ~~7.2. Is not part of the required means of egress system.~~ 7.3. Is not concealed within the construction of a wall or a floor/ceiling assembly. 7.4. Is not open to a corridor in Group I and R occupancies. 7.5. Is not open to a corridor on nonsprinklered floors in any occupancy. 7.6. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures. 7.7. Is limited to the same smoke compartment.	~~**708.2 - 7.**~~ **712.1.8 Two story openings**. In other than Groups I-2 and I-3~~,~~ ~~a shaft enclosure is not required for~~ a floor opening that is not used as one of the applications listed in this section shall be permitted if it complies with all the items below ~~or an air transfer opening that complies with the following:~~ ~~7.1~~ 1. Does not connect more than two stories. ~~7.2~~ 2. Does not contain a stairway or ramp required by Chapter 10. ~~Is not part of the required means of egress system~~. 3 Does not penetrate a horizontal assembly that separates fire areas or smoke barriers that separate smoke compartments. ~~7.3~~ 4. Is not concealed within the construction of a wall or a floor/ceiling assembly. ~~7.4~~ 5. Is not open to a corridor in Group I and R occupancies. ~~7.5~~ 6. Is not open to a corridor on nonsprinklered floors ~~in any occupancy~~. ~~7.6~~ 7. Is separated from floor openings and air transfer openings serving other floors by construction conforming to required shaft enclosures. ~~7.7. Is limited to the same smoke compartment~~.
1009.3 ~~-~~ 5. Exit access stairways and ramps in open parking garages that serve only the parking garage are not required to be enclosed.	~~**708.2 - 8.**~~ **712.1.9 Parking garages**. ~~A shaft enclosure is not required for~~ Automobile ramps in open and enclosed parking garages shall be permitted where constructed in accordance with Sections 406.3 and 406.4, respectively.
	~~**708.2 - 9.**~~ **712.1.10 Mezzanine.** ~~A shaft enclosure is not required for~~ vertical ~~floor~~ openings between a mezzanine complying with Section 505 and the floor below shall be permitted. ~~and the floor below.~~
	~~**708.2 - 10.**~~ **712.1.11 Joints.** ~~A shaft enclosure is not required for~~ Joints shall be permitted where complying ~~protected by a fire-resistant joint system in accordance~~ with Section ~~714~~ 715.
1009.2 - 3. In buildings with only group B or M occupancies , exit access stairway openings are not required to be enclosed provided that the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the area of the floor opening between stories does not exceed twice the horizontal projected area of the exit access stairway, and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. ~~**708.2 - 11.** A shaft enclosure shall not be required for floor openings created by unenclosed stairs or ramps in accordance with Exception 3 or 4 in Section 1016.1.~~	~~**708.2 - 11.**~~ **712.1.12 Unenclosed stairs and ramps.** A ~~shaft enclosure shall not be required for~~ vertical floor openings created by unenclosed stairs or ramps in accordance with Exception 3 or 4 in Section 1016.1 shall be permitted.
	~~**708.2 - 12.**~~ **712.1.13 Floor Fire Doors.** ~~Floor~~ Vertical openings shall be permitted where protected by floor fire doors in accordance with Section ~~712.8~~ 711.8.

Open Stairway Proposals	Vertical opening Proposals
1009.3 - 9. In Group I-3 occupancies, an exit access enclosure is not required for floor openings in accordance with Section 408.5. ~~**708.2 - 13.** In Group I-3 occupancies, a shaft enclosure is not required for floor openings in accordance with Section 408.5.~~	~~**708.2 - 13.**~~ **712. 1.14. Group I-3.** In Group I-3 occupancies, ~~a shaft enclosure is not required for floor~~ vertical openings shall be permitted in accordance with Section 408.5.
	~~**708.2 - 14.**~~ **712.1.15 Elevators in parking garages.** ~~A shaft enclosure is not required for e-~~vertical openings for elevator hoistways in open or enclosed parking garages that serve only the parking garage, and complying with 406.3 and 406.4 respectively, shall be permitted..
	~~**708.2 - 15.**~~ **712.1.16 Duct systems in parking garages.** Vertical openings for mechanical exhaust or supply duct systems in open or enclosed parking garages~~a shaft enclosure is not required to enclose mechanical exhaust or supply duct systems~~ complying with 406.3 and 406.4 respectively, shall be permitted to be unenclosed where ~~when~~ such duct system is contained within and serves only the parking garage.
	712.1.17 Nonfire-resistance-rated joints. Joints in or between floors without a required fire-resistance rating shall be permitted in accordance with section 711.4.1.
	~~**708.2 - 16.**~~ **712.1.18 Openings otherwise permitted.** Vertical openings shall be ~~Where~~ permitted where allowed by other sections of this code
1009.3 - 6. Stairways serving outdoor facilities where all portions of the means of egress are essentially open to the outside.	
1009.3 - 7. Exit access stairways serving stages shall comply with Section 410.5.3.1 and 1015.6.	
1009.3 - 8. Exit access stairways serving balconies, galleries and press boxes shall comply with Section 1028.5.1.	
	SECTION 713
	SHAFT ENCLOSURES
1009.3.1 Construction. Where required, enclosures for exit access stairways shall be constructed in accordance with this section. Exit access stairway enclosures shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies in accordance with Section 712, or both.	**713.1 General.** The provisions of this section shall apply to shafts required to protect openings and penetrations through floor/ceiling and roof/ceiling assemblies. Shaft enclosures shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies in accordance with Section 711, or both.
1009.3.1.1 Materials. Exit access stairway enclosures shall be of materials permitted by the building type of construction.	~~**708.3**~~ **713.2 Materials.** The shaft enclosure shall be of materials permitted by the building type of construction.
1009.3.1.2 Fire-resistance rating. Exit access stairway enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more, and not less than 1 hour where connecting less than four stories. The number of stories connected by the exit access stairway enclosures shall include any basements, but not any mezzanines. Exit access stairway enclosures shall have a fire-resistance rating not less than the floor assembly penetrated, but need not exceed 2 hours.	~~**708.4**~~ **713.3 Fire-resistance rating.** Shaft enclosures shall have a *fire-resistance rating* of not less than 2 hours where connecting four *stories* or more, and not less than 1 hour where connecting less than four *stories*. The number of *stories* connected by the shaft enclosure shall include any basements but not any *mezzanines*. Shaft enclosures shall have a *fire-resistance rating* not less than the floor assembly penetrated, but need not exceed 2 hours. Shaft enclosures shall meet the requirements of Section 703.2.1.
1009.3.1.3 Continuity. Exit access stairway enclosures shall have continuity in accordance with Section 707.5 for fire barriers or Section 712.4 for horizontal assemblies as applicable.	~~**708.5**~~ **713.4 Continuity.** Shaft enclosures shall be constructed as *fire barriers* in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 712, or both, and shall have continuity in accordance with Section 707.5 for *fire barriers* or Section 712.4 for *horizontal assemblies* as applicable.
1009.3.1.8 Exterior walls. Where exterior walls serve as a part of an exit access stairway enclosure, such walls shall comply with the requirements of Section 705 for exterior walls and the fire-resistance-rated enclosure requirements shall not apply. ~~**708.6**~~ **708.7Exterior walls.** Where exterior walls serve as a part of a required shaft enclosure, such walls shall comply with the requirements of Section 705 for exterior walls and the fire-resistance-rated enclosure requirements shall not apply. **Exception:** Exterior walls required to be fire-resistance rated in accordance with Section 1019.2 for exterior egress balconies, Section ~~1022.6~~ 1022.7 for enclosures for interior exit stairways and ramps ~~exit enclosures~~ and Section 1026.6 for exterior exit ramps and stairways.	~~**708.6**~~ **713.5 Exterior Walls.** Where exterior walls serve as a part of a required shaft enclosure, such walls shall comply with the requirements of Section 705 for exterior walls and the fire-resistance-rated enclosure requirements shall not apply. **Exception:** Exterior walls required to be fire-resistance rated in accordance with Section 1019.2 for exterior egress balconies, Section 1022.6 for exit enclosures and Section 1026.6 for exterior exit ramps and stairways.
1009.3.1.4 Openings. Openings in an exit access stairway enclosure shall be protected in accordance with Section 715 as required for fire	~~**708.7**~~ **713.6 Openings.** Openings in a shaft enclosure shall be protected in accordance with Section 715 as required for *fire barriers*. Doors shall be

Open Stairway Proposals	Vertical opening Proposals
barriers. Doors shall be self- or automatic-closing by smoke detection in accordance with Section 715.4.8.3.	self- or automatic closing by smoke detection in accordance with Section 715.4.8.3.
1009.3.1.4.1 Prohibited openings. Openings other than those necessary for the purpose of the exit access stairway enclosure shall not be permitted in exit access stairway enclosures.	~~**708.7.1**~~ **713.6.1 Prohibited openings.** Openings other than those necessary for the purpose of the shaft shall not be permitted in shaft enclosures.
1009.3.1.5 Penetrations. Penetrations in a shaft enclosure shall be protected in accordance with Section 713 as required for fire barriers.	~~**708.8**~~ **713.7 Penetrations.** Penetrations in a shaft enclosure shall be protected in accordance with Section 713 as required for *fire barriers*.
1009.3.1.5.1 Prohibited penetrations. Penetrations other than those necessary for the purpose of the exit access stairway enclosure shall not be permitted in exit access stairway enclosures.	~~**708.8.1**~~ **713.7.1 Prohibited penetrations.** Penetrations other than those necessary for the purpose of the shaft shall not be permitted in shaft enclosures.
1009.3.1.6 Joints. Joints in an exit access stairway enclosure shall comply with Section 714.	~~**708.9**~~ **713.8 Joints.** Joints in a shaft enclosure shall comply with Section 714.
1009.3.1.7 Ducts and air transfer openings. Penetrations of an exit access stairway enclosure by ducts and air transfer openings shall comply with Section 716.	~~**708.10**~~ **713.9 Duct and air transfer openings.** Penetrations of a shaft enclosure by ducts and air transfer openings shall comply with Section 716.
	~~**708.11**~~ **713.10 Enclosure at the bottom.** (No change to text)
706.5 Continuity. Fire barriers shall extend from the top of the floor/ceiling assembly below to the underside of the floor or roof slab or deck above and shall be securely attached thereto. Such fire barriers shall be continuous through concealed spaces, such as the space above a suspended ceiling. The supporting construction for fire barriers shall be protected to afford the required fire-resistance rating of the fire barrier supported, except for 1-hour fire-resistance-rated incidental use area separations as required by Table 508.2 in buildings of Type IIB, IIIB and VB construction. Hollow vertical spaces within a fire barrier shall be fireblocked in accordance with Section 717.2 at every floor level. **Exceptions:** 1. The maximum required fire-resistance rating for assemblies supporting fire barriers separating tank storage as provided in section 415.6.2.1 shall be 2 hours, but not less than required by Table 601 for the building construction type. 2. Shaft enclosures shall be permitted to terminate at a top enclosure complying with Section 707.12. 3. Interior exit stairway and ramp enclosures required by Section 1009.2.2 and exit access stairway and ramp enclosures required by Section 1009.3 shall be permitted to terminate at a top enclosure complying with Section 707.12.	~~**708.12**~~ **713.11 Enclosure at top.** A shaft enclosure that does not extend to the underside of the roof sheathing, deck or slab of the building shall be enclosed at the top with construction of the same *fire-resistance rating* as the topmost floor penetrated by the shaft, but not less than the *fire-resistance rating* required for the shaft enclosure.
	~~**708.13**~~ **713.12 Refuse and laundry chutes** (No change to text and subsections)
	~~**708.14**~~ **713.13 Elevator, dumbwaiter and other hoistways.** (No change to text and subsections)

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Heilsted-G8-410.5.3.1

E6–09/10

505.3, 505.4, 1002.1, 1006.3, 1011.1, 1015 (IFC [B] 1002.1, 1006.3, 1011.1, 1015)

Proponent: Anne VonWeller, Murray City, and Ron Clements, Chesterfield County Building Inspection Department, representing the Utah Chapter of the International Code Council

Revise as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

EXIT ACCESS ~~DOORWAY~~ POINT. A door or access point along the path of egress travel within the exit access from an occupied room, area or space where the path of egress enters an intervening room, corridor, unenclosed exit access stair or unenclosed exit access ramp.

SECTION 1015 (IFC [B] 1015.1)
EXITS AND EXIT ACCESS ~~DOORWAYS~~ POINTS FOR ROOMS AND SPACES

1015.1 (IFC [B] 1015.1) Number required ~~Exit or exit access doorways from spaces.~~ Two exits or exit access points ~~doorways~~ from any room or space shall be provided where one of the following conditions exists:

Exception: Group I-2 occupancies shall comply with Sections 1014.2.2 through 1014.2.7

1. The occupant load of the room or space exceeds one of the values in Table 1015.1.

   Exception: In Groups R-2 and R-3 occupancies, one exit or exit access point ~~means of egress~~ is permitted within and from individual dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

2. The common path of egress travel exceeds one of the limitations of Section 1014.3.
3. Where required by Section 1015.3, 1015.4, 1015.5, 1015.6 or 1015.6.1.

Where a building contains mixed occupancies, each individual occupancy shall comply with the applicable requirements for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1.

TABLE 1015.1 (IFC [B] 1015.1)
ROOMS & SPACES WITH ONE EXIT OR EXIT ACCESS ~~DOORWAYS~~ POINT
(*Portions of table not shown remain unchanged)*

1015.1.1 (IFC [B] 1015.1.1) Additional ~~Three or more~~ exits or exit access ~~doorways~~ points. Three exits or exit access ~~doorways~~ points shall be provided from any room or space with an occupant load of 501 to 1,000. Four exits or exit access doorways shall be provided from any room or space with an occupant load greater than 1,000.

1015.2 (IFC [B] 1015.2) Availability ~~Exit or exit access doorways arrangement.~~ Required exits and exit access points shall be located in a manner that makes their availability obvious. Exits and exit access points shall be unobstructed at all times. Exit and exit access ~~doorways~~ points shall be arranged in accordance with Section~~s~~ 1015.3.~~1015.2.1 and 1015.2.2.~~

~~1015.2.1~~ 1015.3 (IFC [B] ~~1015.2.1~~ 1015.3) Arrangement ~~Two exits or exit access doorways.~~ Where two or more exits or exit access ~~doorways~~ points are required from any portion of the exit access, at least two of the exit doors or exit access ~~doorways~~ points shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between exit doors or exit access ~~doorways~~ points. For doors and doorways such distance shall be measured from the center of doors and openings. For unenclosed interior stairways and ramps such distance shall be measured from the center of the first stair riser or beginning of ramp slope. Interlocking or scissor stairs shall be counted as one exit or exit access point ~~stairway~~.

Exceptions:

1.~~2.~~ Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance ~~of the exit doors or exit access doorways~~ shall not be less than one-third of the length of the maximum overall diagonal dimension of the area served.

2.~~1.~~ Where exit enclosures are provided ~~as a portion of the required exit~~ and such exit enclosures are interconnected by a 1-hour fire-resistance-rated corridor conforming to the requirements of Section 1018, the required ~~exit~~ separation distance shall be measured along the shortest direct line of egress travel within the corridor.

~~**1015.2.2 (IFC [B] 1015.2.2) Three or more exits or exit access doorways.** Where access to three or more exits is required, at least two exit doors or exit access doorways shall be arranged in accordance with the provisions of Section 1015.2.1.~~

~~**1015.3**~~ **1015.4 (IFC [B] ~~1015.3~~ 1015.4) Boiler, incinerator and furnace rooms.** Two exit access ~~doorways~~ points are required in boiler, incinerator and furnace rooms where the area is over 500 square feet (46 m^2) and any fuel-fired equipment exceeds 400,000 British thermal units (Btu) (422 000 KJ) input capacity. Where two exit access ~~doorways~~ points are required, one is permitted to be a fixed ladder or an alternating tread device. Exit access ~~doorways~~ points shall be separated by a horizontal distance equal to one-half the length of the maximum overall diagonal dimension of the room.

~~**1015.4**~~ **1015.5 (IFC [B] ~~1015.4~~ 1015.5) Refrigeration machinery rooms.** Machinery rooms larger than 1,000 square feet (93 m^2) shall have not less than two exits or exit access ~~doorways~~ points. Where two exit access ~~doorways~~ points are required, one such ~~doorways~~ points is permitted to be served by a fixed ladder or an alternating tread device. Exit access ~~doorways~~ points shall be separated by a horizontal distance equal to one-half the maximum horizontal dimension of room.

All portions of machinery rooms shall be within 150 feet (45 720 mm) of an exit or exit access ~~doorways~~ point. An increase in travel distance is permitted in accordance with Section 1016.1.

Doors shall swing in the direction of egress travel, regardless of the occupant load served. Doors shall be tight fitting and self-closing.

~~**1015.5**~~ **1015.6 (IFC [B] ~~1015.5~~ 1015.6) Refrigerated rooms or spaces.** Rooms or spaces having a floor area larger than 1,000 square feet (93m^2), containing a refrigerant evaporator and maintained at a temperature below 68°F (20°C), shall have access to not less than two exits or exit access ~~doorways~~ points.

Travel distance shall be determined as specified in Section 1016.1, but all portions of a refrigerated room or space shall be within 150 feet (45 720 mm) of an exit or exit access ~~doorways~~ points where such rooms are not protected by an approved automatic sprinkler system in accordance with Section 903.3.1.1. Egress is allowed through adjoining refrigerated rooms or spaces.

Exception: Where using refrigerants in quantities limited to the amounts based on the volume set forth in the International Mechanical Code.

~~**1015.6**~~ **1015.7 (IFC [B] ~~1015.6~~ 1015.7) Stage means of egress.** Where two ~~means of egress~~ exits or exit access points are required, based on the stage size or occupant load, one ~~means of egress~~ exit or exit access point shall be provided on each side of the stage.

~~**1015.6.1**~~ **1015.7.1 (IFC [B] ~~1015.6.1~~ 1015.7.1) Gallery, gridiron and catwalk means of egress.** The means of egress from lighting and access catwalks, galleries and gridirons shall meet the requirements for occupancies in Group F-2.

Exceptions:

1. A minimum width of 22 inches (559 mm) is permitted for lighting and access catwalks.
2. Spiral stairs are permitted in the means of egress.
3. Stairways required by this subsection need not be enclosed.
4. Stairways with a minimum width of 22 inches (559 mm), ladders, or spiral stairs are permitted in the means of egress.

5. A second ~~means of egress~~ exit or exit access point is not required from these areas where a means of escape to a floor or to a roof is provided. Ladders, alternating tread devices or spiral stairs are permitted in the means of escape.
6. Ladders are permitted in the means of egress.

SECTION 505
MEZZANINES

505.3 Egress. Each occupant of a mezzanine shall have access to at least two independent exits ~~means of egress~~ where the common path of egress travel exceeds the limitations of Section 1014.3. Where an unenclosed stairway provides a means of exit access from a mezzanine, the maximum travel distance includes the distance traveled on the stairway measured in the plane of the tread nosing. Accessible means of egress shall be provided in accordance with Section 1007.

Exception: A single exit or exit access point ~~means of egress~~ shall be permitted in accordance with Section 1015.1.

505.4 Openness. A mezzanine shall be open and unobstructed to the room in which such mezzanine is located except for walls not more than 42 inches (1067 mm) high, columns and posts.

Exceptions:

1. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the occupant load of the aggregate area of the enclosed space does not exceed 10.
2. A mezzanine having two or more exits or exit access points ~~means of egress~~ is not required to be open to the room in which the mezzanine is located if at least one exit or exit access point ~~of the means of egress~~ provides direct access to an exit from the mezzanine level.
3. Mezzanines or portions thereof are not required to be open to the room in which the mezzanines are located, provided that the aggregate floor area of the enclosed space does not exceed 10 percent of the mezzanine area.
4. In industrial facilities, mezzanines used for control equipment are permitted to be glazed on all sides.
5. In occupancies other than Groups H and I, that are no more than two stories above grade plane and equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, a mezzanine having access to two or more exits ~~means of egress~~ shall not be required to be open to the room in which the mezzanine is located.

SECTION 1006
MEANS OF EGRESS ILLUMINATION

1006.3 (IFC [B] 1006.3) Illumination emergency power. The power supply for means of egress illumination shall normally be provided by the premises' electrical supply.

In the event of power supply failure, an emergency electrical system shall automatically illuminate all of the following areas:

1. Aisles and unenclosed ~~egress~~ exit access stairways and ramps in rooms and spaces that require two or more exits or exit access points. ~~means of egress~~.
2. Corridors, exit enclosures and exit passageways in buildings required to have two or more exits.
3. Exterior egress components at other than their levels of exit discharge until exit discharge is accomplished for buildings required to have two or more exits.
4. Interior exit discharge elements, as permitted in Section 1027.1, in buildings required to have two or more exits.
5. Exterior landings as required by Section 1008.1.6 for exit discharge doorways in buildings required to have two or more exits.

The emergency power system shall provide power for a duration of not less than 90 minutes and shall consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Chapter 27.

SECTION 1011
EXIT SIGNS

1011.1 (IFC [B] 1011.1) Where required. Exits and exit access ~~doors~~ points shall be marked by an approved exit sign readily visible from any direction of egress travel. The path of egress travel to exits and within exits shall be marked by readily visible exit signs to clearly indicate the direction of egress travel in cases where the exit or the path of egress travel is not immediately visible to the occupants. Intervening means of egress doors within exits shall be marked by exit signs. Exit sign placement shall be such that no point in an exit access corridor or exit passageway is more than 100 feet (30 480mm) or the listed viewing distance for the sign, which ever is less, from the nearest visible exit sign.

Exception:

1. Exit signs are not required in rooms, spaces or areas which require only one exit or exit access point.
2. Main exterior exit doors or gates that are obviously and clearly identifiable as exits need not have exit signs where approved by the building official.
3. Exit signs are not required in occupancies in Group U and individual sleeping units or dwelling units in Group R-1, R-2 or R-3.
4. Exit signs are not required in dayrooms, sleeping rooms or dormitories in occupancies in Group I-3.
5. In occupancies in Groups A-4 and A-5, exit signs are not required on the seating side of vomitories or openings into seating areas where exit signs are provided in the concourse that are readily apparent from the vomitories. Egress lighting is provided to identify each vomitory or opening within the seating area in an emergency.

Reason:

Background

The 2009 edition added a definition for 'exit access doorway' to clarify that the provisions for exit access doorways applied to components where there is not always a doorway, such as the transition point along the path of egress to unenclosed interior stairways and ramps.

During the discussions of the CTC's Unenclosed Stairway Work Group it was recognized a more clear term was needed to describe the 'point' where requirements such as those for number, availability, and arrangement should be applied. 'Exit Access Point' was very clear and straight forward.

Most of the language in the above proposal was developed in the study group. However, it was determined 'exit access point' was beyond the scope of the specific study. There was a good deal of support for the concept and we were encouraged to bring it forward as a separate change.

The Changes

The one word change in the definition going from 'doorway' to 'point' is the focus of the change. The new term is carried throughout the change. Also, 'within the exit access' was added to make clear an 'exit access point' in only applicable in those portions of the means of egress.

The name of the section was expanded to assist users and avoid confusion with Section 1020.

'Means of egress' was changed to 'exit or exit access point' in several places because means of egress applies to all occupied portions of a building. The change occurs where a term refers to the number of required components which is more appropriate than the general term.

In 1015.3 we have made it clear exactly where to measure the required separation distance between egress components in the exit access. How many debates have been about "Do we measure to the center of the door? The closest edge? The furthest edge? We chose the center. This becomes more important to pin down when now using the concept of 'point'.

Changes to 505, 1006.3, and 1011.1 are for correlation with those in 1015.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:				
Committee:	AS	AM	D	
Assembly:	ASF	AMF	DF	

ICCFILENAME:Vonweller-E3-1023.6

E7–09/10

1002.1 (IFC [B] 1002.1)

Proponent: Edward A Hite, CML, representing self

Revise definition as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in the code, have the meanings shown herein:

PANIC HARDWARE. A ~~door latching~~ bar assembly incorporating a device that releases ~~the~~ a lock or latch upon the application of force in the direction of egress travel.

Reason:

1. Latching is only required with fire exit hardware and in areas such as corridors to control smoke.

2. Bars directly releasing locking mechanisms not necessarily attached to the bar, itself, should also be considered panic bars.
3. Currently, panic hardware would need to be a bar in order to meet the requirements of 1008.1.10.1, #3.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HITE-E1-1002-PANIC HARDWARE

E8–09/10
1002.1 (IFC [B] 1002.1); IRC R202

Proponent: David W. Cooper, Stair Manufacturing and Design Consultants, representing the Stairway Manufacturers' Association, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE MEANS OF EGRESS COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

Add new text as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

PROJECTED TREAD DEPTH. The full depth dimension of a tread with a nosing projection or the sum of the tread depth measured between adjacent nosings and the depth of the nosing projection.

NOSING PROJECTION. The additional depth of a tread in excess of the tread depth or the distance between the edges of adjacent treads overlapping horizontally.

RISER. The vertical component of a step or stair.

PART II – IRC BUILDING/ENERGY

Revise as follows:

SECTION R202
DEFINITIONS

RISER.

1. The vertical component of a *step* or *stair*
2. A water pipe that extends vertically one full story or more to convey water to branches or to a group of fixtures

Reason:
Part I -These definitions clarify the intent of the code.
Projected Tread Depth is currently incorrectly characterized as the tread depth in reference to measuring alternating tread devices. This definition will allow for the same terminology to apply to all vertical egress devices as it does to both stairs and ship ladders. Please see our related change to Alternating tread devices.
Nosing projection needs to be better understood by all that use the code. One of the most common misinterpretations akin to the measurement of tread depth is the concept of a nosing projection and how it is measured. This simple definition is long overdue.
Riser is currently listed in the IRC with a definition for a plumbing application. Please see our change to the IRC as well.
Part II-These definitions clarify the intent of the code.
Riser – I the 07/09 cycle the IRC committee pointed out that the term riser was confused with riser height and that further confusion was caused by the present definition of a plumbing application. The stair term is more commonly known and is therefore listed first. The existing definition remains unchanged.

Cost Impact: The code change will not increase the cost of construction.

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME:Cooper-G1-202

E9–09/10
1003.5 (IFC [B] 1003.5)

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

1003.5 (IFC [B] 1003.5) Elevation change. Where changes in elevation of less than 12 inches (305 mm) exist in the means of egress, sloped surfaces shall be used. Where the slope is greater than one unit vertical in 20 units horizontal (5-percent slope), ramps complying with Section 1010 shall be used. Where the difference in elevation is 6 inches (152 mm) or less, the ramp shall be equipped with either handrails or floor finish materials that contrast with adjacent floor finish materials.

Exceptions:

1. A single step with a maximum riser height of 7 inches (178 mm) is permitted for buildings with occupancies in Groups F, H, R-2, R-3, S and U at exterior doors not required to be accessible.
2. A stair with a single riser or with two risers and a tread is permitted at locations not required to be accessible by Chapter 11, provided that the risers and treads comply with Section 1009.3, the minimum depth of the tread is 13 inches (330 mm) and at least one handrail complying with Section 1012 is provided within 30 inches (762 mm) of the centerline of the normal path of egress travel on the stair.
3. A step is permitted in aisles serving seating that has a difference in elevation less than 12 inches (305 mm) at locations not required to be accessible by Chapter 11, provided that the risers and treads comply with Section 1025.11 and the aisle is provided with a handrail complying with Section 1025.13.

Throughout a story in a Group I-2 occupancy, any change in elevation in portions of the ~~exit access~~ means of egress that serve nonambulatory persons shall be by means of a ramp or sloped walkway.

Reason: The last paragraph was changed in Palms Springs (E13-07/08). The proponent argued that corridors should not be the only component of MOE mentioned in this section. It was argued that passageways should also be considered. Although the reasoning was sound, “exit access” was added to the Code language. Exit passageways are part of exit component of MOE not exit access. In order to capture all components of MOE, “exit access” is eliminated here and “means of egress” is added.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME:Maiel-E3-1003.5

E10–09/10
1004.1, 1004.1.1, 1004.1.1.1(New), 1004.4, 1004.5, 1004.6, 1005.1, 1005.1.1(New), 1005.1.2(New); [IFC [B] 1004.1, 1004.1.1, 1004.1.1.1(New), 1004.4, 1004.5, 1004.6, 1005.1, 1005.1.1(New), 1005.1.2(New)]

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

SECTION 1004
OCCUPANT LOAD

1004.1 (IFC [B] 1004.1) Design occupant load. In determining means of egress requirements, the number of occupants for whom means of egress facilities shall be provided shall be determined in accordance with this section.

~~Where occupants from accessory areas egress through a primary space, the calculated occupant load for the primary space shall include the total occupant load of the primary space plus the number of occupants egressing through it from the accessory area.~~

1004.1.1 (IFC [B] 1004.1.1) Cumulative occupant loads. Where the path of egress travel includes intervening rooms, areas or spaces, cumulative occupant loads shall be determined in accordance with this section.

1004.1.1.1 (IFC [B] 1004.1.1.1) Intervening spaces. Where occupants egress from one room, area or space through another, the design occupant load shall be based on the cumulative occupant loads of all rooms, areas or spaces to that point along the path of egress travel.

~~1004.6~~ 1004.1.1.2 (IFC [B] ~~1004.6~~ 1004.1.1.2) ~~Mezzanine~~ Adjacent levels. The occupant load of a mezzanine or story ~~level~~ with egress ~~onto~~ through a room, ~~or~~ area or space on an adjacent level ~~below~~ shall be added to ~~that room or area's~~ the occupant load of that room, area or space. ~~and the capacity of the exits shall be designed for the total occupant load thus established.~~

~~1004.1.1~~ 1004.1.2 (IFC [B] ~~1004.1.1~~ 1004.1.2) Areas without fixed seating. *(No change to text)*

TABLE ~~1004.1.1~~ 1004.1.2 (IFC [B] ~~1004.1.1~~ 1004.1.2)
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT
(No change to table)

1004.2 (IFC [B] 1004.2) Increased occupant load. *(No change to text)*

1004.3 (IFC [B} 1004.3) Posting of occupant load. *(No change to text)*

~~**1004.4 (IFC [B] 1004.4) Exiting from multiple levels.** Where exits serve more than one floor, only the occupant load of each floor considered individually shall be used in computing the required capacity of the exits at that floor, provided that the exit capacity shall not decrease in the direction of egress travel.~~

~~**1004.5 (IFC [B] 1004.5) Egress convergence.** Where means of egress from floors above and below converge at an intermediate level, the capacity of the means of egress from the point of convergence shall not be less than the sum of the two floors.~~

~~1004.7~~ 1004.4 (IFC [B] ~~1004.7~~ 1004.4) Fixed seating. *(No change to text)*

~~1004.8~~ 1004.5 (IFC [B] ~~1004.8~~ 1004.5) Outdoor areas. *(No change to text)*

~~1004.9~~ 1004.6 (IFC [B] ~~1004.9~~ 1004.6) Multiple occupancies. *(No change to text)*

SECTION 1005
EGRESS WIDTH

1005.1 (IFC [B] 1005.1) Minimum required egress width. The means of egress width shall not be less than required by this section. The total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by 0.3 inches (7.62 mm) per occupant for stairways and 0.2 inches (5.08 mm) per occupant for other egress components. The width shall not be less than specified elsewhere in this code. Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available ~~capacity~~ width to less than 50 percent of the required ~~capacity~~ width. The ~~maximum capacity~~ required width from any story of a building shall be maintained to the termination of the means of egress.

Exception: Means of egress complying with Section 1028.

1005.1.1 (IFC [B] 1005.1.1) Egress from multiple levels. Where exits serve more than one story, only the occupant load of each story considered individually shall be used in computing the required width of the exits at that story, provided that the exit width shall not decrease in the direction of egress travel.

1005.1.2 (IFC [B] 1005.1.2) Egress convergence. Where occupants from stories above and below converge at an intermediate level, the width of the exit from the point of convergence shall not be less than that based on the sum of the occupant loads of the two stories.

1005.2 (IFC [B] 1005.2) Door encroachment. *(No change to text)*

1005.3 (IFC [B] 1005.3) Door hardware encroachment. *(No change to text)*

Reason: This proposal is intended to repair certain fundamental means of egress provisions relating to the determination of occupant load and egress width. In Section 1004.1, cumulative occupant load provisions have been removed from general topic provisions and placed in a new Section 1004.1.1. In context, provisions for the determination of cumulative occupant loads on the same building level and adjacent building levels are stated in the same section. Adjacent level provisions are based on current Section 1004.6, mezzanine level requirements. It is felt that the scope of the provision needs to be expanded. This is due to the fact that Section 1021.1 permits access to exits from adjacent stories. Cumulative occupant load determination requirements prior to arrival at an exit should be the same regardless of whether the adjacent level is a mezzanine or story.

Sections 1004.4 and 1004.5 have been relocated in context in Section 1005. Each of those sections currently addresses determination of egress capacity, a width related provision. It is felt that it would best serve code users if all width related provisions were located in the same section.

Within Section 1005, the term “capacity” occurs numerous times. The term "capacity" is not defined in the IBC. Moreover, there is no context established for the term. In IBC context, the term capacity is most often confused with the term “width.” It is acknowledged that there are capacity based approaches to means of egress design. References to capacity in the IBC, however, do a disservice to code users who do not have benefit of experience with capacity based codes. The IBC needs to stand on its own technical merit and terminology.

Capacity represents the theoretical maximum occupant load that can be accommodated by a minimally sized means of egress component(s). Section 1005.1 clearly states that the required egress width is based on the occupant load served, or the prescribed component minimum, whichever is greater. This is reinforced in the charging statements of virtually every means of egress component section. Obviously, the minimum width of various means of egress components is based on anthropometrics. A 44-inch means of egress component assumes opposing traffic under typical usage conditions. It is acknowledged that it is highly likely that the occupant load served by a pair of 44-inch wide stairways will be less than 294. The theoretical capacity of the stairway is academic. The required width of each stairway is 44 inches. At that point that the occupant load increases beyond 294, the required width increases incrementally and the required width and the capacity now coincidentally align.

When two terms are used to describe the same condition, many code practitioners will attempt to infer differing requirements. This unnecessarily confuses code interpretation and application. In addition to this core correction of differing terminology, it is recommended that the ICC Means of Egress Code Development Committee direct the ICC technical staff to editorially covert these terms elsewhere in the IBC. This will greatly assist in the correct and consistent application of IBC egress width provisions.

Approval of this proposal will add clarity to the IBC by creating consistency in terminology in this fundamental area. Any one us may be familiar with the concept of capacity based means of egress design. Unfortunately, not all code users share in that level of experience. It is imperative that IBC requirements stand alone and assume no prior experience in another code system. After over a decade of publication, the 2012 Edition of the International Building Code should finally correlate this basic terminology and eliminate residual legacy provisions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Keith-E5-1004.1

E11–09/10
1004.1.1 (IFC [B] 1004.1.1)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

1004.1.1 (IFC [B] 1004.1.1) Areas without fixed seating. The number of occupants shall be computed at the rate of one occupant per unit of area as prescribed in Table 1004.1.1. For areas without fixed seating, the occupant load shall not be less than that number determined by dividing the floor area under consideration by the occupant per unit of area factor assigned to the ~~occupancy~~ function of the space as set forth in Table 1004.1.1. Where an intended function ~~use~~ is not listed in Table 1004.1.1, the building official shall establish a function ~~use~~ based on a listed function ~~use~~ that most nearly resembles the intended function ~~use~~.

> **Exception:** Where approved by the building official, the actual number of occupants for whom each occupied space, floor or building is designed, although less than those determined by calculation, shall be permitted to be used in the determination of the design occupant load.

Reason: The title of the left hand column in Table 1004.1.1 was changed in the 2006 Edition of the IBC from “occupancy” to “function of space.” This change was appropriate in that the listed items are functions or uses within an area served by the means of egress system. The stated function may or may not coincide with the occupancy classification of the building. For instance, assembly functions such as conference rooms and break rooms are often contained within Group B (business area) occupancies. Unfortunately, the text that charges Table 1004.1.1 was not included in the approved change to the column title in Table 1004.1.1. This proposal corrects that oversight. Approval of this proposal will create editorial consistency and eliminate potential confusion caused by the differing terms applicable to the same provision.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

E12–09/10
1004.1.1, Table 1004.1.1 (IFC [B] 1004.1.1, Table 1004.1.1)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

1004.1.1 (IFC [B] 1004.1.1) Areas without fixed seating. The number of occupants shall be computed at the rate of one occupant per unit of area as prescribed in Table 1004.1.1. For areas without fixed seating, the occupant load shall not be less than that number determined by dividing the floor area under consideration by the occupant load ~~per unit of area~~ factor assigned to the occupancy as set forth in Table 1004.1.1. Where an intended use is not listed in Table 1004.1.1, the building official shall establish a use based on a listed use that most nearly resembles the intended use.

Exception: Where approved by the building official, the actual number of occupants for whom each occupied space, floor or building is designed, although less than those determined by calculation, shall be permitted to be used in the determination of the design occupant load.

TABLE 1004.1.1 (IFC [B] 1004.1.1)
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

FUNCTION OF SPACE	OCCUPANT LOAD FACTOR[a] ~~FLOOR AREA IN SQ. FT. PER OCCUPANT~~

(Portions of Table not shown, remain unchanged)

For SI: 1 square foot = 0.0929 m^2.

a. Floor area in sq. ft. per occupant.

Reason: Table 1004.1.1 represents the genesis for the design of a means of egress system. The determination of the occupant load is fundamental to the process. The right hand column represents a factor based on the function of the space that is multiplied by the area under consideration so as to determine the applicable occupant load of the space. The current column title heading, "floor area in sq. ft. per occupant," is somewhat cumbersome and actually states what the unit of measurement represents. The term "occupant load factor" is felt to be easier to use in conversation and more accurately describes the purpose of the tabular values. The term was chosen based on a term that is already recognized in Section 402.4.4.1. The legend in Equation 4-1 states that, "OLF = The occupant load factor (square feet per person). Floor area in sq. ft. per occupant and square feet per person are exactly the same thing. Perhaps a contemporary term such as "occupant density factor" would be more descriptive. Regardless, a functional term should identify this commonly used provision. The descriptive language in the current column title has been appropriately moved to a footnote indicating the unit of measurement. Approval of this proposal will simplify means of egress design by creating a descriptive, common use term while eliminating potential conflicts with other IBC provisions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

E13–09/10

Table 1004.1.1 (IFC [B] Table 1004.1.1)

Proponent: Jay Wallace, The Boeing Company

Revise as follows:

TABLE 1004.1.1 (IFC [B] TABLE 1004.1.1)
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

FUNCTION OF SPACE	FLOOR AREA IN SQ. FT. PER OCCUPANT
~~Aircraft hangars~~	~~500 gross~~
Aircraft Related Uses	
Airport terminal	
Baggage claim	20 gross
Baggage handling	300 gross
Concourse	100 gross
Waiting areas	15 gross
Manufacturing	
Final assembly	500 gross
Sub-assembly fabrication	300 gross
Hangars	
Maintenance and repair	500 gross
Storage or painting	1,000 gross

(Portions of the table not shown remain unchanged.)

Reason: This proposal intends to provide more representative occupant density factors for aircraft manufacturing and storage facilities. Presently, other than for aircraft hangars, there are no industry specific occupant load factors. The recommended values are typical of industry practices. It should be noted that automation has greatly reduced the number of persons necessary to manufacture aircraft. The typically large area necessary for the manufacturing or storage of aircraft is also a factor in the determination of appropriate values. Assigning one occupant for each 32' x 32' area (1000 sf) in an aircraft storage or paint hanger is actually a conservative approach. This figure was selected to account for common usage in smaller facilities. The proposed fabrication occupant load factors also represent typical production practices. These factors become significant in means of egress design. The Boeing Company has a 4,500,000 square foot manufacturing facility. Using the current industrial area occupant load factor of 100 square feet per occupant, the design occupant load of this building is 45,000. It should be noted that The Boeing Company has only 160,000 employees worldwide. In fact, approximately 20,000 employees divided into three shifts work in this factory. The current calculated occupant load would result in a minimum of four exits having 750 feet of egress width. The proposed occupant load factor of 500 would result in a design occupant load of 9,000. Four exits would still be required, however, total egress width would now be a more realistic 150 total feet (50 x 3'-0" doors). Since the facility also contains sub-assembly fabrication operations, the occupant load would be greater than 9,000 resulting in more total egress width. Approval of this proposal will provide code users with occupant load factors representative of industry practices. Such characteristic values will provide for the safe egress of building occupants while not requiring excessive numbers of means of egress components.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wallace-E1-T1004.1.1

E14–09/10
Table 1004.1.1 (IFC [B] Table 1004.1.1)

Proponent: David S. Collins, FAIA, The Preview Group, Inc. representing The American Institute of Architects

Revise as follows:

Table 1004.1.1 (IFC [B] Table 1004.1.1)
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

FUNCTION OF SPACE	FLOOR AREA IN SQ. FT. PER OCCUPANT
Assembly	
Gaming floors (keno, slots, etc.)	11 gross
Exhibit Gallery and Museum	30 net

(Portions of table not shown remain unchanged.)

Reason: Museums, such as fine arts and sciences, are unique in that determining the occupant load presents considerations that are not usual to calculating loads for other assembly spaces. Such facilities have need for high occupancy rooms, for gala openings etc., and museums have

dedicated spaces for such purposes. It is the actual gallery/exhibit spaces that defy use of the existing tables and it is only those spaces that this change addresses. To determine the occupant load of these spaces one must consider how exhibits are viewed.

What must be taken into consideration is the way exhibit in a museum is viewed. There has never been a museum gallery that has been filled to capacity, using even a 15 sf factor, simply because the display could not be seen by the vast majority of the people in the room at that load. Very few displays are actually viewed from close proximity. In fact, most art works are best viewed from distances and most people are not within 10 to 15 feet of the object being viewed. People do make close inspections but only after viewing the object from a distance and, when approaching a display common courtesy to others in the gallery call for "honoring a person's space" and no one moves toward the object until the other viewer has left the area. Consequently, a museum gallery will never be filled with its design capacity simply because of how the spaces are used.

The King Tut exhibit just left the Dallas Museum of Art and throughout its lengthy stay the galleries were never filled to design capacity. That exhibit included wall-mounted objects and free standing object within the room. The American Institute of Architects is confident that a 30sf/occupant load factor will more than suffice for a safe exiting calculation and we hope to have more data in the near future that will show that an occupant load of 50sf/occupant is satisfactory.

In the City of Cincinnati, Ohio has a number of large museum/assembly facilities that have utilized the factor of 1 occupant per 30 square feet. This includes the Museum Center, the Art Museum and the National Underground Freedom Center. Based on various efforts to rectify the problem with determining occupant loads in this building type, the City of Cincinnati has concluded that the 30 sf/occupant basis is rational and supportable.

In the over 100 year history of the Cincinnati Art Museum there has never been an event that saw the number of occupants that is required by the current code. The 30sf/occupant load factor was derived from calculations of the Museum Center's egress capacity. The structure was designed originally as a train terminal in the 1930's. Using the "smoke protected" concept within the code (because of the volume of the space), the City officials were comfortable with the way the building functioned with a multi-use, high volume traffic occupancy. Therefore, the 30sf factor has been used to design and manage many similar facilities in the Ohio region.

As a part of this change, Section 1004.3 would continue to require posting of occupant loads within an assembly use. The designer and user of the facility would continue to establish the appropriated anticipated occupant load. If the intended use is for other than as a gallery or museum, this should be taken into consideration in the design with an appropriate occupant load for the function.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Collins-E1-T1004.1.1

E15–09/10
Table 1004.1.1 (IFC [B] Table 1004.1.1)

Proponent: Sarah A. Rice, CBO, representing self

Revise as follows:

TABLE 1004.1.1 (IFC [B] TABLE 1004.1.1)
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

FUNCTION OF SPACE	FLOOR AREA IN SQ. FT. PER OCCUPANT
Circulation space where primary function uses a net value Toilet rooms, stairways, corridors, elevators/escalators	100 gross

(Portions of Table not shown remain unchanged.)

Reason. When the majority of a story is intended to be occupied by a function where the occupant load is calculated using a "net" value, often the circulation or ancillary spaces are ignored. The occupant loads of these spaces often can make the difference between when 2 or 3 exits is required. The issue is NOT when a "gross" value is used to calculate occupant load, but when "net" is used.

The argument has been made that the people who might occupy these spaces are the same people who will be in the rooms adjoining these types of spaces and that they do not contribute an additional occupant load. But think of a college setting where all the rooms in a building are used for classrooms. To calculate the occupant load of the classroom Table 1004.1.1 says to use 20 net. But for anyone who has been in one of these buildings right when classes are changing, there are always students waiting in the hallways for the next class. Do you just ignore the occupant load generated by these people.

The IBC presently does not have any specific provision for non-simultaneous occupancy which is what is being done when these spaces are ignored. Unless people are strictly monitored, there will always be the potential for people to be in all parts of a building at the same time.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Rice-E4-Table 1004.1.1

E16–09/10

Table 1004.1.1 (IFC [B] Table 1004.1.1)

Proponent: Sarah A. Rice, CBO, representing self
Revise as follows:

TABLE 1004.1.1 (IFC [B] TABLE 1004.1.1)
MAXIMUM FLOOR AREA ALLOWANCES PER OCCUPANT

FUNCTION OF SPACE	FLOOR AREA IN SQ. FT. PER OCCUPANT
Covered mall building. Open air mall building	See Section 402.4.1

(Portions of Table not shown remain unchanged.)

Reason: Adds a line that directs the user to Chapter 4 when determining the occupant load of a covered mall building.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME:Rice-E6-Table 1004.1.1

E17–09/10
1004.3 (IFC [B] 1004.3)

Proponent: Lee Kranz representing Washington Association of Building Officials (WABO), Technical Code Development Committee

Revise as follows:

1004.3 (IFC [B] 1004.3) Posting of occupant load. Every room or space that is an assembly occupancy shall have the maximum occupant load of the room or space posted in a conspicuous place no more than 12 feet (3.66 m) above the floor, near the main exit or exit access doorway from the room or space. Posted signs shall be of ~~an approved legible~~ permanent design with letters and numbers not less than 1 inch (25 mm) high on a contrasting background and shall be maintained by the owner or authorized agent.

Reason: The term "approved legible design" for a maximum occupant load sign is ambiguous and creates unnecessary conflicts in the field, usually around the time when a certificate of occupancy is ready to be issued. The revised language creates a clear standard that will reduce disagreements and potential waste. The proposed language is similar to the text found in Section 1008.1.9.3.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: KRANZ-E1-1004.3.DOC

E18–09/10
1004.7 (IFC [B] 1004.7)

Proponent: Ed Roether, Populous (Formerly HOK Sport Venue Event), representing self

Revise as follows:

1004.7 (IFC [B] 1004.7) Fixed seating. For areas having fixed seats and aisles, the occupant load shall be determined by the number of fixed seats installed therein. The occupant load for areas in which fixed seating is not installed, such as waiting spaces ~~and wheelchair spaces~~, shall be determined in accordance with Section 1004.1.1 and added to the number of fixed seats.

The occupant load of wheelchair spaces and the associated companion seat shall be based on one occupant for each wheelchair space and one occupant for the associated companion seat provided in accordance with Section 1108.2.

For areas having fixed seating without dividing arms, the occupant load shall not be less than the number of seats based on one person for each 18 inches (457 mm)of seating length.

The occupant load of seating booths shall be based on one person for each 24 inches (610 mm) of booth seat length measured at the backrest of the seating booth.

Reason: A wheelchair space is required to have a minimum width of 33" and depth of 48" to be in compliance with ICC/ANSI A117.1. However, the minimum space required may be greater depending upon layout with the potential required size of a wheelchair space per ICC/ANSI A117.1 being 36" by 60". In addition, an unobstructed accessible route that is 36" wide is required to adjoin one side of the wheelchair space, so it requires at a minimum 33" by 36" and a maximum of 36" by 60" of additional space for each wheelchair space. Therefore, the minimum amount of space required for one wheelchair space is 19.25 square feet and the maximum amount of space required for one wheelchair space is 30 square feet. Since this wheelchair space is required to be "open" floor space, the floor area per occupant listed in Table 1004.1.1 is 5 square feet per occupant. This means that without this change 1004.7 would require between 4 and 6 occupants within a single wheelchair space and its adjacent accessible route. This is not how it is typically handled or enforced.

In addition, ICC/ANSI A117.1 allows the companion chairs to be movable, therefore the floor space needed for the movable chair would not have fixed seating. At a minimum, a companion chair will be 20" wide, so each companion chair and the respective accessible route for accessing the wheelchair space will take at least 20" by 84" of space, which is 11.67 square feet. This area would equate to at least 2 occupants per companion chair. A wheelchair space location with 8 wheelchair spaces and 8 companion chairs to be in compliance with Section 1108.2.2 would result in an occupant load of 16 per Section 1108.2.2. However, without this change the occupant load for this same space would be between 48 and 64 occupants even though Section 1108.2.2 requires 16. This many occupants would render this wheelchair seating area completely unusable by someone in a wheelchair. This proposal provides consistency between Sections 1004.7, 1108.2 and the approach that has historically been taken to occupant load within a wheelchair seating area.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Roether-E2-1004.7

E19–09/10
1004.8 (IFC [B] 1004.8)

Proponent: Eirene Oliphant, MCP, Building Official, representing Leawood, KS

Revise as follows:

1004.8 (IFC [B] 1004.8) Outdoor areas. Yards, patios, courts and similar outdoor areas accessible to and usable by the building occupants shall be provided with means of egress as required by this chapter. The occupant load of such outdoor areas shall be assigned by the building official in accordance with the anticipated use. Where outdoor areas are to be used by persons in addition to the occupants of the building, and the area is confined by barriers, ~~and the path of egress travel from the outdoor areas passes through the building,~~ means of egress ~~requirements for the building~~ shall be provided from the area without passing through the building. ~~based on the sum of the occupant loads of the building plus the outdoor areas~~.

Exceptions:

1. For areas not confined by barriers, the path of egress travel from the outdoor areas are permitted to pass through the building. Means of egress requirements for the building shall be based on the sum of the occupant loads of the building plus the outdoor areas.

~~1~~2. Outdoor areas used exclusively for service of the building need only have one means of egress.

~~2~~3. Both outdoor areas associated with Group R-3 and individual dwelling units of Group R-2.

Reason: With the increasing number of outdoor patios associated with restaurants, specifically raised patios requiring guard assemblies, our jurisdiction has concerns with allowing occupants of the patio area re-entering the building in the event of a fire. Why are we sending people into the building where the fire is most likely occurring? If the patio is at grade and not confined by guards, the occupants can very easily escape in the event of a fire. However, if we allow them to pass through the restaurant or force them to jump over a guard, we are increasing the degree of hazard for which they will be exposed. Is not the purpose of the code to safeguard the general welfare of the public? How is allowing the public to enter a building which is on fire providing that?

Cost Impact: The code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Oliphant-E1-1004.8

E20–09/10

1005.1, Table 1005.1 (New) [IFC [B] 1005.1, Table 1005.1(New)]; 3404.6, 3412.6.11, Table 3412.6.11(1) [IEBC [B] 303.6, 1301.6.11, Table 1301.6.11(1)]; IFC 4604.7, Table 4604.7

Proponent: David S. Collins, FAIA, The Preview Group, Inc., representing The American Institute of Architects

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE MEANS OF EGRESS COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

PART I – MEANS OF EGRESS

1. Revise as follows:

1005.1 (IFC [B] 1005.1) Minimum required egress width. The *means of egress* width shall not be less than required by ~~this section~~ Table 1005.1. ~~The total width of *means of egress* in inches (mm) shall not be less than the total *occupant load* served by the *means of egress* multiplied by 0.3 inches (7.62 mm) per occupant for stairways and by 0.2 inches (5.08 mm) per occupant for other egress components.~~ The minimum width shall not be less than specified elsewhere in this code. Multiple *means of egress* shall be sized such that the loss of any one *means of egress* shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any *story* of a building shall be maintained to the termination of the *means of egress*.

Exception: *Means of egress* complying with Section 1028.

2. Add new Table as follows:

TABLE 1005.1 (TABLE [B] 1005.1)
EGRESS WIDTH PER OCCUPANT SERVED

OCCUPANCY	WITHOUT SPRINKLER SYSTEM		WITH SPRINKLER SYSTEM[a]	
	Stairways (inches per occupant)	Other egress components (inches per occupant)	Stairways (inches per occupant)	Other egress components (inches per occupant)
Occupancies other than those listed below	0.3	0.2	0.2	0.15
Hazardous: H-1, H-2, H-3 and H-4	0.7	0.4	0.3	0.2
Institutional: I-2	NA	NA	0.3	0.2

For SI: 1 inch = 25.4 mm. NA = Not applicable.

a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

3. Delete without substitution:

~~**3404.6 (IEBC [B] 303.6) Means of egress capacity factors.** Alterations to any existing building or structure shall not be subject to the egress width factors in Section 1005.1 of the International Building Code for new construction in determining the minimum egress widths or the minimum number of exits in an existing building or structure. The minimum egress widths for the components of the means of egress shall be based on the means of egress width factors in the building code under which the building was constructed, and shall be considered as complying means of egress for any alteration if, in the opinion of the code official, they do not constitute a distinct hazard to life.~~

4. Revise as follows:

3412.6.11(IEBC [B] 1301.6.11) Means of egress capacity and number. Evaluate the means of egress capacity and the number of exits available to the building occupants. In applying this section, the means of egress are required to conform to the following sections of this code: 1003.7, 1004, 1005.1, 1014.2, 1014.3, 1015.2, 1021, 1024.1, 1027.2, 1027.6, 1028.2, 1028.3, 1028.4 and 1029 ~~[except that the minimum width required by this section shall be determined solely by the width for the required capacity in accordance with Table 3412.6.11(1)].~~ The number of exits credited is the number that is available to each occupant of the area being evaluated. Existing fire escapes shall be accepted as a component in the means of egress when conforming to Section 3406.

Under the categories and occupancies in Table 3412.6.11~~(2)~~, determine the appropriate value and enter that value into Table 3412.7 under Safety Parameter 3412.6.11, Means of Egress Capacity, for means of egress and general safety.

5. Delete without substitution:

~~TABLE 3412.6.11(1) (IEBC [B] 1301.6.11(1))~~
~~EGRESS WIDTH PER OCCUPANT SERVED~~

~~OCCUPANCY~~	~~WITHOUT SPRINKLER SYSTEM~~		~~WITH SPRINKLER SYSTEM[a]~~	
	~~Stairways (inches per occupant)~~	~~Other egress components (inches per occupant)~~	~~Stairways (inches per occupant)~~	~~Other egress components (inches per occupant)~~
~~Occupancies other than those listed below~~	~~0.3~~	~~0.2~~	~~0.2~~	~~0.15~~
~~Hazardous: H-1, H-2, H-3 and H-4~~	~~0.7~~	~~0.4~~	~~0.3~~	~~0.2~~
~~Institutional: I-2~~	~~NA~~	~~NA~~	~~0.3~~	~~0.2~~

~~For SI: 1 inch = 25.4 mm. NA = Not applicable.~~

~~a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.~~

6. Revise as follows:

TABLE 3412.6.11~~(2)~~ (IEBC [B] TABLE 1301.6.11~~(2)~~)
MEANS OF EGRESS VALUES
(No change to table)

PART II – IFC

Delete without substitution:

~~4604.7 Minimum required egress width.~~ ~~The means of egress width shall not be less than as required by the code under which constructed but not less than as required by this section. The total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by the factors in Table 4604.7 and not less than specified elsewhere in this section. Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any story of a building shall be maintained to the termination of the means of egress.~~

~~TABLE 4604.7~~
~~EGRESS WIDTH PER OCCUPANT SERVED~~

~~OCCUPANCY~~	~~WITHOUT SPRINKLER SYSTEM~~		~~WITH SPRINKLER SYSTEM[a]~~	
	~~Stairways (inches per occupant)~~	~~Other egress components (inches per occupant)~~	~~Stairways (inches per occupant)~~	~~Other egress components (inches per occupant)~~
~~Occupancies other than those listed below~~	~~0.3~~	~~0.2~~	~~0.2~~	~~0.15~~
~~Hazardous: H-1, H-2, H-3 and H-4~~	~~0.7~~	~~0.4~~	~~0.3~~	~~0.2~~
~~Institutional: I-2~~	~~NA~~	~~NA~~	~~0.3~~	~~0.2~~

~~For SI: 1 inch = 25.4 mm. NA = Not applicable.~~

~~a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.~~

(Renumber subsequent sections)

Reason: This change will undo what happened as a result of code change E19-07/08. The major issue was the elimination of the added capacity in buildings when they are protected by a sprinkler system. The proponents indicated that they felt that circumstances arise where the evacuation of a building may be necessary in circumstances where there is no threat of a fire.

While this undoubtedly is true, there is no record, nor were any offered as part of the supporting information for this change for any event or series of events causing a loss of life due to this modification to the fundamental capacity of each element of the means of egress. On the contrary, the record of life loss in buildings which are protected by fire suppression is remarkable.

Events such as earthquakes, and tornados and even terrorist attacks are not events that can be planned for. Hurricanes and floods are typically fairly well understood and can be planned for allowing persons to leave in an orderly fashion. However, these events pose little immediate threat to building occupants. Even though the WTC was attacked by airplanes, the NIST report states:

During the last 20 minutes before each building collapsed, the evacuation rate in both buildings had slowed to about one-fifth the immediately prior evacuation rate. ***This suggests that for <u>those seeking and able to reach and use undamaged exits and stairways, the egress capacity (number and width of exits and stairways) was adequate to accommodate survivors</u>.***

In the same NIST report it states that the building design was modified such that it:

Reduced the number of required stairwells from 6 to 3, and the size of doors leading to the stairs from 44 inches to 36 inches;

These changes were due to the change to the 1968 Port Authority Code allowing the same changes to the width of the stairs just removed from the IBC. Even under the most dire of circumstances, the reduced width of the elements of the means of egress in the WTC allowed "those seeking and able to reach and use undamaged exits and stairways, the egress capacity (number and width of exits and stairways) was adequate to accommodate survivors."

The impact of this change on buildings and building design is enormous, and couldn't have happened at a worse time for the construction industry. Standard elements of the means of egress which were typically modified to allow the sprinkler increases are now restricted as follows:

Sprinklered Doors – 36" ..... 34" clear .... 226 capacity
Unsprinklered Doors – 36" .... 34" clear .... 179 capacity

Sprinklered Stairs – 44" .... 220 capacity
Unsprinklered Stairs – 44" .... 146 capacity

Speculative office buildings which would have a single corridor, or open space and two exit stairs would have been allowed to serve a total capacity of 440 occupants; based on 100 sf. per occupant, the building could be built 44,000 sf. in area with a fire suppression system based strictly on means of egress capacity. Using the same scenario under the current IBC, the maximum occupant load served by the same door and stairs would be limited to 292 occupants; which would serve a total building area of 29,200 sf.

The result of this change will likely be less fire suppression in such office buildings as well, resulting in the following scenarios:

Office building

2009 IBC		2006 IBC	
2 exits 29,200 sf. in area	3 exits 43,800 sf. in area	2 exits 44,000 sf. in area	3 exits 66,000 sf. in area
3 stories Type IIB No fire suppression	3 stories Type IIB No fire suppression	4 stories Type IIB Fire suppression	4 stories Type IIB Fire suppression
3 stories Type IIIB No fire suppression	3 stories Type IIIA No fire suppression	4 stories Type IIIB Fire suppression	4 stories Type IIIA Fire suppression
5 stories Type IV No fire suppression	5 stories Type IV No fire suppression	6 stories Type IV Fire suppression	6 stories Type IV Fire suppression
3 stories Type VA No fire suppression	NP	4 stories Type VA Fire suppression	NP

In every case, the reductions from what was allowed in 2006 are marginal compared to what is allowed without fire suppression.15,000 sf per floor of leasable space for Types IIB, IIB, IV and VA construction has been traded for fire suppression. These smaller buildings are less economically viable and will not be built, and yet we know that with the incentives for use of sprinklers they are a rational and safe way to build. Today, they would be required to add a third stair to achieve the same leasable building area or widen the two stairs, which would also reduce the leasable space.

I believe approving this code change will undo what is a very regressive position for the IBC. We are penalizing the users and designers by removing the one life safety system we know works virtually every time, causing undue economic pressure on development at a time when it can least afford it.

Fewer and fewer states are seeing the economic advantage of tri-annual adoption of the ICC codes for various reasons. This is an unfortunate trend that is likely to cause an undoing of the joint efforts by industry and code officials to assure as much as possible a uniform set of standards for construction in the United States. This change forges a stand that indicates a more balanced and rational approach to safety in buildings. It recognizes the overwhelming benefits of fire safety protection as part of the design and operation of buildings.

Cost: This code change will reduce the cost of construction.

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Collins-E7-1005.1

E21–09/10

1005.1 (IFC [B] 1005.1); 3404.6, 3412.6.11, Table 3412.6.11(1) [IEBC [B] 303.6, 1301.6.11, Table 1301.6.11(1)]; IFC 4604.7, Table 4604.7

Proponent: Ray Grill, Arup, representing self

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE MEANS OF EGRESS COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

PART I – IBC MEANS OF EGRESS

Revise as follows:

1005.1 (IFC [B] 1005.1) Minimum required egress width. The means of egress width shall not be less than required by this section. The total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by 0.3 inches (7.62 mm) per occupant for stairways and by 0.2 inches (5.08 mm) per occupant for other egress components. The width shall not be less than specified elsewhere in this code. Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any story of a building shall be maintained to the termination of the means of egress.

~~Exception~~ Exceptions:

1. Means of egress complying with Section 1028.
2. For other than H and I-2 occupancies, the total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by 0.2 inches (5.1 mm) per occupant for stairways and by 0.15 inches (3.8 mm) per occupant for other egress components in buildings that are provided with sprinkler protection in accordance with 903.3.1.1 or 903.3.1.2 and an emergency voice/alarm communication system in accordance with 907.5.2.2.

~~**3404.6 (IEBC [B] 303.6) Means of egress capacity factors.** Alterations to any existing building or structure shall not be subject to the egress width factors in Section 1005.1 of the International Building Code for new construction in determining the minimum egress widths or the minimum number of exits in an existing building or structure. The minimum egress widths for the components of the means of egress shall be based on the means of egress width factors in the building code under which the building was constructed, and shall be considered as complying means of egress for any alteration if, in the opinion of the code official, they do not constitute a distinct hazard to life.~~

3412.6.11(IEBC [B] 1301.6.11) Means of egress capacity and number. Evaluate the means of egress capacity and the number of exits available to the building occupants. In applying this section, the means of egress are required to conform to the following sections of this code: 1003.7, 1004, 1005.1, 1014.2, 1014.3, 1015.2, 1021, 1024.1, 1027.2, 1027.6, 1028.2, 1028.3, 1028.4 and 1029 ~~[except that the minimum width required by this section shall be determined solely by the width for the required capacity in accordance with Table 3412.6.11(1)].~~ The number of exits credited is the number that is available to each occupant of the area being evaluated. Existing fire escapes shall be accepted as a component in the means of egress when conforming to Section 3406.

Under the categories and occupancies in Table 3412.6.11~~(2)~~, determine the appropriate value and enter that value into Table 3412.7 under Safety Parameter 3412.6.11, Means of Egress Capacity, for means of egress and general safety.

2. Delete without substitution:

~~**TABLE 3412.6.11(1) (IEBC [B] 1301.6.11(1))**~~
~~**EGRESS WIDTH PER OCCUPANT SERVED**~~

~~OCCUPANCY~~	~~WITHOUT SPRINKLER SYSTEM~~		~~WITH SPRINKLER SYSTEM[a]~~	
	~~Stairways (inches per occupant)~~	~~Other egress components (inches per occupant)~~	~~Stairways (inches per occupant)~~	~~Other egress components (inches per occupant)~~
~~Occupancies other than those listed below~~	~~0.3~~	~~0.2~~	~~0.2~~	~~0.15~~
~~Hazardous: H-1, H-2, H-3 and H-4~~	~~0.7~~	~~0.4~~	~~0.3~~	~~0.2~~
~~Institutional: I-2~~	~~NA~~	~~NA~~	~~0.3~~	~~0.2~~

~~For SI: 1 inch = 25.4 mm. NA = Not applicable.~~

~~a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.~~

Revise as follows:

TABLE 3412.6.11~~(2)~~ (IEBC [B] TABLE 1301.6.11~~(2)~~)
MEANS OF EGRESS VALUES
(No change to table)

PART II – IFC

Delete without substitution:

~~**4604.7 Minimum required egress width.** The means of egress width shall not be less than as required by the code under which constructed but not less than as required by this section. The total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by the factors in Table 4604.7 and not less than specified elsewhere in this section. Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any story of a building shall be maintained to the termination of the means of egress.~~

~~**TABLE 4604.7**~~
~~**EGRESS WIDTH PER OCCUPANT SERVED**~~

~~OCCUPANCY~~	~~WITHOUT SPRINKLER SYSTEM~~		~~WITH SPRINKLER SYSTEM[a]~~	
	~~Stairways (inches per occupant)~~	~~Other egress components (inches per occupant)~~	~~Stairways (inches per occupant)~~	~~Other egress components (inches per occupant)~~
~~Occupancies other than those listed below~~	~~0.3~~	~~0.2~~	~~0.2~~	~~0.15~~
~~Hazardous: H-1, H-2, H-3 and H-4~~	~~0.7~~	~~0.4~~	~~0.3~~	~~0.2~~
~~Institutional: I-2~~	~~NA~~	~~NA~~	~~0.3~~	~~0.2~~

~~For SI: 1 inch = 25.4 mm. NA = Not applicable.~~
~~a. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.~~

(Renumber subsequent sections)

Reason: The egress factors for sprinklered buildings were eliminated during the last cycle with no technical justification. The exception reinstates the egress factors for sprinklers buildings but also would require an emergency voice/alarm communication system (EVAC) to be provided.

The EVAC system provides the ability to communicate instructions to occupants that would facilitate evacuation or relocation that may be necessary in fire or other emergencies. This would also lead to more efficient use of the egress system.

The original submitter of this code change had also submitted a code change (E17-07/08) to reduce the occupant load in office buildings by changing the occupant load factor from 1/100 sq.ft. to 1/175 sq.ft. The change in occupant load factor was rejected even though that proposal had a scientific study published by NIST to back the proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Grill-E1-1005.1

E22–09/10

1004.5, 1005.1 (IFC [B] 1004.5, 1005.1)

Proponent: Lawrence G. Perry, AIA, representing Building Owners and Managers Association (BOMA) International

Revise as follows:

~~**1005.1 (IFC [B] 1005.1) Minimum required egress width.** The means of egress width shall not be less than required by this section. The total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by 0.3 inches (7.62 mm) per occupant for stairways and by 0.2 inches (5.08 mm) per occupant for other egress components. The width shall not be less than specified elsewhere in this code. Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any story of a building shall be maintained to the termination of the means of egress.~~

~~**Exception:** Means of egress complying with Section 1028.~~

1005.1 (IFC [B] 1005.1) General. The means of egress shall be sized in accordance with this section.

Exception: Means of egress complying with Section 1028.

1005.2 (IFC [B] 1005.2) Minimum width based on component. The width of egress components shall not be less than specified elsewhere in this code.

1005.3 (IFC [B] 1005.3) Capacity based on occupant load. The means of egress for any floor, room, or story shall be sized to accommodate the total occupant load, as determined by Section 1004, in accordance with the following:

1005.3.1 (IFC [B] 1005.3.1) Stairways. The capacity of means of egress stairways shall be calculated using a factor of 0.3 inches (7.62 mm) of width per person.

1005.3.2 (IFC [B] 1005.3.2) Other egress components. The capacity of means of egress components other than stairways shall be calculated using a factor of 0.2 inches (5.08 mm) of width per person.

1005.4 (IFC [B] 1005.4) Capacity based on egress path. The capacity of the means of egress required from any story of a building shall be maintained to the termination of the means of egress.

1005.5. (IFC [B] 1005.5) Distribution of egress capacity. Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity.

1005.6 (IFC [B] 1005.6) Egress convergence. Where means of egress from floors above and below converge at an intermediate level, the capacity of the means of egress from the point of convergence shall not be less than the sum of the two floors.

(Renumber subsequent sections.)

Delete without substitution:

~~**1004.5 (IFC [B] 1004.5) Egress convergence.** Where means of egress from floors above and below converge at an intermediate level, the capacity of the means of egress from the point of convergence shall not be less than the sum of the two floors.~~

(Renumber subsequent sections.)

Reason: This proposal seeks to editorially reorganize and clarify the multiple requirements related to 'egress width' currently contained in a single paragraph in 10051, and to relocate a related provision from 1004.5 to a more logical location with other egress width/capacity provisions. No technical changes are intended by this change.

1005.1 creates a new charging paragraph.

1005.2 replaces the current second sentence of 1005.1, noting that minimum width requirements for means of egress components may be specified in other locations in the code.

1005.3 is consistent with the current egress width factors, but reorganizes the text to clarify that the total occupant load (which is determined in Section 1004) drives the capacity for which the egress width must be provided. The new text also clearly states that egress width/capacity is determined on a floor, room, and story basis.

1005.4 replaces the last sentence of current 1005.1, and notes that once a minimum capacity is required along a means of egress, it must be provided along the entire path of egress travel.

1005.5 is consistent with the current 4th sentence of 1005.1.
1005.6 relocates the provision for 'egress convergence' from 1004.5. This is really an issue of egress capacity/width, and should more appropriately be located here, instead of buried in a section on occupant load.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Perry-E1-1005.1

E23–09/10
1005.1 (IFC [B] 1005.1)

Proponent: Maureen Traxler representing Washington Association of Building Officials Technical Code Development Committee

Revise as follows:

1005.1 (IFC [B] 1005.1) Minimum required egress width. The means of egress width shall not be less than required by this section. The total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by 0.3 inches (7.62 mm) per occupant for stairways and by 0.2 inches (5.08 mm) per occupant for other egress components. The width shall not be less than specified elsewhere in this code. <u>The width of exit access doorways shall not be less than the width required for doors in Section 1008.</u> Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any story of a building shall be maintained to the termination of the means of egress.

Exception: Means of egress complying with Section 1028.

Reason: The IBC lacks a reasonable provision for minimum width of exit access doorways. The factors in Section 1005.1 only make sense when they are applied to situations where another code section sets forth a minimum width for an egress element, but a high number of occupants would use that element. For example, Section 1018.2 sets forth minimum corridor widths, but also states that the width shall not be less than allowed by Section 1005.1. Section 1018.2 establishes 44 inches as the minimum for most corridors, but if the corridor serves an occupant load of 300, Section 1005.1 would require 60 inches. However, the only section that addresses minimum widths for exit access doorways is 1005.1 which can produce some unacceptable results. For example, if a doorway from a space serves 50 people, Section 1005.1 says the minimum width is 10 inches.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TRAXLER-E1-1005.1

E24–09/10
1005.2, 1005.2.1(New), 1005.2.2(New), 1005.2.3(New), 1005.3, 1017.1, 1018.2, 1018.3, 1023.2, 1027.5.1; (IFC [B] 1005.2, 1005.2.1(New), 1005.2.2(New), 1005.2.3(New), 1005.3, 1017.1, 1018.2, 1018.3, 1023.2, 1027.5.1)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

1. Revise as follows:

1005.2 (IFC [B] 1005.2) ~~Door~~ Encroachment. <u>Encroachments into the required means of egress width shall be in accordance with the provisions of this section.</u>

<u>1005.2.1 (IFC [B] 1005.2.1) Doors</u>. Doors, when fully opened, ~~and handrails~~ shall not reduce the required width by more than 7 inches (178 mm). Doors in any position shall not reduce the required width by more than one-half. ~~Other nonstructural projections such as trim and similar decorative features shall be permitted to project into the required width a maximum of 1½ inches (38 mm) on each side.~~

~~Exception~~ <u>Exceptions:</u>

1. Surface-mounted latch release hardware shall be exempt from inclusion in the 7- inch maximum (178 mm) encroachment where:
   1.1. The hardware is mounted to the side of the door facing away from the adjacent wall where the door is in the open position; and,
   1.2. The hardware is mounted not less than 34 inches (865mm) nor more than 48 inches (1220 mm) above the finished floor.
2. The restrictions on ~~a~~ door swing shall not apply to doors within individual dwelling units and sleeping units of Group R-2 occupancies and dwelling units of Group R-3 occupancies.

2. Add new text as follows:

1005.2.2 (IFC [B] 1005.2.2) Other projections. Handrail projections shall be in accordance with the provisions of Section 1012.8. Other nonstructural projections such as trim and similar decorative features shall be permitted to project into the required width a maximum of 1½ inches (38 mm) on each side.

1005.2.3 (IFC [B] 1005.2.3) Protruding objects. Protruding objects shall comply with the applicable requirements of Section 1003.3.

3. Delete without substitution:

~~**1005.3 (IFC [B] 1005.3) Door hardware encroachment.** Surface-mounted latch release hardware shall be exempt from inclusion in the 7- inch maximum (178 mm) projection requirement of Section 1005.2 when:~~

~~1. The hardware is mounted to the side of the door facing the corridor width when the door is in the open position; and~~
~~2. The hardware is mounted not less than 34 inches (865mm) or more than 48 inches (1220 mm) above the finished floor.~~

4. Revise as follows:

1017.1 (IFC [B] 1017.1) General. Aisles serving as a portion of the exit access in the means of egress system shall comply with the requirements of this section. Aisles shall be provided from all occupied portions of the exit access which contain seats, tables, furnishings, displays and similar fixtures or equipment. Aisles serving assembly areas shall comply with Section 1028. Aisles serving reviewing stands, grandstands and bleachers shall also comply with Section 1028. The required width of aisles shall be unobstructed.

Exception: ~~Doors~~ Encroachments complying with Section 1005.2.

1018.2 (IFC [B] 1018.2) ~~Corridor~~ Width. The minimum ~~corridor~~ width of corridors shall be as determined in Section 1005.1, but not less than 44 inches (1118 mm).

Exceptions:

1. Twenty-four inches (610 mm)—For access to and utilization of electrical, mechanical or plumbing systems or equipment.
2. Thirty-six inches (914 mm)—With a required occupant capacity of less than 50.
3. Thirty-six inches (914mm)—Within a dwelling unit.
4. Seventy-two inches (1829 mm)—In Group E with a corridor having a required capacity of 100 or more.
5. Seventy-two inches (1829 mm)—In corridors and areas serving gurney traffic in occupancies where patients receive outpatient medical care, which causes the patient to be not capable of self-preservation.
6. Ninety-six inches (2438 mm)—In Group I-2 in areas where required for bed movement.

1018.3 (IFC [B] 1018.3) ~~Corridor~~ Obstruction. The required width of corridors shall be unobstructed.

Exception: ~~Doors~~ Encroachments complying with Section 1005.2.

1023.2 (IFC [B] 1023.2) Width. The minimum width of exit passageways shall be determined as specified in Section 1005.1 but such width shall not be less than 44 inches (1118 mm), except that exit passageways serving an occupant load of less than 50 shall not be less than 36 inches (914 mm) in width. The required width of exit passageways shall be unobstructed.

Exception: ~~Doors~~ Encroachments complying with Section 1005.2.

1027.5.1 (IFC [B] 1027.5.1) Width. The minimum width of egress courts shall be determined as specified in Section 1005.1, but such width shall not be less than 44 inches (1118 mm), except as specified herein. Egress courts serving Group R-3 and U occupancies shall not be less than 36 inches (914 mm) in width. The required width of egress courts shall be unobstructed to a height of 7 feet (2134 mm).

Exception: ~~Doors~~ Encroachments complying with Section 1005.2.

Where an egress court exceeds the minimum required width and the width of such egress court is then reduced along the path of exit travel, the reduction in width shall be gradual. The transition in width shall be affected by a guard not less than 36 inches (914 mm) in height and shall not create an angle of more than 30 degrees (0.52 rad) with respect to the axis of the egress court along the path of egress travel. In no case shall the width of the egress court be less than the required minimum.

Reason: This proposal is intended to clarify required width encroachment provisions. Current encroachment provisions have been reorganized into two categories: Doors and other projections. Minor editorial changes have been made in a few locations. For instance, the width determination requirements for corridors, exit passageways and egress courts have been correlated so as to contain identical charging language. It is not the intention of this proposal to change any current technical requirement. This format will coordinate with various means of egress component width provisions that generally reference Section 1005.2. Additionally, it provides a tie to Section 1003.3 that provides related requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Keith-E6-1005.2

E25–09/10

1005.2, 1005.4 (New), 1009.1, 1009.5, 1010.5.3, 1012.8, 1028.6 (IFC [B] 1005.2, 1005.4 (New), 1009.1, 1009.5, 1010.5.3, 1012.8, 1028.6)

Proponent: Ed Roether, Populous (Formerly HOK Sport Venue Event), representing self

1. Revise as follows:

1005.1 (IFC [B] 1005.1) Minimum required egress width. The means of egress width shall not be less than required by this section. The total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by 0.3 inches (7.62 mm) per occupant for stairways and 0.2 inches (5.08 mm) per occupant for other egress components. The width shall not be less than specified elsewhere in this code. Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any story of a building shall be maintained to the termination of the means of egress.

Exception: Means of egress complying with Section 1028.

1005.2 (IFC [B] 1005.2) Door encroachment. Doors, when fully opened~~, and handrails~~ shall not reduce the required means of egress width by more than 7 inches (178 mm). Doors in any position shall not reduce the required width by more than one-half. ~~Other nonstructural projections such as trim and similar decorative features shall be permitted to project into the required width a maximum of 1 1/2 inches (38 mm) on each side.~~

Exception: The restrictions on a door swing shall not apply to doors within individual dwelling units and sleeping units of Group R-2 and dwelling units of Group R-3.

1005.3 (IFC [B] 1005.3) Door Hardware encroachment. Surface-mounted latch release hardware shall be exempt from inclusion in the 7-inch (178 mm) maximum projection requirement of Section 1005.2 when:

1. The hardware is mounted to the side of the door facing the corridor width when the door is in the open position; and
2. The hardware is mounted not less than 34 inches (865 mm) or more than 48 inches (1220 mm) above the finished floor.

2. Add new text as follows:

1005.4 (IFC [B] 1005.4) Projections. Handrail projections into the required means of egress width of stairways and ramps at each handrail not exceeding 4.5 inches (114 mm) at or below the handrail height shall be permitted. Projections into the required means of egress width shall not be limited above the minimum headroom height required in Section 1003.2. Other nonstructural projections such as trim and similar decorative features shall be permitted to project into the required means of egress width a maximum of 1 1/2 inches (38 mm) on each side.

3. Revise as follows:

1009.1 (IFC [B] 1009.1) Stairway width. The width of stairways shall be determined as specified in Section 1005.1, but such width shall not be less than 44 inches (1118 mm). See Section 1007.3 for accessible means of egress stairways.

Exceptions:

1. Stairways serving an occupant load of less than 50 shall have a width of not less than 36 inches (914 mm).
2. Spiral stairways as provided for in Section 1009.9.
3. Aisle stairs complying with Section 1028.
4. Where an incline platform lift or stairway chairlift is installed on stairways serving occupancies in Group R-3, or within dwelling units in occupancies in Group R-2, a clear passage width not less than 20 inches (508 mm) shall be provided. If the seat and platform can be folded when not in use, the distance shall be measured from the folded position.
5. Projections into the required stairway width in accordance with Section 1005.4 shall be permitted.

1009.5 (IFC [B] 1009.5) Stairway landings. There shall be a floor or landing at the top and bottom of each stairway. The width of landings shall not be less than the width of stairways they serve. Every landing shall have a minimum dimension measured in the direction of travel equal to the width of the stairway. Such dimension need not exceed 48 inches (1219 mm) where the stairway has a straight run. Doors opening onto a landing shall not reduce the landing to less than one-half the required width. When fully open, the door shall not project more than 7 inches (178 mm) into a landing. When wheelchair spaces are required on the stairway landing in accordance with Section 1007.6.1, the wheelchair space shall not be located in the required width of the landing and doors shall not swing over the wheelchair spaces.

~~Exception~~ Exceptions:

1. Aisle stairs complying with Section 1028.
2. Projections into the required landing width in accordance with Section 1005.4 shall be permitted.

1010.5 (IFC [B] 1010.5) Minimum dimensions. The minimum dimensions of means of egress ramps shall comply with Sections 1010.5.1 through 1010.5.3.

1010.5.1 (IFC [B] 1010.5.1) Width. The minimum width of a means of egress ramp shall not be less than that required for corridors by Section 1018.2. The clear width of a ramp between handrails, if provided, or other permissible projections shall be 36 inches (914 mm) minimum.

1010.5.2 (IFC [B] 1010.5.2) Headroom. The minimum headroom in all parts of the means of egress ramp shall not be less than 80 inches (2032 mm).

1010.5.3 (IFC [B] 1010.5.3) Restrictions. Means of egress ramps shall not reduce in width in the direction of egress travel. Projections into the required ramp and landing width are prohibited. Doors opening onto a landing shall not reduce the clear width to less than 42 inches (1067 mm).

Exception: Projections into the required means of egress width in accordance with Section 1005.4 shall be permitted.

4. Delete without substitution:

~~**1012.8 (IFC [B] 1012.8) Projections.** On ramps, the clear width between handrails shall be 36 inches (914 mm) minimum. Projections into the required width of stairways and ramps at each handrail shall not exceed 4.5 inches (114~~

~~mm) at or below the handrail height. Projections into the required width shall not be limited above the minimum headroom height required in Section 1009.2.~~

5. Revise as follows:

1028.6 (IFC [B] 1028.6) Width of means of egress for assembly. The clear width of aisles and other means of egress shall comply with Section 1028.6.1 where smoke-protected seating is not provided and with Section 1028.6.2 or 1028.6.3 where smoke-protected seating is provided. The clear width shall be measured to walls, edges of seating and tread edges ~~except for permitted projections~~.

Exception: Projections into the required aisle and other means of egress width in accordance with Section 1005.4 shall be permitted.

Reason: Handrail projections into the required means of egress width is more appropriately located in Section 1005. Also, handrails and other nonstructural projections should be relocated from door encroachment and clear width between handrails for ramps is already covered by Section 1010.5.1. Therefore, this proposal combines both the handrail projections and nonstructural projections into a new projections section under means of egress width and the duplicative clear ramp width requirement was eliminated. This proposal does not reduce the minimum ramp width requirements of Section 1010.5.1. It clarifies that handrails can project into the required means of egress width to the extent that it would not be in conflict with Section 1010.5.1. Changes to stairways and assembly aisles, where handrails are most commonly found, are revised for consistency.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Roether-E3-1005.2

E26–09/10
1006.3, 1006.4 (IFC [B] 1006.3, 1006.4)

Proponent: Manny Muniz, California Deputy State Fire Marshal (Ret.), representing self

Revise as follows:

1006.3 (IFC [B] 1006.3) Illumination emergency power. The power supply for means of egress illumination shall normally be provided by the premises' electrical supply.

In the event of power supply failure, an emergency electrical system shall automatically illuminate the following areas:

1. Aisles and unenclosed egress stairways in rooms and spaces that require two or more means of egress.
2. Corridors, exit enclosures and exit passageways in buildings required to have two or more exits.

   Exception: When approved by the building official, approved luminous egress path marking listed and labeled in accordance with UL 1994 and installed in accordance with the manufacturer's instructions shall be permitted to be used.

3. Exterior egress components at other than their levels of exit discharge until exit discharge is accomplished for buildings required to have two or more exits.
4. Interior exit discharge elements, as permitted in Section 1027.1, in buildings required to have two or more exits.
5. Exterior landings, as required by Section 1008.1.6, for exit discharge doorways in buildings required to have two or more exits.

The emergency power system shall provide power for a duration of not less than 90 minutes and shall consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Chapter 27.

1006.4 (IFC [B] 1006.4) Performance of system. Emergency lighting facilities shall be arranged to provide initial illumination that is at least an average of 1 foot-candle (11 lux) and a minimum at any point of 0.1 foot-candle (1 lux) measured along the path of egress at floor level. Illumination levels shall be permitted to decline to 0.6 foot-candle (6

lux) average and a minimum at any point of 0.06 foot-candle (0.6 lux) at the end of the emergency lighting time duration. A maximum-to-minimum illumination uniformity ratio of 40 to 1 shall not be exceeded.

Exception: When luminous egress path marking listed and labeled in accordance with UL 1994 is approved for use, it shall be continuous except as interrupted by doorways, corridors or other such architectural features in order to provide a visible delineation along the path of travel.

Reason: Means of egress illumination is intended to allow people to visibly see the means of egress by providing 1 foot-candle at the walking surface of a continuous and unobstructed path of vertical and horizontal egress travel from any occupied portion of a building or structure to a public way. This typically is accomplished with emergency light units that have a battery back-up.
Full scale tests conducted by the National Research Council of Canada and Public Works and Government Services Canada in 2006 by Dr. G. Proulx, Dr. N. Bénichou, Dr. J.K. Hum and Dr. K.N. Restivo at a 13 story office building in downtown Ottawa, Canada indicate that there may be a better and more cost-effective way to help people get out of a building.

"Comparative studies found that photoluminescent material could provide an acceptable alternative to conventional emergency lighting. Findings also indicated that the material provided a high level of performance when installed in stairwells. It was also found that low-level lighting wayguidance systems performed better than conventional emergency lighting. Studies with smoke concluded that the continuity of information of photoluminescent lines ensured an uninterrupted visual reinforcement, which provided a significant advantage over conventional emergency lighting, which became obscured by the smoke. Other advantages of the material were its easy installation in new or existing buildings, its cost-effectiveness and its low maintenance."

"This study's findings show the interesting potential of photoluminescent signage to assist occupant evacuation. Such signage, properly installed, can address certain deficiencies in the traditional approach of emergency lighting associated with power failure or smokelogging of high-mounted luminaires. In order to obtain the expected outcome though, it is essential to properly install the signs, material and wayguidance components. Setting up a PLM wayfinding system appears as a cost-effective addition to, or even a potential replacement for, traditional electrical emergency lighting, since it does not consume energy, requires no wiring, minimum maintenance, and is completely reliable provided it is installed in locations where sufficient activation is ensured from normal illumination maintained on the evacuation route. The occupants' behaviour, their speed of movement and their subjective appraisal of the material are all in concordance to indicate that PLM signs and safety wayguidance system could be a worthwhile addition improving occupant fire safety in office buildings."

403.5.5 of the 2009 IBC and 4604.23 of the 2009 IFC already require such non-electrical luminous egress path marking systems in all new and existing buildings of Groups A, B, E, I, M and R-1 having occupied floors located more than 75 feet above the lowest level of fire department vehicle access. A key reason the ICC voting membership voted to require non-electrical luminous egress path marking systems was to insure that the egress path was visible under normal, emergency and total blackout lighting conditions so as to not rely on battery or generator backup systems that sometimes fail during an emergency.

Given that 1003.6 of the 2009 IBC and IFC already requires that "Obstructions shall not be placed in the required width of a means of egress except projections permitted by this chapter.", the only thing that needs to be visible is the path of egress travel.

This will allow the building official to approve systems on a case by case basis as deemed appropriate as long as the luminous egress path marking system has been tested for such use in accordance with UL 1994.

A copy of this study, "Evaluation of the Effectiveness of Different Photoluminescent Stairwell Installations for the Evacuation of Office Building Occupants" has been submitted to ICC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Muniz-E1-1006.3

E27–09/10
1006.3 (IFC [B] 1006.3)

Proponent: Alex Boesenberg representing National Electrical Manufacturers Association

Revise as follows:

1006.3 (IFC [B] 1006.3) Illumination emergency power. The power supply for means of egress illumination shall normally be provided by the premises' electrical supply.

In the event of power supply failure, an emergency electrical system shall automatically illuminate all of the following areas:

1. Aisles and unenclosed egress stairways in rooms and spaces that require two or more means of egress.
2. Corridors, exit enclosures and exit passageways in buildings required to have two or more exits.
3. Exterior egress components at other than their levels of exit discharge until exit discharge is accomplished for buildings required to have two or more exits.
4. Interior exit discharge elements, as permitted in Section 1027.1, in buildings required to have two or more exits.
5. Exterior landings as required by Section 1008.1.6 for exit discharge doorways in buildings required to have two or more exits.

6. Electrical rooms containing panelboards, distribution boards, switchboards, control centers and similar equipment rated 200 amperes or above.

The emergency power system shall provide power for a duration of not less than 90 minutes and shall consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Chapter 27.

Reason: This proposal will add electrical rooms to those spaces and areas requiring emergency lighting. Electrical rooms and areas containing the equipment described pose a unique hazard for anyone in this area. Panelboards, distribution boards, switchboards, control centers, etc. are capable of releasing tremendous amounts of energy under fault conditions, including extremely elevated temperatures, pressure waves, sound waves, molten metal, and flying objects. Compounding the hazard is that such an event often leaves the electrical room or area, and anyone in the vicinity, in complete darkness. Anyone working on or near the equipment in such a circumstance may be suffering from burns, vision loss, hearing loss, injury from flying objects, and disorientation. It is imperative that there be sufficient light so any injured person can locate and access a means to escape the area and seek help or, in a worst case scenario, allow rescue workers to quickly locate and evacuate injured persons from the area.

There are numerous cases of such catastrophic failures that leave the room or area in total darkness. Many of these instances have been documented by security cameras and can be viewed on public sites such as You-tube. The small expense of providing a minimal level of lighting can easily save a life or minimize injury. The requirement can be met by the installation of inexpensive unit lighting with integral backup power, or through the building's emergency power supply if so equipped.

Cost Impact: This proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOESENBERG-E1-1006.3

E28–09/10
1006.3, 1006.4 (IFC [F] 1006.3, 1006.4)

Proponent: Gene Boecker, Code Consultants, Inc., representing Code Consultants, Inc.

Revise as follows:

1006.3 (IFC [B] 1006.3) ~~Illumination~~ Emergency power. The power supply for *means of egress* illumination shall normally be provided by the premises' electrical supply.

In the event of power supply failure, an emergency electrical system shall automatically illuminate all of the following areas:

1. *Aisles* and unenclosed egress *stairways* in rooms and spaces that require two or more *means of egress*.
2. *Corridors*, *exit enclosures* and *exit passageways* in buildings required to have two or more *exits*.
3. Exterior egress components at other than their *levels of exit discharge* until *exit discharge* is accomplished for buildings required to have two or more *exits*.
4. Interior *exit discharge* elements, as permitted in Section 1027.1, in buildings required to have two or more *exits*.
5. Exterior landings as required by Section 1008.1.6 for *exit discharge* doorways in buildings required to have two or more *exits*.

The emergency power system shall provide power for a duration of not less than 90 minutes and shall consist of storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Chapter 27.

~~1006.4~~ 1006.3.1 (IFC [B] ~~1006.4~~ 1006.3.1) ~~Performance of system~~ Illumination level. Emergency lighting facilities shall be arranged to provide initial illumination that is at least an average of 1 foot-candle (11 lux) and a minimum at any point of 0.1 foot-candle (1 lux) measured along the path of egress at floor level. Illumination levels shall be permitted to decline to 0.6 foot-candle (6 lux) average and a minimum at any point of 0.06 foot-candle (0.6 lux) at the end of the emergency lighting time duration. A maximum-to-minimum illumination uniformity ratio of 40 to 1 shall not be exceeded.

Reason: The proposed code change eliminates confusion between Section 1006.2 and 1006.4. Section 1006.2 states that the lighting must be at least 1 foot candle when Section 1006.4 states an average. As currently written, Sections 1006.2 and 1006.4 have the same hierarchy in the Section. This leads to confusion as to which is applicable. Although the terms used in 1006.4 say "emergency lighting" it is often misunderstood as being applicable whenever a facility is subject to emergency lighting and not the specific characteristics of the lights during the emergency lighting scenario.

By making the provisions in [current] Section 1006.4 subordinate to the emergency lighting section, it clarifies the fact that the averaging method for determining compliance is only applicable to those systems with emergency power requirements; and, that the minimums in Section 1006.2 apply to "normal" lighting conditions.

The suggested change to the heading/title of Section 1006.3 makes it easier to grasp what the subject matter is; and, since the entire Section (1006) is about "illumination" it reduces redundancy in wording.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Boecker-E1-1006.2_1006.4

E29–09/10
1006.4 (IFC [B] 1006.4)

Proponent: Ken Brouillette, representing City of Puyallup Washington

Revise as follows:

1006.4 (IFC [B] 1006.4) Performance of system. Emergency lighting facilities shall be arranged to provide initial illumination that is at least an average of 1 foot-candle (11 lux) and a minimum at any point of 0.1 foot-candle (1 lux) measured along the path of egress at floor level. Illumination levels shall be permitted to decline to 0.6 foot-candle (6 lux) average and a minimum at any point of 0.06 foot-candle (0.6 lux) at the end of the emergency lighting time duration. A maximum-to-minimum illumination uniformity ratio of 40:1 shall not be exceeded.

Exception: In a single story building equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 the emergency lighting facilities shall be permitted to be arranged to provide initial illumination that is at least an average of 0.5 foot-candle (5 lux) and a minimum at any point of 0.1 foot-candle (1 lux) measured along the path of egress at floor level. Illumination levels shall be permitted to decline to 0.3 foot-candle (3 lux) average and a minimum at any point of 0.06 foot-candle (0.6 lux) at the end of the emergency lighting time duration. A maximum-to-minimum illumination uniformity ratio of 40:1 shall not be exceeded.

Reason: Fire sprinkler tests have indicated that the level of smoke during evacuation is substantially decreased following the activation of an approved automatic fire sprinkler system. I have conducted many illumination tests in my jurisdiction and had to upgrade the emergency lighting facilities to comply with the current code language. This reduction will allow for adequate emergency lighting for evacuating.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Brouillette-E1-1006.4

E30–09/10
1007 (IFC [B] 1007)

Proponent: Rick Lupton, City of Seattle, representing Seattle Dept of Planning & Development

Revise as follows:

1007.1 (IFC [B] 1007.1) Accessible means of egress required. Accessible means of egress shall comply with this section. Accessible spaces shall be provided with not less than one accessible means of egress. Where more than one means of egress are required by Section 1015.1 or 1021.1 from any accessible space, each accessible portion of the space shall be served by not less than two accessible means of egress.

Exceptions:

1. Accessible means of egress are not required in alterations to existing buildings.
2. One accessible means of egress is required from an accessible mezzanine level in accordance with Section ~~1007.3~~ 1007.6, ~~1007.4~~ 1007.7 or ~~1007.5~~ 1007.8.
3. In assembly areas with sloped or stepped aisles, one accessible means of egress is permitted where the common path of travel is accessible and meets the requirements in Section 1028.8.

1007.1.1 (IFC [B] 1007.1.1) Elevators required. In buildings where a required accessible floor is four or more stories above or below a level of exit discharge, at least one required accessible means of egress shall be an elevator complying with Section 1007.7.

Exceptions:

1. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, an elevator shall not be required as an accessible means of egress on floors provided with a horizontal exit and located at or above the levels of exit discharge.
2. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, an elevator shall not be required as an accessible means of egress on floors provided with a ramp conforming to the provisions of Section 1010.

1007.2 (IFC [B] 1007.2) Continuity and components. Each required accessible means of egress shall be continuous to a public way and the components shall ~~consist of one or more of the following components:~~ comply with Sections 1007.3 through 1007.14

~~1. Accessible routes complying with Section 1104.~~
~~2. Interior exit stairways complying with Sections 1007.3 and 1022.~~
~~3. Exterior exit stairways complying with Sections 1007.3 and 1026.~~
~~4. Elevators complying with Section 1007.4.~~
~~5. Platform lifts complying with Section 1007.5.~~
~~6. Horizontal exits complying with Section 1025.~~
~~7. Ramps complying with Section 1010.~~
~~8. Areas of refuge complying with Section 1007.6.~~

Exceptions:

1. Where the exit discharge is not accessible, an exterior area for assisted rescue shall be provided in accordance with Section ~~1007.7~~ 1007.10.
2. Where the exit stairway is open to the exterior, the accessible means of egress shall include either an area of refuge in accordance with Section ~~1007.6~~ 1007.9 or an exterior area for assisted rescue in accordance with Section ~~1007.7~~ 1007.10.

~~**1007.2.1 (IFC [B] 1007.2.1) Elevators required.** In buildings where a required accessible floor is four or more stories above or below a level of exit discharge, at least one required accessible means of egress shall be an elevator complying with Section 1007.4.~~

~~**Exceptions:**~~

~~1. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a horizontal exit and located at or above the levels of exit discharge.~~
~~2. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a ramp conforming to the provisions of Section 1010.~~

1007.3 (IFC [B] 1007.3) Accessible route of travel. An accessible route of travel shall be in accordance with Section 1104 and ICC A117.1.

1007.4 (IFC [B] 1007.4) Ramps. A ramp shall be in accordance with Section 1010.

1007.5 (IFC [B] 1007.5) Horizontal exits. A horizontal exit shall be in accordance with Section 1025.

~~1007.3~~ 1007.6 (IFC [B] ~~1007.3~~ 1007.6) Stairways. In order to be considered part of an accessible means of egress, an exit access stairway as permitted by Section 1016.1 or exit stairway shall have a clear width of 48 inches (1219 mm) minimum between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section ~~1007.6~~ 1007.9 or a horizontal exit.

Exceptions:

1. The area of refuge is not required at open exit access or exit stairways as permitted by Sections 1016.1 and 1022.1 in buildings that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
2. The clear width of 48 inches (1219 mm) between handrails is not required at exit access stairways as permitted by Section 1016.1or exit stairways in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Areas of refuge are not required at exit stairways in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
4. The clear width of 48 inches (1219 mm) between handrails is not required for exit stairways accessed from a horizontal exit.
5. Areas of refuge are not required at exit stairways serving open parking garages.
6. Areas of refuge are not required for smoke protected seating areas complying with Section 1028.6.2.
7. The areas of refuge are not required in Group R-2 occupancies.

~~1007.4~~ **1007.7 (IFC [B] ~~1007.4~~ 1007.7) Elevators.** In order to be considered part of an accessible means of egress, an elevator shall comply with the emergency operation and signaling device requirements of Section 2.27 of ASME A17.1. Standby power shall be provided in accordance with Chapter 27 and 3003. The elevator shall be accessed from either an area of refuge complying with Section ~~1007.6~~ 1007.9 or a horizontal exit.

Exceptions:

1. Elevators are not required to be accessed from an area of refuge or horizontal exit in open parking garages.
2. Elevators are not required to be accessed from an area of refuge or horizontal exit in buildings and facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Elevators not required to be located in a shaft in accordance with Section 708.2 are not required to be accessed from an area of refuge or horizontal exit.
4. Elevators are not required to be accessed from an area of refuge or horizontal exit for smoke protected seating areas complying with Section 1028.6.2.

~~1007.5~~ **1007.8 (IFC [B] ~~1007.5~~ 1007.8) Platform lifts.** Platform (wheelchair) lifts shall not serve as part of an accessible means of egress, except where allowed as part of a required accessible route in Section 1109.7~~, Items 1 through 9~~. Standby power shall be provided in accordance with Chapter 27 for platform lifts permitted to serve as part of a means of egress.

Exception: A platform lift shall not be permitted as a component of an accessible means of egress at locations where existing site constraints make use of a ramp or elevator infeasible.

~~1007.5.1~~ **1007.8.1 (IFC [B] ~~1007.5.1~~ 1007.8.1) Openness.** Platform lifts on an accessible means of egress shall not be installed in a fully enclosed hoistway.

~~1007.6~~ **1007.9 (IFC [B] ~~1007.6~~ 1007.9) Areas of refuge.** Every required area of refuge shall be accessible from the space it serves by an accessible means of egress. The maximum travel distance from any accessible space to an area of refuge shall not exceed the travel distance permitted for the occupancy in accordance with Section 1016.1. Every required area of refuge shall have direct access to a stairway within an exit enclosure complying with Sections ~~1007.3~~ 1007.6 and 1022 or an elevator complying with Section ~~1007.4~~ 1007.7. Where an elevator lobby is used as an area of refuge, the shaft and lobby shall comply with Section 1022.9 for smokeproof enclosures except where the elevators are in an area of refuge formed by a horizontal exit or smoke barrier.

Exceptions:

1. A stairway serving an area of refuge is not required to be enclosed where permitted in Sections 1016.1 and 1022.1.
2. A smokeproof enclosure is not required for an elevator lobby used as an area of refuge where the elevator is not required to be enclosed.

~~1007.6.1~~ **1007.9.1 (IFC [B] ~~1007.6.1~~ 1007.9.1) Size.** Each area of refuge shall be sized to accommodate one wheelchair space of 30 inches by 48 inches (762 mm by1219 mm) for each 200 occupants or portion thereof, based

on the occupant load of the area of refuge and areas served by the area of refuge. Such wheelchair spaces shall not reduce the required means of egress width. Access to any of the required wheelchair spaces in an area of refuge shall not be obstructed by more than one adjoining wheelchair space.

~~1007.6.2~~ 1007.9.2 (IFC [B] ~~1007.6.2~~ 1007.9.2) Separation. Each area of refuge shall be separated from the remainder of the story by a smoke barrier complying with Section 710 or a horizontal exit complying with Section 1025. Each area of refuge shall be designed to minimize the intrusion of smoke.

Exception: Areas of refuge located within an exit enclosure.

~~1007.6.3~~ 1007.9.3 (IFC [B] ~~1007.6.3~~ 1007.9.3) Two-way communication. Areas of refuge shall be provided with a two-way communication system complying with Sections ~~1007.8.1~~ 1007.11.1 and ~~1007.8.2~~ 1007.11.2.

~~1007.7~~ 1007.10 (IFC [B] ~~1007.7~~ 1007.10) Exterior area for assisted rescue. ~~The~~ An exterior area for assisted rescue shall ~~must~~ be open to the outside air and meet the requirements of Section ~~1007.6.1~~ 1007.9.1. Separation walls shall comply with the requirements of Section 705 for exterior walls. Where walls or openings are between the area for assisted rescue and the interior of the building, the building exterior walls within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening shall have a fire-resistance rating of not less than 1 hour. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than ¾ hour. This construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the floor level of the area for assisted rescue or to the roof line, whichever is lower.

~~1007.7.1~~ 1007.10.1 (IFC [B] ~~1007.7.1~~ 1007.10.1) Openness. The exterior area for assisted rescue shall be at least 50 percent open, and the open area above the guards shall be so distributed as to minimize the accumulation of smoke or toxic gases.

~~1007.7.2~~ 1007.10.2 (IFC [B] ~~1007.7.2~~ 1007.10.2) Exterior exit stairway. Exterior exit stairways that are part of the means of egress for the exterior area for assisted rescue shall provide a clear width of 48 inches (1219 mm) between handrails.

~~1007.8~~ 1007.11 (IFC [B] ~~1007.8~~ 1007.11) Two-way communication. A two-way communication system shall be provided at the elevator landing on each accessible floor that is one or more stories above or below the story of exit discharge complying with Sections ~~1007.8.1~~ 1007.11.1 and ~~1007.8.2~~ 1007.11.2.

Exceptions:

1. Two-way communication systems are not required at the elevator landing where the two-way communication system is provided within areas of refuge in accordance with Section ~~1007.6.3~~ 1007.9.3.
2. Two-way communication systems are not required on floors provided with exit ramps conforming to the provisions of Section 1010.

~~1007.8.1~~ 1007.11.1 (IFC [B] ~~1007.8.1~~ 1007.11.1) System requirements. Two-way communication systems shall provide communication between each required location and the fire command center or a central control point location approved by the fire department. Where the central control point is not constantly attended, a two-way communication system shall have a timed automatic telephone dial-out capability to a monitoring location or 911. The two-way communication system shall include both audible and visible signals.

~~1007.8.2~~ 1007.11.2 (IFC [B] ~~1007.8.2~~ 1007.11.2) Directions. Directions for the use of the two-way communication system, instructions for summoning assistance via the two-way communication system and written identification of the location shall be posted adjacent to the two-way communication system.

~~1007.9~~ 1007.12 (IFC [B] ~~1007.9~~ 1007.12) Signage. Signage indicating special accessibility provisions shall be provided as shown:

1. Each door providing access to an area of refuge from an adjacent floor area shall be identified by a sign stating: AREA OF REFUGE.
2. Each door providing access to an exterior area for assisted rescue shall be identified by a sign stating: EXTERIOR AREA FOR ASSISTED RESCUE.

Signage shall comply with the ICC A117.1 requirements for visual characters and include the International Symbol of Accessibility. Where exit sign illumination is required by Section 1011.2, the signs shall be illuminated. Additionally,

tactile signage complying with ICC A117.1 shall be located at each door to an area of refuge and exterior area for assisted rescue in accordance with Section 1011.3.

~~1007.10~~ 1007.13 (IFC [B] ~~1007.10~~ 1007.13) Directional signage. Direction signage indicating the location of the other means of egress and which are accessible means of egress shall be provided at the following:

1. At exits serving a required accessible space but not providing an approved accessible means of egress.
2. At elevator landings.
3. Within areas of refuge.

~~1007.11~~ 1007.14 (IFC [B] ~~1007.11~~ 1007.14) Instructions. In areas of refuge and exterior areas for assisted rescue, instructions on the use of the area under emergency conditions shall be posted. The instructions shall include all of the following:

1. Persons able to use the exit stairway do so as soon as possible, unless they are assisting others.
2. Information on planned availability of assistance in the use of stairs or supervised operation of elevators and how to summon such assistance.
3. Directions for use of the two-way communications system where provided.

Reason: This proposal primarily reorganizes the section for purposes of clarity and contains no substantive changes.

Section 1007.1.1 is relocated from the subsection on continuity and components. Because section 1007.1 specifies how many accessible means of egress (AMOE) are required, it is appropriate that the requirement for an elevator, in some buildings, be included here as well. The exceptions have been modified to reflect that the exceptions apply only to the AMOE and that elevators may still be required by other sections of the code.

The laundry list of cross-references in Section 1007.2 has been omitted in favor of a reference to the series of sections detailing component and general requirements.

Section 1007.3 is added and because Section 1104 covers only location, the cross-reference to ICC A117.1 for accessible route requirements has been added.

Section 1007.4 is added for consistent treatment of accepted components.

Section 1007.5 is added for consistent treatment of accepted components.

Currently, item 10 of where platform lifts are allowed is specifically omitted in allowable locations within an AMOE. This proposal adds an exception that states the condition where a platform lift can be used as part of an accessible route of travel but not an AMOE. Adding the exception highlights the distinction.

Except for renumbering and updating references, the remainder of Section 1007 is unchanged.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Lupton-E1B-AMOE Clarity

E31–09/10
1007.1 (IFC [B] 1007.1)

Proponent: Maureen Traxler representing City of Seattle, representing Seattle Dept of Planning & Development

Revise as follows:

1007.1 (IFC [B] 1007.1) Accessible means of egress required. Accessible means of egress shall comply with this section. Accessible spaces shall be provided with not less than one accessible means of egress. Where more than one means of egress are required by Section 1015.1 or 1021.1 from any accessible space, each accessible portion of the space shall be served by not less than two accessible means of egress.

Exceptions:

1. Accessible means of egress are not required in alterations to existing buildings.
2. One accessible means of egress is required from an accessible mezzanine level in accordance with Section 1007.3, 1007.4 or 1007.5.
3. In assembly areas with sloped or stepped aisles, one accessible means of egress is permitted where the common path of travel is accessible and meets the requirements in Section 1028.8.
4. In parking garages, accessible means of egress are not required to serve parking areas that do not contain accessible parking spaces or other accessible elements.

Reason: This proposal fills a gap in the current regulations. Currently, the code can be read to require all portions of all buildings to have an accessible means of egress, regardless of whether an accessible route of travel is required to a particular space. This proposal clarifies that areas in parking garages that do not have accessible parking spaces do not need to be provided with an accessible means of egress.

A requirement to provide an accessible means of egress to all portions of a parking garage would practically dictate that all multi-level parking garages be designed with level plates connected by vehicle ramps, in order to provide a complying accessible means of egress to all portions of the garage. This is often not an efficient design for parking garages. It would be very difficult for many continuously-ramped garages to comply, since the slope of any portion of the garage would be limited to 5% (1 vertical to 20 horizontal), in order to avoid providing handrails and landings every 30 inches of rise (see IBC 1010.4, 1010.8, and definition of "ramp" in IBC 1002).We do not believe the intent behind the code is to dictate the design of garages in this way. This proposal maintains the requirement for an accessible means of egress for the areas in a garage with accessible parking, but allows the rest of the garage to be designed as necessary.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TRAXLER-E2-1007.1

E32–09/10
1007.1.1 (New) [IFC [B] 1007.1.1(New)]

Proponent: Rick Lupton, City of Seattle, representing Seattle Dept of Planning & Development

Revise as follows:

1007.1 (IFC [B] 1007.1) Accessible means of egress required. Accessible means of egress shall comply with this section. Accessible spaces shall be provided with not less than one accessible means of egress. Where more than one means of egress are required by Section 1015.1 or 1021.1 from any accessible space, each accessible portion of the space shall be served by not less than two accessible means of egress.

Exceptions:

1. Accessible means of egress are not required in alterations to existing buildings.
2. One accessible means of egress is required from an accessible mezzanine level in accordance with Section 1007.3, 1007.4 or 1007.5.
3. In assembly areas with sloped or stepped aisles, one accessible means of egress is permitted where the common path of travel is accessible and meets the requirements in Section 1028.8.

1007.1.1 (IFC [B] 1007.1.1) Separation of accessible means of egress. When two accessible means of egress are required, they shall be located as far apart as practical.

Reason: This proposal is intended to address a gap in the code. Currently, there is no specific code language that would prevent two accessible means of egress (AMOE) from being located immediately adjoining. Yet complying with Section 1015.2.1 would place an undue burden on the designer because there are times that an elevator is required as an AMOE and the measure between the elevator and a stair would likely control rather than the measure between stairs as intended for conventional design. According to ICC staff the intent is that two accessible means of egress be separated, but that flexibility is necessary to accommodate types and possible locations of AMOE. While this proposal does not detail exactly how far apart the two AMOE are required to be, it does state the intent yet allows the building official flexibility where necessary.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Lupton-E1F-1007 Exit slip AMOE

E33–09/10
1007.1.1(New), 1007.6 (IFC [B] 1007.1.1(New), 1007.6)

Proponent: Proponent: Rick Lupton, City of Seattle, representing Seattle Dept of Planning & Development

Revise as follows:

1007.1 (IFC [B] 1007.1) Accessible means of egress required. Accessible means of egress shall comply with this section. Accessible spaces shall be provided with not less than one accessible means of egress. Where more than

one means of egress are required by Section 1015.1 or 1021.1 from any accessible space, each accessible portion of the space shall be served by not less than two accessible means of egress.

Exceptions:

1. Accessible means of egress are not required in alterations to existing buildings.
2. One accessible means of egress is required from an accessible mezzanine level in accordance with Section 1007.3, 1007.4 or 1007.5.
3. In assembly areas with sloped or stepped aisles, one accessible means of egress is permitted where the common path of travel is accessible and meets the requirements in Section 1028.8.

1007.1.1 (IFC [B] 1007.1.1) Travel distance. The maximum travel distance from any accessible space to an accessible exterior exit door, horizontal exit, exit stairway, elevator, area of refuge, or exterior area for assistedrescue shall not exceed the travel distance permitted for the occupancy in accordance with Section 1016.1.

1007.6 (IFC [B] 1007.6) Areas of refuge. Every required area of refuge shall be accessible from the space it serves by an accessible means of egress. ~~The maximum travel distance from any accessible space to an area of refuge shall not exceed the travel distance permitted for the occupancy in accordance with Section 1016.1.~~ Every required area of refuge shall have direct access to a stairway within an exit enclosure complying with Sections 1007.3 and 1022 or an elevator complying with Section 1007.4. Where an elevator lobby is used as an area of refuge, the shaft and lobby shall comply with Section 1022.1.7 for smokeproof enclosures except where the elevators are in an area of refuge formed by a horizontal exit or smoke barrier.

Exceptions:

1. A stairway serving an area of refuge is not required to be enclosed where permitted in Sections 1016.1 and 1022.1.
2. Smokeproof enclosure is not required for an elevator lobby used as an area of refuge not required to be enclosed.

Reason: This proposal relocates the travel distance provision from the area of refuge section to Section 1007.1 and applies the requirement to exits, areas of refuge or exterior areas for assisted rescue. Under the 2009 IBC areas of refuge are not required in sprinkled buildings and as a result no travel distance limitations would apply in those circumstances. As proposed, the same travel distance limitations that apply for conventional means of egress would apply to accessible means of egress (AMOE), except that the dimension may be less for the AMOE because the measurement terminates at an area of refuge or exterior area for assisted rescue. For a larger building, this may mean additional AMOE.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Lupton-E1A-1007 travel distance

E34–09/10
1007.2.1 (New), 1007.6 (IFC [B] 1007.2.1 (New), 1007.6)

Proponent: Ed Roether, Populous (Formerly HOK Sport Venue Event), representing self

Revise as follows:

1007.2 (IFC [B] 1007.2) Continuity and components. Each required accessible means of egress shall be continuous to a public way and shall consist of one or more of the following components:

1. Accessible routes complying with Section 1104.
2. Interior exit stairways complying with Sections 1007.3 and 1022.
3. Exterior exit stairways complying with Sections 1007.3 and 1026.
4. Elevators complying with Section 1007.4.
5. Platform lifts complying with Section 1007.5.
6. Horizontal exits complying with Section 1025.
7. Ramps complying with Section 1010.
8. Areas of refuge complying with Section 1007.6.

Exceptions:

1. Where the exit discharge is not accessible, an exterior area for assisted rescue shall be provided in accordance with Section 1007.7.
2. Where the exit stairway is open to the exterior, the accessible means of egress shall include either an area of refuge in accordance with Section 1007.6 or an exterior area for assisted rescue in accordance with Section 1007.7.

1007.2.1 (IFC [B] 1007.2.1) Travel distance limitations. Each required accessible means of egress component shall be so located on each story such that the maximum length of accessible exit access travel, measured from the most remote point of an accessible space to an accessible means of egress exit component, shall not exceed the travel distance permitted for the occupancy in accordance with Section 1016.1.

(Renumber subsequent sections)

1007.6 (IFC [B] 1007.6) Areas of refuge. Every required area of refuge shall be accessible from the space it serves by an accessible means of egress. ~~The maximum travel distance from any accessible space to an area of refuge shall not exceed the travel distance permitted for the occupancy in accordance with Section 1016.1.~~ Every required area of refuge shall have direct access to a stairway in an exit enclosure complying with Sections 1007.3 and 1022 or an elevator complying with Section 1007.4. Where an elevator lobby is used as an area of refuge, the shaft and lobby shall comply with Section 1022.9 for smokeproof enclosures except where the elevators are in an area of refuge formed by a horizontal exit or smoke barrier.

Exceptions:

1. A stairway serving an area of refuge is not required to be enclosed where permitted in Sections 1016.1 and 1022.1.
2. A smokeproof enclosure is not required for an elevator lobby used as an area of refuge where the elevator is not required to be enclosed.

Reason: Currently, any building that provides accessible means of egress without the use of an area of refuge has no limit to the travel distance required by the accessible means of egress system. Travel distance limits are only found in Section 1007.6. The general means of egress requires a limit to travel distance as part of a holistic approach to the exit system to address the occupant flow rates through exit components and travel speeds along its path. There is limited information on how people with disabilities impact these flow rates and travel speeds, but persons with mobility impairments typically move at a slower rate than able bodied people. The exit system for persons with a disability should be within the same travel distance limits as that provided others within the building. Therefore, this proposal moves the travel distance limitation requirement from that pertaining to only an area of refuge and applies it to the continuity of the overall accessible means of egress where it belongs.

Cost Impact: This code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Roether-E5-1007.2.1

E35–09/10
1007.2 (IFC [B] 1007.2)

Proponent: Anne VonWeller, Murray City, representing the Utah Chapter of the International Code Council

Revise as follows:

1007.2 (IFC [B] 1007.2) Continuity and components. Each required means of egress shall be continuous to a public way and shall consist of one or more of the following components:

1. Accessible routes complying with Section 1104.
2. Interior exit stairways complying with Sections 1007.3, 1009 and 1022.
3. Interior exit ramps complying with Sections 1010 and 1022.
4. Unenclosed exit access stairways complying with 1007.3, 1009 and Exception 3 or 4 of Section 1016.1.
5. Unenclosed exit access ramps complying with 1010 and Exception 3 or 4 of Section 1016.1.
~~3~~ 6. Exterior exit stairways complying with Sections 1007.3, 1009 and1026.
7. Exterior exit ramps complying with 1010 and 1026.
~~4~~ 8. Elevators complying with 1007.4

~~5~~ 9. Platform lifts complying with Section 1007.5
~~6.~~10. Horizontal exits complying with Section 1025.
~~7.~~ ~~Ramps complying with Section 1010.~~
~~8~~ 11. Areas of refuge complying with Section 1007.6

Exceptions:

1. Where the exit discharge is not accessible, an exterior area for assisted rescue shall be provided in accordance with Section 1007.7.
2. Where the exit stairway is open to the exterior, the accessible means of egress shall include either an area of refuge in accordance with Section 1007.6 or an exterior area for assisted rescue in accordance with Section 1007.7.

Reason: In the 2009 Edition a distinction has been made between 'exit' stairways and ramps and 'exit access' stairways and ramps. In the past all of the exceptions for unenclosed stairways and ramps occurred in Section 1022.1. Now some of those exceptions are located in 1022.1 and some in 1016.1. This change is offered to lead user to the new location for the two exceptions relocated to 1016.1 and to provide consistence with changes made to the 2009 edition of the IBC regarding unenclosed exit access stairways and ramps. It also clarifies the base requirements contained in 1009 apply to the stairways in this section 1007.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Vonweller-E4-1007.2

E36–09/10
1007.2 (IFC [B] 1007.2)

Proponent: Ed Roether, Populous (Formerly HOK Sport Venue Event), representing self

Revise as follows:

1007.2 Continuity and components. Each required accessible means of egress shall be continuous to a public way and shall consist of one or more of the following components:

1. Accessible routes complying with Section 1104.
2. Interior exit stairways complying with Sections 1007.3 and 1022.
3. Interior exit access stairways complying with Section 1007.3 and Section 1016.1, Exception 3 and 4.
~~3.~~4. Exterior exit stairways complying with Sections 1007.3 and 1026.
~~4.~~5. Elevators complying with Section 1007.4.
~~5.~~6. Platform lifts complying with Section 1007.5.
~~6.~~7. Horizontal exits complying with Section 1025.
~~7.~~8. Ramps complying with Section 1010.
~~8.~~9. Areas of refuge complying with Section 1007.6.

Exceptions:

1. Where the exit discharge is not accessible, an exterior area for assisted rescue shall be provided in accordance with Section 1007.7.
2. Where the exit stairway is open to the exterior, the accessible means of egress shall include either an area of refuge in accordance with Section 1007.6 or an exterior area for assisted rescue in accordance with Section 1007.7.

Reason: Exit access stairways as permitted by Section 1016.1 are not listed as a component of an accessible means of egress. Therefore their use should be included here to avoid conflict with Section 1007.3.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Roether-E10-1007.2

E37–09/10
1007.2, 1007.7, 1007.7.1, 1007.7.2 (IFC [B] 1007.2, 1007.7, 1007.7.1, 1007.7.2)

Proponent: Ron Clements, Chesterfield County Virginia Building Inspection Department, representing Chesterfield County Virginia Building Inspection Department

Revise as follows:

1007.2 Continuity and components. Each required accessible means of egress shall be continuous to a public way and shall consist of one or more of the following components:

1. Accessible routes complying with Section 1104.
2. Interior exit stairways complying with Sections 1007.3 and 1022.
3. Exterior exit stairways complying with Sections 1007.3 and 1026 and serving levels other than the level of exit discharge.
4. Elevators complying with Section 1007.4.
5. Platform lifts complying with Section 1007.5.
6. Horizontal exits complying with Section 1025.
7. Ramps complying with Section 1010.
8. Areas of refuge complying with Section 1007.6.
9. Exterior area for assisted rescue complying with Section 1007.7 serving exits at the level of exit discharge.

~~Exceptions:~~

1. ~~Where the exit discharge is not accessible, an exterior area for assisted rescue shall be provided in accordance with Section 1007.7.~~
2. ~~Where the exit stairway is open to the exterior, the accessible means of egress shall include either an area of refuge in accordance with Section 1007.6 or an exterior area for assisted rescue in accordance with Section 1007.7.~~

1007.7 (IFC [B] 1007.7) Exterior area for assisted rescue. The exterior area for assisted rescue ~~must be open to the outside air and~~ shall be an area provided on the exterior landing serving an exit door on an accessible route. The exterior area of assisted rescue shall meet the size and access requirements of Section 1007.6.1.

1007.7.1 (IFC 1007.7.1) Seperation. ~~Separation walls shall comply with the requirements of Section 705 for exterior walls. Where walls or openings are between the area for assisted rescue and the interior of the building, the building exterior walls within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening shall have a fire-resistance rating of not less than 1 hour.~~ Exterior walls separating the exterior area of assisted rescue from the interior of the building shall have a minimum fire resistance rating of 1 hour, rated for exposure to fire from the inside. The fire resistance rated exterior wall construction shall extend horizontally 10 feet (3048mm) beyond the landing on either side of the landing or equivalent fire resistance rated construction is permitted to extend out perpendicular to the exterior wall 4 feet(1220 mm) minimum on the side of the landing. The fire resistance rated construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the floor level of the area for assisted rescue or to the roof line, whichever is lower. Openings within such fire resistance rated exterior walls shall be protected in accordance with Section 715 ~~by opening protectives having a fire protection rating of not less than 3/4 hour~~. ~~This construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the floor level of the area for assisted rescue or to the roof line, whichever is lower.~~

~~1007.7.1~~ 1007.7.2 (IFC [B] ~~1007.7.1~~ 1007.7.2) Openness. The exterior area for assisted rescue shall be at least 50 percent open, and the open area ~~above the guards~~ shall be so distributed as to minimize the accumulation of smoke or toxic gases.

~~1007.7.2~~ 1007.7.3 (IFC [B] ~~1007.7.2~~ 1007.7.3) Exterior ~~exit~~ stairway. Exterior ~~exit~~ stairways that are part of the means of egress for the exterior area for assisted rescue shall provide a clear width of 48 inches (1219 mm) between handrails.

Reason: The intent of this proposal is to clarify where the exterior are for assisted rescue is intended to be utilized and provide better code language for the requirements.

Section 1007.2. The addition language to item 3 is to indicate that the provisions for exterior exit stairways are for stairways from upper floors or basements, not the couple of steps somewhere along the path of exit discharge. If an area of refuge inside a building can be a component of an

accessible means of egress, the exterior area of assisted rescue should also be one of that list, thus the addition of item 9. The exceptions are no longer needed with the revisions to the list.

Section 1007.7 - The first text strike-through removed redundant language regarding openness to the exterior. The requirement for openness is provided in detail in Section 1007.7.1 therefore the statement is redundant in the first sentence of 1007.7. The added text to the first sentence clearly states that the exterior area for assisted rescue is an area on an exterior landing serving an exit door on an accessible route. This clarifies that the area is on an exterior landing, that it is served by an exit door therefore this is part of the exit discharge and that it is on an accessible route, which guarantees that there is an accessible route to get to the exterior area for assisted rescue. The current language is ambiguous about exactly how the exterior area for assisted rescue fits into the overall means of egress system.

The rest of the paragraph is split into a new section for clarity – Section 1007.7.1. The second text strike-through removes confusing text that states "building exterior walls within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening shall have a fire-resistance rating". That language suggests that some portion of the separation wall is non rated but the wall beyond the non rated portion is to be rated? It is very confusing text that is corrected in the following new text proposed. The new text attempts to capture the basic technical requirements of the current Section with two technical changes. The first was the added text that allows the rated construction to extend out perpendicular from the building on the end of the landing. This is a method that we have used to protect exterior areas for assisted rescue adjacent to, and within 10 feet of, loading dock doors to avoid having to provide a ¾ hour protected opening at the loading dock door. The 4 foot minimum dimension is based on the 4 foot protection required for similar types of exposure protection specified in Sections 706.5 Exception #2 and 3, and 706.5.1 exception #1. The second technical change is the requirement for the rating to be for inside exposure. This is based on the current method for prescribing exterior wall fire ratings in Section 705.5. Inside exposure is specified in this case since the protection intended is from a fire inside the building. The last change to Section 1007.7 is to refer opening protection of the fire rated construction to Section 715. Section 715 has the complete opening protection provisions necessary to properly protect the openings. Having the opening protection specification in Section 1007.7 without all of the supporting Sections provided in Section 715 is technically inaccurate. Table 715.4 requires ¾ hour protection in exterior walls so no amendment to the table is required and additionally the current text could be mis-applied to allow ¾ hour opening protection when the wall had a higher fire rating for another purpose, which would not occur with a direct reference to Section 715. This revision clarifies the original intent for the use of the exterior area of assisted rescue as a protected area serving an exit at the level of exit discharge where there is not be an accessible route to the public way.

Section 1007.7.1 (new Section 1007.7.2) has the text "above the guards" removed because the text accomplishes the performance requirement intended without that text. Additionally an exterior area for assisted rescue could be constructed without a guardrail in some circumstances such as a grade level landing that connects to the public way with a stair in the exit discharge. Lastly "guard" is not a defined term.

Section 1007.7.2 (new Section 1007.7.3) uses the term exterior "exit" stair. Exterior exit stairs are regulated by Section 1026 and are an exit component. The exterior stair serving an exterior area for assisted rescue is typically an exit discharge component. If a true Section 1026 exit stair is used to serve an exterior area for assisted rescue per 1007.2 exception #2 removal of the work "exit" would not pose a problem because the more generic term "exterior stair" could be applied to an exit stair. Based on these points "exit" is proposed to be deleted from 1007.7.2.

Cost Impact: This will reduce the cost of construction by reducing the confusion associated with interpreting the current exterior area for assisted rescue provisions.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Clements-E1-1007.7

E38–09/10

1007.2, 1007.7, 1007.7.1 (New), 1007.7.2 (IFC [B] 1007.2, 1007.7, 1007.7.1 (New), 1007.7.2)

Proponent: Ed Roether, Populous (Formerly HOK Sport Venue Event), representing self

Revise as follows:

1007.2 (IFC [B] 1007.2) Continuity and components. Each required accessible means of egress shall be continuous to a public way and shall consist of one or more of the following components:

1. Accessible routes complying with Section 1104.
2. Interior exit stairways complying with Sections 1007.3 and 1022.
3. Exterior exit stairways complying with Sections 1007.3 and 1026.
4. Elevators complying with Section 1007.4.
5. Platform lifts complying with Section 1007.5.
6. Horizontal exits complying with Section 1025.
7. Ramps complying with Section 1010.
8. Areas of refuge complying with Section 1007.6.
9. Exterior area for assisted rescue complying with 1007.7

~~Exceptions:~~

1. ~~Where the exit discharge is not accessible, an exterior area for assisted rescue shall be provided in accordance with Section 1007.7.~~
2. ~~Where the exit stairway is open to the exterior, the accessible means of egress shall include either an area of refuge in accordance with Section 1007.6 or an exterior area for assisted rescue in accordance with Section 1007.7.~~

1007.7 (IFC [B] 1007.7) Exterior area for assisted rescue. Exterior areas for assisted rescue shall be accessed by an accessible route from the area served shall be permitted in accordance with Section 1007.7.1 or 1007.7.2.

1007.7.1 (IFC [B] 1007.7.1) Level of exit discharge. Where the exit discharge does not include an accessible route from an exit located on a level of exit discharge to a public way, an exterior area of assisted rescue shall be provided on the exterior landing in accordance with Sections 1007.7.3 through 1007.7.6.

1007.7.2 (IFC [B] 1007.7.2) Stories above level of exit discharge. Where exit access from the area served is outdoor open air, an exterior area of assisted rescue is permitted as an alternative to an area of refuge. Every required exterior area of assisted recue shall have direct access to an interior exit stairway, exterior stairway, or elevator serving as an accessible means of egress component. The exterior area of assisted rescue shall comply with Section 1007.7.3 through 1007.7.6 and shall be provided with a two-way communication system complying with Sections 1007.8.1 and 1007.8.2.

1007.7.3 (IFC [B] 1007.7.3) Size. Each exterior area for assisted rescue shall be sized to accommodate wheelchair spaces in accordance with Section 1007.6.1. ~~The exterior area for assisted rescue must be open to the outside air and meet the requirements of Section 1007.6.1.~~

1007.7.4 (IFC [B] 1007.7.4) Separation. Separation walls shall comply with the requirements of Section 705 for exterior walls. Where walls or openings are between the area for assisted rescue and the interior of the building, the building exterior walls within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening shall have a fire-resistance rating of not less than 1 hour. Openings within such exterior walls shall be protected by opening protectives having a fire protection rating of not less than 3/4 hour. This construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the floor level of the area for assisted rescue or to the roof line, whichever is lower.

~~1007.7.1~~ 1007.7.5 (IFC [B] ~~1007.7.1~~ 1007.7.5) Openness. The exterior area for assisted rescue shall be open to the outside air. The sides other than the separation walls shall be at least 50 percent open, and the open area above ~~the~~ guards shall be ~~so~~ distributed so as to minimize the accumulation of smoke or toxic gases.

~~1007.7.2~~ 1007.7.6 (IFC [B] ~~1007.7.2~~ 1007.7.6) ~~Exterior exit~~ Stairway. ~~Exterior exit~~ Stairways that are part of the means of egress for the exterior area for assisted rescue shall provide a clear width of 48 inches (1219 mm) between handrails.

> **Exception:** The clear width of 48 inches (1219 mm) between handrails is not required at stairways serving buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

Reason: An exterior area of assisted rescue is a component of an accessible means of egress, like other components listed. It is not an exception to a component of an accessible means of egress – it is a viable alternative to an interior area of refuge. This proposal clarifies how an exterior area of assisted rescue can serve as a component and still maintain the provisions relating to other components. With proper separation, communication and signage an exterior area of assisted rescue should not be limited to an exit discharge or an exterior exit stair. A stair complying with Section 1022 allows for an exterior stair, but it also allows for an enclosed exit stair to serve an exterior area of assisted rescue and Section 1107.4 would allow an elevator to also serve it. This option needs clarification on it use and this proposal provides that clarification.

Cost Impact: This code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Roether-E6-1007.2

E39–09/10
1007.2.1, 1007.8 (IFC [B] 1007.2.1, 1007.8)

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1007.2.1 (IFC [B] 1007.2.1) Elevators required. In buildings where a required accessible floor is four or more stories above or below a level of exit discharge, at least one required accessible means of egress shall be an elevator complying with Section 1007.4.

Exceptions:

1. ~~In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a horizontal exit and located at or above the levels of exit discharge.~~ The elevator shall not be required on floors provided with a horizontal exit and located at or above the levels of exit discharge provided:
   1.1. The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2; and,
   1.2. The horizontal exit provides a minimum of two distinct exits or, in addition to the horizontal exit, a second accessible means of egress is provided.
2. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with an exit ramp conforming to the provisions of Section 1010 and at least one additional accessible means of egress.

1007.8 (IFC [B] 1007.8) Two-way communication. A two-way communication system shall be provided at the elevator landing on each accessible floor that is one or more stories above or below the story of exit discharge complying with Sections 1007.8.1 and 1007.8.2.

Exceptions:

1. Two-way communication systems are not required at the elevator landing where the two-way communication system is provided within areas of refuge in accordance with Section 1007.6.3.
2. Two-way communication systems are not required at the elevator landing on floors provided with an exit ramp~~s~~ conforming to the provisions of Section 1010 and at least one additional accessible means of egress.

Reason: The existing exceptions assume that the horizontal exit and the ramp are always available and accessible. This cannot be guaranteed as the hazard may be blocking access to the ramp or horizontal exit. At most, only two accessible means of egress are required to be provided. The exception reduces that down to one. If the one remaining horizontal exit or ramp is not available, there is no accessible means of egress provided. The restated exceptions assume a higher probability that at least one option will be available. The same reasoning applies to the communication system.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Weihle-E2-1007.2.1

E40–09/10

1007.2.1 (IFC [B] 1007.2.1)

Proponent: Rick Lupton, City of Seattle, representing Seattle Dept of Planning & Development

Revise as follows:

1007.2.1 (IFC [B] 1007.2.1) Elevators required. In buildings where a required *accessible* floor is four or more stories above or below a *level of exit discharge*, at least one required *accessible means of egress* shall be an elevator complying with Section 1007.4.

Exceptions:

1. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a *horizontal exit* and located at or above the *levels of exit discharge*.
2. In buildings equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a ramp conforming to the provisions of Section 1010.
3. Where rooms, spaces or floor levels are not required to be accessible or where stories are not required to be connected by an accessible route in accordance with Chapter 11, an elevator is not required to serve as part of an accessible means of egress.

Reason: Where spaces like a mechanical penthouse are not required to be accessible, then Section 1007.1 clearly does not require an accessible means of egress. But there are many locations within a building that might be required to contain accessible elements and yet are not required to be

wheelchair accessible. The 2006 IBC Commentary – Volume I explains that many of these exceptions are because of the economic impracticality in installing an elevator to serve such locations. And the ADA Title III frankly refers to this as "the elevator exemption". These locations are clearly intended to be exempted from installing an elevator as impractical, whether the intended purpose is for an accessible route or an accessible means of egress.

Examples of where a room, space or floor level would not require an accessible route abound, even spaces located 4 stories or more above or below the level of exit discharge. For example, the 2000 square foot mezzanine executive office of a five story building does not require elevator access and so, should not require an elevator as part of the accessible means of egress.

If a parking garage constructed six stories below grade serves a retail store having accessible entries at the 1st story only, then Section 1106.6 would require all the accessible parking spaces to be located at only the 1st story to provide shortest accessible route possible and none of the remaining parking garage levels would require an accessible route because they contain no accessible parking. As such, an elevator should not be a required part of an accessible means of egress.

The 2nd story of a multistory Type B penthouse dwelling unit in a high-rise apartment building is not required to be accessible if the conditions of Section 1107.7.2 are met, so an elevator should not be required as a part of the accessible means of egress within the dwelling unit.

This proposal adds exception 3 to clarify that when no accessible route is provided, then an elevator need not be provided solely for purposes of the accessible means of egress, consistent with explanations contained in the 2006 IBC Commentary under Section 1007.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Lupton-E1E-1007 Elevator Exception

E41–09/10
1007.3, 1007.6 (IFC [B] 1007.3, 1007.6)

Proponent: Ed Roether, Populous (Formerly HOK Sport Venue Event), representing self

Revise as follows:

1007.3 (IFC [B] 1007.3) Exit Stairways. In order to be considered part of an accessible means of egress, an ~~exit access stairway as permitted by Section 1016.1 or~~ exit stairway in compliance with Sections 1022 and 1026 shall have a clear width of 48 inches (1219 mm) minimum between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

1. ~~The area of refuge is not required at open exit access or exit stairways as permitted by Section 1016.1 and 1022.1 in buildings that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.~~
1. The clear width of 48 inches (1219 mm) between handrails is not required at exit access stairways as permitted in Section 1016.1 or exit stairways in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Areas of refuge are not required at exit stairways in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. The clear width of 48 inches (1219 mm) between handrails is not required for exit stairways accessed from a horizontal exit.
4. Areas of refuge are not required at exit stairways serving open parking garages.
5. Areas of refuge are not required for smoke protected seating areas complying with Section 1028.6.2.
6. The area of refuge are not required in Group R-2 occupancies.

1007.6 (IFC [B] 1007.6) Areas of refuge. Every required area of refuge shall be accessible from the space it serves by an accessible means of egress. The maximum travel distance from any accessible space to an area of refuge shall not exceed the travel distance permitted for the occupancy in accordance with Section 1016.1. Every required area of refuge shall have direct access to an exit stairway ~~in an exit enclosure~~ complying with Section~~s~~ 1007.3 ~~and 1022~~ or an elevator complying with Section 1007.4. Where an elevator lobby is used as an area of refuge, the shaft and lobby shall comply with Section 1022.9 for smokeproof enclosures except where the elevators are in an area of refuge formed by a horizontal exit or smoke barrier.

Exceptions:

1. An exit stairway serving an area of refuge is not required to be enclosed where permitted in Sections ~~1016.1 and~~ 1022~~.1~~ and 1026.

2. A smokeproof enclosure is not required for an elevator lobby used as an area of refuge where the elevator is not required to be enclosed.

Reason: Exit access stairways as permitted by Section 1016.1 are not listed as a component of an accessible means of egress. Therefore, either their use should be stricken from 1007.3 to avoid confusion or added as a component. This proposal deletes reference to exit access stairs consistent with the limited components since the location of exit access stairs can be wide ranging making it difficult for first responders to locate potential people waiting to be evacuated, especially in facilities where an area of refuge with two-way communication is not required or provided. Section 1007.3 exception #1 is redundant with exception #3 when the reference to exit access stairs is removed, therefore this proposal eliminates exception #1 rather than a more complex modification.

Cost Impact: This proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Roether-E4-1007.2

E42–09/10
1007.3 (IFC [B] 1007.3)

Reason: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1007.3 (IFC [B] 1007.3) Stairways. In order to be considered part of an accessible means of egress, an exit access stairway as permitted by Section 1016.1 or exit stairway shall have a clear width of 48 inches (1219 mm) minimum between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

~~1. The area of refuge is not required at open exit access or exit stairways as permitted by Sections 1016.1 and 1022.1 in buildings that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.~~

~~2~~ 1. The clear width of 48 inches (1219 mm) between handrails is not required at exit access stairways as permitted by Section 1016.1 or exit stairways in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

~~3~~ 2. Areas of refuge are not required ~~at exit stairways~~ in buildings equipped throughout by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

~~4~~ 3. The clear width of 48 inches (1219 mm) between handrails is not required for exit stairways accessed from a horizontal exit.

~~5~~ 4. Areas of refuge are not required at exit stairways serving open parking garages.

~~6~~ 5. Areas of refuge are not required for smoke protected seating areas complying with Section 1028.6.2.

~~7~~ 6. The areas of refuge are not required in Group R-2 occupancies.

Reason: Combining exceptions 1 and 3 is effectively an editorial change which does not affect the application of the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Wiehle, E3-1007.3-1

E43–09/10
1007.3, 1007.4, 1007.6.2 (IFC [B] 1007.3, 1007.4, 1007.6.2)

Proponent: Rick Lupton, City of Seattle, representing Seattle Dept of Planning & Development

Revise as follows:

1007.3 (IFC [B] 1007.3) Stairways. In order to be considered part of an accessible means of egress, exit access stairway as permitted by Section 1016.1 or exit stairway shall have a clear width of 48 inches (1219 mm) minimum

between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

~~1. The area of refuge is not required at open exit access or exit stairways as permitted by Sections 1016.1 and 1022.1 in buildings that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2~~

~~2.~~ 1. The clear width of 48 inches (1219 mm) between handrails is not required at exit access stairways as permitted by Section 1016.1 or exit stairways in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

~~3. Areas of refuge are not required at exit stairways in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.~~

~~4.~~ 2. The clear width of 48 inches (1219 mm) between handrails is not required for exit stairways accessed from a horizontal exit.

~~5.~~ 3. Areas of refuge are not required at exit stairways serving open parking garages.

~~6.~~ 4. Areas of refuge are not required for smoke protected seating areas complying with Section 1028.6.2.

~~7.~~ 5. The areas of refuge are not required in Group R-2 occupancies.

1007.4 (IFC [B] 1007.4) Elevators. In order to be considered part of an accessible means of egress, an elevator shall comply with the emergency operation and signaling device requirements of Section 2.27 of ASME A17.1. Standby power shall be provided in accordance with Chapter 27 and 3003. The elevator shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

1. Elevators are not required to be accessed from an area of refuge or horizontal exit in open parking garages.

~~2. Elevators are not required to be accessed from an area of refuge or horizontal exit in buildings and facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.~~

~~3.~~ 2. Elevators not required to be located in a shaft in accordance with Section 708.2 are not required to be accessed from an area of refuge or horizontal exit.

~~4.~~ 3. Elevators are not required to be accessed from an area of refuge or horizontal exit for smoke protected seating areas complying with Section 1028.6.2.

1007.6.2 (IFC [B] 1007.6.2) Separation. Each area of refuge shall be separated from the remainder of the story by a smoke barrier complying with Section 710 or a horizontal exit complying with Section 1025. Each area of refuge shall be designed to minimize the intrusion of smoke.

~~Exception~~ Exceptions:

1. Areas of refuge located in buildings that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 shall not be required to be separated from the remainder of the story.
2. Areas of refuge located within an exit enclosure.

Reason: This proposal primarily regards areas of refuge in sprinkled buildings. The 2009 code excepts areas of refuge for stairs and elevators in fully sprinkled buildings. In this proposal the separation requirements are excepted where a building is fully sprinkled, but the wheelchair space and communication features of an area of refuge are maintained. The change is based on sprinklers substituting only for protection and time. Wheelchair spaces and communication are still needed and desired in order for assisted rescue, even in sprinkled buildings. As a result, an area of refuge becomes a space where a person in a wheelchair can get assistance. However, by not requiring the separation from the rest of the building, including logically the design for smoke intrusion, sprinklers are credited yet other necessary features are maintained. The proposal will not cause any conflict with the current definition of area of refuge –refer Section 1002. However, the proposal will add some cost to construction over current code requirements. The change is accomplished by deleting exceptions to Sections 1007.3 and 1007.4 and an exception is added to Section 1007.6.2, detailing separation requirements for areas of refuge.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Lupton-E1D-1007 Areas of Refuge

E44–09/10
1007.3, 1007.4 (IFC [B] 1007.3, 1007.4)

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1007.3 (IFC [B] 1007.3) Stairways. In order to be considered part of an accessible means of egress, an exit access stairway as permitted by Section 1016.1 or exit stairway shall have a clear width of 48 inches (1219 mm) minimum between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from ~~either~~ an area of refuge complying with Section 1007.6 ~~or a horizontal exit~~.

Exceptions:

1. The area of refuge is not required at open exit access or exit stairways as permitted by Sections 1016.1 and 1022.1 in buildings that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
2. The clear width of 48 inches (1219 mm) between handrails is not required at exit access or exit stairways in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Areas of refuge are not required at exit stairways in buildings equipped throughout by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
4. ~~The clear width of 48 inches (1219 mm) between handrails is not required for exit stairways accessed from a horizontal exit.~~
5. ~~4.~~ Areas of refuge are not required at exit stairways serving open parking garages.
6. ~~5.~~ Areas of refuge are no required for smoke protected seating areas complying with Section 1028.6.2.
7. ~~7~~ 6. ~~The~~ areas of refuge are not required in Group R-2 occupancies.

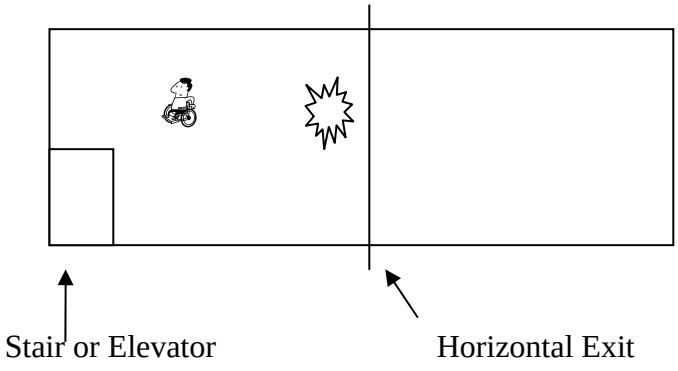
1007.4 (IFC [B] 1007.4) Elevators. In order to be considered part of an accessible means of egress, an elevator shall comply with the emergency operation and signaling device requirements of Section 2.27 of ASME A17.1. Standby power shall be provided in accordance with Sections 2702 and 3003. The elevator shall be accessed from ~~either~~ an area of refuge complying with Section 1007.6 ~~or a horizontal exit~~.

Exceptions:

1. Elevators are not required to be accessed from an area of refuge ~~or horizontal exit~~ in open parking garages.
2. Elevators are not required to be accessed from an area of refuge ~~or horizontal exit~~ in buildings ~~and facilities~~ equipped throughout by an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Elevators not required to be located in a shaft in accordance with Section 707.2 are not required to be accessed from an area of refuge ~~or horizontal exit~~.
4. Elevators are not required to be accessed from an area of refuge ~~or horizontal exit~~ for smoke protected seating areas complying with Section 1025.6.2.

Reason: The concept of “accessed from a horizontal exit” is flawed in that it assumes everyone passes through the horizontal exit. This is only true for half of the occupants of the floor (assuming the horizontal exit splits the floor in two). The stair or elevator cannot be accessed from a horizontal exit when the person and the stair or elevator are on the same side of the horizontal exit.

The criteria for accessible stairs and elevators must be maintained without regard to the horizontal exit. The horizontal exit cannot be used to eliminate the area of refuge or the width of the stair for those occupants that are already on the stair/elevator side of the horizontal exit. Each portion of the floor on either side of the horizontal exit requires two accessible means of egress per Section 1007.1; the stair/elevator (1) and the horizontal exit (2). The area of refuge and width of the stair must be maintained in order to provide a second exit in the event the hazard blocks access to the horizontal exit.



Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:				
Committee:	AS	AM	D
Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E4-1007.3-2

E45–09/10
1007.3, 1007.4 (IFC [B] 1007.3, 1007.4)

Proponent: Rick Lupton, City of Seattle, representing Seattle Dept of Planning & Development

Revise as follows:

1007.3 (IFC [B] 1007.3) Stairways. In order to be considered part of an accessible means of egress, an exit access stairway as permitted by Section 1016.1 or exit stairway shall have a clear width of 48 inches (1219 mm) minimum between handrails and shall either incorporate an area of refuge within an enlarged floor-level landing or shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

1. The area of refuge is not required at open exit access or exit stairways as permitted by Sections 1016.1 and 1022.1 in buildings that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
2. The clear width of 48 inches (1219 mm) between handrails is not required at exit access stairways as permitted by Section 1016.1or exit stairways in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Areas of refuge are not required at exit stairways in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
4. The clear width of 48 inches (1219 mm) between handrails is not required for exit stairways accessed from a horizontal exit.
5. Areas of refuge are not required at exit stairways serving open parking garages.
6. Areas of refuge are not required for smoke protected seating areas complying with Section 1028.6.2.
7. ~~The areas~~ Areas of refuge are not required ~~in~~ within Group R-2 or R-3 ~~occupancies~~ dwelling or sleeping units.

1007.4 (IFC [B] 1007.4) Elevators. In order to be considered part of an accessible means of egress, an elevator shall comply with the emergency operation and signaling device requirements of Section 2.27 of ASME A17.1. Standby power shall be provided in accordance with Chapter 27 and 3003. The elevator shall be accessed from either an area of refuge complying with Section 1007.6 or a horizontal exit.

Exceptions:

1. Elevators are not required to be accessed from an area of refuge or horizontal exit in open parking garages.
2. Elevators are not required to be accessed from an area of refuge or horizontal exit in buildings and facilities equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

3. Elevators not required to be located in a shaft in accordance with Section 708.2 are not required to be accessed from an area of refuge or horizontal exit.
4. Elevators are not required to be accessed from an area of refuge or horizontal exit for smoke protected seating areas complying with Section 1028.6.2.
5. Private residence elevators are not required to be accessed from an area of refuge or horizontal exit within individual dwelling units and sleeping units of Group R-2 or R-3 occupancy.

Reason: This proposal is intended to clarify exception 7 of Section 1007.3. It is my understanding that this exception is intended to apply within individual units of a Group R-2 occupancy and not the common stairs and elevators used by all occupants of a Group R-2 occupancy. It follows, logically, that the exception should also apply to Group R-3 units and to elevators within individual units. IRC townhouses, for example, should not require areas of refuge. Common stairs and elevators can still use the sprinkler exception to areas of refuge.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Lupton-E1C-1007 AOR in R2

E46–09/10
1007.6, 1007.6.2 (IFC [B] 1007.6, 1007.6.2)

Proponent: David S. Collins, FAIA, The Preview Group, Inc., representing The American Institute of Architects

Revise as follows:

1007.6 Areas of refuge. Every required area of refuge shall be accessible from the space it serves by an accessible means of egress. The maximum travel distance from any accessible space to an area of refuge shall not exceed the travel distance permitted for the occupancy in accordance with Section 1016.1. Every required area of refuge shall have direct access to a stairway within an exit enclosure complying with Sections 1007.3 and 1022 or an elevator complying with Section 1007.4. Where an elevator lobby is used as an area of refuge, the shaft and lobby shall comply with Section 1022.9 for smokeproof enclosures except where the elevators are in an area of refuge formed by a horizontal exit or smoke ~~barrier~~ partition.

Exceptions:

1. A stairway serving an area of refuge is not required to be enclosed where permitted in Sections 1016.1 and Section 1022.1.
2. A smokeproof enclosure is not required for an elevator lobby used as an area of refuge where the elevator is not required to be enclosed.

1007.6.2 Separation. Each area of refuge shall be separated from the remainder of the story by a smoke ~~barrier~~ partition having a fire-resistance rating of not less than 1 hour complying with Section ~~710~~ 711 or a horizontal exit complying with Section 1025. Each area of refuge shall be designed to minimize the intrusion of smoke.

Exception: Areas of refuge located within an exit enclosure.

Reason: The continuity of smoke barriers is required by Section 710.4 to extend from outside wall to outside wall. Smoke partitions are not required to extend from outside wall to outside wall. I do not believe the code intended areas of refuge related to elevators to be separated with smoke barriers.

Cost Impact: This will decrease the cost of construction.

Analysis: There is a code change proposal on the docket of the Fire Safety Committee to Section 710 that is proposing to revise continuity of fire barrier requirements around areas of refuge.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Collins-E3-1007.6

E47–09/10
1007.6 (IFC [B] 1007.6)

Proponent: Lee Kranz representing Washington Association of Building Officials (WABO), Technical Code Development Committee

Revise as follows:

1007.6 (IFC [B] 1007.6) Areas of refuge. Every required area of refuge shall be accessible from the space it serves by an accessible means of egress. The maximum travel distance from any accessible space to an area of refuge shall not exceed the travel distance permitted for the occupancy in accordance with Section 1016.1. Every required area of refuge shall have direct access to a stairway within an exit enclosure complying with Sections 1007.3 and 1022 or an elevator complying with Section 1007.4. ~~Where an elevator lobby is used as an area of refuge, the shaft and lobby shall comply with Section 1022.9 for smoke-proof enclosures except where the elevators are in an area of refuge formed by a horizontal exit or smoke barrier~~.

Exceptions:

1. A stairway serving an area of refuge is not required to be enclosed where permitted in Sections 1016.1 and 1022.1.
2. A smoke-proof enclosure is not required for an elevator lobby used as an area of refuge where the elevator is not required to be enclosed.

Reason: Areas of refuge required to serve an elevator or stair enclosure must be separated from the remainder of the building by a smoke barrier or a horizontal exit per Section 1007.6.2. As written above, this sentence would never apply as all areas of refuge are formed by either a smoke barrier or horizontal exit.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KRANZ-E4-1007.6.DOC

E48–09/10
1007.6.1 (IFC [B] 1007.6.1)

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1007.6.1 (IFC [B] 1007.6.1) Size. Each area of refuge shall be sized to accommodate one wheelchair space of 30 inches by 48 inches (762 mm by1219 mm) for each 200 occupants or portion thereof, based on the occupant load of the area of refuge and areas served by the area of refuge. Such wheelchair spaces shall not reduce the required means of egress width. Access to any of the required wheelchair spaces in an area of refuge shall not be obstructed by more than one adjoining wheelchair space. Wheelchair spaces shall be clear of any door swing. A turning space complying with ICC A117.1 shall be provided within the area of refuge.

Reason: A turning space is necessary in order to avoid entrapment inside the area of refuge and to ensure minimal maneuverability within the area of refuge. Without the turning space requirement the area of refuge could be no more than a 3' by 4' room. While it seems apparent that the door into the stairway should not overlap the wheelchair space the 2nd sentence of Section 1007.6.1 does not guarantee that.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E5-1007.6.1

E49–09/10
1007.6.2 (IFC [B] 1007.6.2)

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1007.6.2 ~~Separation~~ Construction. At a minimum, Each area of refuge shall ~~be separated from the remainder of the story by a smoke barrier complying with Section 709 or a horizontal exit complying with Section 1025~~ provide an equivalent level of protection as the enclosure serving the area of refuge. Each area of refuge shall be designed to minimize the intrusion of smoke.

~~**Exception:** Areas of refuge located within an exit enclosure.~~

Reason: When an area of refuge is required, the rating for the construction should match the stairway or elevator shaft construction. Since smoke barrier requirments do not include criteria for 2 hour construction, the appropriate construction is a fire barrier, so only referencing Section 709 is inadequate. The fire or hazard location might block access through a horizontal exit, therefore, the area of refuge should always be required.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E6-1007.6.2

E50–09/10
1007.8, 1007.8.2, 1007.8.3 (New), 1007.9, 1007.10 (IFC [B] 1007.8, 1007.8.2, 1007.8.3 (New), 1007.9, 1007.10)

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1007.8 (IFC [B] 1007.8) Two-way communication. A two-way communication system shall be provided at the elevator landing on each accessible floor that is one or more stories above or below the story of exit discharge complying with Sections 1007.8.1 and 1007.8.2. Signage for the two-way communication system shall be provided in accordance with Section 1007.8.3.

Exceptions:

1. Two-way communication systems are not required at the elevator landing where the two-way communication system is provided within areas of refuge in accordance with Section 1007.6.3.
2. Two-way communication systems are not required on floors provided with exit ramps conforming to the provisions of Section 1010.

1007.8.1 (IFC [B] 1007.8.1) System requirements. Two-way communication systems shall provide communication between each required location and the fire command center or a central control point location approved by the fire department. Where the central control point is not constantly attended, a two way communication system shall have a timed automatic telephone dial-out capability to a monitoring location or 911. The two-way communication system shall include both audible and visible signals.

1007.8.2 (IFC [B] 1007.8.2) System Directions. Directions for the use of the two-way communication system, instructions for summoning assistance via the two-way communication system and written identification of the location shall be posted adjacent to the two-way communication system. Signage shall comply with ICC A117.1 requirements for visual characters.

1007.8.3 (IFC [B] 1007.8.3) System signage. Directional signage indicating the location of the nearest two-way communication system shall be provided at the following:

1. Exit access and exit stairways not providing a two-way communication system.
2. Elevator landings, other than levels of exit discharge, not providing a two-way communication system.

1007.9 (IFC [B] 1007.9) Signage. Signage indicating special accessibility provisions shall be provided as shown:

1. Each door providing access to an area of refuge from an adjacent floor area shall be identified by a sign stating: AREA OF REFUGE.
2. Each door providing access to an exterior area for assisted rescue shall be identified by a sign stating: EXTERIOR AREA FOR ASSISTED RESCUE.
3. Each stairway serving as part of an accessible means of egress but not accessed by an area of refuge shall be identified by a sign stating: AREA FOR ASSISTED RESCUE.
4. Each elevator landing providing a two-way communication system shall provide a sign at the two-way communication system stating: CALL STATION FOR ASSISTED RESCUE.

Signage shall comply with the ICC A117.1 requirements for visual characters and include the International Symbol of Accessibility. Where exit sign illumination is required by Section 1011.2, the signs shall be illuminated. Additionally, tactile signage complying with ICC A117.1 shall be located at each door to an area of refuge and exterior area for assisted rescue in accordance with Section 1011.3.

1007.10 (IFC [B] 1007.10) Directional signage. Directional signage indicating the location of the ~~other means of egress and which are~~ accessible means of egress shall be provided at the following:

1. At exits serving a required accessible space but not providing an approved accessible means of egress.
2. At elevator landings.
3. ~~Within areas of refuge~~ At exit access and exit stairways not providing an approved accessible means of egress.

Reason: Signage is a critical component to an effective accessible means of egress system. Directional signage to a two-way communication system may be the most important component in the egress system as this communication system is the only element provided to obtain assisted rescue.

Exception 2 at Section 1007.8 is amended because there is no assurance that if only one ramp is provided that it will not be blocked by the hazard.

When an area of refuge or other approved accessible means of egress is provided, directional signage at other noncompliant routes must be provided to direct individuals to the compliant route.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E7-1007.8

E51–09/10
1008.1.2 (IFC [B] 1008.1.2)

Proponent: Gaius G. Nelson, Architect, Nelson•Tremain Partnership, representing self

Revise as follows:

1008.1.2 (IFC [B] 1008.1.2) Door swing. Egress doors shall be of the pivoted or side-hinged swinging type.

Exceptions:

1. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.
2. Group I-3 occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within sleeping rooms or suites of sleeping rooms in Group I-2.
4. ~~5~~. Doors within or serving a single dwelling unit in Groups R-2 and R-3.
5. ~~6~~. In other than Group H occupancies, revolving doors complying with Section 1008.1.4.1.
6. ~~7~~. In other than Group H occupancies, horizontal sliding doors complying with Section 1008.1.4.3 are permitted in a means of egress.
7. ~~8~~. Power-operated doors in accordance with Section 1008.1.4.2.
8. ~~9~~. Doors serving a bathroom within an individual sleeping unit in Group R-1.
9. ~~9~~. In other than Group H occupancies, manually operated horizontal sliding doors are permitted in a means of egress from spaces with an occupant load of 10 or less.

Doors shall swing in the direction of egress travel where serving an occupant load of 50 or more persons or a Group H occupancy.

Reason: Sliding doors are more easily operated by the disabled and present less of an obstacle than swinging doors when moving from one room to another. The NFPA 101 Life Safety Code allows sliding doors in areas serving an occupant load of fewer than 10. Refer to Chapter 18, New Health Care Occupancies.

Many state and local jurisdictions (eg. MN, WI, TX, MO, KS, IL) allow sliding doors in these occupancies.
Residents within I-2 occupancies have long term tenure, and are familiar with their living environment.
I-2 buildings are already constructed to high life safety standards.

Cost Impact: The cost of construction is potentially reduced because sliding doors allow for more useable floor space. The door approach clearances are reduced, and the door swing space is eliminated.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Nelson-E2-1008.1.2.2

E52–09/10
1008.1.2 (IFC [B] 1008.1.2)

Proponent: Gaius G. Nelson, Architect, Nelson•Tremain Partnership, representing self

Revise as follows:

1008.1.2 (IFC [B] 1008.1.2) Door swing. Egress doors shall be of the pivoted or side-hinged swinging type.

Exceptions:

1. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.
2. Group I-3 occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within or serving a single dwelling unit in Groups R-2, ~~and~~ R-3, and I-1.
5. In other than Group H occupancies, revolving doors complying with Section 1008.1.4.1.
6. In other than Group H occupancies, horizontal sliding doors complying with Section 1008.1.4.3 are permitted in a means of egress.
7. Power-operated doors in accordance with Section 1008.1.4.2.
8. Doors serving a bathroom within an individual sleeping unit in Group R-1.
9. In other than Group H occupancies, manually operated horizontal sliding doors are permitted in a means of egress from spaces with an occupant load of 10 or less.

Doors shall swing in the direction of egress travel where serving an occupant load of 50 or more persons or a Group H occupancy.

Reason: Sliding doors are more easily operated by the disabled and present less of an obstacle than swinging doors when moving from one room to another. The NFPA 101 Life Safety Code allows sliding doors in areas serving an occupant load of fewer than 10. Refer to Chapter 18, New Health Care Occupancies.

Many state and local jurisdictions (e.g., MN, WI, TX, MO, KS, IL) allow sliding doors in these occupancies.
Residents within I-1 occupancies have long term tenure, and are familiar with their living environment.
I-1 buildings are already constructed to high life safety standards.

Cost Impact: The cost of construction is potentially reduced because sliding doors allow for more useable floor space. The door approach clearances are reduced, and the door swing space is eliminated.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Nelson-E1-1008.1.2

E53–09/10
1008.1.2 (IFC [B] 1008.1.2)

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

1008.1.2 (IFC [B] 1008.1.2) Door swing. Egress doors shall be side-hinged swinging.

Exceptions:

1. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.
2. Group I-3 occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within or serving a single dwelling unit in Groups R-2 and R-3.
5. In other than Group H occupancies, revolving doors complying with Section 1008.1.4.1.
6. In other than Group H occupancies, horizontal sliding doors complying with Section 1008.1.4.3 are permitted in a means of egress.
7. Power-operated doors in accordance with Section 1008.1.4.2.
8. Doors serving a bathroom within an individual sleeping unit in Group R-1.
9. In other than Group H occupancies, manually operated horizontal sliding doors are permitted in a means of egress from spaces with an occupant load of 10 or less.

Doors shall swing in the direction of egress travel where serving a room or area containing an occupant load of 50 or more persons or a Group H occupancy.

Reason: The current wording of the second paragraph of Section 1008.1.2 can result in an incorrect interpretation of the intent of this section. The present wording can be interpreted to mean that the *door* itself must serve a tributary occupant load of 50 or more. However, the 2006 IBC Commentary for this code section located on page 10-40, clearly specifies that a side-hinged door must swing in the direction of egress travel where the required occupant capacity *of the room* is 50 or more. The 2006 IBC Commentary goes on to give the example of a room with 99 occupants and two exit doors where each door would individually serve less than 50, but the intent is that both doors must swing in the direction of egress. Because of this published conclusion of the intent of this paragraph, the current wording would benefit from the proposed change so that it would no longer be subject to an incorrect interpretation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Maiel-E4-1008.1.2

E54–09/10
1008.1.4.3 (IFC [B] 1008.1.4.3)

Proponent: Gregory J. Cahanin, Cahanin Fire & Code Consulting Representing the Smoke Safety Council

Revise as follows:

1008.1.4.3 (IFC [B] 1008.1.4.3) Horizontal or vertical ~~sliding~~ doors. In other than Group H occupancies, horizontal or vertical ~~sliding~~ doors permitted to be a component of a *means of egress* in accordance with Exception 6 to Section 1008.1.2 shall comply with all of the following criteria:

1. The doors shall be power operated and shall be capable of being operated manually in the event of power failure.
2. The doors shall be openable by a simple method from both sides without special knowledge or effort.
3. The force required to operate the door shall not exceed 30 pounds (133 N) to set the door in motion and 15 pounds (67 N) to close the door or open it to the minimum required width.
4. The door shall be openable with a force not to exceed 15 pounds (67 N) when a force of 250 pounds (1100 N) is applied perpendicular to the door adjacent to the operating device.
5. The door assembly shall comply with the applicable *fire protection rating* and, where rated, shall be self-closing or automatic closing by smoke detection in accordance with Section 715.4.8.3, shall be installed in accordance with NFPA 80 and shall comply with Section 715.
6. The door assembly shall have an integrated standby power supply.
7. The door assembly power supply shall be electrically supervised.
8. The door shall open to the minimum required width within 10 seconds after activation of the operating device.

Reason: Doors other than side-swinging doors have had special classifications for some time- turnstiles, revolving doors, and horizontal sliding doors suitable for egress are the most common. Horizontal sliding door classifications for egress were first developed more than 2 decades ago for Won Door's then unique bi-fold door and wall system. Since that time there have been multiple manufacturers whose opening protectives are not side swinging, but meet the same performance and safety requirements for horizontal sliding doors while have a different orientation. This change is

recognition of any door system orientation that meets the specific operational requirements that have been successfully in place for horizontal doors is acceptable. Further, it does not matter if the door slides, folds, or rolls up- only that it perform successfully for safe egress. There is no change in the testing or operational requirements- only a clarification of orientation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Cahanin-E1-1008.1.4.3

E55–09/10
1008.1.4.3 (IFC [B] 1008.1.4.3)

Proponent: John W. Park, John Park consulting representing Won-Door Corporation.

Revise as follows:

1008.1.4.3 (IFC [B] 1008.1.4.3) Horizontal sliding doors. In other than Group H occupancies, horizontal sliding doors permitted to be a component of a means of egress in accordance with Exception 6 to Section 1008.1.2 shall comply with all of the following:

1. The doors shall be power operated and shall be capable of being operated manually in the event of power failure.
2. The doors shall be openable by a simple method from both sides without special knowledge or effort.
3. The force required to operate the door shall not exceed 30 pounds (133 N) to set the door in motion and 15 pounds (67 N) to close the door or open it to the minimum required width.
4. The door shall be openable with a force not to exceed 15 pounds (67 N) when a force of 250 pounds (1100 N) is applied perpendicular to the door adjacent to the operating device.
5. The door assembly shall comply with the applicable fire protection rating and, where rated, the door assembly shall comply with all of the following:
   - 5.1 Be self-closing or automatic closing by smoke detection in accordance with Section 715.4.8.3,
   - 5.2 The door assembly shall be installed in accordance with NFPA 80, ~~and~~
   - 5.3 The door assembly shall comply with Section 715, and
   - 5.4 Electronic controls for horizontal sliding doors that include closing and signaling functions shall be tested and listed in accordance with UL 864.
6. The door assembly shall have an integrated standby power supply.
7. The door assembly power supply shall be electrically supervised.
8. The door shall open to the minimum required width within 10 seconds after activation of the operating device.

Reason: Self closing or automatic closing devices referenced need to work seamlessly with fire alarm systems, including providing feedback signals to achieve joint control with the fire control center. UL 864, *Standard for Control Units and Accessories for Fire Alarm Systems* is a nationally recognized standard that provides appropriate tests and guidelines to assure compatibility. It further deals with critical functions such as alarm verification, endurance, life safety networks, notification, power supplies, resets, risk of electrical shock, risk of fire, standby power sources, storage batteries, dual power source systems, supervisory signals, and trouble signals. Since the closing device essentially releases the door from its open to closed position on receipt of a signal from the fire alarm system, they should be evaluated to the 864 standard under the “Releasing Device” category. Holding said closing devices to nationally recognized standards ensures consistency and compatibility for these types of products.

Separating the requirements for compliance with section 715 as well as being installed in accordance with NFPA 80 breaks out the separate requirements and makes for better understanding.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Park-E1-1008.1.4.3

E56–09/10
1008.1.4.4, Chapter 35 (IFC [B] 1008.1.4.4, Chapter 45)

Proponent: Kurt Roeper, representing Ingersoll Rand

1. Revise as follows:

1008.1.4.4 Access Controlled Egress Doors. The entrance doors in a means of egress in buildings with an occupancy in Groups A, B, E, I-2, M, R-1,or R-2 and entrance doors to tenant spaces in occupancies in groups A, B, E, I-2, M, R-1,or R-2 are permitted to be equipped with an approved entrance and egress access control system, listed in accordance with ANSI / UL 294, which shall be installed in accordance with all of the following criteria;

1. A sensor shall be provided on the egress side arranged to detect an occupant approaching the doors. The doors shall be arranged to unlock by a signal from or loss of power to the sensor.
2. Loss of power to that part of the access control system which locks the doors shall automatically unlock the doors.
3. The doors shall be arranged to unlock from a manual unlocking device located 40 inches to 48 inches (1016mmto 1219 mm) vertically above the floor and within 5 feet (1524 mm) of the secured doors. Ready access shall be provided to the manual unlocking device and the device shall be clearly identified by a sign that reads "PUSH TO EXIT." When operated, the manual unlocking device shall result in direct interruption of power to the lock—independent of the access control system electronics—and the doors shall remain unlocked for a minimum of 30 seconds.
4. Activation of the building fire alarm system, if provided, shall automatically unlock the doors, and the doors shall remain unlocked until the fire alarm system has been reset.
5. Activation of the building automatic sprinkler or fire detection system, if provided, shall automatically unlock the doors. The doors shall remain unlocked until the fire alarm system has been reset.
6. Entrance doors in buildings with an occupancy in Group A, B, E or M shall not be secured from the egress side during periods that the building is open to the general public.

2. Add new standard to Chapter 35 (IFC [B] Chapter 45) as follows:

UL – Underwriters Laboratories, Inc.
ANSI / UL 294-1999 – Access Control System Units with revisions through 2009

Reason: The increasing technological complexity of wired and wireless access control systems necessitates a baseline level of system performance and reliability be established via testing and listing to a nationally recognized standard. This proposal does not remove the AHJ's right to approve such systems, but supplements their evaluation by requiring listing to a nationally recognized standard. The existing requirements of the code do not provide any foundation from which an AHJ can assess electronic systems and communication devices used in access / egress control systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, UL 294, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Roepe-E1-1008.1.4.4

E57–09/10
1008.1.5, 1008.1.7(IFC [B] 1008.1.5, 1008.1.7)

Proponent: Julie Ruth, PE, JRuth Code Consulting, representing American Architectural Manufacturers Association

1. Revise as follows:

1008.1.5 (IFC [B] 1008.1.5) Floor elevation. There shall be a floor or landing on each side of a door. Such floor or landing shall be at the same elevation on each side of the door. Landings shall be level except for exterior landings, which are permitted to have a slope not to exceed 0.25 unit vertical in 12 units horizontal (2-percent slope). Thresholds at doorways shall not exceed ¾ inch (19.1 mm) in height for sliding doors serving dwelling units or ½ inch (12.7 mm) for other doors. Floor level changes greater than ¼ inch (6.4 mm) at the required exit door, including those due to raised thresholds, shall be beveled with a slope not greater than one unit vertical in two units horizontal (50-percent slope).

Exceptions:

1. Doors serving individual dwelling units in Groups R-2 and R-3 where the following apply:
   1.1. A level floor or landing on each side of a door is not required for a door ~~is permitted to open~~ at the top step of an interior flight of stairs, provided the door does not swing over the top step.
   1.2. Screen doors and storm doors are permitted to swing over stairs or landings.

2. Exterior doors as provided for in Section 1003.5, Exception 1, and Section 1020.2, which are not on an accessible route.
3. In Group R-3 occupancies, and dwelling units in Group R-2 occupancies, where the following apply:
   3.1. Are not required to be Accessible units, Type A units or Type B units,
   3.2. The exterior floor or landing at an exterior doorway ~~shall~~ is not ~~be~~ more than 7 ¾ inches (197 mm) below the top of the threshold, ~~provided~~ and
   3.3. The exterior door, other than an exterior storm or screen door, does not swing over the landing.

Thresholds at doorways shall not exceed ¾ inch (19.1 mm) in height above the interior finished floor for sliding doors serving dwelling units or ½ inch (12.7 mm) for other doors. If the top of the threshold at these doors is more than ¼ inch (6.4 mm) above the interior finished floor the threshold or floor shall be beveled with a slope towards the interior not greater than one unit vertical in two units horizontal (50 percent slope).

4. Variations in elevation due to differences in finish materials, but not more than ½ inch (12.7 mm).
5. Exterior decks, patios or balconies that are part of Type B dwelling units, have impervious surfaces and meet the following:
   5.1. ~~that~~ Are not more than 4 inches (102 mm) below the finished floor level of the adjacent interior space of the dwelling unit,
   5.2. Are not more than 4 ½ inches below the top of the threshold of any side swinging doors between the exterior deck, patio or balcony and the adjacent interior space, and
   5.3. Are not more than 4 ¾ inches below the top of the threshold of any sliding doors between the exterior deck, patio or balcony and the adjacent interior space.

Thresholds at doorways shall not exceed ¾ inch (19.1 mm) in height above the interior finished floor for sliding doors serving dwelling units or ½ inch (12.7 mm) for other doors. If the top of the threshold at these doors is more than ¼ inch (6.4 mm) above the interior finished floor the threshold or floor shall be beveled with a slope towards the interior not greater than one unit vertical in two units horizontal (50 percent slope).

2. Delete without substitution:

~~**1008.1.7 Thresholds.** Thresholds at doorways shall not exceed ¾ inch (19.1 mm) in height for sliding doors serving dwelling units or ½ inch (12.7 mm) for other doors. Raised thresholds and floor level changes greater than ¼ inch (6.4 mm) at doorways shall be beveled with a slope not greater than one unit vertical in two units horizontal (50-percent slope).~~

~~**Exception:** The threshold height shall be limited to 7 ¾ inches (197 mm) where the occupancy is Group R-2 or R-3, the door is an exterior door that is not a component of the required means of egress; the door, other than an exterior storm or screen door does not swing over the landing or step; and the doorway is not on an accessible route as required by Chapter 11 and is not part of an Accessible unit, Type A unit or Type B unit.~~

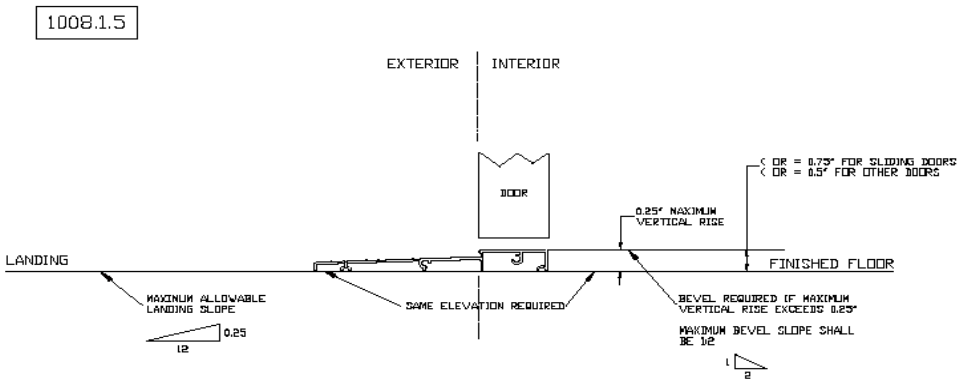
(Renumber subsequent sections)

Reason: This proposal seeks to clarify the requirements of the International Building Code with regards to floor elevations and thresholds at and adjacent to exterior doorways, by combining the requirements that are currently in two sections into one section. The 2009 IBC deals with floor elevations at doorways separately from thresholds, as did the previous editions of the IBC. This has resulted in confusion.

The primary concern with regards to egress through a door is the changes in elevation that occurs as the building occupant passes from one space on one side of the door to another space on the other side. This proposal seeks to address that transition in one section.

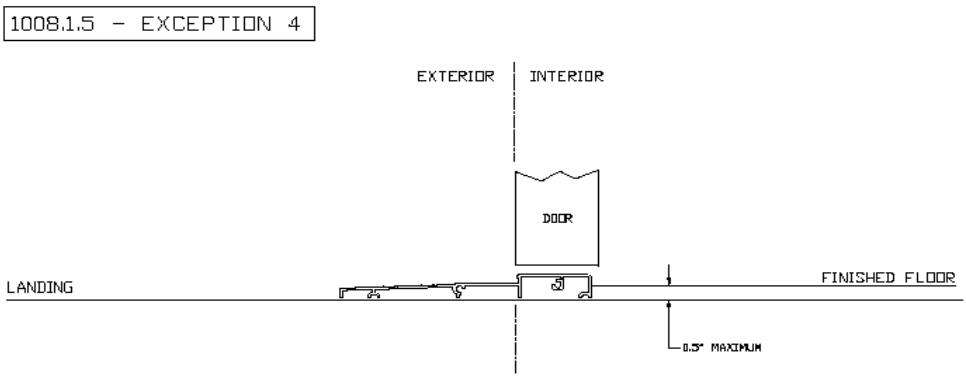
When the wind blows across the surface of an exterior wall a phenomenal known as pressure differentiation occurs between the surface of that wall and the wall cavity. The exact nature of the differentiation, both with regards to whether or not it is positive or negative, and its magnitude, will depend upon the surface of the exterior wall itself, openings that occur between the wall cavity and the exterior surface, the direction the wind is blowing and the speed of the wind. If the pressure in the wall cavity is less than the pressure on the exterior surface, then exterior air will be drawn into the wall cavity. If the exterior air is laden with moisture, then that moisture will be drawn into the cavity as well.

The exact nature of this pressure differentiation, and particularly its potential magnitude, is a subject that AAMA and its members have been studying for decades. AAMA/WDMA/CSA 101/I.S.2/A440 requires exterior wall fenestrations to be tested for water infiltration at a difference in pressure between the interior side of the wall and the exterior side of the wall of either 15 or 20% of structural design pressure, with a cap of 12 psf. In areas where the exterior design wind speed is 90 mph (the majority of the U.S.), the resultant design wind pressure on the exterior surface of the wall of a building under 60 feet in height can be as great as +/- 37 psf, with resultant design pressure differential for water infiltration as high as 7.4 psf. This translates into 1.42 inches of water when measured using a manometer. A threshold height of 1/2 inch or 3/4 inch, as is currently required by Section 1008.1.7 in combination with Section 1008.1.5 and as illustrated in the sketch below, is not adequate to resist this.



Moreover, extreme wind events that have occurred within the U.S. over the past decade appear to indicate that while the design wind pressure calculated using the three second gust model of ASCE 7 - 98 and later editions appear to be adequate for determining required structural load capacity (at least for fenestration) such may not be the case with regards to the pressure differential assumed between the interior and exterior side of the wall for water infiltration. In other words, we know that 3/4 inch is inadequate to resist water penetration through the wall for the majority of the country. What we don't yet know is what the appropriate number should be. AAMA is currently engaged in further research on this topic.

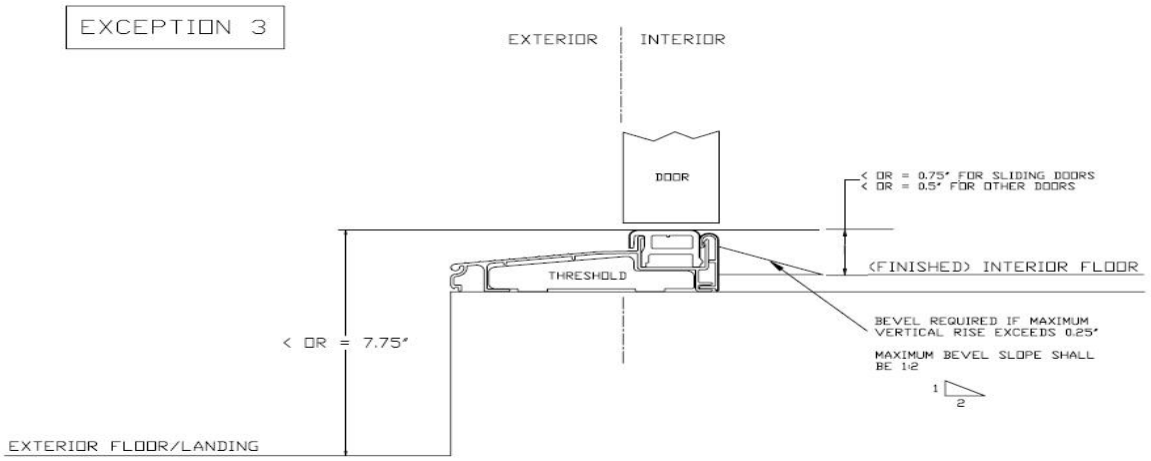
Even though a difference in floor elevation due to floor finish materials is permitted by exception 4 to Section 1008.1.5, the threshold height is still limited to ½ inch for swinging doors or ¾ inch for sliding doors, by Section 1008.1.7. As shown in the sketch below, this slight difference in floor elevation is not adequate to address the water pressure differentiation that could be experienced at the sill of these exterior doors.



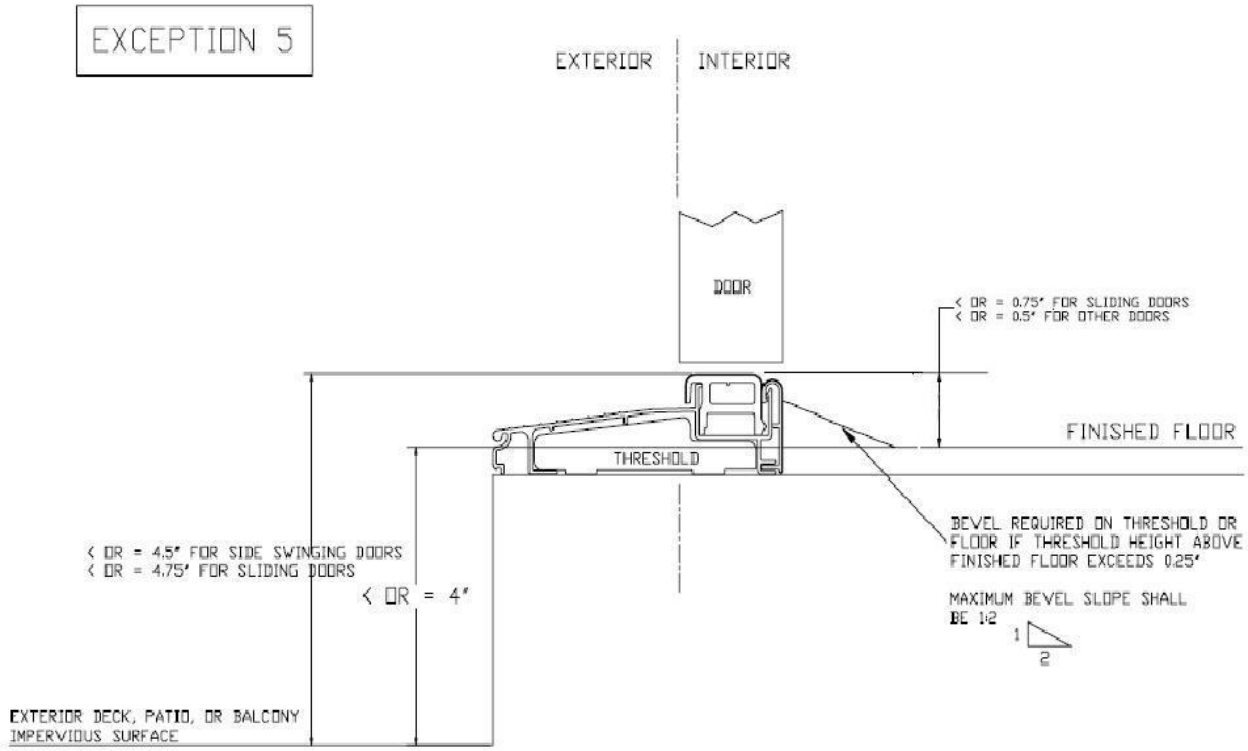
Currently the IBC and IRC permits thresholds greater than 3/4 inch in height for exterior doors that are not required egress doors, do not swing over a landing and are not part of an Accessible unit, Type A or Type B unit, or in a doorway that is on an accessible route, as required by Chapter 11 of the IBC. Such thresholds are permitted by the exception to Section 1008.1.7 to be up to 7 3/4 inches in height.

The intent of the exception to Section 1008.1.7, when it was proposed by the fenestration industry in the first years of the IBC, was to permit thresholds up to 7 3/4 inches in height to be incorporated into the 7 3/4 inches step down in height that is permitted at the door by Exception 3 to Section 1008.1.5. A tie between these two sections, however, does not currently exist. As a result, there has been confusion about the proper use of this exception. By bringing the requirements for threshold height into Section 1008.1.5 the tie between threshold height and floor elevations on either side of the door is more firmly established.

This proposal also addresses concerns that have been expressed that the current exception does not appropriately limit the height of the threshold above the interior floor, by repeating the current provisions on Section 1008.1.5 in Exception 3. The result is shown in the sketch below.



Finally, this proposal addresses the same concern regarding potential water infiltration of Type B dwelling units by bringing revising Exception 5 similarly to Exception 3. The revisions proposed to Exception 3 and Exception 5 to Section 1008.1.5 would permit thresholds higher than 1/2 inch or 3/4 inch to be used, provided the extra height is incorporated into the height difference between the interior and exterior floors that is already permitted by these exceptions, and the current height of threshold above the interior floor surface requirements are maintained. The sketch below illustrates the provisions of proposed Exception 5.



It is our hope that this proposal will address the concerns of ADA advocates who might be opposed to the current exception to Section 1008.1.7, permit our industry to provide thresholds that have a higher potential to resist water infiltration, even under extreme weather conditions, at least for those exterior doorways included within the scope of Exceptions 3 and 5 to Section 1008.1.5, and clarify the intent of the IBC with regards to door thresholds. We urge the committee's approval of this code change proposal.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF D

Filename: RUTH-E2-1008.1.5

E58–09/10
1008.1.7 (IFC [B] 1008.1.7); IRC R311.3.1

Proponent: Julie Ruth, JRuth Code Consulting, representing AAMA

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE MEANS OF EGRESS COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

Revise as follows:

1008.1.7 (IFC [B] 1008.1.7) Thresholds. Thresholds at doorways shall not exceed 3/4 inch (19.1 mm) in height *above the finished floor or landing* for sliding doors serving dwelling units or 1/2 inch (12.7 mm) *above the finished floor or landing* for other doors. Raised thresholds and floor level changes greater than 1/4 inch (6.4mm) at doorways shall be beveled with a slope not greater than one unit vertical in two units horizontal (50-percent slope).

Exception: The threshold height shall be limited to 73/4 inches (197 mm) where the occupancy is Group R-2 or R-3; the door is an exterior door that is not a component of the required means of egress; the door, other than an exterior storm or screen door, does not swing over the landing or step; and the doorway is not on an accessible route as required by Chapter 11 and is not part of an Accessible unit, Type A unit or Type B unit.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R311.3.1 Floor elevations at the required egress door. Landings or finished floors at the required egress door shall not be more than 1.5 inches (38 mm) lower than the top of the threshold.

Exception: The ~~exterior~~ landing or floor on the exterior side shall not be more than 7 3/4 inches (197 mm) below the top of the threshold provided the door does not swing over the landing or floor.

When exterior landings or floors serving the required egress door are not at grade, they shall be provided with access to grade by means of a ramp in accordance with Section R311.8 or a stairway in accordance with Section R311.7.

Reason:
PART I –This proposal clarifies that threshold height is to be measured to the finished floor or landing, and not the top of the subfloor or other surface.
PART II - This proposal clarifies that threshold height is to be measured to the finished floor or landing, and not the top of the subfloor or other surface, and that it is the exterior floor or landing that is permitted to be up to 7 ¾ inches below the top of the threshold, when other criteria are met. As the code currently reads, it could be misconstrued to mean the exterior landing or ANY floor shall not be more than 7 ¾ inches below the top of the threshold. This is not the intent of this exception. The proposal seeks to clarify that.

Cost Impact: The code change will not increase the cost of construction.

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RUTH-E1-1008.1.7.DOC

E59–09/10
1008.1.7 (IFC [B] 1008.1.7)

Proponent: Jeff Lowinski, representing the Window and Door Manufacturers Association (WDMA)

Revise as follows:

1008.1.7 (IFC [B] 1008.1.7) Thresholds. Thresholds at doorways shall not exceed 3/4 inch (19.1 mm) in height for sliding doors serving dwelling units or 1/2 inch (12.7 mm) for other doors. Raised thresholds and floor level changes greater than 1/4 inch (6.4 mm) at doorways shall be beveled with a slope not greater than one unit vertical in two units horizontal (50-percent slope).

~~**Exception:** The threshold height shall be limited to 7 3/4 inches (197 mm) where the occupancy is Group R-2 or R-3; the door is an exterior door that is not a component of the required means of egress; the door, other than an exterior storm or screen door, does not swing over the landing or step; and the doorway is not on an accessible route as required by Chapter 11 and is not part of an Accessible unit, Type A unit or Type B unit.~~

Exception: In occupancy Group R-2 or R-3, threshold heights for sliding and side-hinged exterior doors shall be permitted to be up to 7-3/4 inches (197mm) in height if all of the following apply:

1. The door is not part of the required means of egress.
2. The door is not part of an accessible route as required by Chapter 11.
3. The door is not part of an Accessible unit, Type A unit or Type B unit.

Reason: This proposal clarifies the exception in this section of the code for ease of understanding and enforcement. This revision is intended to essentially an editorial reformatting of the technical requirements of the code. WDMA members have received numerous questions from code officials and project owners regarding this section of the IBC. This proposal removes the reference to exterior storm and screen doors because this is addressed in 1008.1.5, Exception 1.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Woestman-E1-1008.1.7

E60–09/10
1008.1.9.3 (IFC [B] 1008.1.9.3); IPMC 304.18.1; IRC R311.2, R311.2.1 (New)

Proponent: John Morgan, City of Frontenac, Missouri, representing Missouri Association of Building Officials and Inspectors

THIS IS A 3 PART CODE CHANGE. PARTS I AND II WILL BE HEARD BY THE MEANS OF EGRESS COMMITTEE. PART III WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

Revise as follows:

1008.1.9.3 (IFC [B] 1008.1.9.3) Locks and latches. Locks and latches shall be permitted to prevent operation of doors where any of the following exists:

1. Places of detention or restraint.
2. In buildings in occupancy Group A having an occupant load of 300 or less, Groups B, F, M and S, and in places of religious worship, the main exterior door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:
   2.1. The locking device is readily distinguishable as locked;
   2.2. A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background; and
   2.3. The use of the key-operated locking device is revocable by the building official for due cause.
3. Where egress doors are used in pairs, approved automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts has no doorknob or surface-mounted hardware.

4. ~~Doors from individual dwelling or sleeping units of Group R occupancies having an occupant load of 10 or less are permitted to be equipped with a night latch, dead bolt or security chain, provided such devices are openable from the inside without the use of a key or tool.~~ All side-hinged doors providing access to individual dwelling units or sleeping units of Group R occupancies shall be equipped with a deadbolt lock designed to be readily openable from the side which egress is to be made without the need for keys, special knowledge or effort and shall have a lock throw of not less than 1 inch (25mm).
   Exception: Dead bolts shall not be required on doors leading from dwelling units to attached garages, where secured exterior garage doors are provided.
5. Fire doors after the minimum elevated temperature has disabled the unlatching mechanism in accordance with listed fire door test procedures.

PART II – IPMC

Revise as follows:

304.18.1 Doors. All side-hinged doors providing access to a dwelling unit, rooming unit or housekeeping unit that is rented, leased or let shall be equipped with a deadbolt lock designed to be readily openable from the side from which egress is to be made without the need for keys, special knowledge or effort and shall have a lock throw of not less than 1 inch. Such deadbolt locks shall be installed according to the manufacturer's specifications and maintained in good working order. For the purpose of this section, a sliding bolt shall not be considered an acceptable deadbolt lock.

> **Exception:** Dead bolts shall not be required on doors leading from dwelling units to attached garages, where secured exterior garage doors are provided.

PART III – IRC BUILDING/ENERGY

Add new text as follows:

R311.2 Egress door. At least one egress door shall be provided for each *dwelling* unit. The egress door shall be side-hinged, and shall provide a minimum clear width of 32 inches (813 mm) when measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). The minimum clear height of the door opening shall not be less than 78 inches (1981 mm) in height measured from the top of the threshold to the bottom of the stop. Other doors shall not be required to comply with these minimum dimensions. ~~Egress doors shall be readily openable from inside the *dwelling* without the use of a key or special knowledge or effort.~~

R311.2.1 Door locks and latches. All side-hinged doors providing access to a dwelling unit shall be equipped with a deadbolt lock designed to be readily openable from the side which egress is to be made without the need for keys, special knowledge or effort and shall have a lock throw of not less than 1 inch (25mm).

> **Exception:** Dead bolts shall not be required on doors leading from dwelling units to attached garages, where secured exterior garage doors are provided.

Reason:
Part I & III-The purpose of this change is to coordinate the requirements for deadbolts between the IPMC, IBC and IRC. Currently section 304.18.1 of the IPMC requires deadbolts to be installed on doors providing access to a dwelling unit, rooming unit, or housekeeping unit that is rented, leased or let. It is not reasonable to require a minimum level of security to a renter, but not provide that same security to a person who owns the property.

Furthermore, at the time of construction it is not reasonable to know the intentions of the owner to possibly lease, rent or let the unit. This can lead to additional steps to obtain compliance when it is learned that a unit is to be a rental. Originally in the IPMC it states all doors providing access, and we a proposing a change to the IPMC to address the need to allow certain style doors such as glass sliding doors and doors leading to secured garages to be exempt from this requirement as we are recommending in this change. The IPMC does require all doors, windows and hatchways to have security devices, therefore sliding doors would have to have some type of locking device.
Part II- The purpose of the change is to coordinate the requirements for deadbolts between the IPMC, IRC and IBC. The current language hinders the coordination of the codes through the installation of deadbolts on differing types of doors. This section will clarify on which doors deadbolts are required and where they are exempt, (i.e. sliding glass doors, and doors between a residence and an attached garage, which are required by 304.18 to have some type of security device).

Cost Impact: Part I & III-The code change proposal will have minimal increase to cost of construction.

Cost Impact: Part II- The code change proposal will not increase the cost of construction.

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IPMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Morgan-E1-1008.1.9.3

E61–09/10
1008.1.9.3 (IFC [B] 1008.1.9.3)

Proponent: Jim McClintic, Sandy City, representing the Utah Chapter

Revise as follows:

1008.1.9.3 (IEBC [B] 1008.1.9.3) Locks and latches. Locks and latches shall be permitted to prevent operation of doors where any of the following exists:

1. Places of detention or restraint.
2. In buildings in occupancy Group A having an occupant load of 300 or less, Groups B, F, M and S, and in places of religious worship, the main exterior door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:
   2.1. The locking device is readily distinguishable as locked;
   2.2. A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background; and
   2.3. The use of the key-operated locking device is revocable by the building official for due cause.
3. Where egress doors are used in pairs, approved automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts has no doorknob or surface-mounted hardware.
4. Doors from individual dwelling or sleeping units of Group R occupancies having an occupant load of 10 or less are permitted to be equipped with a night latch, dead bolt or security chain, provided such devices are openable from the inside without the use of a key or tool <u>and complying with the height requirements outlined in Section 1008.1.9.2.</u>
5. Fire doors after the minimum elevated temperature has disabled the unlatching mechanism in accordance with listed fire door test procedures.

Reason: This additional language will clarify hardware height requirements in these locations and help eliminate the confusion when this section of the code is being enforced.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Mcclintic-E1-1008.1.9.3

E62–09/10
1008.1.9.3 (IFC [B] 1008.1.9.3)

Proponent: Lee Kranz representing Washington Association of Building Officials (WABO), Technical Code Development Committee

Revise as follows:

1008.1.9.3 (IFC [B] 1008.1.9.3) Locks and latches. Locks and latches shall be permitted to prevent operation of doors where any of the following exists:

1. Places of detention or restraint.
2. In buildings in occupancy Group A having an occupant load of 300 or less, Groups B, F, M and S, and in places of religious worship, the main exterior door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:
   2.1. The locking device is readily distinguishable as locked;
   2.2. A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background; and
   2.3. The use of the key-operated locking device is revocable by the building official for due cause.
3. Where egress doors are used in pairs, approved automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts has no doorknob or surface-mounted hardware.
4. Doors from individual dwelling or sleeping units of Group R occupancies having an occupant load of 10 or less are permitted to be equipped with a night latch, dead bolt or security chain, provided such devices are openable from the inside without the use of a key or tool.
5. Fire doors after the minimum elevated temperature has disabled the unlatching mechanism in accordance with listed fire door test procedures.
6. Doors serving outdoor areas specified in Section 1004.8 having an occupant load of 300 or less are permitted to be equipped with key-operated locking devices from the egress side provided:
   6.1. The locking device is readily distinguishable as locked;
   6.2. A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN THE BUILDING IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background;
   6.3. A two-way communication system complying with Sections 1007.8.1 and 1007.8.2 shall be provided on the egress side.
   6.4 The use of the key-operated locking device is revocable by the building official.

Reason: Egress from confined outdoor areas, as required by Section 1004.8, is necessary. Unfortunately, many building owners are reluctant to leave required egress doors from these areas unlocked for security reasons, which places the public at risk. Fire Code officials, who conduct maintenance inspections, and building owners are at odds on this issue. It makes sense to recognize that this conflict exists and place safeguards in the code to eliminate the conflict. The two-way communication system will allow an occupant to call for help if the egress is accidently locked while the outdoor area is occupied. This new text is similar to exception #2 of Section 1008.1.9.3 as it relates to an allowance to lock egress doors under certain conditions.

Cost Impact: This code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KRANZ-E2-1008.1.9.3.DOC

E63–09/10
1008.1.9.3 (IFC [B] 1008.1.9.3)

Proponent: Tom Lariviere, Chairman, representing Joint Fire Service Review Committee

Revise as follows:

1008.1.9.3 (IFC [B] 1008.1.9.3) Locks and latches. Approved locks and latches shall be permitted to prevent operation of doors where any of the following exists:

1. Places of detention or restraint.
2. In buildings in occupancy Group A having an occupant load of 300 or less, Groups B, F, M and S, and in places of religious worship, the main exterior door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:
   2.1 The locking device is readily distinguishable as locked;
   2.2 A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background; and
   2.3 The use of the key-operated locking device is revocable by the building official for due cause.
3. Where egress doors are used in pairs, approved automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts has no doorknob or surface-mounted hardware.

4. Doors from individual dwelling or sleeping units of Group R occupancies having an occupant load of 10 or less are permitted to be equipped with a night latch, dead bolt or security chain, provided such devices are openable from the inside without the use of a key or tool.
5. Fire doors after the minimum elevated temperature has disabled the unlatching mechanism in accordance with listed fire door test procedures.
6. In Group I-2 occupancies housing clients where the means of egress needs to be secured for the safety of the clients provided all the following requirements are met:
   - 6.1 The facility is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1,
   - 6.2 The doors unlock upon actuation of the automatic sprinkler system,
   - 6.3 The doors unlock upon activation of the automatic smoke detection system,
   - 6.4 The doors unlock upon loss of power controlling the lock or lock mechanism,
   - 6.5 The door locks shall have the capability of being unlocked by a signal from an approved location,
   - 6.6 Emergency lighting is provided at the door, and
   - 6.7 The facility is constantly staffed.

Reason: The new language addresses the problem faced by providers of patients suffering from Alzheimer's or Dementia wandering out of facilities and endangering their persons. Cognitive impairments caused by these diseases and other forms of dementia, render the residents of this type of facility unable to make the most appropriate decisions for their safety and welfare. This proposal would allow for door locking arrangements without delayed egress locks that are currently approved in health care type occupancies.

These patients can be very quick and mobile. The delayed egress lock poses a very challenging situation for staff when providing care for these patients who seek wandering or "exit seeking" associated with their disease.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A concern would be how this proposal will coordiante with Section 1008.1.9.6 Special locking arrangements in Group I-2.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Lariviere-E1-1008.1.9.3

E64–09/10
1008.1.9.4 (IFC [B] 1008.1.9.4)

Proponent: Gene Boecker, AIA, Code Consultants, Inc., representing Code Consultants, Inc.

Revise as follows:

1008.1.9.4 (IFC [B] 1008.1.9.4) Bolt locks. Manually operated flush bolts or surface bolts are not permitted.

Exceptions:

1. On doors not required for egress in individual dwelling units or sleeping units.
2. Where a pair of doors serves a storage or equipment room, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf.
3. Where a pair of doors serves an *occupant load* of less than 50 persons in a Group B, F or S occupancy, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf. The inactive leaf shall contain no doorknobs, panic bars or similar operating hardware.
4. Where a pair of doors serves a Group B, F or S occupancy, manually operated edge- or surface-mounted bolts are permitted on the inactive leaf provided such inactive leaf is not needed to meet egress width requirements and the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1. The inactive leaf shall contain no doorknobs, panic bars or similar operating hardware.
5. Where a pair of doors serves patient care rooms in Group I-2 occupancies, self-latching edge or surface-mounted bolts are permitted on the inactive leaf provided that the inactive leaf is not needed to meet egress width requirements and the inactive leaf contains no doorknobs, panic bars or similar operating hardware.
6. Where pairs of doors are installed in accordance with Section 1008.1.9.3, item 2, the inactive leaf shall be permitted to be equipped with manually operated surface or flush bolts provided the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 and the inactive leaf is not required for means of egress width.

Reason: This recognizes one of the current practices in the construction industry. Whether we choose to admit it or not, the standard manner in which the doors are installed in compliance with item #2 for Section 1008.1.9.3 is that the active leaf has the readily distinguishable lock and sign

while the inactive leaf is simply held in place by flush (edge) bolts. It is the flush bolt that keeps the inactive leaf secure so that the active leaf can be locked when the building is not occupied.

Although it could be easy to simply recognize this condition and include it alone, the exception adds the requirement for sprinkler protection as an added measure of safety. It also differentiates this exception from exception #3 which limits the occupant load to less than 50 and does not address sprinkler protection.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Boecker-E2-1008.1.9.4

E65–09/10
1008.1.9.8 (IFC [B] 1008.1.9.8)

Proponent: Edward A. Hite, CML, representing self

Revise as follows:

1008.1.9.8 (IFC [B] 1008.1.9.8) Electromagnetically locked egress doors. Doors in the means of egress ~~that are not otherwise required to have panic hardware~~ in buildings with an occupancy in Group A, B, E, M, R-1 or R-2 and doors to tenant spaces in Group A, B, E, M, R-1 or R-2 shall be permitted to be electromagnetically locked if equipped with listed hardware that incorporates a built-in switch and meet the requirements below:

1. The listed hardware that is affixed to the door leaf has an obvious method of operation that is readily operated under all lighting conditions.
2. The listed hardware is capable of being operated with one hand.
3. Operation of the listed hardware releases ~~to~~ the electromagnetic lock and unlocks the door immediately.
4. Loss of power to the listed hardware automatically unlocks the door.

Reason: Bars tested and listed to release electromagnetic locks include both panic bars and fire exit hardware. When power is removed from a listed electromagnetic lock, it will release in less than ½ second. Bars with switches directly release that power. The number of people going through the door has no bearing on this.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HITE-E2-1008.1.9.8

E66–09/10
1008.1.9.10 (IFC [B] 1008.1.9.10)

Proponent: Tom Lariviere, Chairman, representing Joint Fire Service Review Committee

Revise as follows:

1008.1.9.10 (IFC [B] 1008.1.9.10) Stairway doors. Interior stairway means of egress doors shall be openable from both sides without the use of a key or special knowledge or effort.

Exceptions:

1. Stairway discharge doors shall be openable from the egress side and shall only be locked from the opposite side.
2. This section shall not apply to doors arranged in accordance with Section 403.5.3.
3. ~~In stairways serving not more than four stories,~~ Stairway doors are permitted to be locked from the stairway side ~~opposite the egress side, provided they are openable from the egress side and~~ when the stairway serves no more than four stories and the doors are capable of being unlocked simultaneously without unlatching upon a signal from the fire command center, if present, or a signal by emergency personnel from a single location inside the main entrance to the building.

4. Stairway doors are permitted to be locked from the stairway side when the stairways serves no more than two stories and the stairway discharge door leads directly to the exit discharge and a key box is provided in accordance with Section 506 of the International Fire Code.

Reason: Many buildings are concerned with security and reentry into the building from the stairways. As a result, building owners and managers desire to lock the stairwell doors to prohibit entry onto the floor from the stairwell. This practice of locking the stairwell doors increases the building security.

This proposal will provide an additional exception for buildings not more than two stories in height. This new exception will allow for the prohibition of reentry from the stairwell as long as a key box is provided for fire department use. The fire department could access the key box and unlock the stairwell doors for fire use.

The current requirements are allow for the locking of these doors, but only is an electric override is provided within the building for fire department use. The current requirement is overly restrictive for stairways serving only two stories, and this exception will provide another option for building owners and managers.

Item 4 is added to provide the allowance for doors to be locked when the building serves no more than 2 stories. Item 3 is revised without changing the intent. This revision is to simplify the wording and clarify the section. This wording is similar to the current wording in Section 403.5.3.

Cost Impact: This code change proposal will decrease the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Lariviere-E3-1008.1.9.10

E67–09/10
1009.1 (IFC [B] 1009.1)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

1009.1 (IFC [B] 1009.1) General. Stairways serving occupied portions of a building shall comply with the requirements of this section.

~~**1009.1**~~ **1009.2 (IFC [B] ~~1009.1~~ 1009.2) ~~Stairway~~ Width.** The width of stairways shall be determined as specified in Section 1005.1, but such width shall not be less than 44 inches (1118 mm). See Section 1007.3 for accessible means of egress stairways.

Exceptions:

1. Stairways serving an occupant load of less than 50 shall have a width of not less than 36 inches (914 mm).
2. Spiral stairways as provided for in Section 1009.9.
3. Aisle stairs complying with Section 1028.
4. Where an incline platform lift or stairway chairlift is installed on stairways serving occupancies in Group R-3, or within dwelling units in occupancies in Group R-2, a clear passage width not less than 20 inches (508 mm) shall be provided. If the seat and platform can be folded when not in use, the distance shall be measured from the folded position.

(Renumber subsequent sections)

Reason: Presently, Section 1009 has no general charging provisions. It is essential that all means of egress components have legal charging statements so as to establish the applicability of given prescriptive technical requirements. This is especially true with stairways. Often, there are stairs or stairways in a building in excess of those minimally required to support a given means of egress design. This proposal establishes that the applicable technical provisions of Section 1009 apply to all stairways serving occupied portions of the building, regardless of whether or not they are a required means of egress component. Approval of this proposal will increase consistency in the application of very important stairway provisions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Keith-E7-1009.1

E68–09/10
1009.1 (IFC [B] 1009.1)

Proponent: Catherine Heeb, representing City of Portland Bureau of Development Services

Revise as follows:

1009.1 (IFC [B] 1009.1) Stairway width. The width of stairways shall be determined as specified in Section 1005.1, but such width shall not be less than 44 inches (1118 mm). See Section 1007.3 for accessible means of egress stairways.

Exceptions:

1. Stairways serving an occupant load of less than 50 shall have a width of not less than 36 inches (914 mm).
2. Spiral stairways as provided for in Section 1009.9.
3. Aisle stairs complying with Section 1028.
4. Where an incline platform lift or stairway chairlift is installed on stairways serving occupancies in Group R-3, or within dwelling units in occupancies in Group R-2, a clear passage width not less than 20 inches (508 mm) shall be provided. If the seat and platform can be folded when not in use, the distance shall be measured from the folded position.
5. Stairways in Group E serving an occupant load of 100 or more shall have a width of not less than 60 inches (1525 mm).

Reason: The code currently and historically has required 6' corridors in group E occupancies where the occupant load is over 100 (2009 IBC 1018.2, exception 4). The prior Uniform Building Code required a 5' minimum width on the stair (1997 UBC, section 1007.3.5) as well.

As written, a 44" stair in an E occupancy could accommodate 146 occupants, and a 5' stair would not be needed until it served 200 occupants. The code acknowledges that stairs require greater egress width than other means of egress components by requiring 0.3" of width per occupant stair as compared to 0.2" for other portions of the means of egress. Given the population served, the presence of other distractions, and the possibility of staff occupying landings to guide students during an evacuation, the 5' stair width is needed to alleviate congestion and improve egress on staircases in large E occupancies.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Heeb-E1-1009.1

E69–09/10
1009.1, 1009.12, 1013.2 (IFC [B] 1009.1, 1009.12, 1013.2)

Proponent: John Jensen, representing Chevron Products Company

Revise as follows:

1009.1 (IFC [B] 1009.1) Stairway width. The width of stairways shall be determined as specified in Section 1005.1, but such width shall not be less than 44 inches (1118 mm). See Section 1007.3 for accessible means of egress stairways.

Exceptions:

1. Stairways serving an occupant load of less than 50 shall have a width of not less than 36 inches (914 mm).
2. Spiral stairways as provided for in Section 1009.9.
3. Aisle stairs complying with Section 1028.
4. Where an incline platform lift or stairway chairlift is installed on stairways serving occupancies in Group R-3, or within dwelling units in occupancies in Group R-2, a clear passage width not less than 20 inches (508 mm) shall be provided. If the seat and platform can be folded when not in use, the distance shall be measured from the folded position.
5. Stairways serving industrial applications and construction site trailers shall have a width of not less than 30 inches.

1009.12 (IFC [B] 1009.12) Handrails. Stairways shall have handrails on each side and shall comply with Section 1012. Where glass is used to provide the handrail, the handrail shall also comply with Section 2407.

Exceptions:

1. Handrails for aisle stairs are not required where permitted by Section 1028.13.
2. Stairways within dwelling units, spiral stairways and aisle stairs serving seating only on one side are permitted to have a handrail on one side only.
3. Decks, patios and walkways that have a single change in elevation where the landing depth on each side of the change of elevation is greater than what is required for a landing do not require handrails.
4. In Group R-3 occupancies, a change in elevation consisting of a single riser at an entrance or egress door does not require handrails.
5. Changes in room elevations of three or fewer risers within dwelling units and sleeping units in Group R-2 and R-3 do not require handrails.
6. Stairways serving industrial applications and construction site trailers are permitted to have handrails on only the open side of the stairway.

1013.2 (IFC [B] 1013.2) Height. Required guards shall be not less than 42 inches (1067 mm) high, measured vertically above the adjacent walking surfaces, adjacent fixed seating or the line connecting the leading edges of the treads.

Exceptions:

1. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.
2. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, where the top of the guard also serves as a handrail on the open sides of stairs, the top of the guard shall not be less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.
3. For stairways serving industrial applications and construction site trailers, where the top of guard also serves as a handrail, the top of the guard shall be permitted be at the height specified for handrails in Section 1012.2.

~~3~~4. The height in assembly seating areas shall be in accordance with Section 1028.14.

~~4~~5. Along alternating tread devices and ship ladders, guards whose top rail also serves as a handrail, shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread nosing.

Reason: The purpose of this proposal is to provide allowances for stairs serving industrial applications and construction site trailers where access is limited. Section 1009.1 - A stairway with a minimum width of 30 inches meets the requirements for industrial stair width per Cal OSHA (Section 3234(d)). Section 1009.12 - A stairway with a handrail on only the open side of exposed stairways meets the requirements for industrial stairs per Cal OSHA (Section 3234 (g)). Section 1013.2 - A guardrail on stairways with a vertical height that of handrails meets the requirements for industrial stairs per Cal OSHA (Section 3214 (b), 3234 (g)(3)).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: JENSEN-E1-1013.2

E70–09/10

1009.4.1 (IFC [B] 1009.4.1); IRC R311.7.4

Proponent: Tim Pate, City and County of Broomfield, representing the Colorado Chapter ICC Code Change Committee

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC MEANS OF EGRESS. PART II WILL BE HEARD BYTHE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

Revise as follows:

1009.4.1 (IFC [B] 1009.4.1) Dimension Reference Surfaces. For the purpose of this section all dimensions are exclusive of ~~carpets,~~ rugs, or runners.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R311.7.4 Stair treads and risers. Stair treads and risers shall meet the requirements of this section. For the purposes of this section all dimensions and dimensioned surfaces shall be exclusive of ~~carpets,~~ rugs or runners.

Reason: This code change will delete the word "carpets" since it does not make any sense to require inspectors to do inspections and sign off on stairs before all of the floor coverings are installed. Building departments will always require all floor finishes to be installed at time of final inspection to verify handicap accessibility requirements and flame/smoke spread requirements – especially on stairs. We also see some stairs that have a mix of carpet and hard surfaces (wood or tile) and the current language would require the stairs to have these hard surfaces but not carpet which would probably not get the treads and risers to meet the plus or minus $^{3}/_{8}$" rule – especially if using ¾" wood at top and/or bottom landings. We typically do quick check of stairs at time of roughs so as to see if they might be way off but a lot times all of the stairs are not even in place at time of roughs so that would necessitate contractor having to call in for special inspection of stairs after hard surfaces are installed but before carpet is installed.

I understand the original proponents' reason statement for bringing in this new section feel that this will result in even more problems when doing inspections. I firmly believe that all of the floor finishes need to be installed and checked at time of complete final inspection and this will result in uniformity in inspection process.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PATE-E1-1009.4

E71–09/10
1009.4.1 (IFC [B] 1009.4.1); IRC R311.7.4

Proponent: Dave Frable, U.S. General Services Administration, representing the U.S. General Services Administration

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC MEANS OF EGRESS. PART II WILL BE HEARD BYTHE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

Revise as follows:

1009.4.1 (IFC [B] 1009.4.1) Dimension reference surfaces. For the purpose of this section, all dimensions are ~~exclusive~~ inclusive of carpets, rugs or runners.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R311.7.4 Stair treads and risers. Stair treads and risers shall meet the requirements of this section. For the purposes of this section all dimensions and dimensioned surfaces shall be ~~exclusive~~ inclusive of carpets, rugs or runners.

Reason: The intent of this code change is to ensure the method for measuring riser height and tread depth includes all floor coverings including carpets, rugs, or runners. Stairs that are covered with resilient floor coverings might need additional tread depth beyond the minimum specified in the IBC. Any horizontal projection of resilient covering materials beyond the tread nosing and riser, such as carpet and underlayment, can interfere with users' feet and thereby reduce usable tread depth. At the tread nosing, such resilient covering materials might not be capable of providing stable support for users' feet. Generally, effective tread depth is reduced by the uncompressed thickness of such resilient coverings and might be further reduced over time if coverings are not well secured and consequently might move forward at the nosings.

Cost Impact: This code change will not increase the cost of construction.

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Frable-E1-1009.4

E72–09/10
1009.4.1 (IFC [B] 1009.4.1); IRC R311.7.4

Proponent: Jake Pauls, representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC MEANS OF EGRESS. PART II WILL BE HEARD BYTHE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

Revise as follows:

1009.4.1. (IFC [B] 1009.4.1) Dimension reference surfaces ~~For the purpose of this section, all dimensions are exclusive of carpets, rugs or runners.~~ Dimensions of rise and tread depth shall be permitted to be taken without carpet, rug runner or pad covering in place provided that all surfaces that are intended to be so covered are consistently measured without such covering in place. Subsequently applied covering, prior to final inspection, shall be securely

fixed in place and be consistent in overall thickness on all surfaces measured for rise and tread depth so that the uniformity limits stipulated in Section 1009.4.4 are maintained. Nosing profiles, in accordance with Section 1009.4.5, shall be limited to those that result, at the time of final inspection, in no more than a 9/16 inch loss of horizontal surface, due to nosing rounding or beveling of the exposed surface of any carpet, rug or runner installed over the treads.

Exception: Up to 1 inch of loss of horizontal surface at the nosing is permitted at the exposed surface of any carpet, rug or runner in place at the time of final inspection provided that the minimum tread depth stipulated in Section 1009.4.2 is increased by the amount by which such loss of horizontal surface exceeds 9/16 inch.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R311.7.4 Stair treads and risers. Stair treads and risers shall meet the requirements of this section. ~~For the purposes of this section all dimensions and dimensioned surfaces shall be exclusive of carpets, rugs or runners.~~ Dimensions of rise and tread depth shall be permitted to be taken without carpet, rug runner or pad covering in place provided that all surfaces that are intended to be so covered are consistently measured without such covering in place. Subsequently applied covering, prior to final inspection, shall be securely fixed in place and be consistent in overall thickness on all surfaces measured for rise and tread depth so that the uniformity limits stipulated in Sections R311.7.4.1 and R311.7.4.2 are maintained. Nosing profiles, in accordance with Section R311.7.4.3, shall be limited to those that result, at the time of final inspection, in no more than a 9/16 inch loss of horizontal surface, due to nosing rounding or beveling of the exposed surface of any carpet, rug or runner installed over the treads.

Exception: Up to 1 inch of loss of horizontal surface at the nosing is permitted at the exposed surface of any carpet, rug or runner in place at the time of final inspection provided that the minimum tread depth stipulated in Section R311.7.4.2 is increased by the amount by which such loss of horizontal surface exceeds 9/16 inch.

Reason: All my proposals deal with the urgent need to address the recent rapid growth in home stair-related injuries reported in national estimates of the U.S. Consumer Product Safety Commission, CPSC, in its National Electronic Injury Surveillance System (NEISS) and the long-term trend for much greater number of injuries related to home stairs compared to stairs in other settings. This is shown in Figure 1, the same figure used in my proposal on R311.7.4.2 but reproduced here as well because other aspects of the figure are relevant here.

Figure 1 shows two trends with home stairs. One is the long-term (one-third century) trend of home stair related injuries in the CPSC NEISS national estimates (of hospital emergency department-treated injuries) exceeding those in all other settings by about a factor of five. The recent increase to this ratio—growing in the last several years to a factor of about eight—is discussed in relation to my proposal on R311.7.4.2. The long-term trend is shown on Figure 1 with the broken line, with the three simplified straight-trend sections covering the period from about 1975 through 2007. The short-term trend, an average annual growth rate of the national estimate of nearly 5 percent—or about five times the annual rate of US population growth—is shown by the longest vertical bars, for home stair-related injuries in the period 1998 to 2007.

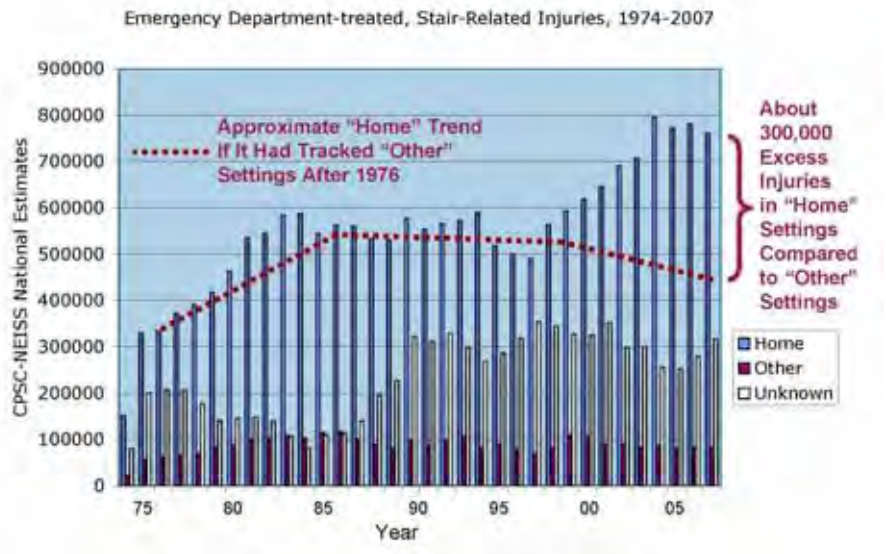


Figure 1. Growth of Home Stair-related Injuries in USA in Recent Years.

Among the reasons we have the long-term over-representation of home stair-related injuries is the significantly different code rules and practices on maximum rise, minimum tread depth, control of nosing geometry, and control of carpet and other resilient tread coverings. These differences have been most enshrined in the International Residential Code. Now with the annual societal costs of stair-related injuries in the range of $100 billion per year in the USA (with the medical treatment cost component alone around $10 billion per year or just over $1 million per hour), relative to stair construction costs being only a small fraction of this, it is time for ICC members in particular to understand fully the individual, family and societal costs of all aspects of the double, lower standard for home stairways in the I-codes. After all, ICC members voted strongly in favor of home sprinkler

protection which costs far more than the various home stairway improvements in my proposals and even if sprinklers prevented all of the current fire-related injuries, the societal public health benefit would still pale in comparison with what could be achieved at lower cost with improvements to stairways. The ratio of stair-injuries to structural fire-related injuries is about 50 to one.

Furthermore, for every fall-associated use of a stair there are many that have benefits that must be considered in any benefit-cost evaluation of stairway design and construction improvements. This matter of benefits and costs is further addressed in my accompanying proposal on changes to the minimum tread depth and maximum rise height criteria where it is shown that normal (non-fall) uses of stairs are the largest benefit of providing stairs in the first place. (Sprinklers by contrast have no benefit other than controlling fire, a very, very rare event compared with the number of times daily that people use stairs in their homes for example. Each one of those stair uses has a benefit or value that must be considered in benefit-cost analyses.)

Thus, in relation to this proposal, the intent is to make sure that rise and tread depth criteria required by this code actually make meaningful differences in the usability and safety of the stairways as they are actually used, as opposed to the stairways inspected at various stages of dwelling construction before the dwelling is turned over to its occupants.

Furthermore, in keeping with stairway safety research results, the effort here is to make sure that the effective tread depth dimensions, not including the portion lost at the front of the tread due to beveling and rounding of the nosing, are meaningful in relation to the research that led to the tread depth criteria in the first place. For example, the latest published research specifically on home stair step geometry cleared showed that the tread depth dimension (called the "going" dimension in the UK and some other parts of the world)—***measured nosing face to nosing face***—was more important than was the rise dimension. The results of this study, as reported by Wright and Roys of the UK Building Research Establishment (an organization comparable to the sum of NIST and the NAHB Research Center in relation to building technology) are shown in Figure 2. Figure 2 has been augmented for some of my presentations and, indeed, is one of hundreds of PowerPoint slides in presentations given internationally over the last year or so.

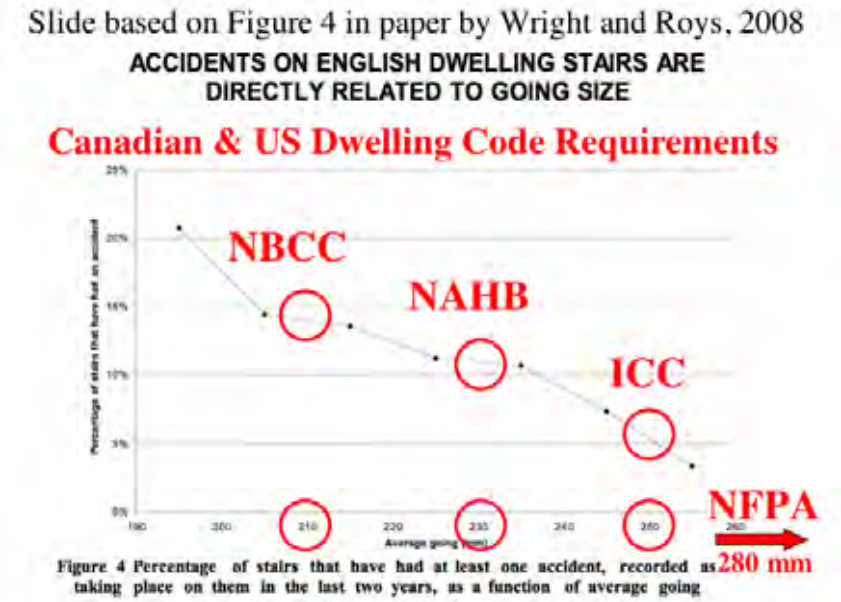


Figure 2. Role of Stair Tread Depth ("Going" in UK) in Stair-related "Accidents" in Homes (PowerPoint slide based on Wright and Roys, 2008)

The circles that I have superimposed on the Figure 2 graph depict the various tread depth (run or going) dimensions of various code criteria used in the USA and Canada. What is especially valuable about this graph is that it allows us to estimate the degrading of stairway safety due to the loss of say 1 inch or 25 mm of effective tread depth. For example, if the ICC minimum tread depth of 10 inches or 250 mm is used for a stair design in which the use of a 1/2-inch radius rounded nosing and a covering of a half-inch thick carpet results in an effective one-inch reduction, that would suggest approximately an increase of "accident" rate from 5 percent to about 11 percent, an effective doubling of the risk of an potentially injurious stair-related fall compared to a square-nosing design without any covering. The conventional, NAHB-favored (by national NAHB policy) tread depth of 9 inches or 230 mm has about a 10 percent base rate of "accident" risk and, with the loss of an additional inch of tread depth, the risk rises to about 14 percent, nearly triple the risk of an IRC-complying tread depth with no loss of effective tread depth due to nosing rounding or beveling.

So, from this we can see the benefit to safety of limiting the loss of effective tread depth as carpet is installed. We should not install thick carpet on top of any already compromised tread with a large nosing rounding or beveling. Thus I am suggesting that anything over 9/16 inch—the current upper limit set in the IBC and IRC for loss of effective tread depth—should be compensated for by increasing the minimum tread depth stipulated in 1009.4.2 and R311-7.4.2. It should also be noted here that the step geometry work performed recently—described in my accompanying proposal on minimum tread depth and maximum rise limits, was based on nosings that ranged between a square design to a rounded 1/2 inch radius design. This is why my proposed language for Exceptions to Sections 1009.4.1 and R311.7.4, is based on the 9/16 inch limit for overall nosing radius or other loss of horizontal surface at the nosing (aside from the fact this is the current limit in 1009.4.5 and R311.7.4.3).

ICC members need to appreciate that the common practice of installing padded carpet on home stairs—prior to occupancy, without accounting for the detrimental safety effects of such installation is a kind of shell game. As home occupants we are not getting the safety benefits the code should be helping to guarantee. The fiction about effective tread depth dimensions on actually occupied, new home stairs has to stop so that the large, growing toll of home stair-related injuries can be brought under control in the same way that we are now beginning to tackle residual fire risks in new homes. Again, with home sprinklers we are spending considerably more to accomplish potentially much, much less in terms of injury prevention.

The overall ratio of home stair-related injuries is, again, about 50 times greater than the injuries from structural fires. And the latter rate has been dropping by about a half in the last few decades while stair-related injuries have been rising. Now, with the improvements made in the last decade or two with non-home stairways, we are finally seeing the same kind of reduction in injuries outside of homes that we have seen in homes and elsewhere with fire-related injuries. But home stair-related injuries are now rising several times faster than the roughly one percent or so we are beginning to see with reduction for stairs other than those serving homes. We have had, over the last several years, a slight reducing injury trend for all but home stairs contrasting with a very large increasing trend for home stair-related injuries.

Bibliography
Wright, M. and Roys, M. (2008). Accidents on English dwelling stairs are directly related to going size. In Bust, P.D. (ed.) *Contemporary Ergonomics 2008*. Taylor and Francis, 632-637.

Cost Impact: The code change proposal will slightly increase the cost of construction for stairs that are covered with thick carpet and possibly a pad underneath.

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Pauls-E2-1009.4.1

E73–09/10
1009.4.2 (IFC [B] 1009.4.2)

Proponent: Jake Pauls, representing self

Revise as follows:

1009.4.2 (IFC [B] 1009.4.2) Riser height and tread depth. Stair riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum. The riser height shall be measured vertically between the ~~leading edges~~ nosings of adjacent treads. Rectangular tread depths shall be 11 inches (279 mm) minimum measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's ~~leading edge~~ nosing. Winder treads shall have a minimum tread depth of 11 inches (279 mm) measured between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline and a minimum tread depth of 10 inches (254 mm) within the clear width of the stair.

Exceptions:

1. Alternating tread devices in accordance with Section 1009.10.
2. Ship ladders in accordance with Section 1009.11.
3. Spiral stairways in accordance with Section 1009.9.
4. Aisle stairs in assembly seating areas where the stair pitch or slope is set, for sightline reasons, by the slope of the adjacent seating area in accordance with Section 1028.11.2.
5. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; the maximum riser height shall be 7 ¾ inches (197 mm); the minimum tread depth shall be 10 inches (254 mm); the minimum winder tread depth at the walkline shall be 10 inches (254 mm); and the minimum winder tread depth shall be 6 inches (152 mm).A nosing projection not less than ¾ inch (19.1 mm) but not more than 1 ¼ inches (32 mm) shall be provided on stairways with solid risers where the tread depth is less than 11 inches (279 mm).
6. See Section 3404.1 for the replacement of existing stairways.
7. In Group I-3 facilities, stairways providing access to guard towers, observation stations and control rooms, not more than 250 square feet (23 m^2) in area, shall be permitted to have a maximum riser height of 8 inches (203 mm) and a minimum tread depth of 9 inches (229 mm).

Reason: There is no technical change to the requirement in this proposal (although a separate proposal addresses technical issues). It is editorial with respect to replacement, in two places, of the old term "leading edge" with the now-defined term "nosing." There is also a clarification of intent in Exception 5 with the addition of the work "projection." There is a nosing, by definition; what the Code intends here is that there be a projection of such a nosing.

Bibliography
Wright, M. and Roys, M. (2008). Accidents on English dwelling stairs are directly related to going size. In Bust, P.D. (ed.) *Contemporary Ergonomics 2008*. Taylor and Francis, 632-637.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Pauls-E3-1009.4.2

E74–09/10
1009.4.2 (IFC [B] 1009.4.2); IRC R311.7.4.1, R311.7.4.2

Proponent: Jake Pauls, representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC MEANS OF EGRESS COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

Revise as follows:

1009.4.2 (IFC [B] 1009.4.2) Riser height and tread depth. Stair riser heights shall be 7 inches (178 mm) maximum and 4 inches (102 mm) minimum. The riser height shall be measured vertically between the leading edges of adjacent treads. Rectangular tread depths shall be 11 inches (279 mm) minimum measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. Winder treads shall have a minimum tread depth of 11 inches (279 mm) measured between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline and a minimum tread depth of 10 inches (254 mm) within the clear width of the stair.

Exceptions:

1. Alternating tread devices in accordance with Section 1009.10.
2. Ship ladders in accordance with Section 1009.11.
3. Spiral stairways in accordance with Section 1009.9.
4. Aisle stairs in assembly seating areas where the stair pitch or slope is set, for sightline reasons, by the slope of the adjacent seating area in accordance with Section 1028.11.2.
5. In ~~Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in~~ Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; the maximum riser height shall be 7 ¾ inches (197 mm); the minimum tread depth shall be 10 inches (254 mm); the minimum winder tread depth at the walkline shall be 10 inches (254 mm); and the minimum winder tread depth shall be 6 inches (152 mm).A nosing not less than ¾ inch (19.1 mm) but not more than 1 ¼ inches (32 mm) shall be provided on stairways with solid risers where the tread depth is less than 11 inches (279 mm).
6. See Section 3404.1 for the replacement of existing stairways.
7. In Group I-3 facilities, stairways providing access to guard towers, observation stations and control rooms, not more than 250 square feet (23 m^2) in area, shall be permitted to have a maximum riser height of 8 inches (203 mm) and a minimum tread depth of 9 inches (229 mm).

PART II – IRC BUILDING/ENERGY

Revise as follows:

R311.7.4.1 Riser height. The maximum riser height shall be 7 inches (178 mm) ~~7 ¾ inches (196 mm)~~. The riser shall be measured vertically between leading edges of the adjacent treads. The greatest riser height within any flight of stairs shall not exceed the smallest by more than $^3/_8$ inch (9.5 mm).

R311.7.4.2 Tread depth. The minimum tread depth shall be 11 inches (279 mm) ~~10 inches (254 mm)~~. The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than $^3/_8$ inch (9.5 mm). Consistently shaped winders at the walkline shall be allowed within the same flight of stairs as rectangular treads and do not have to be within $^3/_8$ inch (9.5 mm) of the rectangular tread depth.

Winder treads shall have a minimum tread depth of 11 inches (279 mm) ~~10 inches (254 mm)~~. measured between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline. Winder treads shall have a minimum tread depth of 6 inches (152 mm) at any point within the clear width of the stair. Within any flight of stairs, the largest winder tread depth at the walkline shall not exceed the smallest winder tread by more than $^3/_8$ inch (9.5 mm).

Reason: This is purely a technical change affecting maximum and minimum rise and tread depth dimensions respectively. This is the long overdue mainstreaming of the so-called "7-11" step geometry in terms of maximum rise and minimum tread depth. (The proponent has submitted a separate change proposal which simply formats and restates the current requirements; that proposal and this one should be dealt with separately or independently as their purposes and effects are different.)

Much has been written about this topic, especially around 2003 in relation to the IRC and the NFPA codes (NFPA 101 and NFPA 5000 which adopted this change to the mainstreamed "7-11" step geometry at that time. Since that day nobody has attempted to revert to pre-"7-11" criteria for dwelling unit stairs within NFPA and for non-dwelling unit stairs within ICC. The "7-11" minimum standard is the most widely used step geometry standard internationally and reasons for keeping it at least the minimum standard have grown. This is because all the recent research on use of stairs—*including the matter of falls on stairs, including injurious ones*—confirms that it is a very reasonable minimum standard and that it is a long way—about three inches or more—from an "optimum" standard.

The very extensive 2003 proposal I submitted to both ICC and NFPA is not reproduced within this proposal for reasons of length and, more importantly, its free availability on the Internet, specifically the Downloads area of my website, http://web.me.com/bldguse. Once within the Downloads area (where over a hundred PDF files can be freely downloaded on stairway usability and safety plus means of egress performance), simply open the folder titled, "Home Stairway Safety and Codes," and download the 3.4 MB, 40-page file, "Pauls-R311-2003.pdf." Here follows an outline of what was covered in that proposal which I submitted to ICC with NFPA getting a comparable, earlier one that was approved by NFPA members and withstood technical and procedural challenges from the NAHB.

Benefit-Cost Analysis for Improved Stairs in the USA
Injury Epidemiology
History of Debate on Improved Step Geometry Requirements in Codes & Standards
Benefits and Costs
Industry's and Regulators' Reviews of Research
Latest Research on Step Geometry from Britain
Politically-driven Local and State Adoption Process
Building and Marketing Improved Stairs
The Problem of the Double Standard
Intimidation of Building Officials
Roles of NFPA and APHA
Summary.

What Has Changed Since 2003?

The changes for the worse appear to be directly attributable to even worse home stair construction and regulation than existed before 2003. This is seen in Figure 1 which shows the growth of home stair-related injuries that are NOT due to the aging of the population—as this was checked out to learn that people under 65 and those 65 or more in age both contributed in more or less the same proportion to the substantial growth in home stair, related injuries. A recent, widely-circulated document described the statistical insights as follows: "For both 1997 and 2007, the percentage of NEISS-reported injuries for the 65-and-older group was 15.3 percent plus/minus 0.4 percent for both home settings and all settings." Thus, both before and after 1997, elderly persons were only slightly—but consistently—over-represented in hospital emergency department-treated injuries associated with stairs as reported in national estimates by the US Consumer Product Safety Commission. (The note, titled "The Home Stairway Safety Problem and Related Code Development, Adoption and Enforcement Problems in the USA," is also posted for free downloading from the website "http://web.me.com/bldguse" Downloads area as file "Pauls2009Letter&InjuryNote" within the folder titled, "Home Stairway Safety and Codes.") A list of the topics addressed therein is provided below Figure 1.

Figure 1 shows an extraordinary growth in the US national estimates from the US CPSC/NEISS for stair-related injuries, particularly in homes. The average annual rate of increase in the last several years exceeds the average annual rate of US population growth by a factor of about five while stair-related injuries in non-home settings decrease slightly, resulting in about a 2 percent reduction annually for non-home stairs over the last several years—since about 1998. During these several years there has been increasing use of the "7-11" minimum step geometry standard for non-home stairs, thanks to the adoption—beginning in the 1980s—of this standard in model building codes. This is further evidence of a partial success story on the stairway safety front and ICC members might rightly claim some of the credit for this partial success. Now building officials who control the adoption of the requirements in model codes need to finish the job where it will count most, in homes.

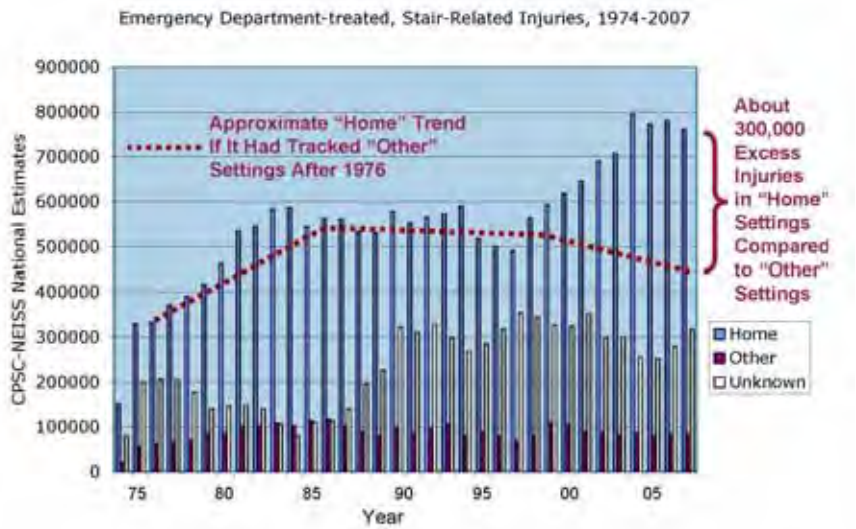


Figure 1. Growth of Home Stair-related Injuries in USA in Recent Years.

Updating the 2003 ICC proposal on mainstreaming the "7-11" minimum standard was the note which began circulating in February of 2009. Here are the topics it addressed in its 26 pages (including over two pages of references and additional resources).

Preface

The 2003 proposal to ICC, "Pauls-R311-2003," included substantial benefit-cost information about stair step geometry in homes which must be updated to take account of recent, dramatic growth in home stair-related injuries (in terms of CPSC-NEISS national estimates) as well as higher-than-general inflation rates for medical treatment costs. The latter are currently running at about $1 million per hour in the USA with total, societal costs running at about $10 million per hour in the USA.

Societal Cost of Stair-related Injuries. Currently, for the USA, the annual societal costs of home stair-related injuries—currently comprising about 89 percent of all stair-related injuries where the location or setting is known—are on the order of $100 billion annually for comprehensive, societal costs. (The basis for the 89-percent figure is the NEISS data described above.) The basis for the societal cost (the sum of medical care costs, direct productivity losses and pain-and-suffering or quality of life costs) is a paper by Lawrence, *et al.* (1999). (Among coauthors for this paper are internationally recognized experts in burden of injury, like Ted Miller.) They estimated a societal cost (in 1997 dollars) of $46.7 billion for stair-related injuries occurring in 1995. For that year the NEISS national estimate for US emergency department-treated, stair-related injuries was 892,610 for all settings and 517,641 for homes. Between 1995 and 2007 these increased, respectively, to 1,161,915 (a 30-percent increase) and 761,881 (a 47-percent increase). (These national estimates for 1995 are the "adjusted" ones obtained via the NEISS website; they correct for a change in NEISS sampling that took effect in January 1, 1997.)

Accounting also for inflation (of about 3 to 4 percent annually—although medical care increases were higher), we can assume that, for 2007, the societal costs for stair-related injuries in the USA were on the order of $100 billion in 2007 dollars (including on the order of $10 billion for medical care, $20 billion for direct productivity losses, and $70 billion for pain and suffering or quality of life costs—with this estimated distribution based on a personal communication with Bruce Lawrence and Ted Miller, among the authors of the above noted paper). This cost was about an order of magnitude greater than the annual construction cost of new stairs (just prior to the recent economic downturn) in the USA. For an analysis of home and stair construction costs see Pauls (2003). The smallest cost component, medical care, is about one million dollars per hour in the US."

Quoting also from the paper by Pauls, 2009 on "Injury Increase Comparisons: The apparent, relatively rapid increase recently in home stair-related injuries has an average annual growth rate of about 4.5%, a few times greater than annual population growth (1%). The overall increase, over a three-decade period, was about 130 percent with the most recent ten-year period showing a 55-percent increase. By contrast, fire-related injuries (the majority of which occur in homes), a major concern traditionally in safety standards and codes, have shown a three-decade pattern of average annual *decrease* of about 2 percent. (If fire-related injuries were plotted on Figure 1A, that plot would be appear very close to the base of the graph, declining from about 50,000 to about 25,000 annual injuries over a three-decade period.) Moreover, the trend for all NEISS injury national estimates for home settings—other than stairs, during the period 1997-2007 has a 39-percent increase over the same last ten-year period when home stair-related injuries increased by 55 percent. For *all* products and settings, the increase in NEISS national estimates over the same 1997-2007 period was only 19 percent, about the same as the 18-percent increase for stairs in other settings (i.e., not homes). From this, and other analyses the author has performed with the CPSC-NEISS data, we can see generally, that homes generally are the major site for injuries, relative to other settings; homes account for about 49 percent of the NEISS national estimates of injuries during the 1997-2007 period.

Aside from fire-related injuries—these NEISS-reported national estimates of all injuries in home settings are increasing faster than in other settings (39 percent versus 19 percent for all NEISS national estimates during the 1997-2007 period).

NEISS national estimates of stair-related injuries in home settings have been increasing over the last ten years at a fast rate relative to NEISS national estimates for all NEISS-coded products (55 percent versus 19 percent) and relative to population growth (55 percent versus 10 percent). Over the 1997-2007 period, NEISS national estimates of home stair-related injuries comprised 89 percent of NEISS national estimates for stair-related injuries in all known settings. For early years of NEISS national estimates, specifically 1975-1977, this was 85 percent. Most of the increase in this proportion occurred since 1990.

Generally, in recent years stairs have accounted for about 9 percent of the NEISS national estimates for all products; home stairs accounted for about 6 percent; other settings' stairs accounted for less than 1 percent; unknown settings' stairs accounted for over 2 percent.
Stairs maintain their position, since the earliest days of CPSC-NEISS, as the leading product, associated with injuries coded by NEISS. Floors are the second leading category. See Lawrence, *et al.* (1999), Table 5, using data for 1995-1996, for an analysis for the top ten NEISS-coded products, ranked by injury cost, for various age groups. As well as ranking first for all ages, stairs rank first for 5 of 12 age groups (preschool children and middle-age adults) and second for another three. Only for the two highest age categories, 70-79 and 80 or more (for which stair use is relatively rare), do floors rank first, reflecting the contribution of gait and balance deterioration. However, stairs are still the second leading product for the 70-79 age group and third (after beds) for the 80-plus age group."

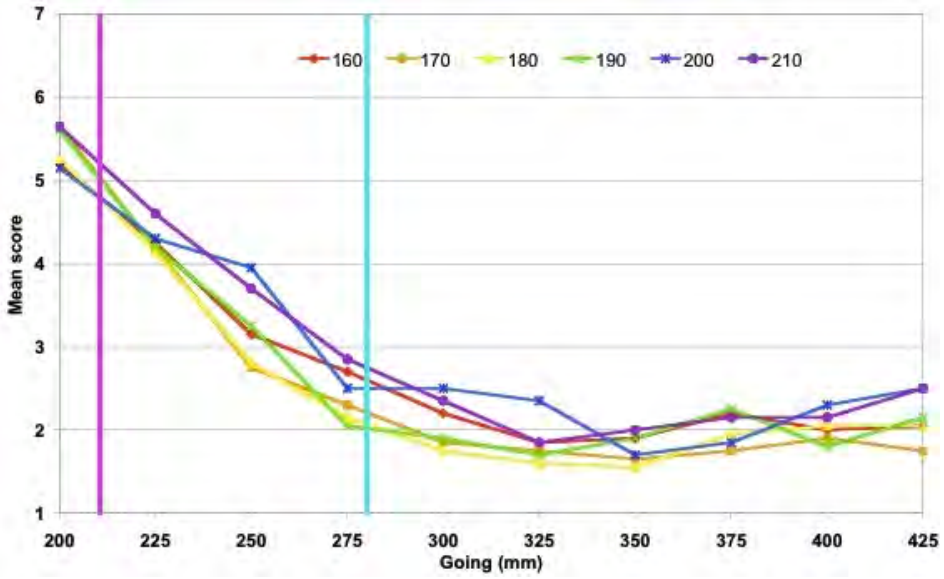
Laboratory and Field Research and Investigations of the Role of Step Geometry on Stairway Safety

The last several years have seen some important work on questions that have long troubled ICC members when addressing this issue of appropriate minimum standards for home step geometry. This work brings no comfort to those arguing that the minimum standards should stay as they are in the IRC and IBC or, even worse, that the NAHB's even lower standard should be the norm. The latter is based on NAHB's long-held national policy position which can be read directly on its website at "www.nahb.org/generic.aspx?sectionID=224&genericContentID=3093" (accessed June 1, 2009): "Support efforts by state and local affiliated Home Builder Associations to oppose the adoption of any new stair geometry that is not consistent with the requirements originally contained in the 1993 BOCA and 1992 CABO Codes by amending those provisions when adopting new editions of model building codes." This is the 8 1/4-inch maximum rise by 9-inch minimum tread depth that, especially with carpeting further degrading the usability and safety of the home stairs, makes them so dangerous and difficult to use. It is indeed beyond belief that, as the stair safety epidemic grows, the homebuilders insist on using a code that was out of date decades ago.

UK Research. Mike Roys and Mike Wright, UK Building Research Establishment have conducted some extraordinarily useful research in recent years, with the last of their papers published in May 2008. Working with a test stairway that offered 10 combinations of tread depth ("going" as it is called in the UK and "run" in some other places), in the range of 200 to 425 mm or 7.9 to 16.7 inches, with 6 combinations of rise height, in the range of 160 to 210 mm or 6.3 to 8.3 inches, they clearly showed the benefits of larger tread depths. Altogether, 60 adult subjects walked up and down each of 20 stair arrangements. Their work, while not completely published yet, is represented centrally in my recent one-day workshops on stairway usability and safety, the PowerPoint slides of which (including a fair selection of the BRE study slides) are available for downloading from my website in the folder titled, "Presentations at MUTN Conference in BC, Canada, April 2009." Papers on this work include Roys, 2001; Wright and Roys, 2005; and Wright and Roys, 2008. (Dr Wright moved to the USA in late 2008 so that now we are fortunate to have, in the USA, one of the top world talents in designing and conducting studies of step geometry and stair use performance.)

Answering a very old question in the code field, they showed that optimum tread depth in terms of many objective and subjective measures was much larger than 11 inches; 14 inches is about where this becomes optimum. The much-used 11-inch criterion is approximately where the graph of some of their findings, reproduced below as Figure 2, shows a change of direction from steep to more gradual slope and finally leveling off at the "optimum" tread depth of about 14 inches or 350 mm. This supports treating 11 inches as the minimum and clearly not the "optimum."

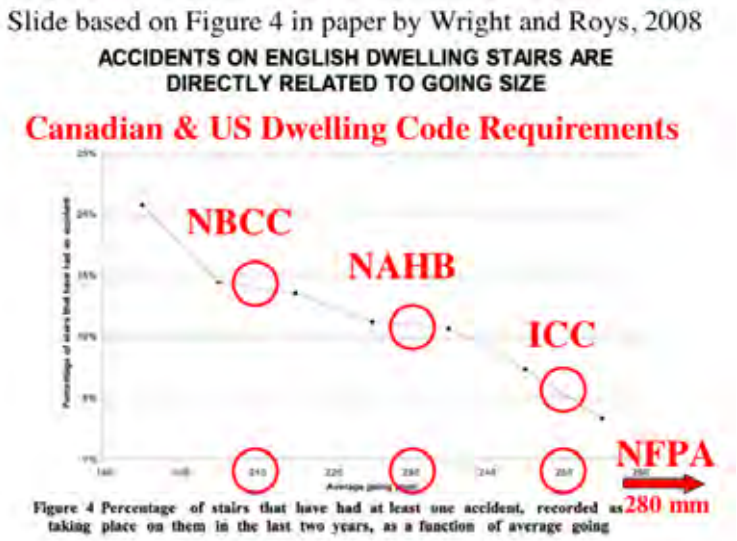
Figure 2. Graph of Findings from the UK Research by Wright and Roys, as Presented (in a PowerPoint) in 2005 at an International Conference on Falls in the UK.



The responses plotted here are to the scaled remark, "I felt safe walking down the stair," with the "most-safe" responses at the bottom of the curves.

The most recent of their papers, Wright and Roys (2008), contains some of the most interesting and valuable work—*in this case conducted in the field and inquiring into actual fall incidents as a function of home stairway rise and tread depth ("going" in the graph).* This is shown in Figure 3, onto which I have superimposed some of the criteria for US and Canadian home stair minimum tread depth, the same range shown in Figure 2 with the vertical bars at the left half of the Figure, specifically at the 210 and 280 mm, 8 1/4 and 11-inch minimum tread depth criteria. Note that any rounding or beveling of the nosing and presence of carpet and pad (in some cases, especially on typical home stairs), the effective tread depth is significantly reduced from these values so that the effective tread depth of some home stairs, built to code, is as small as 180 mm or 7 inches. Incidentally, the testing that led to the results in Figure 2, were with uncarpeted treads with no more than 13 mm or 1/2 inch loss of effective tread depth due to rounding of the nosing. The safety differences among the various tread depths are large and cannot be ignored.

Figure 3. Role of Stair Tread Depth ("Going" in UK) in Stair-related "Accidents" in Homes (PowerPoint slide based on Wright and Roys, 2008)



Recent US Research on Step Geometry. While there are other studies that could be referenced and described here in relation to the step geometry issue, in the interests of time and space, I will note only one more. This was a paper based on 80 relatively intensively investigated stair-related fall injuries that led to litigation and subsequent investigation by one of the top three or so research and investigation experts in North America with excellent ergonomics credentials. The paper was published in January of 2009 *Professional Safety,* the peer-reviewed journal of the American Society of Safety Engineers and was titled, "Stairway Falls: an ergonomic analysis of 80 cases," by Cohen, LaRue and Cohen (2009). Among their conclusions they note: "In this analysis, excessive dimensional variation appeared to be the most pervasive factor in stairway fall causation, followed by noncompliance with the 7-11 design rule for risers and treads, respectively. As with dimensional variation, this investigation showed a tendency for staircase geometry to fall outside the recommended limits of established building codes. Therefore, stairs that do not follow these requirements are more likely to be involved in falls. It stands to reason that greater adherence to the criteria specified in existing codes (i.e., risers in the range of 7 in. and treads in the range of 11 in.) would decrease the number of actual stairway falls that occur. Therefore, it is essential for both architects and builders to adhere to existing codes regarding stairway dimensions. Furthermore, prevailing codes must be enforced by building code officials, plan checkers and field inspectors, since stair dimensions can often be overlooked in the haste to issue building occupancy permits."

Any ICC chapter wishing to have their members participate in a one-day workshop (also slated for presentation in Eastern Canada on September 14, 2009) should contact Jake Pauls. It is available in a not-for-profit mode. Code authorities should be prepared to deal knowledgeably with consumers who, upon discovering the defects in their home stairs, contact their local building department and ask for a re-inspection of their home stairways. If there has been an injurious fall on such a stairway they should also be prepared to deal with resulting legal actions that might name the local building department as a third party defendant. (ICC itself is also a potential third-party defendant—as are homebuilders and their trade associations—a matter taken up in the so-called "New Orleans Decalaration" I issued in the spring of 2009 and posted on my website Downloads area.) Inspectors should at least know about how measurements of the stair step geometry are performed that are of a quality expected in such litigation actions. These measurement techniques, usually requiring use of a spirit level or electronic level, are all described in the workshop materials posted on the above-mentioned website Downloads area and on the DVD of the Spring 2009 workshop noted above. These measurement techniques are consistent with the ICC requirements both as currently stated and as further clarified if the package of proposals I put forward is accepted.

As indicated with all of the epidemiological and etiological work outlined in this proposal, the home stair-related injury issue is many times larger than is the home fire-related injury problem. It should thus be nearly a no-brainer, after adopting home sprinkler requirements, for responsible ICC members to vote for the mainstreaming of the "7-11" step geometry standard. I will be counting on such ICC members and others who can sway opinion to speak out with conviction based on the primacy of their duties to the public, the first item in the code of ethics for certified officials, a code which is available on my website if it cannot be located on ICC's.

Bibliography

Cohen, J, LaRue, C.A. and Cohen, H.H. (2009). Stairway Falls: An ergonomic analysis of 80 cases. *Professional Safety*, Vol. 54, No. 1, January, pp. 27-32.

Lawrence, B.A. et al. (1999). Estimating the costs of nonfatal consumer product injuries in the United States. *Proceedings of 7th International Conference on Product Safety Research*, September 30 - October 1, 1999, Washington, DC, pp. 97-113. Also, *Injury Control & Safety Promotion*, Vol. 7, No. 2, pp. 97-113.

National Association of Home Builders (1995-2009). Codes and Standards Policy. NAHB, Washington, DC. www.nahb.org/generic.aspx?sectionID=224&genericContentID=3093 (Accessed June 1, 2009).

Pauls, J. (2009). The Home Stairway Safety Problem and Related Code Development, Adoption and Enforcement Problems in the USA. Silver Spring, MD. (Posted for free downloading from the website "http://web.me.com/bldguse" Downloads area as file "Pauls2009Letter&InjuryNote" within the folder titled, "Home Stairway Safety and Codes.")

Pauls, J. and Harbuck, S. (2008). Ergonomics-based Methods of Inspecting, Assessing and Documenting Environmental Sites of Injurious Falls Resulting from Missteps on Small Elevation Differences, Slopes and Steps. *Proceedings of the American Society of Safety Engineers Professional Development Conference & Exposition*, Las Vegas, NV, 2008. (Downloadable as file, "Pauls-Harbuck-ASSE-paper.pdf," from folder, "Home Stairway Safety and Codes," accessible from the Downloads area of http://web.me.com/bldguse/Site/Downloads.html.)

Roys, M.S. (2001). Serious stair injuries can be prevented by improved stair design. *Applied Ergonomics*, Vol. 32, pp. 135-139.

Wright, M. and Roys, M. (2005). Effect of changing stair dimensions on safety. In Bust, P.D. and McCabe (eds.) *Contemporary Ergonomics 2005*, Taylor and Francis Books, pp. 469-474.

Wright, M. and Roys, M. (2008). Accidents on English dwelling stairs are directly related to going size. In Bust, P.D. (ed.) *Contemporary Ergonomics 2008*. Taylor and Francis, 632-637.

Cost Impact: The code change proposal will increase the cost of construction. However, more importantly, the change will lead to much larger benefits in injury reduction and usability, especially for older users.

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Pauls-E4-1012.3

E75–09/10

1009.4.5, 1009.4.5.1 (New), 1009.4.5.2 (New), 1009.4.5.3 (New) [IFC [B] 1009.4.5, 1009.4.5.1 (New), 1009.4.5.2 (New), 1009.4.5.3 (New)]; IRC R311.7.4.3, R311.7.4.3.1 (New), R311.7.4.3.2 (New), R311.7.4.3.3 (New)

Proponent: Jake Pauls, representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC MEANS OF EGRESS. PART II WILL BE HEARD BY IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

Revise as follows:

1009.4.5 (IFC [B] 1009.4.5) Nosing and Riser Profile. The radius of curvature at the leading edge of the tread shall be not greater than $^{9}/_{16}$ inch (14.3 mm). Beveling of nosings shall not exceed $^{9}/_{16}$ inch (14.3 mm). Risers shall be ~~solid and~~ vertical or sloped under the tread above from the underside of the nosing above at an angle not more than 30 degrees (0.52 rad) from the vertical. ~~The leading edge (nosings) of treads shall project not more than 1 ¼ inches (32 mm) beyond the tread below and all projections of the leading edges shall be of uniform size, including the leading edge of the floor at the top of a flight.~~

~~**Exceptions:**~~

1. ~~Solid risers are not required for stairways that are not required to comply with Section 1007.3, provided that the opening between treads does not permit the passage of a sphere with a diameter of 4 inches (102 mm).~~
2. ~~Solid risers are not required for occupancies in Group I-3 or in F, H and S occupancies other than areas accessible to the public. There are no restrictions on the size of the opening in the riser.~~
3. ~~Solid risers are not required for spiral stairways constructed in accordance with Section 1009.9.~~
4. ~~Solid risers are not required for alternating tread devices constructed in accordance with Section 1009.10.~~

1009.4.5.1 (IFC [B] 1009.4.5.1) Nosing Projection Size. The leading edge (nosings) of treads shall project not more than 1 ¼ inches (32 mm) beyond the tread below.

1009.4.5.2 (IFC [B] 1009.4.5.2) Nosing Projection Uniformity. All nosing projections of the leading edges shall be of uniform size, including the projections of the nosings leading edge of the floor at the top of a flight.

1009.4.5.3 (IFC [B] 1009.4.5.3) Solid Risers. Risers shall be solid.

Exceptions:

1. Solid risers are not required for stairways that are not required to comply with Section 1007.3, provided that the opening between treads does not permit the passage of a sphere with a diameter of 4 inches (102 mm).

2. Solid risers are not required for occupancies in Group I-3 or in Group F, H and S occupancies other than areas accessible to the public. There are no restrictions on the size of the opening in the riser.
3. Solid risers are not required for spiral stairways constructed in accordance with Section 1009.9.
4. Solid risers are not required for alternating tread devices constructed in accordance with Section 1009.10.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R311.7.4.3 Nosing and Riser Profile. The radius of curvature at the nosing shall be no greater than $^{9}/_{16}$ inch (14 mm). ~~A nosing not less than ¾ inch (19 mm) but not more than 1 ¼ inches (32 mm) shall be provided on stairways with solid risers. The greatest nosing projection shall not exceed the smallest nosing projection by more than $^{3}/_{8}$ inch (9.5 mm) between two stories, including the nosing at the level of floors and landings.~~ Beveling of nosings shall not exceed ½ inch (12.7 mm). Risers shall be vertical or sloped under the tread above from the underside of the nosing above at an angle not more than 30 degrees (0.51 rad) from the vertical. ~~Open risers are permitted, provided that the opening between treads does not permit the passage of a 4-inch diameter (102 mm) sphere.~~

~~**Exceptions:**~~

1. ~~A nosing is not required where the tread depth is a minimum of 11 inches (279 mm).~~
2. ~~The opening between adjacent treads is not limited on stairs with a total rise of 30 inches (762 mm) or less.~~

R311.7.4.3.1 Nosing Projection Size. A nosing projection of not less than ¾ inch (19 mm) but not more than 1 ¼ inches (32 mm) shall be provided on stairways with solid risers.

Exception: A nosing projection is not required where the tread depth is a minimum of 11 inches (279 mm).

R311.7.4.3.2 Nosing Projection Uniformity. The greatest nosing projection shall not exceed the smallest nosing projection by more than $^{3}/_{8}$ inch (9.5 mm) within each flight of stairs, including the nosing at the level of floors and landings.

R311.7.4.3.3 Open Risers. Open risers are permitted, provided that the opening between treads does not permit the passage of a 4-inch diameter (102 mm) sphere.

Exception: The opening between adjacent treads is not limited on stairs with a total rise of 30 inches (762 mm) or less.

Reason: There is no technical change to the requirements in this proposal. It is a clarification of intent by separating out and labeling the separate issues of (1) nosing and riser profile or shape, (2) nosing projection size, (3) nosing projection uniformity, and (3) open risers. Based on evidence of poor compliance and inspection, it has been confusing for various topics to be lumped together in one long paragraph.

My special concern here is the apparent widespread failure to build and inspect stairs with regard to uniformity of nosing projection, especially at the top of stair flights. For this reason alone, it is important for this section—with a few topics in one paragraph—to be divided into smaller pieces dealing with a smaller set of issues. It appears that the nosing projection uniformity issue— particularly omitting the nosing projection on the landing nosing—might be mostly responsible for the rapid growth of what I refer to as "Excess Injuries" in Figure 1. Over the several years where these "Excess Injuries" have been seen in the CPSC-NEISS national estimates, there have been a total of about 2 million such "Excess Injuries" which have an associated annual societal cost in the USA of about $200 billion (yes, that is billion with a "b") with the medical care component of these "Excess Injuries" accounting for about $20 billion. (The substantial basis for these cost-of-injury estimates comes from the work of Lawrence, et al., 1999.)

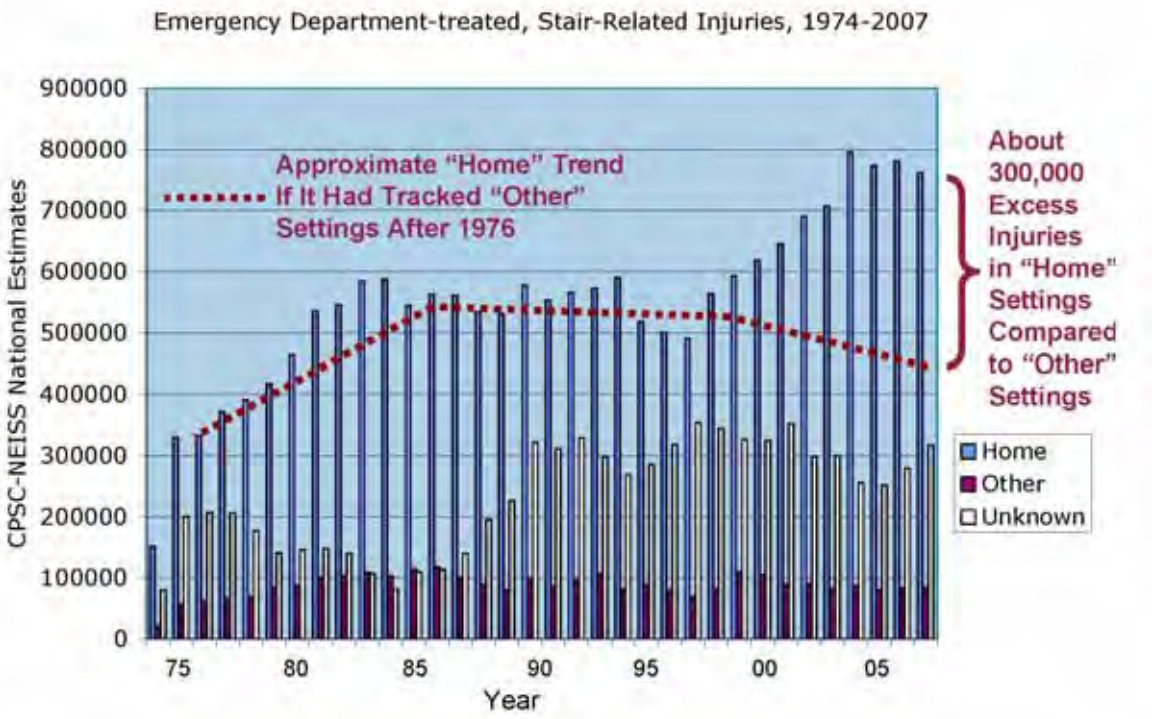


Figure 1. Growth of Home Stair-related Injuries in USA in Recent Years.

A far too common error in design and construction of stairways is the lack of attention to keeping all tread depths, especially the top one in a flight, uniform in size, particularly where projecting nosings are provided on a flight of stairs installed as a manufactured unit which does not include the top or landing nosing projection. Thus this is a dual issue of non-uniform tread depths and non-uniform nosing projections. ICC IRC guides for inspection and for the homebuilding industry (published by ICC in conjunction with NAHB) fail to even mention these two important IRC rules. These two ICC publications are listed in the Bibliography. Surely it is fairly strong evidence of a code inadequacy when even ICC experts apparently do not recognize the existence and importance of two rules governing the most potent of factors—step geometry uniformity—for the most dangerous product in homes and other buildings.

The resulting non-uniformities in tread depths, with a larger top tread followed by smaller treads in the flight make the stair flight orders of magnitude more dangerous for descent-direction users. This pervasive systemic defect has also become so concerning to leading stairway safety professionals such as myself that a special website page has been created simply to deal with this issue. See http://web.me.com/bldguse/Site/Stairways.html for information on this including the graph provided below as Figure 1 showing a large increase in the number of home stair-related injuries identified in the CPSC NEISS national estimates for the USA in the last several years. Excerpts of text from the Stairways website page are also quoted below as are excerpts from an American Society of Safety Engineers 2008 Professional Development Conference paper by Pauls and Harbuck. The full ASSE conference paper is freely accessible as a PDF download from the Downloads area of my website, http://web.me.com/bldguse/Site/Downloads.html. Generally, it is suspected that with recent greater use of manufactured stair flights, the incidence of systemic, top-of-flight non-uniformities has grown with resulting significant increases in home stair-related injuries.

On the Stairways website page, referenced above, is the following text and photograph (here identified as Figure 2) of a typical dwelling unit stairway with the systemic top-of-flight defect in nosing projection non-uniformity, the most common reason for the tread depth below the landing to be larger in size than the tread depths below it. Below Figure 2 is an additional photograph, Figure 3, showing what a stair flight looks like it very likely conforms to the uniformity requirements. The crouch-and-sight, visual test is helpful but is neither perfect nor quantitative; therefore, the stair geometry should be properly measured, at least at the top three steps, to confirm that there is not a rare coincidence of both larger tread depth and larger rise dimensions at the top step.

Figure 2. Typical Dwelling Unit Stairway with the Systemic, Top-of-Flight Defect.

Here follows the text from the website (http://web.me.com/bldguse/Site/Stairways.html) which has been publicly available since May 2009.

"While more investigation is required, it appears that a major reason for the recent 'excess' injuries related to home stairs might be a systemic defect on many home stairways (as well as some in other settings) in the USA and Canada. This defect is a non-uniformity of the nosing projection at the top of stair flights; due to the omission of a $10 nosing piece, at the landing level, at the time of stairway construction. This makes the top tread below the landing effectively larger than all the steps below it.

This common defect greatly increases the risk of an 'overstepping misstep' on the second or third step down the flight. Such missteps can lead to a very serious fall down the stair flight, with resulting injuries.

This is why we should now give our stairways 'a second look.' Specifically we should perform the simple 'crouch and sight' test. Do this from the landing above the stair flight you wish to check. Crouch down so you are able to see all the stair nosings (the leading edges) line up. If the top, landing nosing does not line up with all the other step nosings, your stair likely has the systemic defect. Here is a home stairway with the systemic defect."

The "Stairways" page of the website goes on to provide advice specifically for homeowners who perform the "crouch and sight" test and discover that their stairway has the systemic, top-of-flight defect.

"If your home stairway has this defect—which results from the non-uniformities of nosing projections and of what are called 'tread depth' or 'run' dimensions—and your home was recently constructed, call your local building inspection authorities and request that the stairway be re-inspected for building code compliance. Both the non-uniform nosing projection and the non-uniform tread depth or run are building code violations, for example under widely used codes in the USA.

If there has been a fall and significant injury on the non-uniform stair flight, you might also want to confer with an attorney (experienced in dealing with stair-related injury cases), especially if the home was recently constructed.

Much more information on this (and other) safety problems with stairways is found in the downloadable files associated with this website. See especially the latest papers and presentations by Jake Pauls on home stairways in the two most recently posted folders.

•Home Stairway Safety and Codes (Posted February 2009)

•Presentations at MUTN Conference in BC, Canada, April 2009

Also, in early summer 2009, watch this website for an announcement of the availability of an educational DVD package, based on the one-day workshop at the MUTN Conference in BC, Canada, in April 2009. (Contact Jake Pauls for purchase information.)"

Figure 3. Dwelling Unit Stair Very Likely Not Having the Systemic, Top-of-Flight Defect.

Any ICC chapter wishing to have their members participate in a one-day workshop (also slated for presentation in Eastern Canada on September 14, 2009) should contact Jake Pauls. It is available in a not-for-profit form. Code authorities should be prepared to deal knowledgeably with consumers who, upon discovering the systemic defect in their homes (after performing their own "crouch-and-sight" test), contact their local building department and ask for a re-inspection of their home stairways. If there has been an injurious fall on such a stairway they should also be prepared to deal with resulting legal actions that might name the local building department as a third party defendant. They should know how to perform the measurements of the stair step geometry that are of a quality expected in such litigation actions. These measurement techniques, usually requiring use of a spirit level or electronic level, are all described in the workshop materials posted on the above-mentioned website Downloads area and on the DVD of the Spring 2009 workshop noted above. These measurement techniques are consistent with the ICC requirements both as currently stated and as further clarified if this proposal is accepted.

In order to begin stopping all future misinterpretations of the IRC requirements for tread depth uniformity—and thus preventing many predictable and preventable missteps and falls (NOT "accidents" which are defined in the public health field as unpredictable and unpreventable events)—it is hoped that all code enforcement authorities heed very carefully the current and clarified requirements in IBC 109.4.5 (and1009.4.2) as well as R311.7.4.2 (and R311.7.4.3).

Bibliography

ICC (2007). Residential Inspector's Guide Based on the 2006 IRC, Chapters 1-11. International Code Council, Washington, DC., ISBN 978-1-58001-568-4.

ICC and NAHB. Home Builders' Jobsite Codes: a Pocket Guide to the 2006 International Residential Code. International Code Council, Washington, DC and National Association of Home Builders, Washington, DC.

Lawrence, B.A. et al. (1999). Estimating the costs of nonfatal consumer product injuries in the United States. *Proceedings of 7th International Conference on Product Safety Research*, September 30 - October 1, 1999, Washington, DC, pp. 97-113. Also, *Injury Control & Safety Promotion*, Vol. 7, No. 2, pp. 97-113.

Pauls, J. and Harbuck, S. (2008). Ergonomics-based Methods of Inspecting, Assessing and Documenting Environmental Sites of Injurious Falls Resulting from Missteps on Small Elevation Differences, Slopes and Steps. *Proceedings of the American Society of Safety Engineers Professional Development Conference & Exposition*, Las Vegas, NV, 2008. (Downloadable as file, "Pauls-Harbuck-ASSE-paper.pdf," from folder, "Home Stairway Safety and Codes," accessible from the Downloads area of http://web.me.com/bldguse/Site/Downloads.html.)

Cost Impact: The code change proposal will not increase the cost of construction as there is no technical change proposed. (The nosing piece required to comply with both the current code and the code as clarified by this proposal costs about $10 per home stair flight in terms of material, in oak, at retail level.)

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PAULS-E1-1009.4.5.1

E76–09/10
1009.5 (IFC [B] 1009.5)

Proponent: David W. Cooper, Stair Manufacturing and Design Consultants, representing the Stairway Manufacturers' Association, Inc.

Revise as follows:

1009.5 (IFC [B] 1009.5) Stairway landings. There shall be a floor or landing at the top and bottom of each stairway. The width of landings shall not be less than the width of stairways they serve. Every landing shall have a minimum ~~dimension~~ width measured perpendicular to ~~in~~ the direction of travel equal to the width of the stairway. Where the stairway has a straight run the depth ~~Such dimension~~ need not exceed 48 inches (1219 mm) ~~where the stairway has a straight run~~. Doors opening onto a landing shall not reduce the landing to less than one-half the required width. When fully open, the door shall not project more than 7 inches (178 mm) into a landing. When wheelchair spaces are required on the stairway landing in accordance with Section 1007.6.1, the wheelchair space shall not be located in the required width of the landing and doors shall not swing over the wheelchair spaces.

Exception: Aisle stairs complying with Section 1028.

Reason: This change clarifies that landing width is measured perpendicular to the line of travel. The commentary offers clarification of this language to reinforce the most common interpretation allowing the periphery of stairway landings to be curved or segmented because this does not reduce the effective width of the landing to those using the stairway. This proposal will allow more consistent application and enforcement of the intent of this section.

Cost Impact: This proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Cooper-E3-1009.4

E77–09/10
1009.5 (IFC [B] 1009.5)

Proponent: Lee Kranz representing Washington Association of Building Officials (WABO), Technical Code Development Committee

Revise text as follows:

1009.5 (IFC [B] 1009.5) Stairway Landings. There shall be a floor or landing at the top and bottom of each stairway. The width of landings shall not be less than the width of stairways they serve. Every landing shall have a minimum dimension measured in the direction of travel equal to the width of the stairway. Such dimension need not exceed 48 inches (1219 mm) where the stairway has a straight run or where a curved stairway has a continuous radius. Doors opening onto a landing shall not reduce the landing to less than one-half the required width. When fully open, the door shall not project more than 7 inches (178 mm) into a landing. When wheelchair spaces are required on the stairway landing in accordance with Section 1007.6.1, the wheelchair space shall not be located in the required width of the landing and doors shall not swing over the wheelchair spaces.

Exception: Aisle stairs complying with Section 1028.

Reason: There are many curved or radius stairways that exceed the minimum required egress width. In those cases, to require the length of the landing in the direction of travel to be equal to the width of the stair is impractical and takes up valuable floor space. Per Section 1005.1, egress width must be maintained to the termination of the means of egress so changes in direction of the stair will not be allowed to be less than the width of the stair.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KRANZ-E3-1009.5.DOC

E78–09/10
1009.10.2 (IFC [B] 1009.10.2)

Proponent: Elliott Mertz, Lapeyre Stair, representing self

Revise as follows:

1009.10.2 (IFC [B] 1009.10.2) Treads of alternating tread devices. Alternating tread devices shall have a minimum projected tread of 5 inches (127 mm), a minimum tread depth of 8 ½ inches (216 mm), a minimum tread width of 7 inches (178 mm) and a maximum riser height of 9 ½ inches (241 mm). The projected tread depth shall be measured horizontally between the vertical planes of the foremost projections of ~~adjacent treads~~ the tread being measured and the tread directly above the tread being measured. The riser height shall be measured vertically between the leading edges of adjacent treads. The combination of riser height and projected tread depth provided shall result in an alternating tread device angle that complies with Section 1002. The initial tread of the device shall begin at the same elevation as the platform, landing or floor surface.

Exception: Alternating tread devices used as an element of a means of egress in buildings from a mezzanine area not more than 250 square feet (23 m^2) in area which serves not more than five occupants shall have a minimum projected tread of 8 ½ inches (216 mm) with a minimum tread depth of 10 ½ inches (267 mm). The rise to the next alternating tread surface should not be more than 8 inches (203 mm).

Reason: Clarify the code. The only way to measure the projected tread depth of alternating tread devices is using treads that are directly above and below each other rather than adjacent treads which are to the side of each other. An adjacent tread has no effect on the usable depth of a tread adjacent.

Cost impact: The code change proposal will not affect the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Mertz-E2-1009.10.2

E79–09/10
1009.10.2 (IFC [B] 1009.10.2)

Proponent: David W. Cooper, Stair Manufacturing and Design Consultants, representing the Stairway Manufacturers' Association, Inc.

Revise as follows:

1009.10.2 (IFC [B] 1009.10.2) Treads of alternating tread devices. Alternating tread devices shall have a minimum ~~projected~~ tread depth of 5 inches (127 mm), a minimum projected tread depth of 8 ½ inches (216 mm), a minimum tread width of 7 inches (178 mm) and a maximum riser height of 9 ½ inches (241 mm). The ~~projected~~ tread depth shall be measured horizontally between the vertical planes of the foremost projections of adjacent treads. The riser height shall be measured vertically between the leading edges of adjacent treads. The ~~combination of~~ riser height and ~~projected~~ tread depth provided shall result in an ~~alternating tread device~~ angle of ascent from the horizontal that complies with Section 1002. The initial tread of the device shall begin at the same elevation as the platform, landing or floor surface.

Exception: Alternating tread devices used as an element of a means of egress in buildings from a mezzanine area not more than 250 square feet (23 m^2) in area which serves not more than five occupants shall have a minimum ~~projected~~ tread depth of 3.0 inches (76 mm) ~~of 8 ½ inches (216 mm)~~with a minimum projected tread depth of 10 ½ inches (267 mm). The rise to the next alternating tread surface should not be more than 8 inches (203 mm).

Reason: Currently in this section the code recognizes that "projected tread depth" is the distance measured horizontally between the vertical planes of the foremost projections of adjacent treads. This is what the code cites as being "tread depth" in both the stairway and ship ladder sections.

Alternating tread devices, ships ladders, and stairs have several things in common. They are vertical egress devices, they all have treads, and ascend at an angle. Mathematically any angle or slope can be defined by two components called Rise and Run. When calculating an angle it is these two components that are used. In reference to stairs and ladders of all types the horizontal component is usually called Run or Going however the ICC recognizes and substitutes the term "tread depth" for this horizontal unit of the slope that is used to calculate the angle.

If tread depth is the given term used in the ICC codes then it should and can be used correctly and in the same fashion for alternating tread devices, ships ladders and stairs.

The changes above simply correct long mistaken use of terms in this section that were amplified by changes made to this section in 2009 in an attempt to describe how to measure the tread depth.

Please see the graphics attached that provide additional clarification of this proposal in relation to the referenced definition of Alternating tread device in section 1002.

ALTERNATING TREAD DEVICE. A device that has a series of steps between 50 and 70 degrees (0.87 and 1.22 rad) from horizontal, usually attached to a center support rail in an alternating manner so that the user does not have both feet on the same level at the same time.

To assure that the device meets the definition it is necessary to calculate the angle of ascent from the horizontal. The corrected language makes this possible.

Referenced defintion from Section 1002:

ALTERNATING TREAD DEVICE. A device that has a series of steps between 50 and 70 degrees (0.87 and 1.22 rad) from horizontal, usually attached to a center support rail in an alternating manner so that the user does not have both feet on the same level at the same time.

Figure 1

Figure 2

Figures 1 and 2 show the two tread depths and riser heights as corrected by the proposal and the related angles of ascent with the horizontal that are applicable to the referenced definition in Section 1002 for Alternating tread devices.

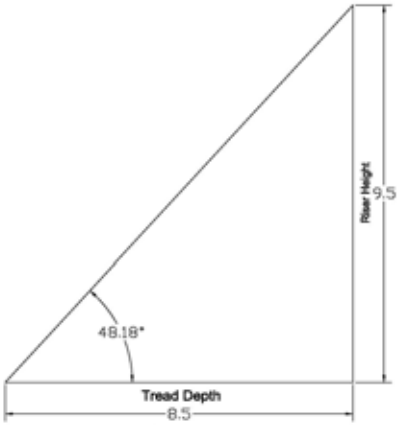


Figure 3

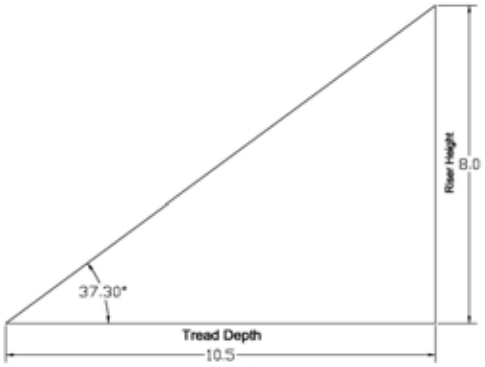


Figure 4

Figures 3 and 4 above show the two tread depths and riser heights as currently stated in the code and the resulutant incorrect angles calculated. These errant angles do not match the devices angle nor do they fit the referenced definition in Section 1002 for Alternating tread devices.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Cooper-E1-1009.9.2

E80–09/10
1009.12, 1010.8, 1028.13 (IFC [B] 1009.12, 1010.8, 1028.13)

Proponent: Ed Roether, Populous (Formerly HOK Sport Venue Event), representing self

Revise as follows:

1009.12 (IFC [B] 1009.12) Handrails. Stairways shall have handrails on each side and shall comply with Section 1012. Where glass is used to provide the handrail, the handrail shall also comply with Section 2407.

Exceptions:

1. Handrails for aisle stairs ~~are not required where permitted by~~ provided in accordance with Section 1028.13.
2. Stairways within dwelling units~~,~~ and spiral stairways ~~and aisle stairs serving seating only on one side~~ are permitted to have a handrail on one side only.
3. Decks, patios and walkways that have a single change in elevation where the landing depth on each side of the change of elevation is greater than what is required for a landing do not require handrails.
4. In Group R-3 occupancies, a change in elevation consisting of a single riser at an entrance or egress door does not require handrails.
5. Changes in room elevations of three or fewer risers within dwelling units and sleeping units in Group R-2 and R-3 occupancies do not require handrails.

1010.8 (IFC [B] 1010.8) Handrails. Ramps with a rise greater than 6 inches (152 mm) shall have handrails on both sides. Handrails shall comply with Section 1012.

Exception: Handrails for ramped aisles ~~are not required where permitted by~~ provided in accordance with Section 1028.13.

1028.13 (IFC [B] 1028.13) Handrails. Ramped aisles having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and aisle stairs shall be provided with handrails in compliance with Section 1012 located either at the side or within the aisle width.

Exceptions:

1. Handrails are not required for ramped aisles having a gradient no greater than one unit vertical in eight units horizontal (12.5-percent slope) and seating on both sides.
2. Handrails are not required if, at the side of the aisle, there is a guard that complies with the graspability requirements of handrails.
3. Handrail extensions are not required at the top and bottom of aisle stairs and aisle ramp runs to permit crossovers within the aisles.

1028.13.1 (IFC [B] 1028.13.1) Discontinuous handrails. Where there is seating on both sides of the aisle, the handrails shall be discontinuous with gaps or breaks at intervals not exceeding five rows to facilitate access to seating and to permit crossing from one side of the aisle to the other. These gaps or breaks shall have a clear width of at least 22 inches (559 mm) and not greater than 36 inches (914 mm), measured horizontally, and the handrail shall have rounded terminations or bends.

1028.13.2 (IFC [B] 1028.13.2) Intermediate handrails. Where handrails are provided in the middle of aisle stairs, there shall be an additional intermediate handrail located approximately 12 inches (305 mm) below the main handrail.

Reason: The handrail requirements for aisle stairs and ramps differ from the handrail requirements for stairs since aisles serve seating to the side of an aisle stair or ramp. The occupant movement between the seating area and the aisle requires unique and specific requirements from that of a stair. Therefore, the exception should not be based upon where a handrail is permitted to be omitted, but rather that the handrail is required to comply with the handrail provisions for aisle stairs and ramps, not the handrail provisions for stairs. Also, there is more clarity by eliminating the portion pertaining to aisle stairs serving seating on one side from the exception pertaining to stairs in dwelling units and spiral stairs. By simply requiring compliance with the section on aisle handrail requirements there is no need for having the aisle serving seating on one side connected with a stair exception. Finally, Section 1028.13 should clearly require compliance with Section 1012 to fully separate and coordinate the requirements for stair handrails and aisle handrails.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Roether-E7-1009.12

E81–09/10
1009.12, 1010.8 (IFC [B] 1009.12, 1010.8)

Proponent: Bill Conner, representing American Society of Theatre Consultants

Revise as follows:

1009.12 (IFC [B] 1009.12) Handrails. Stairways shall have handrails on each side and shall comply with Section 1012. Where glass is used to provide the handrail, the handrail shall also comply with Section 2407.

Exceptions:

1. Handrails for aisle stairs are not required where permitted by Section 1028.13.
2. Stairways providing access between the stage and the assembly seating area are permitted to have a handrail on one side only.
3. ~~2.~~ Stairways within dwelling units, spiral stairways and aisle stairs serving seating only on one side are permitted to have a handrail on one side only.
4. ~~3.~~ Decks, patios and walkways that have a single change in elevation where the landing depth on each side of the change of elevation is greater than what is required for a landing do not require handrails.
5. ~~4.~~ In Group R-3 occupancies, a change in elevation consisting of a single riser at an entrance or egress door does not require handrails.
6. ~~5.~~ Changes in room elevations of three or fewer risers within dwelling units and sleeping units in Group R-2 and R-3 do not require handrails.

1010.8 (IFC [B] 1010.8) Handrails. Ramps with a rise greater than 6 inches (152 mm) shall have handrails on both sides. Handrails shall comply with Section 1012.

Exceptions:

1. Handrails for ramped aisles are not required where permitted by Section 1028.13.
2. Ramps providing access between the stage and the assembly seating area are permitted to have a handrail on one side only.

Reason: Guards are not required on the front of a stage. Traditionally stairs or ramps leading to the stage have only had a handrail on the wall side to that they do not obstruct view of the stage. Sometimes ramps that wing a stage are also used as part of the stage during events. While single handrails are permitted in aisle steps within the seating areas, it is interpretive if the stairs to the stage are covered by this allowance. This proposal will clarify the issue.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Conner-E3-1028.13 split

E82-09/10
1009.12 (IFC [B] 1009.12)

Proponent: Kyle Hantz, PE, General Services Administration, representing self

Revise as follows:

1009.12 (IFC [B] 1009.12) Handrails. Stairways shall have handrails on each side and shall comply with Section 1012. Where glass is used to provide the handrail, the handrail shall also comply with Section 2407.

Exceptions:

1. Handrails for aisle stairs are not required where permitted by Section 1028.13.
2. Stairways within dwelling units, spiral stairways and aisle stairs serving seating only on one side are permitted to have a handrail on one side only.
3. ~~Decks, patios and walkways that have a single change in elevation where the landing depth on each side of the change of elevation is greater than what is required for a landing do not require handrails.~~

3.4. In Group R-3 occupancies, a change in elevation consisting of a single riser at an entrance or egress door does not require handrails.
4.5. Changes in room elevations of three or fewer risers within dwelling units and sleeping units in Group R-2 and R-3 do not require handrails

Reason: Refer to NFPA 101 7.2.2.4.1.1. This states stairs and ramps have handrails. Yet 1009.12 exception #3 allows one change of elevation not to have a handrail. I think Exception #3 is referring to walkways that are not a component of a means of egress.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Hantz-E1-1009.12.doc

E83–09/10
1009.12 (IFC [B] 1009.12)

Proponent: Ali M. Fattah, City of San Diego, representing SD Area Chapter ICC Code Committee

Revise as follows:

1009.12 (IFC [B] 1009.12) Handrails. Stairways shall have handrails on each side and shall comply with Section 1012. Where glass is used to provide the handrail, the handrail shall also comply with Section 2407.

Exceptions:

1. Handrails for aisle stairs are not required where permitted by Section 1028.13.
2. Stairways within dwelling units, spiral stairways and aisle stairs serving seating only on one side are permitted to have a handrail on one side only.
3. Decks, patios and walkways that have a single change in elevation where the landing depth on each side of the change of elevation is greater than what is required for a landing do not require handrails.
4. In Group R-3 occupancies, a change in elevation consisting of a single riser at an entrance or egress door does not require handrails.
5. Changes in room elevations of three or fewer risers within dwelling units and sleeping units in Group R-2 and R-3 do not require handrails.
6. At individual dwellings and their accessory structures, exterior stairways that are located on grade and do not provide the only means of egress to the public way do not require handrail.

Reason: The proposed code change adds clarity to the IBC. Exterior stairways on grade do not require handrails since the fall potential is not as critical on elevated stairways. There will be no obscuration of exterior path in a fire emergency s would be in an interior stairway. The IRC does not regulate exterior means of egress and flatwork.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Fattah-E2-1012.1

E84–09/10
1009.12 (IFC [B] 1009.12)

Proponent: Don Birdsall, LIFT-U Division, Hogan Mfg., Inc., representing self

Revise as follows:

1009.12 (IFC [B] 1009.12) Handrails. Stairways shall have handrails on each side and shall comply with Section 1012. Where glass is used to provide the handrail, the handrail shall also comply with Section 2407.

Exceptions:

1. Handrails for aisle stairs are not required where permitted by Section 1028.13.

2. Stairways within dwelling units, spiral stairways and aisle stairs serving seating only on one side are permitted to have a handrail on one side only.
3. Decks, patios and walkways that have a single change in elevation where the landing depth on each side of the change of elevation is greater than what is required for a landing do not require handrails.
4. In Group R-3 occupancies, a change in elevation consisting of a single riser at an entrance or egress door does not require handrails.
5. Changes in room elevations of three or fewer risers within dwelling units and sleeping units in Group R-2 and R-3 do not require handrails.
6. Changes in elevation of one or two risers where there is an adjacent support on at least one side with a height of not less than 34 inches (864 mm)and not more than 42 inches (1067 mm) and with a top surface that complies with the graspability requirements of a handrail.

Reason: To eliminate the requirement of a handrail on a one or two step stairway when there is a fixed structure in place along the step(s) that can be grasped and used to support the user. A prime example of the situation is in a courtroom. To gain access to the Judges' Bench, the Judge may walk through the Witness Stand or Clerks' Station on one side of his Bench. The elevation change is typically two steps or less. If a wheelchair lift is present in the Witness Stand or Clerks' Station, a hazard is created between the fixed handrail and the wheelchair/user as the platform rises in height to the Judges' Bench. The millwork throughout the Bench area provides horizontal surfaces that can be used for support as would a handrail. By eliminating the requirement for handrails when there are support surfaces available, a potential crushing hazard between the handrail and the wheelchair user is eliminated while protecting the decorum of the courtroom.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BIRDSALL-E1-1009.12.DOC

E85-09/10
1009.13 (IFC [B] 1009.13)

Proponent: David S. Collins, FAIA, The Preview Group, Inc., representing The American Institute of Architects

Revise as follows:

1009.13 (IFC [B] 1009.13) Stairway to roof. In buildings four or more stories above grade plane, one stairway shall extend to the roof surface, unless the roof has a slope steeper than four units vertical in 12 units horizontal (33-percent slope). In buildings four stories or more above grade plane, without an occupied roof, access to the roof from the top story shall be permitted to be by an alternating tread device or ladder.

Reason: The second sentence in Section 1009.13 isn't clear as to what it applies to; buildings four or more stories above grade plane, buildings of any height, or any building without an occupied roof? The proposed amendment clarifies the criteria to apply to buildings four stories above grade plane and having an unoccupied roof.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Collins-E4-1009.13

E86–09/10
1009.13 (IFC [B] 1009.13)

Proponent: J. Nigel Ellis, Ph.D., PE, Ellis Fall Safety Solutions, LLC

Revise as follows:

1009.13 (IFC [B] 1009.13) Stairway to roof. In buildings four or more stories above grade plane, one stairway shall extend to the roof surface, unless the roof has a slope steeper than four units vertical in 12 units horizontal (33-percent slope). In buildings without an occupied roof, access to the roof from the top story shall be permitted to be by an alternating tread device. Hatch openings shall be provided with a means to facilitate access and exit such as ladder grab bars that can be grasped by the climber. Ladder grab bars shall be elevated above the roof and horizontally arranged in a uniform manner.

Reason: The code is presently silent on roof hatch fall hazards.

To avoid necessity for crouching to stabilize balance before entering the roof hatch or to reduce the incidence of tripping on the curb before descending, he externally mounted grab bars can be reached without stooping to permit access or bodily turn around with reduced falling hazard; such fall hazard can be up to 30 ft. in some mental buildings with highly injurious or fatal consequences.

The requirement would also apply to fixed ladder roof hatch access where exemptions to the IBC Code are permitted.

ANSI A14.3 – 2008 Section 5.3.4.3 states the following: "5.3.4.3 Hatch opening shall be provided with a means to facilitate access and exit from a fixed ladder (i.e, grab bars or other such items that can be grasped by the climber."

The University of Michigan Biomechanics Laboratory research report 4/08 financed by NIOSH (awarded by The Center to Protect Worker' Rights) supports the selection of effective horizontal grab bars over ineffective vertical grab bars. NIOSH/CDC is the National Institute of Occupational Safety & Health/Center for Disease Control.

A picture of ladder grab bars for roof hatch access is attached for a commercial building roof hatch. Ladder grab bars have been recognized for decades in industry by OSHA and ANSI known simply as "grab bars". Since 1971, OSHA 1910.27(b)(5) and (d)(4) only has "grab bars" in mind for fixed ladders which are typically 12 inches long, one inch diameter, bolted or welded at each end and 1.5-4" space to grab where a fixed ladder is used. I am proposing that these ladder grab bars only be placed horizontally. Side rails are always vertically arranged which when grasped is a hazard when you fall more than approx. six inches because the hand slides as shown in the University of Michigan ladder report which I submitted electronically to ICC with the file name UM_CPWR_Final1.pdf and can be viewed on the FallSafety.com website under Ladder Improvements. CPWR (Center for Protection of Worker Rights) dispenses NIOSH grants for research. Another reference is the US Corps of Engineers EM385-1-1 (2003) (mandatory) Appendix Fixed Ladder and Stairs J3(h) "Openings shall be provided with elevated horizontal grab bars to facilitate access and exit from upper levels", J4(d) Horizontal grab bars shall be provided to facilitate grip in case of a fall".

I also understand the use of the term "grab bar" since 1990 approx. for bathroom safety rails in the building code and to which no reference is made in this proposal.

ANSI (American National Standards Institute) has used the term "grab bars" for ladder holding stability (when rungs and side rails were not available) since 1956 in the A14.3 fixed ladder standard, as defined in section 2 as follows:
"2.14 Grab Bars are individual handholds placed adjacent to or as an extension above ladders for the purpose of providing access beyond the limits of the ladder"

Fixed ladder grab bars are addressed in proposed OSHA standard 1910.23(c)(21), and alternating tread type stairs are addressed in ANSI A1264.1-2007 section 6 and also proposed OSHA Standard 1910.25(f) and Fig. D3 (4 10 90). OSHA/DOL is the Occupational Safety & Health Administration/Department of Labor.

Horizontal grab bars can be attached by bolting or welding to protective guardrails arranged around roof openings for access to and from alternating tread devices and fixed ladders. More information on www.FallSafety.com Ladder Improvements related to ladder horizontal grab bars.

Cost Impact: Roof Hatch grab bars permanently installed approximately $320 cost and four bolt holes to drill for installation. Where guardrails are added around the roof hatch, the total system costs approximately $1300 before installation.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Ellis-E1-1009.12

E87–09/10
1010.1 (IFC [B] 1010.1)

Proponent: Jon Siu, City of Seattle, representing Washington Association of Building Officials Technical Code Development Committee

Revise as follows:

1010.1 (IFC [B] 1010.1) Scope. The provisions of this section shall apply to ramps used as a component of a means of egress.

Exceptions:

1. Other than ramps that are part of the accessible routes providing access in accordance with Sections 1108.2 through 1108.2.4 and 1108.2.6, ramped aisles within assembly rooms or spaces shall conform with the provisions in Section 1028.11.
2. Curb ramps shall comply with ICC A117.1.
3. Vehicle ramps in parking garages for pedestrian exit access shall not be required to comply with Sections 1010.3 through 1010.9 when they are not an accessible route serving accessible parking spaces~~,~~ or other required accessible elements ~~or part of an accessible means of egress~~.
4. In a parking garage where one accessible means of egress serving accessible parking spaces or other accessible elements is provided, a second accessible means of egress serving that area shall be permitted to include a vehicle ramp that does not comply with Sections 1010.4 through 1010.8.

Reason: This proposal solves a practical problem with current code language. In parking garages where parking is provided on the ramps, the accessible parking spaces are usually located on flat areas at the ends of the ramps. One accessible means of egress can usually be easily provided on the flat portion of the garage ramp. However, many times the second required means of egress is provided at the other end or at the center of the garage, and is accessed via the vehicle ramp. While the ramp may be able to provide the correct slope to provide the second accessible means of egress from the accessible parking spaces (1 vertical in 12 horizontal), it is impractical in these types of garages to provide features such as handrails on both sides of the ramp, or to provide a landing for every 30 inches of rise.

The proposed text is modeled on Section 1010.1 exception 3, which allows the deletion of the some provisions for vehicle ramps used as exit access for pedestrians. However, because the ramp still needs to be used as an accessible means of egress, it is necessary to maintain a usable cross-slope (Section 1010.3). In addition, protection at the edges of the ramp should still be provided where the accessible means of egress is along the edge of the vehicle ramp (Section 1010.9). On the other hand, if the accessible means of egress is not near the edge of the vehicle ramp (the most likely scenario), Section 1010.9, Exception 1 can be used to eliminate the edge protection, since the requirement for 1:10 sloped "flares" will easily be met.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SIU-E1-1010.1

E88–09/10
1010.1 (IFC [B] 1010.1)

Proponent: Ali M. Fattah, City of San Diego, representing SD Area Chapter ICC Code Committee

Revise as follows:

1010.1 (IFC [B] 1010.1) Scope. The provisions of this section shall apply to ramps used as a component of a means of egress.

Exceptions:

1. Other than ramps that are part of the accessible routes providing access in accordance with Sections 1108.2 through 1108.2.4 and 1108.2.6, ramped aisles within assembly rooms or spaces shall conform with the provisions in Section 1028.11.
2. Curb ramps shall comply with ICC A117.1.
3. Vehicle ramps in parking garages for pedestrian exit access shall not be required to comply with Sections 1010.3 through 1010.9 when they are not an accessible route serving accessible parking spaces, other required accessible elements or part of an accessible means of egress.
4. Sloped driveways used for vehicular access to Group U occupancies or private garages, that are associated with Group R-3 dwelling units that are not required to meet Type B unit requirements in Section 1107, shall not be required to comply with this section.

Reason: The proposed code change adds clarity to the IBC. This requirement existed under the 1997 UBC but was not enforced. The IRC does not regulate exterior means of egress. It is not practical on single family dwellings and two-family dwellings to provide egress ramps.

Cost Impact: This proposal will minimally impact the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Fattah-E3-1010.1

E89–09/10
1011.2, 1011.4, 1011.5.3 (IFC [B] 1011.2, 1011.4, 1011.5.3)

Proponent: Manny Muniz, California Deputy State Fire Marshal (Ret.), representing self

Revise as follows:

1011.2 (IFC [B] 1011.2) Illumination. Exit signs shall be internally or externally illuminated. Exit signs shall be illuminated at all times.

Exceptions:

1. Tactile signs required by Section 1011.3 need not be provided with illumination.
2. When approved by the building official, exit signs are not required to be illuminated when the building is unoccupied.

1011.4 (IFC [B] 1011.4) Internally illuminated exit signs. Electrically powered, self-luminous and photoluminescent exit signs shall be listed and labeled in accordance with UL 924 and shall be installed in accordance with the manufacturer's instructions and Chapter 27. ~~Exit signs shall be illuminated at all times.~~

1011.5 (IFC [B] 1011.5) Externally illuminated exit signs. Externally illuminated exit signs shall comply with Sections 1011.5.1 through 1011.5.3.

1011.5.3 (IFC [B] 1011.5.3) Power source. ~~Exit signs shall be illuminated at all times.~~ To ensure continued illumination for a duration of not less than 90 minutes in case of primary power loss, the sign illumination means shall be connected to an emergency power system provided from storage batteries, unit equipment or an on-site generator. The installation of the emergency power system shall be in accordance with Chapter 27.

Exception: Approved exit sign illumination means that provide continuous illumination independent of external power sources for a duration of not less than 90 minutes, in case of primary power loss, are not required to be connected to an emergency electrical system.

Reason: Many buildings that are required to have exit signs illuminated 24/7 are unoccupied more than they are occupied. This wastes electricity needlessly and often shortens the life span of exit sign bulbs, thus requiring more frequent bulb replacement. Failure to maintain and replace exit sign bulbs is the number one cause of exit sign inoperability. The building official should be given the power to make determinations of when it is appropriate to have exit signs illuminated at all times and when it is not. It should be noted that 1006.1 means of egress illumination (1 foot candle) "..shall be illuminated at all times the building space served by the means of egress is occupied." Means of egress illumination and exit sign illumination should always operate together so that a person can see the egress path and then identify the exit doors. In a typical office building where workers work from 9 AM to 6 PM Monday through Friday, and allowing for the building being opened at 8 AM and closed at 7 PM, the building is occupied less than one-third of the time. Two thirds of the time, electricity consuming exit signs are serving no purpose at all.

Typical Office Building
Exit signs on when building occupied = 55 hrs/week
52 weeks = 2,860 hrs/year

Versus
Exit signs on 24/7 = 168 hrs/week
365 days per year = 8,760 hrs/year

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Muniz-E3-1011.4

E90–09/10
1011.2 (New) [IFC [B] 1011.2 (New)]

Proponent: Donald LeBrun, CBO, State of Indiana, Fire & Building Safety, representing Indiana Association of Building Officials

Add new text as follows:

1011.2 (IFC [B] 1022.1) Location. When exit signs are mounted on the same vertical plane as the exit or exit-access door served the sign shall be centered above the door with the bottom of the sign no more than 12 inches (305 mm) above the door leaf. Other exit signs used to direct persons to the exit or exit-access door shall be no higher than 10' feet (3.05 m) above the finish floor.

(Renumber subsequent sections)

Reason: Currently we have no direction as to where exit signs should be located. With the higher ceilings being used in more structures we are finding exit signs being mounted well above the exit served, sometimes as much as 25 feet above the door. In an emergency situation people will seek exiting information at their eye level and never see the exit sign 20 feet above their heads. Mounting exit signs at the proposed levels would greatly increase the visibility and effectiveness of the exit signs.

Cost Impact: This proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Lebrun-E1-1011.2

E91–09/10
1011.2 (New) [IFC [B] 1011.2 (New)]

Proponent: Donald LeBrun, CBO, State of Indiana, Fire & Building Safety, representing Indiana Association of Building Officials

Add new text as follows:

1011.2 (IFC [B] 1022.1) Floor-level exit signs in Group R-1. Where exit signs are required by Section 1011.1, additional low-level exit signs shall be provided in all corridors serving guest rooms in Group R-1 occupancies.

The bottom of such sign shall be not less than 6 inches (152mm) nor more than 8 inches (203mm) above the floor level. For exit and exit-access doors, the sign shall be on the door or adjacent to the door with the closest edge of the sign within 4 inches (102 mm) of the door frame.

(Renumber subsequent sections)

Reason: This proposal is specifically intended for use group R-1 occupancies where the occupants are transient and not familiar with their surroundings. The current practice of installing exit signs above the heads of most people works well except in a smoke filled space which often accompanies a fire situation. As the space fills with smoke the effectiveness of the high level exit signage diminishes forcing evacuees to crawl on the floor to reach the nearest exit. The installation of these low level will greatly assist these persons in safely exiting the structure.

Cost Impact: This proposal will increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Lebrun-E2-1011.2

E92–09/10
1011.3, 1011.3.1-1011.3.8 (New) [IFC [B] 1011.3, 1011.3.1-1011.3.8 (New)]

Proponent: Dallas Dixon, representing ERR Architecture INC

Delete and substitute as follows:

.

1011.3 (IFC [B] 1011.3) Tactile ~~exit~~ signs. ~~A tactile sign stating EXIT and complying with ICC A117.1 shall be provided adjacent to each door to an area of refuge, an exterior area for assisted rescue, an exit stairway, an exit ramp, an exit passageway and the exit discharge.~~ Tactile signs shall be provided adjacent to exit access doors and doors leading to enclosed exits where exit signs are required by Section 1011.1. Tactile signs shall be provided adjacent to doors leading to areas of refuge and exterior areas for assisted rescue where identification signs are required by Section 1007.9. Signs shall provide information as indicated in Sections 1101.3.1 through 1101.3.8. All tactile signs shall comply with ICC A117.1 requirements for raised characters and Braille.

Exception: Where the configuration of the walls and doors will not allow for placement of the tactile signage in accordance with ICC A117.1, tactile signage in accordance with this section is not required.

1011.3.1 (IFC [B] 1011.3.1) Exit stairway. Tactile signs shall be provided adjacent to each door leading to an enclosed exit stairway stating 'EXIT STAIR'.

1011.3.2 (IFC [B] 1011.3.2) Exit access. Tactile signs shall be provided adjacent to exit access doorways stating 'EXIT ACCESS.'

1011.3.3 (IFC [B] 1011.3.3) Exit discharge. Tactile signs shall be provided adjacent to each door leading directly to an exit discharge stating 'EXIT'.

1011.3.4 (IFC [B] 1011.3.4) Exit passageway. Tactile signs shall be provided adjacent to each door leading to an exit passageway stating 'PASSAGEWAY TO EXIT'.

1011.3.5 (IFC [B] 1011.3.5) Horizontal exit. Tactile signs shall be provided adjacent to doors leading to horizontal exits stating 'EXIT TO REFUGE AREA'.

1011.3.6 (IFC [B] 1011.3.6) Exit ramps. Tactile signs shall be provided adjacent to each door or on adjacent wall leading to interior or exterior exit ramps.

1. Where an interior exit ramp is located at an exit access or an exit, signage shall state 'INTERIOR EXIT RAMP'.
2. Where an exterior exit ramp is provided, signage shall state 'EXTERIOR EXIT RAMP'

1011.3.7 (IFC [B] 1011.3.7) Exit discharge with Exterior steps. In addition to signage required by Section 1011.3.3, if the exit discharge includes a step down or stairs, tactile signs shall be provided adjacent to the exit door and:

1. Where there is a step down as permitted in Sections 1008.1.5, signage shall state 'STEP DOWN.'
2. Where the exit door landing leads to stairs, signage shall state 'OUTSIDE STAIRS'.

1011.3.8 (IFC [B] 1011.3.8) Area of refuge. Where identification signage is required by Section 1007.9, tactile signage shall be provided at the following locations:

1. Where an area of refuge is located in an elevator lobby, tactile signs shall be provided on all doors leading to the elevator lobby stating 'AREA OF REFUGE'.
2. Where an area of refuge is located inside an exit stairway enclosure, in addition to the sign required by Section 1011.3.1, a tactile sign shall be provided adjacent to the door leading to the stairway stating 'AREA OF REFUGE'.
3. Where an area of refuge is located adjacent to an exit stairway enclosure, in addition to the sign required by Section 1011.3.2, a tactile sign shall be provided adjacent to the door leading to the area of refuge stating 'AREA OF REFUGE.'
4. Where an exterior area for assisted rescue is provided, in addition to the sign required by Sections 1011.3.3 and 1011.3.7, a tactile sign shall be provided adjacent to the exterior door stating 'EXTERIOR AREA FOR ASSISTED RESCUE.'

Reason: The intent of this proposal is to provide clarity where tactile exit signage should be provided. In addition, specific text will help direct persons with vision impairments to a safe path out of the building or to an area of rescue assistance. For example, letting someone with visual impairments know that they will be dealing with steps or ramps when they walk through a door, will provide for safer paths.

With the advent of the Big Box buildings and mega size multi-use building, the requirements for Tactile Signage as addressed in Section 1011.3 does not provide enough specifics or clarity. The exceptions of Section 1011.1 further provide confusion for where tactile signs shall be required and where are they exempted. Section 1011.3 generically addresses the placement of tactile signs adjacent to doors leading to an area of refuge, an area of assisted rescue, an exit stairway, an exit ramp, an exit passageway and exit discharge.

Tactile signage is not required where exit signs are not required so it will be manageable for code officials and fire officials to identify appropriate locations. The intent of the exception to Section 1011.3 is to address situations where there is no practical place to locate such signage so it can be found by a person with visual impairments (i.e., open stairways, horizontal sliding doors, storefront arrangement with glass doors and side lights, multiple doors together like at a main assembly space exit).

Current code does not address tactile signage requirement for exiting through horizontal exits or specific requirement and information when areas of refuge and exterior areas of rescue assistance are required. This code change includes text that specifically addresses these areas with regard to tactile signage

Cost Impact: This code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DIXON-E1-1011.3

E93–09/10

1011.6 (New) [IFC [B] 1011.6 (New); IFC 1030.4.1

Proponent: Joshua D. Smith, Fire Protection Specialist, representing New York State Department of State – Office of Fire Prevention and Control

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC MEANS OF EGRESS CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

PART I – IBC MEANS OF EGRESS

Add new text as follows:

1011.6 (IFC [B] 1011.6) Door Mounted Exit Signs. For Groups A, B, E, I, M, and R-1 occupancies, all exit and exit access doors required to have exit signs in accordance with Section 1011.1 shall, in addition, be marked on the door with a self-luminous or photoluminescent exit sign. The bottom of the sign shall not be less than 6 inches above the floor and not more than 18 inches above the floor. The sign shall be permitted to be made of any material, including paint, provided that an electrical charge is not required to maintain the required luminance. Such materials shall include, but are not limited to, self-luminous materials and photoluminescent materials in accordance with Section 1024.4

PART II – IFC

Add new text as follows:

1030.4.1 Door Mounted Exit Signs. For Groups A, B, E, I, M, and R-1 occupancies, all exit and exit access doors required to have exit signs in accordance with Section 1011.1 shall, in addition, be marked on the door with a self-luminous or photoluminescent exit sign. The bottom of the sign shall not be less than 6 inches above the floor and not more than 18 inches above the floor. The sign shall be permitted to be made of any material, including paint, provided that an electrical charge is not required to maintain the required luminance. Such materials shall include, but are not limited to, self-luminous materials and photoluminescent materials in accordance with Section 1024.4

Reason: The current requirements for exit signs have them being hung from the ceiling or mounted high up on a wall. In the event of a fire as a room or corridor is filling with smoke, the exit signs and emergency lighting can quickly become obscured. As building occupants and/or fire fighters are moving through the building with obscured exit signs, determining the difference between an exit door from any other door can become complicated if not impossible at times. Having the floor proximity exit signs mounted on the doors will still provide a marked means of egress when other exit signs are no longer visible. NFPA 101 also has provisions for these signs.

Cost Impact: The code change proposal will increase the cost of construction

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

E94–09/10
1012.2 (IFC [B] 1012.2)

Proponent: Kenneth F. Traugott, NVR, Inc, representing self

Revise as follows:

1012.2 (IFC [B] 1012.2) Height. Handrail height, measured above stair tread nosings, or finish surface of ramp slope shall be uniform, not less than 34 inches (864 mm) and not more than 38 inches (965 mm). Handrail height of alternating tread devices and ship ladders, measured above tread nosings, shall be uniform, not less than 30 inches (762 mm) and not more than 34 inches (864mm).

> **Exception:** When handrail fittings or bendings are used to provide continuous transition between flights, transition at winder treads, transition from handrail to guard, or when used at the start of a flight, the handrail height at the fittings or bendings shall be permitted to exceed the maximum height.

Reason: The above information is being requested to clarify the Code. Fittings such as easings and gooseneck risers are commonly used features intended to provide rail continuity at locations where a straight transition is not possible. Incorporating such features is consistent with the provisions of IBC Section 1012.4 (Continuity) and with standard architectural and construction practice.

The intent of the Code is that the provisions of 1012.3 be applied only over the stair run, and not at landings. The handrail height requirements are applicable over the stairway run, not at landings. The height of the handrail, when it doglegs or u-turns over a landing, will vary so that the handrail can remain continuous in accordance with Section 1012.4 and 1012.5. The handrail extensions at the end must also meet the protruding object provisions if they return to a support post (Section 1003.3.2 and 1012.5).

Unfortunately, the current wording of the Code, although it does indicate that height requirements should be "measured above stair tread nosings," does not clearly state that the height requirements do not apply over landings, at winder treads, where handrails meet a guardrail, or when used at the start of a flight. Inspectors, plan reviewers, and other building code officials in many jurisdictions are currently not accepting handrail fittings such as easings or gooseneck risers.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TRAUGOTT-E1-1012.2

E95–09/10
1012.2 (IFC [B] 1012.2)

Proponent: Kenneth F. Traugott, NVR, Inc, representing self

Revise as follows:

1012.2 (IFC [B] 1012.2) Height. Handrail height, measured above stair tread nosings, or finish surface of ramp slope shall be uniform, not less than 34 inches (864 mm) and not more than 38 inches (965 mm). Handrail height of alternating tread devices and ship ladders, measured above tread nosings, shall be uniform, not less than 30 inches (762 mm) and not more than 34 inches (864 mm).

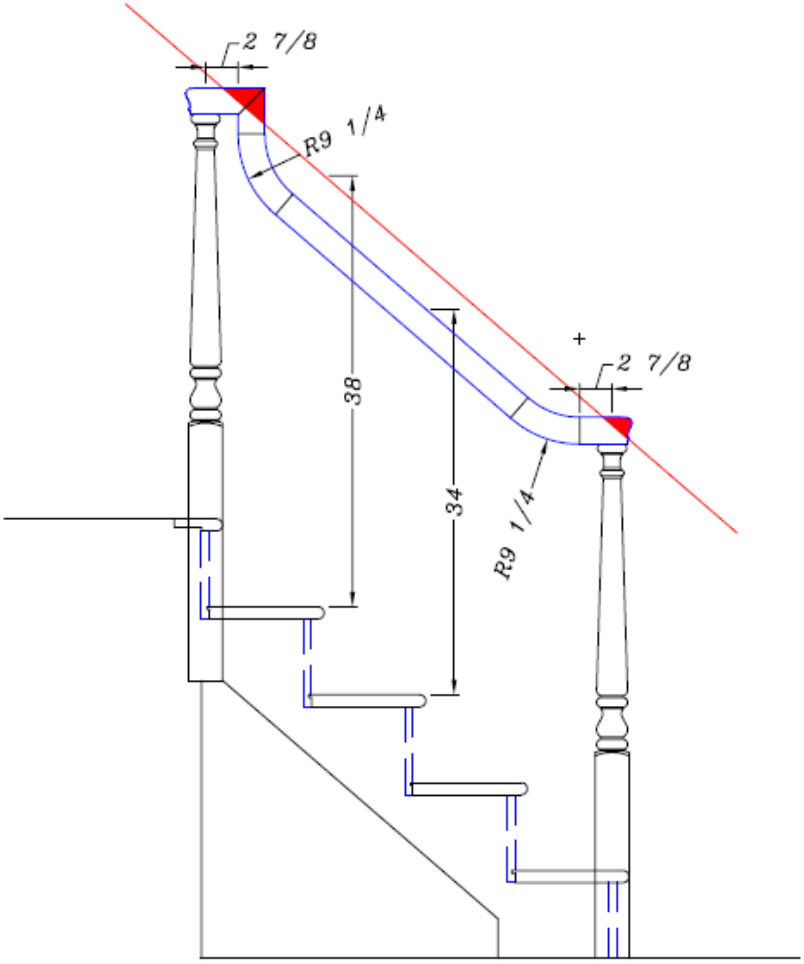
> **Exception:** In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are associated with a Group R-3 occupancy or associated with individual dwelling units in Group R-2 occupancies; when handrail fittings or bendings are used to provide continuous transition between flights, transition at winder treads, transition from handrail to guard, or when used at the start of a flight, the handrail height at the fittings or bendings shall be permitted to exceed the maximum height.

Reason: The above information is being requested to clarify the Code. Fittings such as easings and gooseneck risers are commonly used features intended to provide rail continuity at locations where a straight transition is not possible. Incorporating such features is consistent with the provisions of IBC Section 1012.4 (Continuity) and with standard architectural and construction practice.

The intent of the Code is that the provisions of Section 1012.3 be applied only over the stair run, and not at landings. The handrail height requirements are applicable over the stairway run, not at landings. The height of the handrail, when it doglegs or u-turns over a landing, will vary so that the handrail can remain continuous in accordance with Section 1012.4 and 1012.5. The handrail extensions at the end must also meet the protruding object provisions if they return to a support post (Section 1003.3.2 and 1012.5).

Unfortunately, the current wording of the Code, although it does indicate that height requirements should be "measured above stair tread nosings," does not clearly state that the height requirements do not apply over landings, at winder treads, where handrails meet a guardrail, or when used at the start of a flight. Inspectors, plan reviewers, and other building code officials in many jurisdictions are currently not accepting handrail fittings such as easings or gooseneck risers which are provided to maintain continuity.

This would be consistent with the provisions in the International Residential Code, Section R311.7.7.1, Exp. 2.



Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TRAUGOTT-E2-1012.2

E96–09/10
1012.3 (IFC [B] 1012.3)

Proponent: David W. Cooper, Stair Manufacturing and Design Consultants, representing the Stairway Manufacturers' Association, Inc.

Revise as follows:

1012.3 (IFC [B] 1012.3) Handrail graspability. At ramps that serve as a portion of an accessible route required by Chapter 11, handrails shall comply with Section 1012.3.1 or shall provide equivalent graspability. All other required handrails shall comply with Section 1012.3.1 or 1012.3.2 or shall provide equivalent graspability.

> ~~**Exception:** In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; handrails shall be Type I, Type II as follows or shall provide equivalent graspability.~~

1012.3.1 Type I. Handrails with a circular cross section shall have an outside diameter of at least 1 ¼ inches (32 mm) and not greater than 2 inches (51 mm). If the handrail is not circular, it shall have a perimeter dimension of at least 4 inches (102 mm) and not greater than 6 ¼ inches (160 mm) with a maximum cross-section dimension of 2 ¼ inches (57 mm). Edges shall have a minimum radius of 0.01 inch (0.25 mm).

1012.3.2 Type II. Handrails with a perimeter greater than 6 ¼ inches (160 mm) shall provide a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of ¾ inch (19 mm) measured vertically from the tallest portion of the profile and achieve a depth of at least $^{5}/_{16}$ inch (8 mm) within $^{7}/_{8}$ inch (22 mm) below the widest portion of the profile. This required depth shall continue for at least $^{3}/_{8}$ inch (10 mm) to a level that is not less than 1 ¾ inches (45 mm) below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1 ¼ inches (32 mm) to a maximum of 2 ¾ inches (70 mm). Edges shall have a minimum radius of 0.01 inch (0.25 mm).

Reason: This proposal identifies additional applications of the use of Type II handrails only in those areas that are not part of an accessible route. The A117.1 standard is not referenced for stairways or their handrails. This provision will clarify that other options are and should be available for advantageous and safe use of all.

Understanding the Options:
Type II Handrails provide many advantageous options recognized in the ICC's acceptance within both the IRC and IBC. Among these of course is regulated design freedom controlled by a standard that will provide rails with known performance equivalent to or exceeding the performance of the minimum standard accepted for type I rails.

Type II Handrails cannot be any shape but are precisely controlled by the code text to provide graspable recesses within the grasp of all.

Type I rails may be any shape, regardless of practicality, provided the perimeter and cross section dimension is met. Lacking specific criteria the handrails may only be designed for hand size specific applications, i.e. small perimeters for smaller hands, larger perimeters for larger hands.

The Type II handrail code language provides a recognized value in describing the best way in which to design handrail shapes other than round and thereby improves the code.

Type II Handrails are not impeded by obstructions to the bottom of the rail. They allow for more versatile installations using brackets or balusters attached to the bottom for support without compromising the graspable surface. Especially in the event of a fall the Type II handrail grasping surface is readily available without interference from supports. In fact its grasping surface is the same as its guidance and stabilizing surface and a continuous grasp is possible without interruption. The user does not need to change the position of the hands and fingers to achieve a stabilizing or fall arresting grasp but only increase the tightness of the grip. In the real world of handrail use this kind of practicality also aids those that need to pull themselves with the benefit of maintaining a controlled continuous grip without the need to release the handrail.

Type I rails require access to the bottom surface of the rail and the formation of a full finger wrap grip in order to exert forces comparable to Type II handrails with required recesses. In the event of a fall the purchase point of a grip is random unlike common type I rail uses where it may only be possible for the user to choose the available purchase points they can see or simply run their fingers on the top or side of the rail. Brackets or balusters are allowed to block up to 20% of the grasping surface in some codes and could easily diminish the effective use of the type I rail in a fall by a similar factor or more in reducing the probability of arresting a fall especially when compared to Type II handrails where a constant continuously safe grip, in the ready state, can be maintained. The extent of this very real detriment of type I rail, although recognized, may be impossible to determine.

Research and Testing Advances Since Previous Proposal in Rochester:
Since the addition of Type II handrails in the IBC in 2007 at the Rochester final action hearings significant advancements have been made. As requested in opposing testimony ***Peer review and publication of the research*** and also ***testing of persons with disabilities***, has been done. These were the reasons for approval of the adoption of Type II handrails in the IBC only for residential applications. I am pleased to report that both these issues have been addressed.

SMA Funded Research Published in Peer Reviewed Journal:
The substantial research and testing funded by the Stairway Manufacturers' Association supporting the adoption of Type II handrails has been peer reviewed, accepted for publication, and published in the July 2009 edition of Applied Ergonomics a highly respected peer review journal. This lengthy and rigorous review process of more than two-years was initiated prior to the Rochester hearing at the request of the A117.1 committee. The paper title and reference are:

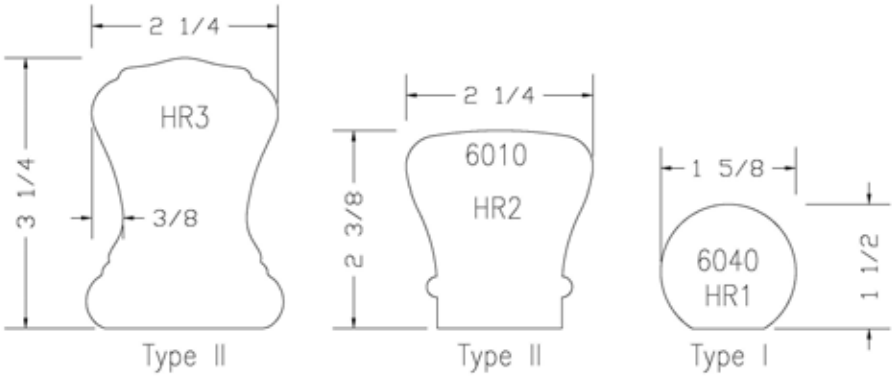
> **"Effect of handrail shape on graspability"**; Donald O. Dusenberry, Howard Simpson, Steven J. DelloRusso; Applied Ergonomics, Volume 40 (2009), issue 4, pp.657-669.

The paper has been published electronically for comment by the scientific community since June 2008. The author's pre-print manuscript can be downloaded at http://www.sgh.com/pdf/Effect-of-Handrail-Shape-on-Graspability.pdf At the time of this submission more than a year has passed and no comments have been received by the author, Applied Ergonomics, or through the on-line scientific collaborative.

Handrail Shape Testing of Persons with Disabilities Funded by SMA

Of additional consequence are the first tests of persons with disabilities related to the shape of handrails in use on stairs and ramps. Three handrail profiles (shown below) were tested by persons in 4 categories of mobility impairments while using stairs and ramps. These tests were performed at PARAQUAD a state of the art assisted living facility in St. Louis, MO, where research related to mobility impairments is done on a regular basis. The tests were performed by **Dr. David B. Gray** a noted researcher from Washington University also in St. Louis. Each of the 28 participants was videotaped in their use of handrails as they ascended and descended stairs and ramps. The complete report of the study and excerpts from the many hours of video are available at http://www.stairways.org/code_changes/A117%20Binder%20SMA%20Presentation%20090105.pdf . The study was completed on the eve of the January 5, 2009 meeting of the A117 Committee. Although the committee had requested testing of persons with disabilities related to handrail shape in testimony, ballot comment, and in committee reason statements the January meeting schedule was reduced from 2 days to I day and only a brief 20 minute summary of the research and the proposal was allowed making the review of any of the video content not possible. At the time of this submission the SMA has filed an appeal with the secretariat in an attempt to have the opportunity to make a detailed presentation of the study and video recordings with in the 2008 cycle of the standard. We would encourage you to read the full study. While further work with larger samples was suggested to provide enough data to analyze for comparison of data between sample groups, some of the findings are summarized here:

> All shapes were rated good to excellent and reported to be of assistance
> Wheelchair users preferred the Type I profile, HR1 shape (reported use only while ascending ramps).
> **All other participants preferred the larger Type II, HR3 handrail. (on left below)**



Other Facts:
This proposal identifies suitable application of the use of type II rails only in those areas that are not part of an accessible route. The A117.1 standard is not referenced by the means of egress code for stairways because stairs are not part of an accessible route. This provision will help to clarify that other options are and should be available for advantageous and safe use by all. Conflict with the accessibility provisions of Chapter 11 and the A117.1 standard referenced there is eliminated by the text that requires use of Type I rails at ramps, which are a part of an accessible route. **No stairway is part of an accessible route.**

It is important to understand that this change only provides the optional use of the scientifically proven, peer reviewed, Type II alternative but does not eliminate the option to use type I rails. This proposal does not create any conflict with the referenced application of the A117.1 Standard.

This option will reduce the cost of construction by allowing materials and fabrication methods in the development of handrail and related guard products now restricted by the code. This will be best illustrated by the use of larger section handrails with necessary strength properties in wood, plastic, and lighter metals may be included with other options currently available and easily fabricated in the field.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Cooper-E2-1012.3

E97–09/10

1012.3, 1012.3.1, 1012.3.2 (IFC [B] 1012.3, 1012.3.1, 1012.3.2); IRC R311.7.7.3

Proponent: Jake Pauls, representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC MEANS OF EGRESS. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

Revise as follows:

1012.3 (IFC [B] 1012.3) Handrail graspability. ~~All required handrails shall comply with Section 1012.3.1 or shall provide equivalent graspability.~~

> **~~Exception:~~** ~~In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; handrails shall be Type I in accordance with Section 1012.3.1, Type II in accordance with Section 1012.3.2 or shall provide equivalent graspability.~~

~~1012.3.1 (IFC [B] 1012.3.1) Type I.~~ Handrails with a circular cross section shall have an outside diameter of at least 1 ¼ inches (32 mm) and not greater than 2 inches (51 mm) or shall provide equivalent graspability. If the handrail is not circular, it shall have a perimeter dimension of at least 4 inches (102 mm) and not greater than 6 ¼ inches (160 mm) with a maximum cross-section dimension of 2 ¼ inches (57 mm). Edges shall have a minimum radius of 0.12 ~~0.01~~ inch (3 mm ~~0.25 mm~~).

~~1012.3.2 (IFC [B] 1012.3.2) Type II.~~ ~~Handrails with a perimeter greater than 6 ¼ inches (160 mm) shall provide a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of ¾ inch (19 mm) measured vertically from the tallest portion of the profile and achieve a depth of at least $^{5}/_{16}$ inch (8 mm) within $^{7}/_{8}$ inch (22 mm) below the widest portion of the profile. This required depth shall continue for at least $^{3}/_{8}$ inch (10 mm) to a~~

~~level that is not less than 1 ¾ inches (45 mm) below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1 ¼ inches (32 mm) to a maximum of 2 ¾ inches (70 mm). Edges shall have a minimum radius of 0.01 inch (0.25 mm).~~

PART II – IRC BUILDING/ENERGY

R311.7.7.3 Graspability ~~Grip size~~. ~~All~~ required handrails shall ~~be of one of the following types or provide~~ ~~Equivalent graspability.~~

1. ~~Type I. Handrails with~~ have a circular cross section shall have an outside diameter of at least 1 ¼ inches (32 mm) and not greater than 2 inches (51 mm) or shall provide equivalent graspability. If the handrail is not circular, it shall have a perimeter dimension of at least 4 inches (102 mm) and not greater than 6 ¼ inches (160 mm) with a maximum cross section of dimension of 2 ¼ inches (57 mm). Edges shall have a minimum radius of 0.12 ~~0.01~~ inch (3 mm ~~0.25 mm~~).
2. ~~Type II. Handrails with a perimeter greater than 6 ¼ inches (160 mm) shall provide a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of ¾ inch (19 mm) measured vertically from the tallest portion of the profile and achieve a depth of at least $^{5}/_{16}$ inch (8 mm) within $^{7}/_{8}$ inch (22 mm) below the widest portion of the profile. This required depth shall continue for at least $^{3}/_{8}$ inch (10 mm) to a level that is not less than 1 ¾ inches (45 mm) below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1 ¼ inches (32 mm) to a maximum of 2 ¾ inches (70 mm). Edges shall have a minimum radius of 0.01 inch (0.25 mm).~~

Reason: Over the last decade or so there has been much discussion about the research that the Stairway Manufacturers Association (SMA) has funded on handrail graspability. There have been a few conference papers produced specifically on the Type II handrails testing in comparison with the 2-inch round handrail, the largest circular shape permitted under the codes and standards. Identified as Dusenberry and Simpson (1996) and Dusenberry et al. (1999), these lacked detail and were impossible to assess scientifically. The only peer-reviewed, mainstream journal article for which SMA provided research support—but had to let its author, Dr. Brian Maki publish without restriction from SMA—had the appropriate detail and made a great contribution to the field of handrail performance. SMA is congratulated for funding Maki's work but, in saying this, I betray a bit of bias here as I funded Maki's work from my research management position at the National Research Council of Canada in the 1980s.

The SMA-funded work on the Type II handrails was different and thus there was much anticipation of it finally being published in a mainstream, peer-reviewed journal, Applied Ergonomics. While not one of the peer reviewers, I had access to the paper in draft and preprint form through my membership on the A117 Committee on for the ICC/ANSI standard,A117.1, Accessible and Usable Buildings and Facilities (with ICC as its secretariat). SMA's representative on this Committee wanted to have Type II handrails permitted in that standard, especially after SMA efforts to get Type II handrails into the IBC for non-dwelling stairways were blocked by some arguing that the mainstreamed Type II handrails should at least be acceptable to the A117 Committee. As the draft paper worked its way through the Applied Ergonomics review and publication process, it was unclear how the A117 Committee would finally come down on its acceptability for the ICC/ANSI A117.1 standard. There were clear misgivings by many on the Committee about the functionality of such handrails which severely constrained the potential graspability of users and did not permit fingers to wrap around the handrail from any approach direction.

Finally, when the preprint was made available by the publisher, it was finally possible to see exactly what had survived Applied Ergonomics peer review process which, to Dr. Maki and myself, appeared to miss identifying and correcting some serious weaknesses in the study design, execution and reporting. In our view the paper was not suitable for publication in the form we saw. Finally, in January 2009—over a decade since the first, clearly superficial publication of the SMA work (other than the work written up by Dr. Maki)—it finally became clear that there were far deeper problems with SMA's work (other than Maki's). Stated as simply and directly as possible, the early papers glossed over exactly what was done and what the results were to the point that it was not evident that the Type II handrails being tested were not the ones that were being sold in the handrail marketplace. Figure 1, which has now (as of the July 2009 issue has appeared in final print form in Applied Ergonomics) shows what was tested.

Figure 1. Railing Sections Tested by SMA

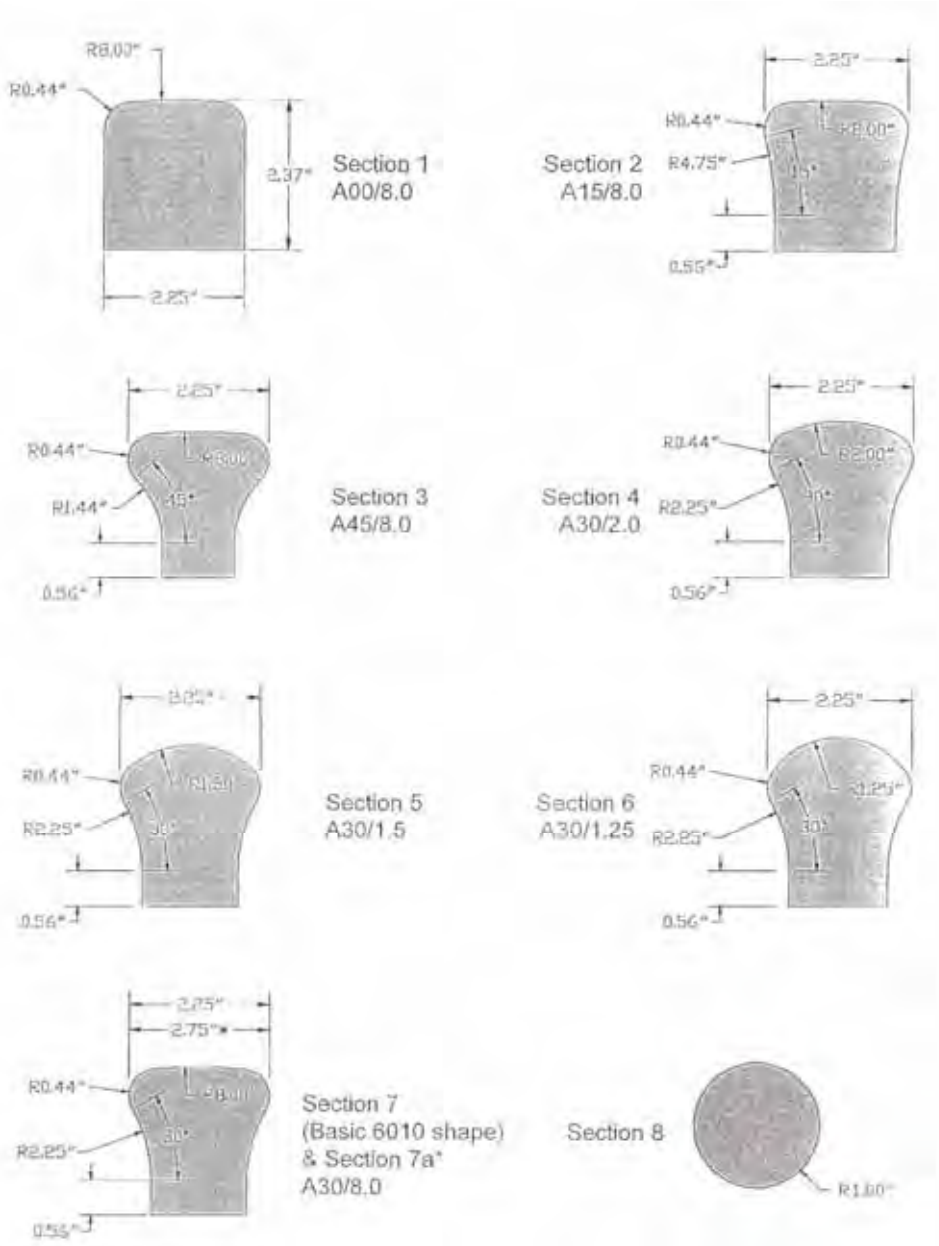
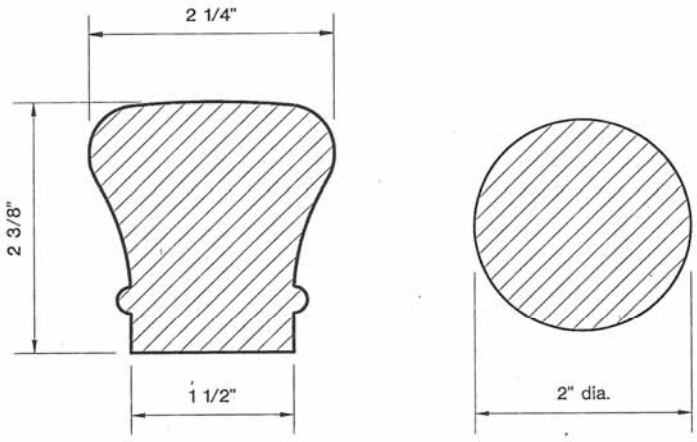


Figure 2 shows the most commonly used Type II handrail. Notably, unlike all of the sections tested (at least as described in the now authoritative Applied Ergonomics paper), the marked Type II handrail, specifically the "6010" designation, had prominent ridges near the bottom of the sides. Figure 2 shows the "6010" Type II rail next to the 2-inch round rail. In effect, SMA compared the worst (or one of the worst) of the standards/codes complying "Type I" handrail with one of the best if not the best of the Type II handrails.

Figure 2. "6010 " Handrail—a Very Commonly Marketed and Installed section (on dwelling unit stairs especially)—and a 2-inch Round Handrail. (Notably, this was not a figure in the Applied Ergonomics paper which only shows sections and testing procedures without the ridges.)

Cross Sections of Handrail Shapes
used in tests performed by Simpson Gumpertz and Heger Inc.
during March and April of 1995



LJ Smith Style "LJ-6010"
Milled Handrail

Two inch diameter
Round Handrail

So there appears to be a kind of "bait and switch" here. The Type II handrails tested were consistent with the handrails sold and installed.

But there are other problems that occupied me (and perhaps Dr. Maki) in reviewing the final preprint in comparison with the results we had dribbled out in public form in earlier publications in the 1990s—and the technical basis for all of the code changes that I am now trying to reverse by eliminating Type II handrails from the IRC and IBC. Figure 3 shows the early version of some test results that were purported to show superiority of the Type II handrail—or, at a minimum, at least equivalency—in comparison to the 2-inch round, again, one of the worst of the Type I handrails. Compare Figure 3 with the finally published figure which, for the first time, shows the actual data points and reveals that the round handrail performed about twice as well as the Type II (designation "6010") without its ridges.

Figure 3. Early Published Comparison of Type II Performance with 2-inch Round Performance.

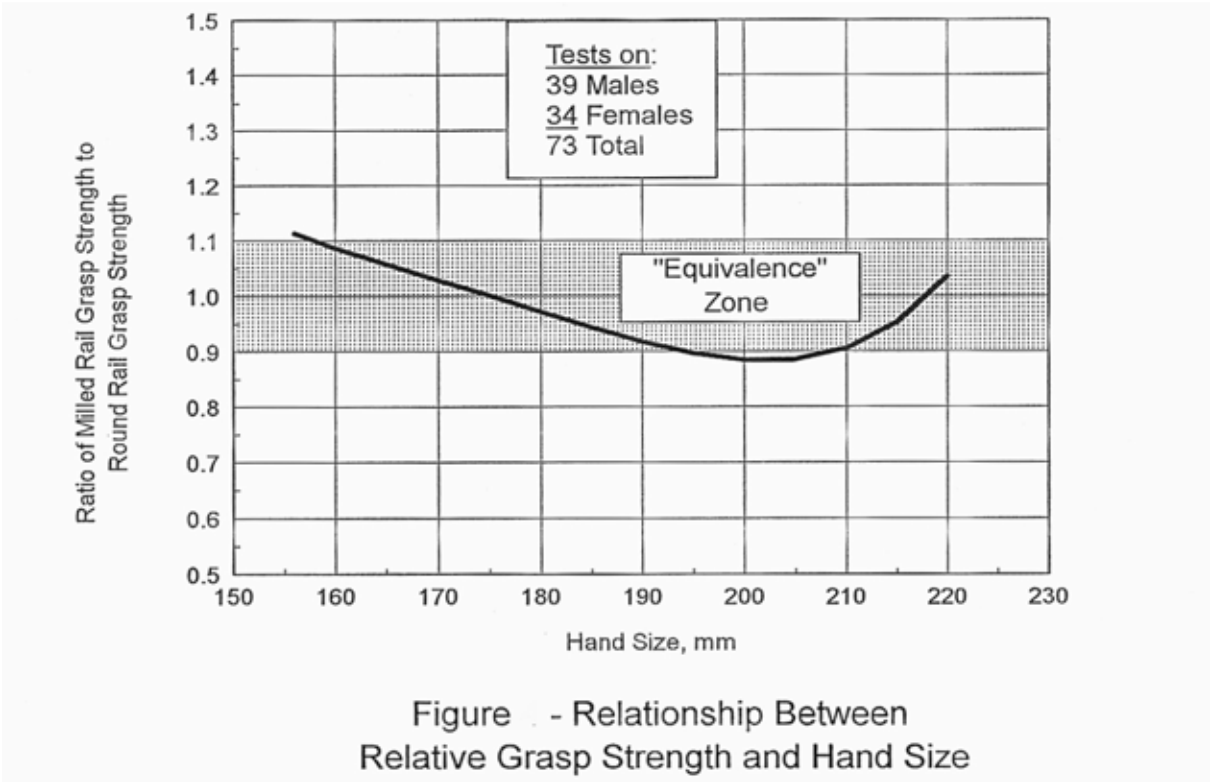


Figure - Relationship Between
Relative Grasp Strength and Hand Size

Figure 4. Finally Published Data (Figure 6 in the Applied Ergonomics Paper) that Should have been Presented in Figure 3 Years Earlier

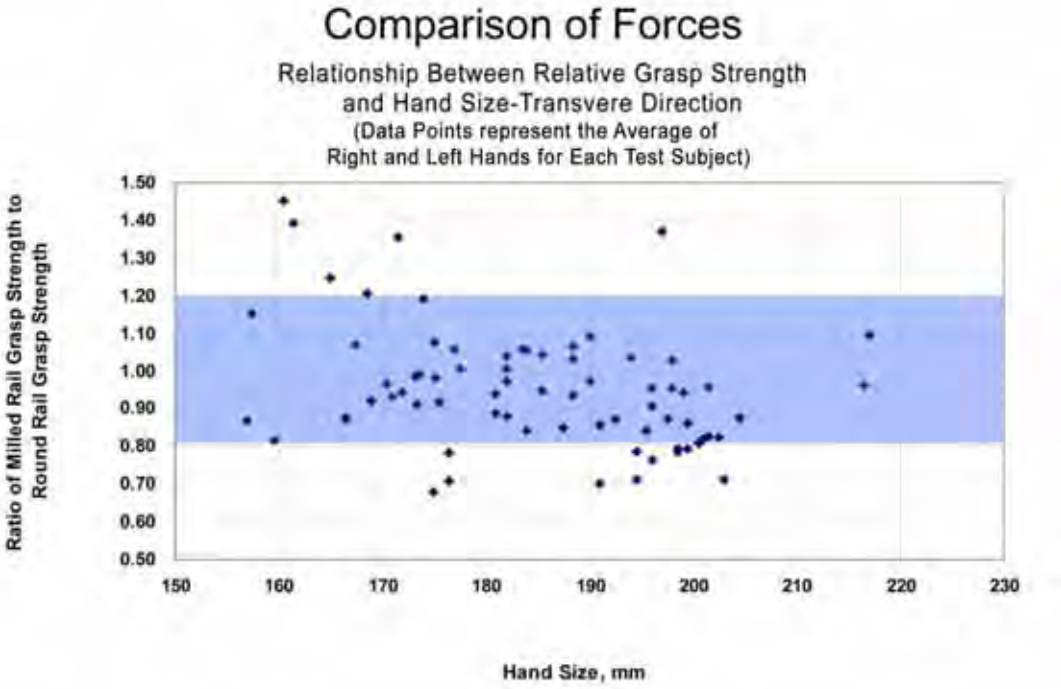
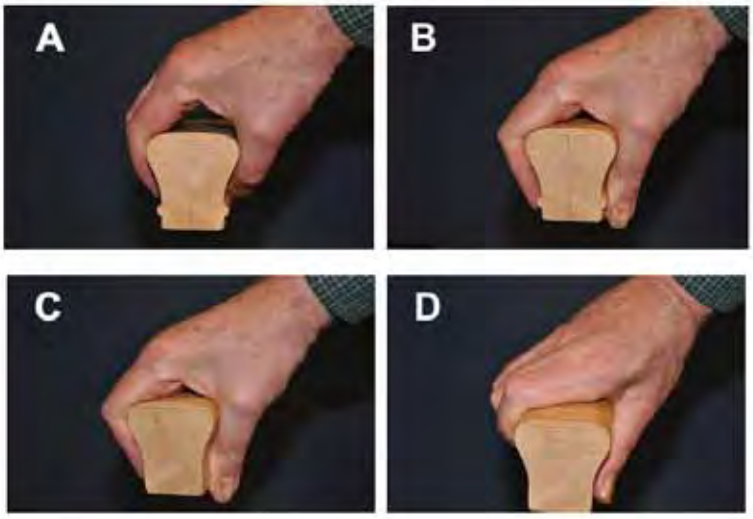


Figure 6- Phase I Graspability Test Results - Comparison of 51-mm Diameter Round Rail and Basic 6010 Milled Shape.

Finally, what is the potential role played by the ridges that, apparently, were conveniently left off the tested sample sections (if we are to believe the Applied Ergonomics paper)?

The remaining figures illustrate the awkward pressure points these ridges cause in various attempts to gain the one type of grip permitted by the Type II rails, a pinch grip (as opposed to the power grip afforded by Type I handrails). Clearly, in my professional opinion, Type II handrails are not superior or even equivalent to Type I handrails, even without the annoying and painful ridges when attempting to get a pinch grip, such as it is.

Figure 5 A, B, C and D (top left, top right, bottom left, bottom right). Examples of Various Attempts to Grasp a "6010" Designation, Type II Handrail and a "6010" with Its Ridges Taken Off.



Experiencing the pressure points from the ridges is painful. Experiencing the same rail without the ridges is frustrating, albeit not as painful. Neither is an appropriate handrail in a safety-oriented code or within a national standard focused on usability.

With the publication of the Applied Ergonomics paper, it is time to clear up exactly what we bought when the Type II handrails were incorporated in the IRC and to a limited extent in the IBC. They do not belong in either with their very dubious justification that we have gotten over the last decade or so. Soon perhaps, there will be the first court case after publication of the Applied Ergonomics paper. It will be interesting to see

how the courts, and the litigation process generally, handle the technical evidence in comparison to how it was handled in the ICC process. (NFPA has stayed clear of Type II handrails.)

Bibliography

Dusenberry, D.O. and Simpson, H. (1996). Handrail graspability. *Proceedings of 11th Conference, Engineering Mechanics Division, American Society of Civil Engineers,* May 19-22, pp. 466-469. (www.pubs.asce.org/WWWdisplaybn.cgi?0784401721)
Dusenberry, D.O., Simpson, H., DelloRusso, S.J., and Rao, R.S. (1999). Evaluation of Graspability of Handrails During Falls on Stairs, *Proceedings of the 13th Conference of Engineering Mechanics, Baltimore, MD, 13-16, June, 1999*.
Donald O. Dusenberry, Howard Simpson, Steven J. DelloRusso (2009). Effect of handrail shape on graspability. Applied Ergonomics, 40(4) 657-669.

Cost Impact: The code change proposal will not increase the cost of construction. Easily grasped handrails are typically less costly than are the "Type II" handrails.

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Pauls-E5-1012.3

E98–09/10
1012.3.1 (IFC [B] 1012.3.1)

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

1012.3.1 (IFC [B] 1012.3.1) Type I. *Handrails* with a circular cross-section shall have an outside diameter of at least 1-1/4 inches (32 mm) and not greater than 2 inches (51 mm). If the *handrail* is not circular, it shall have a perimeter dimension of at least 4 inches (102 mm) and not greater than 6-1/4 inches (160 mm) with a maximum cross-section dimension of 2-1/4 inches (57mm) and minimum cross-section dimension of 1 inch (25 mm). Edges shall have a minimum radius of 0.01 inch (0.25 mm).

Reason: The type I profile has no minimum cross sectional dimension. It needs a minimum dimension to assure graspability. The human hand gets its most secure grip on a Type I cross section that is round and smooth and allows the hand to fit comfortably around it. A handrail shape such as a 3/8" x 2" steel flat bar meets both the minimum perimeter and maximum cross section dimensions of Type I, but results in a less secure grip because it requires a pinching grasp. Try doing a chin up or pull up on a 1-½" diameter tube versus a 3/8" x 2" steel bar having the 2 inch dimension oriented vertically. The tube is more comfortable because a flat steel bar does not accommodate the natural curvature of a grasping hand as readily. Even with the required 1/100 of an inch radius at the corners, the flat bar is likely to be painful when applying a firm grip. When falling on a stairway, the handrail becomes the only means to steady or support oneself. For this reason, all handrails should have a shape that is comfortable and accommodating of the human hand's natural grasping shape. The proposed 1 inch minimum cross section was selected to allow use of the maximum 2" cross section in the perpendicular cross section axis and not exceed the maximum allowed 6-1/4" total perimeter.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Maiel-E5-1012.3

E99–09/10
1012.8 (IFC [B] 1012.8)

Proponent: Gene Boecker, Code Consultants, Inc., representing Code Consultants, Inc.

Revise as follows:

1012.8 (IFC [B] 1012.8) Projections. On ramps, the clear width between handrails shall be 36 inches (914 mm) minimum. Projections into the required width of stairways and ramps at each ~~handrail~~ side shall not exceed 4 ½ inches (114 mm) at or below the handrail height. Projections into the required width shall not be limited above the minimum

headroom height required in Section 1009.2. Projections due to intermediate handrails shall not constitute a reduction in the egress width.

Reason: There are two changes in this proposal. First, the second sentence is being reworded to address the actual condition – the side of the ramp or stairway. It is not just the handrail that is the issue; it could be the stringer to the stairway or the edge protection detail for the ramp. Both of these are located at the side. The word "handrail" is extraneous.

Second, there is currently no direction on whether or not the intermediate handrail, required by Section 1012.9 creates a projection or reduces the egress width of the stairway or ramp (if provided). The sentence makes it clear that the intermediate handrail is recognized and does not reduce the width.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Boecker-E3-1012.8

E100–09/10

1002.1, 1013.2 (IFC [B] 1002.1, 1013.2); IRC R202, R312.2

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC MEANS OF EGRESS COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

1. Add new definition as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

FIXED SEATING. Furniture or fixture designed and installed for the use of sitting and secured in place including bench-type seats and seats with or without back or arm rests.

2. Revise as follows:

1013.2 (IFC [B] 1013.2) Height. Required guards shall not be less than 42 inches (1067 mm) high, measured vertically ~~above the~~ as follows:

1. From the adjacent walking surfaces,
2. From a seat surface of adjacent fixed seating, with or without arm or back rests, within 22 inches of a required guard, the guard height shall provide a minimum 42 inches measured diagonally between the top of the guard and the nearest edge of the seat surface ~~or~~
3. On stairs, from the line connecting the leading edges of the tread ~~treads~~ nosings, and
4. On ramps, from the ramp surface at the guard.

Exceptions:

1. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, *guards* on the open sides of *stairs* shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.
2. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, where the top of the *guard* also serves as a *handrail* on the open sides of *stairs*, the top of the *guard* shall not be less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.
3. The guard height in front row assembly seating areas complying ~~shall be in accordance~~ with Section 1028.14.
4. Along *alternating tread devices* and ship ladders, *guards* whose top rail also serves as a *handrail*, shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread *nosing*.

PART II – IRC BUILDING/ENERGY

1. Add new definition as follows:

SECTION R202
DEFINITIONS

FIXED SEATING. Furniture or fixture designed and installed for the use of sitting and secured in place including bench-type seats and seats with or without back or arm rests.

2. Revise as follows:

R312.2 Height. Required guards at open-sided walking surfaces, including stairs, porches, balconies or landings, shall be not less than 36 inches high measured vertically ~~above the~~ as follows:

1. From the adjacent walking surface,
2. From a seat surface of adjacent fixed seating, with or without arm or back rests, within 22 inches of the required guard, the guard height shall provide a minimum 36 inches measured diagonally between the top of the guard and the nearest edge of the seat surface ~~or~~
3. On stairs, from the line connecting the leading edges of the tread ~~treads~~ nosings and
4. On ramps, from the ramp surface at the guard.

Exceptions:

1. Guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.
2. Where the top of the guard also serves as a handrail on the open sides of stairs, the top of the guard shall not be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Climbable Guards". The scope of the activity is noted as:

The study of climbable guards will focus on determining the need for appropriate measures to prevent or inhibit an individual from utilizing the elements of a guard system, including rails, balusters and ornamental patterns, to climb the guard, thereby subjecting that person to the falling hazard which the guard system is intended to prevent.

The purposes of this proposal are to address several items raised last cycle during consideration of code change E85-07/08 which was approved. In particular, this proposal clarifies what constitutes "fixed seating" and proposes a horizontal distance between an object that reduces the "effective" height of a required guard rather than placing total reliance on the term "adjacent".

Definition: The definition of "fixed seating" provides for a common understanding where the term is used. This was a concern that was raised in Public Comment #2 to E85 which was not successful.

Item #2: The concern addressed in this revision is that of fixed seating, with or without arm rests and with or without back rests including bench seating located within 22" of the guard. This seating provides a potential standing surface which as a result reduces the effective height of the guard. For seating within 22" of the guard, the guard height is to be measured diagonally from the nearest edge of the seat to the top of the guard. This measurement method is currently utilized in Section 1028.14.3. The guard would be required to extend past the "last" seat in a row so that the guard top is 42" above the edge of the last seat.

The distance of 22" utilized in this exception has been determined by CTC to be a reasonable distance for the purpose described.

Item #3: The current text is modified to indicate that the line is to be between the tread nosings. In the case of a single riser, hence a single nosing, a minimum tread depth of 11 inches on the lower walking surface establishes the slope.

Item #4: The guard height at the edge of a ramp is to be measured at the guard without consideration for the ramp slope as the dimensional change in the guard height is relatively insignificant. With a ramp slope towards the guard of 1/12, the highest point 22" from the guard is 1.83 inches above the ramp surface at the guard. If the ramp slope is 1/8, at 22" from the guard, the ramp surface is 2.75 inches above the ramp surface at the guard.

IBC Exception **3:** The provisions for guard reduction for front row seating are primarily intended to accommodate the sight line for seated occupants- see section 1028.14.2. The seating within 22 inches of the guards elsewhere would necessitate an increase in the required guard height as indicated in **Item #2.**

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME:Heilstedt-E3-1013.2

E101–09/10
1013.2 (IFC [B] 1013.2)

Proponent: John Woestman, The Kellen Company, representing the Composite Lumber Manufacturers Association (CLMA)

Revise as follows:

1013.2 (IFC [B] 1013.2) Height. Required guards shall be not less than 42 inches (1067 mm) high, measured vertically above the adjacent walking surfaces, adjacent fixed seating or the line connecting the leading edges of the treads.

Exceptions:

1. For occupancy Group R-3 not more than three stories above grade in height and individual dwelling units in occupancy Group R-2 not more than three stories above grade in height with separate means of egress, required guards shall not be less than 36 inches (914 mm) high measured vertically above the adjacent walking surfaces, adjacent fixed seating or the line connecting the leading edges of the treads.
2. ~~1.~~ For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.
3. ~~2.~~ For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, where the top of the guard also serves as a handrail on the open sides of stairs, the top of the guard shall not be less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.
4. ~~3.~~ The height in assembly seating areas shall be in accordance with Section 1028.14.
5. ~~4.~~ Along alternating tread devices and ship ladders, guards whose top rail also serves as a handrail, shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread nosing.

Reason: This proposal revises the IBC such that guards for one or two family occupancies not more than three stories above-grade in height and individual dwelling units in occupancy Group R-2 not more than three stories above-grade in height with a separate means of egress (i.e. townhouses) may be constructed to the same height requirements as the IRC. This disconnect between the IBC and the IRC has become quite visible in a large jurisdiction that adopted the IBC, but not the IRC, and has been applying the IBC to one and two family dwellings and to townhouses.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The corresponding section in the International Residential Code is Section R312.2.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME:Woestman-E3-1013.2

E102–09/10
1013.2 (IFC [B] 1013.2)

Proponent: Kerwin Lee, AIA, CASp, Rolf Jensen & Associates

Revise as follows:

1013.2 (IFC [B] 1013.2) Height. Required guards shall be not less than 42 inches (1067 mm) high, measured vertically above the adjacent walking surfaces, adjacent fixed seating or the line connecting the leading edges of the treads.

Exceptions:

1. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.
2. For occupancies in Group R-3, and within individual dwelling units in occupancies in Group R-2, where the top of the guard also serves as a handrail on the open sides of stairs, the top of the guard shall not be less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.
3. The height in assembly seating areas shall be in accordance with Section 1028.14.
4. Along alternating tread devices and ship ladders, guards whose top rail also serves as a handrail, shall have height not less than 30 inches (762 mm) and not more than 34 inches (864 mm), measured vertically from the leading edge of the device tread nosing.
5. In other than Group E occupancies, guards along stairways shall not be less than 34 inches (864mm) in height above the leading edge of the tread, where the stairway reverse direction at an intermediate landing and the opening between successive flights is 8 inches (203mm) or less, measured horizontally.

Reason: This language is taken from the National Building code. The code does not specifically address if a guard is required in a standard stair that switches back on itself. If the opening between the stair runs is 8 inches or less a guard should not be required. (Section 1013.3 limits openings to 8 inches above 34 inches when the opening is 34 inches or more above the surface). Normally these types of stairs are used for egress only and people do not stop along the stair. Once on the stair run, the user continues to the landing and next run of stairs. The need for a guard is not necessary in these situations. The exception to the exception is with E occupancies where children are present.

Cost Impact: No anticipated cost impact for construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Lee-E1-1013.2

E103–09/10
1014.2, Table 1018.1 (IFC [B] 1014.2, Table 1018.1)

Proponent: Dennis Richardson PE / dbr group inc. representing self

Revise as follows:

1014.2 (IFC [B] 1014.2) Egress through intervening spaces. Egress through intervening spaces shall comply with this section.

1. Egress from a room or space shall not pass through adjoining or intervening rooms or areas, except where such adjoining rooms or areas and the area served are accessory to one or the other, are not a Group H occupancy and provide a discernible path of egress travel to an *exit*.

   Exception: *Means of egress* are not prohibited through adjoining or intervening rooms or spaces in a Group H, S or F occupancy when the adjoining or intervening rooms or spaces are the same or a lesser hazard occupancy group.

2. An *exit access* shall not pass through a room that can be locked to prevent egress.
3. *Means of egress* from dwelling units or sleeping areas shall not lead through other sleeping areas, toilet rooms or bathrooms.
4. Egress shall not pass through kitchens, storage rooms, closets or spaces used for similar purposes.

   Exceptions:

   1. *Means of egress* are not prohibited through a kitchen area serving adjoining rooms constituting part of the same dwelling unit or sleeping unit.
   2. *Means of egress* are not prohibited through stockrooms in Group M occupancies when all of the following are met:
      2.1. The stock is of the same hazard classification as that found in the main retail area;
      2.2. Not more than 50 percent of the *exit access* is through the stockroom;
      2.3. The stockroom is not subject to locking from the egress side; and

2.4. There is a demarcated, minimum 44-inch-wide (1118 mm) *aisle* defined by full- or partial-height fixed walls or similar construction that will maintain the required width and lead directly from the retail area to the *exit* without obstructions.

5. Egress from a Group A or E occupancy room or space with an occupant load of 501-1000 that passes through non-rated corridors, or adjoining or intervening rooms or areas, shall have at least one of the three required means of egress:
   5.1. Directly from the room to an exit;
   5.2. Through a one hour corridor; or
   5.3. Passing through a smoke compartment protected area, meeting the provisions of Section 1014.2 and restricting the movement of smoke from other exit access areas
6. Egress from a Group A or E occupancy room or space with an occupant load of more than 1000 that passes through non-rated corridors, or adjoining or intervening rooms or areas, shall have at least two of the four required means of egress:
   6.1. Directly from the room to an exit;
   6.2. Through a one hour corridor; or
   6.3. Passing through a smoke compartment protected area, meeting the provisions of Section 1014.2 and restricting the movement of smoke from other exit access areas

TABLE 1018.1 (IFC [B] TABLE 1018.1)
CORRIDOR FIRE-RESISTANCE RATING.

OCCUPANCY	OCCUPANT LOAD SERVED BY ORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		Without sprinkler system	With sprinkler system[c]
H-1, H-2, H-3	All	Not Permitted	1
H-4, H-5	Greater than 30	Not Permitted	1
A[d], B, E[d], F, M, S, U	Greater than 30	1	0
R	Greater than 10	Not Permitted	0.5
I-2[a], I-4	All	Not Permitted	0
I-1, I-3	All	Not Permitted	1[b]

a. For requirements for occupancies in Group I-2, see Sections 407.2 and 407.3.
b. For a reduction in the fire-resistance rating for occupancies in Group I-3, see Section 408.8.
c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 where allowed
d. For requirement for occupancies in Group A and E, see Section 1014.2, Items 5 and 6.

Reason : The number one complaint heard when teaching egress classes on the IBC is about the language found in Section 1014.2 requiring a "discernible path of egress travel to an *exit"* for egress through intervening spaces. This language is subject to a wide variety of interpretation resulting in non-uniform enforcement. Concern about this language is greatest in situations where a large number of occupants requiring multiple egress paths can wander through an area that is unfamiliar and shares a common atmosphere causing all means of egress paths to potentially fill with smoke from a single source in the event of a fire. There is little in the code other than the language "a discernible path of egress travel to an *exit*" and overall exit travel distance restrictions to provide a minimum level of safety even for large assembly or educational areas surrounded by a number of interconnected spaces. This situation is becoming more common when large warehouse facilities are converted to a church or recreational facility.

This proposal would require at least one of three required means of egress for assembly and educational occupancies of 501 to 1000 occupant load, and at least two of four required means of egress for assembly and educational occupancies of more than 1000 occupant load to be directly into an exit or through a one hour corridor or passing through an area constructed as a smoke compartment independent from other exit access areas. This proposal provides a bare minimum level of independent refuge from smoke for paths of egress from large assembly and educational occupancies. As part of this proposal, a footnote is added to Table 1018.1 to point users of code to this section which affects assembly and educational occupancies with non-rated corridors.

Cost Impact: Since many designers already provide some level of protected means of egress or direct exits this proposal would not add cost to projects in most cases. This proposal could add cost in instances where designers rely solely on a number of egress paths through intervening rooms or spaces for large occupant loads.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME:Richardson-E2-1014.2

E104–09/10

1002.1, 1014.2.2 - 1014.2.7, 1015.1, Table 1015.1; (IFC [B] 1002.1, 1014.2.2 - 1014.2.7, 1015.1, Table 1015.1)

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC)

Revise as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

CARE SUITE. A group of ~~patient~~ treatment rooms, ~~patient~~ care recipient sleeping rooms and their associated support rooms or spaces and circulation space within Group I-2 occupancies where staff are in attendance for supervision of all ~~patients~~ care recipients within the suite, and the suite is in conformance with the requirements of Section 1014.2.2 through 1014.2.6.

1014.2.2 (IFC [B] 1014.2.2) Group I-2. Habitable rooms ~~or suites~~ in Group I-2 occupancies shall have an *exit access* door leading directly to a *corridor*.

Exceptions:

1. Rooms with *exit* doors opening directly to the outside at ground level.
2. Rooms arranged as care suites complying with Section 1014.2.4

~~1014.2.6~~ 1014.2.3 (IFC [B] ~~1014.2.6~~ 1014.2.3) Travel distance. The travel distance between any point in a Group I-2 occupancy ~~patient~~ sleeping room and an *exit access* door in that room shall not exceed 50 feet (15 240 mm).

1014.2.4 (IFC [B] 1014.2.4) Group I-2 care suites. Care suites in Group I-2 shall comply with Section 1014.2.4.1 through 1014.2.4.4 and either Section 1014.2.4.5 or 1014.2.4.6.

~~1014.2.5~~ 1014.2.4.1 (IFC [B] ~~1014.2.5~~ 1014.2.4.1) Exit access through care suites. *Exit access* from all other portions of a building not classified as a care *suite* in ~~a Group I-2 occupancy~~ shall not pass through a care *suite*. In a care suite required to have more than one exit, one exit access may pass through an adjacent care suite provided all of the other requirements of Section 1014.2 are satisfied.

~~1014.2.7~~ 1014.2.4.2 (IFC [B] ~~1014.2.7~~ 1014.2.4.2) Separation. Care *suites* ~~in Group I-2 occupancies~~ shall be separated from other portions of the building by a *smoke partition* complying with Section 711.

1014.2.4.3 (IFC [B] 1014.2.4.3) One intervening room. For rooms other than ~~patient~~ sleeping rooms located within a care suite, ~~*suites* of rooms are~~ exit access travel from the care suite shall be permitted ~~to have~~ through one intervening room where ~~if~~ the travel distance ~~within the *suite*~~ to the *exit access* door from the care suite is not greater than 100 feet (30 480 mm).

1014.2.4.4 (IFC [B] 1014.2.4.4) Two intervening rooms. For rooms other than ~~patient~~ sleeping rooms located within a care *suite*, *exit access* travel ~~from~~ within the care *suite* shall be permitted through two intervening rooms where the travel distance to the *exit access* door from the care suite is not greater than 50 feet (15 240 mm).

~~1014.2.3~~ 1014.2.4.5 (IFC [B] ~~1014.2.3~~ 1014.2.4.5) Care suites containing ~~in patient~~ sleeping rooms areas. ~~Patient~~ Sleeping rooms ~~areas~~ ~~in Group I-2 occupancies~~ shall be permitted to be grouped ~~divided~~ into care *suites* with one intervening room if one of the following conditions is met:

1. The intervening room within the care *suite* is not used as an *exit access* for more than eight ~~patient~~ care recipient beds.
2. The arrangement of the care *suite* allows for direct and constant visual supervision by ~~nursing personnel~~ care providers.

1014.2.4.5.1 ~~1014.2.3.1~~ (IFC [B] 1014.2.4.5.1 ~~1014.2.3.1~~) Area. Care *suites* containing ~~of~~ sleeping rooms shall not exceed 5,000 square feet (465 m^2).

1014.2.4.5.2 ~~1014.2.3.2~~ (IFC [B] 1014.2.4.5.2 ~~1014.2.3.2)~~ Exit access. Any ~~patient~~ sleeping room, or any care *suite* that contains ~~patient~~ sleeping rooms, of more than 1,000 square feet (93 m^2) shall have at least two *exit access* doors from the care suite ~~remotely~~ located in accordance with Section 1015.2. ~~from each other.~~

1014.2.4.5.3 ~~1014.2.3.3~~ (IFC [B] 1014.2.4.5.3 ~~1014.2.3.3)~~ Travel distance. The travel distance between any point in a care *suite* containing sleeping rooms and an *exit access* door ~~of~~ from that care *suite* shall not exceed 100 feet (30 480 mm).

1014.2.4.6 ~~1014.2.4~~ (IFC [B] 1014.2.4.6 ~~1014.2.4~~) Care Suites not containing sleeping rooms. ~~in areas other than patient sleeping areas.~~ Areas not containing sleeping rooms, but only treatment areas and the associated rooms, spaces or circulation space ~~other than patient sleeping areas in Group I-2 occupancies~~ shall be permitted to be grouped into care suites and shall conform to the limitations in Section 1014.2.4.6.1 and 1014.4.6.2. ~~be permitted to be divided into *suites*.~~

1014.2.4.6.1 ~~1014.2.4.1~~ (IFC [B] 1014.2.4.6.1 ~~1014.2.4.1)~~ Area. Care s*uites* of rooms, other than ~~patient~~ sleeping rooms, shall not exceed 10,000 square feet (929 m^2).

.

1014.2.4.6.2 ~~1014.2.4.2~~ (IFC [B] 1014.2.4.6.2 ~~1014.2.4.2)~~ Exit access. Care suites ~~Any room or group of rooms~~, other than ~~patient~~ sleeping rooms, of more than 2,500 square feet (232 m^2) shall have at least two *exit access* doors from the care suite located in accordance with Section 1015.2. ~~remotely located from each other~~.

1015.1 (IFC [B] 1015.1) Exits or exit access doorways from spaces. Two *exits* or *exit access doorways* from any space shall be provided where one of the following conditions exists:

~~Exception:~~ ~~Group I-2 occupancies shall comply with Section 1014.2.2 through 1014.2.7.~~

1. The *occupant load* of the space exceeds one of the values in Table 1015.1.

   Exceptions:

   1. In Group R-2 and R-3 occupancies, one *means of egress* is permitted within and from individual dwelling units with a maximum *occupant load* of 20 where the dwelling unit is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
   2. Care suites in Group I-2 occupancies complying with Section 1014.2.2 through 1014.2.4.6.2.

2. The *common path of egress travel* exceeds one of the limitations of Section 1014.3.
3. Where required by Section 1015.3, 1015.4, 1015.5, 1015.6 or 1015.6.1.

Where a building contains mixed occupancies, each individual occupancy shall comply with the applicable requirements for that occupancy. Where applicable, cumulative *occupant loads* from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1.

TABLE 1015.1 (IFC [B] TABLE 1015.1)
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAXIMUM OCCUPANT LOAD
A, B, E[a], F, M, U	49
H-1, H-2, H-3	3
H-4, H-5, I-1, I-2, I-3, I-4, R	10
S	29

a. Day care maximum occupant load is 10.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Care Facilities". The scope of the activity is noted as:

Study issues associated with Day Care/Adult Care, Ambulatory Health Care and Assisted Living facilities with an emphasis on the number of occupants in relation to the supervision, and the determination of the resident's capability of responding to an emergency situation without physical assistance from the facility's supervision.

The Code Technology Committee Study Group on Care Facilities has conducted a comprehensive review of current building and fire codes, federal regulations and prior code change proposals dealing with the provision of "care". "Care" as it relates to the scope of this work relates to an occupant of a building who is compromised (mentally or physically) and receives some type of support (care). These facilities encompass a full spectrum of acuity and span a wide range of occupancy types including Groups B, E, I and R. On the lower end of the spectrum, occupants may be aged and receive occasional day living assistance such as cooking and cleaning. On the opposite end of the spectrum, occupants may be completely bedridden and dependant on medical gases and emergency power to maintain life.

The proposed changes provide clear direction for design and construction by using terms and concepts consistently and clearly identifying thresholds related to the condition of an occupant. Federal regulations and state licensing provisions were considered, but primarily in terms of avoiding conflicting requirements. It is not the intent of these changes to address licensing or operational issues. We do believe that the proposed changes will provide consistent and correlated language between these multiple sources of regulations that will help design and code professionals address the needs of care recipients in the many different types of facilities.

A major goal is to provide clarity and consistency of terminology. New definitions are added to specifically describe each type of care or facility and identify the distinct differences in these. Some terms are consolidated to be more descriptive of a group of occupants, yet generic enough to be used interchangeably. For example: a "Patient" is now identified as a "care recipient" and "nurse" is now "care provider". People receive care of varying types but they are not always referred to as "patients". They receive care from a wide range of persons with different technical abilities, not just a "nurse" or "staff". Other definitions address existing terms not defined within current code. The study group believes that these changes bring a practical response to the recent developments within the healthcare delivery system.

Care Suites –
This proposal includes changes identified by the ICC CTC care facilities study group in their efforts to coordinate the sections of this Code dealing with the provision of "care". During the course of this study, several items were identified within this section dealing with suites within Group I-2 occupancies. Changes to this section include:

Clarification that the definition applies only to "care suites" used as related to patient sleeping or treatment. This addresses the confusion caused by tenant spaces in other occupancy types that are referred to or addressed as "suite."

The definition of care suite has been modified to correct an unintended consequence of the 2009 code. The proposal clarifies that support spaces, such as clean and soiled utility room and nurses stations are allowed within the suite.

Sections have been re-ordered so that general requirements that apply to all suites are located near the charging section.

The reference to the term "patient" has been replaced with "care recipient" as consistent with other proposals by the CTC. Since the definition of care suite includes the reference to care recipient, wherever possible the term is not repeated in each section.

The requirement for remoteness of exits has been clarified with a reference to the established calculation of remoteness as defined by Section 1015.2

Lastly, a modification is proposed that would allow the second required exit to pass through another suite. This concept is allowed by several jurisdictions and provides a similar safeguard by allowing suite occupants to pass through a smoke partition to a separate atmosphere. This allowance is limited to the second required exit. Single exit suites would not qualify for this allowance.

Section 1015.1
The change made to this section attempts to clarify the existing language. Group I-2 was added to Table 1015.1 to address areas that are not care suites. Spaces that were not suites were not previously addressed in this table. The existing exception to the charging language is more appropriately an exception to condition #1.

Cost Impact: None given.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Heilstedt-E1-1002.1

E105–09/10

1014.3, Table 1014.3 (New) [IFC [B] 1014.3, Table 1014.3 (New)]

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

1. Revise as follows:

1014.3 (IFC [B] 1014.3) Common path of egress travel. The common path of egress travel shall not exceed the tavel distances in Table 1014.3. ~~In occupancies other than Groups H-1, H-2 and H-3, the common path of egress travel shall not exceed 75 feet (22 860 mm). In Group H-1, H-2 and H-3 occupancies, the common path of egress travel shall not exceed 25 feet (7620 mm). For common path of egress travel in Group A occupancies and assembly occupancies accessory to Group E occupancies having fixed seating, see Section 1028.8.~~

~~Exceptions:~~

~~1. The length of a common path of egress travel in Group B, F and S occupancies shall not be more than 100 feet (30 480 mm), provided that the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.~~

~~2. Where a tenant space in Group B, S and U occupancies has an occupant load of not more than 30, the length of a common path of egress travel shall not be more than 100 feet (30 480 mm).~~

~~3. The length of a common path of egress travel in a Group I-3 occupancy shall not be more than 100 feet (30 480 mm).~~

~~4. The length of a common path of egress travel in a Group R-2 occupancy shall not be more than 125 feet (38 100 mm), provided that the building is protected throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.~~

2. Add new Table as follows:

TABLE 1014.3 (IFC TABLE [B] 1014.3)
COMMON PATH OF EGRESS TRAVEL

OCCUPANCY	WITHOUT SPRINKLER SYSTEM (feet)			WITH SPRINKLER SYSTEM [a] (feet)
	Any Occupant Load (OL)	Occupant Load		
		OL 30	OL 30	
B, S	Not Applicable	100	75	100
U	Not Applicable	100	75	75
F	75	Not Applicable	Not Applicable	100
H-1, H-2, H-3	Not Permitted	Not Permitted	Not Permitted	25
R-2	75	Not Applicable	Not Applicable	125 [b]
I-3	100	Not Applicable	Not Applicable	100
All others [c]	75	Not Applicable	Not Applicable	75

a. Approved automatic sprinkler system in accordance with Section 903.3.1.1
b. Approved automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2
c. For Group A occupancies and assembly occupancies accessory to Group E occupancies having fixed seating, see Section 1025.8

Reason: This is an editorial change to simplify this code section. The existing paragraphs, with accompanying exceptions, have been replaced with a table which is easier to understand and follow. The content and code requirements are not altered in any form or shape.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME:Maiel-E2-1014.3

E106–09/10
1014.3 (IFC [B] 1014.3)

Proponent: Gene Boecker, Code Consultants Inc., representing Code Consultants, Inc.

Revise as follows:

1014.3 (IFC [B] 1014.3) Common path of egress travel. In occupancies other than Groups H-1, H-2 and H-3, the common path of egress travel shall not exceed 75 feet (22 860 mm). In Groups H-1, H-2 and H-3 occupancies, the common path of egress travel shall not exceed 25 feet (7620 mm). For common path of egress travel in Group A occupancies and assembly occupancies accessory to Group E occupancies having fixed seating, see Section 1028.8

Exceptions:

1. The length of a common path of egress travel in Group B, F and S occupancies shall not be more than 100 feet (30 480 mm), provided that the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
2. Where a tenant space in Group B, S and U occupancies has an occupant load of not more than 30, the length of a common path of egress travel shall not be more than 100 feet (30 480 mm).
3. The length of a common path of egress travel in a Group I-3 occupancy shall not be more than 100 feet (30 480 mm).
4. The length of a common path of egress travel in a Group R-2 or R-3 occupancy shall not be more than 125 feet (38 100 mm), provided that the building is protected throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

Reason It is only appropriate that the exception should apply to a dwelling unit that is a single or double and not "three or more." Where a dwelling unit is associated with another occupancy and there are multiple apartments it will be an R-2 occupancy. If there is only the owner's apartment or two small apartments, then it would be treated as an R-3 occupancy. This is the case in urban areas. Additionally, R-3 needs the second means of egress where the area of the dwelling unit exceeds 4,000 sf (resulting in an occupant load >20) or where the unit is more than 3 stories in height.

By extending the exception to these dwelling units, it is only clarifying that the same rules apply to these types of uses whether there are one, two or three units in the same building.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Boecker-E4-1014.3

E107–09/10
1015.2.1 (IFC [B] 1015.2.1)

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

1015.2.1 (IFC [B] 1015.2.1) Two exits or exit access doorways. Where two exits or exit access doorways are required from any portion of the exit access, the exit doors or exit access doorways shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between exit doors or exit access doorways. Interlocking or scissor stairs shall be counted as one exit stairway.

Exceptions:

1. Where exit enclosures are provided as a portion of the required exit and are interconnected by a 1-hour fire-resistance-rated corridor conforming to the requirements of Section 1018, the required exit separation shall be measured along the shortest direct line of travel within the corridor. <u>The exit or exit access doorway to such enclosures shall not be less than 25 feet (7.62 m), measured in a straight line, from the exit or exit access doorway of another exit enclosure.</u>
2. Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance of the exit doors or exit access doorways shall not be less than one-third of the length of the maximum overall diagonal dimension of the area served.

Reason: The current exception 1 allows the separation of two exits to be measured in a line of travel within a rated corridor. Although this length (traveling within a corridor) may be longer than one-half of the overall diagonal, the exit enclosures can be placed very close to each other. Thus a fire could compromise both exits. Furthermore, the travel distance in the corridor can be reduced to one third (per exception 2) which can further exacerbate this problem.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Maiel-E1-1015.2.1

E108–09/10
1016.1, 1022.1 (IFC [B] 1016.1, 1022.1)

Proponent: Ronald W. Clements, Jr., representing Chesterfield County Virginia Building Inspection Department; Gregory R. Keith, Professional heuristic Development, representing The Boeing Company; and Michael L. Perrino, CBO, representing Code Consultants, Inc.; Sarah Rice, CBO, representing self

Revise as follows:

1016.1 (IFC [B] 1016.1) Travel distance limitations. Exits shall be so located on each story such that the maximum length of exit access travel, measured from the most remote point within a story along the natural and unobstructed path of egress travel to an exterior door at the level of exit discharge, an entrance to a vertical exit enclosure, an exit passageway, a horizontal exit, an exterior exit stairway or an exterior exit ramp shall not exceed the distances given in Table 1016.1.

Exceptions:

1. Travel distance in open parking garages is permitted to be measured to the closest riser of open exit stairways.
2. In outdoor facilities with open exit access components and open exterior exit stairways or exit ramps, travel distance is permitted to be measured to the closest riser of an exit stairway or the closest slope of the exit ramp.
3. ~~In other than occupancy Groups H and I, the exit access travel distance to a maximum of 50 percent of the exits is permitted to be measured from the most remote point within a building to an exit using unenclosed exit access stairways or ramps when connecting a maximum of two stories. The two connected stories shall be provided with at least two means of egress. Such interconnected stories shall not be open to other stories.~~
4. ~~In other than occupancy Groups H and I, exit access travel distance is permitted to be measured from the most remote point within a building to an exit using unenclosed exit access stairways or ramps in the first and second stories above grade plane in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. The first and second stories above grade plane shall be provided with at least two means of egress. Such interconnected stories shall not be open to other stories.~~

Where applicable, travel distance on unenclosed exit access stairways or ramps and on connecting stories shall also be included in the travel distance measurement. The measurement along stairways shall be made on a plane parallel and tangent to the stair tread nosings in the center of the stairway.

1022.1 (IFC [B] 1022.1) Enclosures required. Interior exit stairways and interior exit ramps shall be enclosed with fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. Exit enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the exit enclosure shall include any basements but not any mezzanines. Exit enclosures shall have a fire-resistance rating not less than the floor assembly penetrated but need not exceed 2 hours. Exit enclosures shall lead directly to the exterior of the building or shall be extended to the exterior of the building with an exit passageway conforming to the requirements of Section 1023, except as permitted in Section 1027.1. An exit enclosure shall not be used for any purpose other than means of egress.

Exceptions:

1. <u>In other than Group H and I occupancies, stairways and ramps that serve only one adjacent story need not be enclosed. Any two such interconnected stories shall not be open to other stories.</u> ~~In all occupancies, other than Groups H and I occupancies, a stairway is not required to be enclosed when the stairway serves an occupant load of less than 10 and the stairway complies with either Item 1.1 or 1.2. In all cases, the maximum number of connecting open stories shall not exceed two.~~
   - ~~1.1. The stairway is open to not more than one story above its level of exit discharge, or~~
   - ~~1.2. The stairway is open to not more than one story below its level of exit discharge.~~
2. Exits in buildings of Group A-5 where all portions of the means of egress are essentially open to the outside need not be enclosed.
3. Stairways serving and contained within a single residential dwelling unit or sleeping unit in Group R-1, R-2 or R-3 occupancies are not required to be enclosed.
4. Stairways in open parking structures that serve only the parking structure are not required to be enclosed.
5. Stairways in Group I-3 occupancies, as provided for in Section 408.3.8, are not required to be enclosed.
6. Means of egress stairways as required by Section 410.5.3 and 1015.6.1are not required to be enclosed.
7. Means of egress stairways from balconies, galleries and press boxes as provided for in Section 1028.5.1, are not required to be enclosed.

Reason: This proposal is intended to correlate and correct fundamental interior exit stairway enclosure provisions. The history and technical inconsistency of current provisions were brought to light during ICC Code Technology Committee (CTC), Unenclosed Exit Stairway Study Group discussions associated with the drafting of a CTC code change proposal for the current (2009/2010) development cycle. One of the main charges of the study group was to validate the relationship between Chapter 10 required exit, access to exit, exit enclosure and exit access travel distance provisions. These provisions lie at the heart of means of egress design philosophy.

Unfortunately, the 2000 Edition of the IBC did not do a particularly good job of consolidating the means of egress provisions contained in the former model (legacy codes). This was owed to several factors, not the least of which was the significantly different systems or approaches to means of egress design used by the various contributing codes. This is probably best illustrated through the 2000 IBC exceptions to interior exit stairway enclosure requirements. In fact, none of the 2000 IBC general design related exceptions appeared in any of the legacy codes. The exceptions were spawned as compromises with former provisions. The BOCA building code fundamentally maintained that required interior exit stairways at all stories be enclosed. The ICBO building code, on the other hand, basically allowed that in other than Group H and I occupancies, exit

enclosures were not required for interior stairways serving only one adjacent story. The 2000 IBC resolved the issue by permitting 50% of the required stairways to be unenclosed. That provision supported neither legacy philosophy.

In subsequent editions, the related provisions have been manipulated to a point that current requirements create or support no functional means of egress strategy. Unfortunately, with the inability of the IBC to effectively state its intent, practitioners have largely resorted to their specific legacy indoctrination resulting in varying interpretations. In the 2003 Edition, an additional exception to exit enclosure provisions allowed for all interior exit stairways to be unenclosed at the first and second stories of a sprinklered building of other than Group H and I occupancies. The 2006 Edition formalized the concept of accessing required exits from adjacent levels by way of unenclosed interior stairways and ramps. In the 2009 Edition of the IBC, two fundamental exceptions to exit enclosure requirements were moved to Section 1016.1, travel distance provisions. As has been previously mentioned, various provisions have been manipulated over time in an attempt to contort them to a desired technical end. Virtually all of these attempts have failed to recognize the delicate technical relationships between the fundamental means of egress concepts of numbers of exits, access to required exits and exit access travel distance.

The 2009/2010 CTC interior stairway proposal effectively establishes such a system with supporting terminology and requirements based on current IBC means of egress provisions. The study group intentionally avoided including substantial technical changes in its code change proposal, although a majority of members may have agreed with a certain concept or provision.

This proposal is intended to further cultivate and clarify the IBC system of means of egress design. Essentially, it allows for a general two-story exception to the enclosure of required interior exit stairways in other than Group H and I occupancies. This arguably represents the cumulative impact of numerous current exceptions addressing unenclosed exits or access to exits. It also serves to reinforce access to exits at adjacent building level provisions. The ultimate goal is to require that all interior exit stairways (required exit components) be enclosed without specifying their required location. Effectively, this allows a given means of egress design to dictate which exit components are employed and where. It also acknowledges that exits may be accessed from an adjacent story or level within prescribed exit access travel distance limitations.

This proposal effectively integrates the related legacy requirements with current IBC provisions. The reason that this provision was not included in the 2009/2010 CTC interior stairway proposal is that it represents a relaxation of current IBC exit enclosure requirements. Again, please bear in mind that current IBC enclosure requirements are based on an ICC Means of Egress Drafting Committee technical compromise. What is recommended in this proposal is identical in concept to that of the former Uniform Building Code. Such a means of egress design method has decades of distinguished performance history. It is also consistent with the means of egress philosophy promoted in the 2009/2010 CTC interior stairway proposal. That is, that formal exits, or access to exits, shall be provided in prescribed numbers from each building level. Unenclosed stairways and ramps (certain occupancies notwithstanding) may access exits at an adjacent building level within prescribed exit access travel distance limitations. Accordingly, buildings more than two stories in height will have not less than two enclosed interior exit stairways. It is acknowledged that such exit enclosures may not serve all building stores based on the specific building and means of egress design; however, such enclosed exits are within the exit access travel distance limitations and are not more than one level removed from the exit. It should be noted that when exit enclosures are employed to support a given design, they typically serve all building stories. Occasionally, security or privacy concerns dictate that access to enclosed interior exit stairways at all stories is undesirable. Nevertheless, occupants at those levels have access to exits comparable to that required for any building level. Additionally, the fire service has protected enclosures to serve as staging areas for the attack of a fire at, above or below the story of incident origin.

In summary, this proposal eliminates many of the technical inconsistencies associated with current means of egress provisions. This proposal, in combination with the 2009/2010 CTC interior stairway proposal, effectively repairs the IBC means of egress system design requirements and their technical relationships. Each of the proponents of this proposal was a voting member of the ICC Code Technology Committee, Unenclosed Exit Stairway Study Group and they represent a majority of voting study group members.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Keith-Clements-Perrino-E1-1022.1

E109–09/10

1016.3 (New), Table 1016.3 (New), 1016.3.1 (New); [IFC [B] 1016.3 (New), Table 1016.3 (New), 1016.3.1 (New)]

Proponent: Jay Wallace, The Boeing Company and Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Add new text and table as follows:

1016.3 (IFC [B] 1016.3) Aircraft manufacturing facilities. In buildings used for the manufacturing of aircraft, exit access travel distances indicated in Section 1016.1 shall be increased in accordance with the following:

1. The building shall be of Type I or II construction.
2. Exit access travel distance shall not exceed the distances given in Table 1016.3.

TABLE 1016.3 (IFC [B] TABLE 1016.3)
AIRCRAFT MANUFACTURING EXIT ACCESS TRAVEL DISTANCE

HEIGHT (feet) [b]	MANUFACTURING AREA (sq. ft.) [a]					
	≥150,000	≥200,000	≥250,000	≥500,000	≥750,000	≥1,000,000
≥ 25	400	450	500	500	500	500
≥ 50	400	500	600	700	700	700

≥75	400	500	700	850	1,000	1,000
≥ 100	400	500	750	1,000	1,250	1,500

For SI: 1 foot = 304.8 mm

a. Contiguous floor area of the aircraft manufacturing facility having the indicated height.

b. Minimum height from finished floor to bottom of ceiling or roof slab or deck.

1016.3.1 (IFC [B] 1016.3.1) Associated areas. Egress from rooms, areas and spaces associated with the primary manufacturing area shall be permitted through such area having a minimum height as indicated in Table 1016.3. Exit access travel distance within the associated room, area or space shall not exceed that indicated in Table 1016.1 based on the occupancy classification of that associated area. Total exit access travel distance shall not exceed that indicated in Table 1016.3.

Reason: Many aircraft manufacturing buildings are unusually large due to the size of the commercial or military aircraft being produced. For instance, an assembled Boeing 747 has a tail height of over 63 feet. The rectangular footprint of a Boeing 747-800 is over 56,000 square feet.

Group F-1 occupancies greater than 150,000 square feet can have difficulty complying with 250 foot, sprinklered exit access travel distance limitations without incorporating exit passageways or horizontal exits into the design of the building means of egress system. The use of either exit component is somewhat problematic. Due to the compartmentalized nature of horizontal exits, they do not lend to aircraft production processes or movement of the finally assembled aircraft. For similar reasons, exit passageways are generally installed below the floor of the assembly level. The use of underground exit passageways during an emergency in a very high volume space is generally contrary to human nature. Once aware of an event, employees would instinctively evacuate the building at the level with which they are most familiar. Also, it is relatively easy to move away from the point of origin of a fire due to a person's sensory awareness within the entire open space. Given the fact that occupants sense safety as they move away from the fire, it is counter-intuitive to enter an underground area unless as a last resort.

Regardless of human nature, it must be demonstrated that high volume spaces provide a tenable environment for the evacuation or relocation of building occupants. The Boeing Company conducted smoke and temperature fire modeling using the NIST FDS (National Institute of Standards and Technology - Fire Dynamics Simulator) computer program.

In order to establish a performance baseline, a series of worse case scenarios were combined into the first test. We referenced previous Boeing proprietary laboratory test data on a large, 10 megawatt fire and duplicated and calibrated those data in our fire and smoke model. We placed the 10 megawatt event in an interior corner of a 400 foot x 400 foot building with exterior exit doors at the midpoints of each exterior wall. A corner fire was considered worse case because anticipated radiation off of adjacent 90° walls focuses and accelerates the progression of the fire. The minimum ceiling height permitted in the means of egress by the International Building Code is 7'-6"--impractically low for an aircraft manufacturing area ceiling height. A similarly impractical ceiling height of 10 feet was selected as a worse case baseline for data determination purposes. Active fire suppression was not included in the model; therefore, the test fire burns until it is consumed. It should be noted that because sprinklers were not utilized in the model, they are not included as a requirement in the proposed provision. That being said, it is recognized that to achieve the qualifying contiguous areas of proposed Table 1016.3, the building would be sprinklered based on the fire area thresholds in Section 903. This proposal lets each issue stand on its own merit without introducing a new sprinkler trade-off. Also, for simplicity, it was also assumed that when smoke is introduced into the space, smoke detection would shut down any HVAC systems. Therefore, no mechanical ventilation is included in the model. The model assumed no fuel contribution by the building itself; therefore, the proposed provisions are limited to buildings of Type I or II construction.

Six modeling runs were conducted. One, for the 400 foot x 400 foot space with a 10 foot ceiling height for data base line purposes. Four additional runs were made for the same building area with ceiling heights of 25, 50, 75 and 100 feet for purposes of data development. One additional run was conducted for a 1,000,000 square foot building with a 100 foot ceiling height for data interpolation purposes. These data points were selected to support the area and height thresholds established in proposed Table 1016.3.

The 160,000 sf, 10' high ceiling baseline model indicates: (Maximum permitted travel distance: 200 feet [Group F-1, unsprinklered; Table 1016.1]. Based on an assumed rate of travel of 250 feet per minute, maximum travel time is 48 seconds.)

After 4 minutes, the exit nearest the point of origin of the fire is still completely free of smoke and heat from the fire.

Ceiling temperatures near the source immediately reach 165 degrees and the fire sprinkler system would activate.

The 160,000 sf, 25' high ceiling model indicates: (Maximum proposed travel distance: 400 feet [≥150,000 sf, ≥ 25'; Table 1016.3]. Based on an assumed rate of travel of 250 feet per minute, maximum travel time is 96 seconds.)

After 120 seconds, the smoke plume extends approximately 100 feet from the point of origin of the fire. The smoke level is at approximately 20 feet above the floor. After 360 seconds, the smoke level is at approximately 10 feet above the floor (360 - 96 = 264 ÷ 96 = 2.75 factor of safety).

After 150 seconds, the ceiling temperature has just reached 165 degrees directly above the point of origin of the fire. Sprinkler activation occurs 54 seconds after building evacuation has occurred. After 300 seconds, no ceiling temperature is greater than 127 degrees.

The 160,000 sf, 50' high ceiling model indicates: (Maximum proposed travel distance: 400 feet [≥150,000 sf, ≥ 25'; Table 1016.3]. Based on an assumed rate of travel of 250 feet per minute, maximum travel time is 96 seconds.)

After 120 seconds, the smoke plume extends approximately 100 feet from the point of origin of the fire. The smoke level is at approximately 42 feet above the floor. After 420 seconds, the smoke level is at approximately 25 feet above the floor (420 - 96 = 324 ÷ 96 = 3.37 factor of safety).

After 150 seconds, the ceiling temperature is 108 degrees directly above the point of origin of the fire. Sprinkler activation occurs 84 seconds after building evacuation has occurred. After 300 seconds, no ceiling temperature is greater than 98.5 degrees.

The 160,000 sf, 75' high ceiling model indicates: (Maximum proposed travel distance: 400 feet [≥150,000 sf, ≥ 25'; Table 1016.3]. Based on an assumed rate of travel of 250 feet per minute, maximum travel time is 96 seconds.)

After 120 seconds, the smoke plume extends less than 100 feet from the point of origin of the fire. The smoke level is at approximately 60 feet above the floor. After 420 seconds, the smoke level is at approximately 25 feet above the floor at one point (420 - 96 = 324 ÷ 96 = 3.37 factor of safety).

After 150 seconds, the ceiling temperature is 98.5 degrees directly above the point of origin of the fire. Sprinkler activation occurs 144 seconds after building evacuation has occurred. After 300 seconds, no ceiling temperature is greater than 98.5 degrees.

The 160,000 sf, 100' high ceiling model indicates: (Maximum proposed travel distance: 400 feet [≥150,000 sf, ≥ 25'; Table 1016.3]. Based on an assumed rate of travel of 250 feet per minute, maximum travel time is 96 seconds.)

After 120 seconds, the smoke plume extends less than 100 feet from the point of origin of the fire. The smoke level is at approximately 85 feet above the floor. After 420 seconds, the smoke level is at approximately 30 feet above the floor at one point (420 - 96 = 324 ÷ 96 = 3.37 factor of safety).

After 150 seconds, the ceiling temperature is 89 degrees directly above the point of origin of the fire. Sprinkler activation occurs 144 seconds after building evacuation has occurred. After 300 seconds, no ceiling temperature is greater than 89 degrees.

The 1,000,000 sf, 100' high ceiling model indicates: (Maximum proposed travel distance: 1,500 feet [≥1,000,000 sf, ≥ 100'; Table 1016.3]. Based on an assumed rate of travel of 250 feet per minute, maximum travel time is 360 seconds.)

After 360 seconds, the smoke plume extends less than 500 feet from the point of origin of the fire. The smoke level is at approximately 75 feet above the floor. After 720 seconds, the smoke level is still at approximately 75 feet above the floor (720 - 360 = 360 ÷ 360 = 1.0 factor of safety).

At 300 seconds, the ceiling temperature is 70 degrees directly above the point of origin of the fire. At 300 seconds, ceiling temperatures are dropping and no temperature is greater than 89 degrees.

Data clearly indicate that the proposed exit access travel distances for aircraft manufacturing facilities provide for a high for level of occupant tenability with a minimum factor of safety of 100 percent. It is intuitive that high volume spaces provide sufficient time for an occupant to safely access an exit. Nevertheless, The Boeing Company has reinforced that common sense through fire modeling that validates and quantifies that logic.

Most manufacturing facilities have other supporting occupancies including offices, break rooms, cafeterias, etc. This proposal would permit occupants of such associated spaces to egress through the manufacturing area with the increased exit access travel distance provided that the exit access travel distance within the associated areas does not exceed that specified in Table 1016.1 for the occupancy(s) under consideration.

Please do not be distracted by some of the larger exit access travel distance values contained in the proposed table. The longest allowance of 1,500 feet appears extreme compared to Table 1016.1 values. In reality, it only represents six minutes of travel time based on an assumed rate of travel of 250 feet per minute (*NFPA Life Safety Code Handbook* data), and it is only permitted in a building with a volume of over one hundred million cubic feet. Upon further examination, 71 percent of the cells of the proposed table require less than three minutes of exit access travel time for buildings having a volume of not less than 3.75 million cubic feet. The results of Boeing modeling runs would indicate that ceiling height is a major factor in the maintenance of occupant tenability during egress from a fire event. This proposal is limited to aircraft manufacturing facilities only. This is because of a high degree of occupant familiarity and the relatively low fuel loading compared with many other Group F-1 and S-1 occupancies.

In summary, the unique size of some aircraft manufacturing facilities inherently provides a tenable environment for building occupants as they travel to an exit. It is logical that spaces with higher ceilings provide for a greater level of occupant tenability than those with lower ceilings. Rather than arbitrarily selecting travel distance values based on former provisions or attempting an educated guess, The Boeing Company has conducted computer modeling in order to determine acceptable travel distances. Supporting data is available for review at http://www.boeing.com/nosearch/tds/. Approval of this proposal will acknowledge means of egress design issues associated with large area, high volume aircraft manufacturing spaces while providing a high degree of occupant safety during egress from such buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Keith-Wallace-E1-1016.3

E110–09/10
1017.5 (New) [IFC [B] 1017.5 (New)]

Proponent: Ali M. Fattah, City of San Diego, representing SD Area Chapter ICC Code Committee

Add new text as follows:

1017.5 (IFC [B] 1017.5) Aisles in other than Groups A, B and M. In other than Group A, B and M occupancies, the minimum clear aisle width shall be determined by Section 1005.1 for the occupant load served, but shall not be less than 36 inches (914 mm).

Reason: This proposed code change adds clarity and a requirement inadvertently omitted. The are currently no minimum aisle requirements for F, S, H, I, R occupancies. For example in a parking garage an access aisle may be through a space between two columns to get to the main drive aisle. Or between storage racks or shelving in a warehouse.

Cost Impact: The code change proposal will minimally increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Fattah-E1-1017.5

E111–09/10
1018.1 (IFC [B] 1018.1)

Proponent: Mark Blanke, PE, New York State Div. of Code Enforcement and Administration

Revise as follows:

1018.1 (IFC [B] 1018.1) Construction. Corridors shall be fire-resistance rated in accordance with Table 1018.1. The corridor walls required to be fire-resistance rated shall comply with Section 709 for fire partitions.

Exceptions:

1. A fire-resistance rating is not required for corridors in an occupancy in Group E where each room that is used for instruction has at least one door directly to the exterior and rooms for assembly purposes have at least one-half of the required means of egress doors opening directly to the exterior. Exterior doors specified in this exception are required to be at ground level.
2. A fire-resistance rating is not required for corridors contained within a dwelling or sleeping unit in an occupancy in Group R.
3. A fire-resistance rating is not required for corridors in open parking garages.
4. A fire-resistance rating is not required for corridors in an occupancy in Group B which is a space requiring only a single means of egress complying with Section 1015.1.
5. A fire-resistance rating is not required for corridors where the length of the corridor is less than 2.5 times the least width.

Reason: This proposed amendment provides a uniform application for corridor enclosure requirements and offers a design option to enlarge a corridor width in lieu of providing a fire resistance rating.

The IBC definition of a corridor does not readily establish when a space should be considered a room or a corridor. This is because it does not acknowledge narrowness or length as corridor characteristics commonly found in most dictionaries. The definition of a corridor is "an enclosed exit access component that defines and provides a path of egress travel to an exit." Any room is an enclosed exit access component that provides a path of egress to an exit. The room becomes a corridor when it actually defines a path to an exit. But the question is what room configuration defines a path to an exit where it becomes a corridor that should be subject to fire-resistance rating requirements. This proposed amendment provides a length-to-width ratio that more clearly and uniformly establishes this threshold.

The purpose of fire rating corridor enclosures is to protect occupants traveling in a confined space from the hazards of fire. The more the space is confined the greater the hazard, and by contrast, decreasing the confinement reduces the hazard. If a corridor width is increased, it begins to resemble a room where it becomes reasonable to eliminate the fire-resistance rating of the enclosure. As an example, a corridor measuring 3'x25' serving an occupant load of 40 in an unsprinklered Group B occupancy is required to have 1-hour fire-resistance rated enclosures with fire protection of door openings. Given the confined nature of this space, it is appropriate to require the necessary fire protection. However, if the corridor width were increased to 10 feet while maintaining its original length, the space becomes much less confined, less hazardous, and begins to resemble an adjoining or intervening room otherwise permitted without rated enclosures as part of an exit access. Some would argue that the enlarged space is no longer a corridor and not subject to the provisions of Section 1018.

The proposed amendment establishes a 2.5 length/width ratio as the transition for requiring fire-resistant rated corridor enclosures. This ratio was chosen because it is the same as that used in exception #3 of Section 1018.4 that would allow an unlimited dead end corridor where the length is less than 2.5 times the width. Given that the code has established this ratio as an appropriate exception to allow unlimited dead end corridors, it seems appropriate to use the same standard to corridor fire-resistance requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Blanke-E1-1018.1

E112–09/10
1018.1 (IFC [B] 1018.1)

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

1018.1 (IFC [B] 1018.1) Construction. Corridors shall be fire-resistance rated in accordance with Table 1018.1. The corridor walls required to be fire-resistance rated shall comply with Section 709 for fire partitions.

Exceptions:

1. A fire-resistance rating is not required for corridors in an occupancy in Group E where each room that is used for instruction has at least one door opening directly to the exterior and rooms for assembly purposes have at least one-half of the required means of egress doors opening directly to the exterior. Exterior doors specified in this exception are required to be at ground level.
2. A fire-resistance rating is not required for corridors contained within a dwelling or sleeping unit in an occupancy in Group R.
3. A fire-resistance rating is not required for corridors in open parking garages.

4. A fire-resistance rating is not required for corridors in an occupancy in Group B which is a space requiring only a single means of egress complying with Section 1015.1.
5. Corridors adjacent to the exterior walls of buildings shall be permitted to have unprotected openings on the exterior wall where permitted by Table 705.8 and Table 602.

Reason: Since protected openings are only required where corridor walls are required to be fire-resistive construction, the exterior walls of buildings which also form a corridor wall need not be of fire-resistive construction, provided that the protection is not required based on Tables 705.8 and 602.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME:Maiel-E9-1018.1

E113–09/10

Table 1018.1 (IFC [B] Table 1018.1)

Proponent: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM): Thomas S. Zaremba, Roetzel & Andress, representing self

Revise as follows:

TABLE 1018.1 (IFC [B] TABLE 1018.1)
CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	OCCUPANT LOAD SERVED BY CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		Without sprinkler system	With sprinkler system[c]
H-1, H-2, H-3	All	Not permitted	1
H-4, H-5	Greater than 30	Not permitted	1
A, B, ~~E~~, F, M, S, U	Greater than 30	1	0
E	Greater than 30	1	1
R	Greater than 10	Not permitted	0.5
I-2[a], I-4	All	Not permitted	0
I-I, I-3	All	Not Permitted	1[b]

a. For requirements for occupancies in Group I-2. see Sections 407.2 and 407.3.
b. For a reduction in the fire-resistance rating for occupancies in Group I-3, see Section 408.8.
c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 901.3.1.1 or 903.3.1.2 where allowed.

Reason:
Davidson/Shuman – This code change was proposed by several parties in the last development cycle as E117-07/08. Although half the Committee supported its adoption, the Chair broke a tie vote in favor of a recommendation of disapproval. At the Final Action Hearings, the Committee's recommendation was overturned, but a motion to "approve as submitted" failed to secure the 2/3 majority needed for adoption. The Membership voted 55% in favor of adoption.

There are good reasons that a solid majority of the Membership favors adopting this proposal. First, the E occupancies at issue represent structures built to house a dense population of children ranging from ages 4 through early teens. Group E occupancies typically have paper and other flammables hung from ceilings to floors throughout. Classrooms are filled with desks containing books, papers and other flammables. Science labs use chemicals and accelerants. Lunch rooms have stoves, ovens and trash cans spread throughout loaded with waste paper and other flammables. Theaters house clothing, wooden and cardboard props and paper banners strung from one end of the room to the other. Lockers contain books and hide things that are not easily monitored. Janitorial closets house cleaning solutions and solvents. Many Group E occupancies are multi-story buildings with classrooms on several floors.

Group E occupancies mix a high concentration of children with fuel loads on a daily basis. As budgets shrink, so do the number of adult supervisors. Our children are in schools because they are required to be there. We owe them a duty to ensure they are safe from the risk of fire while in school. We simply cannot wait for a catastrophe to protect children while at school.

Unfortunately the world of elementary, secondary and higher education learning has gone through tremendous changes in security measures undertaken, both operationally and hardware installations, due to the threat of violent acts committed against students and staff. Where we had educational facilities with highly effective fire drill evacuation procedures and actions during system activation, we now have written plans and training in place to ignore the activation of the fire alarm system if a "lockdown" has been declared because the activation of the fire alarm system may be a diversion to bring staff and students out into the open to serve as victims.

This is not a possible situation. This is a very real situation that occurs throughout the country in response to the acts of violence that have occurred at educational facilities. Though the exact procedure may vary site to site, the main premise of a "lockdown" is to gather staff and students into classrooms and offices and to lock the doors, preventing intruders from getting into the room and preventing staff and students from leaving the rooms until an all clear is announced. The staff and students are trained to ignore a fire alarm activation during a lockdown until they are ordered to evacuate after someone in authority, (could be a Principal or could be a Police Commander), makes a determination that the fire threat is real and that they must evacuate to survive the fire.

Because the students and staff will delay their evacuation while a fire is attacking the structure and potentially cutting off escape routes where corridors are not protected, this code change proposal will require all corridors serving an occupant load greater than 30 in group E educational occupancies to have 1 hour fire resistant rating except as allowed by Exception 1 to section 1018.1.

Exception 1 to Section 1018.1 is a legitimate exception for the one hour corridor fire resistant rating requirement, since it requires every classroom to have at least one door directly to the exterior and rooms used for assembly purposes have at least ½ of the required means of egress directly to the exterior as well. Under those conditions, there is no need for the students and other occupants to rely on exiting the building through the corridors since they can go directly to the exterior and move to a safe area of refuge. Once the announcement to evacuate occurs they can exit without being exposed to the fire threat potentially extended into the unprotected corridor.

However, if this is not the case, then the students, teachers, and other occupants of the educational occupancy must rely on the corridor system to exit safely from the building. In that case the paths of travel to get out of the building are restricted and the occupants may be exposed to the room of fire origin while trying to evacuate. Certainly, the basis for 1 hour fire resistive protection for corridors when the occupant load exceeds 30 is to provide for a reasonable level of protection for the occupants as they exit the building without having them unduly be exposed to a fire condition, water, and smoke which may impede their egress because they have delayed their evacuation due to a "lockdown".

It has been reported that there is an annual average of 14,700 fires in educational properties in the United States. The estimated average property loss from these fires is $85 million per year, and caused approximately 100 injuries. The costs of bussing students to alternate facilities, the impact of double sessions in schools to accommodate displaced students, and the mental aspect of the children who fell victim to the fires is less than construction costs of a 1 hour fire resistant corridor.

Nearly half (49.7 %) of these fires were incendiary or suspicious in nature. Structure fires can start in a wide variety of different areas. During 1999-2001, 23% of the fire origins were in bathrooms/locker rooms, 13% started in the kitchen area, 7% in the classrooms, and another 7% started in corridors. Even more disturbing are findings indicating that injuries per school fires are higher than those of ALL non-residential structure fires. Certainly, the fact that more than 70% of fires occur between 0800 and 1600, the hours students are most likely to be in school, and 16% of fires occur between 1700 and 2400; 12% occur between 2400 and 0800 shows that the threat of a fire occurring while children are present is real.

Currently, the International Building Code (IBC) allows the 1-hour fire –resistance rated corridor to be omitted where the building is protected by an automatic sprinkler system. We don't believe that such a "trade-off" is appropriate, especially in an educational occupancy where there are large numbers of children at relatively high density who are placed at risk in a fire situation. We believe that due to the expanding use of "lockdown" procedures a balanced design approach to providing life safety in educational occupancies is prudent so that the 1-hour fire resistance rated corridors can work in conjunction with the automatic sprinkler system to assure the level of life safety for the building's occupants intended by the code.

Note that an I-3 occupancy, (correctional centers, detention centers, jails, prerelease centers, prisons, and reformatories), requires the corridors to have 1 hour fire-resistance ratings when the occupancy is protected by a fire suppression system, regardless of the number of occupants. When a "lockdown" occurs in a school the staff and students are prisoners. They are prohibited from leaving the rooms or areas of protection until given permission (ordered) to do so, or because they are being held hostage. For consistency purposes the staff and students in educational occupancies deserve the same level of protection we provide to inmates. A comparison to the other I groups where evacuation of the occupants may be delayed or prevented because they are incapable of self preservation is also appropriate and substantiates a need to increase the protection level for corridors in the education group occupancies since in the case of "lockdowns" the staff and students are prevented from taking self preservation actions when the fire alarm activates until authorized, (ordered), to evacuate after an undetermined delay in time.

Other points to consider are the construction modifications made due to high-profile events and fuel loads in our schools. Events as the Columbine High School shootings, the need of school security can sometimes conflict with the requirements of fire safety. For example, exits may be restricted for security reasons preventing escape should a fire occur. Today's structures are unquestionably safer, yet the contents of today's classrooms are more combustible. Evidence suggests that fires in schools can spread far more rapidly due to the fuel load in the school buildings.

An additional benefit of the 1-hour fire resistance rated corridor is that it can assist fire fighters and tactical response team members in doing their job by providing a protected means of access to the interior of the building where they can perform their search and rescue missions, as well as fire fighting operations, in relative safety. Fire resistant corridors provide fire fighters and tactical response team members with additional time to conduct their life safety operations more effectively and safely.

From an economic perspective, fires rank as a major national problem, and since no individual safety measure is reliable all of the time, fire protection should and must be redundant. We are concerned that the compounding effect of sprinkler trade-offs could lead to greater risk to the life safety of the building occupants, especially if combined with the reduction in or the elimination of the 1 hour fire resistance rated corridors providing access to the exits or exit stairwells in an occupancy that routinely has staff and students drill and respond in real events to ignore fire alarm system activations. Too much reliance on automatic sprinkler systems may not be wise where life safety is a key consideration. We strongly believe that a balanced approach to fire and life safety in buildings should be provided when a fire occurs.

Zaremba -This code change was proposed by several parties in the last development cycle. Although half the Committee supported its adoption, the Chair broke a tie vote resulting in a Committee recommendation of disapproval. At the Final Action Hearings, however, the Committee recommendation was overturned. Although a motion to "approve as submitted" received a favorable vote of 55% of the Membership, it did not receive the 2/3 majority needed for adoption.

A majority of the Membership had good reason to favor the adoption of this proposal. First, the E occupancies at issue represent structures built to house a dense population of children ranging from ages 4 through early teens. Group E occupancies typically have paper and other flammables hung from ceiling to floor on every wall. Classrooms are filled with desks containing books, papers and other flammables. Science labs use chemicals and accelerants. Lunch rooms have stoves, ovens and trash cans spread throughout, all loaded with waste paper and other flammables. Theaters house clothing, wooden and cardboard props and paper banners strung from one end of to the other. Lockers contain books and hide things that are not easily monitored. Many Group E occupancies are multi-story buildings with relatively long corridors between classrooms and exit discharges.

In short, Group E occupancies represent a daily mix of high occupancy loads, children and significant fuel loads. As budgets shrink, so do the number of adult supervisors. E occupancies should provide children with an environment redundant in fire safety protections.

Especially because large numbers of children would be at risk in the event of a fire, redundant fire protection systems is warranted without waiting for a catastrophic loss of life to provide the motivation for making this change. Sprinklered Group E occupancies with corridors serving occupant loads of more than 30 children should include 1-hour fire resistance rated corridor construction.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Zaremba-E2-Table 1018.1

E114–09/10
1018.1, 1018.1.1 (New) [IFC [B] 1018.1, 1018.1.1 (New)]

Proponent: Robert J Davidson, Code Consultant, Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM); Thomas S. Zaremba, Roetzel & Andress representing self

Add new text as follows:

1018.1 (IFC [B] 1018.1) Construction. Corridors, other than those regulated by Section 1018.1.1, shall be fire-resistance rated in accordance with Table 1018.1. The corridor walls required to be fire-resistance rated shall comply with Section 709 for fire partitions.

Exceptions:

1. A fire-resistance rating is not required for corridors in an occupancy in Group E where each room that is used for instruction has at least one door opening directly to the exterior and rooms for assembly purposes have at least one-half of the required means of egress doors opening directly to the exterior. Exterior doors specified in this exception are required to be at ground level.
2. A fire-resistance rating is not required for corridors contained within a dwelling or sleeping unit in an occupancy in Group R.
3. A fire-resistance rating is not required for corridors in open parking garages.
4. A fire-resistance rating is not required for corridors in an occupancy in Group B which is a space requiring only a single means of egress complying with Section 1015.1.

TABLE 1018.1 (IFC [B] TABLE 1018.1)
CORRIDOR FIRE-RESISTANCE RATING

OCCUPANCY	OCCUPANT LOAD SERVED BY CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		Without sprinkler system	With sprinkler system[c]
H-1, H-2, H-3	All	Not Permitted	1
H-4, H-5	Greater than 30	Not Permitted	1
A, B, E, F, M, S, U	Greater than 30	1	0
R	Greater than 10	Not Permitted	0.5
I-2[a], I-4	All	Not Permitted	0
I-1, I-3	All	Not Permitted	1[b]

a. For requirements for occupancies in Group I-2, see Sections 407.2 and 407.3.
b. For a reduction in the fire-resistance rating for occupancies in Group I-3, see Section 408.8.
c. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 where allowed.

1018.1.1 (IFC [B] 1018.1.1) Category III and IV Buildings in Hurricane-Prone and Seismic Areas. Corridors in all Category III and Category IV buildings as defined in Table 1604.5 shall have a fire resistance rating of 1-hour if located in hurricane-prone regions defined in Section 1609.2 or assigned to seismic design categories C, D, E or F in Section 1613.5.6.

Reason:
Davidson, Shuman - Category III buildings are defined in Table 1604.5 as those "that represent a substantial hazard to human life in the event of failure." They include, but are not limited to:

- Public assembly occupancies with occupant loads greater than 300,
- Elementary or secondary schools or day care facilities with occupant loads greater than 250,
- Adult education facilities with occupant loads greater than 500,
- Group I-2 occupancies with occupant loads greater than 50, and
- Group I-3 occupancies.

Category IV buildings are those which are designated as essential facilities. "Essential Facilities" are defined in section 1602.1 as "[b]uildings and other structures that are intended to remain operational in the event of extreme environmental loading from flood, wind, snow or earthquakes. These include, but are not limited to:

- Designated earthquake, hurricane or other emergency shelters,
- Designated emergency preparedness, communications and operations centers and other facilities required for emergency response, and
- Fire, rescue, ambulance and police stations and emergency vehicle garages.

In the face of impending natural disasters, residents regularly seek refuge in, or are evacuated from their homes to, Category III or IV buildings. At the same time, hurricanes and earthquakes regularly render roads impassable, often times cutting these evacuation shelters off from municipal and emergency medical, police and fire services. Even if these sites remain accessible by road, first responders may be unable to promptly respond when confronted with the wide spread devastations of a hurricane or earthquake.

Adopting this code change would ensure that redundant safety features, in the form of sprinklers and fire resistance rated corridors, are in place to ensure a safe evacuation of high occupancy buildings used as emergency shelters in hurricane and seismic areas.

Zaremba - Buildings and infrastructures can be severely damaged in hurricanes and earthquakes.

Category III buildings are those that represent a "substantial hazard to human life in the event of failure" and include buildings with high occupancy loads, for example, public assembly buildings with occupant loads greater than 300; elementary or secondary schools or day care facilities with occupant loads greater than 250; adult education facilities with occupant loads greater than 500; Group I-2 occupancies with occupant loads greater than 50; and Group I-3 occupancies.

Category IV buildings are specifically intended to provide shelter in natural catastrophes. These are "essential facilities," defined in section 1602.1 as those intended to remain operational throughout a natural disaster. They include designated earthquake, hurricane or other emergency shelters; designated emergency preparedness, communications and operations and emergency response centers; and fire, rescue, ambulance and police stations and emergency vehicle garages.

Hurricanes and earthquakes can quickly interrupt utilities, including power, communications and water supplies, while slowing or prohibiting travel to and from these facilities. A fire in a Category III or IV building during or after a hurricane or seismic event could result in a significant loss of life when large concentrations of people, including first responders, or those suffering from disabilities, are forced to evacuate under circumstances where communications and sprinkler systems are inoperable and emergency fire and rescue services are inaccessible or unavailable. To ensure safe evacuations in the event of fire, this proposal would require Cat. III and IV buildings in hurricane prone and seismic areas to include 1-hour fire-resistance rated corridors.

Cost impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Davidson-Shuman-E2-1018.1.1

E115–09/10

1018.2, Table 1018.2 (New) [IFC [B] 1018.2, Table 1018.2 (New)]

Proponent: John England, MCO, England Enterprises Inc., representing self

1. Revise as follows:

1018.2 (IFC [B] 1018.2) Corridor width. The minimum corridor width shall be as determined in Section 1005.1, but not less than specified in Table 1018.2~~ but not less than 44 inches (1118 mm).~~

~~**Exceptions:**~~

1. ~~Twenty-four inches (610 mm) – For access to and utilization of electrical, mechanical or plumbing systems or equipment.~~
2. ~~Thirty-six inches (914 mm) – With a required occupant capacity of less than 50.~~
3. ~~Thirty-six inches (914 mm) – Within a dwelling unit.~~
4. ~~Seventy-two inches (1829 mm) – In Group E with a corridor having a required capacity of 100 or more.~~
5. ~~Seventy-two inches (1829 mm) – In corridors and areas serving gurney traffic in occupancies where patients receive outpatient medical care, which causes the patient to be not capable of self-preservation.~~
6. ~~Ninety-six inches (2438 mm) – In Group I-2 in areas where required for bed movement~~

2. Add new Table as follows:

Table 1018.2 (IFC [B] Table 1018.2)
MINIMUM CORRIDOR WIDTH

Occupancy	Width (min)
Any facilities not listed below	44" (1118 mm)
Access to and utilization of mechanical, plumbing or electrical systems or equipment	24" (610 mm)

Occupant load less than 50	36” (914 mm)
Within a dwelling unit	36” (914 mm)
Group E with occupant load of 100 or more	72” (1829 mm)
Group B or I-2 outpatient medical facilities where patients are moved on gurneys	72” (1829 mm)
Group I-2 in areas where care recipients are moved on beds	96” (2438 mm)

Reason: A table will make it easier to understand.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The terminology used in the text of the exceptions is different than the terminology used in the proposed table. A concern would be if this change in terminology change the original interpretation of these exceptions.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME:England-E1-1018.2

E116–09/10
1018.5 (IFC [B] 1018.5) (IMC [B] 601.2)

Proponent: Guy Tomberlin, Fairfax County, Virginia Plumbing and Mechanical Inspectors Association, representing VA Building and Code Officials

Revise as follows:

1018.5 (IFC [B] 1018.5) (IMC [B] 601.2) Air movement in egress elements. Corridors shall not serve as supply, return, exhaust, relief or ventilation air ducts.

Exceptions:

1. Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, smoking lounges and janitor closets, shall be permitted, provided that each such corridor is directly supplied with ~~outdoor air~~ ventilation air at a rate greater than the rate of makeup air taken from the corridor.
2. Where located within a dwelling unit, the use of corridors for conveying return air shall not be prohibited.
3. Where located within tenant spaces of 1,000 square feet (93 m^2) or less in area, utilization of corridors for conveying return air is permitted.
4. Incidental air movement from pressurized rooms within health care facilities, provided that the corridor is not the primary source of supply or return to the room.

Reason: It was not the original intent of this section to provide outdoor air to a corridor to be used as makeup air. This has now been clarified through the addition of new exhaust column found in IMC Table 403.3. If the intent were to use just outdoor air, only corridors served by 100% outdoor air systems would qualify for this exception or exhausting extremely large amounts of ventilation air.

For example: If a bathroom directly off a corridor is required to exhaust 150 cfm of “outdoor air”. And, if the corridor is provided with a ventilation system that has 20% outdoor air, the exhaust rate for the bathroom would have to be increased to 750 cfm (150/0.20)

Cost Impact: The code change proposal will decrease the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: TOMBERLIN-E1-1018.5

E117–09/10
1018.6 (IFC [B] 1018.6)

Proponent: Anne VonWeller, Murray City, representing the Utah Chapter of the International Code Council

Revise as follows:

1018.6 (IFC [B] 1018.6) Corridor continuity. Fire-resistance-rated corridors shall be continuous from the point of entry to an exit, and shall not be interrupted by intervening rooms. Where the path of egress travel within a fire-resistance-rated corridor to the exit includes travel along unenclosed exit access stairways or ramps, the fire resistance-rating shall be continuous for the length of the stairway or ramp and for the length of the connecting corridor on the adjacent floor leading to the exit.

Exception: Foyers, lobbies or reception rooms constructed as required for corridors shall not be construed as intervening rooms.

Reason: This change is offered to clarify how the fire-resistance of rating of a corridor is maintained from the corridor to an exit where an unenclosed exit access stairway or ramp is allowed and occurs along the path of egress travel.

Cost Impact: None.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Vonweller-E2-1018.6

E118–09/10
1020.1 (IFC [B] 1020.1)

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

1020.1 (IFC [B] 1020.1) General. Exits shall comply with Section 1020 through 1026 and the applicable requirements of Sections 1003 though 1013. An exit shall not be used for any purpose that interferes with its function as a means of egress. Once a given level of exit protection is achieved, such level of protection shall not be reduced until arrival at the exit discharge.

Exception: A reduced level of exit protection is allowed at the level of exit discharge as permitted by the exceptions to Section 1027.1

Reason: The prohibition of a reduced level of exit protection within an exit as specified in last sentence in Section 1020.1 is permitted to be violated in specific cases. Two exceptions to Section 1027.1 allow certain interior spaces (e.g., a lobby or vestibule) located on the level of exit discharge to have less than two-hour protection from other adjacent interior spaces even though occupants may have previously been inside a two hour rated exit enclosure. The proposed exception to 1020.1 removes the contradiction between the last sentence of 1020.1 and those provisions contained in the exceptions to Section 1027.1 that explicitly permit a reduced level of protection while still inside the building.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Maiel-E8-1020.1

E119–09/10
1021.1, 1021.1.3 (New) [IFC [B] 1021.1, 1021.1.3 (New)]

Proponent: Marshall Klein PE, representing Marshall A. Klein & Associates Inc.

1. Revise as follows:

1021.1 (IFC [B] 1021.1) Exits from stories. All spaces within each story shall have access to the minimum number of approved independent exits as specified in Table 1021.1 based on the occupant load of the story. For the purposes of this chapter, occupied roofs shall be provided with exits as required for stories.

Exceptions:

1. As modified by Section 403.15.3.
2. As modified by Section 1021.2.
3. Exit access stairways and ramps that comply with Exception 3 or 4 of Section 1016.1 shall be permitted to provide the minimum number of approved independent exits required by Table 1021.1 on each story.
4. ~~In Group R-2 and R-3 occupancies, one means of egress is permitted within and from individual dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.~~
5~~4~~. Within a story, rooms and spaces complying with Section 1015.1 with exits that discharge directly to the exterior at the level of exit discharge, are permitted to have one exit.

2. Add new text as follows:

1021.1.3 (IFC [B] 1021.1.3) Single-story or multi-story dwelling units. Individual single-story or multi-story dwelling units shall be permitted to have a single exit from the dwelling unit provided all of the following criteria are met:

1. The dwelling unit complies with Section 1015.1 as a space with one means of egress and
2. Either the exit from the dwelling unit is located at the level of exit discharge, or the exit access outside the dwelling unit's entrance door provides access to not less than two approved independent exits.

Exception: Single exits designed in accordance with Section 1021.2

(Renumber subsequent sections)

Reason: This code proposal is only clarifying the application of the single means of egress requirements out of an individual dwelling unit under the Code.

The two criteria that need to be met to have a single means of egress for a dwelling unit are already stated in various sections of the Code, but are not stated in a single location so that code users can quickly find, and apply them, to designs.

Criteria #1 provides the code user Code Section 1015.1 where the provisions for spaces with one exit, or exit access, are given. Also covered in Criteria #1 is existing Section 1014.3 Exception #4 (which is referenced in Section 1015.1(2)) which requires the common path of egress travel within the dwelling unit to be no more than 125', and existing Section 1015.1(1) Exception permits a single means of egress within a dwelling unit with a maximum occupant load of 20.

Criteria #2 provides the code user the code requirements for means of egress after the occupant has left the dwelling unit, i.e. the occupant is now in the exit discharge (which is the exterior of the building/dwelling unit), or the occupant is now in the common exit access component of a building. If the occupant is in the exit discharge, then according to the Code the occupant is considered to be in a safe environment that will lead to a publicway. If the occupant has left the dwelling unit and is not on the level of exit discharge, then the occupant is now continuing through the exit access portion of the building, and will require access to at least two exits from the point he/she walked out of the dwelling unit.

This code proposal references both single and multi-level dwelling units because existing Section 1022.1 Exception #3 permits the stairway(s) within the dwelling unit to be unenclosed.

The exception to this new Section 1021.1.3 is for the special "single exit" design criteria under the existing Section 1021.2, "Single exits".

Please note that the deletion of Exception #4 under Section 1021.1 is NOT intended to remove this exception under the Code. Under existing Section 1015.1 Exception #1's Exception is the same exception as in existing Section 1021.1 Exception #4 that is being proposed for deletion (See approved Code Proposal E115-06/07). Exception #4 is being incorporated into new Section 1021.1.3 under Criteria #1 which references existing Section 1015.1.. Leaving this same exception in existing Section 1021.1 may lead to user confusion on whether this exception would be applied differently under Section 1021.1 vs. Section 1021.1.3. The answer is no, so the redundancy is not needed if it will just cause confusion.

In summary, this proposed new Section 1021.1.3 provides a user friendly section under the minimum number of exits section to the other scattered sections of Code in Article 10 that relate to single exit criteria for dwelling units.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KLEIN-E1-1021.1.3

E120–09/10
1021.1, Table 1021.1 (IFC [B] 1021.1, Table 1021.1)

Proponent: Dennis Richardson PE, dbr group inc. representing self

Revise as follows:

1021.1 (IFC [B] 1021.1) Exits from stories. All spaces within each *story* shall have access to the minimum number of *approved* independent *exits* as specified in Table 1021.1 based on the *occupant load* of the *story*. For the purposes of this chapter, occupied roofs shall be provided with *exits* as required for stories.

Exceptions:

1. As modified by Section 403.5.2.
2. As modified by Section 1021.2.
3. *Exit access stairways* and *ramps* that comply with Exception 3 or 4 of Section 1016.1 shall be permitted to provide the minimum number of *approved* independent *exits* required by Table 1021.1 on each *story*.
4. In Group R-2 and R-3 occupancies, one *means of egress* is permitted within and from individual dwelling units with a maximum *occupant load* of 20 where the dwelling unit is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
5. Within a *story*, rooms and spaces complying with Section 1015.1 with *exits* that discharge directly to the exterior at the *level of exit discharge*, are permitted to have one *exit*.
6. Exits serving specific spaces or areas need not be accessed by the remainder of the story when all of the following are met:
   - 6.1 The number of exits from the entire story complies with Table 1021.1;
   - 6.2 The access to exits from each individual space in the story complies with Section 1015.1; and
   - 6.3 All spaces within each portion of a story shall have access to the minimum number of approved independent exits as specified in Table 1021.1 based on the occupant load of that portion of the story.

TABLE 1021.1 (IFC [B] TABLE 1021.1)
MINIMUM NUMBER OF EXITS FOR OCCUPANT LOAD

OCCUPANT LOAD (persons per story, or portion thereof)	MINIMUM NUMBER OF EXITS (per story, or portion thereof)
1-500	2
501-1,000	3
More than 1,000	4

Reason: Code change E113 06/07 which was approved as modified removed the words “except as modified in Section 1015.1” from section 1019.1 of the 2006 IBC. This language was confusing and should have been revised because Section 1015.1, regulating exit and exit access from spaces, and Section 1019.1, regulating exits from stories, referred back and forth to each other.

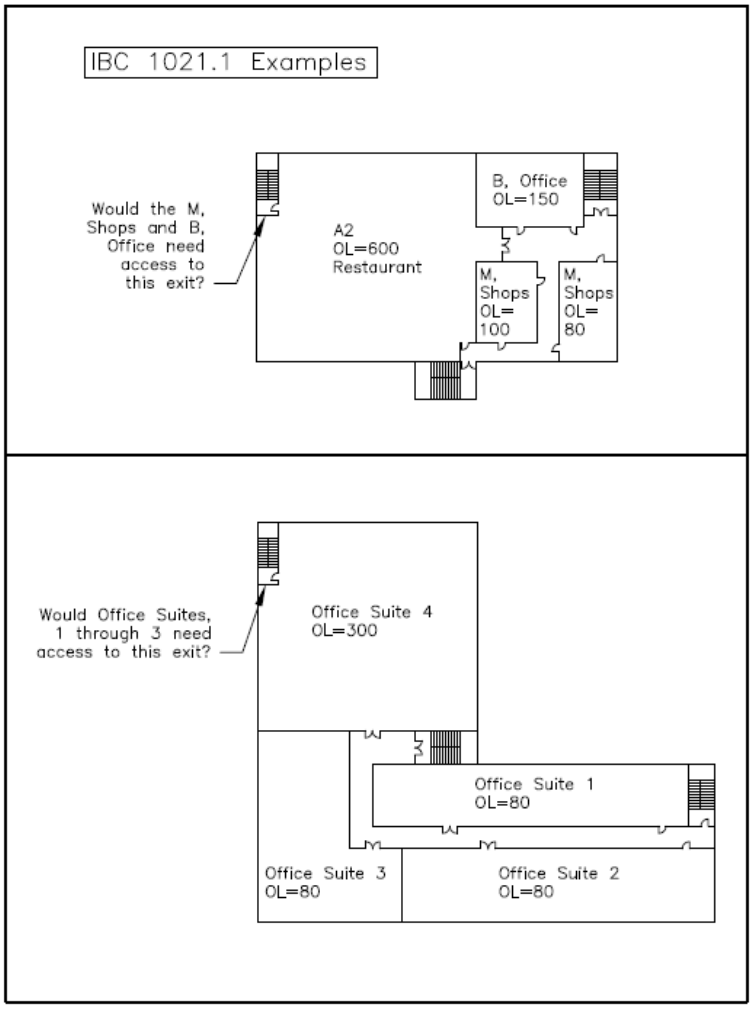
Even though this language was confusing, it did provide some relief from the provisions of 1019.1 which stated “All rooms and spaces within each story shall be provided with and have access to the minimum number of approved independent exits required by Table 1019.1 based on the occupant load of the story…”

It is simply not possible nor is it always necessary with a number of building configurations to provide access to all required exits from all portions of a story (see attached examples). This is true in cases where one or more of the required exits are located independently within a tenant space such as an open office space, large assembly tenant or other portion of the building that is not open for access to all of the other occupants of the building.

This code change proposal provides an exception which allows exits serving a specific area or portion of a building to not be accessible to all other portions of the building so long as:

the overall number of exits are provided from the story as required by Table 1021.1,
access to exits from individual spaces comply with Section 1015.1, and
all spaces within each portion of a story shall have access to the minimum number of approved independent exits as specified in Table 1021.1 based on the occupant load of that portion of the story

The column headings of Table 1021.1 are also revised to acknowledge the number of exits required could also apply to a portion of a story as indicated in the proposed exception.



Cost Impact: This proposed code change will save cost of construction by creating an exception which clarifies the requirements of E113-06/07 which (depending on how interpreted) could cause the loss of floor space and construction of corridors or other modifications to connect all areas of a story with all exits including those which may be located in a specific area or portion of the story.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Richardson-E1-1021.1

E121–09/10

1021.2, Table 1021.2, Table 1021.2(1) (New); [IFC [B] 1021.2, Table 1021.2, Table 1021.2(1) (New)]

Proponent: Wayne R. Jewell, CBO, Department of Building and Safety Engineering, City of Southfield and Sam Dorchen, representing Martin Associates, Inc.

1. Revise as follows:

1021.2 (IFC [B] 1021.2) Single exits. ~~Only one exit~~ Single exits shall be ~~required~~ permitted from Group R-3 occupancy buildings, Group R-2 dwelling units as indicated in Table 1021.2(1) or from stories of other buildings as indicated in Table 1021.2(2). Occupancies shall be permitted to have a single exit ~~in buildings~~ when otherwise required to have more than one exit if the area~~s~~ served by the single exit ~~do~~ does not exceed the limitations of Tables 1021.2(1) or 1021.2(2). Mixed occupancies shall be permitted to be served by single exits provided each individual occupancy complies with the applicable requirements of Tables 1021.2(1) or 1021.2(2) for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1. ~~Basements~~ A basement provided with a single exit shall not be located more than one story below grade plane.

2. Add new Table as follows:

TABLE 1021.2(1) (IFC [B] TABLE 1021.1(1))
SINGLE EXITS FOR R-2 OCCUPANCIES

STORY	OCCUPANCY	MAXIMUM NUMBER OF DWELLING UNITS PER FLOOR SERVED BY A SINGLE EXIT AND TRAVEL DISTANCE TO THE EXIT
Basement, first, second or third story	R-2[a]	4 dwelling units and 125 feet travel distance

For SI: 1 foot = 3048 mm.

a. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1029.

3. Revise as follows:

TABLE 1021.2(2) (IFC [B] TABLE 1021.1(2))
~~STORIES WITH ONE EXIT~~ SINGLE EXITS FOR OTHER OCCUPANCIES

STORY	OCCUPANCY	MAXIMUM OCCUPANTS ~~(OR DWELLING UNITS)~~ PER FLOOR AND TRAVEL DISTANCE TO THE EXIT
First story or basement	A, B[d], E[e], F[d], M, U, S[d]	49 occupants and 75 feet travel distance
	H-2, H-3	3 occupants and 25 feet travel distance
	H-4, H-5, I, R-1, R-2[c,f], R-4	10 occupants and 75 feet travel distance
	S[a]	29 occupants and 100 feet travel distance
Second story	B[b], F, M, S[a]	29 occupants and 75 feet travel distance
	~~R-2~~	~~4 dwelling units and 50 feet travel distance~~
~~Third story~~	~~R-2[e]~~	~~4 dwelling units and 50 feet travel distance~~

For SI: 1 foot = 3048 mm.

a. For the required number of exits for parking structures, see Section 1021.1.1.
b. For the required number of exits for air traffic control towers, see Section 412.3.
c. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1029.
d. Group B, F and S Occupancies in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall have a maximum travel distance of 100 feet.
e. Day care occupancies shall have a maximum occupant load of 10.
f. This Table is used for R-2 occupancies consisting of sleeping units. For R-2 occupancies consisting of dwelling units, use Table 1021.2(1).

Reason: This proposal is intended to follow up on Code Proposals E136-06/07 and E127-07/08 approved in the past 2 code cycles to clarify the application of single exit requirements under Section 1021.2, "Single exits", and Section 1015.1, "Exits or exit access doorways from spaces".

The revisions to Table 1021.2 splitting the Table into two Tables addresses changes to the Code dealing with the common path of travel for sprinklered R-2 occupancies that consists of dwelling units now required by the code to be sprinklered and not considered in original drafting of Table 1021.2 in the first edition of the IBC. Section 1014.3 Exception #4 of the current code permits up to 125' common path of travel to an exit in sprinklered R-2 occupancies. This proposed revision to Table 1021.2 would be consistent with that requirement. The existing Table has been clarified to apply to the R-1, R-2 and R-4 occupancies that consists of sleeping units, and clarified not to be applicable to R-3 which have been, and continue to be, permitted to have a single exit based on the text in Section 1021.2.

The original Table 1021.2 was placed in the 2000 edition of the Code when R-2 occupancies were not required to be sprinklered and the original travel distance numbers in Table 1021.2 were based on the non-sprinklered requirements. From a life safety aspect, the application of this revision would be equal to, if not considered better than; the presently permitted means of egress for a two exit R-2 occupancy with a typical exit access corridor and exit stairway at each end. The current code will allow a common path of travel of 125' and a total maximum travel distance to one of the exits of 250' (Table 1016.1). This code proposal would reasonably permit multiple groups of 4 dwelling units on a story as long as the design complies with the limitation of 125 feet of travel distance to a single exit provided it complies with the height and area limitations in Chapter 5 and Table 503. For the single exit provisions under this code proposal, the maximum travel distance permitted would be 50% less than presently permitted for a 2 exit R-2 building. The dwelling units' horizontal and vertical separations and stair enclosure requirements are the same regardless of the number of exits. The single exit provisions would still retain the emergency window requirement (Footnote "c" under the existing Table 1021.2 which would become Footnote "a" under the new Table 1021.2(1)) that is not required for a 2 exit R-2 building.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Jewell-Dorchen-E1-1019.2

E122–09/10
1021.2 (IFC [B] 1021.2); R311.4

Proponent: Christine Reed and Stuart Tom, P.E., CBO, representing the California Fire Chiefs Association and the Los Angeles Basin Chapter, ICC; Jonathan C. Siu, representing City of Seattle, Department of Planning and Development

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC MEANS OF EGRESS COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

Revise as follows:

1021.2 (IFC [B] 1021.2) Single exits. ~~Only one exit shall be required from Group R-3 occupancy buildings or from stories of other buildings as indicated in Table 1021.2.~~ Occupancies shall be permitted to have a single exit in buildings otherwise required to have more than one exit if the areas served by the single exit do not exceed the limitations of Table 1021.2. Mixed occupancies shall be permitted to be served by single exits provided each individual occupancy complies with the applicable requirements of Table 1021.2 for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1. Basements with a single exit shall not be located more than one story below grade plane.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R311.4 Vertical egress. Egress from habitable levels including habitable attics and basements not provided with an egress door in accordance with Section R311.2 shall be by ~~a~~ one or more ramps in accordance with Section R311.8 or ~~a~~ one or more stairways in accordance with Section R311.7 or both. Habitable levels larger than 1,000 square feet (92.9 m^2) located more than one story above or below an egress door shall be provided with not less than two means of egress.

Reason:
PART I –Section 1015.1 and Section 1021.1 both contain identical, very specific, exception language that allows Group R-3 occupancies to be permitted with one means of egress provided the occupant load is limited to a maximum of 20 and the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. As currently written, Section 1021.2 creates two (2) potential conflicts.

In one case, a potential conflict arises if the stricken sentence remains because of the reference "… as indicated in Table 1021.2". Table 1021.2 limits the number of occupants on the first story or basement of Group R occupancies to a maximum of 10 and a maximum travel distance of 75 feet. This conflict would result in the severe limitation of the size of 1-story Group R-3 occupancies with one means of egress to only 2,000 square feet, which is contrary to Sections 1015.1 and 1021.1 which allow up to 4,000 square feet in buildings equipped throughout with an automatic sprinkler system.

In the second case, a potential conflict arises if the stricken sentence remains because some readers might ignore the reference " … as indicated in Table 1021.2" and provide only one means of egress for Group R-3 occupancy buildings regardless of size. This would be in conflict with Sections 1015.1 and 1021.1 which impose a size limitation of 4,000 square feet based upon the maximum occupant load limit of 20, considering the occupant load factor of 200 square feet per occupant as indicated in Table 1004.1.1.

This proposal eliminates a confusing sentence within Section 1021.2, that is currently in conflict with Sections 1015.1 and 1021.1, thereby making all three sections consistent.

PART II –The IRC fails to address the fact that a single exit may not be sufficient for every R-3 occupancy One- or Two- Family Dwelling. While a single exit may be suitable for most dwellings, the same cannot be said of all dwellings. The IRC establishes the standards that will also apply to very large dwellings and dwellings constructed on steep lots, where egress design becomes more critical.

In comparison, the IBC addresses the need for a second means of egress through Sections IBC 1015.1 and IBC 1021.1. Both of these provisions will require a second means of egress from a Group R-3 occupancy if the occupant load exceeds 20 persons. Furthermore, since the IBC utilizes the 3-part means of egress design concept, Group R-3 occupancies regulated by the IBC would be required to have both means of egress comply with all applicable provisions of IBC Chapter 10.

Since the IRC does not utilize the 3-part means of egress concept nor the occupant load concept, it is not practical to use the same approach as the IBC in establishing whether a second means of egress is required in R-3 occupancies up to 3-stories in height. Furthermore, the need for a second means of egress is most critical on floors that are located more than one story above or below an egress door. This proposal does not require a second means of egress from 1- or 2- story Group R-3 occupancies because the length of vertical egress travel is inherently limited to a

maximum of one story in such buildings. This proposal will only require a second means of egress from habitable levels that are located more than one level above or below the egress door, and only if such levels exceed 1,000 square feet in area. Egress from such occupied floor levels becomes more critical because of the combination of increased vertical egress travel combined with the increased travel distance within a large floor area exceeding 1,000 square feet.

The IRC also fails to adequately address egress from Group R-3 occupancy dwellings constructed on steep hillside lots, especially lots located on the down-slope side of a street. Many jurisdictions throughout the country have steep hillside residential areas, where it is common to construct homes on the down-slope side of a street with the topmost floor located at street level and two additional floors located below street level. Often such down-slope lots are so steep that there is no usable rear yard. Consequently, homes constructed on such steep terrain typically do not have a rear door (that could serve as a second means of egress), because a door that leads to a steep and unusable rear yard is not likely to be installed. This proposal would require such occupied levels that are greater than 1,000 square feet in area to be provided with a second means of egress.

This code change proposal will not affect the majority of Group R-3 occupancy One- and Two- Family Dwellings regulated by the IRC.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:tom-reed-siu-E1-1021.2

E123–09/10
1021.2 (IFC [B] 1021.2)

Proponent: Maureen Traxler representing City of Seattle, representing Seattle Dept of Planning & Development

Revise as follows:

1021.2 (IFC [B] 1021.2) Single exits. Only one exit shall be required from Group R-3 occupancy buildings or from stories of other buildings as indicated in Table 1021.2. Occupancies shall be permitted to have a single exit in buildings otherwise required to have more than one exit if the areas served by the single exit do not exceed the limitations of Table 1021.2. ~~Mixed occupancies shall be permitted to be served by single exits provided each individual occupancy complies with the applicable requirements of Table 1021.2 for that occupancy. Where applicable, cumulative occupant loads from adjacent occupancies shall be considered in accordance with the provisions of Section 1004.1.~~ Basements with a single exit shall not be located more than one story below grade plane.

Mixed occupancies shall be permitted to be served by single exits provided each individual occupancy complies with the applicable requirements of Table 1021.2 for that occupancy. In each story of a mixed occupancy building, the maximum number of occupants served by a single exit shall be such that the sum of the ratios of the calculated number of occupants of the space divided by the allowable number of occupants for each occupancy shall not exceed one.

Reason: As written, the provision would allow a single exit from a mixed occupancy story with as much as twice the occupant load allowed for a single occupancy story. For example, if on the second story of a building there are two tenant spaces, one is a B and one is an M, the B has 28 occupants and the M has 28 occupants. Both tenant spaces have a single door to a single exit stairway. Each of these occupancies complies with the limits of Table 1021.2, but cumulatively there are now 56 people using a single exit. The only way to prevent this substantial expansion of the number of occupants relying on a single exit, is to use a 'unity' formula that allows a calculation to see if the number of occupants is reasonable. This proposal moves the sentences regarding mixed occupancy out of the first paragraph and places them in their own paragraph. The new third sentence is added establishing a unity formula for mixed occupancies sharing the same single exit. This is based on the provision in Section 508.4.2 used to determine the allowable area of a separated mixed occupancy building. Finally, this will work in conjunction with the concept of a single story multiple tenant building where each tenant space has its own exterior exit. If someone chooses to have 2 tenant spaces of different occupancies share the same exit, then this added sentence would apply. But if that is too restrictive, they can always put in individual exits from each space.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Traxler-E3-1021.2

E124–09/10
1022.3, 1022.4 (IFC [B] 1022.3, 1022.4)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

1022.3 (IFC [B] 1022.3) Openings ~~and penetrations~~. Exit enclosure opening protectives shall be in accordance with the requirements of Section 715.

Openings in exit enclosures other than unprotected exterior openings shall be limited to those necessary for exit access to the enclosure from normally occupied spaces and for egress from the enclosure. There shall be no communicating openings, whether protected or not, between adjacent exit enclosures.

Elevators shall not open into an exit enclosure.

1022.4 (IFC [B] 1022.4) Penetrations. Penetrations into and ~~openings~~ through an exit enclosure are prohibited except for ~~required exit doors,~~ equipment and duct work necessary for independent pressurization, sprinkler piping, standpipes, electrical raceway for fire department communication and electrical raceway serving the exit enclosure and terminating at a steel box not exceeding 16 square inches (0.010 m^2). Such penetrations shall be protected in accordance with Section 713.

There shall be no penetrations ~~or communicating openings~~, whether protected or not, between adjacent exit enclosures.

Reason: The current title of Section 1022.3 is somewhat misleading in that it references "penetrations." No provisions in Section 1022.3 apply to penetrations and there are no cross-references to Section 713. Section 1022.4, however, does address the penetration provisions applicable to exit enclosures. Technical references to openings in Section 1022.4 have either been removed or relocated to Section 1022.3. For instance, the reference to "required exit doors" in the first sentence has been eliminated because that concern is addressed in the second paragraph of Section 1022.3 that limits openings into an exit enclosure to those necessary for egress. Approval of this proposal will reduce confusion and assist users in the correct identification of applicable exit enclosure opening and penetration requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Keith-E8-1022.3

E125–09/10
1022.3 (IFC [B] 1022.3)

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

1022.3 (IFC [B] 1022.3) Openings and penetrations. Exit enclosure opening protectives shall be in accordance with the requirements of Section 715.

Openings in exit enclosures other than unprotected exterior openings shall be limited to those ~~necessary~~ required for exit access to the enclosure from normally occupied spaces and for egress from the enclosure.

Exception: Protected openings shall be permitted in exit enclosure at the level of exit discharge in accordance with Section 715.

Elevators shall not open into an exit enclosure.

Reasons: The exception is to allow openings from ground level lobbies into exit enclosures. This opening may not be necessary for exit access from the lobby. However, the way the code language is, only openings "necessary" for exit access can open into exit enclosure. This exception will allow any opening, necessary or otherwise, at the exit discharge, to open into exit enclosure. The word "necessary" could be construed as subjective. However, the word "required" is more definitive and has been used in the code more consistently.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Maiel-E7-1022.3

E126–09/10
1022.4, 1023.6 (IFC [B] 1022.4, 1023.6)

Proponent: Matthew Davy, PE, Schirmer Engineering Corporation, representing self

Revise as follows:

1022.4 (IFC [B] 1022.4) Penetrations. Penetrations into and openings through an exit enclosure are prohibited except for required exit doors, equipment and ductwork necessary for independent ventilation or pressurization, sprinkler piping, standpipes, electrical raceway for fire department communication systems and electrical raceway serving the exit enclosure and terminating at a steel box not exceeding 16 square inches (0.010 m^2). Such penetrations shall be protected in accordance with Section 713. There shall be no penetrations or communication openings, whether protected or not, between adjacent exit enclosures.

> **Exception:** Membrane penetrations shall be permitted on the outside of the exit enclosure. Such penetrations shall be protected in accordance with Section 713.3.2.

1023.6 (IFC [B] 1023.6) Penetrations. Penetrations into and openings through an exit passageway are prohibited except for required exit doors, equipment and ductwork necessary for independent pressurization, sprinkler piping, standpipes, electrical raceway for fire department communication and electrical raceway serving the exit passageway and terminating at a steel box not exceeding 16 square inches (0.010m^2). Such penetrations shall be protected in accordance with Section 713. There shall be no penetrations or communicating openings, whether protected or not, between adjacent exit passageways.

> **Exception:** Membrane penetrations shall be permitted on the outside of the exit passageway. Such penetrations shall be protected in accordance with Section 713.3.2.

Reason: The purpose of Sections 1022.4 and 1023.6 is to limit through penetrations into an exit enclosure or exit passageway; however, membrane penetrations should be permitted on the outside of the exit enclosure or exit passageway. As currently written, a pull station next to a door into the stair, fire hose cabinets, fire extinguisher cabinets, request-to-exit devices related to access control locks, notification appliances, etc., are not permitted on the outside of the exit enclosure. This exceptions needs to clarify the intent of Sections 1022.4 and 1023.6.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Davy-E1-1023.5

E127–09/10
1022.8 (IFC [B] 1022.8)

Proponent: Manny Muniz, California Deputy State Fire Marshal (Ret.), representing self

Revise as follows:

1022.8 (IFC [B] 1022.8) ~~Floor~~ Stairway identification signs. A sign shall be provided at each floor landing in exit enclosures connecting more than three stories designating the floor level, the terminus of the top and bottom of the exit enclosure and the identification of the stair or ramp. The signage shall also state the story of, and the direction to, the exit discharge and the availability of roof access from the enclosure for the fire department. The sign shall be located 5 feet (1524 mm) above the floor landing in a position that is readily visible when the doors are in the open and closed positions. ~~Floor level identification~~ In addition to the stairway identification sign, a floor level sign~~s~~ in ~~tactile~~ raised characters and braille complying with ICC A117.1 shall be located at each floor level landing adjacent to the door leading from the enclosure into the corridor to identify the floor level.

1022.8.1 (IFC [B] 1022.8.1) Signage requirements. Stairway identification signs shall comply with all of the following requirements:

1. The signs shall be a minimum size of 18 inches (457 mm) by 12 inches (305 mm).
2. The letters designating the identification of the stair enclosure shall be a minimum of 11/2 inches (38 mm) in height.
3. The number designating the floor level shall be a minimum of 5 inches (127 mm) in height and located in the center of the sign.
4. All other lettering and numbers shall be a minimum of 1 inch (25 mm) in height.
5. Characters and their background shall have a nonglare finish. Characters shall contrast with their background, with either light characters on a dark background or dark characters on a light background.
6. When signs required by Section 1022.8 are installed in interior exit enclosures of buildings subject to Section 1024, the signs shall be made of the same materials as required by Section 1024.4.

Reason: Sections 1022.8 and 1022.8.1 contain three (3) different sign names. “Floor identification signs” in the title of Section 1022.8, “Floor level identifications signs” in the fourth sentence of Section 1022.8 and “Stairway identification signs” in the first sentence of Section 1022.8.1”. The actual intent of this section is that there be two signs, one for the sight-impaired and one for people who can read signs. The first clarification is to use the term “stairway identification sign” as found in Section 1022.8.1. This will clarify what the sign should be called and will be consistent with the NFPA 101 Life Safety Code description of this sign. The second clarification is to make it clear that in addition to the stairway identification sign, a floor level sign in raised characters and braille complying with ICC A117.1 shall be located at each floor level landing adjacent to the door leading from the enclosure into the corridor to identify the floor level.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Muniz-E2-1022.8

E128–09/10
1022.9 (IFC [B] 1022.9)

Proponent: Maureen Traxler representing City of Seattle, representing Seattle Dept of Planning & Development

Revise as follows:

1022.9 (IFC [B] 1022.9) Smokeproof enclosures and pressurized stairways. ~~In buildings~~ Where required by Sections 403.5.4 or 405.7.2 ~~to comply with Section 403 or 405~~, ~~each of the~~ exit enclosures ~~serving a story with a floor surface located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access or more than 30 feet (9144 mm) below the finished floor of a level of exit discharge serving such stories~~ shall be smokeproof enclosures or pressurized stairways in accordance with Section 909.20.

Reason: As written, this provision combines the high-rise and underground building requirements, thus making them unclear. It could be mistakenly read that in a high-rise building, stair enclosures serving parking garage stories more than 30 feet below the level of exit discharge and meeting the exceptions of 405.1 would need to be smokeproof enclosures or pressurized stairways, and that is not the intent of the code. This proposal removes the language that describes which exit enclosures need to be smokeproof or pressurized and directly references the high-rise and underground building sections instead (Sections 403.5.4 and 405.7.2).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Traxler-E4-1022.9

E129–09/10
1023.3 (IFC [B] 1023.3)

Proponent: Michael DiMascio, Arup, representing self

Revise as follows:

1023.3 (IFC [B] 1023.3) Construction. Exit passageway enclosures shall have walls, floors and ceilings of not less than 1-hour fire-resistance rating~~, and not less than that required for any connecting exit enclosure~~. When acting as a horizontal continuation of an exit enclosure on the level of exit discharge, the fire-resistance rating of the exit

passageway shall not be less than the rating required for the exit enclosure. Exit passageways shall be constructed as fire barriers in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

Reason: This amendment is primarily intended as clarification. The present wording uses the term “any connecting exit enclosure”. This has been interpreted to require a 2-hr exit passageway on a floor, other than the level of exit discharge, even when the exit passageway; (1) only provides access to a 2-hr vertical exit enclosure, which in turn continues to exit discharge, (2) only serves the floor on which it is located and (3) is separated from the vertical exit enclosure by 2-hr rated construction and the required opening protectives. This exit passageway is not a “continuation” of the vertical exit enclosure. It provides access to the vertical exit enclosure and is properly separated from the vertical exit enclosure. The level of protection provided is commensurate with the hazard, since the exit passageway is only protecting occupants from the hazards on the floor they are exiting. Whereas the vertical exit enclosure provides protection from the hazards on all floors it connects. In fact the code only requires a 1 hour rated vertical exit enclosure when the enclosure connects three floors or less.

This amendment provides needed clarification to the level of protection intended.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Dimascio-E1-1023.3

E130–09/10
1002.1, 1023.4 (IFC [B] 1002.1, 1023.4)

Proponent: Michael DiMascio, Arup; representing self

Revise as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

EXIT PASSAGEWAY. An exit component that is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives, and provides for a protected path of egress travel in a horizontal direction to an exit or an exit discharge ~~or the public way~~.

1023.4 (IFC [B] 1023.4) Termination. Exit passageways on the level of exit discharge shall terminate at an exit discharge ~~or a public way~~. Exit passageways on other levels shall terminate at an exit.

Reason: This amendments are primarily intended as clarification. The present wording does not define the use of exit passageways on levels other than the level of exit discharge. This means it does not address the use of exit passageways in malls and on upper and lower floors in buildings with large floor plates. In malls, exit passageways are frequently used between the mall itself and the vertical exit enclosure. (See Section 402.4.5 and 402.4.6) Using exit passageways on levels other than the level of exit discharge is a common practice where the travel distance to the vertical exit enclosure exceeds the allowable travel distance. The removal of the term, "or a public way" is for consistency. Based on the definition of means-of-egress, you must pass through an exit discharge before you reach a public way. Since the exit passageway is an extension of the exit enclosure, it must end at an exit discharge when located on the level of exit discharge.

This amendment provides needed clarification as to when the exit passageway must terminate at an exit discharge and clarifies it would not end at a public way.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Dimascio-E2-1023.4

E131–09/10
1024.4 (IFC [B] 1024.4)

Proponent: Lee C. DeVito, PE, FIREPRO Incorporated, representing self

Revise as follows:

1024.4 (IFC [B] 1024.4) ~~Self-luminous and photoluminescent~~ Luminescent materials. Luminous egress path markings shall be permitted to be made of any material, including paint, ~~provided that an electrical charge is not required to maintain the required luminance~~. Such materials shall include, but are not limited to, self-luminous materials ~~and~~ photoluminescent materials and electroluminescent materials. Materials shall comply with either:

1. UL 1994; or
2. ASTM E 2072, except that the charging source shall be 1 foot-candle (11 lux) of fluorescent illumination for 60 minutes, and the minimum luminance shall be 30 millicandelas per square meter at 10 minutes and 5 millicandelas per square meter after 90 minutes.

Reason: Electrical systems provide the building management with more flexibility with the operation of the exit path marking systems.

Electrical systems do not need backup lighting which will allow building managers to control lighting. Furthermore, energy savings and Green/LEEDS requirements (for example thru the use of motion sensor lighting) may be further achieved with electroluminescent materials, as separate, continuously operational light sources are not required for charging purposes. A later section of this code, 1024.5 Illumination, requires means of egress illumination for photoluminscent exit path markings is required for at least 60 minutes prior to periods when the building is occupied. Electroluminescent exit path markings would not require this.

Electrical systems can be operated at any time as they have available power and they are protected with battery standby support. Therefore, the building management can utilize the electrical systems when ever there is an alarm activity or other situation in the building, whether the building power is available or not. Self luminous and photoluminescent materials only provide lighting when the background lighting is limited.

Electrical systems are supervised so the building management will know that there is a problem. Self-luminous materials and photoluminescent materials are not supervised, so they can be damaged or removed and no one is notified until a manual check is performed on the system. Whereas the systems are required in some high-rise buildings manual inspection will be time consuming and possibly burdensome, which may mean that self luminous or photoluminescent systems may not be inspected.

The building management can utilize the flexibility of electrical systems to provide further information on the availability or disruption of an egress path.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Devito-E1-1024.4

E132–09/10

707.3.10 (New), 1026 (IFC [B] 1026)

Proponent: Ron Clements, Chesterfield County Virginia Building Inspection Department, representing self

1. Revise as follows:

SECTION 1026 (IFC [B] 1026)
EXTERIOR EXIT STAIRWAYS ~~RAMPS~~ AND RAMPS ~~STAIRWAYS~~

1026.1 (IFC [B] 1026.1) General ~~Exterior exit ramps and stairways.~~ Exterior exit stairways ~~ramps~~ and ramps ~~stairways~~ serving as an exit component in the ~~element of a~~ ~~required~~ means of egress shall comply with this section.

~~Exception~~ Exceptions: ~~Exterior exit ramps and stairways for outdoor stadiums complying with Section 1022.1, Exception 2.~~

1. Exits in buildings of Group A-5 where all portions of the means of egress are essentially open to the outside are not required be comply with this section.
2. Stairways in open parking structures that serve only the parking structure are not required to comply with this section.

1026.2 (IFC [B] 1026.2) Occupancy and height limitations ~~Use in a means of egress.~~ ~~Exterior exit stairways shall not be used as an element of a required means of egress for occupancies in Group I-2. For occupancies in other than Group I-2,~~ In other than Group I-2 occupancies, exterior exit stairways ~~ramps~~ and ramps ~~stairways~~ shall be permitted as ~~an element of~~ a required ~~means of egress~~ exit ~~for~~ in buildings not ~~exceeding~~ more than six stories above grade plane in height or having occupied floors more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access.

1026.3 (IFC [B] 1026.3) Open side. Exterior exit stairways ~~ramps~~ and ramps ~~stairways~~ ~~serving as an~~ ~~element of a required means of egress~~ shall be open to a yard, court or public way on at least one side. ~~An~~ The open side shall have a minimum ~~of~~ 35 square feet (3.3 m^2) of aggregate open area adjacent to each floor level and the level of each intermediate landing. The required open area shall be located not less than 42 inches (1067 mm) above the adjacent floor or landing level.

~~**1026.4 (IFC [B] 1026.4) Side yards.** The open areas adjoining exterior exit ramps or stairways shall be either yards, courts or public ways; the remaining sides are permitted to be enclosed by the exterior walls of the building.~~

~~1026.5~~ 1026.4 (IFC [B] ~~1026.5~~ 1026.4) Fire separation distance ~~Location~~. Exterior exit stairways and ramps ~~and stairways~~ shall ~~be located in accordance with Section 1027.3.~~ have a fire separation distance of not less than 10 feet. The outermost vertical plane of the exterior stair assembly shall be considered the building face for the fire separation distance measurement.

~~1026.6~~ 1026.5 (IFC [B] ~~1026.6~~ 1026.5) Exterior ramps and stairway protection. Exterior exit stairways and ramps ~~and stairways~~ shall be separated from the interior of the building with fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. Such separation shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories ~~as required in Section 1022.1~~. Openings in such fire barriers shall be limited to those necessary for egress from normally occupied spaces.

Where the sides of the exterior stairway or ramp are exposed to other parts of the building at an angle of less than 180 degrees (3.14 rad), the exterior walls of the building within 10 feet (3048 mm) horizontally of the exterior stairway or ramp exposed sides shall have a fire-resistance rating of not less than 1 hour or the exposed side of the exterior stairway must be a wall constructed as a fire barrier having a fire-resistance rating of not less than 1 hour. Openings within the 1 hour fire-resistive rated exposure protection shall be protected by opening protectives having a fire protection rating of not less than 3/4-hour. The fire rated construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the topmost landing of the stairway or to the roof line, whichever is lower.

Exceptions:

1. In other than Group R-1 or R-2 occupancies, separation from the interior of the building is not required ~~for occupancies, other than those in Group R-1 or R-2,~~ in buildings that are no more than two stories above grade plane where a level of exit discharge serving such occupancies is the first story above grade plane.
2. Separation from the interior of the building is not required where the exterior exit stairway ~~ramp~~ and ramp ~~stairway~~ is served by an exterior ramp ~~and/~~or balcony that connects two remote exterior stairways or other approved exits, with a perimeter that is not less than 50 percent open. To be considered open, the opening shall be a minimum of 50 percent of the height of the enclosing wall, with the top of the openings no less than 7 feet (2134 mm) above the top of the balcony.
3. Separation from the interior of the building is not required for an exterior exit stairway ~~ramp~~ and ramp ~~stairway~~ serving ~~located in~~ a building ~~or structure~~ that is permitted to have unenclosed ~~interior~~ stairways in accordance with Section 1022.1.
4. Separation from the interior of the building is not required for exterior exit stairways ~~ramps~~ and ramps ~~stairways~~ connected to open-ended corridors provided that Items 4.1 through 4.4 are met:
   - 4.1. The building, including corridors, exit stairways ~~ramps and~~ or ramps ~~stairs~~, shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
   - 4.2. The open-ended corridors comply with Section 1018.
   - 4.3. The open-ended corridors are connected on each end to an exterior exit ramp or stairway complying with Section 1026.
   - 4.4. At any location in an open-ended corridor where a change of direction exceeding 45 degrees (0.79 rad) occurs, a clear opening of not less than 35 square feet (3.3 m^2) or an exterior exit stairway ~~ramp~~ and ramp ~~stairway~~ shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

2. Add new text as follows:

707.3.10 Exterior Exit Stairways and ramps. The fire-resistance rating of the fire barrier separating building areas from an exterior exit stairway and ramp shall comply with Section 1026.5.

Reason: This is an attempt to clean up the exterior exit stair provisions. First the majority of exterior exit elements that are designed in accordance with this section are stairs, not ramps therefore Stairway has been placed before Ramp.

Section 1026.1 has been re-titled as General so the title is not a restatement of the overall section title and follows the common code format. The exception for open exterior stairways have been revised to allow exterior exit stairways that are attached to open buildings to not have to meet the provisions in this section since the danger of smoke accumulation in the stairway is not there.

Section 1026.2 changes are all editorial.

Section 1026.4 was deleted and the requirement for the stair to be open to a yard was added to Section 1026.3.

Section 1026.5 Location was renamed separation distance and the 10 fire separation distance based on Section 1027.2 was included in section 1026.5 and the reference to Section 1027.3 was removed. Exterior exit stairs are not part of the exit discharge therefore it is incorrect and confusing to reference the separation requirements on exit discharge requirements. Furthermore a cross reference was added for Section 705.2.

Section 1026.6 was modified to include the fire rated protection requirements for an exterior stair in the exterior stair section and remove the reference to interior exit stairs. These are not interior exit stairs and the protection requirements should be available in the exterior exit stair section specific to exterior exit stairs.

Section 707.3.10 was added in keeping with the organization of Section 707.3 listing as a cross reference all of the locations fire barriers are used.

Cost Impact: This proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Clements-E5-1026

E133–09/10
1026.6 (IFC [B] 1026.6)

Proponent: Anne VonWeller, Murray City, representing the Utah Chapter of the International Code Council

Revise as follows:

1026.6 (IFC [B] 1026.6) Exterior ramps and stairway protection. Exterior exit ramps and stairways shall be separated from the interior of the building as required in Section 1022.1. Openings shall be limited to those necessary for egress from normally occupied spaces.

Exceptions:

1. Separation from the interior of the building is not required for occupancies, other than those in Group R-1 or R-2, in buildings that are no more than two stories above grade plane where a level of exit discharge serving such occupancies is the first story above grade plane.
2. Separation from the interior of the building is not required where the exterior ramp or stairway is served by an exterior ramp or balcony that connects two remote exterior stairways or other approved exits, with a perimeter that is not less than 50 percent open. To be considered open, the opening shall be a minimum of 50 percent of the height of the enclosing wall, with the top of the openings no less than 7 feet (2134 mm) above the top of the balcony.
3. Separation from the interior of the building is not required for an exterior ramp or stairway located in a building or structure that is permitted to have unenclosed interior stairways in accordance with Section 1022.1 or Exceptions 3 and 4 of Section 1016.1.
4. Separation from the interior of the building is not required for exterior ramps or stairways connected to open-ended corridors, provided that Items 4.1 through 4.4 are met:
   - 4.1. The building, including corridors and ramps and stairs, shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
   - 4.2. The open-ended corridors comply with Section 1018.
   - 4.3. The open-ended corridors are connected on each end to an exterior exit ramp or stairway complying with Section 1026.
   - 4.4. At any location in an open-ended corridor where a change of direction exceeding 45 degrees (0.79 rad) occurs, a clear opening of not less than 35 square feet (3.3 m^2) or an exterior ramp or stairway shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

Reason: In the 2009 Edition a distinction has been made between 'exit' stairways and ramps and 'exit access' stairways and ramps. In the past all of the exceptions for unenclosed stairways and ramps occurred in Section 1022.1. Now some of those exceptions are located in Section 1022.1 and some in Section 1016. This change is to lead user to the new location for the two exceptions relocated to Section 1016.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Vonweller-E1-1023.6

E134–09/10
1026.6 (IFC [B] 1026.6)

Proponent: Rej Simenson, City of Aurora Building Codes Division, Aurora, Colorado

Revise as follows:

1026.6 (IFC [B] 1026.6) Exterior ramps and stairway protection. Exterior exit ramps and stairways shall be separated from the interior of the building as required in Section 1022.1. Openings shall be limited to those necessary for egress from normally occupied spaces.

Exceptions:

1. Separation from the interior of the building is not required for occupancies, other than those in Group R-1 or R-2, in buildings that are no more than two stories above grade plane where a level of exit discharge serving such occupancies is the first story above grade plane.
2. Separation from the interior of the building is not required where the exterior ramp or stairway is served by an exterior ramp or balcony that connects two remote exterior stairways or other approved exits, with a perimeter that is not less than 50 percent open. To be considered open, the opening shall be a minimum of 50 percent of the height of the enclosing wall, with the top of the openings no less than 7 feet (2134 mm) above the top of the balcony.
3. Separation from the interior of the building is not required for an exterior ramp or stairway located in a building or structure that is permitted to have unenclosed interior stairways in accordance with Section 1022.1.
4. Separation from the interior of the building is not required for exterior ramps or stairways connected to open-ended corridors, provided that the adjacent exterior wall and openings comply with Section 1022.6 and Items 4.1 through 4.4 are met:
   - 4.1. The building, including corridors and ramps and stairs, shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.
   - 4.2. The open-ended corridors comply with Section 1018.
   - 4.3. The open-ended corridors are connected on each end to an exterior exit ramp or stairway complying with Section 1026.
   - 4.4. At any location in an open-ended corridor where a change of direction exceeding 45 degrees (0.79 rad) occurs, a clear opening of not less than 35 square feet (3.3 m^2) or an exterior ramp or stairway shall be provided. Where clear openings are provided, they shall be located so as to minimize the accumulation of smoke or toxic gases.

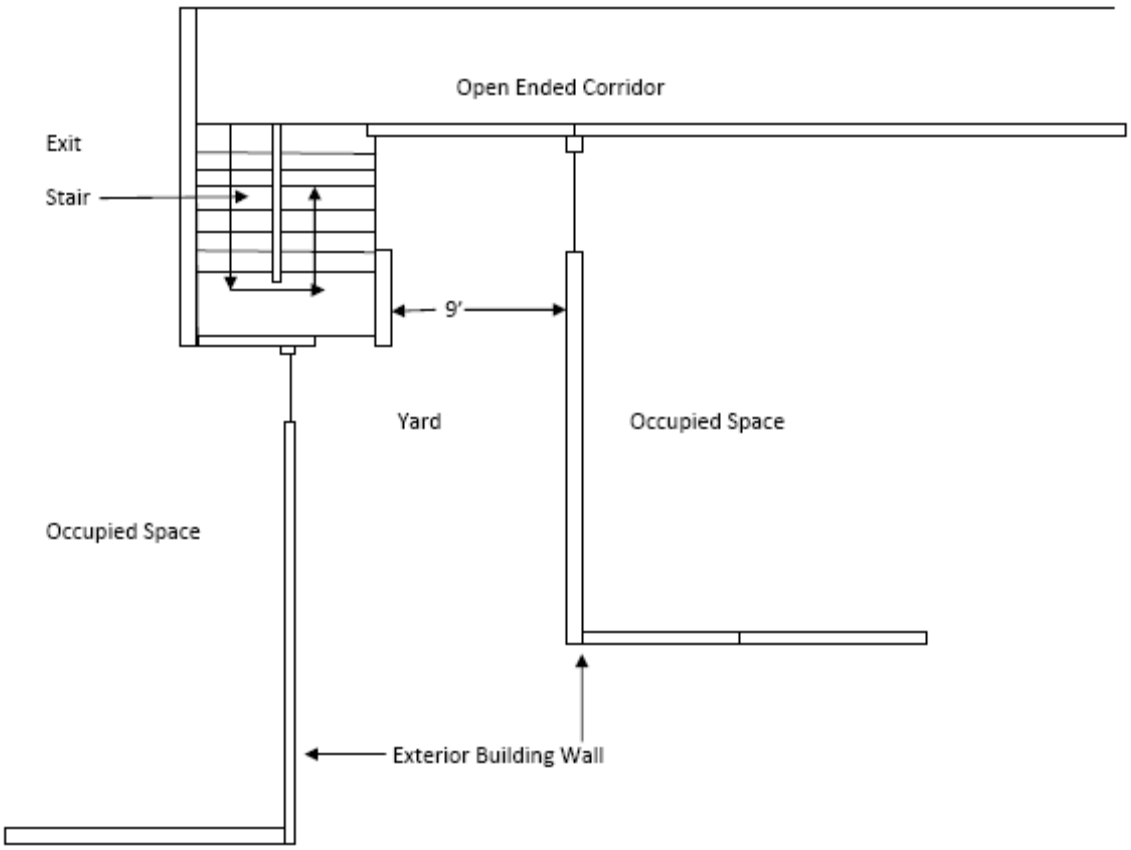
Reason: This code change directs the code user back to Section 1022.6 for the building wall and opening rating requirements adjacent to the exterior exit stairway openings. The 2009 Section 1022.6 requirements protect openings on the exterior of the exit enclosure from fires on the interior of the building that may project through windows or other openings in the exterior building walls at an angle of less than 180 degrees. This code change clarifies the minimum protection for occupants and fire responders using the exit.

The original exception #4 eliminated the interior separation wall and door between the interior corridor and the exterior exit stairway. Separation from the **exterior** building wall at less than 180 degrees is NOT addressed in exception 4 and this has led to varied application of this section to the exterior walls of the building adjacent to the exterior exit stairway when this exception was the end of the code research.

The exterior exit stairway is defined as an exit and the protection of exit enclosures from smoke and fire is addressed in Section 1022.6. This code change makes that code connection for this critical life safety protection within the exception. The designer is directed to that critical reference, so that lesser protection standards are not assumed for openings adjacent to an exterior exit stairway than other vertical exit enclosures. This code change clarifies the minimum exterior wall protection for safe exiting during an emergency for occupants and provides safety to the fire fighters and emergency responders during emergency operations.

The graphics below show an interpretation of this section and the unprotected openings without reference to Section 1022.6 requirements.


APT-2
APT-3
APT-5
APT-7
APT-1
APT-4
APT-6
APT-8



Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Simenson-E1-1026.6

E135–09/10
1027.1 (IFC [B] 1027.1)

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

1027.1 (IFC [B] 1027.1) General. Exits shall discharge directly to the exterior of the building. The exit discharge shall be at grade or shall provide direct access to grade. The exit discharge shall not reenter a building. The combined use of Exceptions 1 and 2 below shall not exceed 50 percent of the number and capacity of the required exits.

Exceptions:

1. A maximum of 50 percent of the number and capacity of exit enclosures is permitted to egress through areas on the level of discharge provided all of the following are met.
   - 1.1 Such exit enclosures egress to a free and unobstructed path of travel to an exterior exit door and such exit is readily visible and identifiable from the point of termination of the exit enclosure.
   - 1.2 The entire area of the level of exit discharge is separated from areas below by construction conforming to the fire-resistance rating for the exit enclosure.
   - 1.3 The egress path from the exit enclosure on the level of exit discharge is protected throughout by an approved automatic sprinkler system. All portions of the level of exit discharge with access to the egress path shall either be protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the ~~enclosure of exits~~ exit enclosure.
2. A maximum of 50 percent of the number and capacity of the exit enclosures is permitted to egress through

a vestibule provided all of the following are met:

~~2.4~~ 2.1 The area is used only for means of egress and exits directly to the outside.

2.2 The vestibule depth from the exterior of the building is not greater than 10 feet (3048 mm) and the vestibule length is not greater than 30 feet (9144 mm).

2.3 The area is separated from the remainder of the level of exit discharge by a fire barrier having a one hour fire-resistance rating. ~~construction providing protection at least the equivalent of approved wire glass in steel frames~~ Doors and windows in the separation walls shall be rated ¾ hour and shall not exceed the size limits specified in Section 707.6. Duct penetrations shall comply with Section 713.1.1, and other penetrations shall comply with Section 713.3.

~~2.1~~ 2.4 The entire area of the vestibule is separated from areas below by construction conforming to the fire-resistance rating for the exit enclosure.

3. Stairways in open parking garages complying with Section 1022.1, Exception 4, are permitted to egress through the open parking garage at their levels of exit discharge.
4. Horizontal exits complying with Section 1025 shall not be required to discharge directly to the exterior of the building.

Reason: Exception item 1.3 is editorially revised to replace the wording "requirements for the enclosure of exits" with "requirements for the "*exit enclosure*". The existing wording is vague because it does not specify the type of exit (exit enclosure) that it intends to require, while the replacement wording matches that used in current items 1.2 and 2.1

In Exception 2, items 2.1 and 2.4 are relocated but their wording is unchanged, and exception items 2.2 and 2.3 are revised with new wording. Exceptions 3 and 4 are unchanged.

Existing item 2.4 is unchanged, but is relocated to the beginning (becomes item 2.1) because it states a primary egress criterion, and because it corresponds to the type of information specified in item 1.1 of Exception 1.

Existing item 2.1 is unchanged, but is relocated to the end (becomes item 2.4).

Existing item 2.2 has the word "vestibule" added before the depth and length dimensions, to clarify that these dimension apply to the vestibule's maximum size.

Existing item 2.3 has its first sentence revised to specify exactly what type of rated wall and what minimum fire resistance must be provided to separate the vestibule from other areas on the level of discharge. Item 2.3 currently only vaguely describes what is intended by making the statement "*construction providing protection at least the equivalent of approved wire glass in steel frames*". Not only does that statement not provide specific guidance regarding wall type or minimum rating, it is also silent regarding the rating of the wire glass or its maximum area.

To remedy this lack of specificity, a new second sentence is added to specify a minimum ¾ hour rating for any door and window openings in the separation wall. That rating is consistent with Table 715.4 for doors in "other fire barriers" having one hour rating, and with Table 715.5 for windows in one hour rated fire barriers. The ¾ hour rating allows wire glass to be used, but places limits on the size of those windows, as specified for ¾ hour wire glass panels in Table 715.5.4. The second sentence also limits total opening area consistent with the limits set forth in Section 707.6 for all fire barrier walls. A new third sentence also specifies that duct penetrations and other penetrations in the separation wall must comply with Sections 713.1.1 and 713.3.

Code users need more specificity regarding the construction of the fire resistive walls surrounding the vestibule permitted in exception 2. Adequate protection of this interior space on the level of discharge is certainly warranted to ensure the safety of occupants during egress and to provide protection of fire personnel entering through the vestibule to use the exit enclosure for rescue or fire suppression. This change intends to bring the necessary specificity into this code provision by providing one hour rated fire barrier walls and ¾ hour rated door or window openings of a size appropriate for the nature of the egress component being protected.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Maiel-E6-1027.1

E136–09/10
1027.1 (IFC [B] 1027.1)

Proponent: Sarah A. Rice, CBO, representing self

Revise as follows:

1027.1 (IFC [B] 1027.1) General. Exits shall discharge directly to the exterior of the building. The exit discharge shall be at grade or shall provide direct access to grade. The exit discharge shall not reenter a building. The combined use of Exceptions 1 and 2 below shall not exceed 50 percent of the number and capacity of the required exits.

Exceptions:

1. A maximum of 50 percent of the number and capacity of the exit enclosures is permitted to egress through areas on the level of discharge provided all of the following are met:
   1.1. Such exit enclosures egress to a free and unobstructed path of travel to an exterior exit door and such exit is readily visible and identifiable from the point of termination of the exit enclosure.

1.2. The entire area of the level of exit discharge is separated from areas below by construction conforming to the fire-resistance rating for the exit enclosure.
1.3. The egress path from the exit enclosure on the level of exit discharge is protected throughout by an approved automatic sprinkler system. All portions of the level of exit discharge with access to the egress path shall either be protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, or separated from the egress path in accordance with the requirements for the enclosure of exits.

2. A maximum of 50 percent of the number and capacity of the exit enclosures is permitted to egress through a vestibule provided all of the following are met:
   2.1. The entire area of the vestibule is separated from areas below by construction conforming to the fire-resistance rating for the exit enclosure.
   2.2. The depth from the exterior of the building is not greater than 10 feet (3048 mm) and the length is not greater than 30 feet (9144 mm).
   2.3. The area is separated from the remainder of the level of exit discharge by construction providing protection at least the equivalent of approved wired glass in steel frames.
   2.4. The area is used only for means of egress and exits directly to the outside.
3. Stairways in open parking garages complying with Section 1022.1, Exception 4, are permitted to egress through the open parking garage at their levels of exit discharge.
4. Horizontal exits complying with Section 1025 shall not be required to discharge directly to the exterior of the building.
5. The exit discharge for an exit enclosure which terminate in a court without direct access to a public way is permitted to reenter the building provided one of the following are met:
   5.1. An exit passageway which has the same fire-resistance rating as the exit enclosure served, is provided through the building from the court to an exterior wall of the building fronting on a public way; or
   5.2. A covered walkway which is open to the atmosphere at opposite ends is provided through the building to an exterior wall fronting on a public way and which has walls and ceiling of not less than 1 hour fire-resistance-rated-construction and opening protected with opening protectives have not less than a ¾ hour rating.

Reason: Prior to 1997 at least one of the legacy codes allowed exit enclosures to terminate into an open central court surround on all sides by a building. To provide exit discharge from such court, the code permitted an exit passageway. The IBC is silent on this type of design, and a strict reading of Section 1027.1 would prohibit it. The exception proposes two options. The first is the exit passageway. The second is an open 'breezeway' or 'tunnel' which goes from the court to the public way. It has been interpreted that the code allows the approach in 5.2 because it doesn't 're-enter' the building, but simply goes 'under' the building. This proposal codifies that interpretation. Essentially the 5.2 option is a passageway without enclosures at either end. To be consistent with other exit passageways, the passageway allowed here should have the same rating as the vertical exit enclosure served. Only one hour is proposed for the open breezeways as this is consistent with the egress court provisions in Section 1027 and because this is an atmospherically open tunnel, 1 hour should be sufficient to protect the users.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Rice-E2-1027.1

E137–09/10
705.2, 1027.3 (IFC [B] 1027.3)

Proponent: Ron Clements, Chesterfield County Virginia Building Inspection Department, representing self

Revise as follows:

1027.3 (IFC [B] 1027.3) Exit discharge separation distance ~~location~~. Exterior balconies, stairways and ramps within the exit discharge component of the means of egress shall be ~~located~~ separated in accordance with Section 705.2.~~at least 10 feet (3048 mm) from adjacent lot lines and from other buildings on the same lot unless the adjacent building exterior walls and openings are protected in accordance with Section 705 based on fire separation distance.~~

705.2 Projections. Cornices, eave overhangs, exterior balconies, exterior stairways, and exterior ramps, and similar projections extending beyond the exterior wall shall conform the requirements of this section and Section 1406. Exterior egress balconies and exterior exit stairways shall also comply with Section 1019 and 1026, respectively. Projections shall not extend beyond the distance determined by the following three methods, whichever results in the lesser projections:

1. A point one-third the distance from the exterior face of the wall to the lot line where protected openings or a combination of protected and unprotected openings are required in the exterior wall.
2. A point one-half the distance from the exterior face of the wall to the lot line where all openings in the exterior wall are permitted to be unprotected or the building is equipped throughout with an automatic sprinkler system installed under the provisions of Section 705.8.2.
3. More than 12 inches (305 mm) into areas where openings are prohibited.

Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with this section.

Reason: The intent of this change is to refer back to Section 705.2 for separation distance requirements related to exterior exit discharge balconies, ramps and stairways. Additionally Section 705.2 Projections in chapter 7 provides the required separation guidelines for building elements that project out past the exterior wall of the building and includes exterior balconies and exterior exit stairways and ramps. Another issue with the text proposed for deletion is that the 10 feet is measured to the other building on the same lot unless the exterior walls are protected. That leaves the question if the exterior walls are protected for) clearances is no clearance required between the adjacent building's exterior wall and the balcony or stair if 705.2 is limiting the projection per the 3 items in 705.2?

Section 705.2 is included to add Stairways and Ramps to the section.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Clements-E4-1027.3

E138–09/10
1027.3 (IFC [B] 1027.3)

Proponent: Lawrence Brown, CBO, National Association of Home Builders (NAHB); Eirene Oliphant, MCP, Building Official, representing City of Leawood, KS

Revise as follows:

1027.3 (IFC [B] 1027.3) Exit discharge location. Exterior balconies, stairways and ramps shall be located at least 10 feet (3048 mm) from adjacent lot lines and from other buildings on the same lot unless the adjacent building exterior walls and openings are protected in accordance with Section 705 based on fire separation distance.

Exception: Where serving Group R-3 occupancies, exterior balconies, stairways and ramps shall be permitted to be located 5 feet (1524 mm) minimum from adjacent lot lines and from other buildings on the same lot.

Reason: The added exception will help to coordinate this section with the provisions found in Table 705.8. Footnote "f" of Table 705.8 allows an unlimited amount of unprotected openings with a fire separation distance of 5 feet or greater. It would seem reasonable to allow the exterior stairways, ramps and balconies for a Group R-3 to be located in the 5 to 10 foot range if it is permissible to have an unlimited amount of unprotected openings.

While the 10 foot provision of this section does coordinate with the exterior wall rating required in Table 602 for most Group R-3 construction, permitting an unlimited amount of unprotected openings in that wall effectively eliminates the required protection beyond the 5 foot distance. Changing this section will help to coordinate with many local zoning laws that impose a 5 foot side yard requirement in residential areas. In addition Table R302.1 of the IRC permits walls to be non-rated if over 5 feet.

If the committee and members would consider another possible exception, it may be reasonable to add a second exception that would coordinate with footnote "d" of Table 705.8. This second exception would allow exterior stairs, ramps and balconies to have a minimum of 3 feet of separation provided that the wall had no more than 25 percent of unprotected or protected openings. Possible wording would be:

Exceptions:

2. In Group R-3 occupancies where the exterior wall of the exterior stairway, ramp and balcony comply with footnote "d" of Table705.8, a separation of 3 feet (915 mm) minimum shall be provided from adjacent lot lines and from other buildings on the same lot.

This second exception would not only coordinate with the provisions of Table 705.8 but would seem to correct an inconsistency that occurs within the code. As currently written, the code would allow an "interior" stairway to be located within the 3 to 5 foot range and allow 25 percent of the wall to be an unprotected opening. However, if that opening or an opening on an adjacent side exceeded 35 square feet (Section 1026.3) and the stair then was considered as an "exterior" stair it would need to be located "at least 10 feet (3048 mm) from adjacent lot lines." If the level of protection provided for the wall facing the property line is consistent then the code should not impose a 10 foot requirement on "exterior" stairs while allowing "interior" stairs to be 3 feet from the line.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Brown-E1-1027.3

E139–09/10
1019.4 (New), 1026.5, 1027.3 (IFC [B] 1019.4 (New), 1026.5, 1027.3)

Proponent: Gary Pringey representing Colorado Code Consulting, LLC, Colorado Chapter ICC

1. Delete without substitution:

~~**1027.3 (IFC [B] 1027.3) Exit discharge location.** Exterior balconies, stairways and ramps shall be located at least 10 feet (3048 mm) from adjacent lot lines and from other buildings on the same lot unless the adjacent building exterior walls and openings are protected in accordance with Section 705 based on fire separation distance.~~

(Renumber following subsections)

2. Add new text as follows:

1019.4 (IFC [B] 1019.4) Location. Exterior egress balconies shall have a minimum fire separation distance of 10 feet (3048 mm) measured from the exterior edge of the egress balcony to adjacent lot lines and from other buildings on the same lot unless the adjacent building exterior walls and openings are protected in accordance with Section 705 based on fire separation distance.

3. Revise as follows:

1026.5 (IFC [B] 1026.5) Location. Exterior exit ramps and stairways shall ~~be located in accordance with Section 1027.3~~ have a minimum fire separation distance of 10 feet (3048 mm) measured from the exterior edge of the ramp or stairway, including landings to adjacent lot lines and from other buildings on the same lot unless the adjacent building exterior walls and openings are protected in accordance with Section 705 based on fire separation distance.

Reason: The purpose of this proposal is to centralize and clarify design requirements for the exit access portion and exit portion of the means of egress system. Obviously, Section 1027 is titled "EXIT DISCHARGE." Requirements in Section 1027.3 apply only to exterior egress balconies, which are components in the Exit Access, and exterior exit ramps and stairways, which are components in the Exit. These design provisions are mislocated.

Requirements for exterior egress balconies are stated in Section 1019. This proposal relocates the intent of the requirement for the location of exterior egress balconies to Section 1019.4, the applicable subsection for that exit access component. This proposal relocates the intent of the requirement for location of exterior exit ramps and stairways to Section 1026.5. Section 1027.3 is deleted as an inappropriate location to specify design requirements for components of the Exit Access and Exit elements.

Approval of this proposal will clarify current code provisions and assist in the proper determination of exit access and exit design requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINGEY-E1-1014.5.3 NEW

E140–09/10
303.1, 1010.2, 1014.3, 1017, 1028, 1104.3, 1104.3.2, 1108.2, (IFC [B] 202, 1010.2, 1014.3, 1017, 1028)

Proponent: Ed Roether, Populous (Formerly HOK Sport Venue Event), representing self

Revise as follows:

303.1 (IFC [B] 202) Assembly Group A. Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption or awaiting transportation.

Exceptions:

1. A building or tenant space used for assembly purposes with an occupant load of less than 50 persons shall be classified as a Group B occupancy.
2. A room or space used for assembly purposes with an occupant load of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

3. A room or space used for assembly purposes that is less than 750 square feet (70m^2) in area and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.
4. ~~Assembly areas~~ A room or space used for assembly purposes that are ~~accessory to~~ associated with a Group E occupancies are not considered separate occupancies ~~except when applying the assembly occupancy requirements of Chapter 11~~.
5. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.

1010.2 (IFC [B] 1010.2) Slope. Ramps used as part of a means of egress shall have a running slope not steeper than one unit vertical in 12 units horizontal (8-percent slope). The slope of other pedestrian ramps shall not be steeper than one unit vertical in eight units horizontal (12.5-percent slope).

Exception: Aisle ramp slope in a room or space used for assembly purposes ~~occupancies of Group A or assembly occupancies accessory to Group E occupancies~~ shall comply with Section 1028.11.

1014.3 (IFC [B] 1014.3) Common path of egress travel. In occupancies other than Groups H-1, H-2 and H-3, the common path of egress travel shall not exceed 75 feet (22 860 mm). In Group H-1, H-2 and H-3 occupancies, the common path of egress travel shall not exceed 25 feet (7620 mm). For common path of egress travel in a room or space used for assembly purposes ~~Group A occupancies and assembly occupancies accessory to Group E occupancies~~ having fixed seating, see Section 1028.8.

Exceptions:

1. The length of a common path of egress travel in Group B, F and S occupancies shall not be more than 100 feet (30 480 mm), provided that the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
2. Where a tenant space in Group B, S and U occupancies has an occupant load of not more than 30, the length of a common path of egress travel shall not be more than 100 feet (30 480 mm).
3. The length of a common path of egress travel in a Group I-3 occupancy shall not be more than 100 feet (30 480 mm).
4. The length of a common path of egress travel in a Group R-2 occupancy shall not be more than 125 feet (38 100 mm), provided that the building is protected throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

SECTION 1017 (IFC [B] 1017)
AISLES and AISLE ACCESSWAYS

1017.1 (IFC [B] 1017.1) General. Aisles and aisle accessways serving as a portion of the exit access in the means of egress system shall comply with the requirements of this section. Aisles or aisle accessways shall be provided from all occupied portions of the exit access which contain seats, tables, furnishings, displays and similar fixtures or equipment. Aisles serving a room or space used for assembly purposes ~~areas~~ shall comply with Section 1028. ~~Aisles serving reviewing stands, grandstands and bleachers shall also comply with Section 1028.~~ The required width of aisles shall be unobstructed.

Exception: Doors complying with Section 1005.2.

~~**1017.4 (IFC [B] 1017.4) Seating at tables.**~~ *(Relocate to Section 1028)*

~~**1017.4.1 (IFC [B] 1017.4.1) Aisle accessway for tables and seating.**~~ *(Relocate to Section 1028)*

~~**1017.4.2 (IFC [B] 1017.4.2) Table and seating accessway width.**~~ *(Relocate to Section 1028)*

~~**1017.4.3 (IFC [B] 1017.4.3) Table and seating aisle accessway length.**~~ *(Relocate to Section 1028)*

SECTION 1028
ASSEMBLY

1028.1 (IFC [B] 1028.1) General. A room or space used for assembly purposes ~~Occupancies in Group A and assembly occupancies accessory to Group E~~ which contain seats, tables, displays, equipment or other material shall comply with this section.

1028.2 (IFC [B] 1028.2) Assembly main exit. ~~Group A~~ A building, room or space used for assembly purposes ~~occupancies and assembly occupancies accessory to Group E occupancies~~ that ~~have~~ has an occupant load of greater than 300 ~~shall be~~ and provided with a main exit~~. The~~ , the main exit shall be of sufficient width to accommodate not less than one-half of the occupant load, but such width shall not be less than the total required width of all means of egress leading to the exit. Where the building is classified as a Group A occupancy, the main exit shall front on at least one street or an unoccupied space of not less than 10 feet (3048 mm) in width that adjoins a street or public way. In a building, room or space used for assembly purposes where there is no well-defined main exit or where multiple main exits are provided, exits shall be permitted to be distributed around the perimeter of the building provided that the total width of egress is not less than 100 percent of the required width.

~~**Exception:** In assembly occupancies where there is no well-defined main exit or where multiple main exits are provided, exits shall be permitted to be distributed around the perimeter of the building provided that the total width of egress is not less than 100 percent of the required width.~~

1028.3 (IFC [B] 1028.3) Assembly other exits. In addition to having access to a main exit, each level in ~~Group A~~ a building used for assembly purposes ~~occupancies or assembly occupancies accessory to Group E occupancies~~ having an occupant load greater than 300 and provided with a main exit, shall be provided with additional means of egress that shall provide an egress capacity for at least one-half of the total occupant load served by that level and comply with Section 1015.2. In a building used for assembly purposes where there is no well-defined main exit or where multiple main exits are provided, exits for each level shall be permitted to be distributed around the perimeter of the building, provided that the total width of egress is not less than 100 percent of the required width.

~~**Exception:** In assembly occupancies where there is no well-defined main exit or where multiple main exits are provided, exits shall be permitted to be distributed around the perimeter of the building, provided that the total width of egress is not less than 100 percent of the required width.~~

1028.5 (IFC [B] 1028.5) Interior balcony and gallery means of egress. For balconies, galleries or press boxes having a seating capacity of 50 or more located in a building, room or space used for assembly purposes ~~Group A occupancies~~, at least two means of egress shall be provided, with one from each side of every balcony, gallery or press box and at least one leading directly to an exit.

1028.6.2 (IFC [B] 1028.6.2) Smoke-protected seating. The clear width of the means of egress for smoke-protected assembly seating shall not be less than the occupant load served by the egress element multiplied by the appropriate factor in Table 1028.6.2. The total number of seats specified shall be those within the space exposed to the same smoke-protected environment. Interpolation is permitted between the specific values shown. A life safety evaluation, complying with NFPA 101, shall be done for a facility utilizing the reduced width requirements of Table 1028.6.2 for smoke-protected assembly seating.

Exception: For an outdoor smoke-protected assembly seating with an occupant load not greater than 18,000, the clear width shall be determined using the factors in Section 1028.6.3.

TABLE 1028.6.2(IFC [B] 1028.6.2)
WIDTH OF AISLES FOR SMOKE-PROTECTED ASSEMBLY

TOTAL NUMBER OF SEATS IN THE SMOKEPROTECTED ASSEMBLY ~~OCCUPANCY~~ SEATING	INCHES OF CLEAR WIDTH PER SEAT SERVED			
	Stairs and aisle steps with handrails within 30 inches	Stairs and aisle steps without handrails within 30 inches	Passageways, doorways and ramps not steeper than 1 in 10 in slope	Ramps steeper than 1 in 10 in slope

(Portions of table not shown remain unchanged)

1028.6.3 (IFC [B] 1028.6.3) Width of means of egress for outdoor smoke-protected assembly seating. The clear width in inches (mm) of aisles and other means of egress shall be not less than the total occupant load served by the egress element multiplied by 0.08 (2.0 mm) where egress is by aisles and stairs and multiplied by 0.06 (1.52 mm) where egress is by ramps, corridors, tunnels or vomitories.

Exception: The clear width in inches (mm) of aisles and other means of egress shall be permitted to comply with Section 1028.6.2 for the number of seats in the outdoor smoke-protected assembly seating where Section 1028.6.2 permits less width.

1028.9 (IFC [B] 1028.9) Assembly aisles are required. Every occupied portion of any a building, room or space used for assembly purposes ~~occupancy~~ ~~in Group A or assembly occupancies accessory to Group E~~ that contains seats, tables, displays, similar fixtures or equipment shall be provided with aisles leading to exits or exit access doorways in accordance with this section. Aisle accessways for tables and seating shall comply with Section 1017.4.

1028.10 (IFC [B] 1028.10) Aisle accessways. Aisle accessways for seating at tables shall comply with Section 1028.10.1. Aisle accessways for seating in rows shall comply with Section 1028.10.2.

~~1017.4~~ 1028.10.1 (IFC [B] ~~1017.4~~ 1028.10.1) Seating at tables. Where seating is located at a table or counter and is adjacent to an aisle or aisle accessway, the measurement of required clear width of the aisle or aisle accessway shall be made to a line 19 inches (483 mm) away from and parallel to the edge of the table or counter. The 19-inch (483 mm) distance shall be measured perpendicular to the side of the table or counter. In the case of other side boundaries for aisle or aisle accessways, the clear width shall be measured to walls, edges of seating and tread edges, except that handrail projections are permitted.

Exception: Where tables or counters are served by fixed seats, the width of the aisle accessway shall be measured from the back of the seat.

~~1017.4.1~~ 1028.10.1.1 (IFC [B] ~~1017.4.1~~ 1028.10.1.1) Aisle accessway width for seating at tables ~~and seating~~. Aisle accessways serving arrangements of seating at tables or counters shall have sufficient clear width to conform to the capacity requirements of Section 1005.1 but shall not have less than ~~the appropriate minimum clear width specified in Section 1017.4.2~~ a minimum of 12 inches (305 mm) of width plus 1/2 inch (12.7 mm) of width for each additional 1 foot (305 mm), or fraction thereof, beyond 12 feet (3658 mm) of aisle accessway length measured from the center of the seat farthest from an aisle.

~~1017.4.2 (IFC [B] 1017.4.2) Table and seating accessway width.~~ ~~Aisle accessways shall provide a minimum of 12 inches (305 mm) of width plus 1/2 inch (12.7 mm) of width for each additional 1 foot (305 mm), or fraction thereof, beyond 12 feet (3658 mm) of aisle accessway length measured from the center of the seat farthest from an aisle.~~

Exception: Portions of an aisle accessway having a length not exceeding 6 feet (1829 mm) and used by a total of not more than four persons.

~~1017.4.3~~ 1028.10.1.2 (IFC [B] ~~1017.4.3~~ 1028.10.1.2) Seating at table ~~and seating~~ aisle accessway length. The length of travel along the aisle accessway shall not exceed 30 feet (9144 mm) from any seat to the point where a person has a choice of two or more paths of egress travel to separate exits.

~~1028.10~~ 1028.10.2 (IFC [B] ~~1028.10~~ 1028.10.2) Clear width of aisle accessways serving seating in rows. Where seating rows have 14 or fewer seats, the minimum clear aisle accessway width shall not be less than 12 inches (305 mm) measured as the clear horizontal distance from the back of the row ahead and the nearest projection of the row behind. Where chairs have automatic or self-rising seats, the measurement shall be made with seats in the raised position. Where any chair in the row does not have an automatic or self-rising seat, the measurements shall be made with the seat in the down position. For seats with folding tablet arms, row spacing shall be determined with the tablet arm in the used position.

Exception: For seats with folding tablet arms, row spacing is permitted to be determined with the tablet arm in the stored position where the tablet arm when raised manually to vertical position in one motion automatically returns to the stored position by force of gravity.

~~1028.10.1~~ 1028.10.2.1 (IFC [B] ~~1028.10.1~~ 1028.10.2.1) Dual access. For rows of seating served by aisles or doorways at both ends, there shall not be more than 100 seats per row. The minimum clear width of 12 inches (305 mm) between rows shall be increased by 0.3 inch (7.6 mm) for every additional seat beyond 14 seats, but the minimum clear width is not required to exceed 22 inches (559 mm).

Exception: For smoke-protected assembly seating, the row length limits for a 12-inch-wide (305 mm) aisle accessway, beyond which the aisle accessway minimum clear width shall be increased, are in Table 1028.10.1.

TABLE ~~1028.10.1~~ 1028.10.2.1(IFC [B] ~~1028.10.1~~ 1028.10.2.1)
SMOKE-PROTECTED
ASSEMBLY AISLE ACCESSWAYS

TOTAL NUMBER OF SEATS IN THE SMOKEPROTECTED ASSEMBLY ~~OCCUPANCY~~ SEATING	MAXIMUM NUMBER OF SEATS PER ROW PERMITTED TO HAVE A MINIMUM 12-INCH CLEAR WIDTH AISLE ACCESSWAY	
	Aisle or doorway at both ends of row	Aisle or doorway at one end of row only

(Portions of table not shown remain unchanged)

~~1028.10.2~~ 1028.10.2.2 (IFC [B] ~~1028.10.2~~ 1028.10.2.2) Single access. For rows of seating served by an aisle or doorway at only one end of the row, the minimum clear width of 12 inches (305 mm) between rows shall be increased by 0.6 inch (15.2 mm) for every additional seat beyond seven seats, but the minimum clear width is not required to exceed 22 inches (559 mm).

Exception: For smoke-protected assembly seating, the row length limits for a 12-inch-wide (305 mm) aisle accessway, beyond which the aisle accessway minimum clear width shall be increased, are in Table ~~1028.10.1~~ 1028.10.2.1.

1028.12 (IFC [B] 1028.12) Seat stability. In ~~places of~~ a building, room or space used for assembly purposes, the seats shall be securely fastened to the floor.

Exceptions:

1. In ~~places of~~ a building, room or space used for assembly purposes or portions thereof without ramped or tiered floors for seating and with 200 or fewer seats, the seats shall not be required to be fastened to the floor.
2. In ~~places of~~ a building, room or space used for assembly purposes or portions thereof with seating at tables and without ramped or tiered floors for seating, the seats shall not be required to be fastened to the floor.
3. In ~~places of~~ a building, room or space used for assembly purposes or portions thereof without ramped or tiered floors for seating and with greater than 200 seats, the seats shall be fastened together in groups of not less than three or the seats shall be securely fastened to the floor.
4. In ~~places of~~ a building, room or space used for assembly purposes where flexibility of the seating arrangement is an integral part of the design and function of the space and seating is on tiered levels, a maximum of 200 seats shall not be required to be fastened to the floor. Plans showing seating, tiers and aisles shall be submitted for approval.
5. Groups of seats within a ~~places of~~ a building, room or space used for assembly purposes separated from other seating by railings, guards, partial height walls or similar barriers with level floors and having no more than 14 seats per group shall not be required to be fastened to the floor.
6. Seats intended for musicians or other performers and separated by railings, guards, partial height walls or similar barriers shall not be required to be fastened to the floor.

1028.14 (IFC [B] 1028.14) Assembly guards. ~~Assembly~~ Guards adjacent to seating in a building, room or space used for assembly purposes shall comply with Sections 1028.14.1 through 1028.14.3.

~~**1028.15 (IFC [B] 1028.15) Bench seating.** Where bench seating is used, the number of persons shall be based on one person for each 18 inches (457 mm) of length of the bench.~~

1104.3 Connected spaces. When a building or portion of a building is required to be accessible, an accessible route shall be provided to each portion of the building, to accessible building entrances connecting accessible pedestrian walkways and the public way.

Exceptions:

1. In a building, room or space used for assembly purposes ~~areas~~ with fixed seating, an accessible route shall not be required to serve levels where wheelchair spaces are not provided.
2. In Group I-2 facilities, doors to sleeping units shall be exempted from the requirements for maneuvering clearance at the room side provided the door is a minimum of 44 inches (1118 mm) in width.

1104.3.2 Press boxes. Press boxes in a building, room or space used for assembly purposes ~~areas~~ shall be on an accessible route.

Exceptions:

1. An accessible route shall not be required to press boxes in bleachers that have points of entry at only one level, provided that the aggregate area of all press boxes is 500 square feet (46 m^2) maximum.
2. An accessible route shall not be required to free-standing press boxes that are elevated above grade 12 feet (3660 mm) minimum provided that the aggregate area of all press boxes is 500 square feet (46 m^2) maximum.

1108.2 Assembly area seating. A building, room or space used for assembly purposes ~~areas~~ with fixed seating shall comply with Sections 1108.2.1 through ~~1108.2.8~~ 1108.2.5. Lawn seating areas shall comply with Section 1108.2.6. Assistive listening systems shall comply with Section 1108.2.7. Performance areas viewed from assembly seating areas shall comply with Section 1108.2.8. Dining areas shall comply with Section 1108.2.9. ~~In addition, lawn seating shall comply with Section 1108.2.6~~.

1108.2.1 Services. *(No change to text)*

1108.2.2 Wheelchair spaces. *(No change to text)*

1108.2.2.1 General seating. *(No change to text)*

1108.2.2.2 Luxury boxes, club boxes and suites. *(No change to text)*

1108.2.2.3 Other boxes. *(No change to text)*

TABLE 1108.2.2.1
ACCESSIBLE WHEELCHAIR SPACES

CAPACITY OF SEATING IN ASSEMBLY AREAS	MINIMUM REQUIRED NUMBER OF WHEELCHAIR SPACES

(Portions of table not shown remain unchanged)

1108.2.2.4 Team or player seating. *(No change to text)*

1108.2.3 Companion seats. *(No change to text)*

1108.2.4 Dispersion of wheelchair spaces in multilevel assembly seating areas. In multilevel assembly seating areas, wheelchair spaces shall be provided on the main floor level and on one of each two additional floor or mezzanine levels. Wheelchair spaces shall be provided in each luxury box, club box and suite within assembly facilities.

Exceptions:

1. In multilevel assembly seating areas ~~spaces~~ utilized for worship services where the second floor or mezzanine level contains 25 percent or less of the total seating capacity, wheelchair spaces shall be permitted to all be located on the main level.
2. In multilevel assembly seating areas where the second floor or mezzanine level provides 25 percent or less of the total seating capacity and 300 or fewer seats, all wheelchair spaces shall be permitted to be located on the main level.
3. Wheelchair spaces in team or player seating serving areas of sport activity are not required to be dispersed.

1108.2.5 Designated aisle seats. *(No change to text)*

1108.2.6 Lawn seating. *(No change to text)*

1108.2.7 Assistive listening systems. Each building, room or space used for assembly purposes ~~area~~ where audible communications are integral to the use of the space shall have an assistive listening system.

Exception: Other than in courtrooms, an assistive listening system is not required where there is no audio amplification system.

1108.2.7.1 Receivers. Receivers shall be provided for assistive listening systems in accordance with Table 1108.2.7.1.

Exceptions:

1. Where a building contains more than one room or space used for assembly purposes ~~area~~, the total number of required receivers shall be permitted to be calculated according to the total number of seats ~~in the assembly areas~~ in the building, provided that all receivers are usable with all systems and if the rooms or spaces used for assembly purposes ~~areas~~ required to provide assistive listening are under one management.
2. Where all seats in ~~an~~ a building, room or space used for assembly purposes ~~area~~ are served by an induction loop assistive listening system, the minimum number of receivers required by Table 1108.2.7.1 to be hearing-aid compatible shall not be required.

1108.2.8 Performance areas. *(No change to text)*

1108.2.9 Dining areas. *(No change to text)*

1108.2.9.1 Dining surfaces. *(No change to text)*

Reason: Throughout the building code there are three distinct use of the term assembly; assembly occupancy, assembly and assembly seating. Primarily, the portions relating to assembly occupancy establish the fire resistance associated with that Use Group. Assembly relates to a room or space where people assemble with the building code addressing life safety and accessibility requirements associated. Assembly seating relates to either seating at tables or row seating, which have unique accessibility and life safety requirements that differ from other assembly areas. This proposal clarifies the requirements associated with assembly and assembly seating from an assembly occupancy. For example, Table 1108.2.2.1 requires a wheelchair space where there are 4 fixed seats in assembly seating, an assembly occupancy requires at least 50 occupants.

The intent of this proposal is for consistency throughout the IBC. The purpose is to separate the Group A occupancy classifications used for height and area requirements, sprinklers, etc., from provisions for assembly areas where the use of the space determines the requirements (i.e., means of egress and accessibility). Sections 1028 and 1108.2 are for spaces used for assembly puroses, not just Group A buildings, therefore the text that references these provisions and included in those provisions should reflect that where appropriate.

The provisions for occupant load, seating, aisles and aisle accessways, and accessibility are associated with the use of the space (items found in Chapter 10 and 11), not the group assigned for height and area limitations, therefore, the limitation in Exception 4 to just Chapter 11 is inappropriate. This proposal also relocated Section 1017.4 that covers aisle access ways in assembly spaces with tables to Section 1028 since aisles for all assembly, including tables, are covered in Sections 1028.9 through 1028.9.6. The assistive listening and performance areas are not always associated with fixed seating. Lawn seating does not contain any fixed seating, therefore, the base paragraph should be revised to reflect the sections appropriately. Section 1028.15 is not needed since it repeats what is required in Section 1004.7.

Cost Impact: The proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Roether-G1-303.1

E141–09/10

303.1, 1010.2, 1014.3, 1028 (IFC [B] 1010.2, 1014.3, 1028)

Proponent: Daniel E. Nichols, PE, New York State Dept. of State, Div. of Code Enforcement and Administration

Revise as follows:

303.1 Assembly Group A. Assembly Group A occupancy includes, among others, the use of a building or structure, or a portion thereof, for the gathering of persons for purposes such as civic, social or religious functions; recreation, food or drink consumption or awaiting transportation.

Exceptions:

1. A building or tenant space used for assembly purposes with an occupant load of less than 50 persons shall be classified as a Group B occupancy.
2. A room or space used for assembly purposes with an occupant load of less than 50 persons and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.

3. A room or space used for assembly purposes that is less than 750 square feet (70m^2) in area and accessory to another occupancy shall be classified as a Group B occupancy or as part of that occupancy.
4. ~~Assembly areas~~ A room or space used for assembly purposes that are accessory to Group E occupancies are not considered separate occupancies ~~except when applying the assembly occupancy requirements of Chapter 11~~.
5. Accessory religious educational rooms and religious auditoriums with occupant loads of less than 100 are not considered separate occupancies.

1010.2 (IFC [B] 1010.2) Slope. Ramps used as part of a means of egress shall have a running slope not steeper than one unit vertical in 12 units horizontal (8-percent slope). The slope of other pedestrian ramps shall not be steeper than one unit vertical in eight units horizontal (12.5-percent slope).

Exception: Aisle ramp slope in a room or space used for assembly purposes ~~occupancies of Group A or assembly occupancies accessory to Group E occupancies~~ shall comply with Section 1028.11.

1014.3 (IFC [B] 1014.3) Common path of egress travel. In occupancies other than Groups H-1, H-2 and H-3, the common path of egress travel shall not exceed 75 feet (22 860 mm). In Group H-1, H-2 and H-3 occupancies, the common path of egress travel shall not exceed 25 feet (7620 mm). For common path of egress travel in a room or space used for assembly purposes ~~Group A occupancies and assembly occupancies accessory to Group E occupancies~~ having fixed seating, see Section 1028.8.

Exceptions:

1. The length of a common path of egress travel in Group B, F and S occupancies shall not be more than 100 feet (30 480 mm), provided that the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.
2. Where a tenant space in Group B, S and U occupancies has an occupant load of not more than 30, the length of a common path of egress travel shall not be more than 100 feet (30 480 mm).
3. The length of a common path of egress travel in a Group I-3 occupancy shall not be more than 100 feet (30 480 mm).
4. The length of a common path of egress travel in a Group R-2 occupancy shall not be more than 125 feet (38 100 mm), provided that the building is protected throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

SECTION 1028
ASSEMBLY

1028.1 (IFC [B] 1028.1) General. Occupancies in Group A and assembly occupancies accessory to ~~Group E~~ other use groups which contain seats, tables, displays, equipment or other material shall comply with this section.

1028.2 (IFC [B] 1028.2) Assembly main exit. Group A occupancies and assembly occupancies accessory to ~~Group E occupancies~~ other use groups that have an occupant load of greater than 300 shall be provided with a main exit. The main exit shall be of sufficient width to accommodate not less than one-half of the occupant load, but such width shall not be less than the total required width of all means of egress leading to the exit. ~~Where the building is classified as a Group A occupancy,~~ the main exit shall front on at least one street or an unoccupied space of not less than 10 feet (3048 mm) in width that adjoins a street or public way.

Exception: In assembly occupancies where there is no well-defined main exit or where multiple main exits are provided, exits shall be permitted to be distributed around the perimeter of the building provided that the total width of egress is not less than 100 percent of the required width.

1028.3 (IFC [B] 1028.3) Assembly other exits. In addition to having access to a main exit, each level in Group A occupancies or assembly occupancies accessory to ~~Group E occupancies~~ other use groups having an occupant load greater than 300, shall be provided with additional means of egress that shall provide an egress capacity for at least one-half of the total occupant load served by that level and comply with Section 1015.2.

Exception: In assembly occupancies where there is no well-defined main exit or where multiple main exits are provided, exits shall be permitted to be distributed around the perimeter of the building, provided that the total width of egress is not less than 100 percent of the required width.

1028.4 (IFC [B] 1028.4) Foyers and lobbies. In Group ~~A-1~~A occupancies or assembly occupancies accessory to

other use groups, where persons are admitted to the building at times when seats are not available, such persons shall be allowed to wait in a lobby or similar space, provided such lobby or similar space shall not encroach upon the required clear width of the means of egress. Such foyer, if not directly connected to a public street by all the main entrances or exits, shall have a straight and unobstructed corridor or path of travel to every such main entrance or exit.

1028.5 (IFC [B] 1028.5) Interior balcony, gallery and press boxes means of egress. For balconies, galleries or press boxes having a seating capacity of 50 or more located in Group A occupancies or assembly occupancies accessory to other use groups,, at least two means of egress shall be provided, with one from each side of every balcony, gallery or press box and at least one leading directly to an exit.

1028.9 (IFC [B] 1028.9) Assembly aisles are required. Every occupied portion of any occupancy in Group A or assembly occupancies accessory to ~~Group E~~ to other use groups that contains seats, tables, displays, similar fixtures or equipment shall be provided with aisles leading to exits or exit access doorways in accordance with this section. Aisle accessways for tables and seating shall comply with Section 1017.4.

Reason: The use of the accessory use section is applied to assembly areas in more than just group E occupancies. As an example, a supermarket (Group M) is permitted to be of unlimited area and is able to use up to 10% of the building area to be used as assembly space (cafeteria, restaurant) without classifying such space as a Group A. In essence, the bigger the building, the bigger the assembly area can be without providing exiting requirements. It is appropriate to provide assembly exiting provisions regardless of whether the assembly space is accessory or not.

Specific to 1028.4, waiting areas are utilized in other than Group A-1 occupancies. Examples of persons that wait in a pre-event area while the event area is still occupied (other than movies or cinemas) would be restaurants, multiple religious worship services, and changes during sporting events in tournament-style gymnasiums/arenas. This change will expand the capacity of egress when more than the assembly occupancies 'operational' capacity is within the building.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Nichols-E1-1028.1

E142–09/10

1028.1.1.1 (New) [IFC [B] 1028.1.1.1 (New)]

Proponent: Gerard A. Hathaway, RA, New York State Department of State Building Codes Division, representing self.

Add new text as follows:

1028.1.1.1 (IFC [B] 1028.1.1.1) Spaces under grandstands and bleachers. When spaces under grandstands or bleachers are used for purposes other than toilet rooms and ticket booths less than 100 sq.ft. (9.29 m^2), such spaces shall be separated by fire barriers complying with Section 707 and horizontal assemblies complying with Secction 712 with not less than 1-hour fire-resistance-rated construction.

Reason: The intent is to provide requirements for buildings under bleachers and grandstands that include spaces such as concessions, storage and ticket booths. The provisions are consistent with what permitted in the legacy codes. The location of this section is chosen for its proximity to the reference to the ICC 300. That way it will not be missed.

The legacy codes included provisions for spaces under seats to be kept free of combustible and flammable materials. Rooms under the bleachers were enclosed in a 1 hour fire-resistant rated construction. None of this information was passed forward into any edition of the IBC.

ICC 300, Section 305 sends you to the building and fire codes for requirements. The IBC does not include any specific provisions for this area except space over 1,000 sq.ft. must be sprinklered in accordance with Section 903.2.1.5.

From an intent point of view, the general stairway provisions (which may be viewed as similar to part of the bleacher system) require that any space under a stairway be enclosed with a 1 hour fire-resistance-rated construction (Section 1009.6.3).

Southern had –
403.6.2.2 When spaces under grandstands or bleachers are used for purposes other than toilet rooms, ticket booths less than 100 sq.ft. (9.29 m^2) in area and open ramps or level exiting facilities, such spaces shall be separated by not less than 1-hour fire resistant construction.

BOCA had –
1013.8 Spaces underneath seats: Spaces underneath grandstand seats shall be kept free of all combustible and flammable materials and shall not be occupied or used for other than exits; except that where enclosed in not less than 1-hour fire resistance rated construction, the code official shall approve the use of such spaces for other purposed, provided that the safety of the public is not endangered.

ICBO had the following provisions (see the 4th paragraph for separation requirements)–
Division 4. Stadiums, reviewing stands and amusement park structures not included within other Group A Occupancies. Specific and general requirements for grandstands, bleachers and reviewing stands are to be found in Chapter 10.

303.2 Construction, Height and Allowable Area.

303.2.2 Special provisions.

303.2.2.3 Division 4 provisions. Grandstands, bleachers or reviewing stands of Type III One-hour, Type IV or Type V One-hour construction shall not exceed 40 feet (12 192 mm) to the highest level of seat boards; 20 feet (6096 mm) in cases where construction is Type III-N or Type V-N; and 12 feet (3658 mm) in cases where construction is with combustible members in the structural frame and located indoors.

Division 4 structures other than Type III-N and Type V-N grandstands, bleachers, reviewing stands and folding and telescoping seating of open skeleton-frame type without roof, cover or enclosed usable space are not limited in area or height.

Erection and structural maintenance shall conform to these special requirements as well as with other applicable provisions of this code.

When the space under a Division 4 Occupancy is used for any purpose, including means of egress, it shall be separated from all parts of such Division 4 Occupancy, including means of egress, by walls, floor and ceiling of not less than one-hour-fire-resistive construction.

EXCEPTIONS:

1. A means of egress under temporary grandstands need not be separated.
2. The underside of continuous steel deck grandstands when erected outdoors need not be fire protected when occupied for public toilets.

The building official may cause Division 4 structures to be reinspected at least once every six months.

Grandstands, bleachers or folding and telescoping seating may have seat boards, toeboards, bearing or base pads and footboards of combustible materials regardless of construction type.

Seating and exiting requirements for reviewing stands, grandstands, bleachers, and folding and telescoping seating are provided under Section 1008.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Hathaway-E1-1028.1.1.1

E143–09/10
1028.9.1 (IFC [B] 1028.9.1)

Proponent: Ed Roether, Populous (Formerly HOK Sport Venue Event), representing self

Revise as follows:

1028.9.1 (IFC [B] 1028.9.1) Minimum aisle width. The minimum clear width for aisles shall be as shown:

1. Forty-eight inches (1219 mm) for aisle stairs having seating on each side.

   Exception: Thirty-six inches (914 mm) where the aisle serves less than 50 seats.

2. Thirty-six inches (914 mm) for aisle stairs having seating on only one side.

   Exception: Twenty-three inches (584 mm) between an aisle stair handrail and seating where an aisle does not serve more than five rows on one side.

3. Twenty-three inches (584 mm) between an aisle stair handrail or guard and seating where the aisle is subdivided by a handrail.
4. Forty-two inches (1067 mm) for level or ramped aisles having seating on both sides.

   Exceptions:

   1. Thirty-six inches (914 mm) where the aisle serves less that 50 seats.
   2. Thirty inches (762 mm) where the aisle does not serve more than 14 seats.

5. Thirty-six inches (914 mm) for level or ramped aisles having seating on only one side.

   Exceptions:

   1. Thirty inches (762 mm) where the aisle does not serve more than 14 seats.
   2. Twenty-three inches (584 mm) between an aisle stair handrail and seating where an aisle does not serve more than five rows on one side.

Reason: The aisle width requirements became less clear when item #6 in the 2003 IBC became into an exception to Item #5 in the 2006 IBC, which remains in the 2009 IBC. The width of an aisle stair should not be an exception to a level or ramped aisle. Either it should be a separate item as it

was in the 2003 IBC or an exception to an aisle stair with seating on one side. This proposal relocates the current exception to the appropriate aisle stair provision to maintain the format changes that has occurred over the last several editions.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME:Roether-E8-1025.9.1

E144–09/10
1028.9.1 (IFC [B] 1028.9.1)

Proponent: Bill Conner, representing American Society of Theatre Consultants

Revise as follows:

1028.9.1 (IFC [B] 1028.9.1) Minimum aisle width. The minimum clear width for aisles shall be as shown:

1. Forty-eight inches (1219 mm) for aisle stairs having seating on each side.

   Exception: Thirty-six inches (914 mm) where the aisle serves less than 50 seats.

2. Thirty-six inches (914 mm) for aisle stairs having seating on only one side.
3. Twenty-three inches (584 mm) between an aisle stair handrail or guard and seating where the aisle is subdivided by a handrail.
4. Twenty-three inches (584 mm) between an aisle stair handrail and seating where an aisle does not serve more than five rows on one side.

~~4.~~5. Forty-two inches (1067 mm) for level or ramped aisles having seating on both sides.

   Exceptions:

   1. Thirty-six inches (914 mm) where the aisle serves less that 50 seats.
   2. Thirty inches (762 mm) where the aisle does not serve more than 14 seats.

~~5.~~6. Thirty-six inches (914 mm) for level or ramped aisles having seating on only one side.

   Exception ~~Exceptions~~:

   ~~1.~~ Thirty inches (762 mm) where the aisle does not serve more than 14 seats.
   ~~2. Twenty-three inches (584 mm) between an aisle stair handrail and seating where an aisle does not serve more than five rows on one side.~~

Reason: This undoes a change made in the last cycle we believe was in error. First it relocates what was Item 6 to a second exception under item 5. This moved an item dealing with aisle stairs to an exception on ramped aisles. Second, the reason stated was erroneous: this exception does not duplicate point 3, which is for aisle serving seating on both sides of the aisle, but is for the specific case of serving seats on one side only. This is a special burden on smaller rooms such as black box and Alittle@ theatres. The hazard is equivalent (or less because of 60 person limitation) than allowed by 1028.9.1-3. Changing the order will help clarify the original intent by grouping aisle stair requirements together.

Cost Impact: None or lower cost because of narrower aisle permitted. This aisle might otherwise have to be 36" as required by 1028.9.1-2.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME:Conner-E1-1025.9.1

E145–09/10
1028.13 (IFC [B] 1028.13)

Proponent: Bill Conner, representing American Society of Theatre Consultants

Revise as follows:

1028.13 (IFC [B] 1028.13) Handrails. Ramped aisles having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and aisle stairs shall be provided with handrails located either at one or both sides of the aisle ~~the side~~ or within the aisle width.

Exceptions:

1. Handrails are not required for ramped aisles having a gradient no greater than one unit vertical in eight units horizontal (12.5-percent slope) and seating on both sides.
2. Handrails are not required if, at the side of the aisle, there is a guard that complies with the graspability requirements of handrails.
3. Handrail extensions are not required at the top and bottom of aisle stairs and aisle ramp runs to permit crossovers within the aisles.

Reason: This change simply clarifies the original intent (which I believe came from the BCMC Report on Means of Egress) that handrails could be at one side of an aisle. The plural Ahandrails@ is sometimes interpreted as requiring them on both sides.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Conner-E4-1028.13

E146–09/10
1028.13 (IFC [B] 1028.13)

Proponent: Bill Conner, representing American Society of Theatre Consultants

Revise as follows:

1028.13 (IFC [B] 1028.13) Handrails. Ramped aisles having a slope exceeding one unit vertical in 15 units horizontal (6.7-percent slope) and aisle stairs shall be provided with handrails located either at the side or within the aisle width.

Exceptions:

1. Handrails are not required for ramped aisles having a gradient no greater than one unit vertical in eight units horizontal (12.5-percent slope) and seating on both sides.
2. Handrails are not required if, at the side of the aisle, there is a guard that complies with the graspability requirements of handrails.
3. Handrail extensions are not required ~~at the top and bottom of~~ in aisle stairs and aisle ramps ~~ramp runs to permit crossovers within the aisles~~.

Reason: The change in 2009 to limit the handrail extension exemption to just the top and bottom of aisle stairs and aisle ramps is a severe restriction on design of assembly aisles. The previous edition=s exception for all handrails in aisles permitted doors and entrances to and from an aisle. Most importantly, this 2009 wording would literally require a railing extension in a handrail at the side of an aisle stair or ramp prohibiting or restricting passage to aisle accessways.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Conner-E3-1028.13 ex 3

E147–09/10
1028.14.2 (IFC [B] 1028.14.2)

Proponent: Ed Roether, Populous (Formerly HOK Sport Venue Event), representing self

Revise as follows:

1028.14.2 (IFC [B] 1028.14.2) Sightline-constrained guard heights. Unless subject to the requirements of Section 1028.14.3, a fascia or railing system in accordance with the *guard* requirements of Section 1013 and having a minimum height of 26 inches (660 mm) measured vertically above the adjacent walking surfaces, adjacent bench seat or the line connecting the leading edges of the treads shall be provided where the floor or footboard elevation is more than 30 inches (762 mm) above the floor or grade below and the fascia or railing would otherwise interfere with the sightlines of immediately adjacent seating. At *bleachers*, a *guard* must be provided where required by ICC 300.

Exception: The height of the guard shall not be required to be measured vertically above an adjacent automatic or self-rising chair.

Reason: This proposal addresses several things, first it brings clarity to confusion that was created by a change that occurred in the 2009 IBC. The term “seatboard” was replaced with the term “fixed seating” in the 2009 IBC Section 1013.2 on how the height of guards are measured with the stated reason "to clarify the measurement, using common terminology". With respect to assembly seating, the term “fixed seating” does not offer greater clarity, instead it offers significantly more confusion. For example, how do you measure the height of the guard adjacent fixed seats when they are self-rising chairs? (Refer to photographs below.) In assembly seating, fixed seats refers to chairs that are secured to the structure, not that they provide a walking surface. The aisle accessway provisions of Section 1028.10 specifically address the clear width between rows of seats where there is automatic or self-rising chairs and chairs with seats that do not move. Therefore, the clarity provided other occupancies unfortunately increased confusion pertaining to assembly seating. Section 1028.14 needs to include how to measure the height of guards so that clarity can be provided assembly seating and still offer other occupancies the clarity needed for them in Section 1013.2. Please note that this proposal does not include any change to Section 1013.2, only to Section 1028.14.

Following are two photographs of self-rising chairs and one of bench seats. The fixed bench seating could serve as a walking surface, however the self-rising chairs are not easily used as a walking surface. 2007 ICC 300 measures vertically above the leading edge of the tread, adjacent walking surface or adjacent bench seat. This proposal maintains how the height of the guard is measured by 1013.2 with the exception of replacing the term "fixed seat" with the term "bench seat" to coordinate with ICC 300 and to enhance clarity that guard height needs to be measured vertically above such seats. Also, the term "bench seat" rather than "seatboard" is commonly used for this type of seating in assembly seating project specifications. An exception was added for self-rising chairs since these seats are not easily used as a walking surface and there is no well defined way to measure these chairs.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Roether-E9-1028.14.2

E148–09/10
1028.14.2 (IFC [B] 1028.14.2)

Proponent: Bill Conner, representing American Society of Theatre Consultants

Revise as follows:

1028.14.2 (IFC [B] 1028.14.2) Sightline-constrained guard heights. Unless subject to the requirements of Section 1028.14.3, a fascia or railing system in accordance with the guard requirements of Section 1013 and having a minimum height of 26 inches (660 mm) shall be provided where the floor or footboard elevation is more than 30 inches (762 mm) above the floor or grade below and the fascia or railing would otherwise interfere with the sightlines of immediately adjacent seating. At bleachers, a guard must be provided where required by ICC 300. Sightline-constrained guard heights shall be measured vertically above the adjacent walking surfaces.

Reason: Section 1013.2 requires all guards to be A....measured vertically above the adjacent walking surfaces, adjacent fixed seating or the line connecting the leading edges of the treads.@ This is not appropriate for sightline constrained rails, as the fixed seating is the reason for the exception, and measuring the 26" from the seat will obstruct sightline.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Conner-E2-1028.14.2

E149–09/10
1028.15 (IFC [B] 1028.15)

Proponent: Bill Conner, representing American Society of Theatre Consultants

Delete without substitution:

~~**1028.15 (IFC [B] 1028.15) Bench seating.** Where bench seating is used, the number of persons shall be based on one person for each 18 inches (457 mm) of length of the bench.~~

Reason: This section should be deleted because it is redundant and contradictory with Section 1004.7

1004.7 Fixed seating. For areas having fixed seats and aisles, the occupant load shall be determined by the number of fixed seats installed therein. The occupant load for areas in which fixed seating is not installed, such as waiting spaces and wheelchair spaces, shall be determined in accordance with Section 1004.1.1 and added to the number of fixed seats.

For areas having fixed seating without dividing arms, the occupant load shall not be less than the number of seats based on one person for each 18 inches (457 mm) of seating length.

The occupant load of seating booths shall be based on one person for each 24 inches (610 mm) of booth seat length measured at the backrest of the seating booth.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Conner-E5-1028.15

E150–09/10
1029.1 (IFC [B] 1029.1); IRC R310.1

Proponent: Steven Orlowski, representing National Association of Home Builders

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC MEANS OF EGRESS COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

Revise as follows:

1029.1 (IFC [B] 1029.1) General. In addition to the means of egress required by this chapter, provisions shall be made for emergency escape and rescue in Group R and I-1 occupancies. Basements and sleeping rooms below the fourth story above grade plane shall have at least one exterior emergency escape and rescue opening in accordance with this section. Where basements contain one or more sleeping rooms, emergency escape and rescue openings shall be required in each sleeping room, but shall not be required in adjoining areas of the basement. Such openings shall open directly into a public way or to a yard or court that opens to a public way.

Exceptions:

1. In ~~other than Group R-3 occupancies,~~ Group R buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, ~~or~~ 903.3.1.2 or 903.3.1.3.
2. In other than Group R-3 occupancies, sleeping rooms provided with a door to a fire-resistance-rated corridor having access to two remote exits in opposite directions.
3. The emergency escape and rescue opening is permitted to open onto a balcony within an atrium in accordance with the requirements of Section 404, provided the balcony provides access to an exit and the dwelling unit or sleeping unit has a means of egress that is not open to the atrium.
4. Basements with a ceiling height of less than 80 inches (2032 mm) shall not be required to have emergency escape and rescue windows.
5. High-rise buildings in accordance with Section 403.
6. Emergency escape and rescue openings are not required from basements or sleeping rooms that have an exit door or exit access door that opens directly into a public way or to a yard, court or exterior exit balcony that opens to a public way.
7. Basements without habitable spaces and having no more than 200 square feet (18.6m^2) in floor area shall not be required to have emergency escape windows.

PART II – IRC BUILDING/ENERGY

R310.1 Emergency escape and rescue required. Basements, habitable attics and every sleeping room shall have at least one operable emergency escape and rescue opening. Where basements contain one or more sleeping rooms, emergency egress and rescue openings shall be required in each sleeping room. Where emergency escape and rescue openings are provided they shall have a sill height of not more than 44 inches (1118 mm) above the floor. Where a door opening having a threshold below the adjacent ground elevation serves as an emergency escape and rescue opening and is provided with a bulkhead enclosure, the bulkhead enclosure shall comply with Section R310.3. The net clear opening dimensions required by this section shall be obtained by the normal operation of the emergency escape and rescue opening from the inside. Emergency escape and rescue openings with a finished sill height below

the adjacent ground elevation shall be provided with a window well in accordance with Section R310.2. Emergency escape and rescue openings shall open directly into a public way, or to a yard or court that opens to a public way.

~~Exception~~ Exceptions:

1. Basements used only to house mechanical equipment and not exceeding total floor area of 200 square feet (18.58 m^2).
2. Emergency escape and rescue openings shall not be required in one- and two family dwellings and townhouses that are equipped with an approved automatic sprinkler system in accordance with Section R313 or Section P2904.

Reason: Based on extensive research on the performance of residential smoke alarms, the NFPA 72 technical committee on residential alarms has determined that both ionization and photoelectric smoke alarms provide adequate escape time along the normal path of egress in both fast flaming and slow smoldering fires. In tests conducted by NIST, the results show that when smoke alarms are present and functioning properly, these devices will detect and notify the occupant with enough time to vacate the structure prior to untenable conditions being reached within the dwelling. The purpose for the emergency egress is to provide a secondary means of escape and rescue, in the event that the normal path of egress becomes blocked or conditions are unsustainable.

During the last code development cycle, the sprinkler proponents testified that residential fire sprinklers are effective in 96% of the fires that grow large enough to activate the system. With the recent addition of residential sprinklers, the time for evacuating the structure before conditions become untenable and incapacitate the occupant have been extended. When sprinklers are used in tandem with smoke alarms, the available escape time in a fast flaming fire is increased and occupants are given more time for escape. Proponents also testified that when sprinklers are present it will provide additional time for firefighters to conduct search and rescue, since the fire will be either extinguished or contained.

If homes are required to be equipped with both an active suppression system and alarm system, it is time to start reevaluating the need for some of the passive life safety features in the home that have previously been justified to protect occupants in the event of a fire. While this proposal may raise the eyebrows of many skeptics, the concept of not requiring emergency egress and rescue openings in one- and two- family dwellings equipped with an automatic suppression system is not new since this exception has been permitted in NFPA 101 The Life Safety Code for several years. In addition, the International Building Code has exempted R-1, R-2 and I-1 occupancies from requiring emergency escape and rescue openings when an approved automatic suppressions system is installed.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Orlowski-E1-1029.1

E151–09/10

406.2.2, [F] 907.5.2.3.4, 1007.9, 1011.3, 1022.8, 1104.4, 1106.7, 1108.2.2, 1108.2.3, 1108.4.1.1, 1108.4.1.2, 1108.4.1.4, 1108.4.1.5, 1109.1, 1109.2.1.1, 1109.2.2, 1109.2.3, 1109.3, 1109.4, 1109.6, 1109.8, 1109.13, [P] 2902.4, 3001.3, 3411.6, E104.3, E105.1, E105.2.1, E105.2.2, E105.3, E105.4, E105.6, E106.2, E106.3, E106.4, E106.4.9, E106.5, E107.2, E109.2.1, E109.2.2.1, E109.2.6, E109.2.8, E110.4; IFC 907.5.2.3.4, [B] 1007.9, [B] 1011.3, [B] 1022.8; IPC 403.4; IEBC [B] 310.6, 605.1

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

THIS IS A 4 PART CODE CHANGE. ALL FOUR PARTS WILL BE HEARD BY THE MEANS OF EGRESS COMMITTEE AS SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

PART I – IBC MEANS OF EGRESS

Revise as follows:

1101.2 Design. Buildings and facilities shall be designed and constructed to be accessible in accordance with this code and ICC A117.1.

SECTION 1102
DEFINITIONS

1102.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in the code, have the meanings shown herein:

ACCESSIBLE UNIT. A dwelling unit or sleeping unit that complies with this code and the provisions for Accessible units in ICC A117.1.

TYPE A UNIT. A dwelling unit or sleeping unit designed and constructed for accessibility in accordance with this code and the provisions for Type A units in ICC A117.1.

TYPE B UNIT. A dwelling unit or sleeping unit designed and constructed for accessibility in accordance with this code and the provisions for Type B units in ICC A117.1, consistent with the design and construction requirements of the federal Fair Housing Act.

1104.4 Multilevel buildings and facilities. At least one accessible route shall connect each accessible level, including mezzanines, in multilevel buildings and facilities.

Exceptions:

1. An accessible route is not required to stories and mezzanines that have an aggregate area of not more than 3,000 square feet (278.7 m2) and are located above and below accessible levels. This exception shall not apply to:
   1.1. Multiple tenant facilities of Group M occupancies containing five or more tenant spaces;
   1.2. Levels containing offices of health care providers (Group B or I); or
   1.3. Passenger transportation facilities and airports (Group A-3 or B).
2. Levels that do not contain accessible elements or other spaces as determined by Section 1107 or 1108 are not required to be served by an accessible route from an accessible level.
3. In air traffic control towers, an accessible route is not required to serve the cab and the floor immediately below the cab.
4. Where a two-story building or facility has one story with an occupant load of five or fewer persons that does not contain public use space, that story shall not be required to be connected by an accessible route to the story above or below.
5. Vertical access to elevated employee work stations within a courtroom is not required at the time of initial construction, provided a ramp, lift or elevator ~~complying with ICC A117.1~~ can be installed without requiring reconfiguration or extension of the courtroom or extension of the electrical system.

1106.7 Passenger loading zones. Passenger loading zones shall be accessible ~~designed and constructed in accordance with ICC A117.1~~.

1107.2 Design. Dwelling units and sleeping units that are required to be Accessible units, Type A units and Type B units shall comply with the applicable portions of Chapter 10 of ICC A117.1. Units required to be Type A units are permitted to be designed and constructed as Accessible units. Units required to be Type B units are permitted to be designed and constructed as Accessible units or as Type A units.

1108.2.2 Wheelchair spaces. In theaters, bleachers, grandstands, stadiums, arenas and other fixed seating assembly areas, accessible wheelchair spaces ~~complying with ICC A117.1~~ shall be provided in accordance with Sections 1108.2.2.1 through 1108.2.2.4.

1108.2.3 Companion seats. At least one companion seat ~~complying with ICC A117.1~~ shall be provided for each wheelchair space required by Sections 1108.2.2.1 through 1108.2.2.3.

1108.4.1.1 Jury box. A wheelchair space ~~complying with ICC A117.1~~ shall be provided within the jury box.

Exception: Adjacent companion seating is not required.

1108.4.1.2 Gallery seating. Wheelchair spaces ~~complying with ICC A117.1~~ shall be provided in accordance with Table 1108.2.2.1. Designated aisle seats shall be provided in accordance with Section 1108.2.5.

1108.4.1.4 Employee work stations. The judge's bench, clerk's station, bailiff's station, deputy clerk's station and court reporter's station shall be located on an accessible route. The vertical access to elevated employee work stations within a courtroom is not required at the time of initial construction, provided a ramp, lift or elevator ~~complying with ICC A117.1~~ can be installed without requiring reconfiguration or extension of the courtroom or extension of the electrical system.

1108.4.1.5 Other work stations. The litigant's and counsel stations, including the lectern, shall be accessible ~~in accordance with ICC A117.1~~.

1109.1 General. Accessible building features and facilities shall be provided in accordance with Sections 1109.2 through 1109.14.

Exception: Accessible units, Type A units and Type B units shall comply with Chapter 10 of ICC A117.1.

1109.2 Toilet and bathing facilities. Each toilet room and bathing room shall be *accessible*. Where a floor level is not required to be connected by an *accessible route*, the only toilet rooms or bathing rooms provided within the facility shall not be located on the inaccessible floor. At least one of each type of fixture, element, control or dispenser in each *accessible* toilet room and bathing room shall be *accessible*.

Exceptions:

1. In toilet rooms or bathing rooms accessed only through a private office, not for *common* or *public use* and intended for use by a single occupant, any of the following alternatives are allowed:
   1.1. Doors are permitted to swing into the clear floor space, provided the door swing can be reversed to meet the requirements in ICC A117.1;
   1.2. The height requirements for the water closet in ICC A117.1 are not applicable;
   1.3. Grab bars are not required to be installed in a toilet room, provided that reinforcement has been installed in the walls and located so as to permit the installation of such grab bars; and
   1.4. The requirement for height, knee and toe clearance shall not apply to a lavatory.
2. This section is not applicable to toilet and bathing rooms that serve *dwelling units* or *sleeping unit*s that are not required to be *accessible* by Section 1107.
3. Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be *accessible*.
4. Where no more than one urinal is provided in a toilet room or bathing room, the urinal is not required to be *accessible*.
5. Toilet rooms that are part of critical care or intensive care patient sleeping rooms are not required to be *accessible*.

1109.2.1.1 Standard. Family or assisted-use toilet and bathing rooms shall comply with Sections 1109.2.1.2 through 1109.2.1.7 ~~and ICC A117.1~~.

1109.2.2 Water closet compartment. Where water closet compartments are provided in a toilet room or bathingfacility, at least one wheelchair-accessible compartment shall be provided. Where the combined total water closet compartments and urinals provided in a toilet room or bathing facility is six or more, at least one ambulatory-accessible water closet compartment shall be provided in addition to the wheelchair-accessible compartment. ~~Wheelchair-accessible and ambulatory-accessible compartments shall comply with ICC A117.1.~~

1109.2.3 Lavatories. Where lavatories are provided, at least 5 percent, but not less than one, shall be *accessible*. Where the total lavatories provided in a toilet room or bathing facility is six or more, at least one lavatory with enhanced reach ranges ~~in accordance with ICC A117.1~~, shall be provided.

1109.3 Sinks. Where sinks are provided, at least 5 percent but not less than one provided in accessible spaces shall be accessible ~~comply with ICC A117.1~~.
Exception: Mop or service sinks are not required to be accessible.

1109.4 Kitchens and kitchenettes. Where kitchens and kitchenettes are provided in accessible spaces or rooms, they shall be accessible ~~in accordance with ICC A117.1~~.

1109.6 Elevators. Passenger elevators on an accessible route shall be accessible and comply with ~~Section 3001.3~~ Chapter 30.

1109.8 Storage. Where fixed or built-in storage elements such as cabinets, shelves, medicine cabinets, closets and drawers are provided in required accessible spaces, at least one of each type shall contain accessible storage space ~~complying with ICC A117.1~~.

1109.13 Fuel-dispensing systems. Fuel-dispensing systems shall be accessible ~~comply with ICC A117.1~~.

SECTION 406
MOTOR-VEHICLE-RELATED OCCUPANCIES

406.2.2 Clear height. The clear height of each floor level in vehicle and pedestrian traffic areas shall not be less than 7 feet (2134 mm). Vehicle and pedestrian areas accommodating van-accessible parking shall comply with ~~required by~~ Section 1106.5 ~~shall conform to ICC A117.1.~~

SECTION 1007 (IFC [B] 1007)
ACCESSIBLE MEANS OF EGRESS

1007.9 (IFC [B] 1007.9) Signage. Signage indicating special accessibility provisions shall be provided as shown:

1. Each door providing access to an *area of refuge* from an adjacent floor area shall be identified by a sign stating: AREA OF REFUGE.
2. Each door providing access to an exterior area for assisted rescue shall be identified by a sign stating: EXTERIOR AREA FOR ASSISTED RESCUE.

Signage shall comply with the ICC A117.1 requirements for visual characters and include the International Symbol of Accessibility. Where exit sign illumination is required by Section 1011.2, the signs shall be illuminated. Additionally, raised character and braille ~~tactile~~ signage complying with ICC A117.1 shall be located at each door to an *area of refuge* and exterior area for assisted rescue in accordance with Section 1011.3.

SECTION 1010 (IFC [B] 1010)
RAMPS

1010.1 (IFC [B] 1010.1) Scope. The provisions of this section shall apply to ramps used as a component of a means of egress.

Exceptions:

1. Other than ramps that are part of the accessible routes providing access in accordance with Sections 1108.2 through 1108.2.4 and 1108.2.6, ramped aisles within assembly rooms or spaces shall conform with the provisions in Section 1028.11.
2. Curb ramps shall comply with ICC A117.1.
3. Vehicle ramps in parking garages for pedestrian exit access shall not be required to comply with Sections 1010.3 through 1010.9 when they are not an accessible route serving accessible parking spaces, other required accessible elements or part of an accessible means of egress.

1010.6.5 (IFC [B] 1010.6.5) Doorways. Where doorways are located adjacent to a ramp landing, maneuvering clearances required by ICC A117.1 are permitted to overlap the required landing area.

1010.9 (IFC [B] 1010.9) Edge protection. Edge protection complying with Section 1010.9.1 or 1010.9.2 shall be provided on each side of ramp runs and at each side of ramp landings.

Exceptions:

1. Edge protection is not required on ramps that are not required to have handrails, provided they have flared sides that comply with the ICC A117.1 curb ramp provisions.
2. Edge protection is not required on the sides of ramp landings serving an adjoining ramp run or stairway.
3. Edge protection is not required on the sides of ramp landings having a vertical drop off of not more than ½ inch (12.7 mm) within 10 inches (254 mm) horizontally of the required landing area.
4. In assembly spaces with fixed seating, edge protection is not required on the sides of ramps where the ramps provide access to the adjacent seating and aisle accessways.

SECTION 1011(IFC [B] 1011)
EXIT SIGNS

1011.3 (IFC [B] 1011.3) ~~Tactile~~ Raised character and Braille exit signs. A ~~tactile~~ sign stating EXIT in raised characters and Braille and complying with ICC A117.1 shall be provided adjacent to each door to an area of refuge, an exterior area for assisted rescue, an exit stairway, an exit ramp, an exit passageway and the exit discharge.

SECTION 1022 (IFC [B] 1022)
EXIT ENCLOSURES

1022.8 (IFC [B] 1022.8) Floor identification signs. A sign shall be provided at each floor landing in exit enclosures connecting more than three stories designating the floor level, the terminus of the top and bottom of the exit enclosure and the identification of the stair or ramp. The signage shall also state the story of, and the direction to, the exit discharge and the availability of roof access from the enclosure for the fire department. The sign shall be located 5 feet (1524 mm) above the floor landing in a position that is readily visible when the doors are in the open and closed positions. In addition, floor level identification signs in ~~tactile~~ raised characters and Braille complying with ICC A117.1 shall be located at each floor level landing adjacent to the door leading from the enclosure into the corridor to identify the floor level.

CHAPTER 30
ELEVATORS AND CONVEYING SYSTEMS

3001.3 Accessibility. Passenger elevators required to be accessible ~~by Chapter 11 shall conform to ICC A117.1~~ or serve as part of an accessible means of egress shall comply with Section 1107 and 1109.6.

3008.13.1 Design and installation. The two-way communication system shall include audible and visible signals and shall be designed and installed in accordance with the requirements in ICC A117.1.

3008.13.2 Instructions. Instructions for the use of the two-way communication system along with the location of the station shall be permanently located adjacent to each station. Signage shall comply with the ICC A117.1 requirements for visual characters.

SECTION 3411 (IEBC 310)
ACCESSIBILITY FOR EXISTING BUILDINGS

3411.6 (IEBC 310.6) Alterations. A building, facility or element that is altered shall comply with the applicable provisions in Chapter 11 of this code ~~and ICC A117.1~~, unless technically infeasible. Where compliance with this section is technically infeasible, the alteration shall provide access to the maximum extent technically feasible.

Exceptions:

1. The altered element or space is not required to be on an accessible route, unless required by Section 3411.7.
2. Accessible means of egress required by Chapter 10 are not required to be provided in existing buildings and facilities.
3. The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall be permitted to meet the provision for a Type B dwelling unit ~~and shall comply with the applicable provisions in Chapter 11 and ICC A117.1~~.

3411.8.2 (IEBC 310.8.2) Elevators. Altered elements of existing elevators shall comply with ASME A17.1 and ICC A117.1. Such elements shall also be altered in elevators programmed to respond to the same hall call control as the altered elevator.

3411.8.3 (IEBC 310.8.3) Platform lifts. Platform (wheelchair) lifts complying with ICC A117.1 and installed in accordance with ASME A18.1 shall be permitted as a component of an accessible route.

APPENDIX E
SUPPLEMENTARY ACCESSIBILITY REQUIREMENTS

E101.2 Design. Technical requirements for items herein shall comply with this code and ICC A117.1.

SECTION E104
SPECIAL OCCUPANCIES

E104.2 Accessible beds. In rooms or spaces having more than 25 beds, 5 percent of the beds shall have a clear floor space complying with ICC A117.1.

E104.2.1 Sleeping areas. A clear floor space complying with ICC A117.1 shall be provided on both sides of the accessible bed. The clear floor space shall be positioned for parallel approach to the side of the bed.

Exception: This requirement shall not apply where a single clear floor space complying with ICC A117.1 positioned for parallel approach is provided between two beds.

E104.3 Communication features. Accessible communication features ~~complying with ICC A117.1~~ shall be provided in accordance with Sections E104.3.1 through E104.3.4.

E104.3.4 Notification devices. Visual notification devices shall be provided to alert room occupants of incoming telephone calls and a door knock or bell. Notification devices shall not be connected to visual alarm signal appliances. Permanently installed telephones shall have volume controls and an electrical outlet complying with ICC A117.1 located within 48 inches (1219 mm) of the telephone to facilitate the use of a TTY.

SECTION E105
OTHER FEATURES AND FACILITIES

E105.1 Portable toilets and bathing rooms. Where multiple single-user portable toilet or bathing units are clustered at a single location, at least 5 percent, but not less than one toilet unit or bathing unit at each cluster, shall be accessible ~~comply with ICC A117.1~~. Signs containing the International Symbol of Accessibility ~~and complying with ICC A117.1~~ shall identify accessible portable toilets and bathing units.

Exception: Portable toilet units provided for use exclusively by construction personnel on a construction site.

E105.2.1Washing machines. Where three or fewer washing machines are provided, at least one shall be accessible ~~comply with ICC A117.1~~. Where more than three washing machines are provided, at least two shall be accessible ~~comply with ICC A117.1~~.

E105.2.2 Clothes dryers. Where three or fewer clothes dryers are provided, at least one shall be accessible ~~comply with ICC A117.1~~. Where more than three clothes dryers are provided, at least two shall be accessible ~~comply with ICC A117.1~~.

E105.3 Depositories, vending machines, change machines and similar equipment. Where provided, at least one of each type of depository, vending machine, change machine and similar equipment shall be accessible ~~comply with ICC A117.1~~.

Exception: Drive-up-only depositories are not required to comply with this section.

E105.4 Mailboxes. Where mailboxes are provided in an interior location, at least 5 percent, but not less than one, of each type shall be accessible ~~comply with ICC A117.1~~. In residential and institutional facilities, where mailboxes are provided for each dwelling unit or sleeping unit, mailboxes be accessible ~~complying with ICC A117.1~~ shall be provided for each unit required to be an Accessible unit.

E105.6 Two-way communication systems. Where two-way communication systems are provided to gain admittance to a building or facility or to restricted areas within a building or facility, the system shall be accessible ~~comply with ICC A117.1~~.

SECTION E106
TELEPHONES

E106.2 Wheelchair-accessible telephones. Where public telephones are provided, wheelchair-accessible telephones ~~complying with ICC A117.1~~ shall be provided in accordance with Table E106.2.

Exception: Drive-up-only public telephones are not required to be accessible.

E106.3 Volume controls. All public telephones provided shall have accessible volume control ~~complying with ICC A117.1~~.

E106.4 TTYs. TTYs ~~complying with ICC A117.1~~ shall be provided in accordance with Sections E106.4.1 through E106.4.9.

E106.4.9 Signs. Public TTYs shall be identified by the International Symbol of TTY ~~complying with ICC A117.1~~. Directional signs indicating the location of the nearest public TTY shall be provided at banks of public pay telephones not containing a public TTY. Additionally, where signs provide direction to public pay telephones, they shall also provide direction to public TTYs. Such signs shall comply with visual signage requirements in ICC A117.1 and shall include the International Symbol of TTY.

E106.5 Shelves for portable TTYs. Where a bank of telephones in the interior of a building consists of three or more public pay telephones, at least one public pay telephone at the bank shall be provided with a shelf and an electrical outlet ~~in accordance with ICC A117.1~~.

Exceptions:

1. In secured areas of detention and correctional facilities, if shelves and outlets are prohibited for purposes of security or safety shelves and outlets for TTYs are not required to be provided.
2. The shelf and electrical outlet shall not be required at a bank of telephones with a TTY.

SECTION E107
SIGNAGE

E107.1 Signs. Required accessible portable toilets and bathing facilities shall be identified by the International Symbol of Accessibility.

E107.2 Designations. Interior and exterior signs identifying permanent rooms and spaces shall be ~~tactile~~ raised chaacters and braille. Where pictograms are provided as designations of interior rooms and spaces, the pictograms shall have ~~tactile~~ raised chaacter and braille text descriptors. ~~Signs required to provide tactile characters and pictograms shall comply with ICC A117.1~~.

Exceptions:

1. Exterior signs that are not located at the door to the space they serve are not required to comply.
2. Building directories, menus, seat and row designations in assembly areas, occupant names, building addresses and company names and logos are not required to comply.
3. Signs in parking facilities are not required to comply.
4. Temporary (seven days or less) signs are not required to comply.
5. In detention and correctional facilities, signs not located in public areas are not required to comply.

E107.3 Directional and informational signs. Signs that provide direction to, or information about, permanent interior spaces of the site and facilities shall contain visual characters complying with ICC A117.1.

Exception: Building directories, personnel names, company or occupant names and logos, menus and temporary (seven days or less) signs are not required to comply with ICC A117.1.

SECTION E108
BUS STOPS

E108.3 Bus shelters. Where provided, new or replaced bus shelters shall provide a minimum clear floor or ground space complying with ICC A117.1, Section 305, entirely within the shelter. Such shelters shall be connected by an accessible route to the boarding area required by Section E108.2.

E108.4 Signs. New bus route identification signs shall have finish and contrast complying with ICC A117.1. Additionally, to the maximum extent practicable, new bus route identification signs shall provide visual characters complying with ICC A117.1.

Exception: Bus schedules, timetables and maps that are posted at the bus stop or bus bay are not required to meet this requirement.

SECTION E109
TRANSPORTATION FACILITIES AND STATIONS

E109.2.1 Station entrances. Where different entrances to a station serve different transportation fixed routes or groups of fixed routes, at least one entrance serving each group or route shall comply with Section 1104 ~~and ICC A117.1~~.

E109.2.2.1 ~~Tactile~~ Raised chaacter and braille signs. Where signs are provided at entrances to stations identifying the station or the entrance, or both, at least one sign at each entrance shall be ~~tactile~~ raised chaacters and braille. A minimum of one ~~tactile~~ raised chaacter and braille sign identifying the specific station shall be provided on each platform or boarding area. Such signs shall be placed in uniform locations at entrances and on platforms or boarding areas within the transit system to the maximum extent practicable. ~~Tactile signs shall comply with ICC A117.1~~.

Exceptions:

1. Where the station has no defined entrance but signs are provided, the ~~tactile~~ raised chaacter and braille signs shall be placed in a central location.
2. Signs are not required to be ~~tactile~~ raised chaacter and braille where audible signs are remotely transmitted to hand-held receivers, or are user or proximity actuated.

E109.2.2.2 Identification signs. Stations covered by this section shall have identification signs containing visual characters complying with ICC A117.1. Signs shall be clearly visible and within the sightlines of a standing or sitting passenger from within the train on both sides when not obstructed by another train.

E109.2.2.3 Informational signs. Lists of stations, routes and destinations served by the station which are located on boarding areas, platforms or mezzanines shall provide visual characters complying with ICC A117.1 Signs covered by this provision shall, to the maximum extent practicable, be placed in uniform locations within the transit system.

E109.2.3 Fare machines. Self-service fare vending, collection and adjustment machines shall comply with ICC A117.1, Section 707. Where self-service fare vending, collection or adjustment machines are provided for the use of the general public, at least one accessible machine of each type provided shall be provided at each accessible point of entry and exit.

E109.2.5 TTYs. Where a public pay telephone is provided in a transit facility (as defined by the Department of Transportation) at least one public TTY complying with ICC A117.1, Section 704.4, shall be provided in the station. In addition, where one or more public pay telephones serve a particular entrance to a transportation facility, at least one TTY telephone complying with ICC A117.1, Section 704.4, shall be provided to serve that entrance.

E109.2.6 Track crossings. Where a circulation path serving boarding platforms crosses tracks, an accessible route ~~complying with ICC A117.1~~ shall be provided.

Exception: Openings for wheel flanges shall be permitted to be 21/2 inches (64 mm) maximum.

E109.2.8 Clocks. Where clocks are provided for use by the general public, the clock face shall be uncluttered so that its elements are clearly visible. Hands, numerals and digits shall contrast with the background either light-on-dark or dark-on-light. Where clocks are mounted overhead, numerals and digits shall comply with visual character requirements ~~ICC A117.1, Section 703.2~~.

SECTION E110
AIRPORTS

E110.2 TTYs. Where public pay telephones are provided, at least one TTY shall be provided in compliance with ICC A117.1, Section 704.4. Additionally, if four or more public pay telephones are located in a main terminal outside the security areas, a concourse within the security areas or a baggage claim area in a terminal, at least one public TTY complying with ICC A117.1, Section 704.4, shall also be provided in each such location.

E110.4 Clocks. Where clocks are provided for use by the general public, the clock face shall be uncluttered so that its elements are clearly visible. Hands, numerals and digits shall contrast with their background either light-on-dark or dark-on-light. Where clocks are mounted overhead, numerals and digits shall comply with visual character requirements ~~ICC A117.1, Section 703.2~~.

PART II – IFC

Revise as follows:

SECTION [F] 907 (IFC 907)
FIRE ALARM AND DETECTION SYSTEMS

[F] 907.5.2.3.4 (IFC 907.5.2.3.4) Group R-2. In Group R-2 occupancies required by Section 907 to have a fire alarm system, all dwelling units and sleeping units shall be provided with the capability to support visible alarm notification appliances in accordance with Chapter 10 of ICC A117.1.

PART III – IPC

Revise 2902.4 to match IPC 403.4 as follows:

SECTION [P] 2902 (IPC 403.4)
MINIMUM PLUMBING FACILITIES

[P] 2902.4 Signage. ~~A legible sign designating the sex shall be provided in a readily visible location near the entrance to each toilet facility~~. Required public facilities shall be designated by a legible sign for each sex. Signs shall be readily visible and located near the entrance to each toilet facility. Signs for accessible toilet facilities shall comply with Section 1110 ~~ICC A117.1~~.

IPC 403.4 Signage. Required *public* facilities shall be designated by a legible sign for each sex. Signs shall be readily visible and located near the entrance to each toilet facility. Signs for accessible toilet facilities shall comply with Section 1110 of the *International Building Code*.

PART IV – IEBC

SECTION 605
ACCESSIBILITY

605.1 General. A building, facility or element that is altered shall comply with the applicable provisions in Sections 605.1.1 through 605.1.14, Chapter 11 of the International Building Code ~~and ICC A117.1~~ unless it is technically infeasible. Where compliance with this section is technically infeasible, the alteration shall provide access to the maximum extent that is technically feasible. A building, facility or element that is constructed or altered to be accessible shall be maintained accessible during occupancy.

Exceptions:

1. The altered element or space is not required to be on an accessible route unless required by Section 605.2.
2. Accessible means of egress required by Chapter 10 of the International Building Code are not required to be provided in existing buildings and facilities.
3. Type B dwelling or sleeping units required by Section 1107 of the International Building Code are not required to be provided in existing buildings and facilities.
4. The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall be permitted to meet the provisions for Type B dwelling units ~~and shall comply with the applicable provisions in Chapter 11 of the International Building Code and ICC A117.1~~.

605.1.2 Elevators. Altered elements of existing elevators shall comply with ASME A17.1 and ICC A117.1. Such elements shall also be altered in elevators programmed to respond to the same hall call control as the altered elevator.

605.1.3 Platform lifts. Platform (wheelchair) lifts complying with ICC A117.1 and installed in accordance with ASME A18.1 shall be permitted as a component of an accessible route.

Reason:
PART I-IBC
Section 1101.2 establishes ICC A117.1 as the standard for accessible design for Chapter 11. Section E101.2 establishes ICC A117.1 as the standard for accessible design for Appendix E. It is unnecessary to repeat this throughout Chapter 11 or Appendix E unless the specific text is an exception to the standard (Ex: Section 1109.2 Ex. 1) or a specific item within the standard (Ex: Section 1002.1, Definitions for Accessible Unit, Type

A unit and Type B unit) . Providing the reference in a haphazard manner within the chapter only serves to create confusion. This is an editorial issue and the editorial committee should verify that there are not other occurrences of this in the chapter. The text provided shows all of the location where ICC A117.1 is currently referenced.

1109.1 – The revisions is correlative with the 2003 A117.1 including Accessible Units in Chapter 10 which only included Type A and Type B units in the 1998 edition. The definition for Accessible units was correlated and approved with the new edition, but this exception was missed.

1109.6 – the reference to Section 3001.3 is only a reference to ICC A117.1, which is not needed since it is already called out in Section 1101.2. All elevators have to comply with Chapter 30 for safety.

406.2.2 – the reference to Section 1106.5 for accessible parking automatically gets ICC A117.1.

1007.9 – ICC A117.1 has changed 'tactile' requirements for signage to 'raised characters and braille'. This revision would correlate with the standard.

1011.3 – ICC A117.1 has changed 'tactile' requirements for signage to 'raised characters and braille'. This revision would correlate with the standard.

3411.6 (IEBC 310.6) - The reference to IBC Chapter 11 already gets the ICC A117.1.

Changes for 'tactile characters' to 'raised characters and braille' is consistent with revisions to the 2009 edition in A117.1.

Part II – IFC - 907.5.2.3.4 – in this situation, the more specific reference would clarify to users where the alarm requirements for dwelling units are found. This would be consistent with the definitions of Accessible units, Type A units and Type B units.

Part III – IPC – 2902.4 (IPC 403.4) – The reference to the signage requirements in Chapter 11 will help a user locate all the provisions for accessible signage associated with toilet rooms and in addition will pick up the ICC A117.1 references. The signage requirements in Chapter 29 should match the Plumbing Code requirements.

Part IV – IEBC – 605.1 – The reference to IBC Chapter 11 already gets the ICC A117.1.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART IV – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E8-1101.2

E152–09/10

1102.1, 1104.2, 1104.3, 1109.7, 1109.14, 1110 (New), 3411.8, 3411.8.15 (New), 3411.8.16 (New) [IEBC [B] 310.8, 310.8.15 (New), 310.8.16 (New); IEBC 605.1, 605.1.15 (New), 605.1.16 (New)

Proponent: Marsha K. Mazz, U.S. Architectural and Transportation Barriers Compliance Board (Access Board)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC MEANS OF EGRESS COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE THIS COMMITTEE.

PART I – IBC MEANS OF EGRESS

1. Add new definitions as follows:

1102.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in the code, have the meanings shown herein:

AMUSEMENT RIDE. A system that moves persons through a fixed course within a defined area for the purpose of amusement.

AMUSEMENT RIDE SEAT. A seat that is built-in or mechanically fastened to an amusement ride intended to be occupied by one or more passengers.

AREA OF SPORT ACTIVITY. That portion of a room or space where the play or practice of a sport occurs.

BOARDING PIER. A portion of a pier where a boat is temporarily secured for the purpose of embarking or disembarking.

BOAT LAUNCH RAMP. A sloped surface designed for launching and retrieving trailered boats and other water craft to and from a body of water.

BOAT SLIP. That portion of a pier, main pier, finger pier, or float where a boat is moored for the purpose of berthing, embarking, or disembarking.

GANGWAY. A variable-sloped pedestrian walkway that links a fixed structure or land with a floating structure. Gangways which connect to vessels are not included.

GOLF CAR PASSAGE. A continuous passage on which a motorized golf car can operate.

PLAY AREA. A portion of a site containing play components designed and constructed for children.

PLAY COMPONENT. An element intended to generate specific opportunities for play, socialization, or learning. Play components may be manufactured or natural, and may be stand alone or part of a composite play structure.

TEEING GROUND. In golf, the starting place for the hole to be played.

TRANSFER DEVICE. Equipment designed to facilitate the transfer of a person from a wheelchair or other mobility device to and from an amusement ride seat.

2. Revise as follows:

1104.2 Within a site. At least one accessible route shall connect accessible buildings, accessible facilities, accessible elements and accessible spaces that are on the same site.

Exceptions:

1. An accessible route is not required between accessible buildings, accessible facilities, accessible elements and accessible spaces that have, as the only means of access between them, a vehicular way not providing for pedestrian access.
2. An accessible route to recreational facilities is not required when exempted under Sections 1110.4 or 1110.6

1104.3 Connected spaces. When a building or portion of a building is required to be accessible, an accessible route shall be provided to each portion of the building, to accessible building entrances connecting accessible pedestrian walkways and the public way.

Exceptions:

1. In assembly areas with fixed seating, an accessible route shall not be required to serve levels where wheelchair spaces are not provided.
2. In Group I-2 facilities, doors to sleeping units shall be exempted from the requirements for maneuvering clearance at the room side provided the door is a minimum of 44 inches (1118 mm) in width.
3. An accessible route to recreational facilities is not required when exempted under Sections 1110.4 or 1110.6

1109.7 Lifts. Platform (wheelchair) lifts are permitted to be a part of a required accessible route in new construction where indicated in Items 1 through ~~10~~ 11. Platform (wheelchair) lifts shall be installed in accordance with ASME A18.1.

1. An accessible route to a performing area and speaker platforms in Group A occupancies.

2. An accessible route to wheelchair spaces required to comply with the wheelchair space dispersion requirements of Sections 1108.2.2 through 1108.2.6.
3. An accessible route to spaces that are not open to the general public with an occupant load of not more than five.
4. An accessible route within a dwelling or sleeping unit.
5. An accessible route to wheelchair seating spaces located in outdoor dining terraces in Group A-5 occupancies where the means of egress from the dining terraces to a public way are open to the outdoors.
6. An accessible route to jury boxes and witness stands; raised courtroom stations including judges' benches, clerks' stations, bailiffs' stations, deputy clerks' stations and court reporters' stations; and to depressed areas such as the well of the court.
7. An accessible route to load and unload areas serving amusement rides.
8. An accessible route to play components or soft contained play structures.
9. An accessible route to team or player seating areas serving areas of sport activity.
10. An accessible route where existing exterior site constraints make use of a ramp or elevator infeasible.
11. Platform lifts shall be permitted to be used instead of gangways that are part of accessible routes serving recreational boating facilities and fishing piers and platforms.

SECTION 1110
RECREATIONAL FACILITIES

1110.1 ~~1109.14~~ Recreational and sports facilities. Recreational and sports facilities shall be provided with accessible features in accordance with Sections 1110.2 ~~1109.14.1~~ through 1110.6 ~~1109.14.4~~.

1110.2 ~~1109.14.1~~ Facilities serving Type B units in a single building. In Group R-2 and R-3 occupancies where recreational facilities are provided serving a single building containing ~~Type A units or~~ Type B units, 25 percent, but not less than one, of each type of recreational facility shall be accessible. Every recreational facility of each type on a site shall be considered to determine the total number of each type that is required to be accessible.

1110.3 ~~1109.14.2~~ Facilities serving Type B units in multiple buildings. In Group R-2 and R-3 occupancies on a single site where multiple buildings containing ~~Type A units or~~ Type B units are served by recreational facilities, 25 percent, but not less than one, of each type of recreational facility serving each building shall be accessible. The total number of each type of recreational facility that is required to be accessible shall be determined by considering every recreational facility of each type serving each building on the site.

1110.4 Facilities serving Accessible and Type A units. In Group R-2 and R-3 occupancies where recreational facilities are provided serving Accessible or Type A units, every recreational facility of each type serving Accessible or Type A units shall be accessible.

1110.5 ~~1109.14.3~~ Other occupancies. All recreational facilities not falling within the purview of Section 1110.2 through 1110.4 ~~1109.14.1 or 1109.14.2~~ shall comply with ICC A117.1 and be located on an accessible route ~~be accessible~~. Each area of sports activity shall be served by an accessible route. Accessible route shall also comply with Section 1110.5.1 through 1110.5.3.

Exception: Areas of sport activity shall not be required to comply with ICC A117.1.

1110.5.1 Protruding objects. Protruding objects shall comply with the requirements of Sections 1003.3.

Exception: Within play areas, protruding objects on circulation paths shall not be required to comply with 1003.3 provided that ground level accessible routes provide vertical clearance in compliance with 1003.3.1.

1110.5.2 Floor surface. Walking surfaces of the accessible route shall comply with ICC ANSI A117.1.

Exception: Within animal containment areas, floor and ground surfaces shall not be required to be stable, firm, and slip resistant.

1110.5.3 Changes in Level. Where changes in level are permitted in floor or ground surfaces, they shall comply with ICC A117.1 for changes in level.

Exception: Animal containment areas shall not be required to comply with ICC A117.1.

1110.6 ~~1109.14.4~~ Recreational and sports facilities exceptions. Recreational and sports facilities required to be accessible shall be exempt from this chapter to the extent specified in this section.

1110.6.1 ~~1108.2.2.4~~ Team or player seating. At least one wheelchair space shall be provided in team or player seating areas serving areas of sport activity.

Exception: Wheelchair spaces shall not be required in team or player seating areas serving bowling lanes that are not required to be located on an accessible route in accordance with Section ~~1109.14.4.1~~ 1110.6.2.

1110.6.2 ~~1109.14.4.1~~ Bowling lanes. An accessible route shall be provided to at least 5 percent, but no less than one, of each type of bowling lane.

1110.6.3 ~~1109.14.4.2~~ Court sports. In court sports, at least one accessible route shall directly connect both sides of the court.

1110.6.4 ~~1109.14.4.3~~ Raised boxing or wrestling rings. Raised boxing or wrestling rings are not required to be accessible or to be on an accessible route.

1110.6.5 ~~1109.14.4.4~~ Raised refereeing, judging and scoring areas. Raised structures used solely for refereeing, judging or scoring a sport are not required to be accessible or to be on an accessible route.

1110.6.6 Swimming pools, wading pools and spas. Swimming pools, wading pools, and spas shall comply with ICC A117.1.

1110.6.6.1 ~~1109.14.4.5~~ Raised diving boards and diving platforms. Raised diving boards and diving platforms are not required to be accessible or to be on an accessible route.

1110.6.6.2 Water Slides. Water slides are not be required to be accessible or to be on an accessible route.

1110.6.7 Amusement Rides. Amusement rides shall comply with Section 1110.6.7.1 through 1110.6.7.3.

Exception: Mobile or portable amusement rides shall not be required to be accessible.

1110.6.7.1 Load and Unload Areas. Load and unload areas serving amusement rides shall comply with ICC A117.1.

1110.6.7.2 Minimum Number. Amusement rides shall provide at least one wheelchair space, or at least one amusement ride seat designed for transfer, or at least one transfer device.

Exceptions:

1. Amusement rides that are controlled or operated by the rider shall not be required to comply with this section.
2. Amusement rides designed primarily for children, where children are assisted on and off the ride by an adult, shall not be required to comply with this section.
3. Amusement rides that do not provide amusement ride seats shall not be required to comply with this section.

1110.6.7.3 Amusement Rides. Accessible amusement rides shall be on an accessible routes in accordance with Section 1110.6.7.3.1 and 1110.6.7.3.2.

1110.6.7.3.1 Load and Unload Areas. Load and unload areas shall be on an accessible route. Where load and unload areas have more than one loading or unloading position, at least one loading and unloading position shall be on an accessible route.

1110.6.7.3.2 Wheelchair Spaces, Ride Seats Designed for Transfer, and Transfer Devices. When amusement rides are in the load and unload position, wheelchair spaces, amusement ride seats designed for transfer and transfer devices shall be on an accessible route.

1110.6.8 Recreational Boating Facilities. Boat slips required to be accessible by Section 1110.6.8.1 and 1110.6.8.2 and boarding piers at boat launch ramps required to be accessible by Section 1110.6.8.3 shall be on an accessible route.

1110.6.8.1 Boat Slips. Boat slips complying with ICC A117.1 shall be provided in accordance with Table 1110.6.8.1. Where the number of boat slips is not identified, each 40 feet (12 m) of boat slip edge provided along the perimeter of the pier shall be counted as one boat slip for the purpose of this section.

TABLE 1110.6.8.1
BOAT SLIPS

Total Number of Boating Slips Provided in Facility	Minimum Number of Required Accessible Boating Slips
1 to 25	1
26 to 50	2
51 to 100	3
101 to 150	4
151 to 300	5
301 to 400	6
401 to 500	7
501 to 600	8
601 to 700	9
701 to 800	10
801 to 900	11
901 to 1000	12
1001 and over	12, plus 1 for every 100, or fraction thereof, over 1000

1110.6.8.2 Dispersion. Accessible boat slips shall be dispersed throughout the various types of boat slips provided. Where the minimum number of accessible boat slips 1 has been met, no further dispersion shall be required.

1110.6.8.3 Boarding Piers at Boat Launch Ramps. Where boarding piers are provided at boat launch ramps, at least 5 percent, but no fewer than one, of the boarding piers shall comply with ICC A117.1.

1110.6.9 Exercise Machines and Equipment. At least one of each type of exercise machines and equipment shall comply with ICC A117.1 and shall be on an accessible route.

1110.6.10 Fishing Piers and Platforms. Fishing piers and platforms shall comply with ICC A117.1 and be on an accessible route.

1110.6.11 Golf Facilities. Golf facilities shall comply with 1110.6.11.1 through 1110.6.11.3.

1110.6.11.1 Golf Courses. Golf courses shall comply with 1110.6.11.1.1 through 1110.6.11.1.3.

1110.6.11.1.1 Teeing Grounds. Where one teeing ground is provided for a hole, the teeing ground shall be designed and constructed so that a golf car can enter and exit the teeing ground. Where two teeing grounds are provided for a hole, the forward teeing ground shall be designed and constructed so that a golf car can enter and exit the teeing ground. Where three or more teeing grounds are provided for a hole, at least two teeing grounds, including the forward teeing ground, shall be designed and constructed so that a golf car can enter and exit each teeing ground.

1110.6.11.1.2 Putting Greens. Putting greens shall be designed and constructed so that a golf car can enter and exit the putting green.

1110.6.11.1.3 Weather Shelters. Where provided, weather shelters shall be designed and constructed so that a golf car can enter and exit the weather shelter and shall comply with ICC A117.1.

1110.6.11.2 Practice Putting Greens, Practice Teeing Grounds, and Teeing Stations at Driving Ranges. At least 5 percent, but no fewer than one, of practice putting greens, practice teeing grounds, and teeing stations at driving ranges shall be designed and constructed so that a golf car can enter and exit the practice putting greens, practice teeing grounds, and teeing stations at driving ranges.

1110.6.11.3 Golf Facilities. At least one accessible route shall connect accessible elements and spaces within the boundary of the golf course. In addition, accessible routes serving golf car rental areas; bag drop areas; course

weather shelters; course toilet rooms; and practice putting greens, practice teeing grounds, and teeing stations at driving ranges complying with Section 1110.6.11.2 shall comply with ICC A117.1.

Exception: Golf car passages complying with ICC A117.1 shall be permitted to be used for all or part of accessible routes required by this section.

1110.6.12 Miniature golf facilities. Miniature golf facilities shall comply with 1110.6.12.1 through 1110.6.12.3.

1110.6.12.1 Minimum Number. At least 50 percent of holes on miniature golf courses shall comply with ICC A117.1.

1110.6.12.2 Miniature Golf Course Configuration. Miniature golf courses shall be configured so that the holes complying with ICC A117.1 are consecutive. Miniature golf courses shall provide an accessible route from the last hole complying with ICC A117.1 to the course entrance or exit without requiring travel through any other holes on the course.

Exception: One break in the sequence of consecutive holes shall be permitted provided that the last hole on the miniature golf course is the last hole in the sequence.

1110.6.12.3 Miniature Golf Facilities. Holes required to comply with 1110.6.12.1, including the start of play, shall be on an accessible route.

1110.6.13 Play Areas. Play areas shall comply with ICC A117.1.

1110.6.14 Shooting Facilities with Firing Positions. Where shooting facilities with firing positions are designed and constructed at a site, at least 5 percent, but no fewer than one, of each type of firing position shall comply with ICC A117.1.

1110.6.15 Animal Containment Areas. Animal containment areas that are not for public use are not required to be accessible or to be on an accessible route.

3411.8 (IEBC 310.8) Scoping for alterations. The provisions of Sections 3411.8.1 through ~~3411.8.14~~ 3411.8.16 shall apply to *alterations* to existing buildings and facilities.

3411.8.15 (IEBC 310.8.15) Existing Amusement Rides. Where existing amusement rides are altered, the alteration shall comply with Section 3411.8.15.1 and 3411.8.15.2.

3411.8.15.1 (IEBC 310.8.15.1) Load and Unload Areas. Where load and unload areas serving existing amusement rides are newly designed and constructed, the load and unload areas shall comply with ICC A117.1.

3411.8.15.2 (IEBC 310.8.15.2) Minimum Number. Where the structural or operational characteristics of an amusement ride are altered to the extent that the amusement ride's performance differs from that specified by the manufacturer or the original design, the amusement ride shall comply with requirements for new construction in Section 1110.6.7.

3411.8.16 (IEBC 310.8) Teeing Grounds. When golf courses are being altered, teeing grounds shall comply with Section 1110.6.11.1.1**.**

Exception: In existing golf courses, the forward teeing ground shall not be required to be one of the teeing grounds on a hole designed and constructed so that a golf car can enter and exit the teeing ground where compliance is not feasible due to terrain.

PART II – IEBC

605.1 General. A building, facility or element that is altered shall comply with the applicable provisions in Sections 605.1.1 through ~~605.1.14~~ 605.2.16, Chapter 11 of the *International Building Code* and ICC A117.1 unless it is *technically infeasible*. Where compliance with this section is *technically infeasible*, the *alteration* shall provide access to the maximum extent that is technically feasible.

A building, facility or element that is constructed or altered to be accessible shall be maintained accessible during occupancy.

Exceptions:

1. The altered element or space is not required to be on an accessible route unless required by Section 605.2.
2. Accessible means of egress required by Chapter 10 of the *International Building Code* are not required to be provided in existing buildings and facilities.
3. Type B dwelling or sleeping units required by Section 1107 of the *International Building Code* are not required to be provided in existing buildings and facilities.
4. The *alteration* to Type A individually owned dwelling units within a Group R-2 occupancy shall meet the provisions for Type B dwelling units and shall comply with the applicable provisions in Chapter 11 of the *International Building Code* and ICC A117.1.

605.1.15 Existing Amusement Rides. Where existing amusement rides are altered, the alteration shall comply with Section 605.1.15.1 and 605.1.15.2.

605.1.15.1 Load and Unload Areas. Where load and unload areas serving existing amusement rides are newly designed and constructed, the load and unload areas shall comply with ICC A117.1.

605.1.15.2 Minimum Number. Where the structural or operational characteristics of an amusement ride are altered to the extent that the amusement ride's performance differs from that specified by the manufacturer or the original design, the amusement ride shall comply with requirements for new construction in Section 1110.6.7.

605.1.16 Teeing Grounds. When golf courses are being altered, teeing grounds shall comply with Section 1110.6.11.1.1**.**

Exception: In existing golf courses, the forward teeing ground shall not be required to be one of the teeing grounds on a hole designed and constructed so that a golf car can enter and exit the teeing ground where compliance is not feasible due to terrain.

Reason: ICC A117.1-2009 will include a new Chapter 11 which contains accessibility requirements for recreational facilities including: amusement rides, recreational boating and fishing facilities, exercise machines and equipment, golf and miniature golf facilities, play areas, swimming and wading pools and shooting facilities. The new requirements in ICC A117.1 and in this proposal are drawn directly from the U.S. Access Board's Americans with Disabilities Act (ADA) Accessibility Guidelines for Recreation Facilities originally published in the *Federal Register* on September 3, 2002. These guidelines and the previously issued guidelines for Play Areas (October 2000) were both later incorporated into the Access Board's 2004 ADA and Architectural Barriers Act (ABA) Accessibility Guidelines. Together with new Chapter 11 of the ICC A117.1, the proposal is consistent with the aforementioned Federal guidelines and will afford adults and children with disabilities a reasonable level of access to recreation and play.

Amusement Rides: This proposal addresses access to amusement rides for persons with disabilities, including those who use wheelchairs. Specifications require provision of either a wheelchair space on the ride or a ride seat or device designed for transfer to the ride. Access at loading and unloading areas is also addressed. Specific criteria for wheelchair spaces, ride seats designed for transfer, and transfer devices is included in ICC ANSI A117.1. Certain exceptions are provided in proposed IBC Sections 1110.6.7 for rides that are: set up temporarily, such as at a traveling carnival, designed primarily for children, controlled or operated by the rider, or not equipped with seats.

Boating Facilities: Boating facilities, such as piers and docks provided at marinas to serve recreational vessels, are covered by this proposal which addresses the minimum number of accessible boat slips required to be accessible. This number is based on a table according to the total amount of boat slips provided at a facility. The dynamic interface between land and water presents unique and significant challenges in providing access to floating facilities. Therefore, new Chapter 11 in ICC ANSI A117.1 – 2009 for gangways connecting floating facilities take these constraints into account by modifying requirements for accessible routes and ramps with exceptions to criteria for maximum rise and slope, handrail extensions, and level landings.

Fishing Piers and Platforms: ICC ANSI A117.1 contains new provisions addressing railings and edge protection located on fishing piers and platforms. Railings, guardrails, and handrails are not required by this accessibility standard. However, where they are provided, a portion (at least 25%) cannot be more than 34 inches high so that the railings do not obstruct fishing for people using wheelchairs. An exception permits the use of a guard complying with the International Building Code where required or voluntarily provided. Edge protection at least 2 inches high is also addressed to prevent the wheels of mobility aids from slipping over the edge.

Golf : Access to golf courses is typically achieved through the use of golf cars. An exception to proposed 1110.6.11.3 permits golf car passages in lieu of accessible routes throughout golf courses. To comply, courses must be designed so that golf cars can access teeing grounds and putting greens. Modified accessible routes are required to serve practice putting greens and driving ranges since they often are not located within the boundary of a course. Technical specifications are provided for golf car passages, accessible routes, teeing grounds, putting greens, and weather shelters in ICC ANSI A117.1.

Miniature Golf: At least half of the holes on a miniature golf course must be served by an accessible route. Specifications for accessible routes take into account design conventions for miniature golf courses, such as carpeted surfaces and curbs. All level areas of an accessible hole where a ball may come to rest must be within the reach of golf clubs (36 inches) from accessible routes.

Play Areas: Requirements in ICC A117.1 comprise a subsection of the new chapter on recreation facilities. They cover the number of play components required to be accessible, accessible surfacing in play areas, ramp access and transfer system access to elevated structures, and access to soft contained play structures. The guidelines address play areas typically provided at schools, parks, child care facilities (except those based in the operator's home, which are exempted by ICC ANSI A117.1 Section 1108), and other facilities.

Exercise Equipment and Machines, Bowling Lanes, and Shooting Facilities: Provisions for exercise equipment, bowling lanes, and shooting facilities are addressed in this proposal. The accessibility standards do not affect the design of exercise equipment and machines, but instead require one of each type to be on an accessible route and to provide transfer space for persons using wheelchairs. Access is also required to a portion (at least 5%) of bowling lanes and shooting facilities.

Swimming Pools and Wading Pools: Specifications are provided for various means of providing pool access, including pool lifts, sloped entries, transfer walls, transfer systems, and stairs. Access to swimming pools can be achieved by sloped entries or pool lifts. For larger pools (those with 300 or more linear feet of pool wall), a secondary means of access is proposed. Stairs, transfer systems, or transfer walls can be used instead of lifts or sloped entries for this secondary means of access. This is a reasonable provision in light of the fact that nationally recognized safety standards require two means of exit from such larger swimming pools. Specific provisions are also provided for wading pools, wave action pools and other types of pools where user access is limited to one area.

Cost Impact: This code change will increase the cost of construction. However, because these changes are harmonized with the U.S. Access Board's ADA and ABA Accessibility Guidelines, costs associated with compliance cannot be avoided once the U.S. Department of Justice adopts the guidelines as enforceable standards under the Americans with Disabilities Act. The guidelines have already been adopted as enforceable standards under the Architectural Barriers Act applicable to federally funded facilities.

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Mazz-E2-1102.1

E153–09/10
1102.1

Proponent: Donald E. Irwin, Program Manager, Delivery, Collection & Carrier Equipment, representing United States Postal Service

Revise as follows:

1102.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in the code, have the meanings shown herein:

COMMON USE: Interior or exterior circulation paths, rooms, spaces or elements that are not for public use and are made available for the shared use of either two or more people <u>in a non-residential facility or the residents of two or more units of a residential facility</u>.

Reason: In support of the effort to clarify what the accessibility requirements are for the individual mail delivery compartments of a centralized mailbox, for residential facilities, the current IBC definition of "common use" is inadequate. The definition needs to be expanded in order to relate to the residents of a building (a "covered multi-family dwelling") or residential complex. There are many "common use" examples of what residents of multiple residential dwelling units do share (for instance, a building's trash receptacle, a common entranceway into the building or to ground-level apartments, or a laundry room (including certain items in the room)). Individual mail delivery compartments of a ganged or centralized mailbox, however, are not shared or "common use" for the residents of multiple residential units. They are designed for assignment to residents of only one street address at a time (although the particular mail compartment assigned to an address can subsequently be changed when required (for instance, if there is a reach issue (an assigned compartment is found to be either too low or too high for the current resident).)

The route to the mail room itself is shared amongst the residents of two or more residential units, the mail room (the floor space in front of the mailbox) is shared amongst these residents, even the parcel lockers that might be integral to any centralized mailbox are shared, but the individual mail delivery compartments are not shared amongst the residents of two or more residential units and, therefore, are not "common use" items. The current definition does not allow for this clarification to be understood properly.

From the Department of Justice website, an analysis of how the term "common use" is applicable to a residential (apartment) complex is available in a 2004 court opinion from the United States Court of Appeals for the Sixth Circuit, USA v. Edward Rose & Sons, et al (2004 FED App. 0279P (6th Cir.). (See the "III. Analysis" section content regarding "the two apartments share".)

http://www.usdoj.gov/crt/housing/documents/rose_opin_landing.php

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Irwin-G2-1102.1

E154–09/10
1102.1

Proponent: Janet Reed, Architect, City of Phoenix – Development Services Department

Revise definition follows:

1102.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in the code, have the meanings shown herein:

MULTISTORY UNIT. A dwelling unit or sleeping unit with habitable space located on more than one story or above a private garage.

Reason: This amendment is to make the code consistent with Fair Housing Act requirements. Frank Keating, General Counsel for HUD, issued a memo dated 12/16/1991 that exempts carriage house unit designs. These units are stacked housing units designed to incorporate parking for each unit into the dwelling unit design in non-elevator buildings where the garage footprint is used as the footprint for the remaining floor or floors of the unit. See 1.29 of the Fair Housing Act Design Manual.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ReedJ-E2-1102.1

E155–09/10
1102.1

Proponent: Gilles J. Malkine, Action Toward Independence, Inc.

Add new definition as follows:

1102.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in the code, have the meanings shown herein:

OFFICE OF A HEALTH CARE PROVIDER. A location where a person or entity regulated by a state to provide professional services related to the physical or mental health of an individual makes such services available to the public.

Reason: Add new text (as follows) as definition of “health care provider” as defined by the Americans with Disabilities Act standards, Subpart D, section 36:401 (d)(i):

Adopting this ADA definition will ensure that the scope of covered entities under the IBC (e.g., 1104.4 Exp. 1) will be equal in breadth to that of the ADA. It will help in maximizing the types of agencies obliged to provide accessibility to the public if they provide “professional services related to” health care, as may be determined on a case-by-case basis. It will empower code officials to consider their interpretation of the term ‘health care provider’ in the largest possible context, as opposed to using other, more restrictive and less stringent definitions that exclude all but ‘licensed’ or ‘medical’ entities from the obligation to provide accessibility.

The result will be superior to the current IBC as it will prevent code officials, in the absence of any definition, from construing a narrow and constricted view of what services are health care-related.

In support of this view, the US Code recognizes that entities other than licensed medical providers may be authorized (by contract for example) to provide health care services: **Title 42 USC - Sec. 11151. Definitions** (6) The terms "licensed health care practitioner" and "practitioner" mean, with respect to a State, an individual (other than a physician) who is licensed or otherwise authorized by the State to provide health care services.

Example: an ADA Title III privately owned professional non-profit counseling agency that provides its services publicly to AIDS patients through a state Department of Health contract and that is obliged by that contract to abide by specified state DOH regulations would qualify as a health care provider, and as such would be required to comply with applicable Title III accessibility provisions.

Bibliography:
Americans with Disabilities Act of 1990 – section 36.401
US Code Title 42 The Public Health and Welfare

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:malkine-G1-202

E156–09/10

1102.1, 1107.2, 1107.6, 1107.6.2.2, 1107.6.3, 3411.1 (IEBC 310.1); IEBC 605.1; IRC R202, R320.2 (New)

Proponent: Mark J. Mazz, AIA, representing self

THIS IS A 3 PART CODE CHANGE. PARTS I AND II WILL BE HEARD BY THE IBC MEANS OF EGRESS COMMITTEE. PART III WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

1. Add new definitions as follows:

1102.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

PUBLIC RIGHT OF WAY. Public land or property, usually in interconnected corridors, that is acquired for or devoted to transportation purposes.

TYPE C (Visitable) UNIT. A dwelling unit designed and constructed for accessibility in accordance with this code and the provisions for Type C units in ICC A117.1.

2. Revise as follows:

1107.2 Design. Dwelling units and sleeping units that are required to be Accessible units, Type A units, ~~and~~ Type B units, and Type C units shall comply with the applicable portions of Chapter 10 of ICC A117.1. Units required to be Type A units are permitted to be designed and constructed as Accessible units. Units required to be Type B units are permitted to be designed and constructed as Accessible units or as Type A units. Units required to be Type C (Visitable) units are permitted to be designed and constructed as Accessible units, as Type A units, or as Type B units.

1107.6 Group R. Accessible units, Type A units, ~~and~~ Type B Units, and Type C (Visitable) units shall be provided in Group R occupancies in accordance with Sections 1107.6.1 through 1107.6.4.

1107.6.2.2 Group R-2 other than apartment houses, monasteries and convents. In Group R-2 occupancies, other than apartment houses, monasteries and convents, Accessible units, ~~and~~ Type B units, and Type C units shall be provided in accordance with Sections 1107.6.2.2.1 through ~~1107.6.2.2.2~~ 1107.6.2.2.3.

1107.6.2.2.3 Type C units. Where there are 6 or more dwelling units in a development site, at least 50 percent shall be a Type C unit. All R-2 units on a development site shall be considered to determine the total number of units and the required number of Type C units.

Exceptions: The following units are not required to be Type C units or be considered to determine the total number of units:

1. Units above other units.
2. Units without garages where the slope between the finish ground level at all unit entrances to all points along the property lines that border a public right of way are no greater than 8.33 percent.

1107.6.3 Group R-3. Type B units and Type C units shall be provided in Group R-3 occupancies in accordance with Sections 1107.6.3.1 and 1107.6.3.2.

1107.6.3.1 Type B units. In Group R-3 occupancies where there are four or more dwelling units intended to be occupied as a residence in a single structure, every dwelling unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

1107.6.3.2 Type C units. In Group R-3 occupancies, where there are 6 or more dwelling units in a development site, at least 50 percent shall be a Type C unit. All R-3 units on a development site shall be considered to determine the total number of units and the required number of Type C units.

Exceptions: The following units are not required to be Type C units or be considered to determine the total number of units

1. Units above other units.
2. Units without garages where the slope between the finish ground level at all unit entrances to all points along the property lines that border a public right of way are no greater than 8.33 percent.

1107.7.5 Design flood elevation. The required number of Type A units, Type B units, and Type C units shall not apply to a site in accordance with 1107.7.5.1 through 1107.7.5.2.

1107.7.5.1 Type A units and Type B units. The required number of Type A units and Type B units shall not apply to a site where the required elevation of the lowest floor or the lowest horizontal structural building members of nonelevator buildings are at or above the design flood elevation resulting in:

1. A difference in elevation between the minimum required floor elevation at the primary entrances and vehicular and pedestrian arrival points within 50 feet (15 240 mm) exceeding 30 inches (762 mm), and
2. A slope exceeding 10 percent between the minimum required floor elevation at the primary entrances and vehicular and pedestrian arrival points within 50 feet (15.24 m).

Where no such arrival points are within 50 feet (15.24 m) of the primary entrances, the closest arrival points shall be used.

1107.7.5.2 Type C units. The required number of Type C dwelling units shall not apply to a site where the required elevation of the lowest floor or the lowest horizontal structural building members are at or above the design flood elevation resulting in:

1. A difference in elevation between the minimum required floor elevation at all unit entrances and the ground elevation at the entrance exceeds 30 inches (762 mm), or
2. A slope exceeding 8.33 percent between the minimum required floor elevation at all unit entrances to all points along the property lines that border a public right of way.

3411.1 (IEBC 310.1) Scope. The provisions of Sections 3411.1 through 3411.9 apply to maintenance, change of occupancy, additions and alterations to existing buildings, including those identified as historic buildings.

Exceptions:

1. Type B dwelling or sleeping units required by Section 1107 of this code are not required to be provided in existing buildings and facilities being altered or undergoing a change of occupancy.
2. Type C dwelling required by Section 1107 of this code are not required to be provided in additions or in existing buildings and facilities being altered or undergoing a change of occupancy.

(Renumber subsequent sections)

PART II - IEBC

Revise as follows:

605.1 General. A building, facility or element that is altered shall comply with the applicable provisions in Sections 605.1.1 through 605.1.14, Chapter 11 of the International Building Code and ICC A117.1 unless it is technically infeasible. Where compliance with this section is technically infeasible, the alteration shall provide access to the maximum extent that is technically feasible.

A building, facility or element that is constructed or altered to be accessible shall be maintained accessible during occupancy.

Exceptions:

1. The altered element or space is not required to be on an accessible route unless required by Section 605.2.
2. Accessible means of egress required by Chapter 10 of the International Building Code are not required to be provided in existing buildings and facilities.
3. Type B dwelling or sleeping units required by Section 1107 of the International Building Code are not required to be provided in existing buildings and facilities.
4. The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall meet the provisions for Type B dwelling units and shall comply with the applicable provisions in Chapter 11 of the International Building Code and ICC A117.1.
5. Type C dwelling required by Section 1107 of the International Building Code are not required to be provided in additions or in existing buildings and facilities being altered or undergoing a change of occupancy.

PART III – IRC BUILDING/ENERGY

Add new text as follows:

SECTION R202
DEFINITIONS

PUBLIC RIGHT OF WAY. Public land or property, usually in interconnected corridors, that is acquired for or devoted to transportation purposes.

TYPE C (Visitable) UNIT. A dwelling unit designed and constructed for accessibility in accordance with this code and the provisions for Type C units in ICC A117.1.

R320.2 Visitable (Type C) units. Where there are 6 or more dwelling in a development site, at least 50 percent shall be a Type C unit. All units on a development site shall be considered to determine the total number of units and the required number of Type C units.

Exceptions:

1. Type C units shall be permitted to be designed and constructed as Accessible units, Type A units, or Type B units in accordance with Chapter 11 of the International Building Code.
2. The following units are not required to meet Type C unit requirements or be considered to determine the total number of units:
   - 2.1 Units above other units.
   - 2.2 Units without garages where the slope between the finish ground level at all unit entrances to all points along the property lines that border a public right of way are no greater than 8.33 percent.
3. Type C dwelling are not required to be provided in additions or in existing buildings and facilities being altered or undergoing a change of occupancy.
4. The required number of Type C units shall not apply to a site where the required elevation of the lowest floor or the lowest horizontal structural building members are at or above the design flood elevation resulting in:
   - 4.1 A difference in elevation between the minimum required floor elevation at all unit entrances and the ground elevation at the entrance exceeds 30 inches (762 mm), or
   - 4.2 A slope exceeding 8.33 percent between the minimum required floor elevation at all unit entrances to all points along the property lines that border a public right of way.

Reason: Type C dwelling units have been added to the technical requirements in 2009 ICC/A117.1. The intent of this proposal is to scope Type C dwelling units for buildings that fall below the threshold of the Fair Housing Act Accessibility Guidelines.

1. There is a correlative change being proposed for the IBC, IRC and IEBC.
2. Type C (Visitable) units require significantly less accessibility than Type B units do. Type C units require one zero-step entrance on a circulation path (not necessarily an accessible route) from a garage, driveway, sidewalk, or street. The entrance does not have to be the front door. Therefore, an attached garage, with a floor that slopes away from a connecting door that has no step can satisfy the zero-step entrance requirement. Interior requirements for Type C units apply only to the entry level and are equally as lax as the exterior requirements.

3. Jurisdictions across the Country are adding Visitability requirements to their local codes. Neither the technical provisions nor the scoping provisions are consistent. To address the technical provisions, ICC A117.1 created Type C (Visitable) units. This proposed change to the Building Code is to make the scoping provisions consistent.
4. Because of site constraints, individual dwelling units, in-fill units, and small developments may have difficulty with providing a zero-step entrance. Therefore, this proposal limits applicability to developments with 6 or more dwelling units.
5. Other site issues, such as trees, preserving natural terrain, and local design guidelines, when coupled with zero-step entrances may increase construction costs by more than a few hundred dollars. In lieu of listing a series of exceptions, this proposal applies to only half the R-2 and R-3 dwelling units.
6. The technical requirements for Type C units are a subset of the Accessible, Type A, and Type B unit technical requirements. Therefore, requiring those units to comply with Type C units is redundant.
7. Stacked townhomes are becoming popular. The proposal only addresses the units nearest the ground. Upper unit is exempted from compliance. Lower units are exempted when the entrance level is significantly below ground.
8. Providing a zero-step entrance is more expensive on a small lot where the unit does not have a garage, particularly on sites with steeper slopes. Therefore, this proposal exempts units where the difference in grade elevation at all the entrances and the elevation along property lines that are along the public right of way slopes more than 8.33%.
9. Modifying existing structures will cost, on average, more than a few hundred dollars. Therefore, existing structures and additions are exempted.

Cost Impact: $100 to $400 per dwelling unit. See “Increasing Home Access: Designing for Visitability” by the AARP Public Policy Institute. http://assets.aarp.org/rgcenter/il/2008_14_access.pdf

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Mazz Mark-E1-1102.1

E157–09/10
1103.2.3

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1103.2.3 Employee work areas. Spaces and elements within employee work areas shall only be required to comply with Sections 907.9.1.2, 1007 and 1104.3.1 and shall be designed and constructed so that individuals with disabilities can approach, enter and exit the work area. Work areas, or portions of work areas, that are less than 300 square feet (30 m^2) in area and ~~elevated~~ located 7 inches (178 mm) or more above or below the ground or finish floor where the change in elevation is essential to the function of the space shall be exempt from all requirements.

Reason: There is no reason to limit the elevation change to raised areas. Employee work areas may also need be lowered in order to function - as in an automotive service pit.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E9-1103.2.3

E158–09/10
1103.2.7, 1103.2.8 (New)

Proponent: Ron Clements, Chesterfield County Virginia Building Inspection Department, representing self

1. Revise as follows:

1103.2.7 Raised areas, safety and security. Raised areas used primarily purposes of security, life safety or fire safety including, but not limited to, observation galleries, prison guard towers, fire towers or lifeguard stands, are not required to be accessible or be served by an accessible route.

2. Add new text as follows:

1103.2.8 Raised and recessed areas in places of religious worship. Raised and recessed areas used primarily for religious ceremonies in a place of religious worship are not required to be accessible or be served by an accessible route.

(Renumber remaining sections)

Reason: The current accessibility provisions of chapter 11 in the IBC and the ICC/ANSI A117.1 standard were developed from the Americans With Disabilities act and in large part by people involved in the ADA. The Americans with Disabilities act section 307 exempts religious organizations and religions buildings from compliance with the act. Due to this exemption accessibility to specific church architectural elements has never been developed and is not addressed in the code or A117.1standard. Providing access routes to elevated areas such as Altars, bimahs, baptisteries, pulpits, platforms and other elevated areas within churches used for the performance of church religious services is very difficult and costly. Furthermore even if an accessible route is provided to these areas there is no guidance to make a religious feature such as a baptistery accessible. Since there is already an accessibility exemption for raised areas used for safety and security this proposal adds "safety and security" to the existing raised area exemption and adds this new exemption directly following the existing raised area exemption. Recessed areas is also addressed do to the use of recessed areas for religious ceremonies and rites by certain religions.

Cost Impact: This will reduce the cost of constructing religious buildings.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Clements-E2-1103.2

E159–09/10
1103.2.12

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Delete without substitution:

~~**1103.2.12 Day care facilities.** Where a day care facility (Groups A-3, E, I-4 and R-3) is part of a dwelling unit, only the portion of the structure utilized for the day care facility is required to be accessible.~~

Reason: A business operated in a dwelling is covered in Sections 1103.2.13 and 419 Live/Work Units. Section 1103.2.12 is duplicative and potentially conflicting.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E10-1103.2.12

E160–09/10
1007.5, 1103.2.13, 1109.7 (IFC [B] 1007.5)

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

~~1103.2.13~~ 1109.15 Live/Work units. In Live/Work units constructed in accordance with Section 419, the portion of the unit utilized for nonresidential use is required to be accessible. The residential portion of the Live/Work unit is required to be evaluated separately in accordance with Sections 1107.6.2 and 1107.7.

1109.7 Lifts. Platform (wheelchair) lifts are permitted to be a part of a required accessible route in new construction where indicated in Items 1 through ~~10~~ 11. Platform (wheelchair) lifts shall be installed in accordance with ASME A18.1.

1. An accessible route to a performing area and speaker platforms in Group A occupancies.
2. An accessible route to wheelchair spaces required to comply with the wheelchair space dispersion requirements of Sections 1108.2.2 through 1108.2.6.
3. An accessible route to spaces that are not open to the general public with an occupant load of not more than five.
4. An accessible route within a dwelling or sleeping unit.
5. An accessible route to wheelchair seating spaces located in outdoor dining terraces in Group A-5 occupancies where the means of egress from the dining terraces to a public way are open to the outdoors.
6. An accessible route to jury boxes and witness stands; raised courtroom stations including judges' benches, clerks' stations, bailiffs' stations, deputy clerks' stations and court reporters' stations; and to depressed areas such as the well of the court.
7. An accessible route to load and unload areas serving amusement rides.
8. An accessible route to play components or soft contained play structures.
9. An accessible route to team or player seating areas serving areas of sport activity.
10. An accessible route to or within a live/work unit.

~~10~~.11. An accessible route where existing exterior site constraints make use of a ramp or elevator infeasible.

1007.5 (IFC [B] 1007.5) Platform lifts. Platform (wheelchair) lifts shall not serve as part of an accessible means of egress, except where allowed as part of a required accessible route in Section 1109.7, Items 1 through ~~9~~ 10. Standby power shall be provided in accordance with Chapter 27 for platform lifts permitted to serve as part of a means of egress.

Reason: Live/work units should not be located in Section 1103 as this section is for exceptions only. This provision is applying accessibility to the work portion of the dwelling and possibly the dwelling unit and should therefore be located in the Other Facilities section.
Allowing a platform lift to be used for the required accessible route in a live/work unit is reasonable due to the probable low occupant factor and the potential difficulty in providing a ramp. Given the limited occupants, it should also be permitted as part of an accessible means of egress.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E11-1103.2.13

E161–09/10
1103.2.16 (New), 1109.13

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

1. Add new text as follows:

1103.2.16 Appliance controls. Operating mechanisms and controls on appliances such as ATM machines, vending machines, ovens, microwave ovens, cooktops, washers and dryers are not required to be accessible.

2. Delete without substitution:

~~**1109.13 Fuel-dispensing systems.** Fuel-dispensing systems shall comply with ICC A117.1.~~

Reason: The application of the building code to appliances should be limited to the provision of an accessible route and clear floor space. Controls on the appliance itself should not be regulated by the building code. Civil rights laws provide a better means of addressing these issues.
Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E12-1103.2.16

E162–09/10
1104.3.1

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1104.3.1 Employee work areas. Common use circulation paths within employee work areas shall be accessible routes.

Exceptions:

1. Common use circulation paths, located within employee work areas that are less than ~~300~~ 1,000 square feet (~~27.9~~ 93 m^2) in size and defined by permanently installed partitions, counters, casework or furnishings, shall not be required to be accessible routes.
2. Common use circulation paths, located within employee work areas, that are an integral component of equipment, shall not be required to be accessible routes.
3. Common use circulation paths, located within exterior employee work areas that are fully exposed to the weather, shall not be required to be accessible routes.

Reason: To align with the federal Americans with Disabilities Act Accessibility Guidelines.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E13-1104.3.1

E163–09/10
1104.4

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1104.4 Multilevel buildings and facilities. At least one accessible route shall connect each ~~accessible~~ level, including mezzanines, in multilevel buildings and facilities.

Exceptions:

1. An accessible route is not required to stories and mezzanines that have an ~~aggregate area~~ occupant load of not more than ~~3,000 square feet (278.7 m^2)~~ 30 persons and are located above and below accessible levels. This exception shall not apply to:
   1.1. ~~Multiple tenant facilities~~ Public areas of Group M occupancies ~~containing five or more tenant spaces~~;
   1.2. ~~Levels containing offices~~ Public areas of health care providers (Group B or I); ~~or~~
   1.3. Public areas of Passenger transportation facilities and airports (Group A-3 or B); or
   1.4. Public areas of municipal and government facilities.
2. Levels that do not contain accessible elements or ~~other~~ spaces as determined by Section 1106, 1107 or 1108 are not required to ~~be served by an accessible route from an accessible level~~ comply with Section 1104.4.
3. In air traffic control towers, an accessible route is not required to serve the cab and the floor immediately below the cab.

4. ~~Where a two-story building or facility has one story with an occupant load of five or fewer persons that does not contain public use space, that story shall not be required to be connected by an accessible route to the story above or below.~~

~~5.~~4. Vertical access to elevated employee work stations within a courtroom is not required at the time of initial construction, provided a ramp, lift or elevator complying with ICC A117.1 can be installed without requiring reconfiguration or extension of the courtroom or extension of the electrical system.

Reason: Delete accessible from the charging statement as this is the section that defines which levels are required to be accessible. Including accessible in the charging statement is circuitous.

Changes to Exception 1 represent a new approach to determining which stories and mezzanines require an accessible route. The current language appears to be derived from the federal Americans with Disabilities Act guidelines. This approach is inferior to the proposed language as it is based on size of the space. The federal rules do not have a mechanism to determine occupant load and therefore is limited to measuring the size of the space. Building code applies an occupant load based on the use of the space. This is a superior, more logical and consistent method of determining if access to a space is justified. The proposed language establishes a threshold of 30 people maximum where access would not be required. The exceptions to the 30 person occupant load are areas accessed by the general public in certain use groups. All of the "special use groups" are created equal in this proposal including the Group M occupancies. Other than the ADAAG, there is no justification for the current code providing an exception for retail facilities having four or less tenants. The proposed text allows employee work areas within the "special use groups" to have an occupant load of up to 30 employees without providing an accessible route. Exception 4 can be deleted as the issue is sufficiently addressed in Exception 1.

The modification to Exception 2 is to clarify the original intent that spaces or elements addressed in Section 1107 or 1108 are not required to provide an accessible route per Section 1104.4. A new reference to Section 1106 is added for multistory parking structures which will only require an accessible route to the required accessible parking spaces and passenger loading facilities. Levels that do not provide accessible parking spaces will not be required to be provided with an accessible route.

Cost Impact: The code change proposal will increase cost in some situations and reduce cost in others.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E15-1104.4

E164–09/10
1104.5

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1104.5 Location. Accessible routes shall coincide with ~~or be located in the same area as~~ a general circulation path. Where an accessible route diverges from the general circulation path, the accessible route shall be located in the same area as the general circulation path. Where the circulation path is interior, the accessible route shall also be interior. Where only one accessible route is provided, the accessible route shall not pass through kitchens, storage rooms, restrooms, closets or similar spaces.

Exceptions:

1. Accessible routes from parking garages contained within and serving Type B units are not required to be interior.
2. A single accessible route is permitted to pass through a kitchen or storage room in an Accessible unit, Type A unit or Type B unit.

Reason: Providing two criteria in the same sentence, i.e., that routes coincide or be in the same area, gives both alternatives equal value. The intent of the provision should be that the routes coincide to the extent possible and only separate when necessary. Dividing the criteria into two separate sentences achieves this intent.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E17-1104.5-2

E165–09/10
1104.5

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1104.5 Location. Accessible routes shall coincide with or be located in the same area as a general circulation path. Where the circulation path is interior, the accessible route shall also be interior. Where a circulation path is within a tenant space, the accessible route shall also be within the tenant space. Where only one accessible route is provided, the accessible route shall not pass through kitchens, storage rooms, restrooms, closets or similar spaces.

Exceptions:

1. Accessible routes from parking garages contained within and serving Type B units are not required to be interior.
2. A single accessible route is permitted to pass through a kitchen or storage room in an Accessible unit, Type A unit or Type B unit.

Reason: It is fairly common for retail spaces to have multiple levels. Some retailers in multitenant buildings may have convenience stairs to other floors within the retailer's space but rely on the common use elevator for an accessible route. This requires that customers who are unable to use the stair, leave the store, go to a common use elevator, and reenter the store at the other level. Customers unable to use the stair may have to pay for goods twice if the goods they need are on opposite floors. This is a huge inconvenience for customers unable to use the stair.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E16-1104.5

E166–09/10
1106.5

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1106.5 Van spaces. For every six or fraction of six accessible parking spaces, at least one shall be a van-accessible parking space.

~~**Exception:** In Group R-2 and R-3 occupancies, van accessible spaces located within private garages shall be permitted to have vehicular routes, entrances, parking spaces, and access aisles with a minimum vertical clearance of 7 feet (2134 mm).~~

Reason: This exception is discriminatory as it does not afford an individual equal treatment at Group R-2 and R-3 facilities. The code recognizes that a vertical clearance exceeding 7 feet is required for van parking at all occupancies other than Groups R-2 and R-3. What happens to the van, which the code acknowledges requires a clearance in excess of 7 feet, such that when it arrives at a Group R occupancy it no longer requires the additional height? The only justification for this exception is that two federal agencies that develop accessible design criteria don't provide the same guidance on this issue (my understanding is that the federal discrepancy is more accidental than deliberate). There is no reason for ICC to incorporate federal conflicts into the building code.

Rather than provide inconsistent and conflicting requirements in the building code based on provisions from various federal agencies, ICC should take the initiative to rectify the discrepancies. Deleting the exception in Section 1106.5 acknowledges the fact that a van does not change based on where it's located and whatever provisions are necessary for the vehicle hold true to all occupancies and facilities. Deleting the exception also does not conflict with federal rule. It simply exceeds a federal rule.

The other action available to ICC is to delete the height requirement altogether – for all occupancies and facilities. The additional height is a costly provision and it could be determined that the cost/benefit is not justified. This would conflict with federal rule but would send a signal to the federal authority suggesting that this issue be reconsidered.

The worst result for the building code is to maintain the current internal conflict that provides different standards for different occupancy groups when there is no justification for the discrepancy based on the subject matter (van height).

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E18-1106.5

E167–09/10
1107.3

Proponent: Karen L. Braitmayer, FAIA, Studio Pacifica, Ltd. representing self

Revise as follows:

1107.3 Accessible spaces. Rooms, ~~and~~ spaces and elements available to the general public or available for use by residents and serving Accessible units, Type A units or Type B units shall be accessible. Accessible spaces shall include toilet and bathing rooms, kitchen, living and dining areas and any exterior spaces, including patios, terraces and balconies. Accessible elements shall include, but not be limited to, mailboxes and trash chutes serving Accessible units, Type A units and Type B units.

Exceptions:

1. Recreational facilities in accordance with Section 1109.14.
2. In Group I-2 facilities, doors to sleeping units shall be exempted from the requirements for maneuvering clearance at the room side provided the door is a minimum of 44 inches (1118 mm) in width.

Reason: Much confusion exists on what elements that are associated with dwelling units must be accessible, and how many. This proposal provides clarity on what build-in elements that directly serve Accessible units, Type A units and Type B units must be accessible, even if they are not contained within the unit itself.

Cost Impact: This code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Braitmayer-E1-1107.3

E168–09/10
1107.3.1 (New)

Proponent: Edward L. Repic, Architectural Refuse Solutions, LLC, representing self.

Add new text as follows:

1107.3.1 Accessible Rubbish Chute. Rubbish chutes in residential facilities shall be accessible. Rubbish chute intake doors shall comply with ICC A117.1. The combined door and disposal operations shall be capable of being accomplished with a single hand,

Reason: This submittal is part of four such proposals submitted as independent documents with the intent of adequately addressing Rubbish Chutes (which can include "recycling" chutes that simply redirect parts of the rubbish waste stream to locations other than a landfill) and Linen (or Laundry) Chutes. These proposals individually address Life Safety, Sprinkler Placement, Accessibility in new and existing facilities, and actual Chute Construction and a related component to Rubbish Chutes: Compactors (codes generally address the shaft enclosure but ignore the actual chute being enclosed or the compactor it is feeding).

Rubbish chutes, in this case meaning chute intakes, are not required in buildings, but when provided, chutes are typically general access features for use by the public at large ... typically the building end users ... as opposed to features that are solely available to the housekeeping and/or maintenance staff. As such, it is our belief that rubbish chute intake doors are provided as Public-Use Areas in conformance with Section 1102 and should be accessible. By comparison, the rubbish room and its compactor and/or containers ... the disposal facilities for the rubbish chute features on each living levels ... are not designed for public access. Rather, they are the province of the housekeeping and maintenance staff.

The problem lies in the fact that code does not adequately address chute intake doors. It is our purpose to address this particular oversight.

The original 1990 ADA document addressed what it considered "equipment" and their controls. Successive versions, including the ANSI 117.3-2003 document do not address equipment. Rather they address man doors. Their provisions ultimately boil down to the use of lever or tee handles within stipulated reach ranges; a limitation on the force used to open the doors (5lbf or 20N); a prohibition against tight grabbing, pinching or twisting; and finally a requirement for single hand operation.

It is our belief that the rubbish chute intake door should be considered separately from man doors because of their role as opening protectives on a building feature designed for public use. As such, they should be categorized as needing "accessibility" by the ANSI provisions in the previous paragraph and most certainly should meet the single hand operation requirement. Chute industry technology has, for more than a decade, included pneumatically operated intakes that: open with the push of a palm button (large enough to be depressed with *any* available body part); time their opening; and then slowly close themselves.

Compare this with the operation of a non-accessible, standard intake by a disabled person ... let's say an 80 year old woman using a walker and carrying her own garbage. She must get to the door, *release her walker*, grab the intake door handle with one hand, pull it open, hold it open, lift her garbage for disposal, release the door, grab her walker, turn, and walk away. It is not possible for an able bodied person to open a standard intake door and deposit the garbage with one hand. The disabled have no chance.

Cost Impact: ADA compliant, pneumatic intake door: Less than $1000, installed. Compressor: Approximately $800, installed. (Please note that the most expensive chute we have ever designed had a value equal to ½ of 1% of the total project cost. Typically the actual range is ¼ to 1/3 of 1%, but even that has limitations, we have seen $100,000,000 projects with $30,000 chute installations ... 3/100 of 1%!)

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Repic-E1-1103.1

E169–09/10
1107.5.2.1

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1107.5.2 Group I-2 nursing homes. Accessible units and Type B units shall be provided in nursing homes of Group I-2 occupancies in accordance with Sections 1107.5.2.1 and 1107.5.2.2.

1107.5.2.1 Accessible units. At least ~~50~~ 10 percent but not less than one of each type of the dwelling units and sleeping units shall be Accessible units.

1107.5.2.2 Type B units. In structures with four or more dwelling units or sleeping units intended to be occupied as a residence, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

Reason: Units designed to the ICC A117.1 standard are intended for unassisted individual use. The overwhelming majority of nursing home residents are incapable of independent use and rely on assistance. The requirement that 50% of the units be designed for independent use is excessive and does not serve the needs of the typical nursing home resident. A common issue in units designed to ICC A117.1 Accessible unit criteria is that the water closet is located next to a side wall making assisted transfers to and from the fixture more difficult. Units not meeting the Accessible unit requirements will be Type B units which can be designed for assisted use.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E19-1107.5.2.1

E170–09/10
1107.6.1.1, 1107.6.1.1.1 (New)

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Add new text as follows:

1107.6.1 Group R-1. Accessible units and Type B units shall be provided in Group R-1 occupancies in accordance with Sections 1107.6.1.1 and 1107.6.1.2.

1107.6.1.1 Accessible units. ~~In Group R-1 occupancies,~~ Accessible dwelling units and sleeping units shall be provided in accordance with Table 1107.6.1.1. All ~~R-1~~ dwelling units and sleeping units on a site shall be considered to determine the total number of Accessible units. Accessible units shall be dispersed among the various classes of units. Roll-in showers provided in Accessible units shall include a permanently mounted folding shower seat.

1107.6.1.1.1 Accessible unit facilities. All interior and exterior spaces and elements provided as part of or serving an Accessible dwelling unit or sleeping unit shall be accessible and be located on an accessible route.

Exceptions:

1. Where multiple bathrooms are provided within an Accessible unit, at least one full bathroom shall be accessible.
2. Where multiple family or assisted bathrooms serve an Accessible unit, at least 50% but not less than one room for each use at each cluster shall be accessible.

3. Five percent, but not less than one bed shall be accessible.

1107.6.1.2 Type B units. In structures with four or more dwelling units or sleeping units intended to be occupied as a residence, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

Exception: The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

Reason: Delete reference to Group R-1 as it is implicit from Section 1107.6.1. The new section is to provide exceptions for Accessible units with multiple bathrooms or multiple beds.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E20-1107.6.1.1.1

E171–09/10
1107.6.2.2, 1107.6.2.2.1, 1107.6.2.2.2

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1107.6.2.2 Group R-2 other than apartment houses, monasteries and convents. In Group R-2 occupancies, other than apartment houses, monasteries and convents, Accessible units, and Type B units shall be provided in accordance with Sections ~~1107.6.2.2.1 and 1107.6.2.2.2~~ 1107.6.1.1 through 1107.6.1.3.

~~**1107.6.2.2.1 Accessible units.** Accessible dwelling units and sleeping units shall be provided in accordance with Table 1107.6.1.1.~~

~~**1107.6.2.2.2 Type B units.** Where there are four or more dwelling units or sleeping units intended to be occupied as a residence in a single structure, every dwelling unit and every sleeping unit intended to be occupied as a residence shall be a Type B unit.~~

~~**Exception:** The number of Type B units is permitted to be reduced in accordance with Section 1107.7.~~

Reason: To simply the code by deleting duplicative language and to reinforce the concept that these types of units are essentially treated as Group R-1 transient type units.

Note: the reference to Section 1107.6.1.3 is based on approval of a separate proposal to add this new section. If 1107.6.1.3 is not approved, the reference in this proposal should be changed to 1107.6.1.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E22-1107.6.2.2

E172–09/10
1107.7.2

Proponent: Janet Reed, Architect, representing City of Phoenix – Development Services Department

Revise as follows:

1107.7.2 Multistory units. A multistory dwelling or sleeping unit which is not provided with elevator service is not required to be a Type A or Type B unit. Where a multistory unit is provided with external elevator service to only one floor, the floor provided with elevator service shall be the primary entry to the unit, shall comply with the requirements for a Type B unit and a toilet facility shall be provided on the first floor.

Reason: This amendment it needed to meet the original intentions of ICC. As proposed it complies with Fair Housing Act. Accessibility requirements for townhouses conforming to the requirements of the IRC are referred back to IBC section 1107.6.3 which has requirements for only the Type B units and not Type A. unit. The same requirements should apply to two-story units complying with either the IRC or IBC. It might be noted that this amendment was a code change proposal of Jeff Inks, National Association of Home Builders that was submitted as part of the 2006/2007

code development cycle to ICC. Jeff Inks wrote, "The original primary intend of this general exception is to exclude R 2 multistory dwelling units from the accessibility requirements of this chapter. However when this exception was drafted, focus was on the multistory exceptions included under Fair Housing and inclusion of Type A units were therefore overlooked. The intension of the proposal is to exempt multistory townhouse style dwelling units when they fall into Group R-2 from Type A requirements. This would be consistent with Fair Housing requirements.

Cost Impact: The Code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: ReedJ-E1-1107.7.2

E173–09/10
1107.7.2.1 (New)

Proponent: Dominic Marinelli, representing United Spinal Association

Add new text as follows:

1107.7.2 Multistory units. A multistory dwelling or sleeping unit which is not provided with elevator service is not required to be a Type B unit. Where a multistory unit is provided with external elevator service to only one floor, the floor provided with elevator service shall be the primary entry to the unit, shall comply with the requirements for a Type B unit and a toilet facility shall be provided on that floor.

1107.7.2.1 Dwelling units with private residence elevators. Multistory dwelling units containing a private residence elevator within the dwelling unit shall be a Type B unit. All levels within the dwelling unit shall be served by the elevator and shall comply with the requirements for a Type B unit.

Reason: The current code language in Section 1107.7 is currently NOT clear as to the ramifications of placing a private residence elevator within the interior of a dwelling unit. This change will add that needed clarity.

Cost Impact: The code change proposal will increase the cost of construction

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME:Marinelli-E1-1108.7.2.1

E174–09/10
1108.2, 1108.2.6

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1108.2 Assembly area seating. Assembly areas with fixed seating shall comply with Sections 1108.2.1 through ~~1108.2.8~~ 1108.2.7. Assembly areas without fixed seating shall comply with Sections 1108.2.6 and 1108.2.7. Lawn seating shall comply with Section 1108.2.8. Dining areas shall comply with Section 1108.2.9. ~~In addition, lawn seating shall comply with Section 1108.2.6.~~

1108.2.1 Services. *(No change to current text)*

1108.2.2 Wheelchair spaces. *(No change to current text)*

1108.2.2.1 General seating. *(No change to current text)*

1108.2.2.2 Luxury boxes, club boxes and suites. *(No change to current text)*

1108.2.2.3 Other boxes. *(No change to current text)*

1108.2.2.4 Team or player seating. *(No change to current text)*

1108.2.3 Companion seats. *(No change to current text)*

1108.2.4 Dispersion of wheelchair spaces in multilevel assembly seating areas. *(No change to current text)*

1108.2.5 Designated aisle seats. *(No change to current text)*

~~**1108.2.7**~~ **1108.2.6 Assistive listening systems.** *(No change to current text)*

~~**1108.2.7.1**~~ **1108.2.6.1 Receivers.** *(No change to current text)*

~~**1108.2.7.2**~~ **1108.2.6.2 Public address system.** *(Change reference numbers to 1108.2.6.1 and 1108.2.6.2.2)*

~~**1108.2.7.2.1**~~ **1108.2.6.2.1 Prerecorded text messages.** *(No change to current text)*

~~**1108.2.7.2.2**~~ **1108.2.6.2.2 Real-time messages.** *(No change to current text)*

~~**1108.2.8**~~ **1108.2.7 Performance areas.** *(No change to current text)*

~~**1108.2.6**~~ **1108.2.8 Lawn seating.** Lawn seating areas and exterior overflow seating areas, where fixed seats are not provided, shall connect to an accessible route.

1108.2.9 Dining areas. *(No change to current text)*

Reason: This proposal applies the performance area accessible route criteria and assistive listening system criteria to assembly areas without fixed seats. This is necessary to comply with the ADA.

Editorially, relocate lawn seating section and renumber accordingly to provide better flow of section.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E24-1108.2

E175–09/10
1108.2.7.1.2 (New)

Proponent: Dominic Marinelli, representing United Spinal Association

Add new text as follows:

1108.2.7.1.2 Ticket Windows. Where ticket windows are provided in stadiums and arenas at least one of each type shall have an assistive listening system.

Reason: This proposal articulates the advocacy efforts of NY City's Hearing Access Program who worked with the New York Yankees and the New York Mets and Minnesota's Deaf and Hard of Hearing Services who worked with the Minnesota Twins on the installation of induction loop systems at ticket windows to ensure that individuals with hearing disabilities can communicate effectively with ticket agents in their new ballparks.

Cost Impact: The code change proposal will increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Marinelli-E2-1108.2.6.1.2

E176–09/10
1108.2.7.2, 1108.2.7.2.1, 1108.2.7.2.2

Proponent: Ed Roether, Populous (Formerly HOK Sport Venue Event), representing self

1. Revise as follows:

1108.2.7.2 Public address systems. Where stadiums, arenas and *grandstands* have 15,000 fixed seats or more and provide audible public announcements, they shall also provide ~~equivalent text information regarding events and facilities in compliance with Sections 1108.2.7.2.1 and 1108.2.7.2.2~~ pre-recorded or real-time captions of those audible public announcements.

2. Delete without substition:

~~**1108.2.7.2.1 Prerecorded text messages.** Where electronic signs are provided and have the capability to display prerecorded text messages containing information that is the same, or substantially equivalent, to information that is provided audibly, signs shall display text that is equivalent to audible announcements.~~

~~**Exception:** Announcements that cannot be prerecorded in advance of the event shall not be required to be displayed.~~

~~**1108.2.7.2.2 Real-time messages.** Where electronic signs are provided and have the capability to display real-time messages containing information that is the same, or substantially equivalent, to information that is provided audibly, signs shall display text that is equivalent to audible announcements.~~

Reason: This proposal addresses several things. First, currently any grandstand with a public address system requires equivalent text to the information announced, i.e. captioning, and in a little league ballpark the seating would meet the definition of a grandstand and there will likely be a microphone with a loud speaker that would address the public. Therefore, this small volunteer baseball field could be interpreted as a grandstand with a public address system. There are many similar facilities that would be caught by this requirement without any practical way of complying. A facility requires a certain amount of sophistication before captioning can be readily possible. These smaller facilities are often staffed by volunteers rather than the trained staff found in the more sophisticated facilities. Solving the technological challenges alone does not assure effective text to audible announcements, i.e. captioning. This proposal would apply to only those stadiums, arenas and grandstands that would have adequate infrastructure to adequately caption announcements.

The use of the term electronic sign is improper as it relates to providing substantially equivalent text information to audible announcements. "Captions" of audible information is nationally recognized as the term for providing text information that matches audible announcements. Captioning information that is announced over the PA system was ruled as needed for equivalent communication with persons having a hearing impairment in a court decision over civil rights under the Americans with Disabilities Act (ADA) at Fed Ex Field, dated September 30, 2008. It was also proposed as a requirement in the Proposed Rule by the Department of Justice, dated June 17, 2008, to establish new design guidelines for the ADA. Finally, this proposal maintains the use of either pre-recorded or real-time captions of audible announcements at the discretion of the facility as currently required. However, it eliminates the exception for not requiring announcements that cannot be prerecorded in advance under Section 1108.2.7.2.1.

Cost Impact: This code change proposal will not increase the cost of construction overall even though it may increase cost to some facilities and decrease cost to others.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Roether-E1-1108.2.7.2

E177–09/10
1108.2.9

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1108.2.9 Dining and drinking areas. In dining and drinking areas, ~~the total~~ all interior and exterior floor areas ~~allotted for seating and tables~~ shall be accessible.

Exceptions:

1. An accessible route between accessible levels and stories above or below is not required where permitted by Section 1104.4, Exception 1.
2. ~~1.~~ In buildings or facilities not required to provide an accessible route between ~~levels~~ stories, an accessible route to a mezzanine ~~seating area~~ is not required, provided that the mezzanine contains less than 25 percent of the total area and the same services, decor and amenities are provided in the accessible area.
3. ~~2.~~ In sports facilities, tiered dining areas providing seating required to be accessible shall be required to have accessible routes serving at least 25 percent of the dining area, provided that accessible routes serve accessible seating and where each tier is provided with the same services.
4. Employee only work areas shall comply with Sections 1103.2.3 and 1104.3.1.

Reason: Add drinking areas to clarify the intent that this section applies to restaurants and bars, and for consistency with Section 1108.2.8.1. Add interior and exterior spaces to include decks and patios. Delete seating and tables to include all types of public areas such as standing or game areas.

Exception 1 is added because the charging statement literally includes every level including stories.

The term level makes exception 2 irrelevant. A level is any change in elevation and all levels are required to be accessible. Stories is the term used in ADAAG. Décor is added because the mezzanine could provide something unique such as an exterior deck or exceptional exterior views. Decor is used in ADAAG.

Exception 4 is added due to the modification to simplify the charging statement which would cover employee and public areas.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E23-1108.2.9

E178–09/10
1108.3.2 (New)

Proponent: Joseph R. Hetzel, Thomas Associates Inc. representing the Door & Access Systems Manufacturers Association

Add new text as follows:

1108.3 Self-service storage facilities. Self-service storage facilities shall provide accessible individual self-storage spaces in accordance with Table 1108.3.

TABLE 1108.3
ACCESSIBLE SELF-SERVICE STORAGE FACILITIES
(Portions of table not shown remain unchanged)

1108.3.1 Dispersion. Accessible individual self-service storage spaces shall be dispersed throughout the various classes of spaces provided. Where more classes of spaces are provided than the number of required accessible spaces, the number of accessible spaces shall not be required to exceed that required by Table 1108.3. Accessible spaces are permitted to be dispersed in a single building of a multibuilding facility.

1108.3.2 Access doors. Where upward acting doors are provided as the only means of access, such doors shall meet the following requirements:

1. Handles, pulls, latches, locks, and other operable parts shall have a shape that is easy to grasp with one hand and does not require tight grasping, pinching, or twisting of the wrist to operate. Operable parts of such hardware shall be 34 inches (865 mm) minimum and 48 inches (1220 mm) maximum above the floor.
2. Hardware used for operation shall be exposed and usable.
3. For manually operated doors, the force for manual operation shall not exceed 15 pounds (66.6 N) and the door size shall not exceed 8 feet 8 inches (2.64 m) wide by 8 feet (2.44 m) high.
4. Automatic doors shall include a means of disabling automatic operation devices in order to allow for emergency manual operation. The opening force for emergency operation shall not exceed 25 pounds (111 N).

Reason: Sections 1108.3 and 1108.3.1 are shown for context only. Self-service storage facilities often use upward acting doors as the sole means of accessing storage space. When a particular storage space is required to be accessible, in some cases another type of door meeting accessibility requirements cannot be practically provided. Currently, ICC/ANSI A117.1 does not address upward acting doors. The proposed requirements for operable parts, hardware and manual operation force are taken directly from A117.1 as applied to other types of doors. The maximum force limitations for operating a door, and the corresponding maximum size for a manually operated door, are based on design limitations inherent in upward acting doors. The maximum size is also common to self-service storage facilities.

Cost Impact: The proposal will increase the cost of construction if the automatic door option is chosen. However, automatic doors have advantages over manually operated doors from an operational standpoint, and if only accessible doors are automated, the impact on project cost should be minimal.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Hetzel-E1-1108.3.2

E179–09/10
1108.5 (New), Chapter 35

Proponent: Marsha K. Mazz, U.S. Architectural and Transportation Barriers Compliance Board (Access Board)

1. Add new text as follows:

1108.5 Classroom acoustics. Classrooms in Group E occupancies shall meet the acoustical performance criteria in ANSI/ASA S12.60, Part 1.

Exception: Relocatable classrooms shall be permitted to comply with ANSI/ASA S12.60, Part 2.

2. Add new standard to Chapter 35 as follows:

American National Standards Institute (ANSI)
ANSI/ASA S12.60-2010/Part 1 Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools
ANSI/ASA S12.60-200X/Part 2 Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, Relocatable Classroom Factors.

Reason: This code change proposes to reference two new standards: ANSI/ASA S12.60-2010/Part 1 Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools and ANSI/ASA S12.60-200X/Part 2 Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, Relocatable Classroom Factors.

Acoustical performance is an important consideration in the design of classrooms. The proposed standard sets specific criteria for maximum background noise (35 decibels) and reverberation time (0.6 to 0.7 seconds) for unoccupied classrooms. Research indicates that levels of background noise and reverberation little noticed by adults, who are mature and skillful listeners, adversely affect learning environments for young children, whose neurological development is incomplete until late adolescence.[1] Amplification cannot remedy poor classroom acoustics because they amplify both wanted and unwanted sound. This code change will remove educational barrier for children who have hearing loss and those who use cochlear implants. In addition, children who have temporary hearing loss, who may comprise up to 15% of the school age population according to the Centers for Disease Control (CDC), will also benefit, as will children who have speech impairments or learning disabilities and those whose home language is different. Without improvements to the listening environment, children of all backgrounds, ages, and abilities are at risk of educational delay and failure.

Background: In 1998, the U.S. Access Board joined with the **Acoustical Society of America** (ASA) to support the development of a classroom acoustics standard. This resulted in the publication of the first ANSI/ASA S12.60-2002 (R 2009) Acoustical Performance Criteria, Design Requirements and Guidelines for Schools which was reaffirmed in 2009. The standard is now being reformatted to make it more easily interpreted and enforced. Additionally, it will include a new Part 2 to better address relocatable classrooms with support from the Modular Building Institute. We understand that the new editions will be published in 2009 (Part 2) and 2010 (Part 1) in time for consideration at the Final Action Hearings.

Supporting Data: In a large study of students in London and Munich schools, classroom noise levels were related to standardized achievement scores showing that higher noise levels resulted in poorer standardized test scores.[2, 3] Similar scores were reported by Armstrong International.

Bibliography

1. Ponton, C., Eggermont, J., Kwong, B. & Don, M. (2000) Maturation of human central auditory system activity: Evidence from multi-channel evoked potentials, Clinical Neurophysiology 111, 220 – 236.
2. Shield. B and Dockrell J (2008) The effects of environmental and classroom noise on the academic attainments of primary school children, J. Acoust. Soc. Am. Volume 123, 133-144
3. Hygge, S, Evans, G W. & Bullinger, M (2002) A Prospective Study of Some Effects of Aircraft Noise on Cognitive Performance in Schoolchildren. Psychological Science 13 (5), 469-474.

Cost Impact: This code change will increase the cost of construction. Evidence obtained from the State of Connecticut where the ANSI/ASA S12.60-2002 is applicable under state law is that cost increases have been nominal even for modular construction. Data from the UK where a similar standard has been applicable over the past five years indicates an average increase of 1.5% in new school construction. We anticipate that any costs attributable to this code change would be offset by the increased availability of Federal funds through the American Recovery and Reinvestment Act. A funding bill has passed in the U.S. House of Representatives which will support school sustainability improvements, specifically including improvements to acoustical environments.

Analysis: A review of the standards proposed for inclusion in the code, ANSI/ASA S12.60-2010/Part 1 and ANSI/ASA S12.60/Part 2, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Mazz-E4-1108.5

E180–09/10
1109.2

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1109.2 Toilet and bathing facilities. Each toilet room and bathing room shall be accessible. Where toilet rooms or bathing facilities are located on a floor level ~~is~~ not required to be connected by an accessible route, the ~~only toilet~~

~~rooms or bathing rooms provided within the facility shall not be located on the inaccessible~~ same type of facilities shall be located on an accessible floor. At least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing room shall be accessible.

Exceptions:

1. In toilet rooms or bathing rooms accessed only through a private office, not for common or public use and intended for use by a single occupant, any of the following alternatives are allowed:
   1.1. Doors are permitted to swing into the clear floor space, provided the door swing can be reversed to meet the requirements in ICC A117.1;
   1.2. The height requirements for the water closet in ICC A117.1 are not applicable;
   1.3. Grab bars are not required to be installed in a toilet room, provided that reinforcement has been installed in the walls and located so as to permit the installation of such grab bars; and
   1.4. The requirement for height, knee and toe clearance shall not apply to a lavatory.
2. This section is not applicable to toilet and bathing rooms that serve dwelling units or sleeping units that are not required to be accessible by Section 1107.
3. Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be accessible.
4. Where no more than one urinal is provided in a toilet room or bathing room the urinal is not required to be accessible.
5. Toilet rooms that are part of critical care or intensive care patient sleeping rooms are not required to be accessible.

Reason: This is an equity issue. The current text would allow separate gender facilities on the inaccessible floor and only a unisex on the accessible floor. Or, conversely, the only unisex room could be located on an inaccessible floor. As amended, the accessible facilities are required to be of the same type as on the inaccessible floor.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E25-1109.2

E181–09/10
1109.2

Proponent: Hope Reed, New Mexico Governor's Commission on Disability, representing the agency

Revise as follows:

1109.2 Toilet and bathing facilities. Each toilet room and bathing room shall be accessible. Where a floor level is not required to be connected by an accessible route, the only toilet rooms or bathing rooms provided within the facility shall not be located on the inaccessible floor. At least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing room shall be accessible.

Exceptions:

1. In toilet rooms or bathing rooms accessed only through a private office, not for common or public use and intended for use by a single occupant, any of the following alternatives are allowed:
   1.1. Doors are permitted to swing into the clear floor space, provided the door swing can be reversed to meet the requirements in ICC A117.1;
   1.2. The height requirements for the water closet in ICC A117.1 are not applicable;
   1.3. Grab bars are not required to be installed in a toilet room, provided that reinforcement has been installed in the walls and located so as to permit the installation of such grab bars; and
   1.4. The requirement for height, knee and toe clearance shall not apply to a lavatory.
2. This section is not applicable to toilet and bathing rooms that serve dwelling units or sleeping units that are not required to be accessible by Section 1107.
3. Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be accessible.
4. Where no more than one urinal is provided in a toilet room or bathing room, the urinal is not required to be accessible.

5. Toilet rooms that are part of critical care or intensive care patient sleeping rooms are not required to be accessible.
6. Where toilet facilities are primarily for children's use, required accessible water closets, toilet compartments and lavatories shall be permitted to comply with children's provision of ICC A117.1.

Reason: The added text provides "scoping" for children's water closets, toilet compartments and lavatories within the "ICC/ANSI A117.1-2003 Accessible and Usable Buildings and Facilities" section 604.1 Exception and 604.10 which identifies children's wheelchair accessible fixtures. Designers are unclear whether they need to provide additional accessible fixtures for children beyond those required for adults, and how many additional children's fixtures are needed.

Since adults are the minority in areas primarily used by children (such as in the preschool and kindergarten school wing, children's library and children's museum) the children's population needs to be adequately served with the proper number of children's accessible fixtures. Adults fixtures should be provided in other areas where there is a mix of all ages including staff, parents, students and the general public.

The added text makes it clear that children's wheelchair accessible water closets, toilet compartments and lavatories that are provided primarily for children's use may be substituted for the required number of adult fixtures in that area. No additional fixtures are required for children beyond the occupancy requirement. We use similar language in the New Mexico Building Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:ReedH-E1-1109.2

E182–09/10
1109.2

Proponent: Robert J. Heil, Code Inspections, Inc., representing Pennsylvania Association of Building Code Officials, Inc.

Revise as follows:

1109.2 Toilet and bathing facilities. Each toilet room and bathing room shall be accessible. Where a floor level is not required to be connected by an accessible route, the only toilet rooms or bathing rooms provided within the facility shall not be located on the inaccessible floor. At least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing room shall be accessible.

Exceptions:

1. In toilet rooms or bathing rooms accessed only through a private office, not for common or public use and intended for use by a single occupant, any of the following alternatives are allowed:
   1.1. Doors are permitted to swing into the clear floor space, provided the door swing can be reversed to meet the requirements in ICC A117.1;
   1.2. The height requirements for the water closet in ICC A117.1 are not applicable;
   1.3. Grab bars are not required to be installed in a toilet room, provided that reinforcement has been installed in the walls and located so as to permit the installation of such grab bars; and
   1.4. The requirement for height, knee and toe clearance shall not apply to a lavatory.
2. This section is not applicable to toilet and bathing rooms that serve dwelling units or sleeping units that are not required to be accessible by Section 1107.
3. Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be accessible.
4. Where no more than one urinal is provided in a toilet room or bathing room, the urinal is not required to be accessible.
5. Toilet rooms that are part of critical care or intensive care patient sleeping rooms are not required to be accessible.
6. Where a story or mezzanine is not required to be served by an accessible route in accordance with Section 1104.4 and the occupant load of that level is less than 15, then toilet rooms located on that level are not required to be accessible.

Reason: For a small floor level that is permitted to not be on an accessible route, with a limited occupancy, the requirement to have an accessible toilet room(s) occupies a disproportionate amount of space and does little to serve accessible needs.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Heil-E1-1109.2

E183–09/10
1109.4

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1109.4 Kitchens and kitchenettes. Where kitchens and kitchenettes are provided in accessible spaces or rooms, ~~they~~ at least one kitchen shall be accessible ~~in accordance with ICC A117.1~~.

Reason: It is excessive to require all kitchens to be accessible in spaces that have multiple kitchens such as a classroom.
The reference to ICC A117.1 is unnecessary as it is referenced at Section 1101.2 for the entire chapter.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E26-1109.4

E184–09/10
1109.5.1, 1109.5.2

Proponent: Hope Reed, Governor's Commission on Disability, representing the agency

Revise as follows:

1109.5 Drinking fountains. Where drinking fountains are provided on an exterior site, on a floor or within a secured area, the drinking fountains shall be provided in accordance with Section 1109.5.1 and 1109.5.2.

1109.5.1. Minimum number. No fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons.

~~Exception~~ Exceptions:

1. A single drinking fountain that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains.
2. Where drinking fountains are primarily for children's use, drinking fountains for people using wheelchairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30" (762 mm) minimum above the floor.

1109.5.2 More than the minimum number. Where more than the minimum number of drinking fountains specified in Section 1109.5.1 are provided, 50 percent of the total number of drinking fountains provided shall comply with the requirements for persons who use a wheelchair and 50 percent of the total number of drinking fountains provided shall comply with the requirements for standing persons.

~~Exception~~ Exceptions:

1. Where 50 percent of the drinking fountains yields a fraction, 50 percent shall be permitted to be rounded up or down, provided that the total number of drinking fountains complying with this section equals 100 percent of the drinking fountains.
2. Where drinking fountains are primarily for children's use, drinking fountains for people using wheelchairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30" (762 mm) minimum above the floor.

Reason: The added text provides "scoping" for children's drinking fountains within the "ICC/ANSI A117.1-2003 Accessible and Usable Buildings and Facilities" section 602.2 exception. Designers are unclear where and when to provide accessible fixtures for children. The IBC needs to scope the children drinking fountains and state they may be substituted for adult fixtures. Additional fixtures are not needed.

Since adults are the minority in areas primarily used by children (such as in the preschool and kindergarten school wing, children's library and children's museum) the children's population needs to be adequately served with proper number of children's accessible fixtures. Adult fixtures are typically provided where there is a mix of all ages including staff, parents, students and the general public.

Prior to the development of children standards in A117.1 the standing drinking fountains for children were typically located with the spout 30" above the floor. The A117.1 had a children's group and tall people group working on the drinking fountains at the same time and the standing requirement was overlooked for children's areas. This proposal is intended to override the adult standing requirement and provide convenient standing children's access.

See companion proposal for 1109.5.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:ReedH-E2-1109.5.1

E185–09/10
1109.5.1

Proponent: James W. McCall, AIA, Slonaker McCall Architects, representing self

Revise as follows:

1109.5.1 Minimum number. No fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons.

Exceptions:

1. A single drinking fountain that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains.
2. Where Group B, E, I and M occupancies have an occupant load not exceeding 100 persons and where only one drinking fountain is required in accordance with Table 2902.2, the drinking fountain shall comply with the requirements for people who use a wheelchair and a second drinking fountain for standing persons shall not be required.

Reason: Where the plumbing fixture requirement for a small occupancy requires that a single drinking fountain be installed, IBC Section 1109.5.1 currently requires that at least two drinking fountains be installed, one mounted high and one mounted low. In small establishments (those having an occupant load of 100 or less), this is a significant financial burden as well as a waste of precious space for a fixture that will rarely be used especially if the local potable water supply tastes bad. Many small establishments provide bottled water dispensers for their customers and employees because the cost is insignificant and it is often viewed as a "perk" for both customers and workers. I have proposed to a change to the IPC to allow small establishments to substitute bottled water dispensers (or bottled water coolers) for 100 percent of the required number of drinking fountains. However, if the designer chooses to provide a drinking fountain for a small establishment, he should not be penalized by having to supply two drinking fountains. Provision of drinking fountains in small B, E, I and M occupancies should be optional, and if one is provided, the designer should not have to provide two.

Cost Impact: The code change proposal will not increase the cost of construction. (It will decrease for small projects.)

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: McCall-E1-1109.5

E186–09/10
1109.6 (New)

Proponent: Marsha K. Mazz, U.S. Architectural and Transportation Barriers Compliance Board (Access Board)

Add new text as follows:

1109.6 Saunas and Steam Rooms. Where provided, saunas and steam rooms shall comply with ICC A117.1.

Exception: Where saunas or steam rooms are clustered at a single location, no more than 5 percent of the saunas and steam rooms, but no fewer than one, of each type in each cluster shall be required to comply with ICC A117.1.

Reason: This proposal provides scoping for saunas and steam rooms which are addressed in new Chapter 11 of the ICC A117.1. The proposal also harmonizes with the U.S. Access Board's 2004 ADA and ABA Accessibility Guidelines Section 241 which establishes a reasonable requirement for access to such facilities.

Cost Impact: This code change will increase the cost of construction. However, because these changes are harmonized with the U.S. Access Board's ADA and ABA Accessibility Guidelines, costs associated with compliance cannot be avoided once the U.S. Department of Justice adopts the guidelines as enforceable standards under the Americans with Disabilities Act. The guidelines have already been adopted as enforceable standards under the Architectural Barriers Act applicable to federally funded facilities.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Mazz-E3-1109.6

E187–09/10
1109.6, 1109.6.1 (New), 1109.6.2 (New)

Proponent: Don Davies, Salt Lake City Corporation, representing the Utah Chapter of ICC

1. Revise text as follows:

1109.6 Elevators. Passenger elevators on an accessible route shall be accessible and comply with Section ~~3001.3~~ 3001.

2. Add new text as follows:

1109.6.1 Limited use limited application elevators. Limited use limited application elevators are permitted to be a part of a required accessible route. The maximum rise of the car platform shall not exceed 25 feet (7.6 m).

1109.6.2 Private Residence elevators. Private residence elevators are permitted to be part of a required accessible route within or serving an individual dwelling unit or sleeping unit. The maximum rise of the car platform shall not exceed 50 feet (15 m).

Reason: The code currently scopes the provisions for passenger elevators (Section 1109.6). A reference to Section 3001 will pick up a reference to safety standard, ASME A17.1, as well as the accessibility standard, ICC A117.1. It is unclear to those unfamiliar with ASME A17.1 that LULAs and private residence elevators are 'passenger elevators' with limited applications. The 25 feet of vertical rise for LULAs is found in ASME A17.1 Section 5.2.1.16.5. The 50 feet of vertical rise for private residence elevators is found in ASME A17.1 Section 5.3.1.10.3. Since the code is very explicit on the limitations of lifts in new construction it seems reasonable that some guidance be placed in the body of the code scoping the provisions and stating the limitations of these types of elevators.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Davies-E1-1109.7

E188–09/10
1109.8, 1109.8.1, 1109.8.3

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Revise as follows:

1109.8 Storage. Where fixed or built-in storage elements such as cabinets, coat hooks, shelves, medicine cabinets, lockers, closets and drawers are provided in required accessible spaces, at least five percent, but not less than one of each type shall be accessible ~~contain storage space complying with ICC A117.1~~.

1109.8.1 ~~Lockers.~~ ~~Where lockers are provided in accessible spaces, at least five percent, but not less than one, of each type shall be accessible.~~ **Equity.** Accessible facilities and spaces shall be provided with the same storage elements as provided in the similar non-accessible facilities and spaces.

1109.8.2 Shelving and display units. Self-service shelves and display units shall be located on an accessible route. Such shelving and display units shall not be required to comply with reach-range provisions.

~~**1109.8.3 Coat hooks and shelves.** Where coat hooks and shelves are provided in toilet rooms or toilet compartments or in dressing, fitting or locker rooms, at least one of each type shall be accessible and shall be provided in accessible toilet rooms without toilet compartments, accessible toilet compartments and accessible dressing, fitting and locker rooms.~~

Reason: This modification simplifies the section and maintains the intent by providing a measurable 5%, not less than one, criteria to the entire list of items.

The concept of Section 1109.8.3 is reworded to include all of the items from the charging statement and relocated to Section 1109.8.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E27-1109.8

E189–09/10
1109.8.4, Appendix E105.4

Proponent: Donald E. Irwin, Program Manager, Delivery, Collection & Carrier Equipment, representing United States Postal Service

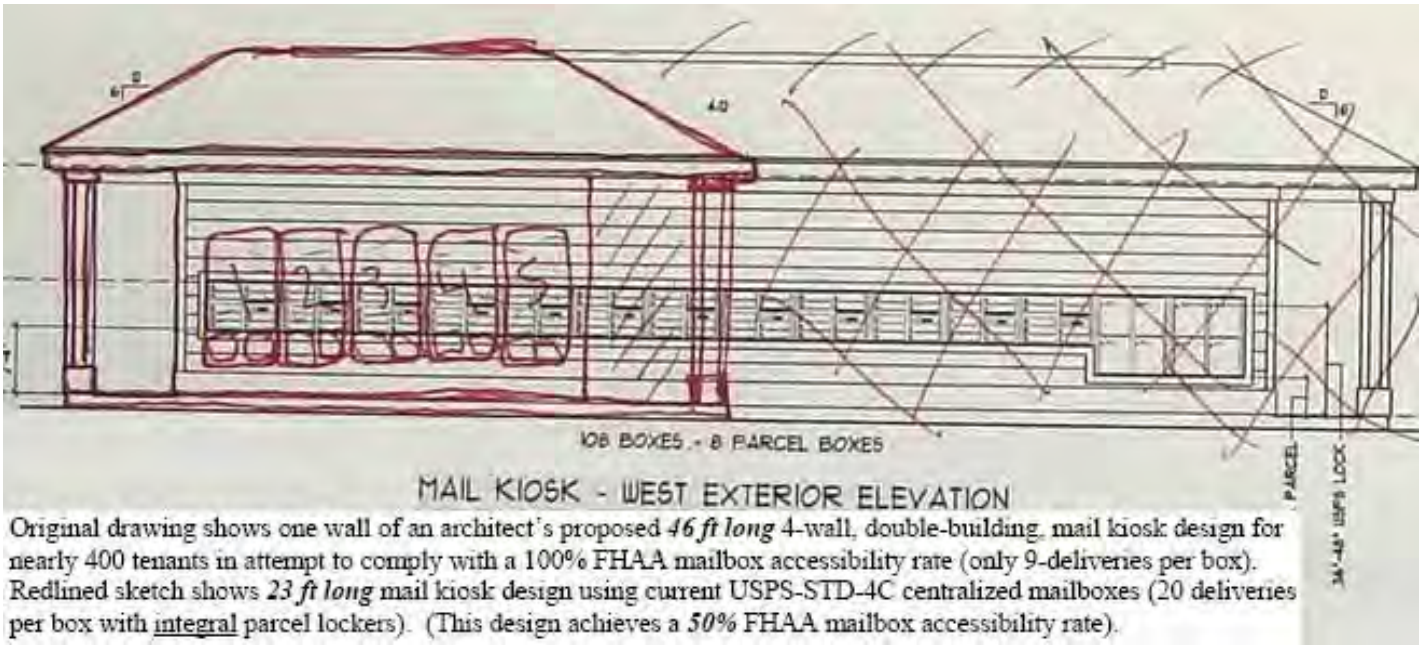
1. Delete without substitution:

~~**E105.4 Mailboxes.** Where mailboxes are provided in an interior location, at least 5 percent, but not less than one, of each type shall comply with ICC A117.1. In residential and institutional facilities, where mailboxes are provided for each dwelling unit or sleeping unit, mailboxes complying with ICC A117.1 shall be provided for each unit required to be an Accessible unit.~~

2. Add new text as follows:

1109.8.4 Centralized Mailboxes and Common Use Parcel Lockers. Centralized mailboxes, which consist of individual mail delivery compartments that are each initially assigned to one address but which are always subject to subsequent reassignment and/or exchange with another compartment, shall be subject to the following accessibility requirements. In non-residential facilities, where mailboxes and common use parcel lockers are provided in a grouped or centralized location, at least 5 percent, but not less than one, of each mailbox type and common use parcel locker type shall comply with ICC A117.1. In residential facilities, where mailboxes and common use parcel lockers are provided in a grouped or centralized location for all dwelling or sleeping units, at least 5 percent, but not less than one, of each mailbox type and common use parcel locker type shall comply with ICC A117.1. In residential and institutional facilities required to have Accessible units or Type A units, all mailboxes for these units shall comply with ICC A117.1.

Reason: The IBC, which is already recognized as an FHA Safe Harbor, needs to address mailbox accessibility directly, not via the optional Appendix E entry (E105.4). There is confusion in the construction industry, the accessibility world, and the courts regarding what mailbox accessibility requirements are for "covered multi-family dwellings" of the Fair Housing Amendments Act of 1988. This confusion is impacting the construction industry and Postal operations while affording suspect at best benefits for the full range of the mobility-disabled community that the Postal Service serves. With USPS requirements restricting mail delivery compartments from being located below a 28 inch wall height, the ICC/ANSI A117.1 upper reach limit of 48 inches only leaves 20 inches of usable wall height. This very restrictive usable wall height, coupled with current misinterpretations of FHA mailbox requirements, is resulting in mailroom designs that are almost double the size they should be. This proposed entry would address this misinterpretation, maintain compliance with all FHA statutory and regulatory requirements, re-establish FHA mailbox accessibility conformity with other accessibility requirements, and formally support what had been in place as the de facto FHA mailbox accessibility requirements for at least the first 15 years after the March 13, 1991 FHA implementation date.



Original drawing shows one wall of an architect's proposed ***46 ft long*** 4-wall, double-building, mail kiosk design for nearly 400 tenants in attempt to comply with a 100% FHAA mailbox accessibility rate (only 9-deliveries per box). Redlined sketch shows ***23 ft long*** mail kiosk design using current USPS-STD-4C centralized mailboxes (20 deliveries per box with integral parcel lockers). (This design achieves a ***50%*** FHAA mailbox accessibility rate).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Irwin-G1-E105.4

E190–09/10

1109.15 (New), 1109.15.1 (New), 1109.15.1.1 (New), 1109.15.1.2 (New), 1109.15.2 (New), Appendix E105.4

Proponent: Cheryl Kent, representing US Department of Housing and Urban Development

1. Add a new text as follows:

1109.15. Mailboxes. Where mailboxes are provided, accessible mailboxes shall be provided in accordance with 1109.15.1 and 1109.15.2.

1109.15.1 Dwelling units and sleeping units. Mailboxes serving dwelling units or sleeping units shall be accessible in accordance with 1109.15.1.1 or 1109.15.1.2.

1109.15.1.1 Individual Mailboxes. Where a mailbox is provided at a dwelling unit or sleeping unit that is required to be an Accessible unit, Type A unit or Type B unit, the mailbox shall be accessible.

1109.15.1.2 Clustered Mailboxes. Where clustered mailboxes serve dwelling units or sleeping units that are required to be Accessible units, Type A units or Type B units, the mailboxes assigned to each Accessible unit, Type A unit and Type B units shall be accessible.

1109.15.2 Other occupancies. Where mailboxes are provided in occupancies not falling within the purview of Section 1109.15.1 and are provided in an interior location, at least 5 percent, but not less than one, of each type shall be accessible.

2. Delete without substitution:.

~~**E105.4 Mailboxes.** Where mailboxes are provided in an interior location, at least 5 percent, but not less than one, of each type shall comply with ICC A117.1. In residential and institutional facilities, where mailboxes are provided for each dwelling unit or sleeping unit, mailboxes complying with ICC A117.1 shall be provided for each unit required to be an Accessible unit.~~

Reason: This proposed changed is intended to ensure that the IBC is consistent with the accessibility requirements of the Fair Housing Act, HUD's implementing regulations, and HUD's Fair Housing Accessibility Guidelines (the Guidelines). It has come to HUD's attention that Section E105.4 is being interpreted as applying to mailboxes serving Type B dwelling units. This was not HUD's understanding of the IBC. Instead, our understanding was that Section 1107.3 covered mailboxes as well as all other types of public and common use facilities serving Type B dwelling units, and that because there were no requirements to scope less than 100% of mailboxes, that the IBC was consistent with HUD's regulations and the Guidelines. However, because Appendix E includes text for mailboxes at Section E105.4 and it appears some developers are interpreting E105.4 as applying a similar requirement for Type B dwelling units, we are recommending that Section E105.4 be struck out and a new section be added as outlined above to Chapter 11 of the IBC. The above text is intended to ensure that accessibility requirements for Type B dwelling units, Accessible Units and Type A units, as well as for mailboxes serving other types of occupancies are all covered in Chapter 11 of the IBC.

The Fair Housing Act, its implementing regulations and the Guidelines require that covered multifamily dwellings contain accessible public and common use areas. Requirement 2 of the Guidelines covers public and common use areas, and provides a chart entitled "Basic Components for Accessible and Usable Public and Common Use Areas or Facilities." Mailboxes are addressed in Item 14 of the chart, which specifically references the primary sections of 1986 ANSI A117.1 that apply to these elements or spaces. Item 14 encompasses Sections 4.1 through 4.30 of the standard, and the relevant accessibility standards applicable for mailboxes typically would include the requirements for an accessible route, clear floor or ground space, accessible reach ranges, and accessible controls and operating mechanisms. In a building with one or more elevators, all of the mailboxes would have to fall within these reach ranges. In a building without an elevator, mailboxes serving the ground floor units would have to meet those requirements. Although HUD's Fair Housing Accessibility Guidelines reference the 1986 ANSI A117.1 standard, which provides for side reach ranges of 9 inches minimum to 54 inches maximum, we recognize the IBC references more recent editions of A117.1. We are not, however, recommending changes to the A117.1 through this proposal.

We would like to ensure that architects and builders involved in designing and constructed buildings that are covered by the Fair Housing Act provide for accessibility of mailboxes consistent with HUD's regulations and Guidelines. Developers who deviate from these standards by providing mailboxes at higher reach ranges have been subject to enforcement proceedings brought by HUD as well as litigation brought by the Department of Justice. The Department of Justice has entered into a number of consent decrees which have required the developer to change the height of mailboxes serving covered multifamily dwellings. We believe this change is needed to ensure that the IBC is consistent with the Fair Housing Act and HUD's regulations and Guidelines, and to avoid unnecessary litigation with respect to mailboxes serving Type B dwelling units.

Cost Impact: There should be no significant cost impact since the IBC has already incorporated text to assure consistency with the Fair Housing Act, HUD's regulations and the Guidelines, and this change is intended to clearly specify requirements for mailboxes serving Type B dwelling units as opposed to only generally covering all public and common use spaces serving Type B dwelling units in Section 1107.3.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Kent-E1-1109.15

E191–09/10
1109.14.4.6 (New)

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Add new text as follows:

1109.14.4.6 Recreational equipment. Equipment such as play structures, amusement rides, and miniature golf are not required to be accessible.

Reason: Accessibility issues for these types of structures are outside the scope of the building code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E28-1109.14.4.6

E192–09/10
1109.14.4.6 (New)

Proponent: Curt Wiehle, Minnesota Construction Codes and Licensing Division, representing CCLD

Add new text as follows:

1109.14.4.6 Trails. Trails and outdoor recreation routes are not required to be accessible.

Reason: The Access Board revised accessibility guidelines (2004 ADA/ABA Accessibility Guidelines) include scoping and technical provisions for several types of recreation facilities, including recreational boating facilities, fishing piers and platforms, golf facilities, play areas, and swimming pools. ICC A117.1 has added the technical criteria for how to make these facilities accessible. However, neither the revised accessibility guidelines or ICC A117.1 address access to such outdoor developed areas, trails, beaches, and picnic and camping facilities. The Access Board is developing technical and scoping requirements for such outdoor developed areas. The regulatory negotiation committee's report is available at the Access Board's website (http://www.access-board.gov/outdoor/outdoor-rec-rpt.htm). At this time, the Access Board has decided to limit this proposed rule to outdoor developed areas designed, constructed, or altered by Federal agencies subject to the Architectural Barriers Act. At a future date, when an

assessment of the impacts on State and local governments and private entities can be prepared, the Access Board will conduct a separate rulemaking for outdoor developed areas subject to the Americans with Disabilities Act. Since the technical information is not currently in ICC A117.1, these types of facilities should not be required to be accessible by the IBC. By limiting this proposal to trails and recreation routes, the intent is to address those routes that exist simply and solely as pedestrian paths. It is not intended to apply to routes that connect buildings or facilities that are on the same site.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Wiehle-E21-1109.14.4.7

E193–09/10

1110.4 (New), 1110.4.1 (New), 1110.4.2 (New)

Proponent: Billie Louise Bentzen, PhD, Assoc. for Education & Rehabilitation of the Blind & Visually Impaired

Add new text as follows:

1110.4 Variable Message Signs. Where provided in the locations in Sections 1110.4.1 and 1110.4.2, Variable Message Signs (VMS) shall comply with the VMS requirements of ICC A117.1

1110.4.1 Transportation facilities. Where provided in transportation facilities, variable message signs conveying transportation related information shall comply with Section 1110.4.

1110.4.2 Emergency shelters. Where provided in buildings that are designated as emergency shelters, variable message signs conveying emergency related information shall comply with Section 1110.4.

> **Exception:** Where equivalent information is provided in an audible manner, VMS signs are not required to comply with ICC A117.1.

Reason: Variable Message Sign (VMS) requirements have been developed by the ICC A117.1 committee and added into the updated edition of the standard. This proposal will provide scoping provisions to assure that VMS signage in transportation facilities and emergency shelters is usable by most of the population. The ICC A117.1 language modifies requirements for visual signs primarily by requiring increased character height and spacing for low resolution VMS signs. Even for users with unimpaired vision, there is strong research evidence that character height in low resolution VMS such as the LED signs that are common in the transportation environment and elsewhere must be approximately 30% greater than for equivalent print signs or VMS with high resolution. The requirements for increased character height, etc. for low resolution VMS are not applicable to high resolution VMS such as video.

The proposed sections will not "require" that VMS signage be installed in any facility type, but will instead require that "where provided" within transportation facilities and emergency shelters VMS comply with the standard and are usable by most of the population.

The phrasing "conveying transportation related information" and "conveying emergency related information" was included in the sections to limit the application of the A117.1 VMS requirements to signs that are necessary for the most effective use of transportation information and information in emergency shelters. The intent of this text is that signs that present information that is not necessary for transportation or emergency use of facilities would be exempt. For example, a VMS that advertised what dining options were available in an airport would not be required to comply with the standard's VMS provisions, nor would a television set within the waiting area that had closed captioning of a news program. However any VMS that indicated what flight was departing from what gate or the time of the flight would be regulated. In the case of an emergency shelter located at a school, only the signage related to shelter would be covered. The signage dealing with the school and possibly listing what school activities were occurring that week would not be expected to comply with the VMS requirements.

Transportation facilities have been included in this proposal for several reasons. Riders with reduced vision are especially dependent on public transportation for travel and are required by the ADA to have information provided that is equivalent to that provided to riders having unimpaired vision. The proposal will coordinate the IBC requirements with those of the Americans with Disabilities Act (ADA). Currently Sections E109 and E110 in Appendix E address some signage requirements within "transportation facilities and stations" and "airports." These provisions are located within the appendix but need to be included in the IBC text to match up with the ADA. Including this text within Chapter 11 will help to make the two accessibility laws more consistent. The VMS signs are often used within transportation facilities (See Sections E109.2.2.2, E109.2.2.3, E109.2.7, E110.3) as a primary means of conveying information to riders. Since the ICC A117 committee has provided specific regulations for these signs it is appropriate to reference these provisions so that designers and code officials know exactly what the technical requirements for the signs are. As noted earlier, this section does not "require" the VMS signs but "where provided" is intended to ensure that VMS comply with the requirements that the ICC A117.1 committee has established.

Emergency shelters are typically identified by a jurisdiction when they are studying emergency planning or working with FEMA to develop community plans. Although any building could ultimately be pressed into service as an emergency shelter in some circumstances, the intent of this text is to apply the requirement only to those facilities that are designated in advance or during that planning stage as an intended shelter. In many communities this may include certain schools, civic administration buildings or even large convention facilities that a community designates as intended emergency shelters. Emergency-related information provided by VMS in emergency shelters is most likely to be information or instructions regarding additional problems, or the recovery process.

The emergency shelter provisions contain an exception that would eliminate the requirement to meet the VMS provisions of the standard. Where audible information is conveyed that is either the same or equivalent to the information provided by the sign, compliance with ICC A117.1's VMS requirements is not needed. The VMS provides the information in a visual method and the A117 provisions assure that the information is clearly visible and legible to both the general population and to people with some level of visual impairment. Providing the equivalent information in an audible manner makes the information accessible to people with severe visual impairment or who are blind.

The exception for equivalent audible information is not included within the section dealing with transportation facilities. This is done to not only coordinate with the ADA but is based upon the fact that in many such facilities the audible information is simply not easily understood. Anyone that has stood on a subway or train platform and tried to understand an audible message at the same time that the train is pulling up to the platform will understand this exclusion. Because of the problems with hearing messages in many transportation facilities, the audible message delivery is simply not considered as being adequate to replace or eliminate the clear visual sign information.

This proposal is suggesting that this VMS section be added into section 1110 in order to be located with the other signage requirements. However, it is recognized that this requirement could just as well be placed within Section 1109 and the "other features and facilities" provisions.

Cost Impact: The code change proposal will not increase the cost of construction. Because this proposal will not "require" the VMS signs to be installed, there is no increased construction cost imposed by it.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Bentzen-E1-1110.4 NEW

E194–09/10
1002.1 (IFC [B] 1002.1); IRC R202

Proponent: Jeff Lowinski, representing the Window and Door Manufacturers Association (WDMA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC MEANS OF EGRESS COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC MEANS OF EGRESS

Add new definition as follows:

1002.1 (IFC [B] 1002.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in the code, have the meanings shown herein:

LANDING. A floor area or a designated portion of a floor area, at the top or bottom of a flight of stairs, or at the top or bottom of a ramp, or at the door of an elevator.

PART II – IRC BUILDING/ENERGY

Add new definition as follows:

SECTION R202
DEFINITIONS

LANDING. A floor area or a designated portion of a floor area, at the top or bottom of a flight of stairs, or at the top or bottom of a ramp.

Reason:
(PART I) This proposal adds a definition to the IBC for "landing" which is beneficial when attempting to interpret and apply the IBC. "landing" is used in numerous locations of the IBC but is not defined.

WDMA is of the perspective than "landing" relates to the flight of stairs (or ramp) that may be near a door; and that doors, other than elevator doors, do not have "landings" necessarily associated to them. A flight of stairs, or ramp, may have a landing, and that landing may be on one side of a door. Hence there are requirements in the code for landings at doors. The proposed definition clarifies that landings are associated with stairs, ramps, or elevators.

WDMA members, as they assist their customers, have found that some jurisdictions have interpreted the exception in 1008.1.7 significantly different than the language intends.

(PART II) This proposal adds a definition to the IRC for "Landing" which is beneficial when attempting to interpret and apply the IRC. "Landing" is used in numerous locations in the IRC but currently is not defined.

WDMA is of the perspective than "landing" relates to the flight of stairs (or ramp) that may be near a door; and that doors do not have "landings" necessarily associated to them. A flight of stairs, or ramp, may have a landing, and that landing may be on one side of a door. Hence there are requirements in the code for landings at doors. The proposed definition clarifies that landings are associated with stairs or ramps.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Woestman-E2-1008.1.7

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE — STRUCTURAL

STRUCTURAL CODE COMMITTEE

David P. Tyree, PE, CBO - ***Chair***
Director, Codes and Standards
Building Owners and Managers Association, International
Washington, DC

Marcelino Iglesias – *Vice Chair*
Code Specialist
State of New Jersey
Dept. of Community Affairs; Division
Trenton, NJ

Alexander Abel, PE
Plans Review Engineer
City and County of Denver
Denver, CO

Lindsey Carter, PE, CBO
Inspection Services Supervisor
Shelby County Department of Development Services
Pelham, AL

Wanda Edwards, PE
Director of Building Code Development
Institute of Business & Home Safety
Tampa, FL

Thomas Faulkner, PE
President
Falcon Engineering
Raleigh, NC

Frank Golon
Rep: National Association of Home Builders
The Kleiner Group LLC
Eatontown, NJ

Cole Graveen, PE, SE
Engineer
Raths & Johnson Inc.
Willowbrook, IL

Kirk Grundahl, PE
President
Qualtim, Inc.
Madison, WI

John Loscheider, PE, SE
Principal
Loscheider Engineering Company
Renton, WA

James Robinson, Jr., PE, SE
Rep: National Council of Structural Engineering Associations
President
Robinson Associates Consulting Engineers Inc.
Atlanta, GA

Gary Searer, PE, SE
Associate Principal
Wiss, Janney, Elstner Associates, Inc.
Burbank, CA

Constadino Sirakis, PE
Acting Director of Engineering
Technical Affairs Division
New York City Dept. of Bldgs
New York, NY

Gary Walker, PE
President
Walker Engineering Inc.
Birmingham, AL

Can Xiao, MS, PE
Camelback Infrastructure Development Manager,
Water Services Department
City of Phoenix
Phoenix, AZ

Staff Secretariat:
Alan Carr, SE
Code and Standards
International Code Council

TENTATIVE ORDER OF DISCUSSION

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL BUILDING CODE

STRUCTURAL

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does **not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair.

S1-09/10, Part I
S3-09/10, Part I
S4-09/10
S5-09/10
S6-09/10
S7-09/10
S8-09/10
S9-09/10
S14-09/10, Part I
S15-09/10, Part I
S16-09/10, Part I
S17-09/10, Part I
S18-09/10, Part I
S19-09/10
S20-09/10, Part I
S21-09/10, Part I
S22-09/10, Part I
S22-09/10, Part II
S23-09/10, Part I
S29-09/10
S30-09/10, Part I
S43-09/10
S32-09/10
S33-09/10
S34-09/10
S35-09/10
S36-09/10
S37-09/10
S38-09/10
S39-09/10
S40-09/10
S41-09/10, Part I
S41-09/10, Part II
S42-09/10
S45-09/10
S47-09/10
S49-09/10
S50-09/10
S52-09/10
S53-09/10
S54-09/10
S55-09/10
S56-09/10
S58-09/10
S59-09/10
S60-09/10
S62-09/10, Part I
S64-09/10
S63-09/10
S65-09/10
S66-09/10, Part I
S57-09/10, Part I
S61-09/10, Part I
S67-09/10
S68-09/10
S69-09/10
S70-09/10
S71-09/10
S72-09/10
S73-09/10
S31-09/10
S74-09/10
S75-09/10
S76-09/10
S77-09/10
S78-09/10
S79-09/10
S80-09/10
S81-09/10
S82-09/10
S83-09/10
S84-09/10
S51-09/10
S85-09/10
S86-09/10
S87-09/10, Part I
S179-09/10
EB71-09/10
EB72-09/10
EB16-09/10
EB17-09/10
S88-09/10
S89-09/10
S90-09/10
S92-09/10, Part I
S92-09/40, Part II
S92-09/10, Part III
S92-09/10, Part IV
S93-09/10
S94-09/10
S91-09/10, Part I
S91-09/10, Part II
G196-09/10
G193-09/10
G194-09/10
EB4-09/10, Part I
EB4-09/10, Part II
EB6-09/10, Part I
EB6-09/10, Part II
EB7-09/10
EB8-09/10, Part I
EB8-09/10, Part II
EB9-09/10, Part I
EB9-09/10, Part II
G195-09/10
G192-09/10
G191-09/10
EB3-09/10, Part I
EB3-09/10, Part II
G190-09/10
G197-09/10
ADM32-09/10
ADM33-09/10
EB15-09/10
EB21-09/10
EB22-09/10
EB24-09/10
EB5-09/10
EB36-09/10
EB37-09/10
EB38-09/10
EB25-09/10
EB40-09/10
EB41-09/10
EB42-09/10
EB43-09/10
EB44-09/10
EB45-09/10
EB46-09/10
EB47-09/10
EB48-09/10
EB49-09/10
EB50-09/10
EB51-09/10
EB52-09/10
EB53-09/10
EB54-09/10
EB55-09/10
EB56-09/10
EB57-09/10
EB58-09/10
EB59-09/10
EB60-09/10
EB61-09/10
EB62-09/10
EB63-09/10
EB64-09/10
EB65-09/10
EB66-09/10
EB67-09/10
EB68-09/10
EB69-09/10

EB70-09/10
S95-09/10
S96-09/10
S97-09/10, Part I
S98-09/10
S99-09/10
S100-09/10
S101-09/10
S102-09/10
S103-09/10
S104-09/10
S105-09/10
S106-09/10
S44-09/10
S48-09/10
S107-09/10
S108-09/10
S109-09/10
G181-09/10
S110-09/10
G40-09/10
S112-09/10
S113-09/10
S114-09/10
S111-09/10
S115-09/10
S116-09/10
S117-09/10
S118-09/10
S119-09/10
S120-09/10
S121-09/10
S122-09/10
S123-09/10
S124-09/10
S125-09/10
S129-09/10
S130-09/10
S131-09/10
S132-09/10
S133-09/10
S134-09/10
S135-09/10
S136-09/10
S137-09/10
S138-09/10
S139-09/10
S140-09/10
S141-09/10
S142-09/10
S143-09/10
S144-09/10, Part I
S145-09/10
S146-09/10, Part I
S146-09/10, Part II
S147-09/10
S148-09/10
S149-09/10
S150-09/10
S151-09/10
S152-09/10
S153-09/10
S154-09/10
S155-09/10
S156-09/10
S157-09/10
S158-09/10
S159-09/10
S160-09/10
S161-09/10
S162-09/10, Part I
S163-09/10
S164-09/10
S165-09/10
S166-09/10
S167-09/10
S168-09/10
S170-09/10
S171-09/10, Part I
S172-09/10
S173-09/10
S174-09/10
S175-09/10
FS148-09/10
FS149-09/10
S176-09/10
S177-09/10
S178-09/10
S180-09/10
S181-09/10
S182-09/10, Part I
S183-09/10
S184-09/10
S185-09/10
S186-09/10
S187-09/10
S189-09/10
S190-09/10
S191-09/10
S192-09/10
S193-09/10
S188-09/10
S194-09/10
S195-09/10
S196-09/10
S197-09/10
S198-09/10
S199-09/10, Part I
S200-09/10, Part I
S201-09/10, Part I
S202-09/10
S203-09/10, Part I
S204-09/10
S205-09/10
S206-09/10
S207-09/01, Part I
FS189-09/10
S209-09/10
S208-09/10
S210-09/10
S211-09/10
S212-09/10
S213-09/10
S214-09/10, Part I
S215-09/10
S216-09/10
S217-09/10
S218-09/10, Part I
S219-09/10, Part I
S220-09/10
S221-09/10
S222-09/10, Part I
S223-09/10
S224-09/10, Part I
S225-09/10, Part I
FS156-09/10, Part I
FS180-09/10
G2-09/10, Part I
S46-09/10
S169-09/10

S1–09/10
1502.1; IRC R202

Proponent: Bob Eugene, representing Underwriters Laboratories Inc

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

1502.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

ROOF ASSEMBLY. A system designed to provide weather protection and resistance to design loads, wind and fire. The system consists of a roof covering and roof deck or a single component serving as both the roof covering and the roof deck. A roof assembly includes the roof deck, vapor retarder, substrate or thermal barrier, insulation, vapor retarder and roof covering.

The definition of "Roof assembly" is limited in application to the provisions of Chapter 15.

PART II – IRC BUILDING/ENERGY

Revise as follows:

SECTION R202
DEFINITIONS

ROOF ASSEMBLY. A system designed to provide weather protection and resistance to design loads, wind and fire. The system consists of a roof covering and roof deck or a single component serving as both the roof covering and the roof deck. A roof assembly includes the roof deck, vapor retarder, substrate or thermal barrier, insulation, vapor retarder and roof covering.

Reason: Roof assemblies are also designed to provide wind resistance and fire resistance.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-S3-1502.1

S2–09/10
1503.4, 1503.4.1; IPC 1107.1; IRC R903.4, R903.4.1

Proponent: Don Surrena, CBO, National Association of Home Builders (NAHB)

THIS IS A 3 PART CODE CHANGE. PARTS I & II WILL BE HEARD BY THE IPC COMMITTEE. PART III WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

1107.1 ~~Secondary drainage required~~. Secondary (emergency overflow) drains or scuppers. Where roof drains are required, secondary (emergency overflow) roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason.

PART II – IBC

Revise as follows:

[P] 1503.4 Roof drainage. Design and installation of roof drainage systems shall comply with Section 1503 of this code and Sections 1106 and 1107 as applicable of the *International Plumbing Code.*

[P] 1503.4.1 ~~Secondary drainage required~~. Secondary (emergency overflow) drains or scuppers. Where roof drains are required, secondary (emergency overflow) roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason. The installation and sizing of secondary emergency overflow drains, leaders and conductors shall comply with Sections 1106 and 1107 as applicable of the *International Plumbing Code*.

PART III – IRC PLUMBING

Revise as follows:

R903.4 Roof drainage. Unless roofs are sloped to drain over roof edges, roof drains shall be installed at each low point of the roof. ~~Where required for roof drainage, scuppers shall be placed level with the roof surface in a wall or parapet. The scupper shall be located as determined by the roof slope and contributing roof area.~~

R903.4.1 Secondary (emergency overflow) drains ~~and~~ or scuppers. Where roof drains are required, secondary emergency overflow roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason. Overflow drains having the same size as the roof drains shall be installed with the inlet flow line located 2 inches (51 mm) above the low point of the roof, or overflow scuppers having three times the size of the roof drains and having a minimum opening height of 4 inches (102 mm) shall be installed in the adjacent parapet walls with the inlet flow located 2 inches (51 mm) above the low point of the roof served. The installation and sizing of overflow drains, leaders and conductors shall comply with Sections 1106 and 1107 as applicable of the *International Plumbing Code*.

Overflow drains shall discharge to an *approved* location and shall not be connected to roof drain lines.

Reason: (IPC/IBC) The purpose of this proposal is to clarify the requirements for roof drains and the requirements for secondary emergency overflow drains, their sizing, location and quantity. The requirements currently in the IBC did not alert the roofer about their responsibility to size drains and or scuppers. This code modification and additional section helps to alert the roofer that additional information and requirements are to be followed and provides a section reference.
(IRC) The purpose of this proposal is to clarify the requirements for roof drains and the requirements for secondary emergency overflow drains, their sizing, location and quantity. The requirements currently in the IRC did not alert the roofer about their responsibility to size drains and or scuppers. This code modification and additional section helps to alert the roofer that additional information and requirements are to be followed.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – IRC PLUMBING

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

S3–09/10
1503.6; IRC R903.2.2

Proponent: John Woestman, The Kellen Company representing the Window and Door Manufacturers Association (WDMA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC-STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

1503.6 Crickets and saddles. A cricket or saddle shall be installed on the ridge side of any chimney or penetration greater than 30 inches (762 mm) wide as measured perpendicular to the slope. Cricket or saddle coverings shall be sheet metal or of the same material as the roof covering.

Exception: Skylights installed and flashed in accordance with the manufacturer's instructions.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R903.2.2 Crickets and saddles. A cricket or saddle shall be installed on the ridge side of any chimney or penetration more than 30 inches (762 mm) wide as measured perpendicular to the slope. Cricket or saddle coverings shall be sheet metal or of the same material as the roof covering.

Exception: Skylights installed and flashed in accordance with the manufacturer's instructions.

Reason: This code language, as written, precludes the use of engineered skylight systems that are designed to prevent water infiltration into the penetration without the use of a cricket. The proposed change addresses this unintended consequence of this language of the IBC and the IRC.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

S4–09/10
1504.3, Chapter 35

Proponent: Mike Ennis representing Single Ply Roofing Industry (SPRI, Inc.)

1. Revise as follows:

1504.3 Wind resistance of nonballasted roofs. Roof coverings installed on roofs in accordance with Section 1507 that are mechanically attached or adhered to the roof deck shall be designed to resist the design wind load pressures for components and cladding in accordance with Section 1609 and shall be installed in accordance with ANSI/SPRI WD-1.

2. Add standard to Chapter 35 as follows:

SPRI
WD-1-08 Wind Design Standard Practice for Roofing Assemblies

Reason: The International Building Code provides specific requirements for calculating the wind uplift load pressure on the roof assembly. However it does not currently provide a prescriptive method to enhance the perimeter and corner attachment due to the higher wind loads in these regions. ANSI/SPRI WD-1 is a national consensus standard that has been reviewed by testing laboratories, membrane manufacturers, roofing system component suppliers, contractors and consultants. This standard provides prescriptive requirements for corner and perimeter enhancement. The user first identifies a suitable roof assembly that will resist the calculated wind uplift pressure for the field of the roof, then enhances the fastening pattern to meet the calculated corner and perimeter wind uplift load pressure. Designing the roof system to resist the higher wind loads at the perimeter and corner regions is accomplished by either adding additional fasteners or increasing the amount of adhesive used, depending upon the specific roof system chosen. This approach allows the user to work from one base assembly and enhance the attachment of the base assembly for perimeter and corner regions instead of trying to locate tested assemblies for each of these areas.

The ANSI/SPRI standard also requires that a 2.0 safety factor be applied to tested wind uplift values, unless another value is specified. So, for example, if a roof system passes a wind uplift test at 120 lbs/ft2, this value is divided by 2 before determining if the system will resist the calculated wind uplift pressure loads for the building. The IBC does not currently contain this requirement.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, SPRI WD-1-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENNIS-S1-1504.3

S5–09/10
1502.1, 1504.4, 1504.6, 1504.7

Proponent: Mark S. Graham, representing National Roofing Contractors Association (NRCA)

1. Add new definition as follows:

1502.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

LOW SLOPE. In roofing, that which commonly describes an incline of a roof which is less than two units vertical in 12 units horizontal (16.7-percent).
The definition of "Low slope" is limited in application to the provisions of Chapter 15.

2. Revise as follows:

1504.4 Ballasted low-slope roof systems. Ballasted low-slope ~~(roof slope < 2:12)~~ single-ply roof system coverings installed in accordance with Sections 1507.12 and 1507.13 shall be designed in accordance with Section 1504.8 and ANSI/SPRI RP-4.

1504.6 Physical properties. Roof coverings installed on low-slope roofs ~~(roof slope < 2:12)~~ in accordance with Section 1507 shall demonstrate physical integrity over the working life of the roof based upon 2,000 hours of exposure to accelerated weathering tests conducted in accordance with ASTM G 152, ASTM G 155 or ASTM G 154. Those roof coverings that are subject to cyclical flexural response due to wind loads shall not demonstrate any significant loss of tensile strength for unreinforced membranes or breaking strength for reinforced membranes when tested as herein required.

1504.7 Impact resistance. Roof coverings installed on low-slope roofs ~~(roof slope < 2:12)~~ in accordance with Section 1507 shall resist impact damage based on the results of tests conducted in accordance with ASTM D 3746, ASTM D 4272, CGSB 37-GP-52M or the "Resistance to Foot Traffic Test" in Section 5.5 of FM 4470.

Reason: This proposed code change is intended to add clarity to the code by providing a specific definition in Section 1502—Definitions for the term "low slope" that is used in several instances in Chapter 15.

Currently in Chapter 15, there are several instances where usage of the term low-slope is defined parenthetically as "…(roof slope < 2:12)…". In other instance in Chapter 15, the term is not specifically defined. Adding a specific definition for the term in Section 1502—Definitions provides for consistent interpretation throughout the chapter.

The addition of the notation limiting the applicability of the definition to Chapter 15 is necessary to avoid possible conflicts with other chapters; a similar notation is also included in Section 1502—Definitions for the term "Roof assembly."

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRAHAM-S1-1502.1

S6–09/10

1504.4, 1504.4.1 (New), 1504.4.2 (New), Table 1504.4 (New), 1504.8, Table 1504.8

Proponent: Thomas L Smith, AIA, RRC, TLSmith Consulting Inc. on behalf of the Roofing Industry Ad Hoc Working Group on Roof Aggregate (including, the Federal Emergency Management Agency, the Asphalt Roofing Manufacturers Association and SPRI).

1. Delete and substitute as follows:

~~**1504.4 Ballasted low-slope roof systems.** Ballasted low-slope (roof slope < 2:12) single-ply roof system coverings installed in accordance with Section 1507.12 and 1507.13 shall be designed in accordance with Section 1504.8 and ANSI/SPRI RP-4.~~

1504.4 Aggregate and paver surfaced low-slope roof coverings. Aggregate and paver surfaced roof system coverings shall be designed and installed in accordance with Section 1504.4.1 or 1504.4.2 as applicable.

2. Add new text as follows:

1504.4.1 Ballasted surfaced roof coverings. Aggregate and paver surfaced roof system coverings shall be designed and installed in accordance with ANSI/SPRI RP-4.

Exceptions:

1. Aggregate and concrete pavers are not permitted where the building height exceeds 150 feet (45 720 mm).
2. In hurricane-prone regions as defined in Section 1609.2, aggregate is not permitted on Occupancy Category III or IV buildings where the basic wind speed is greater than 100 mph (45 m/s).

1504.4.2 Aggregate surfaced roof coverings. Aggregate surfaced roof system coverings shall be designed and installed in accordance with Table 1504.4 based on the exposure category and basic wind speed at the building site. The aggregate shall comply with ASTM D 1863.

Exceptions:

1. In hurricane-prone regions as defined in Section 1609.2, aggregate is not permitted on Occupancy Category III or IV buildings where the basic wind speed is greater than 100 mph (45 m/s).
2. In hurricane-prone regions as defined in Section 1609.2, aggregate is not permitted on Occupancy Category I or II buildings when the basic wind speed is greater than 110 mph (49 m/s).

TABLE 1504.4
MINIMUM REQUIRED PARAPET HEIGHT (INCHES) FOR AGGREGATE SURFACED ROOF COVERINGS[a,b] FOR OCCUPANCY CATEGORY I AND II BUILDINGS [c]

ASTM D1863 Gradation	Mean Roof Height[d] (ft)	WIND EXPOSURE AND BASIC WIND SPEED (MPH, GUST)[e]															
		Exposure Category B					Exposure Category C					Exposure Category D					
		85	90	100	110	120	85	90	100	110	120	85	90	100	110	120	
No. 7 or No. 67	15	0	0	15	20	25	22	25	31	38	45	27	31	38	45	53	
	20	0	12	17	23	28	23	27	33	40	47	29	32	40	47	55	
	30	13	15	21	27	32	26	29	36	44	51	31	35	43	50	58	
	40	15	18	24	29	35	28	31	39	46	53	33	37	45	52	60	
	50	17	20	26	32	38	29	33	40	48	55	34	38	46	54	62	
	60	18	21	28	34	40	30	34	42	49	57	35	39	47	56	64	
	80	21	24	30	37	43	32	36	44	52	60	37	41	49	58	66	
	100	23	26	33	40	46	34	38	46	54	62	38	43	51	60	68	
	125	25	28	35	42	49	36	40	48	56	64	40	44	53	62	70	
	150	27	30	37	45	52	37	41	50	58	66	41	45	54	63	72	
No. 6	15	0	0	11	15	20	16	19	25	31	37	22	25	31	38	45	
	20	0	0	13	17	22	18	21	27	34	40	23	26	33	40	47	
	30	0	11	16	21	26	20	24	30	36	43	25	29	36	43	50	
	40	0	13	18	24	29	22	25	32	39	45	27	30	37	45	52	
	50	12	15	20	26	31	23	27	34	40	47	28	31	39	46	53	
	60	13	16	22	28	33	24	28	35	42	49	29	33	40	47	55	
	80	16	19	25	30	36	26	30	37	44	51	30	34	42	50	57	
	100	18	21	27	33	39	28	31	39	46	53	32	36	43	51	59	
	125	19	23	29	35	42	29	33	40	48	55	33	37	45	53	61	
	150	21	24	31	37	44	30	34	42	50	57	34	38	46	54	62	

SI: 1" = 25.4 mm, 1 ft = 0.3 m, 1 mph = 0.44 m/s

a. Interpolation between wind speeds and building heights shall be permitted.

b. Aggregate surfaced roofs shall not be permitted for basic wind speeds greater than 120 mph, or where the building height exceeds 150 feet.

c. For Occupancy Category III and IV buildings, use the next higher wind speed column.

d. Mean roof height shall be measured from the grade plane to the roof surface at the perimeter of the roof portion under consideration.

e. Wind exposure and basic wind speed shall be determined in accordance with ASCE 7.

3. Delete without substitution:

~~**1504.8 Aggregate.** Aggregate used as surfacing for roof coverings and aggregate, gravel or stone used as ballast shall not be used on the roof of a building located in a hurricane-prone region as defined in Section 1609.2, or on any other building with a mean roof height exceeding that permitted by Table 1504.8 based on the exposure category and basic wind speed at the site.~~

TABLE 1504.8
MAXIMUM ALLOWABLE MEAN ROOF HEIGHT PERMITTED FOR BUILDINGS WITH GRAVEL OR STONE ON THE ROOF IN AREAS OUTSIDE A HURRICANE-PRONE REGION

Basic Wind Speed From Figure 1609 (mph) [b]	Maximum Mean Roof Height (ft) [a,c]		
	Exposure category		
	B	C	D
85	170	60	30
90	110	35	15
95	75	20	NP
100	55	15	NP
105	40	NP	NP
110	30	NP	NP
115	20	NP	NP
120	15	NP	NP
Greater than 120	NP	NP	NP

Greater than 120 NP NP NP

For SI: 1 foot = 304.8 mm; 1 mile per hour = 0.447 m/s.

a. Mean roof height in accordance with Section 1609.2.

b. For intermediate values of basic wind speed, the height associated with the next higher value of wind speed shall be used, or direct interpolation is permitted.

c. NP = gravel and stone not permitted for any roof height.

Reason: Concern with roof aggregate blow-off is not new (Minor, 1977). It has continued to be reinforced by field observations, particularly in regard to damage caused to glazing on surrounding buildings as well as the building from which the aggregate was lifted into the airstream. Most problems have been associated with extreme wind events such as hurricanes and have involved roofs not in compliance with RP-4 and with aggregate surfaced roofs for which the RP4 standard was not intended to address. As a result, recent building code changes (i.e., IBC 2006 and 2009) have severely restricted the use of aggregate surfaced roofs. However, these new restrictions were not based on the K-W design method (Kind Wardlaw 1976), the wind tunnel studies underlying the K-W design method (Kind 1977), or a quantitative analysis of observed good and bad roofing system performances in real wind events. Instead, current building code limitations are based on variation in surface pressure with building height which is known to be an inappropriate predictor of aggregate blow-off or scour due to pressure equalization effects (Smith, 1997). Furthermore, these recent restrictions do not address critical parameters such as aggregate size and parapet height which govern performance.

This code change proposal addresses two types of roof coverings: ballasted single ply roofs and those with aggregate surfaces, such as Built-up roofs (BUR) and certain spray polyurethane roof systems. Reasoning statements are provided for each new section:

New section1504.4.1 - Over 6 billion square feet of ballasted single ply roofing applications have been installed over the last two decades The vast majority of these systems have performed very well with respect to their resistance to wind pressure loads. However some damage has been observed due to aggregate blowing off non-code compliant roofs during high wind events. The above proposals are based on over 200 wind tunnel tests in addition to over 40 years of field experience and observations from hurricane investigation teams. These proposals provide restrictions on the use of ballasted single ply roof systems that will allow for the responsible use of aggregate surfacing that is a cost effective method to keep the roof system in place and to improve the energy performance of the building.

ANSI/SPRI RP-4 is the code referenced design guide for ballasted single ply roof systems. The requirements contained in the guide are based on over 200 wind tunnel tests along with extensive field studies. One of the design criteria of ANSI/SPRI RP-4 is to prevent gravel blow-off. Wind tunnel testing conducted at the National Research Council Canada evaluated conventional stone ballasted and stone and paver ballasted protected membrane roofs. For the systems containing stone ballasting the primary objective was to determine 4 critical wind speeds:

1. U_{c1} – the wind speed at which one or more stones were first observed to move an appreciable distance (i.e. several inches)
2. U_{c2} – the wind speed above which scouring of stones would continue more or less indefinitely as long as the wind speed is maintained.
3. U_{c3} – the wind speed at which stones were first observed to leave the roof by going over the upstream parapet (this was the parapet adjacent to the wind direction)
4. U_{c4} – the wind speed at which stones were first observed to leave the roof by going over the downstream parapet (opposite side from the wind)

In these experiments three nominal stone sizes were used. Each nominal stone size represented a mixture of stone sizes (larger and smaller) similar to the gradation, which would be obtained from a stone quarry. These experiments evaluated the impact of the following variables on the critical wind speeds defined above:

Stone size
Parapet height
Building height
Building geometry
Direction of wind impacting the building
Rooftop wind speed, rooftop gust wind speed, and the shape of the approaching wind velocity profile

In addition to the extensive wind tunnel test program, observed field performance was also a basis for the requirements included in ANSI/SPRI RP-Two of the most critical controlling factors identified through this extensive test program on the various critical wind speeds were stone size and parapet height. A brief summary of the wind tunnel test program, and reports written as part of this program follows.

LTR-LA-142 Estimation of Critical Wind Speeds for Scouring of Gravel or Crushed Stone on Rooftops January 1974

Objectives:

Determine the critical wind speeds and corresponding surface shear stress that cause movement of various stone sizes and shapes by taking direct measurements of these values via wind tunnel testing.

Use this data to determine constants that can be used in equations to calculate critical surface shear stress

Obtain guidance about the effects of parapets and obstacles, which cause strong three-dimensional effects, notably vortices.

Conclusions:

The surface shear stress required to cause stone motion is directly proportional to nominal stone diameter.

The constant of proportionality appears to be essentially independent of stone size and shape and of the detailed shape of the velocity profile near the gravel surface.

Critical wind speeds to initiate stone motion can therefore be easily predicted if the relationship between surface shear stress and wind speed is known for the situation of interest.

The dead air region behind a parapet extended downstream about 15 parapet heights. The turbulence of natural wind will tend to reduce the dead air zone.

LTR-LA-162 Wind Tunnel Tests on Some Building Models to Measure Wind Speeds at Which Gravel is Blown Off Rooftops June 1974

Objectives:

This series of tests was conducted to build upon the data obtained in the January 1974 test series. Specifically to provide data for some typical building geometries and to investigate the effects of building form, building height, parapet height, wind direction, and gravel size on the critical wind speeds required to cause scouring and blow-off of roofing gravel.

In this series 1/10 scale models were evaluated in a 30' x 30' wind tunnel.

Conclusions

The critical wind speeds at which scouring of nominal 0.9", 1.5" and 2.8" diameter gravel (scaled to 1/10 size) occurs and begins to blow-off rooftops were investigated. The nominal sizes represent the average size of a typical mixture.

The critical wind speeds are lowest when the wind direction is at or about 45 to the walls of the building.

For a given building configuration the critical wind speeds are proportional to the square root of the gravel size.

The critical wind speeds increase with increasing parapet height and decrease with increasing building height.

The length:width ratio of the building is unimportant as long as the width and length are large compared to the parapet height.

NRC No. 15544 Design of Rooftops Against Gravel Blow-Off September 1976

Objectives:

This report describes a procedure that can be used to estimate the wind speeds at which gravel of a given nominal size will be blown off rooftops.

The report also describes a procedure for determining design wind speeds at rooftop level.

The gravel blow-off procedure is based on data obtained from previous wind tunnel tests described above.

Conclusions

The results of wind tunnel tests conducted to determine critical wind speeds for scour or blow-off of roofing gravel for a specific low-rise building shape can be generalized to apply to any low-rise rectangular building having a flat rooftop.

Similar generalization is possible for high-rise shapes of any particular length:width ratio.

This permits development of a general, easy to use procedure for estimating critical wind speeds required to cause scour or blow-off of roofing gravel from various building configurations.

LTR-LA-189 Further Wind Tunnel Tests on Building Models to Measure Wind Speeds at Which Gravel is Blown Off Rooftops August 1977

Objectives:

Obtain additional data to permit previously obtained results to be generalized so as to be applicable to any rectangular flat-roofed low-rise building.

Provide data on the effects of substituting solid paving blocks for loose gravel in the most wind sensitive areas of the rooftop.

Conclusions:

The wind speed at rooftop level appears to be the dominant factor in controlling gravel scour and blow-off as opposed to the wind velocity profile.

The measured wind speeds at rooftop level were used to reinterpret the data from previous wind tunnel tests.

Within the boundaries of experimental scatter the critical wind speeds are independent of the rooftop level in the wind boundary layer, allowing for generalization of results to various building heights and geometries.

LTR-LA-234 Model Studies of the Wind Resistance of Two Loose-Laid Roof-Insulation Systems May 1979

Objectives:

Investigate the resistance of protected membrane roof systems to damage from high winds.

Identify wind speeds and failure mechanisms for protected membrane roof systems.

Conclusions:

The results show that wind flows induce pressure distributions underneath the roof-insulation systems as well as on their exterior surfaces. These pressure differences cause uplift and are responsible for system failure.

The wind speed to cause failure for the 2 ft. x 2 ft. paver slabs was found to be proportional to the square root of the system weight per unit area. This relationship should also be true for different geometries.

LTR-LA-269 Further Model Studies of the Wind Resistance of Two Loose-Laid Roof-Insulation Systems (High Rise Buildings) April 1984

Objectives:

This study is an extension of the May 1979 study, to investigate the resistance of various protected membrane roof systems to damage from high winds when they are installed on high-rise buildings.

Conclusions:

The mechanisms for wind damage are the same as those identified in earlier tests, namely gravel scour and uplifting of boards by pressure forces.

The static pressure underneath boards or pavers tend to become equal to the exterior surface because of airflow through the joints between boards or pavers. Complete equalization cannot occur, however, in regions where the exterior pressure distribution is highly non-linear and uplifting pressure differences occur in those regions. System failure therefore tends to occur in these regions.

High parapets are very effective in increasing resistance to wind damage.

Mechanical interconnection of boards or pavers by use of strapping, tongue & groove, etc. is an effective method for increasing wind resistance.

For any particular system configuration, the wind speed to cause failure is proportional to the square root of the system weight per unit area.

Gust speed at rooftop level is the pertinent speed for use in assessing the resistance of the roofing system to wind damage.

LTR-LA-294 Further Wind Tunnel Tests of Loose-Laid Roofing Systems April 1987

Objectives:

Conduct extensive wind tunnel work to further assess the resistance to wind damage of protected membrane roofing system using paver slabs, or similar elements.

Low, intermediate and high-rise buildings were tested, each with several parapet heights.

Conclusions:

When a membrane is loose-laid on a leaky roof deck, ballooning will occur due to air flowing through holes in the deck from the interior of the building. This will normally result in failure at wind speeds well below those required to product failure by other mechanisms.

In the case of immobile membranes, failure results from pressure differences, which develop across elements in some regions of the roof. Increased parapet height generally resulted in more favorable pressure distributions. That is, maximum suctions were reduced and suction peaks were broadened, so that pressure was less non-uniform and therefore increased failure speeds could be expected.

Element size has a noticeable effect on failure speed, i.e. failure speeds were higher for larger elements.

Pressure non-uniformity is reduced by vortex generators mounted on the parapets near the upwind corner of the roof, thus increasing failure wind speeds.

LTR-LA-295 Pressure Distribution Data Measured During the September 1986 Wind Tunnel Tests on Loose-Laid Roofing Systems September 1987

Objectives:

This report supplements LTR-LA-294 by including contour plots of mean and peak roof surface pressure coefficients and mean and peak coefficients for pressure differential between the upper surface and the underside of the roofing system.

New Section 1504.4.2 and New Table 1504.4 – The new Section 1504.2 provides prescriptive design requirements to avoid blow-off of loose aggregate used on roof systems such as BUR and certain SPF roofs. Based on the Kind-Wardlaw design method, blow-off of loose aggregate is avoided by using minimum parapet heights determined by wind speed, Exposure Category, roof height, Building Category and aggregate size.

The Kind-Wardlaw design method ("K-W" design method) for prevention of scour and blow-off of aggregate from aggregate surfaced roofs has been available since the 1970s (Kind & Wardlaw 1976). It saw limited use until the 1980s when adopted as the basis for the initial 1988 edition of ANSI/SPRI RP-4, "Wind Design Standard for Ballasted Single-Ply Roofing Systems," (RP-4) standard which, in its updated form, continues to be used by the single-ply roofing industry for ballasted roofs (SPRI 2008). SPRI utilized the K-W design method as the basis for aggregate ballasted roof systems to prevent ballast scour.

For aggregate surfaced roof systems, a main wind-related issue of concern is with aggregate blow-off. Scour is not considered important to aggregate surfaced roofs, except to the extent that it might require maintenance (re-distribution of aggregate) after an extreme wind event to maintain fire resistance and the long-term durability of the roof system against degradation caused by solar (U-V) radiation or cause pile-up of aggregate on a downwind parapet.

The technical underpinnings of this proposal are three-fold:

1. The wind tunnel basis of the K-W design method was re-evaluated to confirm or make technically supported improvements with respect to prevention of aggregate blow-off
2. Quantitative field observations of roofing system performance in extreme wind events were compared with the K-W design method
3. Prescriptive design requirements to prevent aggregate blow-off based on items 1 and 2 were developed as a new Table 1504.4 for inclusion in the IBC.

As a result of this study (Crandell, 2009), improvements are recommended for a modified K-W design method for aggregate surfaced roofs. The improvements include a reconfiguration of the design method that allows critical wind velocity for initiation of aggregate blow-off to be predicted as a linear relationship directly with parapet height. This approach greatly simplifies the design method at no loss of accuracy, thereby improving the utility of the method for design practitioners to address a recognized deterrent to broader application of the K-W design method (Smith, 1997). It also avoids inefficiencies (generally overdesign) caused by use of non-dimensional building geometry-based parameters to determine roof design requirements of actual buildings (e.g., wind speed limit, aggregate size, and parapet height).

In addition, the effect of gravel size on critical velocity for blow-off is improved based on the reviewed wind tunnel data which shows a clear relationship between critical velocity for blow-off and the cube-root of the aggregate diameter (not the square-root as used in the K-W design method).

Finally, the modified K-W design method using the above improvements is compared to field observations with sufficient quantitative data (e.g., local wind speed, exposure, aggregate size, parapet height, and building height) available to allow for a meaningful comparison. As a result, a calibration factor is proposed to bring the modified K-W design method in line with observations of successful performance while still maintaining adequate requirements to eradicate clearly problematic observations of aggregate blow-off. Use of such a calibration approach is consistent the RP-4 standard's application of the K-W design method.

REFERENCES:

ASCE (2005). Minimum Design Loads for Buildings and Other Structures. American Society of Civil Engineers, Reston, VA.

Crandell, J. H. (2009) Design of Aggregate Surfaced Roofs to Avoid Aggregate Blow-off: Development of a Modified Kind-Wardlaw Design Method for Buildings of All Heights

International Code Council, Inc. (2006). International Building Code. Falls Church, VA

Kind, R.J. and Wardlaw R.L. (1976). Design of Rooftops Against Gravel Blow-Off. National Aeronautical Establishment, National Research Council, Canada.

Kind, R.J. (1977). Further Wind Tunnel Tests on Building Models to Measure Wind Speeds at Which Gravel is Blown Off Rooftops. LTR-LA-189. National Aeronautical Establishment, National Research Council, Canada.

Minor, J.E. (September 1977). Performance of Roofing Systems in Wind Storms. *Proceedings of the Symposium on Roofing Technology*, National Bureau of Standards and National Roofing Contractors Association.

RICOWI (2007). Hurricane Katrina Investigation Report. Roofing Industry Committee on Weather Issues, Inc., Powder Springs, GA.

Smith, T.L., Kind, R.J., and McDonald, R.J. (1992). Hurricane Hugo: Evaluation of Wind Performance and Wind Design Guidelines for Aggregate Ballasted Single-Ply Membrane Roof Systems. Asociacion Internacional De La Impermeabilizacion, VII Congreso Internacional, Madrid, Spain.

Smith, T.L. (June 1997). Aggregate Blow-Off from BUR and SPF Roofs: Recognizing the Potential Hazards and Avoiding Problems. *Proceedings of The 8th U.S. Conference on Wind Engineering*, AAWE.

SPRI (2008). Wind Design Standard for Ballasted Single-Ply Roofing Systems. ANSI/SPRI RP-4-2008. Single-Ply Roofing Industry, Waltham, MA.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SMITH-S1-1504.4

S7–09/10
1504.5

Proponent: Mark S. Graham, representing National Roofing Contractors Association (NRCA)

Revise as follows:

1504.5 Edge securement for low-slope roofs. Low-slope ~~membrane~~ built-up, modified bitumen and single-ply roof systems metal edge securement, except gutters, shall be designed and installed for wind loads in accordance with Chapter 16 and tested in accordance with ANSI/SPRI ES-1, except the basic wind speed shall be determined from Figure 1609.

Reason: This proposed code change is intended to add clarity to the code by providing the specific roof membrane types to which Section 1504.5 applies.

The term "…membrane…" is not currently specifically defined in the context of roof systems in Section 1505—Definitions or Chapter 2—Definitions.

The description of roof membranes as "…built-up, modified bitumen and single-ply…" is consistent with other descriptions for membrane-type roof systems already included in Chapter 15.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRAHAM-S3-1504.5

S8–09/10
1504.5

Proponent: Mark S. Graham, representing National Roofing Contractors Association (NRCA)

Revise as follows:

1504.5 Edge securement for low-slope roofs. Low-slope membrane roof systems metal edge securement, except gutters, shall be designed and installed for wind loads in accordance with Chapter 16 and tested in accordance with Test Methods RE-1, RE-2 and RE-3 of ANSI/SPRI ES-1, except the basic wind speed shall be determined from Figure 1609.

Reason: This proposed code change is intended to add clarity to the code by providing the specific reference to ANSI/SPRI ES-1's test method requirements (RE-1, RE-2 and RE-3).

ANSI/SPRI ES-1 consists of two primary parts. In the first part the wind loads at a roof edge are determined. In the second part the edge metal flashings' wind resistances are determined according to ANSI/SPRI ES-1's RE-1, RE-2 and RE-3 test methods.

Currently, Section 1504 requires that wind loads be determined according to the code's Chapter 16, not ANSI/SPRI ES-1. Adding specific reference to ANSI/SPRI ES-1's test methods helps clarify that.

This proposed code change is not intended to change the code's current technical requirements; it is only intended to add a specific reference and clarity to which part of ANSI/SPRI ES-1 applies in Section 1504.5.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRAHAM-S4-1504.5

S9–09/10
1504.9 (New), Chapter 35

Proponent: Mike Ennis representing Single Ply Roofing Industry (SPRI)

1. Add new text as follows:

1504.9 Roof gardens and landscaped roofs. Roof gardens and landscaped roofs shall comply with Section 1507.16 and shall be installed in accordance with ANSI/SPRI RP14.

2. Add standard to Chapter 35 as follows:

SPRI
RP 14-07 Wind Design Standard for Vegetative Roofing Systems

Reason: Section 1507.16 requires that roof gardens and landscaped roofs comply with the requirements of Chapter 15. Section 1504.1 provides requirements for wind resistance of various roofing assemblies, however no guidance is provided for designing roof gardens and landscaped roofs to withstand wind loads. Roof gardens and landscaped roofs perform in the same manner as ballasted single ply roof assemblies when exposed to wind loads. ANSI/SPRI RP14 is a national consensus standard that has been developed with input from roof membrane manufacturers, component suppliers, contractors, green roofing professionals, testing organizations, and consultants. This design standard is much like the ballast design guide for single-ply roofs currently recognized by the IBC (ANSI/SPRI RP4). It provides the user with a series of tables that define requirements based on design wind speed, building height, parapet height and wind exposure. Three design options are provided. These design options vary in their ability to resist wind loads. Design option 1 uses a 10 lbs/ft2 minimum required load of growth media or trays, Design option 2 also requires minimum 10 lbs/ft2 of growth media or trays in the field of the roof and 13 lbs/ft2 of growth media or interlocking trays or 22 lbs/ft2 of individual trays in the corner and perimeter regions. Design option 3, which is designed for high wind load areas, requires 13 lbs/ft2 of growth media or interlocking trays, or 22 lbs/ft2 of individual trays in the field of the roof and does not allow any loose growth media or trays in the perimeter and corner regions. The perimeter of the building is defined as 40% of the building height. Adjustments are provided to increase the wind resistance of the design based on specific building conditions such as the buildings importance factor, large openings in adjacent walls and rooftop projections to name a few. The standard also provides requirements for newly planted garden roofs that do not have fully developed root systems. Fully developed root systems allow the garden roof assembly to perform very well when exposed to high wind situations, however prior to development of the root system special precautions must be taken.

The basis for the standard includes wind tunnel data generated in support of the ballasted single ply design guide. This wind tunnel testing helped develop an understanding of the impact of particle size and parapet height on the performance of ballasted assemblies. It also provided information regarding the weight of ballast required to keep the roof systems in place at various wind speeds. This data, along with 50-years of garden roof performance data from both the US and Europe were used in the development of this standard.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, SPRI RP-14 07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENNIS-S4-1504.9

S10–09/10
Table 1505.1, 1507.16, 1507.16.1 (New)

Proponent: Robert J Davidson, Code Consultant, Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

Revise as follows:

TABLE 1505.1[a,b, d]
MINIMUM ROOF COVERING CLASSIFICATION
FOR TYPES OF CONSTRUCTION
(No change to table)

(No change to Notes a. through c.)

d. Any exposed portions of roof coverings on roofs containing roof gardens or landscaped roofs shall have their roof covering fire classification increased one level above the level indicated in the table.

1507.16 Roof gardens and landscaped roofs. Roof gardens and landscaped roofs shall comply with the requirements of this chapter and Sections 1607.11.2.2 and 1607.11.2.3 and the International Fire Code.

1507.16.1 Structural fire-resistance. The structural frame and roof construction supporting the load imposed upon the roof by the roof gardens or landscaped roofs shall comply with the requirements of Table 601.

Reason: As rooftop gardens and landscaped roofs gain in acceptance and popularity reasonable requirements need to be added to the codes to address the fuel load that these additions can add to a building or structure.

The addition of a rooftop garden or landscaped roof adds a fuel load to the roof. In recognition of this increased hazard it is proposed that Table 1505.1 be modified by adding a Note d that would require the exposed portions of roof coverings on roofs that contain roof gardens or landscaped roofs have the required classification of the roof covering increased one level. A reference to the International Fire Code is proposed to be added to Section 1507.16.

Table 601 provides for the Fire-Resistance Rating Requirements For Building Elements. Note b of Table 601 states, "

"b. Roof supports: Fire-resistance ratings of structural frame and bearing walls are permitted to be reduced by 1 hour where supporting a roof only."

This reduction is only permitted when the construction elements are "supporting a roof only." The addition of a roof garden or landscaped roof imposes a load and Note b. would not apply. The additional sentence proposed to be added as Section 1507.16.1 is intended to be a pointer to remind the designer and the code official to verify compliance with Table 601 fire-resistance requirements now that a load is planned to be added to the roof structure.

Cost Impact: These requirements will increase the cost of construction for those buildings where a roof garden or landscaped roof is proposed to be installed on the roof.

Analysis: The reference in Section 1507.16 of this proposal to the IFC is dependent on the action on Code Change FXX-09/10 **[Davidson-Shuman-F9-316]** which appears on the hearing order of the IFC Committee and proposes a new IFC *Section 316 - Roof Gardens and Landscaped Roofs*. If that code change is not approved, the reference to the IFC would be deleted from Section 1507.16.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-S1-1505.1

S11–09/10
Table 1505.1

Proponent: Brian Tollisen, PE, New York State Division of Code Enforcement and Administration, representing the New York State Division of Code Enforcement and Administration

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

Revise as follows:

TABLE 1505.1[a,b]
MINIMUM ROOF COVERING CLASSIFICATION
FOR TYPES OF CONSTRUCTION

IA	IB	IIA	IIB	IIIA	IIIB	IV	VA	VB
B	B	B	C[c]	B	C[c]	B	B[d]	C[c]

(No change to footnotes a through c)

d. Buildings of Type VA construction with a fire separation distance greater than or equal to 30 feet on all sides of the building and equipped throughout with a sprinkler system conforming to Section 903.3.1.1, shall be permitted to have a Class C roof covering classification provided the maximum area does not exceed what is allowed for a Type VB building of the same use and occupancy Classification as determined by Section 506. The total allowable building area shall be determined by multiplying the allowable area per story (A_a), by 3. This area increase shall not be permitted in H-1 and I-2 occupancy classifications.

Reason: Roof covering classifications are used to mitigate the spread of fire from adjoining structures or from wild fires. This proposal requires the fire separation distance to be at a minimum of 30' on all sides. This distance, 30', is the minimum fire separation distance where no fire-resistance ratings for exterior walls are required (IBC Table 602).

This proposal allows buildings of Type VA construction to have a Class C roof covering classification provided the total building area does not exceed what would be allowed for the total building area of a similar use building of Type VB Construction a value of 3 is used to determine the total allowable building area. This allows buildings of constructed of Type 5A construction and with a sprinkler system to have a Class C roof covering classification and the total building area that is at least 33% less than what is typically allowed for the same building with a Class B roof covering classification.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOLLISEN-S1-1505.1

S12–09/10
1505.8 (New), Chapter 35

Proponent: Mike Ennis representing the Single Ply Roofing Industry

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

1. Add new text as follows:

1505.8 Roof gardens and landscaped roofs. Roof gardens and landscaped roofs shall comply with Section 1507.16 and shall be installed in accordance with ANSI/SPRI VF-1.

2. Add standard to Chapter 35 as follows:

SPRI
VF-1-08 Fire Design Standard for Vegetative Roofs

Reason: Section 1507.16 requires that roof gardens and landscaped roofs comply with the requirements of Chapter 15. Section 1505 requires that roofing assemblies be fire classified. The current test procedures used to provide this fire classification are not applicable to garden and landscape roofs due to the many variables (plant types, moisture content, etc.) that exist for these types of systems. ANSI/SPRI VF-1 is a national consensus standard that has been developed with input from roof membrane manufacturers, component suppliers, contractors, green roofing professionals, testing organizations, and consultants. This standard provides a design method to assure an acceptable level of performance of roof gardens and landscaped roofs when exposed to exterior fire sources. The general approach used in this standard is to design in fire breaks for large roof areas, around rooftop equipment and penetrations, and next to adjacent walls. Some of the specific requirements are:

> Exposed membrane areas must conform to the designed fire resistance requirements as determined by the authority having jurisdiction.
> For all vegetated roofing systems abutting combustible vertical surfaces, a Class A (per ASTM E108 or UL790) rated assembly must be achieved for a minimum 6 ft (1.83 m) wide continuous border placed around rooftop structures and all rooftop equipment.
> For large roof areas: Partition the roof area into sections not exceeding 15,625 ft2 (1,450 m^2), with each section having no dimension greater than 125 ft (39 m) by installing a minimum of 3ft. (0.9 m) wide, Class A rated assembly barrier zones.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, VF-1-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENNIS-S5-1505.8

S13–09/10
1505.8 (New)

Proponent: Mark S. Graham, representing National Roofing Contractors Association (NRCA)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Add new text as follows:

1505.8 Photovoltaic systems. Rooftop installed photovoltaic systems that are adhered or attached to the roof covering shall be labeled to identify their fire classification in accordance with the testing required in Section 1505.1.

Reason: This proposed code change proposal is intended clarify that rooftop photovoltaic systems that are adhered or attached to the roof covering—often referred to as "building integrated photovoltaic (BIPV)"--need to comply with building code requirements for fire classification. The minimum requirement set forth here is intended for the rooftop photovoltaic system to be required to comply with the same minimum fire classification requirements as the underlying roof assembly.

Specific requirements applicable to the electrical portion of rooftop-mounted photovoltaic systems are left to the applicable electrical code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRAHAM-S5-1505.8 NEW

S14–09/10
Table 1507.2.7.1(2); IRC Table R905.2.4.1(2)

Proponent: Mark S. Graham, representing National Roofing Contractors Association (NRCA)

THIS IS A 2 PART PROPOSAL. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

TABLE 1507.2.7.1(2)
CLASSIFICATION OF ASPHALT SHINGLES PER ASTM D3161

MAXIMUM BASIC WIND SPEED FROM FIGURE 1609	CLASSIFICATION REQUIREMENT
85	~~A,~~ D or F
90	~~A,~~D or F
100	~~A, D or~~ F
110	F
120	~~F~~ Not permitted
130	~~F~~ Not permitted
140	~~F~~ Not permitted
150	~~F~~ Not permitted

PART II – IRC BUILDING/ENERGY

Revise as follows:

TABLE R905.2.4.1(2)
CLASSIFICATION OF ASPHALT SHINGLES PER ASTM D3161

MAXIMUM BASIC WIND SPEED FROM FIGURE R301.2(4) (mph)	CLASSIFICATION REQUIREMENT
85	~~A,~~ D or F
90	~~A,~~D or F
100	~~A, D or~~ F
110	F
120	~~F~~ Not permitted
130	~~F~~ Not permitted
140	~~F~~ Not permitted
150	~~F~~ Not permitted

Reason: This proposed code change is intended to make the classification requirements in IBC Table 1507.2.7.1(2) [IRC Table R905.2.4.1(2)] — Classification of Asphalt Shingles per ASTM D3161 consistent with the classifications described in the test method.

In ASTM D3161, asphalt shingles are classified as Class A (60 mph), Class D (90 mph) and Class F (110 mph).

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRAHAM-S2- TABLE 1507.2.7.1(2)

S15–09/10

1507.2.8.1, 1507.3.3.3 (New), 1507.4.5 (New), 1507.5.3.1 (New), 1507.6.3.1 (New), 1507.7.3.1 (New), 1507.8.3.1 (New), 1507.9.3.1 (New); IRC R905.2.7.2, R905.3.3.3, R905.4.3.2 (New), R905.5.3.2 (New), R905.6.3.2 (New), R905.7.3.2 (New), R905.8.3.2 (New), R905.10.5.1 (New)

Proponent: T. Eric Stafford, PE, representing Institute for Business and Home Safety

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC-STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

1. Revise as follows:

1507.2.8.1 High wind attachment. Underlayment applied in areas subject to high winds [above 110 mph (49 m/s) in accordance with Figure 1609] shall be applied with corrosion-resistant fasteners in accordance with manufacturer's installation instructions. Fasteners are to be applied along the overlap at a maximum spacing of 36 inches (914mm) on center.

Underlayment installed where the basic wind speed equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Head laps shall be 4 inches (102 mm) and end laps shall be a minimum of 6 inches (152 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

Underlayment installed where the basic wind speed equals or exceeds 140 mph (63 m/s) shall be attached using metal cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

2. Add new text as follows:

1507.3.3.3 High wind attachment. Underlayment applied in areas subject to high wind [over 110 mph (49 m/s) in accordance with Figure 1609] shall be applied with corrosion-resistant fasteners in accordance with manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where the basic wind speed equals or exceeds 120 mph (54 m/s) shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Head laps shall be 4 inches (102 mm) and end laps shall be a minimum of 6 inches (152 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

Underlayment installed where the basic wind speed equals or exceeds 140 mph (63 m/s) shall be attached using metal cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

1507.4.5 Underlayment and high wind. Underlayment applied in areas subject to high winds [above 110 mph (49 m/s) in accordance with Figure 1609] shall be applied with corrosion-resistant fasteners in accordance with manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where the basic wind speed equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 1970. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Head laps shall be 4 inches (102 mm) and end laps shall be a minimum of 6 inches (152 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 5/8 inches (41mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

Underlayment installed where the basic wind speed equals or exceeds 140 mph (63 m/s) shall be attached using metal cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

1507.5.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [above 110 mph (49 m/s) in accordance with Figure 1609] shall be applied with corrosion-resistant fasteners in accordance with manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where the basic wind speed equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Head laps shall be 4 inches (102 mm) and end laps shall be a minimum of 6 inches (152 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

Underlayment installed where the basic wind speed equals or exceeds 140 mph (63 m/s) shall be attached using metal cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

1507.6.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [above 110 mph (49 m/s) in accordance with Figure 1609] shall be applied with corrosion-resistant fasteners in accordance with manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914mm) on center.

Underlayment installed where the basic wind speed equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Head laps shall be 4 inches (102 mm) and end laps shall be a minimum of 6 inches (152 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

Underlayment installed where the basic wind speed equals or exceeds 140 mph (63 m/s) shall be attached using metal cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

1507.7.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [above 110 mph (49 m/s) in accordance with Figure 1609] shall be applied with corrosion-resistant fasteners in accordance with manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where the basic wind speed equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Head laps shall be 4 inches (102 mm) and end laps shall be a minimum of 6 inches (152 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

Underlayment installed where the basic wind speed equals or exceeds 140 mph (63 m/s) shall be attached using metal cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

1507.8.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [above 110 mph (49 m/s) in accordance with Figure 1609] shall be applied with corrosion-resistant fasteners in accordance with manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where the basic wind speed equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches between side laps with a 6 inch (152 mm) spacing at the side laps. Head laps shall be 4 inches (102 mm) and end laps shall be a minimum of 6 inches (152 mm). Underlayment shall be attached using metal or plastic cap nails with a head

diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

Underlayment installed where the basic wind speed equals or exceeds 140 mph (63 m/s) shall be attached using metal cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

1507.9.3.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [above 110 mph (49 m/s) in accordance with Figure 1609] shall be applied with corrosion-resistant fasteners in accordance with manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where the basic wind speed equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Head laps shall be 4 inches (102 mm) and end laps shall be a minimum of 6 inches (152 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

Underlayment installed where the basic wind speed equals or exceeds 140 mph (63 m/s) shall be attached using metal cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

R905.2.7.2 Underlayment and high wind. Underlayment applied in areas subject to high winds [above 110 mph (49 m/s) per Figure R301.2(4)] shall be applied with corrosion-resistant fasteners in accordance with manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914mm) on center.

Underlayment installed where the basic wind speed equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 6757. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Head laps shall be 4 inches (102 mm) and end laps shall be a minimum of 6 inches (152 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

Underlayment installed where the basic wind speed equals or exceeds 140 mph (63 m/s) shall be attached using metal cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

R905.3.3.3 Underlayment and high wind. Underlayment applied in areas subject to high wind [over 110 miles per hour (49 m/s) per R301.2(4)] shall be applied with corrosion-resistant fasteners in accordance with manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where the basic wind speed equals or exceeds 120 mph (54 m/s) shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Head laps shall be 4 inches (102 mm) and end laps shall be a minimum of 6 inches (152 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

Underlayment installed where the basic wind speed equals or exceeds 140 mph (63 m/s) shall be attached using metal cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

2. Add new text as follows:

R905.4.3.2 Underlayment and high wind. Underlayment applied in areas subject to high winds [above 110 mph (49 m/s) per Figure R301.2(4)] shall be applied with corrosion-resistant fasteners in accordance with manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where the basic wind speed equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II, ASTM D 4869 Type IV, or ASTM D 1970. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Head laps shall be 4 inches (102 mm) and end laps shall be a minimum of 6 inches (152 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

Underlayment installed where the basic wind speed equals or exceeds 140 mph (63 m/s) shall be attached using metal cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

R905.5.3.2 Underlayment and high wind. Underlayment applied in areas subject to high winds [above 110 mph (49 m/s) per Figure R301.2(4)] shall be applied with corrosion-resistant fasteners in accordance with manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where the basic wind speed equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Head laps shall be 4 inches (102 mm) and end laps shall be a minimum of 6 inches (152 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

Underlayment installed where the basic wind speed equals or exceeds 140 mph (63 m/s) shall be attached using metal cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

R905.6.3.2 Underlayment and high wind. Underlayment applied in areas subject to high winds [above 110 mph (49 m/s) per Figure R301.2(4)] shall be applied with corrosion-resistant fasteners in accordance with manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where the basic wind speed equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Head laps shall be 4 inches (102 mm) and end laps shall be a minimum of 6 inches (152 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

Underlayment installed where the basic wind speed equals or exceeds 140 mph (63 m/s) shall be attached using metal cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

R905.7.3.2 Underlayment and high wind. Underlayment applied in areas subject to high winds [above 110 mph (49 m/s) per Figure R301.2(4)] shall be applied with corrosion-resistant fasteners in accordance with manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914mm) on center.

Underlayment installed where the basic wind speed equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Head laps shall be 4 inches (102 mm) and end laps shall be a minimum of 6 inches (152 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

Underlayment installed where the basic wind speed equals or exceeds 140 mph (63 m/s) shall be attached using metal cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

R905.8.3.2 Underlayment and high wind. Underlayment applied in areas subject to high winds [above 110 mph (49 m/s) per Figure R301.2(4)] shall be applied with corrosion-resistant fasteners in accordance with manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where the basic wind speed equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II or ASTM D 4869 Type IV. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Head laps shall be 4 inches (102 mm) and end laps shall be a minimum of 6 inches (152 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

Underlayment installed where the basic wind speed equals or exceeds 140 mph (63 m/s) shall be attached using metal cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

R905.10.5.1 Underlayment and high wind. Underlayment applied in areas subject to high winds [above 110 mph (49 m/s) per Figure R301.2(4)] shall be applied with corrosion-resistant fasteners in accordance with manufacturer's installation instructions. Fasteners are to be applied along the overlap not farther apart than 36 inches (914 mm) on center.

Underlayment installed where the basic wind speed equals or exceeds 120 mph (54 m/s) shall comply with ASTM D 226 Type II. The underlayment shall be attached in a grid pattern of 12 inches (305 mm) between side laps with a 6 inch (152 mm) spacing at the side laps. Head laps shall be 4 inches (102 mm) and end laps shall be a minimum of 6 inches (152 mm). Underlayment shall be attached using metal or plastic cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

Underlayment installed where the basic wind speed equals or exceeds 140 mph (63 m/s) shall be attached using metal cap nails with a head diameter of not less than 1 5/8 inches (41 mm) with a shank of at least 32 gauge sheet metal with a length to penetrate through the roof sheathing.

Reason: Observations of roof underlayment performance following Hurricane Ike in Texas and in two sets of tests conducted at the University of Florida and Florida International University demonstrated that relatively new and new ASTM 226 Type I underlayments performed very poorly when subjected to wind over about 110 mph. In the laboratory tests, specimen covered with ASTM 226 Type I and Type II underlayments performed dramatically differently. ASTM Type I felt (15#) material completely blew off some portions of the specimen as winds exceeded 110 mph and pulled over the plastic caps on other parts of the specimen. In contrast, the ASTM 226 Type II (30#) material remained in place and showed very few signs of distress. Plastic caps deformed much more than the metal caps in several installations. Consequently, the use of metal caps is recommended for areas with the highest basic design wind speeds.

Cost Impact: The code change proposal will increase the cost of construction

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Stafford-S3-1507.2.8.1

S16–09/10
1507.2.9.3; IRC R905.2.8.5 (New)

Proponent: T. Eric Stafford, PE, Institute for Business and Home Safety

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC-STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

1507.2.9.3 Drip edge. Provide drip edge at eaves and gables of shingle roofs. Overlap to be a minimum of 2 inches (51 mm). Eave drip edges shall extend 1/4 inch (6.4 mm) below sheathing and the flange that rests on top of the sheathing shall extend back on the roof a minimum of 2 inches (51 mm). Drip edge shall be mechanically fastened a maximum of 12 inches (305 mm) o.c. Where the basic wind speed in Figure 1609 is 110 mph (49 m/s) or greater, drip edges shall be mechanically fastened a maximum of 4 inches (102 mm) on center using a stagger pattern such that adjacent fasteners along the length of the drip edge are placed towards opposite sides of the flange. Shingles shall not extend beyond the outer edges of the drip edge by more than ¼ inch (6.4 mm).

PART II – IRC BUILDING/ENERGY

Add new text as follows:

R905.2.8.5 Drip edge. Where a drip edge is provided at eaves and gables of shingle roofs, the installation shall be in accordance with this section. Overlap shall be a minimum of 2 inches (51 mm). Eave drip edges shall extend 1/4 inch (6.4 mm) below sheathing and the flange that rests on the top of the roof sheathing shall extend back on the roof a minimum of 2 inches (51 mm). Drip edge shall be mechanically fastened a maximum of 12 inches (305 mm) o.c. Where the basic wind speed in Figure 1609 is 110 mph (49 m/s) or greater, drip edges shall be mechanically fastened a maximum of 4 inches (102 mm) on center using a stagger pattern such that adjacent fasteners along the length of the drip edge are placed towards opposite sides of the flange. Shingles shall not extend beyond the outer edges of the drip edge or the roof edge by more than ¼ inch (6.4 mm).

Reason: (IBC) The purpose of this proposal is to address two issues related to the wind performance of roofs. Recent hurricanes revealed that even in low wind speeds, the vertical part of the drip edge can rotate upward when subjected to wind, thus triggering the blow off of shingles. Sometimes this resulted in a cascading loss of shingles up or across a roof. By placing the fasteners near the edge of the roof, the potential for rotation of the drip edge is greatly reduced. Shingles that extend significantly beyond the edge of roofs are susceptible to being blown off in high winds. Currently the code does not limit this extension. While some extension is warranted to ensure that water sheds directly into the gutter, too much extension subjects the shingle potentially higher wind loads than what the shingle is capable of resisting.

(IRC)The purpose of this proposal is to address two issues related to the wind performance of roofs. While the IRC doesn't require the installation of a drip edge, improper installation can lead to problems in high wind areas. Recent hurricanes revealed that even in low wind speeds, the vertical part of the drip edge can rotate upward when subjected to wind, thus triggering the blow off of shingles. Sometimes this resulted in a cascading loss of shingles up or across a roof. By placing the fasteners near the edge of the roof, the potential for rotation of the drip edge is greatly reduced. Shingles that extend significantly beyond the edge of roofs are susceptible to being blown off in high winds. Currently the code does not limit this extension. While some extension is warranted to ensure that water sheds directly into the gutter, too much extension subjects the shingle to potentially higher wind loads than what the shingle is capable of resisting.

Cost Impact: The code change proposal will increase the cost of construction

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Stafford-S2-1507.2.9.3

S17–09/10
1507.5.5.1 (New); IRC R905.4.5.1 (New)

Proponent: Bob Eugene, Underwriters Laboratories Inc

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC-STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Add new text as follows:

1507.5.5.1 Wind resistance. Formed metal roof shingles shall be tested in accordance with procedures adapted from ASTM D 3161. Formed metal roof shingles shall meet the classification requirements of Table 1507.2.7.1(2) for the appropriate maximum basic wind speed. Formed metal roof shingle packaging shall bear a label to indicate compliance with the procedures adapted from ASTM D 3161 and the required classification from Table 1507.2.7.1(2).

PART II – IRC BUILDING/ENERGY

Add new text as follows:

R905.4.5.1 Wind resistance. Formed metal roof shingles shall be tested in accordance with procedures adapted from ASTM D 3161. Metal shingles shall meet the classification requirements of Table R905.2.4.1 (2) for the appropriate maximum basic wind speed. Metal shingle packaging shall bear a label to indicate compliance with the procedures adapted from ASTM D 3161 and the required classification from Table R905.2.4.1 (2).

Reason: (IBC) Metal roof shingles are susceptible to wind. The procedures used in ASTM D 3161 for asphalt shingles are appropriate to use for determining wind resistance, when adapted for testing these types of shingles.
(IRC) This proposal introduces a new section covering wind resistance for metal roof shingles used in residential applications. The text is from IBC Section 1507.5, with an additional requirement for wind resistance (proposed Section R905.4.5.1). Metal roof shingles are susceptible to wind. The procedures used in ASTM D3161 for asphalt shingles are appropriate to use for determining wind resistance, when adapted for testing these types of shingles.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-S4-1507.5.5.1

S18–09/10
1507.10.2, Chapter 35; IRC R905.9.2, Chapter 44

Proponent: Bob Eugene, representing Underwriters Laboratories Inc

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

1. Revise as follows:

1507.10.2 Material standards. Built-up roof covering materials shall comply with the standards in Table 1507.10.2 or UL 55A.

2. Add standard to Chapter 35 as follows:

UL
55A-04 Materials for Built-Up Roof Coverings

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

R905.9.2 Material standards. Built-up roof covering materials shall comply with the standards in Table R905.9.2 or UL 55A.

2. Add standard to Chapter 44 as follows:

UL
55A-04 Materials for Built-Up Roof Coverings

Reason: UL 55A has been in use since 1919, and is still used to evaluate the following materials used in the construction of built-up roof coverings – hot-mopping asphalt, asphalt-saturated and organic felt, coal-tar pitch, coal-tar saturated organic felt, and asphalt-coated glass-fire mat (felt). Several of these materials referenced in listed Roofing Systems evaluated to UL 790 or ASTM E 108 are based on compliance with UL 55A; and therefore UL55A should be referenced as an alternate standard in this code section.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, UL 55A-04, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-S5-1507.10.2

S19–09/10
Table 1507.10.2, Chapter 35

Proponent: Michael D. Fischer, The Kellen Company, representing the Asphalt Roofing Manufacturers Association

1. Revise as follows:

TABLE 1507.10.2
BUILT-UP ROOFING MATERIAL STANDARDS

MATERIAL STANDARD	STANDARD
Asphalt coatings used in roofing	ASTM D1227; D 2823 D2824; D4479

(Portions of Table not shown, remain unchanged)

2. Add standard to Chapter 35 as follows:

ASTM International

D 2824-06 Standard Specification for Aluminum-Pigmented Asphalt Roof Coatings, Nonfibered, Asbestos Fibered, and Fibered without Asbestos

Reason: This proposal adds ASTM D2824 to the list of material standards used in BUR systems. The standard is included in the IRC companion table (Table R905.9.2) and should be included in the IBC in order to streamline product approval.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM D2824-06, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FISCHER-S1-1507.5.2

S20–09/10

1507.14.3, Table 1507.14.3 (New); IRC R905.14.3, Table R905.14.3 (New)

Proponent: Mark S. Graham, representing National Roofing Contractors Association (NRCA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

1507.14.3 Application. Foamed-in-place roof insulation shall be installed in accordance with the manufacturer's instructions. A liquid-applied protective coating that complies with ~~Section 1507.15~~ Table 1507.14.3 shall be applied no less than 2 hours nor more than 72 hours following the application of the foam.

TABLE 1507.14.3
PROTECTIVE COATING MATERIAL STANDARDS

MATERIAL	STANDARD
Acrylic coating	ASTM D 6083
Silicone coating	ASTM D 6694
Moisture cured polyurethane coating	ASTM D 6947

PART II – IRC BUILDING/ENERGY

Revise as follows:

R905.14.3 Application. Foamed-in-place roof insulation shall be installed in accordance with this chapter and the manufacturer's instructions. A liquid-applied protective coating that complies with ~~Section R905.15~~ Table R905.14.3 shall be applied no less than 2 hours nor more than 72 hours following the application of the foam.

TABLE R905.14.3
PROTECTIVE COATING MATERIAL STANDARDS

MATERIAL	STANDARD
Acrylic coating	ASTM D 6083
Silicone coating	ASTM D 6694
Moisture cured polyurethane coating	ASTM D 6947

Reason: This proposed code change is intended to clarify the code by adding a table within Section 1507.14.3 that identifies the specific protective coating materials that are applicable to sprayed polyurethane foam roof systems.

The specific coating materials' ASTM standards that are included in this new table are already included in the code in Sec. 1507.15.2. Inclusion of all of the standards from Section 1507.15.2 is not appropriate here because some of these materials are not suitable for spray polyurethane foam roof systems.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRAHAM-S6-1507.14.3

S21–09/10

1507.15, 1507.15.1, 1507.15.2; IRC R905.15, R905.15.1, R905.15.2, R905.15.3

Proponent: Mark S. Graham, representing National Roofing Contractors Association (NRCA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDIING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

PART I- IBC STRUCTURAL

Revise as follows:

1507.15 Liquid-applied ~~coatings~~ roofing. The installation of liquid-applied ~~coatings~~ roofing shall comply with the provisions of this section.

1507.15.1 Slope. Liquid-applied r~~oofs~~ roofing shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope).

1507.15.2 Material standards. Liquid-applied roofing ~~coatings~~ shall comply with ASTM C 836, ASTM C 957, ASTM D 1227 or ASTM D 3468, ASTM D 6083, ASTM D 6694 or ASTM D 6947.

PART II- IRC BUILDING/ENERGY

Revise as follows:

R905.15 Liquid-applied ~~coatings~~ roofing. The installation of liquid-applied ~~coatings~~ roofing shall comply with the provisions of this section.

R905.15.1 Slope. Liquid-applied ~~roofs~~ roofing shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope).

R905.15.2 Material standards. Liquid-applied ~~roof~~ roofing ~~coatings~~ shall comply with ASTM C 836, ASTM C 957, ASTM D 1227 or ASTM D 3468, ASTM D 6083, ASTM D 6694 or ASTM D 6947.

R905.15.3 Application. Liquid-applied ~~roof~~ roofing ~~coatings~~ shall be installed according to this chapter and the manufacturer's installation instructions

Reason: This proposed code change is intended to clarify the code by adding terminology that is appropriate for this section and applicable to the referenced material standards.

This section addresses those materials liquid-applied products that form a waterproof barrier that can serve as a roof covering. When serving the function as a roof covering, these products are not necessarily a "coating."

This proposed code change is not intended to change the code's current technical requirements for the products descried in this section.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I- IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: GRAHAM-S7-1507.15 –RB-3-R905.15

S22–09/10

1502.1, 1507.17 (New), 1509.6 (New), Chapter 35; IRC R202, R905.16 (New), Chapter 44

Proponent: Bob Eugene, representing Underwriters Laboratories Inc

THIS IS A 3 PART CODE CHANGE. PARTS I & II WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART III WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

1. Add definition as follows:

1502.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

PHOTOVOLTAIC MODULES/SHINGLES. A roof covering composed of flat-plate photovoltaic modules fabricated in sheets that resemble three-tab composite shingles.

2. Add new text as follows:

1507.17 Photovoltaic modules/shingles. The installation of photovoltaic modules/shingles shall comply with the provisions of this section.

1507.17.1 Material standards. Photovoltaic modules/shingles shall be listed and labeled in accordance with UL1703.

1507.17.2 Attachment. Photovoltaic modules/shingles shall be attached in accordance with the manufacturer's installation instructions.

1507.17.3 Wind resistance. Photovoltaic modules/shingles shall be tested in accordance with procedures adapted from ASTM D 3161. Photovoltaic modules/shingles shall comply with the classification requirements of Table 1507.2.7.1(2) for the appropriate maximum basic wind speed. Photovoltaic modules/shingle packaging shall bear a label to indicate compliance with the procedures adapted from ASTM D 3161 and the required classification from Table 1507.2.7.1(2).

3. Add standard to Chapter 35 as follows:

UL

1703-02	Flat-Plate Photovoltaic Modules and Panels – with revisions through April 2008

PART II – IBC STRUCTURAL

Add new text as follows:

1509.6 Photovoltaic panels and modules. Photovoltaic panels and modules mounted on top of a roof shall be listed and labeled in accordance with UL 1703 and shall be installed in accordance with the manufacturer's installation instructions.

PART III – IRC BUILDING/ENERGY

1. Add definition as follows:

SECTION R202
DEFINITIONS

PHOTOVOLTAIC MODULES/SHINGLES. A roof covering composed of flat-plate photovoltaic modules fabricated in sheets that resemble three-tab composite shingles.

2. Add new text as follows:

R905.16 Photovoltaic modules/shingles. The installation of photovoltaic modules/shingles shall comply with the provisions of this section.

R905.16.1 Material standards. Photovoltaic modules/shingles shall be listed and labeled in accordance with UL 1703.

R905.16.2 Attachment. Photovoltaic modules/shingles shall be attached in accordance with the manufacturer's installation instructions.

R905.16.3 Wind resistance. Photovoltaic modules/shingles shall be tested in accordance with procedures adapted from ASTM D 3161. Photovoltaic modules/shingles shall comply with the classification requirements of Table R905.2.4.1(2) for the appropriate maximum basic wind speed. Photovoltaic modules/shingle packaging shall bear a label to indicate compliance with the procedures adapted from ASTM D 3161 and the required classification from Table R905.2.4.1(2).

3. Add standard to Chapter 44 as follows:

UL
1703-02 Flat-Plate Photovoltaic Modules and Panels – with revisions through April 2008

Reason: (Parts I & III)The proposal provides guidance for installers and code officials regarding the installation of photovoltaic modules/shingles. These shingles are integrated with the building, and provide both a roof covering and source of electrical power. UL 1703 is the standard used to investigate and list photovoltaic modules. The appropriate design slope and fastening of the shingles are different for each manufacturer's product. For wind resistance, the procedures used in ASTM D 3161 for asphalt shingles are appropriate to use, when adapted for these types of shingles. Several companies currently have listings for these products.
(Part II) The ever increasing number of installations of photovoltaic panels and modules raises concerns about the safety of these installations. This proposal requires these products to be listed and installed in accordance with the manufacturer's instructions. UL 1703 is the standard used to investigate photovoltaic modules and panels, and includes construction and performance requirements to address potential safety hazards. Over 60 companies currently have UL 1703 listings for photovoltaic modules and panels.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, UL 1703-02, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PARTS I & II – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-S1-1507.17

S23–09/10
1507.17 (New); IRC R905.16 (New)

Proponent: Bob Eugene, representing Underwriters Laboratories Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Add new text as follows:

1507.17 Formed plastic shingles. The installation of formed plastic shingles shall comply with the provisions of this section.

1507.17.1 Attachment. Plastic shingles shall be attached as required by the manufacturer.

1507.1.1 Wind resistance. Plastic shingles shall be tested in accordance with procedures adapted from ASTM D 3161.Plastic shingles shall comply with the classification requirements of Table 1507.2.7.1(1) for the appropriate maximum basic wind speed. Plastic shingle packaging shall bear a label to indicate compliance with the procedures adapted from ASTM D 3161 and the required classification from Table 1507.2.7.1(2).

PART II – IRC BUILDING/ENERGY

Add new text as follows:

R905.16 Formed plastic shingles. The installation of formed plastic shingles shall comply with the provisions of this section.

R905.16.1 Attachment. Plastic shingles shall be attached as required by the manufacturer.

R905.16.1.1 Wind resistance. Plastic shingles shall be tested in accordance with procedures adapted from ASTM D 3161. Plastic shingles shall meet the classification requirements of Table R905.2.4.1 (2) for the appropriate maximum basic wind speed. Plastic shingle packaging shall bear a label to indicate compliance with the procedures adapted from ASTM D 3161 and the required classification from Table R905.2.4.1 (2).

Reason: The proposal provides guidance for installers and code officials regarding the installation of formed plastic shingles. The appropriate design slope and fastening of the shingles are different for each manufacturer's product. For wind resistance, the procedures used in ASTM D 3161 for asphalt shingles are appropriate to use, when adapted for these types of shingles.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-S2-1507.17

S24–09/10
1508.1

Proponent: Mike Ennis representing Single Ply Roofing Industry (SPRI)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

Revise as follows:

1508.1 General. The use of above-deck thermal insulation shall be permitted provided such insulation is covered with an approved roof covering and <u>either</u> passes the tests of FM 4450 or UL 1256 when tested as an assembly <u>or is separated from the interior of the building by an approved thermal barrier in accordance with Section 2603.4.</u>

Exceptions~~:~~

1. ~~Foam plastic roof insulation shall conform to the material and installation requirements of Chapter 26.~~
2. Where a concrete roof deck is used and the above-deck thermal insulation is covered with an approved roof covering.

Reason: The proposed wording clarifies requirements for the use of above deck insulation by providing testing options (FM4450 or UL1256) and the installation option (thermal barrier) within the text of Section 1508.1. Chapter 26 of the IBC currently recognizes that thermal barriers provide adequate protection for the use of foam plastic insulation (Section 2603.4). Thermal barriers will also provide adequate protection for other insulation types used in this application. Other commonly used types of insulation for this application are fiberglass, cellular fiber, mineral fiber, perlite and wood fiberboard. By making this change options for including above deck insulation are clearly spelled out, an assembly that has passed UL1256 or FM 4450 must be used, or a thermal barrier must be installed.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENNIS-S3-1508.1

S25–09/10
Table 1508.2, Chapter 35

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

Proponent: Tony Crimi, AC Consulting Solutions Inc., representing North American Insulation Manufacturers Association

1. Revise as follows:

TABLE 1508.2
MATERIAL STANDARDS FOR ROOF INSULATION

Cellular glass board	ASTM C 552
Composite boards	ASTM C 1289, Type III, IV, V or VI
Expanded polystyrene	ASTM C 578
Extruded polystyrene board	ASTM C 578
Perlite board	ASTM C 728
Polyisocyanurate board	ASTM C 1289, Type I or Type II
Wood fiberboard	ASTM C 208
<u>Mineral Fiber Insulation board</u>	<u>ASTM C 726</u>

2. Add standard to Chapter 35 as follows:

ASTM International
<u>C 726-05e1 Standard Specification for Mineral Fiber Roof Insulation Board</u>

Reason: To add the current ASTM C 726 specification for the composition and physical properties of mineral fiber insulation board used above structural roof decks as a base for built-up roofing and single ply membrane systems in building construction.
This specification covers the composition and physical properties of mineral fiber insulation board used above structural roof decks as a base for built-up roofing and single ply membrane systems in building construction.

The current table in section 1508.2 does not include reference to the appropriate ASTM Standard specification for the composition and physical properties of mineral fiber insulation board used above structural roof decks as a base for built-up roofing and single ply membrane systems in materials in the Table. This Standard covers testing and conformance to the following physical properties: compressive resistance, tensile strength, breaking load strength, water absorption, response to thermal and humid aging, linear dimensional change, thermal resistance, and dimensions.

Cost Impact: This proposal does not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM C726-05e1, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRIMI-S2-TABLE 1508.2

S26–09/10
1509.1, 1509.2.4

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

Revise as follows:

1509.1 General. The provisions of this section shall govern the construction of rooftop structures and of rooftop mounted enclosures such as mechanical equipment screens.

1509.2.4 Type of construction. Penthouses and other rooftop enclosures shall be constructed with walls, floors and roof as required for the building.

Exceptions:

1. On buildings of Type I construction, the exterior walls and roofs of penthouses with *a fire separation distance* of more than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be of at least 1-hour fire resistance rated noncombustible construction. Walls and roofs with a *fire separation distance* of 20 feet (6096 mm) or greater shall be of noncombustible construction. Interior framing and walls shall be of noncombustible construction.
2. On buildings of Type I construction two stories above *grade plane* or less in height and Type II construction, the exterior walls and roofs of penthouses with a *fire separation distance* of more than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be of at least 1-hour fire-resistance-rated noncombustible *or fire-retardant-treated wood* construction. Walls and roofs with *a fire separation distance* of 20 feet (6096 mm) or greater shall be of noncombustible or *fire-retardant-treated wood* construction. Interior framing and walls shall be of noncombustible or fire retardant- treated wood construction.
3. On buildings of Type III, IV and V construction, the exterior walls of penthouses with a *fire separation distance* of more than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be at least 1-hour fire resistance- rated construction. Walls with a *fire separation distance* of 20 feet (6096 mm) or greater from a common property line shall be of Type IV construction or noncombustible, *or fire-retardant-treated wood* construction. Roofs shall be constructed of materials and fire-resistance rated as required in Table 601 and Section 603 Item 25.3. Interior framing and walls shall be Type IV construction or noncombustible or *fire-retardant-treated wood* construction.
4. On buildings of Type I construction, unprotected noncombustible enclosures including screens housing only mechanical equipment and located with a minimum *fire separation distance* of 20 feet (6096 mm) shall be permitted.
5. On buildings of Type I construction two stories or less above *grade plane* in height, or Type II, III, IV, and V construction, unprotected noncombustible or *fire-retardant-treated wood* enclosures including screens housing only mechanical equipment and located with a *minimum fire separation distance* of 20 feet (6096 mm) shall be permitted.
6. On one-story buildings, combustible unroofed mechanical equipment screens, fences or similar enclosures are permitted where located with a *fire separation distance* of at least 20 feet (6096 mm) from adjacent property lines and where not exceeding 4 feet (1219 mm) in height above the roof surface.
7. Dormers shall be of the same type of construction as the roof on which they are placed, or of the exterior walls of the building.

Reason: The provisions of Section 1509 include more than just "*rooftop structures*" that are defined in Section 1502 as "*an enclosed structure*", such as a penthouse. The section currently contains provisions for unroofed mechanical equipment screens and towers that may be unenclosed. As a result, there have been disagreements between code enforcers and designers regarding the application of fire resistance rules specified within the exceptions to Section 1509.2.4, to *unenclosed* rooftop structures such as mechanical equipment screens. To address this, the scope statement in Section 1509.1 is revised to specifically add rooftop mounted enclosures such as mechanical equipment screens.

Current exceptions 4, 5 and 6 to Section 1509.2.4 address more than just penthouses. According to written interpretations from ICC staff (Paul Wong), these exceptions are intended to address the necessary fire resistance of mechanical equipment screens that are unenclosed rooftop structures. To clarify this intent, the wording in Exceptions 4 and 5 is revised to state "*enclosures including screens*". The wording in exception 6 is not revised because it is clear that it applies to roof screens as currently written. Exception 6 however is limited to screens having a maximum height of 4'-0", and many jurisdictions require taller screens to hide roof mounted HVAC equipment. As a result exceptions 4 and 5 provide rules that can be applied to those taller screens.

Each of these changes in intended to clarify that unenclosed roof screens are specifically included in the provisions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAIEL-S2-1509.1

S27–09/10

1509.2-1509.5.2, 1509.6-1509.7.5 (New)

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing Alcan Composites USA, Inc. and Jesse J. Beitel, Hughes Associates, Inc., representing, Trespa North America, Ltd.

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

1. Revise as follows:

1509.1 General. The provisions of this section shall govern the construction of rooftop structures.

1509.2 Penthouses. ~~A penthouse or~~ Penthouses in compliance with Sections 1509.2.1 through ~~1509.2.4~~ 1509.2.5 shall be considered as a portion of the story directly below the roof deck on which such penthouses are located. All other penthouses shall be considered as an additional story of the building.

1509.2.1 Height above roof deck. ~~A penthouse~~ Penthouses ~~or other projection above the roof in structures~~ constructed on buildings of other than Type I construction ~~shall not exceed 28 feet (8534 mm) above the roof where used as an enclosure for tanks or for elevators that run to the roof and in all other cases~~ shall not exceed ~~extend more than~~ 18 feet (5486 mm) in height above the roof deck as measured to the average height of the roof of the penthouse.

Exceptions:

1. Where used to enclose tanks or elevators that travel to the roof level, penthouses shall be permitted to have a maximum height of 28 feet (8534 mm) above the roof deck.
2. Penthouses located on the roof of buildings of Type I construction shall not be limited in height.

1509.2.2 Area limitation. The aggregate area of penthouses and other enclosed rooftop structures shall not exceed one-third the area of the supporting roof deck. Such penthouses and other enclosed rooftop structures shall not be required to be included in determining ~~contribute to either~~ the building area or number of stories as regulated by Section 503.1. The area of ~~the penthouse~~ such penthouses shall not be included in determining the fire area ~~defined~~ specified in Section 901.7 ~~902~~.

1509.2.3 Use limitations. ~~A penthouse~~ Penthouses~~, bulkhead or any other similar projection above the~~ ~~roof~~ shall not be used for purposes other than the shelter of mechanical or electrical equipment or ~~shelter of~~ vertical shaft openings in the roof assembly.

1509.2.4 Weather protection. Provisions such as louvers, louver blades or flashing shall be made to protect the mechanical and electrical equipment and the building interior from the elements. ~~Penthouses or bulkheads used for purposes other than permitted by this section shall conform to the requirements of this code for an additional story. The restrictions of this section shall not prohibit the placing of wood flagpoles or similar structures on the roof of any building.~~

~~1509.2.4~~ **1509.2.5 Type of construction.** Penthouses shall be constructed with walls, floors and roof as required for the type of construction of the building on which such penthouses are built.

Exceptions:

1. On buildings of Type I construction, the exterior walls and roofs of penthouses with a fire separation distance ~~of more~~ greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a ~~of at least~~ 1-hour fire resistance-rating ~~rated noncombustible construction~~. The exterior walls and roofs of penthouses with a fire separation distance of 20 feet (6096 mm) or greater shall ~~be of noncombustible construction~~ not be required to have a fire-resistance rating. ~~Interior framing and walls shall be of noncombustible construction.~~
2. On buildings of Type I construction two stories or less in height above grade plane or ~~less in height and~~ Type II construction, the exterior walls and roofs of penthouses with a fire separation distance ~~of more~~ greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a ~~of at least~~ 1-hour fire-resistance-rating ~~rated noncombustible or~~ and be constructed of fire-retardant-treated wood ~~construction~~. The exterior walls and roofs of penthouses with a fire separation distance of 20 feet (6096 mm) or greater shall be permitted to be constructed of ~~noncombustible or~~ fire-retardant-treated wood ~~construction~~ and shall not be required to have a fire-resistance rating. Interior framing and walls shall be permitted to be constructed of ~~noncombustible or~~ fire retardant treated wood ~~construction~~.
3. On buildings of Type III, IV or ~~and~~ V construction, the exterior walls of penthouses with a fire separation distance ~~of more~~ greater than 5 feet (1524 mm) and less than 20 feet (6096 mm) shall be permitted to have not less than a ~~at least~~ 1-hour fire-resistance-rating or a lesser fire-resistance rating as required by Table 602 ~~rated construction~~. The exterior walls of penthouses with a fire separation distance of 20 feet (6096 mm) or greater ~~from a common property line~~ shall be of Type IV construction, or shall be constructed of noncombustible~~,~~ or fire-retardant-treated wood, ~~construction~~ and shall not be required to have a fire-resistance rating. ~~Roofs shall be constructed of materials and fire-resistance rated as required in Table 601 and Section 603, Item 25.3. Interior framing and walls shall be Type IV construction or noncombustible or fire-retardant-treated wood construction.~~
4. ~~On buildings of Type I construction, unprotected noncombustible enclosures housing only mechanical equipment and located with a minimum fire separation distance of 20 feet (6096 mm) shall be permitted.~~
4 ~~5~~. On buildings of ~~Type I construction two stories or less above grade plane in height, or~~ Type ~~II,~~ III, or IV ~~and V~~ construction, ~~unprotected~~ penthouses constructed of noncombustible materials or fire-retardant-treated wood, ~~enclosures~~ housing only mechanical equipment, and located with a ~~minimum~~ fire separation distance ~~of~~ not less than 20 feet (6096 mm) shall be permitted and shall not be required to be fire-resistance-rated.
6. ~~On one-story buildings, combustible unroofed mechanical equipment screens, fences or similar enclosures are permitted where located with a fire separation distance of at least 20 feet (6096 mm) from adjacent property lines and where not exceeding 4 feet (1219 mm) in height above the roof surface.~~
7. ~~Dormers shall be of the same type of construction as the roof on which they are placed, or of the exterior walls of the building.~~

1509.3 Tanks. Tanks having a capacity of more than 500 gallons (2 m^3) ~~placed in or~~ located on the roof deck of a building shall be supported on masonry, reinforced concrete, steel or Type IV construction provided that, where such supports are located in the building above the lowest story, the support shall be fire-resistance rated as required for Type IA construction.

1509.3.1 Valve and drain. ~~Such tanks shall have~~ In the bottom or on the side near the bottom of the tank, a pipe or outlet~~,~~ fitted with a suitable quick opening valve for discharging the contents in an emergency into a ~~through an adequate~~ drain shall be provided.

1509.3.2 Location. ~~Such~~ Tanks shall not be placed over or near a ~~line of stairs~~ stairway or an elevator shaft, unless there is a solid roof or floor underneath the tank.

1509.3.3 Tank cover. Unenclosed ~~roof~~ tanks shall have covers sloping toward the ~~outer edges~~ perimeter of the tanks.

1509.4 Cooling towers. Cooling towers located on the roof deck of a building and greater than ~~in excess of~~ 250 square feet (23.2 m^2) in base area or greater than ~~in excess of~~ 15 feet (4572 mm) ~~high~~ in height above the roof deck, as measured to the highest point on the cooling tower, where ~~located on building~~ the roofs ~~more~~ is greater than 50 feet (15 240 mm) ~~high~~ in height above grade plane shall be constructed of noncombustible materials ~~construction~~. The base area of cooling towers shall not exceed one-third the area of the supporting roof deck ~~area~~.

Exception: Drip boards and the enclosing construction shall be permitted to be ~~of~~ wood not less than 1 inch (25 mm) nominal thickness, provided the wood is covered on the exterior of the tower with noncombustible material.

1509.5 Towers, spires, domes and cupolas. ~~Any tower, spire, dome or cupula~~ Towers, spires, domes and cupolas shall be of a type of construction ~~not less in~~ having fire-resistance ~~rating~~ ratings not less than required for the building ~~to~~ on top of which ~~it~~ such tower, spire, dome or cupola is built. ~~attached, except that any such tower, spire, dome or cupula~~ Towers, spires, domes and cupolas greater than ~~that exceeds~~ 85 feet (25 908 mm) in height above grade plane as measured to the highest point on such structures, and either greater than ~~exceeds~~ 200 square feet (18.6 m2) in horizontal area or ~~is~~ used for any purpose other than a belfry or an architectural embellishment, shall be constructed of and supported on Type I or II construction.

1509.5.1 Noncombustible construction required. ~~Any tower, spire, dome or cupula~~ Towers, spires, domes and cupolas ~~that exceeds~~ greater than 60 feet (18 288 mm) in height above the highest point at which ~~it comes in~~ such structure contacts ~~contact with~~ the roof as measured to the highest point on such structure, or that exceeds 200 square feet (18.6 m^2) in area at any horizontal section, or which is intended to be used for any purpose other than a belfry or architectural embellishment, or is located on the top of a building greater than 50 feet (1524 mm) in building height shall be ~~entirely~~ constructed of and supported by noncombustible materials~~. Such structures~~ and shall be separated from the building below by construction having a fire-resistance rating of not less than 1.5 hours with openings protected in accordance with Section 712. ~~with a minimum 1.5-hour fire protection rating. Structures, except aerial supports 12 feet (3658 mm) high or less, flagpoles, water tanks and cooling towers, placed~~ ~~above~~ Such structures located on the top ~~roof~~ of a ~~any~~ building ~~more~~ greater than 50 feet (15 240 mm) in building height~~, shall be of noncombustible material and~~ shall be supported by noncombustible construction ~~of noncombustible material~~.

1509.5.2 Towers and spires. Enclosed towers and spires ~~where enclosed~~ shall have exterior walls constructed as required for the building ~~to~~ on top of which ~~they~~ such towers and spires are built ~~attached~~. The roof covering of spires shall not be ~~of a~~ less than the same class of roof covering ~~as~~ required for the ~~main roof of the rest of the structure~~ building on top of which the spire is located.

2. Add new text as follows:

1509.6 Mechanical equipment screens. Mechanical equipment screens shall be constructed of the materials specified for the exterior walls in accordance with the type of construction of the building without being required to comply with the fire-resistance rating requirements.

1509.6.1 Height limitations. Mechanical equipment screens shall not exceed 18 feet (5486 mm) in height above the roof deck, as measured to the highest point on the mechanical equipment screen, and the highest point on the mechanical equipment screen, as measured to grade plane, shall not exceed the maximum building height allowed for the building by other provisions of this code.

> **Exception:** Where located on buildings of Type IA construction, the height of mechanical equipment screens shall not be limited.

1509.6.2 Types I, II, III, and IV construction. Regardless of the requirements in Section 1509.6, mechanical equipment screens shall be permitted to be constructed of combustible materials where located on the roof decks of building of Type I, II, III, or IV construction in accordance with any of the following limitations:

1. The fire separation distance shall not be less than 20 feet (6096 mm) and the height of the mechanical equipment screen above the roof deck shall not exceed 4 feet (1219 mm) as measured to the highest point on the mechanical equipment screen.
2. The fire separation distance shall not be less than 20 feet (6096 mm) and the mechanical equipment screen shall be constructed of fire-retardant-treated wood complying with Section 2302.2 for exterior installation.
3. The materials shall have a flame spread index of 25 or less when tested in the minimum and maximum thicknesses intended for use with each face tested independently in accordance with ASTM E 84 or UL 723, the facings shall be tested in the minimum and maximum thicknesses intended for use in accordance with, and shall comply with the acceptance criteria of, NFPA 285, and the facings shall be installed as tested but without any substrates or wall assemblies.

1509.6.3 Type V construction. The height of mechanical equipment screens located on the roof decks of buildings of Type V construction, as measured from grade plane to the highest point on the mechanical equipment screen, shall be permitted to exceed the maximum building height allowed for the building by other provisions of this code where complying with any one of the following limitations, provided the fire separation distance is greater than 5 feet (1524 mm):

1. Where the fire separation distance is not less than 20 feet (6096 mm), the height above grade plane of the mechanical equipment screen shall not exceed 4 feet (1219 mm) more than the maximum building height allowed,
2. The mechanical equipment screen shall be constructed of noncombustible materials,
3. The mechanical equipment screen shall be constructed of fire-retardant-treated wood complying with Section 2303.2 for exterior installation, or
4. Where fire separation distance is not less than 20 feet (6096 mm), the mechanical equipment screen shall be constructed of materials having a flame spread index of 25 or less when tested in the minimum and maximum thicknesses intended for use in accordance with ASTM E 84 or UL 723.

1509.7 Other rooftop structures. Rooftop structures not regulated by Sections 1509.2 through 1509.6 shall comply with Section 1509.7.1 through 1509.7.5 as applicable.

1509.7.1 Aerial supports. Aerial supports shall be constructed of noncombustible materials.

Exception: Aerial supports not greater than 12 feet (3658 mm) in height as measured from the roof deck to the highest point on the aerial supports shall be permitted to be constructed of combustible materials.

1509.7.2 Bulkheads. Bulkheads used for the shelter of mechanical or electrical equipment or vertical shaft openings in the roof assembly shall comply with Section 1509.2 as penthouses. Bulkheads used for any other purpose shall be considered as an additional story of the building.

1509.7.3 Dormers. Dormers shall be of the same type of construction as required for the roof in which such dormers are located or the exterior walls of the building.

1509.7.4 Fences. Fences and similar structures shall comply with Section 1509.6 as mechanical equipment screens.

1509.7.5 Flagpoles. Flagpoles and similar structures shall not be required to be constructed of noncombustible materials and shall not be limited in height or number.

3. Revise as follows:

1502.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

MECHANICAL EQUIPMENT SCREEN. A ~~partially enclosed~~ rooftop structure, not covered by a roof, used to aesthetically conceal ~~heating, ventilating and air conditioning (HVAC)~~ plumbing, electrical or mechanical equipment from view.

PENTHOUSE. An enclosed, unoccupied rooftop structure ~~above the roof of a building, other than a tank, tower, spire, dome, cupola or bulkhead.~~ used for sheltering mechanical and electrical equipment, tanks, elevators and related machinery, and vertical shaft openings.

ROOF DECK. The flat or sloped surface constructed on top of the exterior walls of a building or other supports for the purpose of enclosing the story below, or sheltering an area, to protect it from the elements, not including its supporting members or vertical supports.

ROOFTOP STRUCTURE. ~~An enclosed~~ A structure erected on ~~or above~~ top of the roof deck or on top of any part of a building.

Reason: The vast majority of the revisions proposed in this code change are editorial in nature but there are also a few technical changes, some of which are significant. The editorial changes are provided for:

clarification
elimination of redundant language including redundant Exceptions
consistency of terminology and application of requirements to specific types of rooftop structures
reformatting regarding the use of the Exception format
reformatting into subsections that deal with different requirements contained in the same section
determination of the height of rooftop structures

We have also provided phraseology to address how to determine the height of a rooftop structure since that height is not defined, unlike "Building Height" which is defined in Section 502.1. We have also substituted the term "roof deck" for the word "roof" since it is a defined term found in Section 1502.1. We have also proposed to revise the definition for "Roof Deck" to clarify its application and make it more specific.

The specific revisions proposed to each Subsection of Section 1509 are discussed in the following.

1509.2 Penthouses. The revision to the first sentence clarifies that the story below, of which the penthouse would be considered a portion if complying with these provisions, is the story that is located directly below the roof deck on which the penthouse is located. Since there are many stories below the penthouse, although it may be obvious, this clearly indicates that it is the story directly below the roof deck on which the penthouse is located. The second sentence merely makes it clear that any other penthouse not compliant with these provisions would actually be considered as an additional story of the building.

1509.2.1 Height above roof deck. The reference to other projections above the roof has been deleted since the focus of this section is penthouses which are defined in Section 1502.1. In fact, the definition for "Penthouse" is proposed to be revised by this code change to further clarify it based on the intent of the section addressing penthouses. Also, we have added new Sections 1509.6 and 1509.7 which address other projections above the roof. This section has also been reformatted into Exception format to make its application more clear and the wording has been revised to be consistent with other code text used throughout the code. These revisions should not result in any technical changes.

1509.2.2 Area limitation. The word "enclosed" is proposed to be added to modify the term "rooftop structures" to be consistent with the proposed revision to the definition for "rooftop structure" contained in this code change. It is our opinion that a rooftop structure encompasses all of the types of enclosures and other projections that could be located or constructed on the top of a roof deck of a building, so it would include both enclosed and unenclosed structures. So the definition of rooftop structure has been broadened to delete the limitation on enclosed structures. In this way both mechanical equipment screens, for which the definition is also being revised by this code change proposal, and penthouses become subsets of "rooftop enclosures". Mechanical equipment screens are not covered by a roof so they are not enclosed and "penthouses" are truly enclosed structures. The definition for "Mechanical Equipment Screen," as noted, is proposed to be revised to indicate that it is a rooftop structure that is not covered by a roof and is, thus, not enclosed. We believe this is a better definition than relying on the term "partially enclosed" which is proposed to be deleted in the definition for "Mechanical Equipment Screen." In the last sentence rather than referring to the definition for "Fire Area" in Section 902, we believe it is more appropriate to refer to where fire areas are used in Section 901.7 to clarify the intent of this sentence.

1509.2.3 Use limitations. The reference to "bulkhead or any other similar projection above the roof" has been deleted since it is being addressed in a proposed new Section 1509.7.2 as it is out of context in this section on penthouses. This section has also been revised to include electrical equipment as a part of the sheltering function of a penthouse since most mechanical equipment installations will also be associated with electrical equipment. The word "assembly" has been added to the word "roof" since "roof assembly" is a defined term in Section 1502.1.

New Section 1509.2.4 Weather protection. This is a reformatting of the section since this sentence addresses a separate requirement from the use limitations provisions in Section 1509.2.3. Again, "electrical equipment" has also been added for the same reasons as noted above. The second sentence has been deleted since it is redundant as it has already been addressed in Section 1509.2. The last sentence has been deleted since it is out of context as it addresses wood flagpoles or similar structures on the roofs of buildings. It has been relocated to a new Section 1509.7.5.

1509.2.5 Type of construction. The revision to the charging paragraph is basically a clarification for specifying compliance with the type of construction of the building on which the penthouses are built.

Exception 1. These revisions are editorial to be consistent with terminology used throughout the code. The revisions to the second sentence are to implement the intent of these Exceptions which address the fire-resistance ratings not being required. By default, this results in noncombustible construction in a Type I building. The last sentence has been deleted because it is unnecessary as this is a basic requirement for buildings of Type I construction.

Exception 2. Again, these are basically editorial revisions to use terminology consistent with the rest of the code and to be consistent with the revisions to Exception 1 as noted above. The revisions to the last sentence are made for the same reasons as noted in Exception 1 above where noncombustible construction is the requirement for such partitions, but the intent of the section is to allow for the use of fire-retardant-treated wood in lieu of noncombustible construction.

Exception 3. Since this is an Exception, the word "and" has been changed to "or" in the list of the types of construction to which this Exception is applicable. Additional editorial revisions have been made to be consistent with those made to Exceptions 1 and 2 above. The phrase "from a common property line" has been deleted because it is unnecessary since the term "fire separation distance" is a defined term in Section 702.1. The next to the last sentence has been deleted as it is unnecessary based on the charging sentence in Section 1509.2.4 to which this is an Exception. This appears to be a code requirement within an Exception that is not necessary. Similarly, the last sentence has also been deleted since other provisions of the code already allow such construction.

Exception 4. This Exception has been deleted since it is redundant. It is covered by Exception 1 above and is actually more limiting than Exception 1.

Exception 5. The reference to Types I and II construction have been deleted as they are already covered by Exception 2 above, whereas this Exception as noted in Exception 4 above is somewhat more restrictive than Exception 2. The rest of the revisions are editorial by utilizing consistent terminology to that used throughout the rest of the code and to be consistent with the revisions to Exceptions 1 and 2 above.

Exception 6. This Exception is being deleted since it does not address penthouses and is, thus, out of context. The provisions of this Exception, however, have been utilized in the new Sections 1509.6 and 1509.7 being added by this code change which will be discussed later.

Exception 7. This section is also being deleted since it is out of context as it does not address penthouses. It has been editorially revised and relocated as new Section 1509.7.3.

1509.3 Tanks. This entire subsection including sub-subsections .1, .2, and .3 have been editorially revised with no technical changes.

1509.4 Cooling towers. This section has been revised to make it clear that it is only applicable to cooling towers located on the roof deck of a building. It also provides a clarification on how the height of the cooling tower is to be measured for applying the limitations in this section. The rest of the changes are editorial without technical change.

1509.5 Towers, spires, domes, and cupolas. These are editorial revisions to make the section consistent with the previous sections in terms of format and terminology and also to incorporate the method for measuring the height of these structures.

1509.5.1 Noncombustible construction required. The first sentence has been revised to be consistent with Section 1509.5 including how to make the measurements for the height of these structures. The last sentence has been revised and broken up into separate parts with the one part referencing the noncombustible construction limitation incorporated into the first sentence which deals with the construction of these structures, whereas the last sentence deals with the support of these structures under certain conditions. The second sentence has been revised to be included in the first sentence since it is conditional to the application of the first sentence. The reference to the minimum 1.5 hour fire protection rating for protection of openings in the 1.5 hour separation of the structures from the building below has been deleted with a reference to Section 712 provided. Section 712 addresses how to protect openings in horizontal assemblies. Generally speaking, opening protectives with fire protection ratings are not used to protect openings in horizontal assemblies unless those openings are protected with shaft enclosures with openings. However, there are floor fire door assemblies that can be used which have a fire-resistance rating, as opposed to a fire protection rating.

1509.5.2 Towers and spires. These are basically editorial clarifications without any technical change.

1509.6 Mechanical equipment screens. This is a new section being proposed to specifically address mechanical equipment screens which are defined in Section 1502.1. They are not otherwise addressed in Section 1509 with the exception of the out of context Exception 6 to Section 1509.2.4 which only addresses the type of construction of penthouses as previously noted. Also, as previously noted, we are proposing to revise the definition for "Mechanical Equipment Screen" in Section 1502.1 to make it clear that it is a rooftop structure that is not covered by a roof, rather than a "partially enclosed" rooftop structure.

This new section takes what we believe to be a conservative approach to the construction of mechanical equipment screens on roofs by specifying that they must be constructed of the same materials as required by the code for exterior walls based on the type of construction of the building on which they are located. However, it is proposed that they be exempt from the fire-resistance rating requirements since they do not fully enclose a space as they are without a roof and they represent a different exposure hazard than a penthouse, for example. Basically, the exposure hazard of a mechanical equipment screen is the combustibility of the screen itself and the amount of combustible materials it contains.

1509.6.1 Height limitations. The height limits specified in this section are also conservative, in our opinion, as they are based on those required for penthouses in Section 1509.2.1. The height limit is also based on the assumption that the overall height of the mechanical equipment screen should not exceed that allowed for the maximum building height for the type of construction of the building on which it is constructed. Thus, the need for the Exception for mechanical equipment screens located on buildings of Type IA construction which are not limited in height by Table 503.

1509.6.2 Types I, II, III, and IV construction. This new section is, in essence, an Exception to the requirements in Section 1509.6 for these types of construction which require the exterior walls to be constructed of noncombustible materials. The three itemized limitations in this section allow for combustible materials to be used for the construction of mechanical equipment screens based upon the provisions in those three items as discussed in the following.

Item 1. This item is based on Exception 6 to Section 1509.2.4 as previously noted for penthouses which has been deleted. The 1-story building height limitation has not been included since we believe it is not necessary. In our opinion, the hazard of a combustible mechanical equipment screen located on the roof of a Type I, II, III, or IV building with a fire separation distance of not less than 20 feet and with the height of the mechanical equipment screen limited to 4 feet above the roof deck is not a significant fire hazard. It is interesting to note that Table 705.8 Maximum Area of Exterior Wall Openings Based on Fire Separation Distance and Degree of Opening Protection would allow up to 45% of the exterior wall area of a nonsprinklered building to have unprotected openings and would allow unlimited unprotected openings in sprinklered buildings. Thus, for a building having floor-to-floor heights of at least 10 feet, which is very minimal, unprotected window openings around the entire perimeter could be as tall as 4.5 feet. This would represent a greater fire exposure, once the story flashes over and the windows break out, than a burning 4 foot high mechanical equipment screen which will normally be set back some distance from the face of the exterior wall.

Item 2. The provisions of this Item are based on Exceptions 2 and 3 to Section 1509.2.4 for penthouses with the 2-story limit on Type I buildings omitted. We believe this to be a reasonable approach since the hazard doesn't justify limiting the Type I buildings to two stories in height where fire-retardant-treated wood is used to construct these unenclosed mechanical equipment screens. The main difference between Item 1 above and this Item 2 is that Item 2 does not place a 4 foot height limit on the height of the mechanical equipment screen above the roof deck. That is because it must be constructed of fire-retardant-treated wood as compared to any combustible material allowed by the code being permitted in Item 1. Of course, the height of the mechanical equipment screen is still limited to a maximum of 18 feet above the roof based on Section 1509.6.1. It is also limited to the maximum building height that would be allowed by the type of construction of the building in accordance with Section 1509.6.1 as well.

Item 3. These limitations are based on a totally new concept where the combustible materials used to build the mechanical equipment screen are limited to a maximum flame spread index of 25 (which is also required for fire-retardant-treated wood) and the materials are required to be successfully tested in accordance with NFPA 285 Standard Method of Test for the Evaluation of Flammability Characteristics of Exterior Nonload-Bearing Wall Assemblies Containing Combustible Components. This is the same test method that is used to validate the use of foam-plastic insulations in exterior walls of Types I, II, III, and IV construction, as well as for the use of metal composite materials (MCM) in accordance with Section 1407.10. Although the material would be tested as the outer face (or skin) of the exterior wall in the NFPA 285 test as part of an exterior wall assembly, the test clearly assesses the surface flame spread resistance of the materials constituting the outer face, as well as to a certain degree, the inner face where it is exposed to any open cavities in the wall assembly. The NFPA 285 test is conducted for a full 30 minutes under severe fire exposure conditions to both the inside of the wall assembly and the outside of the wall assembly with an exterior window burner replicating a fire that has gone to post-flashover and has broken out a window, exposing the outside face of the exterior wall finish. Since the materials used to construct the mechanical equipment screen do not comprise a completely enclosed wall assembly, the maximum flame spread index of 25 has been proposed as a conservative limitation for the backside face of the material which may not have been directly exposed to the exterior window burner flame in the NFPA 285 test. Since the NFPA 285 test is used to qualify combustible materials for use where noncombustible exterior walls are required, it seems reasonable to allow its use for this application for mechanical equipment screens without the need to have the entire wall assembly constructed as tested for the mechanical equipment screen, instead utilizing the materials tested on the exterior face of the wall system in accordance with NFPA 285.

1509.6.3 Type V construction. This new section is basically an Exception to the requirements in Section 1509.6.1 Height Limitations for Type V construction where the mechanical equipment screens are allowed to be constructed of combustible materials. The one condition that must be met for all four options in this section is that the minimum fire separation distance must be greater than 5 feet which is consistent with Section 1406 Combustible Materials on the Exterior Side of Exterior Walls.

Item 1. This item is based on Exception 6 to Section 1509.2.4 for penthouses which has been deleted. It was limited to one story buildings. However, we don't see the hazard represented by a 4 foot high increase in the overall height of the mechanical equipment screen on buildings of Type V construction (which are allowed to be constructed entirely of combustible materials) as justifying that one story limitation. This is especially true where the fire separation distance specified is not less than 20 feet. Please refer to the discussion on Item 1 of Section 1509.6.2 above.

Item 2. This seems intuitively obvious to allow these mechanical equipment screens to be taller when they are constructed of noncombustible materials where combustible materials would otherwise be permitted. Noncombustible materials pose no additional fire load or fire exposure to the building.

Item 3. This allows the use of fire-retardant-treated wood which, although combustible, does not pose a significant fire hazard, in our opinion, when constructed as a mechanical equipment screen where there is a minimum 5 foot fire separation distance.

Item 4. This is somewhat similar to Item 3 in that fire-retardant-treated wood is required to have a maximum flame spread index of 25 as proposed for the combustible materials allowed in this item. However, there is an additional requirement that the fire separation distance be not less than 20 feet as compared to the base requirement of 5 feet for these provisions to be allowed to be used. We believe that the fire hazard associated with this type of installation would not be significant so as to allow the greater heights for the mechanical equipment screens installed on these Type V buildings. Again, please refer to the discussion on Item 1 of Section 1509.6.2 above regarding the minimum 20 foot fire separation distance limitation.

1509.7 Other rooftop structures. This new section becomes a catchall section to address other rooftop structures that are not specifically regulated by Sections 1509.2 through 1509.6. In reviewing Section 1509 we found references to such other rooftop structures as aerial supports covered in proposed new Section 1509.7.1, bulkheads covered in proposed new Section 1509.7.2, dormers covered in proposed new Section 1509.7.3, fences covered in proposed new Section 1509.7.4, and flagpoles covered in proposed new Section 1509.7.5. So we believe we have addressed all of the rooftop structures the code currently addresses.

1509.7.1 Aerial supports. The requirements for this section are taken from Section 1509.5.1 which were deleted because they were out of context in regard to the provisions of the section which addressed towers, spires, domes, and cupolas.

1509.7.2 Bulkheads. It is proposed to treat bulkheads like penthouses as we believe was intended by Section 1509.2.3 where bulkheads are currently referred to. We eliminated bulkheads from that section since it specifically addresses penthouses. In this way we keep the section clean and then simply reference it and require bulkheads to be constructed to meet those requirements as if they were penthouses. Looking at the definition for "Bulkhead" in Webster's dictionary, the most likely meaning within the context of Section 1509 is "a projecting framework with a sloping door giving access to a cellar stairway or a shaft."

1509.7.3 Dormers. This is where Exception 7 of Section 1509.2.4 was relocated after it was deleted from that section addressing penthouses since it was clearly out of context.

1509.7.4 Fences. It is our best judgment that fences should be treated as mechanical equipment screens since they are similar structures and can be considered similar in fire hazard. It should be noted that they are mentioned in Exception 6 to Section 1509.2.4 for penthouses which was deleted, again, as being out of context.

1509.7.5 Flagpoles. These requirements are taken from the last sentence of Section 1509.2.3 for penthouses which was deleted as being out of context.

In summary, it is readily obvious after delving into Section 1509 that it is very disjointed and inconsistent and utilizes terminology and language that is not consistent with the rest of the code. It appears to be, as it most likely is, an amalgam of the three legacy code requirements for rooftop structures which was put together without a lot of detailed evaluation or review. Since Trespa North America, Ltd. manufactures products that are used in many of these applications, we have come across many projects where Section 1509 has been attempted to be applied but without much success. It is extremely difficult to determine what the true intent is of many of the requirements, especially those that do not specifically address penthouses. We have tried our best to clarify and reformat this section to make it clearer to understand, easier to read and interpret, and, hopefully, more effectively enforced and applied. We hope that the Committee will give this comprehensive revision to Section 1509 serious and in-depth consideration so that we can fix it for the 2012 IBC, remembering that we only have one chance to get it corrected before the next edition is published.

Cost Impact: The proponent shall indicate one of the following regarding the cost impact of the code change proposal: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Thornberry-S1-1509

S28–09/10
1509.6 (New)

Proponent: Mark S. Graham, National Roofing Contractors Association (NRCA)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC GENERAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

Add new text as follows:

1509.6 Photovoltaic systems. Rooftop mounted photovoltaic systems shall be designed in accordance with this section.

1509.6.1 Wind resistance. Rooftop mounted photovoltaic systems shall be designed for wind loads in accordance with Chapter 16.

1509.6.2 Fire classification. Rooftop mounted photovoltaic systems shall be shall have the same fire classification as the roof assembly as defined Section 1505.

1509.6.3 Installation. Rooftop mounted photovoltaic systems shall be installed in accordance with the manufacturer's installation instructions.

Reason: Rooftop-mounted photovoltaic systems are becoming more common. This proposed code change proposal is intended clarify that rooftop-mounted photovoltaic systems need to comply with building code requirements. The minimum requirements set forth here are intended for the rooftop-mounted photovoltaic system to be required to comply with the same minimum requirements of the underlying roof assembly.

Specific requirements applicable to the electrical portion of rooftop-mounted photovoltaic systems are left to the applicable electrical code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRAHAM-S8-1509.6 NEW

S29–09/10
1510.3

Proponent: Mike Ennis representing Single Ply Roofing Industry (SPRI, Inc.)

Revise as follows:

1510.3 Recovering versus replacement. New roof coverings shall not be installed without first removing all existing layers of roof coverings down to the roof deck where any of the following conditions occur:

1. Where the existing roof or roof covering is water soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.

Exceptions:

1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
2. Metal panel, metal shingle and concrete and clay tile roof coverings shall be permitted to be installed over existing wood shake roofs when applied in accordance with Section 1510.4.
3. The application of a new protective coating over an existing spray polyurethane foam roofing system shall be permitted without tear-off of existing roof coverings.
4. The application of a new single-ply membrane directly over an existing roofing system shall be permitted without tear-off of the existing roof coverings except where the existing roof or roof covering is water soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing..

Reason: A layer of single-ply membrane is very lightweight, adding approximately 1/3 of a pound per square foot to the existing structure. The single-ply membrane can be used as a reflective layer to reduce rooftop temperatures, thus providing a cooling benefit for the building. The cooling benefits of reflective roof systems are recognized by the energy codes. This exception will allow for a cost effective method for increasing the energy efficiency of the building while providing excellent waterproofing protection. A single layer of membrane will also provide the same function and benefit as a new protective coating over an existing spray polyurethane foam roofing system, which is currently allowed as an exception under Section 1510.3, Exception 3.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENNIS-S2-1510.3

S30–09/10
1510.3; IRC R907.3

Proponent: Mark S. Graham, representing National Roofing Contractors Association (NRCA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

1510.3 Recovering versus replacement. New roof coverings shall not be installed without first removing all existing layers of roof coverings down to the roof deck where any of the following conditions occur:

1. Where the existing roof or roof covering is water soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.

Exceptions:

1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
2. Metal panel, metal shingle and concrete and clay tile roof coverings shall be permitted to be installed over existing wood shake roofs when applied in accordance with Section 1510.4.
3. The application of a new protective coating over an existing spray polyurethane foam roofing system shall be permitted without tear-off of existing roof coverings.

4. Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section 1507.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R907.3 Recovering versus replacement. New roof coverings shall not be installed without first removing all existing layers of roof coverings where any of the following conditions exist:

1. Where the existing roof or roof covering is water-soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.
4. For asphalt shingles, when the building is located in an area subject to moderate or severe hail exposure according to Figure R903.5.

Exceptions:

1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
2. Installation of metal panel, metal shingle and concrete and clay tile roof coverings over existing wood shake roofs shall be permitted when the application is in accordance with Section R907.4.
3. The application of new protective coating over existing spray polyurethane foam roofing systems shall be permitted without tear-off of existing roof coverings.
4. Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section R905.

Reason: In roof removal situations where an existing ice barrier membrane is adhered to the existing roof deck, it is oftentimes difficult, if not impossible, to remove the existing layer of adhered ice barrier membrane without damaging or replacing the roof deck.

The proposed addition of a new exception to Section 1510.3 (IRC Section R907.3)—Recovering Versus Replacement is intended to account for this situation by allowing existing adhered ice barrier membrane to remain in place and be covered with a new ice barrier membrane as required in Section 1507 (IRC Section R905), followed by the installation of the new primary roof covering material.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRAHAM-S9-1510.3

S31–09/10
1602.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1602.1 Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

VEHICLE BARRIER SYSTEM. A system of building components near open sides or walls of ~~a~~ garage floors or ramps ~~or building walls~~ that acts as a restraints ~~for~~ for vehicles.

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. The need for correlation is due to ASCE 7 Proposal LLSC-LL9, which was approved by the Live Load Subcommittee and is being balloted by the Main Committee (Item #5 of the Second Main Committee Ballot on Live/Dead Load Provisions). It is expected that the Main Committee will approve the proposal.

The revision to the definition of "vehicle barrier system" will more clearly convey the intent that the entire perimeter of a garage floor or ramp, not merely where there are open sides, is subject o the loading requirements for vehicle barrier systems. It will also avoid the interpretation that building walls, regardless of their proximity to garage floors or ramps, are subject to the same loading requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S20-1602.1

S32–09/10
1602.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1602.1 Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

LIVE LOAD~~S~~. ~~Those loads~~ A load produced by the use and occupancy of the building or other structure ~~and do~~ that does not include construction or environmental loads such as wind load, snow load, rain load, earthquake load, flood load or dead load.

LIVE LOAD~~S~~, ~~(ROOF)~~. ~~Those loads~~ A load on a roof produced (1) during maintenance by workers, equipment and materials; and ~~(2)~~ during the life of the structure by movable objects such as planters ~~and by people~~ or other similar small decorative appurtances that are not occupancy related; or (2) by the use and occupancy of the roof such as for roof gardens or assembly areas.

NOTATIONS.

D = Dead load.
E = Combined effect of horizontal and vertical earthquake induced forces as defined in Section 12.4.2 of ASCE 7.
F = Load due to fluids with well-defined pressures and maximum heights.
F_a = Flood load in accordance with Chapter 5 of ASCE 7.
H = Load due to lateral earth pressures, ground water pressure or pressure of bulk materials.
L = Roof live load greater than 20 psf (0.96 kN/m^2) and floor live load~~, except roof live load, including any permitted live load reduction~~.
L_r = Roof live load ~~including any permitted live load reduction~~ of 20 psf (0.96 kN/m^2) or less.
R = Rain load.
S = Snow load.
T = Self-straining force arising from contraction or expansion resulting from temperature change, shrinkage, moisture change, creep in component materials, movement due to differential settlement or combinations thereof.
W = Load due to wind pressure.

Reason: The purpose for this proposal is to revise the IBC for consistency with an ASCE 7 proposal being considered by the Live Load Subcommittee. The IBC currently treats floor and roof live loads synonymously. Table 1607.1 lists live loads as great as 100 psf for occupied areas of floors and roofs. Roof live load, however, also accounts for loads from maintenance workers. Item #30 of Table 1607.1 separately specifies a uniform load of 20 psf and a concentrated load of 300 lb. for this purpose.

The load combinations in Sections 1605.2 and 1605.3 should account for roof live loads at occupied areas in the same manner as for floor live loads. For strength design in Sec. 1605.2 (neglecting snow load and rain load), Equations 16-3 and 16-4 consider dead load, floor live load, roof live load and wind load. Earthquake load is not considered in combination with roof live load. For allowable stress design in Section 1605.3.1, however (neglecting earth/water pressure, fluid load, snow load and rain load), Equation 16-13 considers dead load, floor live load, roof live load, and wind or earthquake load. Thus, earthquake load is required to be considered in combination with roof live load for allowable stress design but not for strength design.

The proposal changes the notation for floor live load and roof live load by (1) assigning "L" to roof live load greater than 20 psf as well as to floor live load, and (2) assigning "L_r" to roof live load of 20 psf or less. This new boundary between "L" and "L_r" will distinguish between roof live loads intended for the general public ("L") and only for maintenance workers ("L_r").

A separate proposal splits ASD Equation 16-13 into two equations: 16-13 for wind load and 16-14 for earthquake load. This change in the ASD load combinations will make them equivalent to the LRFD load combinations with respect to their treatment of roof live load.

The proposal revises the definitions of "live load" and "live load, roof" for consistency with the corresponding definitions in ASCE 7 as modified by the proposal being considered by the ASCE 7 Live Load Subcommittee. Note that neither the IBC nor ASCE 7 define "floor live load" or utilize the term in their respective provisions. "Live load" in both documents is defined as a load "produced by the use and occupancy of the building or other structure," which can occur on roofs as readily as on floors.

The proposal deletes "including any permitted live load reduction" from the notation "L" and "L_r" in Section 1602.1 for consistency with the same notation in Section 2.2 of ASCE 7, which corresponds to IBC Section 1602.1. This has the added benefit of avoiding potential conflicts with the same notation defined differently in IBC Sections 1607.9.1 ("L") and 1607.11.2.1 ("L_r"), which is reproduced below. These sections define the notation as reduced live load and distinguish them from unreduced live load, L_o, which is tabulated in Table 1607.1. Similar definitions are found in Sections 4.7.1 and 4.8.1 of ASCE 7-10. Note that the addition of "roof" before "live load" in L_r below is in a separate proposal.

IBC Section 1607.9.1 (and Section 4.7.1 of ASCE 7-10):

L = Reduced design live load per square foot (meter) of area supported by the member.

L_o = Unreduced design live load per square foot (meter) of area supported by the member (see Table 1607.1).

IBC Section 1607.11.2.1 (and Section 4.8.1 of ASCE 7-10):

L_r = Reduced roof live load per square foot (m^2) of horizontal projection in pounds per square foot (kN/m^2).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S34-1602.1

S33–09/10

1603.1.3, 1603.1.4, 1603.1.5, 1705.3.4, 2304.6.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1603.1.3 Roof snow load <u>data</u>. The ground snow load, P_g, shall be indicated. In areas where the ground snow load, P_g, exceeds 10 pounds per square foot (psf) (0.479 kN/m^2), the following additional information shall also be provided, regardless of whether snow loads govern the design of the roof:

1. Flat-roof snow load, P_f.
2. Snow exposure factor, C_e.
3. Snow load importance factor, I_s.
4. Thermal factor, C_t.

1603.1.4 Wind design data. The following information related to wind loads shall be shown, regardless of whether wind loads govern the design of the lateral-force-resisting system of the building:

1. Basic wind speed (3-second gust), miles per hour (km/hr).
2. ~~Wind importance factor, *I*, and~~ Occupancy category.
3. Wind exposure; ~~if more than one wind exposure is utilized, the wind exposure and~~ applicable wind direction ~~shall be indicated~~ if more than one wind exposure is utilized.
4. ~~The~~ Applicable internal pressure coefficient.
5. ~~Components and cladding. The~~ Design wind pressures ~~in terms of psf (kN/m^2)~~ to be used for ~~the design of~~ exterior component and cladding materials not specifically designed by the registered design professional responsible for the design of the structure, psf (kN/m^2).

1603.1.5 Earthquake design data. The following information related to seismic loads shall be shown, regardless of whether seismic loads govern the design of the lateral-force-resisting system of the building:

1. ~~Seismic importance factor, *I*, and~~ Occupancy category.
2. Seismic importance factor, I_e.
3. ~~2~~ Mapped spectral response accelerations, S_S and S_1.
4. ~~3~~ Site class.
5. ~~4~~ Spectral response coefficients, S_{DS} and S_{D1}.
6. ~~5~~ Seismic design category.
7. ~~6~~ Basic seismic-force-resisting system(s).
8. ~~7~~ Design base shear(s).

~~8~~9. Seismic response coefficient(s), C_S.
~~9~~10. Response modification factor(s), *R*.
11. Location of base(s) as defined in Section 11.2 of ASCE 7.
~~10~~12. Analysis procedure used.

1705.3.4 Seismic Design Category D. The following additional systems and components in structures assigned to Seismic Design Category D:

1. Systems required for Seismic Design Category C.
2. Exterior wall panels and their anchorage.
3. Suspended ceiling systems and their anchorage.
4. Access floors and their anchorage.
5. Steel storage racks and their anchorage, where the importance factor, I_e, is equal to 1.5 in accordance with Section 15.5.3 of ASCE 7.

2304.6.1 Wood structural panel sheathing. Where wood structural panel sheathing is used as the exposed finish on the exterior of outside walls, it shall have an exterior exposure durability classification. Where wood structural panel sheathing is used elsewhere, but not as the exposed finish, it shall be of a type manufactured with exterior glue (Exposure 1 or Exterior). Wood structural panel wall sheathing or siding used as structural sheathing shall be capable of resisting wind pressures in accordance with Section 1609. Maximum wind speeds for wood structural panel sheathing used to resist wind pressures shall be in accordance with Table 2304.6.1 for enclosed buildings with a mean roof height not greater than 30 feet (9144 mm)~~, importance factor (I) of 1.0~~ and topographic factor (K_{zt}) of 1.0.

Reason: The purpose for the proposal is to update the required documentation of snow, wind and seismic design data with respect to the corresponding provisions in ASCE 7. The deletion of wind importance factor is due to ASCE 7 Proposal WSC-WL8-14, which has been approved by the Wind Subcommittee is being balloted by the Main Committee (Item #20 of the First Main Committee Ballot on Wind Load Provisions). It is expected that the Main Committee will approve the proposal. Adding the locations of the seismic base will add a design parameter that is critical to understanding the basis of the structural design. The remaining changes are editorial.

Changes are also being made to the symbols for importance factor in conjunction with ASCE 7 Proposal GPSC-3BR2, which was approved by the General Subcommittee on March 1, 2009 and is being balloted by the Main Committee (Item #14 of the Second Main Committee Ballot on General Requirements). It is expected that the Main Committee will approve the proposal. All instances of "importance factor" in the 2009 IBC are included in this proposal.

A separate proposal revises all instances of "occupancy category" in the IBC and IEBC to "risk category." These revisions are not repeated in this proposal but, should both proposals be approved by the membership, the proponent intends that "occupancy category" in Item #2 of Section 1603.1.4 and Item #1 of Section 1603.1.5 be changed to "risk category."

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S39-1603.1.3

S34–09/10
1603.1.5

Proponent: Kevin Moore, PE, SE, SECB and Edwin Huston, PE, SE, SECB, representing National Council of Structural Engineers Associations

Revise as follows:

1603.1.5 Earthquake design data. The following information related to seismic design loads shall be shown, regardless of whether seismic loads govern the design of the lateral-force-resisting system of the building:

1. Seismic importance factor, *I*, and *occupancy category.*
2. Mapped spectral response accelerations, S_S and S_1.
3. *Site class.*
4. Spectral response coefficients, S_{DS} and S_{D1}.
5. *Seismic design category.*
6. Basic seismic-force-resisting system(s).
7. Design base shear.
8. Seismic response coefficient(s), C_S.
9. Response modification factor(s), *R*.
10. Analysis procedure used.

11. Applicable horizontal structural irregularities.
12. Applicable vertical structural irregularities.

Reason: Structural irregularities (defined in ASCE-7 section 12.3) can result in restrictions on building height, prohibition of certain configurations, increased design forces, additional analytical requirements, restriction of permissible analytical procedures, greater building separations, or additional detailing requirements for certain structural elements. It is often not evident whether one or more irregularities are applicable to a structure, because many of them require structural analysis to determine their applicability. This information is useful for building officials, plan checkers, peer reviewers, and for structural engineers in future building additions and/or alterations.

Cost Impact: This proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: MOORE-HUSTON-S2-1603.1.5

S35–09/10
Table 1604.3

Proponent: Stephen Kerr, PE, SE, representing self

Revise as follows:

TABLE 1604.3
DEFLECTION LIMITS [a, b, c, h, i]

Construction	L	S or W [f]	D + L [d, g]
Roof members: [e]			
Supporting plaster or stucco ceiling	*l* / 360	*l* / 360	*l* / 240
Supporting nonplaster ceiling	*l* / 240	*l* / 240	*l* / 180
Not supporting ceiling	*l* / 180	*l* / 180	*l* / 120
Floor members	*l* / 360		*l* / 240
Exterior walls and interior partitions:			
With plaster or stucco finishes	-	*l* / 360	-
With other brittle finishes	-	*l* / 240	-
With flexible finishes	-	*l* / 120	-
Farm Buildings	-	-	*l* / 180
Greenhouses	-	-	*l* / 120

(Footnotes not shown, remain unchanged)

Reason: The proposal adds a new line item for the deflection limit on plaster or stucco finishes. The intent is to bring the Deflection Limits table into conformance with the IRC deflection table (Table R301.7) and the referenced ASTM standard. ASTM C926-98a Standard Specification for Application of Portland Cement-Based Plaster section Annex A2.1.6 states "Maximum allowable deflection for vertical or horizontal framing for plaster, not including cladding, shall be L/360."

Cost Impact: The code change proposal will not increase the cost of construction, because the defection limit is already required.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: KERR-S1-TABLE 1604.3

S36–09/10
Table 1604.3

Proponent: Robert McCluer, RMC Code Consulting, representing the Metal Construction Association (MCA)

Revise as follows:

TABLE 1604.3
DEFLECTION LIMITS a, b, c, h, i, j
(No change to table entries.)

(No change to footnotes a through h)

i. Metal composite material panels shall be designed to have not more than *l*/180 permanent set deflection after the application of the design load.

~~i.~~ j. For cantilever members, *l* shall be taken as twice the length of the cantilever.

Reason: The purpose of this proposed code change is to provide a deflection limitation for metal composite material (MCM) panels.
Objectives of Deflection Limitation:
1. To assure structural integrity so that the panel system will remain on the building during design wind load conditions.
2. To assure that sealant joints do not fail due to movement of panels during design wind load conditions.
3. To assure that "permanent set" of panels is not visually objectionable after occurrence of design wind load conditions.

Rationale for L/180 Permanent Set Limitation:
1. The structural adequacy of the panel system to meet the design load and remain on the building will be verified by structural testing. Therefore, deflection limitation will not be a controlling factor in safety considerations (staying on the building).
2. The adequacy of the sealant joints will be verified by the appropriate Static Air Infiltration (ASTM E283) and Static Water Infiltration (ASTM E331) tests. Therefore, deflection limitation will not be a controlling factor in the ability of the panels to provide appropriate protection for wind and water penetration of the building.
3. Generally, the widest available Metal Composite Material panel is 60". Therefore, if L/180 permanent set limitation is maintained the largest deviation from absolute flatness will be 1/3 inch. On a 60" wide panel this is a very acceptable visual deviation after a very severe climatic wind condition. During more normal wind events, permanent set would not occur. The ability of the panel system to accommodate expansion and contraction due to thermal changes is a much more critical visual concern.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCCLUER-S1-T1604.3

S37–09/10
1604.3.6

Proponent: Stephen Kerr, PE, SE, representing self

Delete and substitute as follows:

~~**1604.3.6 Limits.** Deflection of structural members over span, *l*, shall not exceed that permitted by Table 1604.3.~~

1604.3.6 Limits. The deflection limits of Section 1604.3.1 shall be used unless more restrictive deflection limits are required in order to ensure adequate serviceability of the structural members and finish material.

Reason: The intent of this proposal is to address possible increased deflection requirements that may be necessary for certain finishes not specifically addressed in Table 1604.3. Where the manufacturer or association of a specific finish material has deflection requirements more restrictive than Table 1604.3 the designer should take into account possibly changing the deflection limit. While this proposal does not require the designer to adhere to industry standards not specifically referenced in IBC Chapter 35, it is intended to put the designer on notice of possible other criteria for determining deflection limits.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KERR-S2-1604.3.6

S38–09/10
1604.4

Proponent: Randy Lee Dube, Proprietor, representing Tor-Eggs-Tor Design Solutions

Revise as follows:

1604.4 Analysis. *Load effects* on structural members and their connections shall be determined by methods of structural analysis that take into account equilibrium, general stability, geometric compatibility and both short- and long-term material properties.

Members that tend to accumulate residual deformations under repeated service loads shall have included in their analysis the added eccentricities expected to occur during their service life.

Any system or method of construction to be used shall be based on a rational analysis in accordance with well-established principles of mechanics. Such analysis shall result in a system or combined systems that provides a complete load path or combination of load paths capable of transferring loads from their point or multiple points of origin to the load-resisting elements or load-resisting and load-redistributing elements.

The total lateral force shall be distributed to the various vertical elements of the lateral-force-resisting system in proportion to their rigidities, considering the rigidity of the horizontal bracing system or diaphragm. Rigid elements assumed not to be a part of the lateral-force-resisting system are permitted to be incorporated into buildings provided their effect on the action of the system is considered and provided for in the design. Except where diaphragms are flexible, or are permitted to be analyzed as flexible, provisions shall be made for the increased forces induced on resisting elements of the structural system resulting from torsion due to eccentricity between the center of application of the lateral forces and the center of rigidity of the lateral-force-resisting system.

Every structure shall be designed to resist the overturning effects caused by the lateral forces specified in this chapter. See Section 1609 for wind loads, Section 1610 for lateral soil loads and Section 1613 for earthquake loads.

Reason: ICC recognition, authority, enforcement of recently successfully developed (2005-2007) structural body-frame continuous reinforcing method and related structural design, assembly, and performance elements; and design & assembly criteria. (New reinforcing & structural body-frame systems currently not authorized to construction industry by IBC section 1604.4, Par 3 , Sentence 2.)

Cost Impact: Reduces new building/structure reinforcing methods costs; various cost impacts in other applications.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DUBE-S1-1604.4

S39–09/10
Table 1604.5

Proponent: David R. Badger PE, CBO, Virginia Tech, representing self.

Revise as follows:

TABLE 1604.5
OCCUPANCY CATEGORY OF BUILDINGS AND OTHER STRUCTURES

OCCUPANCY CATEGORY	NATURE OF OCCUPANCY
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: • Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. • Buildings and other structures containing elementary school, secondary school or day care facilities with an occupant load greater than 250. ~~• Buildings and other structures containing adult education facilities, such as colleges and universities, with an occupant load greater than 500.~~ • Buildings and other structures used for the education of adults who are either above the 12th grade or not in a formal educational system; where the teaching is done in classroom settings with an occupant load density equal to or greater than that required for educational classroom areas per Table 1004.1.1; and the aggregate occupant load of all classrooms exceeds 500. • Group I-2 occupancies with an occupant load of 50 or more resident patients but not having surgery or emergency treatment facilities. • Group I-3 occupancies. • Any other occupancy with an occupant load greater than 5,000[a]. • Power-generating stations, water treatment facilities for potable water, waste water treatment facilities and other public utility facilities not included in Occupancy Category IV. • Buildings and other structures not included in Occupancy Category IV containing sufficient quantities of toxic or ex-plosive substances to be dangerous to the public if released.

(Portions of table not shown do not change)
(No change to footnote)

Reason: The general language of 1604.5 is ambiguous and misleading. This problem is well recognized, and there have been several proposals to rewrite major portions of this in recent code change cycles. Although a general overhaul of this section is needed, there is a specific problem that needs to be addressed immediately. There is one phrase in Table 1604.5 that is routinely being misinterpreted, resulting in hidden costs which are extremely high, and completely unnecessary. It is a problem primarily for colleges and universities, has been a problem for many years, and must be corrected.

Under 1604.5 the phrase "*Buildings and other structures containing adult education facilities, such as colleges and universities*" is very easily interpreted to require any building on a college or university campus with an occupant load over 500 to be classified as Occupancy Category III, regardless of use. The phrase is so poorly written, it is difficult to not read it this way. The perceived connection to "adult education facilities"

occurs simply because the building is located on a college or university campus; not because there is an educational function occurring within the building.

For example, a research laboratory building with 600 occupants located in an industrial research park clearly would be classified under Occupancy Category II. If the exact same building was placed on a university campus, the Occupancy Category should not change. But in fact, many design professionals and code officials would classify the building as Category III since it now sits on campus. A check of several local structural engineering firms confirmed that every one of them interprets 1604.5 as requiring an Occupancy Category III for any building on campus with an occupant load greater than 500. This is very likely occurring on a national level as well. But this is not the intent of 1604.5.

Occupancy Category III addresses the extra risk associated with the presence of a large number of occupants concentrated in small areas, such as classrooms or lecture halls. There is nothing special about the act of teaching that warrants a Category III classification. The only reason it is referenced in 1604.5 is that teaching is usually done in groups, and it is the people in those groups to be protected. University laboratory and office buildings, with no classrooms, should not be subject to the 500 occupant threshold. The occupant load threshold for a Category III classification for a lab building is 5,000 occupants, not 500. Classification is a function of the building occupancy and not the property upon which the building sits. The proposed new language clarifies the intent of the current regulation in three ways.

It emphasizes that it is the specific use of the building to be evaluated. Reference is made to both higher education, and a catch-all for any other adult educational building, to ensure that a broad scope of coverage is established.

Since the IBC does not define a "classroom," the proposed change uses the basis for occupant load calculations as a handle to indentify spaces to be included in the analysis. Classrooms are calculated at 20 SF per person and this sets the benchmark for "high" occupant densities. Educational spaces with "low" densities such as teaching labs and vocational areas, at 50 SF per person, would not be included in the analysis. There are non-educational uses identified in Table 1004.1.1 which are also at 50 SF per person, and these are not subject to the 500 occupant threshold. Therefore, if the principle is to be applied consistently, this threshold should not apply to low density educational occupancies. Spaces with densities higher than a classroom will normally be classified as assembly space, but it's possible that a classroom could have a density greater than 20, so this potential is also addressed with the phrase "or greater than."

Since the specific risk being addressed occurs only in the classrooms, it is appropriate to use the summation of the occupant loads of just these rooms as the basis for the analysis, and not the total building occupant load. The limit should apply to those people associated with the higher risk, and should not include other general occupants of the building.

Cost Impact: The change would result in a major savings by minimizing the probability of future misapplication of this section. The cost from this problem isn't immediately apparent; it is buried in the structural engineer's calculations and the resulting overdesign. A recent project cost analysis for a 54,000 square foot laboratory building identified a **$1.2 million savings** ($22.71 / gsf) by changing the Occupancy Category from III to II, as shown in the following.

VBI III Conceptual Estimate on Cost Premium for Category III Construction vs Category II

Description	Qty		Unit Cost		Total	Comments
Increase concrete reinforcing by 40%	147	ton	$ 2,500	/ton	$ 367,000	
Increase perimeter beam size by 20%	28	cyd	$ 1,200	/cyd	$ 33,333	
Increase for pre-cast concrete panel	10,056	sf	$ 4.00	/sf	$ 40,224	
Increase CMU wall reinforcing by 30%	2.93	ton	$ 2,500	/ton	$ 7,313	
Increase grout fill by 30%	88	cyd	$ 175	/cyd	$ 15,381	
Increase for Hokie Stone connections	13,600	sf	$ 10.00	/sf	$ 136,000	
Impact on roof screen	150.00	ton	$ 4,000	/ton	$ 400,000	
Increase for metal panel connections	1,103	sf	$ 3.00	/sf	$ 3,309	
Impact on curtain wall due to wind loading increase	15,935	sf	$ 5.00	/sf	$ 79,675	
Impact on acoustical ceiling supports	23,970	sf	$ 1.50	/sf	$ 35,955	
Impact on elevators and shaft						Possibility?
Impact on MEP for seismic supports	54,000	sf	$ 2.00	/sf	$ 108,000	Equipment associated changes need further discussion
					$1,226,190	
					$ 22.71	/gsf

$1.2 million was saved on just one building. Given how prevalent this misinterpretation is likely being made on colleges and universities nationwide, the net potential savings by correcting the problem is enormous.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: BADGER-S1-1604.5

S40-09/10
Table 1604.5, 1705.3.3, 1707.7

Proponent: Philip Brazil, PE, SE, representing self

Revise as follows:

TABLE 1604.5
OCCUPANCY CATEGORY OF BUILDINGS AND OTHER STRUCTURES

OCCUPANCY CATEGORY	NATURE OF OCCUPANCY
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300 Buildings and other structures containing elementary school, secondary school or day care facilities with an occupant load greater than 250 . Buildings and other structures containing adult education facilities, such as colleges and universities, with an occupant load greater than 500 . Group I-2 occupancies with an occupant load of 50 or more resident patients but not having surgery or emergency treatment facilities . Group I-3 occupancies Any other occupancy with an occupant load greater than 5,000 [a] . Power-generating stations, water treatment for potable water, waste water treatment facilities and other public utility facilities not included in Occupancy Category IV . Buildings and other structures not included in Occupancy Category IV containing ~~sufficient~~ quantities of toxic or explosive ~~substances~~ materials that: Exceed maximum allowable quantities per control area as given in Table 307.1(1) or 307.1(2) or per outdoor control area in accordance with the *International Fire Code*; and Are sufficient to ~~be dangerous~~ pose a threat to the public if released [b]
IV	Buildings and other structures designated as essential facilities, including but not limited to: . Group I-2 occupancies having surgery or emergency treatment facilities . Fire, rescue, ambulance and police stations and emergency vehicle garages . Designated earthquake, hurricane or other emergency shelters . Designated emergency preparedness, communications, and operations centers and other facilities required for emergency response . Power-generating stations and other public utility facilities required as emergency backup facilities for Occupancy Category IV structures . Buildings and other structures containing quantities of highly toxic materials ~~as defined by Section 307 where the quantity of the material~~ that: Exceed~~s the~~ maximum allowable quantities ~~of~~ per control area as given in Table 307.1(2) or per outdoor control area in accordance with the *International Fire Code*; and Are sufficient to pose a threat to the public if released [b] . Aviation control towers, air traffic control centers and emergency aircraft hangars . Buildings and other structures having critical national defense functions . Water storage facilities and pump structures required to maintain water pressure for fire suppression

(Portions of table not shown remain unchanged))

(No change to footnote a)

b. Where approved the building official, the classification of buildings and other structures as Occupancy Category III or IV based on their quantities of toxic, highly toxic or explosive materials is permitted to be reduced to Occupancy Category II, provided it can be demonstrated by a hazard assessment in accordance with Section 1.5.2 of ASCE 7 that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public.

1705.3.3 Seismic Design Category C. The following additional systems and components in structures assigned to Seismic Design Category C:

1. ~~Heating, ventilating and air-conditioning (HVAC)~~ Ductwork ~~containing~~ designed to carry hazardous materials and anchorage of such ductwork.
2. Piping systems ~~and mechanical units containing flammable, combustible or highly toxic~~ designed to carry hazardous materials and their associated mechanical units.
3. Anchorage of electrical equipment used for emergency or standby power systems.

1707.7 Mechanical and electrical components. Special inspection for mechanical and electrical equipment shall be as follows:

1. Periodic special inspection is required during the anchorage of electrical equipment for emergency or standby power systems in structures assigned to Seismic Design Category C, D, E or F;
2. Periodic special inspection is required during the ~~installation of~~ anchorage of other electrical equipment in structures assigned to Seismic Design Category E or F;
3. Periodic special inspection is required during the installation and anchorage of piping systems ~~intended~~ designed to carry ~~flammable, combustible or highly toxic contents~~ hazardous materials and their associated mechanical units in structures assigned to Seismic Design Category C, D, E or F;
4. Periodic special inspection is required during the installation and anchorage of ~~HVAC~~ ductwork ~~that will contain~~ designed to carry hazardous materials in structures assigned to Seismic Design Category C, D, E or F; and
5. Periodic special inspection is required during the installation and anchorage of vibration isolation systems in structures assigned to Seismic Design Category C, D, E or F where the construction documents require a nominal clearance of 1/4 inch (6.4 mm) or less between the equipment support frame and restraint.

Reason: The purpose for this proposal is to clarify the determination of occupancy category and the requirements for special inspection where hazardous materials are present. It was prepared in conjunction with ASCE 7 Proposal GPSC-5R2, which was approved by the General Subcommittee on March 1, 2009 and is being balloted by the Main Committee (Second Main Committee Ballot on General Requirements). It is expected that the Main Committee will approve the proposal.

Table 1604.5 currently classifies buildings and other structures containing certain quantities of toxic, highly toxic or explosive materials as Occupancy Category III or IV. The Category III classification applies to toxic and explosive materials and the threshold for the classification is subjective: quantities sufficient to be dangerous to the public if released. The Category IV classification applies to highly toxic materials and the threshold is objective: quantities exceeding the maximum allowable quantities of Table 307.1(2). Table 307.1(2) specifies maximum allowable quantities per control area for hazardous materials posing a health hazard.

Explosive materials are classified as posing a "physical hazard." Toxic and highly toxic materials are classified as posing a "health hazard." Materials that pose a physical hazard or a health hazard are classified as "hazardous materials." Refer to IBC Section 307.2 and IFC Section 2702.1 for definitions of these terms. The maximum quantities per control area are given in IBC Table 307.1(1) and IFC Table 2703.1.1(1) for hazardous materials posing a physical hazard and IBC Table 307.1(2) and IFC Table 2703.1.1(2) for hazardous materials posing a health hazard. The maximum quantities per outdoor control area are given in IFC Table 2703.1.1(3) for hazardous materials posing a physical hazard and IFC Table 2703.1.1(4) for hazardous materials posing a health hazard,.

A "control area" is defined in Section 307.2 as a space "within a building where quantities of hazardous materials not exceeding the maximum allowable quantities per control area are stored, used or handled." The effect of this definition on a Category IV classification is that it is limited to quantities of highly toxic materials within buildings. Not considered in the classification are quantities per "outdoor control area," which is defined in Section 2702.1 of the *International Fire Code* (IFC) as "an outdoor area that contains hazardous materials in amounts not exceeding the maximum allowable quantities of (IFC) Table 2703.1.1(3) (e.g., explosive materials) or Table 2703.1.1(4) (e.g., toxic and highly toxic materials)."

The intent in classifying buildings and other structures containing certain quantities of toxic, highly toxic or explosive materials as Occupancy Category III or IV is to reduce the potential for catastrophic release of these hazardous materials resulting from the failure of a building or structure (or a component conveying or supporting the materials and supported by a building or structure) to resist the structural demands of a design event, such as an earthquake. The required classification is limited to toxic, highly toxic and explosive materials because they pose the most serious threat to the general public if released. The threat being addressed is related to large-scale impacts on the general public, which can be characterized as global (e.g., beyond the boundaries of the site where the building or structure is located) rather than local (e.g., within those same boundaries).

Table 1604.5 currently classifies the building or structure as Occupancy Category III based on a subjective threshold but as Occupancy Category IV based on an objective threshold. This proposal revises the thresholds for both classifications so that two conditions are met for classification as Occupancy Category III or IV and they are summarized below. These revised thresholds are more consistent with the global threat discussed above. Similar thresholds are found in Table 1-1 of ASCE 7-10.

1.The quantities exceed maximum allowable quantities per control area within buildings or structures or per outdoor control area for outdoor areas; and

2. The quantities are sufficient to pose a threat to the public if released.

The first condition has the effect of exempting buildings or portions thereof from being classified as Occupancy Category III or IV except where they are classified as Group H. Where the quantities of hazardous materials in the control areas of a building or portion thereof are less than the maximum allowable quantities per control area, the occupancy classifications without considering the presence of hazardous materials are not affected by their presence. The first condition has the effect of exempting such buildings or portions thereof because the small quantities of hazardous materials permitted in occupancies other than Group H do not generally pose a global threat.

The second condition is subjective but the global threat posed by toxic, highly toxic and explosive materials is not easily quantified. Footnote (b) is added to Table 1604.5 permitting classification as Occupancy Category II for a building or structure otherwise classified as Occupancy Category III or IV, provided a hazard assessment in accordance with Section 1.5.2 of ASCE 7 is performed and it is demonstrated that a release of the toxic, highly toxic or explosive materials is not sufficient to pose a threat to the public. Refer to Section 1.5.2 and Commentary Section C1.5.2 of ASCE 7 for further information.

In Table 1604.5, a reference to IBC Table 307.1(1) is specified as well as Table 307.1(2). This is because explosive materials pose a physical hazard as discussed above but toxic and highly toxic materials pose a health hazard.

Also in Table 1604.5, maximum allowable quantities per outdoor control area are specified as well as maximum allowable quantities per control area. Hazardous materials pose physical or health hazards not only from being located in buildings but also from being located in structures not

generally considered as buildings, such as tanks, towers, bins, hoppers, silos and similar structures. ASCE 7-10 distinguishes between "building structures" (e.g., buildings) and "nonbuilding structures." Refer to Chapter 11 of ASCE 7-10 for definitions of these terms.

In conjunction with Chapter 13 of ASCE 7-10 and the revisions to Table 1604.5 in this proposal, Sections 1705.3.3 and 1707.7 are also revised. All instances of terms related to hazardous materials in the structural chapters (Chapter 16 through 23) in the 2009 IBC are found in these sections. In Item #1 of Section 1705.3.3 and Item #4 of Section 1707.7, "HVAC" is deleted because HVAC ducts typically convey environmental air, not hazardous materials. At items in both sections, the change to "designed to carry" is for consistency with Chapter 13 of ASCE 7-10. The other revisions are either editorial or are intended to make the intent more clear.

Although Section 1705.3.3 is being modified in this proposal, the deletion of this section is the subject of a separate proposal. Should both proposals be approved by the ICC membership, it is not the intent of the proponent to retain Section 1705.3.3 in the 2012 IBC for the purpose of modifying the section in accordance with this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: Brazil-S1-1604.5

S41–09/10

202, 403.2.3, 1602.1, 1603.1.4, 1603.1.5, 1604.5, Table 1604.5, 1604.5.1, 1609.1.2, 1613.2, 1613.5.6, Table 1613.5.6(1), Table 1613.5.6(2), 1614.1, 1704.5-1704.5.3, 1710.2, 1710.3, 1809.5, 2109.1.1, 2308.2, 3408.4; IEBC Table 101.5.4.1, 101.5.4.2, Table 101.5.4.2, 307.4, 907.3.1, 907.3.2, A102.2

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC STRUCTURAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE STRUCTURAL CODE COMMITTEE.

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing myself

PART I- IBC STRUCTURAL

Revise as follows:

SECTION 202
DEFINITIONS

~~**OCCUPANCY**~~ **RISK CATEGORY**. See Section 1602.1.

403.2.3 Structural integrity of exit enclosures and elevator hoistway enclosures. For high-rise buildings of ~~occupancy~~ Risk Category III or IV in accordance with Section 1604.5, and for all buildings that are more than 420 feet (128 000 mm) in building height, exit enclosures and elevator hoistway enclosures shall comply with Sections 403.2.3.1 through 403.2.3.4.

1602.1 Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

~~**OCCUPANCY**~~ **RISK CATEGORY**. A category used to determine structural requirements based on occupancy.

1603.1.4 Wind design data. The following information related to wind loads shall be shown, regardless of whether wind loads govern the design of the lateral-force-resisting system of the building:

1. Basic wind speed (3-second gust), miles per hour (km/hr).
2. Wind importance factor, *I*, and ~~occupancy~~ risk category.
3. Wind exposure. Where more than one wind exposure is utilized, the wind exposure and applicable wind direction shall be indicated.
4. The applicable internal pressure coefficient.
5. Components and cladding. The design wind pressures in terms of psf (kN/m^2) to be used for the design of exterior component and cladding materials not specifically designed by the registered design professional.

1603.1.5 Earthquake design data. The following information related to seismic loads shall be shown, regardless of whether seismic loads govern the design of the lateral-force-resisting system of the building:

1. Seismic importance factor, *I*, and ~~occupancy~~ risk category.
2. Mapped spectral response accelerations, S_S and S_1.
3. Site class.
4. Spectral response coefficients, S_{DS} and S_{D1}.
5. Seismic design category.
6. Basic seismic-force-resisting system(s).
7. Design base shear.
8. Seismic response coefficient(s), C_S.
9. Response modification factor(s), *R*.
10. Analysis procedure used.

1604.5 ~~Occupancy~~ Risk Category. Each building and structure shall be assigned ~~an occupancy~~ a risk category in accordance with Table 1604.5. Where a referenced standard specifies an occupancy category, the risk category shall not be taken as lower than the occupancy category specified therein.

TABLE 1604.5
~~OCCUPANCY~~ RISK CATEGORY OF BUILDINGS AND OTHER STRUCTURES

~~OCCUPANCY~~ RISK CATEGORY	NATURE OF OCCUPANCY
II	Buildings and other structures except those listed in ~~Occupancy~~ Risk Categories I, III and IV.
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300 Buildings and other structures containing elementary school, secondary school or day care facilities with an occupant load greater than 250 . Buildings and other structures containing adult education facilities, such as colleges and universities, with an occupant load greater than 500 . Group I-2 occupancies with an occupant load of 50 or more resident patients but not having surgery or emergency treatment facilities . Group I-3 occupancies Any other occupancy with an occupant load greater than 5,000 [a] . Power-generating stations, water treatment for potable water, waste water treatment facilities and other public utility facilities not included in ~~Occupancy~~ Risk Category IV . Buildings and other structures not included in ~~Occupancy~~ Risk Category IV containing sufficient quantities of toxic or explosive substances to be dangerous to the public if released
IV	Buildings and other structures designated as essential facilities, including but not limited to: . Group I-2 occupancies having surgery or emergency treatment facilities . Fire, rescue, ambulance and police stations and emergency vehicle garages . Designated earthquake, hurricane or other emergency shelters . Designated emergency preparedness, communications, and operations centers and other facilities required for emergency response . Power-generating stations and other public utility facilities required as emergency backup facilities for ~~Occupancy~~ Risk Category IV structures . Structures containing highly toxic materials as defined by Section 307 where the quantity of the material exceeds the maximum allowable quantities of Table 307.1(2) . Aviation control towers, air traffic control centers and emergency aircraft hangars . Buildings and other structures having critical national defense functions . Water storage facilities and pump structures required to maintain water pressure for fire suppression

(Portions of table not shown, remain unchanged)

1604.5.1 Multiple occupancies. Where a building or structure is occupied by two or more occupancies not included in the same ~~occupancy~~ risk category, it shall be assigned the classification of the highest ~~occupancy~~ risk category corresponding to the various occupancies. Where buildings or structures have two or more portions that are structurally separated, each portion shall be separately classified. Where a separated portion of a building or structure provides required access to, required egress from or shares life safety components with another portion having a higher ~~occupancy~~ risk category, both portions shall be assigned to the higher ~~occupancy~~ risk category.

1609.1.2 Protection of openings. In wind-borne debris regions, glazing in buildings shall be impact-resistant or protected with an impact-resistant covering meeting the requirements of an approved impact-resisting standard or ASTM E 1996 and ASTM E 1886 referenced herein as follows:

1. Glazed openings located within 30 feet (9144 mm) of grade shall meet the requirements of the Large Missile Test of ASTM E 1996.
2. Glazed openings located more than 30 feet (9144 mm) above grade shall meet the provisions of the Small Missile Test of ASTM E 1996.

Exceptions:

1. Wood structural panels with a minimum thickness of 7/16 inch (11.1 mm) and maximum panel span of 8 feet (2438 mm) shall be permitted for opening protection in one- and two-story buildings classified as Group R-3 or R-4 occupancy. Panels shall be precut so that they shall be attached to the framing surrounding the opening containing the product with the glazed opening. Panels shall be predrilled as required for the anchorage method and shall be secured with the attachment hardware provided. Attachments shall be designed to resist the components and cladding loads determined in accordance with the provisions of ASCE 7, with corrosion-resistant attachment hardware provided anchors permanently installed on the building. Attachment in accordance with Table 1609.1.2 with corrosion-resistant attachment hardware provided and anchors permanently installed on the building is permitted for buildings with a mean roof height of 45 feet (13 716 mm) or less where wind speeds do not exceed 140 mph (63 m/s).
2. Glazing in ~~Occupancy~~ Risk Category I buildings as defined in Table 1604.5, including greenhouses that are occupied for growing plants on a production or research basis, without public access shall be permitted to be unprotected.
3. Glazing in ~~Occupancy~~ Risk Category II, III or IV buildings located over 60 feet (18,288 mm) above the ground and over 30 feet (9144 mm) above aggregate surface roofs located within 1,500 feet (458 m) of the building shall be permitted to be unprotected.

1613.2 Definitions. The following words and terms shall, for the purposes of this section, have the meanings shown herein.

SEISMIC DESIGN CATEGORY. A classification assigned to a structure based on its ~~occupancy~~ risk category and the severity of the design earthquake ground motion at the site.

1613.5.6 Determination of seismic design category. Structures classified as ~~Occupancy~~ Risk Category I, II or III that are located where the mapped spectral response acceleration parameter at 1-second period, S_1, is greater than or equal to 0.75 shall be assigned to Seismic Design Category E. Structures classified as ~~Occupancy~~ Risk Category IV that are located where the mapped spectral response acceleration parameter at 1-second period, S_1, is greater than or equal to 0.75 shall be assigned to Seismic Design Category F. All other structures shall be assigned to a seismic design category based on their ~~occupancy~~ risk category and the design spectral response acceleration coefficients, S_{DS} and S_{D1}, determined in accordance with Section 1613.5.4 or the site-specific procedures of ASCE 7. Each building and structure shall be assigned to the more severe seismic design category in accordance with Table 1613.5.6(1) or 1613.5.6(2), irrespective of the fundamental period of vibration of the structure, T.

TABLE 1613.5.6(1)
SEISMIC DESIGN CATEGORY BASED ON SHORT-PERIOD RESPONSE ACCELERATIONS

	~~OCCUPANCY~~ RISK CATEGORY		
VALUE OF S_{DS}	**I or II**	**III**	**IV**
$S_{DS} < 0.167g$	A	A	A
$0.167g \le S_{DS} < 0.33g$	B	B	C
$0.33g \le S_{DS} < 0.50g$	C	C	D
$0.50g \le S_{DS}$	D	D	D

TABLE 1613.5.6(2)
SEISMIC DESIGN CATEGORY BASED ON 1-SECOND PERIOD RESPONSE ACCELERATION

	~~OCCUPANCY~~ RISK CATEGORY		
VALUE OF S_{D1}	**I or II**	**III**	**IV**
$S_{D1} < 0.067g$	A	A	A
$0.067g \le S_{D1} < 0.133g$	B	B	C
$0.133g \le S_{D1} < 0.20g$	C	C	D
$0.20g \le S_{D1}$	D	D	D

1614.1 General. Buildings classified as high-rise buildings in accordance with Section 403 and assigned to ~~Occupancy~~ Risk Category III, or IV shall comply with the requirements of this section. Frame structures shall comply with the requirements of Section 1614.3. Bearing wall structures shall comply with the requirements of Section 1614.4.

1704.5 Masonry construction. Masonry construction shall be inspected and verified in accordance with the requirements of Sections 1704.5.1 through 1704.5.3, depending on the ~~occupancy~~ risk of the building or structure.

Exception: Special inspections shall not be required for:

1. Empirically designed masonry, glass unit masonry or masonry veneer designed by Section 2109, 2110 or Chapter 14, respectively, or by Chapter 5, 6 or 7 of TMS 402/ACI 530/ASCE 5, respectively, when they are part of structures classified as ~~Occupancy~~ Risk Category I, II or III in accordance with Section 1604.5.
2. Masonry foundation walls constructed in accordance with Table 1807.1.6.3(1), 1807.1.6.3(2), 1807.1.6.3(3) or 1807.1.6.3(4).
3. Masonry fireplaces, masonry heaters or masonry chimneys installed or constructed in accordance with Section 2111, 2112 or 2113, respectively.

1704.5.1 Empirically designed masonry, glass unit masonry and masonry veneer in ~~Occupancy~~ Risk Category IV. The minimum special inspection program for empirically designed masonry, glass unit masonry or masonry veneer designed by Section 2109, 2110 or Chapter 14, respectively, or by Chapter 5, 6 or 7 of TMS 402/ACI 530/ASCE 5, respectively, in structures classified as ~~Occupancy~~ Risk Category IV, in accordance with Section 1604.5, shall comply with Table 1704.5.1.

1704.5.2 Engineered masonry in ~~Occupancy~~ Risk Category I, II or III. The minimum special inspection programfor masonry designed by Section 2107 or 2108 or by chapters other than Chapter 5, 6 or 7 of TMS 402/ACI 530/ASCE 5, in structures classified as ~~Occupancy~~ Risk Category I, II or III, in accordance with Section 1604.5, shall comply with Table 1704.5.1.

1704.5.3 Engineered masonry in ~~Occupancy~~ Risk Category IV. The minimum special inspection program for masonry designed by Section 2107 or 2108 or by chapters other than Chapter 5, 6 or 7 of TMS 402/ACI 530/ASCE 5, in structures classified as ~~Occupancy~~ Risk Category IV, in accordance with Section 1604.5, shall comply with Table 1704.5.3.

1710.2 Structural observations for seismic resistance. Structural observations shall be provided for those structures assigned to Seismic Design Category D, E or F, as determined in Section 1613, where one or more of the following conditions exist:

1. The structure is classified as ~~Occupancy~~ Risk Category III or IV in accordance with Section 1604.5.
2. The height of the structure is greater than 75 feet (22 860 mm) above the base.
3. The structure is assigned to Seismic Design Category E, is classified as ~~Occupancy~~ Risk Category I or II in accordance with Section 1604.5 and is greater than two stories above grade plane.
4. When so designated by the registered design professional responsible for the structural design.
5. When such observation is specifically required by the building official.

1710.3 Structural observations for wind requirements. Structural observations shall be provided for those structures sited where the basic wind speed exceeds 110 mph (49 m/sec), determined from Figure 1609, where one or more of the following conditions exist:

1. The structure is classified as ~~Occupancy~~ Risk Category III or IV in accordance with Table 1604.5.
2. The building height of the structure is greater than 75 feet (22 860 mm).
3. When so designated by the registered design professional responsible for the structural design,

4. When such observation is specifically required by the building official.

1809.5 Frost protection. Except where otherwise protected from frost, foundations and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:

1. Extending below the frost line of the locality;
2. Constructing in accordance with ASCE-32; or
3. Erecting on solid rock.

   Exception: Free-standing buildings meeting all of the following conditions shall not be required to be protected:

   1. Assigned to ~~Occupancy~~ Risk Category I, in accordance with Section 1604.5;
   2. Area of 600 square feet (56 m^2) or less for light-frame construction or 400 square feet (37 m^2) or less for other than light-frame construction; and
   3. Eave height of 10 feet (3048 mm) or less.

Shallow foundations shall not bear on frozen soil unless such frozen condition is of a permanent character.

2109.1.1 Limitations. The use of empirical design of masonry walls shall be limited as noted in Section 5.1.2 of TMS 402/ACI 530/ASCE 5. The use of dry-stacked surface-bonded masonry shall be prohibited in ~~Occupancy~~ Risk Category IV structures. In buildings that exceed one or more of the limitations of Section 5.1.2 of TMS 402/ACI 530/ASCE 5, masonry shall be designed in accordance with the engineered design provisions of Section 2101.2.1, 2101.2.2, or 2101.2.3 or the foundation wall provisions of Section 1807.1.5.

2308.2 Limitations. Buildings are permitted to be constructed in accordance with the provisions of conventional light-frame construction, subject to the following limitations, and to further limitations of Sections 2308.11 and 2308.12.

1. Buildings shall be limited to a maximum of three stories above grade plane. For the purposes of this section, for buildings in Seismic Design Category D or E as determined in Section 1613, cripple stud walls shall be considered to be a story.

   Exception: Solid blocked cripple walls not exceeding 14 inches (356 mm) in height need not be considered a story.

2. Maximum floor-to-floor height shall not exceed 11 feet, 7 inches (3531 mm). Bearing wall height shall not exceed a stud height of 10 feet (3048 mm).
3. Loads as determined in Chapter 16 shall not exceed the following:
   3.1. Average dead loads shall not exceed 15 psf (718 N/m^2) for combined roof and ceiling, exterior walls, floors and partitions.

   Exceptions:

   1. Subject to the limitations of Sections 2308.11.2 and 2308.12.2, stone or masonry veneer up to the lesser of 5 inches (127 mm) thick or 50 psf (2395 N/m^2) and installed in accordance with Chapter 14 is permitted to a height of 30 feet (9144 mm) above a noncombustible foundation, with an additional 8 feet (2438 mm) permitted for gable ends.
   2. Concrete or masonry fireplaces, heaters and chimneys shall be permitted in accordance with the provisions of this code.

   3.2. Live loads shall not exceed 40 psf (1916 N/m^2) for floors.
   3.3. Ground snow loads shall not exceed 50 psf (2395 N/m^2).
4. Wind speeds shall not exceed 100 miles per hour (mph) (44 m/s) (3-second gust).

   Exception: Wind speeds shall not exceed 110 mph (48.4 m/s) 3-second gust for buildings in Exposure Category B that are not located in a hurricane prone region.

5. Roof trusses and rafters shall not span more than 40 feet (12 192 mm) between points of vertical support.
6. The use of the provisions for conventional light-frame construction in this section shall not be permitted for ~~Occupancy~~ Risk Category IV buildings assigned to Seismic Design Category B, C, D, E or F, as determined in Section 1613.

7. Conventional light-frame construction is limited in irregular structures in Seismic Design Category D or E, as specified in Section 2308.12.6.

3408.4 Change of occupancy. When a change of occupancy results in a structure being reclassified to a higher ~~occupancy~~ risk category, the structure shall conform to the seismic requirements for a new structure of the higher ~~occupancy~~ risk category. Where the existing seismic force-resisting system is a type that can be designated ordinary, values of R, Ω_0 and C_d for the existing seismic force-resisting system shall be those specified by this code for an ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of a detailed, intermediate or special system.

Exceptions:

1. Specific seismic detailing requirements of this code or Section 1613 for a new structure shall not be required to be met where it can be shown that the level of performance and seismic safety is equivalent to that of a new structure. Such analysis shall consider the regularity, overstrength, redundancy and ductility of the structure within the context of the existing and retrofit (if any) detailing provided.
2. When a change of use results in a structure being reclassified from ~~Occupancy~~ Risk Category I or II to ~~Occupancy~~ Risk Category III and the structure is located in a seismic map area where $S_{DS} < 0.33$, compliance with the seismic requirements of this code and Section 1613 are not required.

PART II- IEBC

TABLE 101.5.4.1
PERFORMANCE CRITERIA FOR IBC LEVEL SEISMIC FORCES

~~OCCUPANCY~~ RISK CATEGORY (BASED ON IBC TABLE 1604.5)	PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-1 EARTHQUAKE HAZARD LEVEL	PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-2 EARTHQUAKE HAZARD LEVEL
I	Life safety (LS)	Collapse Prevention (CP)
II	Life safety (LS)	Collapse Prevention (CP)
III	Note a	Note a
IV	Immediate Occupancy (IO)	Life safety (LS)

a. Acceptance criteria for ~~Occupancy~~ Risk Category III shall be taken as 80 percent of the acceptance criteria specified for ~~Occupancy~~ Risk Category II performance levels, but need not be less than the acceptance criteria specified for ~~Occupancy~~ Risk Category IV performance levels.

101.5.4.2 Compliance with reduced IBC level seismic forces. Where seismic evaluation and design is permitted to meet reduced *International Building Code* seismic force levels, the procedures used shall be in accordance with one of the following:

1. The *International Building Code* using 75 percent of the prescribed forces. Values of R, Ω_0 and C_d used for analysis shall be as specified in Section 101.5.4.1 of this code.
2. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A as specified in Items 2.1 through 2.5 shall be deemed to comply with this section.
   2.1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in ~~Occupancy~~ Risk Category I or II are permitted to be based on the procedures specified in Appendix Chapter A1.
   2.2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in ~~Occupancy~~ Risk Category I or II are permitted to be based on the procedures specified in Appendix Chapter A2.
   2.3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in ~~Occupancy~~ Risk Category I or II are permitted to be based on the procedures specified in Chapter A3.
   2.4. Seismic evaluation and design of soft, weak, or open-front wall conditions in multiunit residential buildings of wood construction in ~~Occupancy~~ Risk Category I or II are permitted to be based on the procedures specified in Chapter A4.
   2.5. Seismic evaluation and design of concrete buildings in all ~~occupancy~~ risk categories are permitted to be based on the procedures specified in Chapter A5.
3. Compliance with ASCE 31 based on the applicable performance level as shown in Table 101.5.4.2. It shall be permitted to use the BSE-1 earthquake hazard level as defined in ASCE 41 and subject to the limitations in Item 4 below.
4. Compliance with ASCE 41 using the BSE-1 Earthquake Hazard Level and the performance level shown in Table 101.5.4.2. The design spectral response acceleration parameters S_{XS} and S_{X1} specified in ASCE 41

shall not be taken less than seventy-five percent of the respective design spectral response acceleration parameters S_{DS} and S_{D1} defined by the *International Building Code*.

TABLE 101.5.4.2
PERFORMANCE CRITERIA FOR REDUCED IBC LEVEL SEISMIC FORCES

~~OCCUPANCY~~ RISK CATEGORY (BASED ON IBC TABLE 1604.5)	PERFORMANCE LEVEL FOR USE WITH ASCE 31	PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-1 EARTHQUAKE HAZARD LEVEL
I	Life safety (LS)	Life safety (LS)
II	Life safety (LS)	Life safety (LS)
III	Note a	Note a
IV	Immediate Occupancy (IO)	Immediate Occupancy (IO)

a. Acceptance criteria for ~~Occupancy~~ Risk Category III shall be taken as 80 percent of the acceptance criteria specified for ~~Occupancy~~ Risk Category II performance levels, but need not be less than the acceptance criteria specified for ~~Occupancy~~ Risk Category IV performance levels.
b. For ~~Occupancy~~ Risk Category III, the ASCE 31 screening phase checklists shall be based on the life safety performance level.

[B] 307.4 Structural. When a *change of occupancy* results in a structure being reclassified to a higher ~~occupancy~~ risk category, the structure shall conform to the seismic requirements for a new structure of the higher ~~occupancy~~ risk category. Where the existing seismic force-resisting system is a type that can be designated ordinary, values of R, Ω_0 and C_d for the existing seismic force-resisting system shall be those specified by this code for an ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of a detailed, intermediate or special system.

Exceptions:

1. Specific seismic detailing requirements of this code or ASCE 7 for a new structure shall not be required to be met where it can be shown that the level of performance and seismic safety is equivalent to that of a new structure. Such analysis shall consider the regularity, overstrength, redundancy and ductility of the structure within the context of the existing and retrofit (if any) detailing provided.
2. When a change of use results in a structure being reclassified from ~~Occupancy~~ Risk Category I or II to ~~Occupancy~~ Risk Category III and the structure is located in a seismic map area where $S_{DS} < 0.33$, compliance with the seismic requirements of this code and Section 1613 of the *International Building Code* are not required.

907.3.1 Compliance with the *International Building Code* level seismic forces. Where a building or portion thereof is subject to a change of occupancy that results in the building being assigned to a higher ~~occupancy~~ risk category based on Table 1604.5 of the *International Building Code*; or where such change of occupancy results in a reclassification of a building to a higher hazard category as shown in Table 912.4; or where a change of a Group M occupancy to a Group A, E, I-1 R-1, R-2 or R-4 occupancy with two-thirds or more of the floors involved in Level 3 alteration work, the building shall comply with the requirements for *International Building Code* level seismic forces as specified in Section 101.5.4.1 for the new ~~occupancy~~ risk category.

Exceptions:

1. Group M occupancies being changed to Group A, E, I-1, R-1, R-2 or R-4 occupancies for buildings less than six stories in height and in Seismic Design Category A, B or C.
2. Where approved by the code official, specific detailing provisions required for a new structure are not required to be met where it can be shown that an equivalent level of performance and seismic safety is obtained for the applicable ~~occupancy~~ risk category based on the provision for reduced *International Building Code* level seismic forces as specified in Section 101.5.4.2.
3. Where the area of the new occupancy with a higher hazard category is less than or equal to 10 percent of the total building floor area and the new occupancy is not classified as ~~Occupancy~~ Risk Category IV. For the purposes of this exception, buildings occupied by two or more occupancies not included in the same ~~occupancy~~ risk category shall be subject to the provisions of Section 1604.5.1 of the *International Building Code*. The cumulative effect of the area of occupancy changes shall be considered for the purposes of this exception.
4. Unreinforced masonry bearing wall buildings in ~~Occupancy~~ Risk Category III when assigned to Seismic Design Category A or B shall be allowed to be strengthened to meet the requirements of Appendix Chapter A1 of this code [*Guidelines for the Seismic Retrofit of Existing Buildings* (GSREB)].

907.3.2 Access to ~~Occupancy~~ Risk Category IV. Where a change of occupancy is such that compliance with Section 907.3.1 is required and the building is assigned to ~~Occupancy~~ Risk Category IV, the operational access to the building shall not be through an adjacent structure unless the adjacent structure conforms to the requirements for ~~Occupancy~~ Risk Category IV structures. Where operational access is less than 10 feet (3048 mm) from either an interior lot line or from another structure, access protection from potential falling debris shall be provided by the owner of the ~~Occupancy~~ Risk Category IV structure.

A102.2 Essential and hazardous facilities. The provisions of this chapter shall not apply to the strengthening of buildings or structures in ~~Occupancy~~ Risk Category III when assigned to Seismic Design Category C, D, or E or buildings or structures in ~~Occupancy~~ Risk Category IV. Such buildings or structures shall be strengthened to meet the requirements of the *International Building Code* for new buildings of the same ~~occupancy~~ risk category or other such criteria that have been established by the jurisdiction.

Reason: The purpose for this proposal is to correlate the IBC and IEBC with the 2010 edition of ASCE 7. The need for correlation is due to ASCE 7 Proposal GPSC-3AR2, which was approved by the General Subcommittee on March 1, 2009 and is being balloted by the Main Committee (Item #10 of the Second Main Committee Ballot on General Requirements). It is expected that the Main Committee will approve the proposal.
The proposed changes will reduce confusion between occupancies and their classifications utilized by the codes promulgated by the International Code Council in their fire- and life-safety regulations, and occupancy considerations associated with structural safety. In addition, this proposal recognizes that the factor determining whether a building or other structure falls into a specific Category is not specifically its occupancy, but rather, the risk that failure would pose to persons and society at large. Indeed, some of the structures that fall under the provenance of the IBC and IEBC are unoccupied, such as water treatment plants, but still fall into Category III because their failure would pose a substantial risk to the public.
In Section 1604.5, a statement is added to assign a risk category to an occupancy category specified in a referenced standard. A similar statement is being added to Section 1.5.1 of ASCE 7-10 by Proposal GPSC-3AR1. This is being done in the event that a standard referenced by the 2012 IBC has not updated to be consistent with the change from "occupancy category" to "risk category."
All instances of "occupancy category" in the 2009 IBC and IEBC are included in this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Part I-IBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

Part II-IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S46-1604.5

S42–09/10
Table 1604.5

Proponent: Michael Mahoney, Federal Emergency Management Agency and Ron Lynn, Clark County, Nevada representing Western States Seismic Policy Council Code Committee

Revise as follows:

TABLE 1604.5
OCCUPANCY CATEGORY OF BUILDINGS AND OTHER STRUCTURES

OCCUPANCY CATEGORY	NATURE OF OCCUPANCY
III	Buildings and other structures that represent a substantial hazard to human life in the event of failure, including but not limited to: • Buildings and other structures whose primary occupancy is public assembly with an occupant load greater than 300. ~~• Buildings and other structures containing elementary school, secondary school or day care facilities with an occupant load greater than 250.~~ • Buildings and other structures containing adult education facilities, such as colleges and universities, with an occupant load greater than 500. • Group I-2 occupancies with an occupant load of 50 or more resident patients but not having surgery or emergency treatment facilities. • Group I-3 occupancies. • Any other occupancy with an occupant load greater than 5,000[a]. • Power-generating stations, water treatment facilities for potable water, waste water treatment facilities and other public utility facilities not included in Occupancy Category IV. • Buildings and other structures not included in Occupancy Category IV containing sufficient quantities of toxic or ex-plosive substances to be dangerous to the public if released.
IV	Buildings and other structures designated as essential facilities, including but not limited to: • Group I-2 occupancies having surgery or emergency treatment facilities. • Fire, rescue, ambulance and police stations and emergency vehicle garages. • Designated ~~earthquake, hurricane or other~~ emergency shelters<u>, including elementary school, secondary school or day care facilities with an occupant load greater than 100</u>. • Designated emergency preparedness, communications and operations centers and other facilities required for emergency response. • Power-generating stations and other public utility facilities required as emergency backup facilities for Occupancy Category IV structures. • Structures containing highly toxic materials as defined by Section 307 where the quantity of the material exceeds the maximum allowable quantities of Table 307.1(2). • Aviation control towers, air traffic control centers and emergency aircraft hangars. • Buildings and other structures having critical national defense functions. • Water storage facilities and pump structures required to maintain water pressure for fire suppression.

(Portions of table not shown remain unchanged)
(No change to footnote)

Reason: This proposal makes two changes. The first is to eliminate the list of hazards, since emergency shelters are normally designed to withstand all applicable natural and man-made hazards and are very rarely designated as hazard specific. The second and more significant change is to specifically include elementary, secondary and day care school buildings. The reason for this second change is that 1) most communities have designated their school buildings as community shelters in their emergency operations plans, and 2) almost every school district in the country has instituted a policy of keeping students sheltered in place if disaster strikes during school hours until parents can pick up their children, effectively making school buildings shelters for their students. Further, the impact of losses of school buildings in natural disaster was made painfully aware to the entire world in the China earthquake last year. This country also has its school-related disaster, which was the 1933 Long Beach earthquake, which collapsed a significant percentage of school buildings. Fortunately, the buildings were not occupied at the time, but the disaster led the State of California to adopt the Field Act, which to this day mandates special construction requirements for school buildings.

Cost Impact: The only potential cost impact would potentially be a slight increase to the cost of new schools. However, past similar studies on seismic design by FEMA have shown that the increase would be less than one percent of the total cost of the structure.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: MAHONEY-S3-TABLE 1604

S43–09/10

1604.7, 1702.1, 1703.4, Table 1704.5.1, Table 1704.5.3, 1714.2, 1714.3.1, 1715.1, 1715.2, 1715.3, 2303.4.7, 2407.1, 2408.2.1, 2408.3

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1604.7 Preconstruction load tests. Materials and methods of construction that are not capable of being designed by approved engineering analysis or that do not comply with the applicable ~~material design~~ referenced standards ~~listed in Chapter 35~~, or alternative test procedures in accordance with Section 1712, shall be load tested in accordance with Section 1715.

1702.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

FABRICATED ITEM. Structural, load-bearing or lateral load-resisting assemblies consisting of materials assembled prior to installation in a building or structure, or subjected to operations such as heat treatment, thermal cutting, cold working or reforming after manufacture and prior to installation in a building or structure. Materials produced in accordance with standard specifications referenced by this code, such as rolled structural steel shapes, steel-reinforcing bars, masonry units and wood structural panels or in accordance with a referenced standard, ~~listed in Chapter 35,~~ which provides requirements for quality control done under the supervisions of a third party quality control agency, shall not be considered "fabricated items."

1703.4 Performance. Specific information consisting of test reports conducted by an approved testing agency in accordance with the appropriate referenced standards ~~referenced in Chapter 35~~, or other such information as necessary, shall be provided for the building official to determine that the material meets the applicable code requirements.

TABLE 1704.5.1
LEVEL 1 REQUIRED VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION
(No changes to Table)

For SI: °C = (°F - 32)/1.8.
~~a. The specific standards referenced are those listed in Chapter 35.~~

TABLE 1704.5.3
LEVEL 2 REQUIRED VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION
(No changes to Table)

For SI: °C = (°F - 32)/1.8.
~~a. The specific standards referenced are those listed in Chapter 35.~~

1714.2 Test standards. Structural components and assemblies shall be tested in accordance with the appropriate ~~material~~ referenced standards ~~listed in Chapter 35~~. In the absence of a standard that contains an applicable load test procedure, the test procedure shall be developed by a registered design professional and approved. The test procedure shall simulate loads and conditions of application that the completed structure or portion thereof will be subjected to in normal use.

1714.3.1 Load test procedure specified. Where a referenced standard ~~listed in Chapter 35~~ contains an applicable load test procedure and acceptance criteria, the test procedure and acceptance criteria in the standard shall apply. In the absence of specific load factors or acceptance criteria, the load factors and acceptance criteria in Section 1714.3.2 shall apply.

1715.1 General. In evaluating the physical properties of materials and methods of construction that are not capable of being designed by approved engineering analysis or do not comply with the applicable ~~material design~~ referenced standards ~~listed in Chapter 35~~, the structural adequacy shall be predetermined based on the load test criteria established in this section.

1715.2 Load test procedures specified. Where specific load test procedures, load factors and acceptance criteria are included in the applicable ~~design~~ referenced standards ~~listed in Chapter 35~~, such test procedures, load factors and

acceptance criteria shall apply. In the absence of specific test procedures, load factors or acceptance criteria, the corresponding provisions in Section 1715.3 shall apply.

1715.3 Load test procedures not specified. Where load test procedures are not specified in the applicable ~~design~~ referenced standards ~~listed in Chapter 35~~, the load-bearing and deformation capacity of structural components and assemblies shall be determined on the basis of a test procedure developed by a registered design professional that simulates applicable loading and deformation conditions. For components and assemblies that are not a part of the seismic-load-resisting system, the test shall be as specified in Section 1715.3.1. Load tests shall simulate the applicable loading conditions specified in Chapter 16.

2303.4.7 Truss quality assurance. Trusses not part of a manufacturing process in accordance with either Section 2303.4.6 or a referenced standard ~~listed in Chapter 35~~, which provides requirements for quality control done under the supervision of a third-party quality control agency, shall be manufactured in compliance with Sections 1704.2 and 1704.6, as applicable.

2407.1 Materials. Glass used as a handrail assembly or a guard section shall be constructed of either single fully tempered glass, laminated fully tempered glass or laminated heat-strengthened glass. Glazing in railing in-fill panels shall be of an approved safety glazing material that conforms to the provisions of Section 2406.1.1. For all glazing types, the minimum nominal thickness shall be 1/4 inch (6.4 mm). Fully tempered glass and laminated glass shall comply with Category II of CPSC 16 CFR 1201 or Class A of ANSI Z97.1~~, listed in Chapter 35~~.

2408.2.1 Testing. Test methods and loads for individual glazed areas in racquetball and squash courts subject to impact loads shall conform to those of CPSC 16 CFR 1201 or ANSI Z97.1~~, listed in Chapter 35,~~ with impacts being applied at a height of 59 inches (1499 mm) above the playing surface to an actual or simulated glass wall installation with fixtures, fittings and methods of assembly identical to those used in practice.

Glass walls shall comply with the following conditions:

1. A glass wall in a racquetball or squash court, or similar use subject to impact loads, shall remain intact following a test impact.
2. The deflection of such walls shall not be greater than 1-1/2 inches (38 mm) at the point of impact for a drop height of 48 inches (1219 mm).

Glass doors shall comply with the following conditions:

1. Glass doors shall remain intact following a test impact at the prescribed height in the center of the door.
2. The relative deflection between the edge of a glass door and the adjacent wall shall not exceed the thickness of the wall plus 1/2 inch (12.7 mm) for a drop height of 48 inches (1219 mm).

2408.3 Gymnasiums and basketball courts. Glazing in multipurpose gymnasiums, basketball courts and similar athletic facilities subject to human impact loads shall comply with Category II of CPSC 16 CFR 1201 or Class A of ANSI Z97.1~~, listed in Chapter 35~~.

Reason: The purpose for this proposal is to correlate the references to referenced standards with their charging text in Section 102.4 and to eliminate superfluous text. A “referenced standard” is understood to be a standard listed in Chapter 35, the title of which is “Referenced Standards,” and statements that they are “listed in Chapter 35” are not needed in the IBC. All such references to Chapter 35 in the IBC are included in this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S36-1604.7

S44–09/10
1604.8.2, 1613.7

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self
Jim Rossberg, SEI of ASCE, representing self

1. Revise as follows:

1604.8.2 Structural walls. Walls that provide vertical load bearing resistance or lateral shear resistance for a portion of the structure shall be anchored to the roof and to all floors~~, roofs~~ and ~~other structural elements~~ members that provide lateral support for the wall or that are supported by the wall. ~~Such anchorage shall provide a positive direct connection~~ The connections shall be capable of resisting the horizontal forces specified in ~~this chapter but not less than the minimum strength design horizontal force specified in~~ Section ~~11.7.3~~ 1.4.4 of ASCE 7~~, substituted for "*E*" in the load combinations of Section 1605.2 or 1605.3~~ for walls of structures assigned to Seismic Design Category A and to Section 12.11 of ASCE 7 for walls of all other structures. Concrete and masonry walls shall be designed to resist bending between anchors where the anchor spacing exceeds 4 feet (1219 mm). Required anchors in masonry walls of hollow units or cavity walls shall be embedded in a reinforced grouted structural element of the wall. See Section 1609 for wind design requirements and see Section 1613 for earthquake design requirements.

2. Delete without substitution:

~~**1613.7 ASCE 7, Section 11.7.5.** Modify ASCE 7, Section 11.7.5 to read as follows:~~

> ~~**11.7.5 Anchorage of walls.** Walls shall be anchored to the roof and all floors and members that provide lateral support for the wall or that are supported by the wall. The anchorage shall provide a direct connection between the walls and the roof or floor construction. The connections shall be capable of resisting the forces specified in Section 11.7.3 applied horizontally, substituted for E in the load combinations of Section 2.3 or 2.4.~~

.
Reason:
(BRAZIL)-The purpose for this proposal is to delete a revision to ASCE 7-05 that will no longer be needed because a similar revision will have been incorporated into the 2010 edition of ASCE 7. Section 1604.8.2 is also revised for consistency with this and other related revisions to ASCE 7. These are being accomplished by ASCE 7 Proposal GPSC-2R2, which was approved by the General Subcommittee on March 1, 2009 and is being balloted by the Main Committee (Item #2 of the Second Main Committee Ballot on General Requirements); and by ASCE 7 Proposal SSC TC-4-CH14-07-R1, which was approved by the Seismic Subcommittee on May 15, 2009 and is being balloted by the Main Committee (Item #1 of the Seventh Main Committee Ballot on Seismic Provisions). It is expected that the Main Committee will approve both proposals.
(ROSSBERG)- This provision has been considered and approved by the Seismic Subcommittee of ASCE 7 for inclusion into the 2010 edition of ASCE 7 hence with the adoption of ASCE 7-10 by reference this provision becomes duplicative. As of the submission date of this code change, the ASCE 7 Standards Committee is completing the committee balloting portion of the 2010 edition of ASCE/SEI 7. The document is designated ASCE/SEI 7-10 *Minimum Design Loads for Buildings and Other Structures* and it is expected that it will be completed and available for purchase prior to the ICC Final Action Hearings in May of 2010 . Any person interested in obtaining a public comment copy of ASCE/SEI 7-10 may do so by contacting the proponent at jrossberg@asce.org.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-Rossberg-S23-1604.8.2

S45–09/10
1604.9

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1604.9 Counteracting structural actions. Structural members, systems, components and cladding shall be designed to resist forces due to earthquake and wind, with consideration of overturning, sliding and uplift. Continuous load paths shall be provided for transmitting these forces to the foundation. Where sliding is used to isolate the elements, the effects of friction between sliding elements shall be included as a force. Where all or a portion of the resistance to these forces is provided by dead load, the dead load shall be taken as the minimum dead load likely to be in place during the event causing the considered forces. Consideration shall be given to the effects of vertical and horizontal deflections resulting from such forces.

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. The added text will align IBC Section 1604.9 with Section 1.3.5 of ASCE 7.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S40-1604.9

S46–09/10
1604.11 (New)

Proponent: Daniel J. Walker, PE, Thomas Associates, Inc. representing the National Sunroom Association

Add new text as follows:

1604.11 Patio cover design loads. *Patio covers* shall be designed and constructed to sustain, within the stress limits of this code, all dead loads plus a minimum vertical live load of 10 pounds per square foot (0.48 kN/m^2) except that snow loads shall be used where such snow loads exceed this minimum. Such *patio covers* shall be designed to resist the minimum wind and seismic loads set forth in this code.

Reason: This language has long been included in Appendix I of the code. The requirements are specific to this section and therefore should be included here.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Walker-S1-1604.11

S47–09/10
1605.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1605.1 General. Buildings and other structures and portions thereof shall be designed to resist:

1. The load combinations specified in Section 1605.2, 1605.3.1 or 1605.3.2,
2. The load combinations specified in Chapters 18 through 23, and
3. The load combinations with overstrength factor specified in Section 12.4.3.2 of ASCE 7 where required by Section 12.2.5.2, 12.3.3.3 or 12.10.2.1 of ASCE 7. With the simplified procedure of ASCE 7 Section 12.14, the load combinations with overstrength factor of Section 12.14.3.2 of ASCE 7 shall be used.

Applicable loads shall be considered, including both earthquake and wind, in accordance with the specified load combinations. Each load combination shall also be investigated with one or more of the variable loads set to zero. Where members, elements or components of a structure are designed in accordance with a particular material chapter of this code or a reference standard, they shall be designed to resist all applicable load combinations of Section 1605.2 or of Section 1605.3.

Where the load combinations with overstrength factor in Section 12.4.3.2 of ASCE 7 apply, they shall be used as follows:

1. The basic combinations for strength design with overstrength factor in lieu of Equations 16-5 and 16-7 in Section 1605.2.1.
2. The basic combinations for allowable stress design with overstrength factor in lieu of Equations 16-12, 16-13 and 16-15 in Section 1605.3.1.
3. The basic combinations for allowable stress design with overstrength factor in lieu of Equations 16-20 and 16-21 in Section 1605.3.2.

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. The need for correlation is due to ASCE 7 Proposal LCSC LC-12-R1, which has been approved by the Load Combinations Subcommittee and is being balloted by the Main Committee (Item #22 of the Second Main Committee Ballot on Load Combinations). It is expected that the Main Committee will approve the proposal.

Where proportioning members, elements or components of a particular construction material, Section 2.1 of ASCE-05 requires, throughout the structure, the exclusive use of the load combinations for strength/LRFD design or for allowable stress design (ASD). This requirement does not exist in the 2009 IBC but the modification to Section 2.1 in ASCE 7-10 warrants its inclusion in the 2012 IBC.

ASCE 7 has contained the requirement in Section 2.1 since the introduction of load combinations for strength/LRFD design in the 1982 edition of the standard. The primary reason was to avoid an indiscriminate mixture of strength and allowable stress design methods, which may lead to unpredictable structural system performance. The reliability analyses and code calibrations leading to the strength/LRFD load combinations were based on member limit states rather than system limit states.

The change to Section 2.1 of ASCE 7 acknowledges current industry practice while continuing to prohibit indiscriminate mixing of strength/LRFD and ASD load combinations where it is not appropriate. For example, the design of cold-formed steel framing and open web steel joists is typically done using ASD load combinations but the design of the structural steel is typically done using strength/LRFD load combinations. The AISC Code of Standard Practice indicates that cold-formed steel and steel joists are not considered structural steel. Foundations are also commonly designed at the soil-structure interface using ASD load combinations but the design of the concrete is typically done using strength/LRFD load combinations.

The change permits the mixing of strength/LRFD and ASD load combinations for the design of a structure, provided mixing does not occur for design of the individual classes of members, elements or components (e.g., cold-formed steel, steel joists and structural steel) in accordance with their respective material standards.

The addition to Section 1605.1 will make the 2012 IBC consistent with ASCE 7-10 with respect to this aspect of structural design but the text in this proposal does not match the corresponding text in ASCE 7-10. It has been adapted for inclusion in the IBC. For comparison purposes, the text from ASCE 7 Proposal LCSC LC-12-R1 is: "Where elements of a structure are designed by a particular material standard or specification, they shall be designed exclusively by either Section 2.3 or 2.4."

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S31-1605. 1

S48–09/10
1605.1, 1810.3.6.1, 1810.3.9.4, 1810.3.11.2, 1810.3.12

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1605.1 General. Buildings and other structures and portions thereof shall be designed to resist:

1. The load combinations specified in Section 1605.2, 1605.3.1 or 1605.3.2,
2. The load combinations specified in Chapters 18 through 23, and
3. The ~~load combinations with~~ seismic load effects including overstrength factor ~~specified~~ in accordance with Section ~~12.4.3.2~~ 12.4.3 of ASCE 7 where required by Section 12.2.5.2, 12.3.3.3 or 12.10.2.1 of ASCE 7. With the simplified procedure of ASCE 7 Section 12.14, the ~~load combinations with~~ seismic load effects including overstrength factor ~~of~~ in accordance with Section 12.14.3.2 of ASCE 7 shall be used.

Applicable loads shall be considered, including both earthquake and wind, in accordance with the specified load combinations. Each load combination shall also be investigated with one or more of the variable loads set to zero.

Where the load combinations with overstrength factor in Section 12.4.3.2 of ASCE 7 apply, they shall be used as follows:

1. The basic combinations for strength design with overstrength factor in lieu of Equations 16-5 and 16-7 in Section 1605.2.1.
2. The basic combinations for allowable stress design with overstrength factor in lieu of Equations 16-12, 16-13 and 16-15 in Section 1605.3.1.
3. The basic combinations for allowable stress design with overstrength factor in lieu of Equations 16-20 and 16-21 in Section 1605.3.2.

1810.3.6.1 Seismic Design Categories C through F. For structures assigned to Seismic Design Category C, D, E, or F, splices of deep foundation elements shall develop the lesser of the following:

1. The ~~full~~ nominal strength of the deep foundation element; and
2. The axial and shear forces and moments from the ~~load combinations with~~ seismic load effects including overstrength factor in accordance with Section 12.4.3.2 or 12.14.3.2 of ASCE 7.

1810.3.9.4 Seismic reinforcement. Where a structure is assigned to Seismic Design Category C reinforcement shall be provided in accordance with Section 1810.3.9.4.1. Where a structure is assigned to Seismic Design Category D, E, or F reinforcement shall be provided in accordance with Section 1810.3.9.4.2.

Exceptions:

1. Isolated deep foundation elements supporting posts of Group R-3 and U occupancies not exceeding two stories of light-frame construction shall be permitted to be reinforced as required by rational analysis but with not less than one No. 4 bar, without ties or spirals, where detailed so the element is not subject to lateral loads and the soil provides adequate lateral support in accordance with Section 1810.2.1.
2. Isolated deep foundation elements supporting posts and bracing from decks and patios appurtenant to Group R-3 and U occupancies not exceeding two stories of light-frame construction shall be permitted to be reinforced as required by rational analysis but with not less than one No. 4 bar, without ties or spirals, where the lateral load, *E*, to the top of the element does not exceed 200 pounds (890 N) and the soil provides adequate lateral support in accordance with Section 1810.2.1.
3. Deep foundation elements supporting the concrete foundation wall of Group R-3 and U occupancies not exceeding two stories of light-frame construction shall be permitted to be reinforced as required by rational analysis but with not less than two No. 4 bars, without ties or spirals, where the design cracking moment determined in accordance with Section 1810.3.9.1 exceeds the required moment strength determined using the load combinations with overstrength factor in Section 12.4.3.2 or 12.14.3.2 of ASCE 7 and the soil provides adequate lateral support in accordance with Section 1810.2.1.
4. Closed ties or spirals where required by Section 1810.3.9.4.2 shall be permitted to be limited to the top 3 feet (914 mm) of deep foundation elements 10 feet (3048 mm) or less in depth supporting Group R-3 and U occupancies of Seismic Design Category D, not exceeding two stories of light-frame construction.

1810.3.11.2 Seismic Design Categories D through F. For structures assigned to Seismic Design Category D, E, or F in accordance with Section 1613, deep foundation element resistance to uplift forces or rotational restraint shall be provided by anchorage into the pile cap, designed considering the combined effect of axial forces due to uplift and bending moments due to fixity to the pile cap. Anchorage shall develop a minimum of 25 percent of the strength of the element in tension. Anchorage into the pile cap shall ~~be capable of developing~~ comply with the following:

1. In the case of uplift, the anchorage shall be capable of developing the least of the following:
   1.1. The nominal tensile strength of the longitudinal reinforcement in a concrete element;
   1.2. The nominal tensile strength of a steel element; and
   1.3. The frictional force developed between the element and the soil multiplied by 1.3~~; and~~.

   Exception: The anchorage is permitted to be designed to resist the axial tension force resulting from the ~~load combinations with~~ seismic load effects including overstrength factor in accordance with Section 12.4.3.2 or 12.14.3.2 of ASCE 7.

2. In the case of rotational restraint, the ~~lesser of the following:~~ anchorage shall be designed to resist the axial ~~force,~~ and shear forces, and ~~bending~~ moments resulting from the ~~load combinations with~~ seismic load effects including overstrength factor in accordance with Section 12.4.3.2 or 12.14.3.2 of ASCE 7; ~~or development of~~ or shall be capable of developing the full axial, bending and shear nominal strength of the element.

Where the vertical lateral-force-resisting elements are columns, the pile cap flexural strengths shall exceed the column flexural strength. The connection between batter piles and pile caps shall be designed to resist the nominal strength of the pile acting as a short column. Batter piles and their connection shall be ~~capable of resisting forces and moments from the load combinations with~~ designed to resist the seismic load effects including overstrength factor in accordance with Section 12.4.3.2 or 12.14.3.2 of ASCE 7.

1810.3.12 Grade beams. For structures assigned to Seismic Design Category D, E, or F in accordance with Section 1613, grade beams shall comply with the provisions in Section 21.12.3 of ACI 318 for grade beams, except where they ~~have the capacity~~ are designed to resist the ~~forces from the load combinations with~~ seismic load effects including overstrength factor in accordance with Section 12.4.3.2 or 12.14.3.2 of ASCE 7.

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. The need for correlation is due to ASCE 7 Proposal SSC TC-2-CH12-63-R1, which was approved by the Seismic Subcommittee on 12/10/08 and is being balloted by the Main Committee (Item #23 of the Fourth Main Committee Ballot on Seismic Provisions). It is expected that the Main Committee will approve the proposal.
Proposal SSC-TC-2-CH12-63-R1 changes several references in ASCE 7 from Section 12.4.3.2 to Section 12.4.3 (and from Section 12.14.3.2.2 to Section 12.14.3.2 for the simplified procedure) so that the Exception to Section 12.4.3.1 (and to Section 12.14.3.2.1 for the simplified procedure)

permitting the maximum force that can be developed in the element to substitute for the horizontal seismic effects with overstrength is included. In the process of doing this, "load combinations with overstrength factor" was changed to "seismic load effects including overstrength factor" throughout ASCE 7 for consistency with the subject (and title) of Section 12.4.3 (and Section 12.14.3.2 for the simplified procedure).
This proposal revises the IBC for consistency with the revisions to ASCE 7 in Proposal SSC-TC-2-CH12-63-R1. In Item 3 of Paragraph #1 in Section 1605.1, the references to Sections 12.2.5.2, 12.3.3.3 and 12.10.2.1 of ASCE 7-05 will not be changing in ASCE 7-10. The references to Sections 12.4.3 and 12.14.3.2 of ASCE 7-05 throughout this proposal will also not be changing in ASCE 7-10. The IBC sections in this proposal correspond to the following sections of ASCE 7:

1. IBC Section 1810.3.6.1 corresponds to Section 12.13.6.6 of ASCE 7.
2. IBC Section 1810.3.11.2 corresponds to Section 12.13.6.5 of ASCE 7.
3. IBC Section 1810.3.12 corresponds to Section 14.2.3.2.2 of ASCE 7.

All instances of "load combinations with overstrenght factor" in the 2009 IBC are included in this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S47-1605.1

S49–09/10
1605.2.1, 1605.3.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1605.2.1 Basic load combinations. Where strength design or load and resistance factor design is used, structures and portions thereof shall resist the most critical effects from the following combinations of factored loads:

1.4 ($D + F$) **(Equation 16-1)**

1.2 ($D + F + T$) + 1.6 ($L + H$) +
0.5 (L_r or S or R) **(Equation 16-2)**

1.2 (D + F) + 1.6 (L_r or S or R) + 1.6 H + (f_1 L or 0.8 W) **(Equation 16-3)**

1.2 (D + F) + 1.6 W + f_1 L + 1.6 H + 0.5 (L_r or S or R) **(Equation 16-4)**

1.2 (D + F) + 1.0 E + f_1 L + 1.6 H + f_2 S **(Equation 16-5)**

0.9 D + 1.6 W + 1.6 H **(Equation 16-6)**

0.9 D + 1.0 E + 1.6 H **(Equation 16-7)**

where:

f_1 = 1 for floors in places of public assembly, for live loads in excess of 100 pounds per square foot (4.79 kN/m^2), and for parking garage live load, and
= 0.5 for other live loads.
f_2 = 0.7 for roof configurations (such as saw tooth) that do not shed snow off the structure, and
= 0.2 for other roof configurations.

Exceptions:

1. Where other factored load combinations are specifically required by ~~the~~ other provisions of this code, such combinations shall take precedence.
2. Where the effect of H resists the primary variable load effect, a load factor of 0.9 shall be included with H where H is permanent and H shall be set to zero for all other conditions.

1605.3.1 Basic load combinations. Where allowable stress design (working stress design), as permitted by this code, is used, structures and portions thereof shall resist the most critical effects resulting from the following combinations of loads:

$D + F$ **(Equation 16-8)**

$D + H + F + L + T$ **(Equation 16-9)**

$D + H + F + (L_r \text{ or } S \text{ or } R)$ **(Equation 16-10)**

$D + H + F + 0.75 (L + T) +$
$0.75 (L_r \text{ or } S \text{ or } R)$ **(Equation 16-11)**

$D + H + F + (W \text{ or } 0.7 E)$ **(Equation 16-12)**

$D + H + F + 0.75$ ~~$(W \text{ or } 0.7 E)$~~ $+$
$0.75 L + 0.75 (L_r \text{ or } S \text{ or } R)$ **(Equation 16-13)**

$D + H + F + 0.75 (0.7 E) + 0.75 L + 0.75 S$ **(Equation 16-14)**

$0.6 D + W + H$ **(Equation 16-~~14~~15)**

$0.6 D + 0.7 E + H$ **(Equation 16-~~15~~16)**

(Renumber remaining equations)

Exceptions:

1. Crane hook loads need not be combined with roof live load or with more than three-fourths of the snow load or one-half of the wind load.
2. Flat roof snow loads of 30 psf (1.44 kN/m^2) or less and roof live loads of 30 psf or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf (1.44 kN/m^2), 20 percent shall be combined with seismic loads.
3. Where the effect of H resists the primary variable load effect, a load factor of 0.6 shall be included with H where H is permanent and H shall be set to zero for all other conditions.

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. The need for correlation is due to ASCE 7 Proposal LCSC LC-9a, which has been approved by the Load Combinations Subcommittee (LCSC) and is being balloted by the Main Committee (Item #2 of the Second Main Committee Ballot on Load Combinations). It is expected that the Main Committee will approve the proposal. This proposal is being submitted in conjunction with a similar proposal that revises IBC Sections 1605.2 and 1605.3 to closely match Sections 2.3 and 2.4 of ASCE 7-10 as revised by the ASCE 7 proposal. This proposal is equivalent to that proposal but relies more on the actual load combinations and less on text modifying the load combinations.

The changes will improve the equivalency of the Strength/LRFD and ASD load combinations with respect to the inclusion of loads due to fluids, *F*, and loads due to lateral earth pressures, ground water pressures or the pressure of bulk materials, *H.* The ASCE 7 proposal noted above was prompted, in part, by a proposal that added *F*, *H*, and loads due to self-straining forces, *T*, to the basic strength design load combinations of ASCE 7 necessary to achieve this equivalency. The removal of *T* from the Strength/LRFD and ASD load combinations is the subject of a separate proposal. The removal of earthquake load, *E*, from Equation 16-13 and the addition of Equation 16-14 has the effect of retaining roof live load, L_r, and rain load, *R*, in combination with wind load, *W* (Equation 16-13) but removing these loads in combination with earthquake load, *E* (Equation 16-14). This is being done to improve the equivalency of these load combinations with Strength/LRFD Equations 16-4 and 16-5. A similar deletion from the ASD load combinations in Section 2.4.1 of ASCE 7 is made by Proposal LCSC LC-9a but L_r and *R* are deleted in combination with *W* and *E*.

Correlation of LRFD and Basic ASD load combinations:

1. 1.4 (D+F)	8. D + F
2. 1.2 (D+F+T) + 1.6 (L+H) + 0.5S	9. D + H + F + L + T [not S]
2. 1.2 (D+F+T) + 1.6 (L+H) + 0.5S	10. D + H + F + S [not T, L]
2. 1.2 (D+F+T) + 1.6 (L+H) + 0.5S	11. D + H + F + 0.75L + 0.75T + 0.75S
3a. 1.2D + 1.6S + 1.0L [not H, F, T]	9. D + H + F + L + T [not S]
3a. 1.2D + 1.6S + 1.0L [not H, F]	10. D + H + F + S [not L]
3a. 1.2D + 1.6S + 1.0L [not H, F, T]	11. D + H + F + 0.75L + 0.75T + 0.75S
3b. 1.2D + 1.6S + 0.8W [not H, F]	12a. D + H + F + W [not S]
3b. 1.2D + 1.6S + 0.8W [not H, F, L]	13a. D + H + F + 0.75W + 0.75L + 0.75S
4. 1.2D + 1.6W + 1.0L + 0.5S [not H, F]	12a. D + H + F + W [not L, S]
4. 1.2D + 1.6W + 1.0L + 0.5S [not H, F]	13a. D + H + F + 0.75W + 0.75L + 0.75S
5. 1.2D + 1.0E + 1.0L + 0.2S [not H, F]	12b. D + H + F + 0.7E [not L, S]
5. 1.2D + 1.0E + 1.0L + 0.2S [not H, F]	13b. D + H + F + 0.75 (0.7E) + 0.75L + 0.75S
6. 0.9D + 1.6W + 1.6H	14. 0.6D + W + H
7. 0.9D + 1.0E + 1.6H	15. 0.6D + 0.7 E + H

Correlation of LRFD and Basic ASD load combinations with loads rearranged to facilitate review:

1. 1.4 (D+F)	8. D + F
2. 1.2 (D+F+T) + 1.6H + 1.6L + 0.5S	9. D + H + F + T + L [not S]
2. 1.2 (D+F+T) + 1.6H + 1.6L + 0.5S	10. D + H + F + S [not T, L]
2. 1.2 (D+F+T) + 1.6H + 1.6L + 0.5S	11. D + H + F + 0.75T + 0.75L + 0.75S
3a. 1.2D + 1.0L + 1.6S [not H, F, T]	9. D + H + F + T + L [not S]
3a. 1.2D + 1.0L + 1.6S [not H, F]	10. D + H + F + S [not L]
3a. 1.2D + 1.0L + 1.6S [not H, F, T]	11. D + H + F + 0.75T + 0.75L + 0.75S
3b. 1.2D + 1.6S + 0.8W [not H, F]	12a. D + H + F + W [not S]
3b. 1.2D + 1.6S + 0.8W [not H, F, L]	13a. D + H + F + 0.75L + 0.75S + 0.75W
4. 1.2D + 1.0L + 0.5S + 1.6W [not H, F]	12a. D + H + F + W [not L, S]
4. 1.2D + 1.0L + 0.5S + 1.6W [not H, F]	13a. D + H + F + 0.75L + 0.75S + 0.75W
5. 1.2D + 1.0L + 0.2S + 1.0E [not H, F]	12b. D + H + F + 0.7E [not L, S]
5. 1.2D + 1.0L + 0.2S + 1.0E [not H, F]	13b. D + H + F + 0.75L + 0.75S + 0.75 (0.7E)
6. 0.9D + 1.6H + 1.6W	14. 0.6D + H + W
7. 0.9D + 1.6H + 1.0E	15. 0.6D + H + 0.7 E

Correlation of LRFD and Basic ASD load combinations with proposed changes from proposal originally submitted by the proponent to the ASCE 7 Committee ("T" shown for reference only):

1. 1.4 (D+F)	8. D + F
2. 1.2 (D+F+T) + 1.6H + 1.6L + 0.5S	9. D + H + F + T + L [not S]
2. 1.2 (D+F+T) + 1.6H + 1.6L + 0.5S	10. D + H + F + S [not T, L]
2. 1.2 (D+F+T) + 1.6H + 1.6L + 0.5S	11. D + H + F + 0.75T + 0.75L + 0.75S
3a. 1.2 (D+F+T) + 1.0 (L+H) + 1.6S [not H, F, T]	9. D + H + F + T + L [not S]
3a. 1.2 (D+F+T) + 1.0 (L+H) + 1.6S [not H, F]	10. D + H + F + S [not T, L]
3a. 1.2 (D+F+T) + 1.0 (L+H) + 1.6S [not H, F, T]	11. D + H + F + 0.75T + 0.75L + 0.75S
3b. 1.2 (D+F+T) + 1.6S + 0.8W [not H, F]	12a. D + H + F + W [not T, S]
3b. 1.2 (D+F+T) + 1.6S + 0.8W [not H, F, T]	13a. D + H + F + 0.75L + 0.75S + 0.75W
4. 1.2 (D+F) + 1.0 (L+H) + 0.5S + 1.6W [not H, F]	12a. D + H + F + W [not L, S]
4. 1.2 (D+F) + 1.0 (L+H) + 0.5S + 1.6W [not H, F]	13a. D + H + F + 0.75L + 0.75S + 0.75W
5. 1.2 (D+F) + 1.0 (L+H) + 0.2S + 1.0E [not H, F]	12b. D + H + F + 0.7E [not L, S]
5. 1.2 (D+F) + 1.0 (L+H) + 0.2S + 1.0E [not H, F]	13b. D + H + F + 0.75L + 0.75S + 0.75 (0.7E)
6. 0.9D + 1.6H + 1.6W	14. 0.6D + H + W
7. 0.9D + 1.6H + 1.0E	15. 0.6D + H + 0.7 E

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Brazil-S30-1605.2.1

S50–09/10
1605.2.1, 1605.3.1, 1605.3.2

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1605.2.1 Basic load combinations. Where strength design or load and resistance factor design is used, structures and portions thereof shall resist the most critical effects from the following combinations of factored loads:

1.4 (D + F) **(Equation 16-1)**

1.2 (D + F + T) + 1.6 (L + H)
+ 0.5 (L_r or S or R) **(Equation 16-2)**

1.2*D* + 1.6 (L_r or *S* or *R*) + (f_1*L* or 0.8*W*) **(Equation 16-3)**

1.2*D* + 1.6*W* + f_1*L* + 0.5 (L_r or *S* or *R*) **(Equation 16-4)**

1.2*D* + 1.0*E* + f_1*L* + ~~f_2~~ 0.2 *S* **(Equation 16-5)**

0.9D + 1.6W + 1.6H **(Equation 16-6)**

0.9D + 1.0E + 1.6H **(Equation 16-7)**

where:

f_1 = 1 for floors in places of public assembly, for live loads in excess of 100 pounds per square foot (4.79 kN/m^2), and for parking garage live load, and
= 0.5 for other live loads.
~~f_2 = 0.7 for roof configurations (such as saw tooth) that do not shed snow off the structure, and~~
~~= 0.2 for other roof configurations.~~

~~**Exception:** Where other factored load combinations are specifically required by the provisions of this code, such combinations shall take precedence.~~

1605.3.1 Basic load combinations. Where allowable stress design (working stress design), as permitted by this code, is used, structures and portions thereof shall resist the most critical effects resulting from the following combinations of loads:

$D + F$ **(Equation 16-8)**

$D + H + F + L + T$ **(Equation 16-9)**

$D + H + F + (L_r \text{ or } S \text{ or } R)$ **(Equation 16-10)**

$D + H + F + 0.75 (L + T) + 0.75 (L_r \text{ or } S \text{ or } R)$ **(Equation 16-11)**

$D + H + F + (W \text{ or } 0.7E)$ **(Equation 16-12)**

$D + H + F + 0.75 (W \text{ or } 0.7E) + 0.75L + 0.75 (L_r \text{ or } S \text{ or } R)$ **(Equation 16-13)**

$0.6D + W + H$ **(Equation 16-14)**

$0.6D + 0.7E + H$ **(Equation 16-15)**

Exceptions:

1. ~~1.~~ Crane hook loads need not be combined with roof live load or with more than three-fourths of the snow load or one-half of the wind load.
2. ~~2. Flat roof snow loads of 30 psf (1.44 kN/m^2) or less and roof live loads of 30 psf or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf (1.44 kN/m^2), 20 percent shall be combined with seismic loads.~~

1605.3.2 Alternative basic load combinations. In lieu of the basic load combinations specified in Section 1605.3.1, structures and portions thereof shall be permitted to be designed for the most critical effects resulting from the following combinations. When using these alternate basic load combinations that include wind or seismic loads, allowable stresses are permitted to be increased or load combinations reduced, where permitted by the material chapter of this code or the referenced standards. For load combinations that include the counteracting effects of dead and wind loads, only two-thirds of the minimum dead load likely to be in place during a design wind event shall be used. Where wind loads are calculated in accordance with Chapter 6 of ASCE 7, the coefficient ω in the following equations shall be taken as 1.3. For other wind loads, ω shall be taken as 1.0. When using these alternative load combinations to evaluate sliding, overturning and soil bearing at the soil-structure interface, the reduction of foundation overturning from Section 12.13.4 in ASCE 7 shall not be used. When using these alternative basic load combinations for proportioning foundations for loadings, which include seismic loads, the vertical seismic load effect, E_v, in Equation 12.4-4 of ASCE 7 is permitted to be taken equal to zero.

$D + L + (L_r \text{ or } S \text{ or } R)$ **(Equation 16-16)**

$D + L + (\omega W)$ **(Equation 16-17)**

$D + L + \omega W + S/2$ **(Equation 16-18)**

$D + L + S + \omega W/2$ **(Equation 16-19)**

$D + L + S + E/1.4$ **(Equation 16-20)**

$0.9D + E/1.4$ **(Equation 16-21)**

Exceptions:

1. Crane hook loads need not be combined with roof live load or with more than three-fourths of the snow load or one-half of the wind load.
2. Flat roof snow loads of 30 psf (1.44 kN/m^2) or less and roof live loads of 30 psf or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf (1.44 kN/m^2), 20 percent shall be combined with seismic loads.

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. Most of the provisions being deleted were the product of a legacy code (UBC Section 1612.2.1 for roof configurations and Exception 1 to Section 1612.3.2 for snow and seismic loads). They have not appeared in recent editions of ASCE 7 and there are no proposals being considered by the committees of ASCE 7 to add them to the 2010 edition.

The exception to Section 1605.2.1 for factored load combinations in other sections of the IBC taking precedence over the Strength/LRFD load combinations in Section 1605.2.1 has been in the IBC since the 2003 edition. In that edition, there were other factored load combinations in Section 1605.4. They have since been removed from the IBC by Proposal S8-06/07-AMPC2,3 and there are no other factored load combinations in the IBC. Thus, the exception no longer serves a purpose and should be deleted.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S49-1605.2.1

S51–09/10
1605.2.1, 1605.3.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1605.2.1 Basic load combinations. Where strength design or load and resistance factor design is used, structures and portions thereof shall resist the most critical effects from the following combinations of factored loads:

$1.4\,(D + F)$ **(Equation 16-1)**

$1.2\,(D + F + T) + 1.6\,(L + H) + 0.5\,(L_r \text{ or } S \text{ or } R)$ **(Equation 16-2)**

$1.2D + 1.6\,(L_r \text{ or } S \text{ or } R) + (f_1 L \text{ or } \sout{0.8}\ \underline{0.5}\ W)$ **(Equation 16-3)**

$1.2D + \sout{1.6}\ \underline{1.0}\ W + f_1 L + 0.5\,(L_r \text{ or } S \text{ or } R)$ **(Equation 16-4)**

$1.2D + 1.0E + f_1 L + f_2 S$ **(Equation 16-5)**

$0.9D + \sout{1.6}\ \underline{1.0}\ W + 1.6H$ **(Equation 16-6)**

$0.9D + 1.0E + 1.6H$ **(Equation 16-7)**

where:

f_1 = 1 for floors in places of public assembly, for live loads in excess of 100 pounds per square foot (4.79 kN/m^2), and for parking garage live load, and
= 0.5 for other live loads.

f_2 = 0.7 for roof configurations (such as saw tooth) that do not shed snow off the structure, and
= 0.2 for other roof configurations.

Exception: Where other factored load combinations are specifically required by the provisions of this code, such combinations shall take precedence.

1605.3.1 Basic load combinations. Where allowable stress design (working stress design), as permitted by this code, is used, structures and portions thereof shall resist the most critical effects resulting from the following combinations of loads:

$D + F$ **(Equation 16-8)**

$D + H + F + L + T$ **(Equation 16-9)**

$D + H + F + (L_r \text{ or } S \text{ or } R)$ **(Equation 16-10)**

$D + H + F + 0.75 (L + T) + 0.75 (L_r \text{ or } S \text{ or } R)$ **(Equation 16-11)**

$D + H + F + (\underline{0.6}\ W \text{ or } 0.7E)$ **(Equation 16-12)**

$D + H + F + 0.75 (\underline{0.6}\ W \text{ or } 0.7E) + 0.75L + 0.75 (L_r \text{ or } S \text{ or } R)$ **(Equation 16-13)**

$0.6D + \underline{0.6}\ W + H$ **(Equation 16-14)**

$0.6D + 0.7E + H$ **(Equation 16-15)**

Exceptions:

1. Crane hook loads need not be combined with roof live load or with more than three-fourths of the snow load or one-half of the wind load.
2. Flat roof snow loads of 30 psf (1.44 kN/m^2) or less and roof live loads of 30 psf or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf (1.44 kN/m^2), 20 percent shall be combined with seismic loads.

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. The need for correlation is due to ASCE 7 Proposal LCSC LC-10-R1, which has been approved by the Load Combinations Subcommittee and is being balloted by the Main Committee (Item #17 of the Second Main Committee Ballot on Load Combinations). It is expected that the Main Committee will approve the proposal.

In the load combinations of Section 1605.2.1 for strength/LRFD design, the load factors on wind load are being reduced because of the change in the specification of the design wind speed in Chapter 6 of ASCE 7-10. The wind speed in ASCE 7-10 is mapped at much longer return periods than in ASCE 7-05 (700-1700 years depending on occupancy category), which eliminates a discontinuity in risk between hurricane-prone coastal areas and the remainder of the country and better aligns the treatment of wind and earthquake effects.

Corresponding reductions are made to the basic load combinations for allowable stress design in Section 1605.3.1.

Note that this proposal does not contain similar changes to the alternative basic load combinations in Section 1605.3.2. The ASCE 7 proposal described above does not address these load combinations because they are not included in ASCE 7. Revisions to the alternative basic load combinations for compatibility with the revisions to the wind load provisions in ASCE 7-10 should be pursued by others. The deletion of the alternative basic load combinations is the subject of a separate proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S52-1605.2.1

S52–09/10

1602.1, 1605.2.1, 1605.2.2, 1605.3.1, 1605.3.1.2, 1605.3.2.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1602.1 Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

NOTATIONS.

D = Dead load.
E = Combined effect of horizontal and vertical earthquake induced forces as defined in Section 12.4.2 of ASCE 7.
F = Load due to fluids with well-defined pressures and maximum heights.
F_a = Flood load in accordance with Chapter 5 of ASCE 7.
H = Load due to lateral earth pressures, ground water pressure or pressure of bulk materials.
L = Live load, except roof live load, including any permitted live load reduction.
L_r = Roof live load including any permitted live load reduction.
R = Rain load.
S = Snow load.
T = Self-straining ~~force arising from contraction or expansion resulting from temperature change, shrinkage, moisture change, creep in component materials, movement due to differential settlement or combinations thereof~~ load.
W = Load due to wind pressure.

1605.2.1 Basic load combinations. Where strength design or load and resistance factor design is used, structures and portions thereof shall resist the most critical effects from the following combinations of factored loads:

1.4 (D + F) **(Equation 16-1)**

1.2 (D + F ~~+ T~~) + 1.6 (L + H) +
0.5 (L_r or S or R) **(Equation 16-2)**

1.2*D* + 1.6 (L_r or *S* or *R*) + (f_1L or 0.8*W*) **(Equation 16-3)**

1.2*D* + 1.6*W* + f_1L + 0.5 (L_r or *S* or *R*) **(Equation 16-4)**

1.2*D* + 1.0*E* + f_1L + f_2S **(Equation 16-5)**

0.9D + 1.6W + 1.6H **(Equation 16-6)**

0.9D + 1.0E + 1.6H **(Equation 16-7)**

where:

f_1 = 1 for floors in places of public assembly, for live loads in excess of 100 pounds per square foot (4.79 kN/m^2), and for parking garage live load, and
= 0.5 for other live loads.
f_2 = 0.7 for roof configurations (such as saw tooth) that do not shed snow off the structure, and
= 0.2 for other roof configurations.

Exception: Where other factored load combinations are specifically required by the provisions of this code, such combinations shall take precedence.

1605.2.2 ~~Flood~~ Other loads. Where flood loads, F_a, are to be considered in the design, the load combinations of Section 2.3.3 of ASCE 7 shall be used. Where self-straining loads, *T*, are considered in design, their structural effects in combination with other loads shall be determined in accordance with Section 2.3.5 of ASCE 7.

1605.3.1 Basic load combinations. Where allowable stress design (working stress design), as permitted by this code, is used, structures and portions thereof shall resist the most critical effects resulting from the following combinations of loads:

D + F **(Equation 16-8)**

D + H + F + L ~~+ T~~ **(Equation 16-9)**

D + H + F + (L_r or S or R) **(Equation 16-10)**

D + H + F + 0.75 (L ~~+ T~~) +

0.75 (L_r or S or R) **(Equation 16-11)**

D + H + F + (W or 0.7E) **(Equation 16-12)**

D + H + F + 0.75 (W or 0.7E)
+ 0.75L + 0.75 (L_r or S or R) **(Equation 16-13)**

0.6D + W + H **(Equation 16-14)**

0.6D + 0.7E + H **(Equation 16-15)**

Exceptions:

1. Crane hook loads need not be combined with roof live load or with more than three-fourths of the snow load or one-half of the wind load.
2. Flat roof snow loads of 30 psf (1.44 kN/m^2) or less and roof live loads of 30 psf or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf (1.44 kN/m^2), 20 percent shall be combined with seismic loads.

1605.3.1.2 ~~Flood~~ Other loads. Where flood loads, F_a, are to be considered in design, the load combinations of Section 2.4.2 of ASCE 7 shall be used. Where self-straining loads, *T*, are considered in design, their structural effects in combination with other loads shall be determined in accordance with Section 2.4.4 of ASCE 7.

1605.3.2.1 Other loads. Where *F*, *H* or *T* are to be considered in design, each applicable load shall be added to the combinations specified in Section 1605.3.2. Where self-straining loads, *T*, are considered in design, their structural effects in combination with other loads shall be determined in accordance with Section 2.4.4 of ASCE 7.

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. The need for correlation is due to ASCE 7 Proposal LCSC LC-1-R1, which has been approved by the Load Combinations Subcommittee and is being balloted by the Main Committee (Item #4 of the Second Main Committee Ballot on Load Combinations). It is expected that the Main Committee will approve the proposal.

Self-straining forces are important to the design of many types of structures, for example, the pretensioning and post-tensioning forces in prestressed concrete structures. The self-straining load, *T*, has been in the load combinations of IBC Section 1605 since the 2003 edition, all editions of ASCE 7, and ANSI A58.1-72. However, a consensus emerged within the ASCE 7 Committee to remove *T* from the load combinations of Section 2.3 for strength/LRFD design and Section 2.4 for allowable stress design in favor of text in new Sections 2.3.5 and 2.4.4 requiring consideration of *T* and additional commentary. This is similar to what had been in ASCE 7 prior to the 1995 edition. For example, the load combinations in Sections 2.3 and 2.4 of ASCE 7-88 and ASCE 7-93 did not include *T* but Section 2.3.2 for allowable stress design and Section 2.4.3 for strength design stated that the structural effects of *T* (as well as *F*, *H* and *P*) "shall be considered in design."

Note that the statements being added to Sections 1605.2.2, 1605.3.1.2 and 1605.3.2.1 for self-straining loads, *T*, do not constitute charging text. They are cross references to Section 2.3.5 of ASCE 7-10 for Strength/LRFD load combinations and Section 2.4.4 of ASCE 7-10 for ASD load combinations, which provide the necessary charging text.

The statements in Sections 1605.2.2 and 1605.3.1.2 on flood loads, F_a, also do not constitute charging text but Section 1612.1 serves as the charging text for flood loads in the IBC in that it requires buildings, structures and portions thereof to be designed and constructed to resist the effects of flood loads in flood hazard areas. The revisions in this proposal may appear to eliminate charging text for *T* but the 2009 IBC contains no such charging text except indirectly through the definition of *T* in Section 1602.1.

Although Section 1605.3.2.1 on other loads for use with the alternative basic load combinations is being modified in this proposal, the deletion of these load combinations is the subject of a separate proposal. Should the deletion of the alternative basic load combinations be approved by the ICC membership, it is not the intent of the proponent to retain Section 1605.3.2.1 in the 2012 IBC for the purpose of adding the statement in this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S42-1602.1

S53–09/10
1605.3.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1605.3.1 Basic load combinations. Where allowable stress design (working stress design), as permitted by this code, is used, structures and portions thereof shall resist the most critical effects resulting from the following combinations of loads:

$D + F$ **(Equation 16-8)**

$D + H + F + L + T$ **(Equation 16-9)**

$D + H + F + (L_r \text{ or } S \text{ or } R)$ **(Equation 16-10)**

$D + H + F + 0.75 (L + T) +$
$0.75 (L_r \text{ or } S \text{ or } R)$ **(Equation 16-11)**

$D + H + F + (W \text{ or } 0.7 E)$ **(Equation 16-12)**

$D + H + F + 0.75 (W \text{ or } 0.7 E) +$
$0.75 L + 0.75 (L_r \text{ or } S \text{ or } R)$ **(Equation 16-13)**

$0.6 D + W + H$ **(Equation 16-14)**

$0.6 D + 0.7 E + H$ **(Equation 16-15)**

Exceptions:

1. Crane hook loads need not be combined with roof live load or with more than three-fourths of the snow load or one-half of the wind load.
2. Flat roof snow loads of 30 psf (1.44 kN/m^2) or less and roof live loads of 30 psf or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf (1.44 kN/m^2), 20 percent shall be combined with seismic loads.
3. <u>In Equation 16-14, the wind load, *W*, is permitted to be reduced 10 percent for design of the foundation other than anchorage of the structure to the foundation.</u>
4. <u>In Equation 16-15, 0.6 *D* is permitted to be increased to 0.9 *D* for the design of special reinforced masonry shear walls complying with Chapter 21.</u>

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. The need for correlation is due to ASCE 7 Proposal LCSC LC-4, which has been approved by the Load Combinations Subcommittee (LCSC) and is being balloted by the Main Committee (Item #3 of the Second Main Committee Ballot on Load Combinations). It is expected that the Main Committee will approve the proposal.
The current ASD counteracting load combinations in Equations 16-14 and 16-15 are needed to maintain consistency with the Strength/LRFD counteracting load combinations in Equations 16-6 and 16-7 (Section 1605.2.1). Predictability of dead load cannot justify increasing the ASD counteracting dead load factor from 0.6 because of the large variability in the destabilizing force due to wind or earthquake forces. However, where the effects of fluctuating wind forces are aggregated at the foundation, a measure of conservatism is introduced with a dead load factor of 0.6 due to area-averaging, which justifies an increase. Rather than increase the dead load factor in ASD Load Combination 7 of ASCE-7 (IBC Equation 16-14), the LCSC concluded it was more rational to reduce the wind effects (Exception #3) for evaluating global stability, bearing and uplift at the structure-foundation interface. Similar approaches are taken for seismic actions in Exception #2 of Section 12.4.2.2 and in Section 12.13.4 of ASCE 7-05.

Exception #4 for special reinforced masonry shear walls is being added due to the determination of seismic load effects reduced by the response modification coefficient, R, which means that inelastic action occurs before reaching the limit state. In special reinforced masonry shear walls designed in accordance with Chapter 21, there is a minimum quantity or vertical reinforcement, a conservative value of allowable stress is assumed in proportioning the reinforcement, and there is protection against premature crushing at the compression face. Given these, the limit state of unrestrained overturning is not judged to be a concern, justifying the increase from 0.6 to 0.9 in the load factor for D in Equation 16-15.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S19-1605.3.1

S54–09/10
1605.1, 1605.3.1, 1605.3.2, 1605.3.2.1, 1806.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

1. Revise as follows:

1605.1 General. Buildings and other structures and portions thereof shall be designed to resist:

1. The load combinations specified in Section 1605.2~~, 1605.3.1 or 1605.3.2~~ <u>or 1605.3</u>,
2. The load combinations specified in Chapters 18 through 23, and

3. The load combinations with overstrength factor specified in Section 12.4.3.2 of ASCE 7 where required by Section 12.2.5.2, 12.3.3.3 or 12.10.2.1 of ASCE 7. With the simplified procedure of ASCE 7 Section 12.14, the load combinations with overstrength factor of Section 12.14.3.2 of ASCE 7 shall be used.

Applicable loads shall be considered, including both earthquake and wind, in accordance with the specified load combinations. Each load combination shall also be investigated with one or more of the variable loads set to zero.

Where the load combinations with overstrength factor in Section 12.4.3.2 of ASCE 7 apply, they shall be used as follows:

1. The basic combinations for strength design with overstrength factor in lieu of Equations 16-5 and 16-7 in Section 1605.2.1.
2. The basic combinations for allowable stress design with overstrength factor in lieu of Equations 16-12, 16-13 and 16-15 in Section ~~1605.3.1~~ 1605.3.
3. ~~The basic combinations for allowable stress design with overstrength factor in lieu of Equations 16-20 and 16-21 in Section 1605.3.2.~~

1605.3 Load combinations using allowable stress design.

~~1605.3.1 Basic load combinations.~~ Where allowable stress design ~~(working stress design)~~, as permitted by this code, is used, buildings and other structures, and portions thereof, shall be designed to resist the most critical effects resulting from the following combinations of loads:

$D+F$ **(Equation 16-8)**

$D+H+F+L+T$ **(Equation 16-9)**

$D+H+F+(L_r \text{ or } S \text{ or } R)$ **(Equation 16-10)**

$D+H+F+0.75(L+T)+0.75(L_r \text{ or } S \text{ or } R)$ **(Equation 16-11)**

$D+H+F+(W \text{ or } 0.7E)$ **(Equation 16-12)**

$D+H+F+0.75(W \text{ or } 0.7E)+0.75L+0.75(L_r \text{ or } S \text{ or } R)$ **(Equation 16-13)**

$0.6D+W+H$ **(Equation 16-14)**

$0.6D+0.7E+H$ **(Equation 16-15)**

Exceptions:

1. Crane hook loads need not be combined with roof live load or with more than three-fourths of the snow load or one-half of the wind load.
2. Flat roof snow loads of 30 psf (1.44 kN/m^2) or less and roof live loads of 30 psf or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf (1.44 kN/m^2), 20 percent shall be combined with seismic loads.

2. Delete without substitution:

~~**1605.3.2 Alternative basic load combinations.** In lieu of the basic load combinations specified in Section 1605.3.1, structures and portions thereof shall be permitted to be designed for the most critical effects resulting from the following combinations. When using these alternate basic load combinations that include wind or seismic loads, allowable stresses are permitted to be increased or load combinations reduced, where permitted by the material chapter of this code or the referenced standards. For load combinations that include the counteracting effects of dead and wind loads, only two-thirds of the minimum dead load likely to be in place during a design wind event shall be used. Where wind loads are calculated in accordance with Chapter 6 of ASCE 7, the coefficient ω in the following equations shall be taken as 1.3. For other wind loads, ω shall be taken as 1.0. When using these alternative load combinations to evaluate sliding, overturning and soil bearing at the soil-structure interface, the reduction of foundation overturning from Section 12.13.4 in ASCE 7 shall not be used. When using these alternative basic load combinations~~

~~for proportioning foundations for loadings, which include seismic loads, the vertical seismic load effect, E_v, in Equation 12.4-4 of ASCE 7 is permitted to be taken equal to zero.~~

~~$D + L + (L_r$ or S or $R)$~~ **(Equation 16-16)**

~~$D + L + (\omega W)$~~ **(Equation 16-17)**

~~$D + L + \omega W + S/2$~~ **(Equation 16-18)**

~~$D + L + S + \omega W/2$~~ **(Equation 16-19)**

~~$D + L + S + E/1.4$~~ **(Equation 16-20)**

~~$0.9D + E/1.4$~~ **(Equation 16-21)**

~~Exceptions:~~

1. ~~Crane hook loads need not be combined with roof live load or with more than three-fourths of the snow load or one-half of the wind load.~~
2. ~~Flat roof snow loads of 30 psf (1.44 kN/m^2) or less and roof live loads of 30 psf or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf (1.44 kN/m^2), 20 percent shall be combined with seismic loads.~~

~~1605.3.2.1 Other loads.~~ ~~Where F, H or T are to be considered in design, each applicable load shall be added to the combinations specified in Section 1605.3.2.~~

3. Revise as follows:

1806.1 Load combinations. The presumptive load-bearing values provided in Table 1806.2 shall be used with the allowable stress design load combinations specified in Section 1605.3. ~~The values of vertical foundation pressure and lateral bearing pressure given in Table 1806.2 shall be permitted to be increased by one-third where used with the alternative basic load combinations of Section 1605.3.2 that include wind or earthquake loads.~~

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. Most of the provisions being deleted were the product of a legacy code. They have not appeared in recent editions of ASCE 7 nor are they likely to appear in the 2010 edition.

The provisions of IBC Sections 1605.1 through 1605.3.1.2 for the load combinations using strength/LRDF design and the basic load combinations using allowable stress design are based on Chapter 2 of ASCE 7 (Combinations of Loads). The ASCE 7 Committee develops and maintains the provisions of Chapter 2 and has not chosen not to add provisions for alternative load combinations using allowable stress design into the standard. The differences between the basic and alternative load combinations are such that structural performance of buildings and other structures can be expected to differ depending on which set of load combinations using allowable stress design are utilized in the design. The ICC code development process does not provide the means for adequate deliberation over the merits of each set of load combinations using allowable stress design in providing adequate levels of public safety. This deliberation should be done by the ASCE 7 Committee.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S24-1605.1

S55–09/10
106.1, 1607.1.1

Proponent: Larry Brown, representing National Association of Home Builders

Delete Section 106, Relocate 106.1 to become 1607.1.1 as follows:

1607.1.1 ~~**106.1**~~ **Live loads posted.** Where the live loads for which each floor or portion thereof of a commercial or industrial building is or has been designed to exceed 50 psf (2.40 kN/m^2), such design live loads shall be conspicuously posted by the owner in that part of each *story* in which they apply, using durable signs. It shall be unlawful to remove or deface such notices

~~**106.2 Issuance of certificate of occupancy.** A certificate of occupancy required by Section 111 shall not be issued until the floor load signs, required by Section 106.1, have been installed.~~

(Moved to Section 109.2.1 in CCP ADM1-09/10)

~~106.3 Restriction on loading.~~ ~~It shall be unlawful to place, or cause or permit to be placed, on any floor or roof of a building, structure or portion thereof, a load greater than is permitted by this code.~~
(Moved to Section 102.11.2 in CCP ADM1-09/10)

Reason: The requirements for the actual determination and posting of the live load is better suited to be located with the actual provisions related to these live loads that are located in IBC Section 1607.1.1. This relocation of Section 106.41is similar to the provisions for Smoke Control Systems in Section 909.19, and a Change of Occupancy in Section 3408.2, both relative to the issuance of a Certificate of Occupancy.

Also, as show in a related proposed change, the requirement on restriction on loading of current Section 106.3 are moved to Section 102.11.2 (Specific application of the IBC), and the provisions on the issuance of a Certificate of Occupancy is located from Section 106.2 to Section 109.2 (Certificate of Completion and Occupancy).

Cost Impact: This code change proposal will not increase the cost of construction.

Note: Consideration in this code change proposal is for relocation of Section 106.1 to Section 1607.1.1. The relocation of Section s 106.2 to 109.2.1 and 106.3 to 102.11.2 are proposed for consideration by the Administrative Code Development Committee in CCC ADM1-09/10, and are shown for information only.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BROWN-S1-ITEM_#3_IBC_106_MOVED

S56-09/10
1603.1.3, Table 1607.1

Proponent: Philip Brazil, PE, SE, representing self

Revise as follows:

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS [g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
16. Garages (passenger vehicles only)	40	Note a
Trucks and buses	See Section	1607.6
Piled snow (from snow removal operations)	Note m	

(No changes to the remaining Table)

(No change to footnotes a through l)

m. Piled snow from snow removal operations shall be based on a density of 40 pounds per cubic foot and anticipated maximum depths subject to the approval of the building official.

1603.1.3 Roof snow load. The ground snow load, P_g, shall be indicated. In areas where the ground snow load, P_g, exceeds 10 pounds per square foot (psf) (0.479 kN/m^2), the following additional information shall also be provided, regardless of whether snow loads govern the design of the roof:

1. Flat-roof snow load, P_f.
2. Snow exposure factor, C_e.
3. Snow load importance factor, I.
4. Thermal factor, C_t.
5. Piled snow load from snow removal operations (see Table 1607.1).

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. The need for correlation is due to ASCE 7 Proposal LLSC-LL-4, which has been approved by the Live Load Subcommittee. It is expected that the Main Committee will ballot and approve the proposal. The specified density is based on case histories primarily conducted in the northeast region of the United States. The snow was typically piled using a utility vehicle or a truck with an attached plow. The density was either directly determined through measurements or derived based on the expected failure load. The observed densities ranged form 25 to 46 pcf.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: Brazil-S2-T1607.1

S57-09/10
Table 1607.1; IRC Table R301.5

Proponent: Philip Brazil, PE, SE, representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC RESIDENTIAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES

Part I—IBC Structural:

Revise as follows:

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS [g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
27. Residential		
One- and two-family dwellings		
Uninhabitable attics without storage [i]	10	
Uninhabitable attics with ~~limited~~ storage [i, j, k]	20	
Habitable attics and sleeping areas [k]	30	–
All other areas	40	
Hotels and multiple-family dwellings		
Private rooms and corridors serving them	40	
Public rooms and corridors serving them	100	

(No changes to the remaining Table not shown)

(No change to footnotes a through h)

I. Uninhabitable attics without storage are those where the maximum clear height between the joist and rafter is less than 42 inches, or where there are not two or more adjacent trusses with ~~the same~~ web configurations capable of ~~containing a~~ accommodating an assumed rectangle 42 inches ~~high~~ in height by ~~2 feet wide~~ 24 inches in width, or greater, ~~located~~ within the plane of the trusses. ~~For attics without storage~~, This live load need not be assumed to act concurrently with any other live load requirements.

j. ~~For~~ Uninhabitable attics with ~~limited~~ storage ~~and constructed with trusses, this live load need only be applied to those portions of the bottom chord~~ are those where the maximum clear height between the joist and rafter is 42 inches or greater, or where there are two or more adjacent trusses with ~~the same~~ web configurations ~~containing a~~ capable of accommodating an assumed rectangle 42 inches ~~high~~ in height by ~~2 feet wide~~ 24 inches in width, or greater, ~~located~~ within the plane of the trusses. ~~The rectangle shall fit between the top of the bottom chord and the bottom of any other truss member, provided that each of the following criteria is met~~

At the trusses, the live load need only be applied to those portions of the bottom chords where both of the following conditions are met:

i. The attic area is accessible ~~by a pull-down stairway or framed opening in accordance with Section 1209.2~~ from an opening not less than 20 inches in width by 30 inches in length that is located where the clear height in the attic is a minimum of 30 inches; and

ii. The slopes of the truss ~~shall have a~~ bottom chords ~~pitch less than 2:12~~ are no greater than 2 units vertical to 12 units horizontal.

~~iii.~~ The remaining portions of the bottom chords ~~of trusses~~ shall be designed for ~~the greater of actual imposed dead load or 10 psf,~~ a uniformly distributed ~~over the entire span~~ concurrent live load of not less than 10 lb/ft^2.

k. Attic spaces served by ~~a fixed stair~~ stairways other than pull-down type shall be designed to support the minimum live load specified for habitable attics and sleeping rooms.

(No change to footnote l)

Part II: IRC

Revise as follows:

TABLE R301.5
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS
(in pounds per square foot)

USE	LIVE LOAD
Uninhabitable attics without storage [b]	10
Uninhabitable attics with ~~limited~~ storage [b, g]	20
Habitable attics and attics served with fixed stairs	30

(No changes to the remaining Table not shown)

(No change to footnote a)

b. Uninhabitable attics without storage are those where the maximum clear height between the joist and rafter is less than 42 inches, or where there are not two or more adjacent trusses with ~~the same~~ web configurations capable of ~~containing a~~ accommodating an assumed rectangle 42 inches ~~high~~ in height by ~~2 feet wide~~ 24 inches in width, or greater, ~~located~~ within the plane of the trusses. ~~For attics without storage,~~ This live load need not be assumed to act concurrently with any other live load requirements.

(No change to footnotes c through f)

g. ~~For~~ Uninhabitable attics with ~~limited~~ storage ~~and constructed with trusses, this live load need be applied only to those portions of the bottom chord~~ are those where the maximum clear height between the joist and rafter is 42 inches or greater, or where there are two or more adjacent trusses with ~~the same~~ web configurations ~~containing a~~ capable of accommodating an assumed rectangle 42 inches ~~high or greater~~ in height by ~~2 feet wide~~ 24 inches in width, or greater, ~~located~~ within the plane of the trusses. ~~The rectangle shall fit between the top of the bottom chord and the bottom of any other truss member, provided that each of the following criteria is met~~

At the trusses, the live load need only be applied to those portions of the bottom chords where all of the following conditions are met:

1. The attic area is accessible ~~by a pull-down stairway or framed opening in accordance with Section R807.1~~ from an opening not less than 20 inches in width by 30 inches in length that is located where the clear height in the attic is a minimum of 30 inches.
2. The slopes of the truss ~~has a~~ bottom chords ~~pitch less than 2:12~~ are no greater than 2 units vertical to 12 units horizontal.
3. Required insulation depth is less than the bottom chord member depth.

The remaining portions of the bottom chords ~~of trusses meeting the above criteria for limited storage~~ shall be designed for ~~the greater of the actual imposed dead load or 10 psf,~~ a uniformly distributed ~~over the entire span~~ concurrent live load of not less than 10 lb/ft^2.

(No change to footnote h)

Reason: The purpose for this proposal is to correlate the IBC and IRC with the 2010 edition of ASCE 7. The need for correlation is due to ASCE 7 Proposal LLSC-LL-9, which has been approved by the Live Load Subcommittee and is being balloted by the Main Committee (Item #5 of the Second Main Committee Ballot on Live/Dead Load Provisions). It is expected that the Main Committee will approve the proposal.
The changes are seen as largely editorial. In Footnotes (i) and (j), the threshold that is based on a 24-inch by 42-inch rectangular is changed to an assumed condition (rather than an actual one), which is considered more appropriate for a building code requirement.
In Footnote (j), the reference to "a pull-down stairway or framed opening in accordance with Section 1209.2" is replaced with minimum opening dimensions that are consistent with IBC Section 1209.2 on openings to attic areas. These dimensions are objective and considered more appropriate for a building code requirement, whereas "pull-down stairway" and "framed opening" are considered vague and subject to a wide variation in interpretation.

In Footnote (k), the reference to a "fixed stair" is changed to "stairways other than pull-down type" in conjunction with the deletion of "pull-down type stairway" in Footnote (j) and for consistency with the definitions of "stair" and "stairway" in Section 1002.1. These definitions apply to all instances of the terms throughout the IBC. "Stair" is a "change in elevation consisting of one or more risers." "Stairway" is "one or more flights of stairs…with the necessary landings and platforms connecting them to form a continuous and uninterrupted passage form one level to another" and is the better choice for the footnote. The change will revise the footnote to better convey its intent: require an otherwise uninhabitable attic to be designed for live loads specified for habitable attics where the attic is served by a stairway that could enable it become occupiable. The current threshold of "fixed stair" before design for live loads specified for habitable attics is required is considered vague and subject to a wide variation in interpretation.

In Table 1607.1 and Footnote (j), "limited" at uninhabitable attics with storage is considered superfluous and is deleted. The three categories of uninhabitable attics without storage, uninhabitable attics with storage and habitable attics are sufficiently clear to account for all design conditions. Retaining "limited" begs the question: what is an uninhabitable attic with more than limited storage?

Cost Impact: The code change proposal will not increase the cost of construction.

PART I- IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II- IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: Brazil-S3-T1607.1

S58–09/10
Table 1607.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS [g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
4. Assembly areas and theaters		
Fixed seats (fastened to floor)	60	
~~Follow spot, projections and control rooms~~	~~50~~	
Lobbies	100	–
Movable seats	100	
Stages ~~and~~	~~125~~ 150	
Platforms	100	
Other assembly areas	100	

(Portions of Table not shown, remain unchanged)

Reason The primary purpose for this proposal is to align IBC Table 1607.1 with Table 4-1 of ASCE 7, which specifies separate live loads of 150 psf for stages and 100 psf for platforms in assembly areas. Follow spot, projection and control rooms are being deleted from Table 1607.1 because they are not listed in Table 4-1 of ASCE 7 and a uniform live load of 60 psf for projection rooms conflicts with Table C4-1 of ASCE-7, which specifies a uniform live load of 100 psf. With these changes, the items under "assembly areas" in Table 1607.1 will be within the scope of areas within assembly occupancies where live loads due to assembly use are warranted. There are areas of buildings with assembly occupancies, such as control rooms and dressing rooms, where classification as assembly occupancies are not warranted. Such areas are not listed with "assembly areas" in Table 4-1 of ASCE 7 and will no longer be listed with "assembly areas" in IBC Table 1607.1.

A separate proposal correlates the IBC with changes to the provisions of ASCE 7-10 where reduction of live loads at floors and occupied roofs is restricted or prohibited. That proposal adds Footnote (m) to all the uniform live loads under assembly areas in Item #4 of Table 1607.1 except follow spot, projection and control rooms. The addition of the footnote is not repeated in this proposal but, should this proposal and the proposal adding the footnote be approved by the membership, the proponent intends that Footnote (m) be specified with each uniform live load at Item #4 in Table 1607.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Brazil-S16-T1607.1

S59–09/10
Table 1607.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS [g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
35. ~~Stairs and exits~~ Stairways and ramps		Note f
One- and two-family dwellings	40	
All other	100	
39. Walkways and elevated platforms (other than ~~exitways~~ means of egress)	60	–

(Portions of Table not shown, remain unchanged)

Reason: The purpose for this proposal is to more clearly identify the live loads required for components of the means of egress, including corridors, stairways and ramps. In Item 35, "stair" does not account for landings to or from, or intermediate landings between, flights of stairs. In Section 1002.1, "stair" is defined as a "change in elevation consisting of one or more risers" and "stairway" is defined as "one or more flights of stairs…with the necessary landings and platforms connecting them to form a continuous and uninterrupted passage form one level to another." Stairway is a more technically sound choice.

Also in Item 35, “exit” is one of three components of the means of egress along with the exit access and exit discharge. The distinction between them is related to the requirements of Chapter 10 for the means of egress, not live loads. In Item 39, “exitway” has no technical meaning and is too easily confused with corridors whose live loads are typically required to be the same as the occupancy served.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S44-T1607.1

S60–09/10

1605.2.1, Table 1607.1, 1607.9.1, 1607.9.1.4, 1607.9.2, 1607.11.2.2

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

1. Revise as follows:

1605.2.1 Basic load combinations. Where strength design or load and resistance factor design is used, structures and portions thereof shall resist the most critical effects from the following combinations of factored loads:

1.4 (*D* + *F)*	**(Equation 16-1)**
1.2 (*D* + *F* + *T)* + 1.6 (*L* + *H)* + *0.5 (*L_r *or S or R*)	**(Equation 16-2)**
1.2 *D* + 1.6 (L_r or *S* or *R*) + (f_1 *L* or 0.8 *W*)	**(Equation 16-3)**
1.2 *D* + 1.6 *W* + f_1 *L* + 0.5 (L_r or *S* or *R*)	**(Equation 16-4)**
1.2 *D* + 1.0 *E* + f_1 *L* + f_2 *S*	**(Equation 16-5)**
0.9 *D* + 1.6 *W* + 1.6 *H*	**(Equation 16-6)**
0.9 *D* + 1.0 *E* + 1.6 *H*	**(Equation 16-7)**

where:

f_1 = 1 for floors in ~~places of public~~ assembly areas and recreational uses (see Table 1607.1), for live loads, *L*, in excess of 100 pounds per square foot (4.79 kN/m^2), and for ~~parking~~ floors in passenger vehicle garages ~~live load~~; and

= 0.5 for other live loads, *L*.

f_2 = 0.7 for roof configurations (such as saw tooth) that do not shed snow off the structure; and

= 0.2 for other roof configurations.

Exception: Where other factored load combinations are specifically required by the provisions of this code, such combinations shall take precedence.

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS [g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
3. Armories and drill rooms	150 [m]	–
4. Assembly areas and theaters		
Fixed seats (fastened to floor)	60 [m]	
Follow spot, projections and control rooms	50	
Lobbies	100 [m]	–
Movable seats	100 [m]	
Stages and platforms	125 [m]	
Other assembly areas	100 [m]	
~~6. Bowling alleys~~	~~75~~	~~–~~
~~10. Dance halls and ballrooms~~	~~100~~	~~–~~
~~11~~ 9. Dining rooms and restaurants	100 [m]	–
~~16~~ 14. Garages (passenger vehicles only)	40 [m]	Note a
Trucks and buses	See Section 1607.6	
~~17. Grandstands (see stadium and arena bleachers)~~	~~–~~	~~–~~
~~18. Gymnasiums, main floors and balconies~~	~~100~~	~~–~~
~~22~~ 18. Libraries		
Corridors above first floor	80	1,000

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
Reading rooms	60	1,000
Stack rooms	150 b, m	1,000
~~23~~ 19. Manufacturing		
Heavy	250 m	3,000
Light	125 m	2,000
23. Recreational uses:		
Bowling alleys, poolrooms and similar uses	75 m	
Dance halls and ballrooms	100 m	
Gymnasiums	100 m	
Reviewing stands, grandstands and bleachers	100 c, m	
Stadiums and arenas with fixed seats (fastened to floor)	60 c, m	
~~28. Reviewing stands, grandstands and bleachers~~		~~Note c~~
~~29~~ 25. Roofs:		
All roof surfaces subject to maintenance workers		300
Awnings and canopies:		
Fabric construction supported by a lightweight rigid skeleton structure	5 nonreducible	
All other construction	20	
Ordinary flat, pitched, and curved roofs	20	
Primary roof members, exposed to a work floor:		
Single panel point of lower chord of roof trusses or any point along primary structural members supporting roofs over manufacturing, storage warehouses, and repair garages		2,000
All other occupancies		300
Roofs used for other special purposes	Note l	Note l
Roofs used for promenade purposes	60	
Roofs used for roof gardens ~~or~~	100	
Roofs used for assembly purposes	100 m	
~~32~~ 28. Sidewalks, vehicular driveways and yards, subject to trucking	250 d, m	8,000 e
~~33. Skating rinks~~	~~100~~	–
~~34. Stadiums and arenas~~		
~~Bleachers~~	~~100 c~~	–
~~Fixed seats (fastened to floor)~~	~~60 c~~	
~~36~~ 30. Storage warehouses (shall be designed for heavier loads if required for anticipated storage)		
Heavy	250 m	–
Light	125 m	
~~37~~ 32. Stores		
Retail		
First floor	100	1,000
Upper floors	75	1,000
Wholesale, all floors	125 m	1,000
~~40~~ 35. Yards and terraces, pedestrian	100 m	–

(Portions of table not shown are unchanged)

c. Design in accordance with the ICC 300.
m. Live load reduction is not permitted unless specific exceptions of Section 1607.9 apply.

(Footnotes not shown are unchanged)

1607.9.1 General. Subject to the limitations of Sections 1607.9.1.1 through ~~1607.9.1.4~~ 1607.9.1.3 and Table 1607.1, members for which a value of $K_{LL} A_T$ is 400 square feet (37.16 m^2) or more are permitted to be designed for a reduced live load in accordance with the following equation:

$$L = L_o \left[0.25 + \frac{4.57}{\sqrt{K_{LL} A_T}}\right]$$

$$In\ SI: L = L_o \left[0.25 + \frac{4.57}{\sqrt{K_{LL} A_T}}\right]$$

(Equation 16-22)

where:

L = Reduced design live load per square foot (meter) of area supported by the member.
L_o = Unreduced design live load per square foot (meter) of area supported by the member (see Table 1607.1).
K_{LL} = Live load element factor (see Table 1607.9.1).
A_T = Tributary area, in square feet (square meters).

L shall not be less than 0.50 L_o for members supporting one floor and L shall not be less than 0.40 L_o for members supporting two or more floors.

2. Delete without substitution:

~~**1607.9.1.4 Group A occupancies.** Live loads of 100 psf (4.79 kN/m^2) and at areas where fixed seats are located shall not be reduced in Group A occupancies.~~

3. Revise as follows:

1607.9.2 Alternate floor live load reduction. As an alternative to Section 1607.9.1 and subject to the limitations of Table 1607.1, floor live loads are permitted to be reduced in accordance with the following provisions. Such reductions shall apply to slab systems, beams, girders, columns, piers, walls and foundations.

~~1.~~ ~~A reduction shall not be permitted in Group A occupancies.~~
~~2~~ 1. A reduction shall not be permitted when the live load exceeds 100 psf (4.79 kN/m^2) except that the design live load for members supporting two or more floors is permitted to be reduced by 20 percent.

Exception: For uses other than storage, where approved, additional live load reductions shall be permitted where shown by the registered design professional that a rational approach has been used and that such reductions are warranted.

~~3~~ 2. A reduction shall not be permitted in passenger vehicle parking garages except that the live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20 percent.
~~4~~ 3. For live loads not exceeding 100 psf (4.79 kN/m^2), the design live load for any structural member supporting 150 square feet (13.94 m^2) or more is permitted to be reduced in accordance with Equation 16-23.
~~5~~ 4. For one-way slabs, the area, A, for use in Equation 16-23 shall not exceed the product of the slab span and a width normal to the span of 0.5 times the slab span.

$R = 0.08\,(A - 150)$ **(Equation 16-23)**
For SI: $R = 0.861\,(A - 13.94)$

Such reduction shall not exceed the smallest of:

1. 40 percent for horizontal members,
2. 60 percent for vertical members, or
3. R as determined by the following equation:

$R = 23.1\,(1 + D / L_o)$ **(Equation 16-24)**

where:

A = Area of floor supported by the member, square feet (m^2).
D = Dead load per square foot (m^2) of area supported.
L_o = Unreduced live load per square foot (m^2) of area supported.
R = Reduction in percent.

1607.11.2.2 Special-purpose roofs. Roofs used for promenade purposes, roof gardens, assembly purposes or other special purposes, and marquees, shall be designed for a minimum live load, L_o, as specified in Table 1607.1. Such live loads are permitted to be reduced in accordance with Section 1607.9. ~~Live loads of 100 psf or more at areas of roofs classified as Group A occupancies shall not be reduced.~~

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. The need for correlation is due to ASCE 7 Proposals LLSC-LL9 and LLSC-LL11, which were approved by the Live Load Subcommittee and are being balloted by the Main Committee (Items #5 and #6 of the Second Main Committee Ballot on Live/Dead Load Provisions). It is expected that the Main Committee will approve the proposals.

The proposal focuses on correlating the IBC with changes to the provisions of ASCE 7-10 where reduction of live loads at floors and occupied roofs is restricted or prohibited. The applicable provisions in the IBC are currently located in Section 1607.9. Reduction of live loads is typically permitted except for live loads exceeding 100 psf, in passenger vehicle garages, and in Group A occupancies where the live load is 100 psf or where fixed seats are located. There are exceptions for members supporting two or more floors where the live load exceeds 100 psf or in passenger vehicle garages but the reduction is limited to 20 percent. The corresponding provisions in ASCE 7-05 are nearly identical except that Group A occupancies are identified as assembly occupancies.

The proposal adds a footnote to Table 1607.1 that prohibits live load reduction "unless specific exceptions of Section 1607.9 apply." The footnote is specified at each use or occupancy in Table 1607.1 where live load reduction is to be restricted. With the addition of this footnote, Table 1607.1 will contain limitations on live load reduction and references to Table 1607.1 are added to Sections 1607.9.1 and 1607.9.2 to correlate with the footnote. Section 1607.9.1.4 (basic live load reduction), Item #1 of Section 1607.9.2 (alternative live load reduction), and the last sentence of Section 1607.11.2.2, on Group A occupancies are deleted because their purpose is supplanted by the changes to Table 1607.1. Sections 1607.9.1.2 and 1607.9.1.3 (basic live load reduction) and Items #2 and #3 of Section 1607.9.2 (alternative live load reduction) are retained because they specify exceptions to Section 1607.9 that the proposed footnote of Table 1607.1 references.

These changes will clarify where live load reduction is prohibited or restricted by effectively specifying the requirement at each applicable use or occupancy in Table 1607.1 and they will align the applicable provisions of IBC Section 1607 with the corresponding provisions in Chapter 4 of ASCE 7-10. The change will also eliminate reliance on occupancy classification (Group A), which is not related to structural design but to fire- and life-safety regulations, for determination of whether live load reduction is permitted.

The proposal also consolidates several separately listed items in Table 1607.1 into a single category of recreational use and will align the table with Table 4-1 of ASCE 7-10. This is seen as simplifying the data in the table by grouping similar uses together. With respect to this consolidation, Section 1607.9.1.4 (basic live load reduction) and Item #1 of Section 1607.9.2 (alternative live load reduction) currently prohibit live load reduction in areas of Group A occupancies as noted above. IBC Section 303.1 lists bowling alleys, dance halls, gymnasiums, and pool and billiard parlors as Group A-3 occupancies; arenas and skating rinks as Group A-4 occupancies; and bleachers, grandstands and stadiums as Group A-5 occupancies.

Skating rinks are deleted from Table 1607.1 rather than being an item under "recreational uses" in Table 1607.1 because it is not listed in Table 4-1 of ASCE 7 and it conflicts with Table C4-1 of ASCE-7, which specifies uniform live loads of 250 psf for ice skating rinks and 100 psf for roller skating rinks.

The application of a value of 1.0 for f_1 in Section 1605.2.1 is revised for consistency with the other changes in this proposal. The notation for "L" is added to make it clear that roof live load, L_r, is not intended.

This proposal was prepared in conjunction with a proposal to editorially correlate IBC Section 1607 with Chapter 4 of ASCE 7-10 and is intended to further revise Section 1607 without any overlapping or conflicting changes between the two proposals.

A separate proposal also revises Item 4 of Table 1607.1 with respect to the live loads. These revisions are not repeated in this proposal but, should both proposals be approved by the membership, the proponent intends that Footnote (m) be specified for the uniform live loads at stages and platforms.

A separate proposal also revises Item 29 of Table 1607.1 in conjunction with correlating the IBC with changes to the provisions of ASCE 7-10 where reduction of live loads at floors and occupied roofs is restricted or prohibited. These revisions are not repeated in this proposal but, should both proposals be approved by the membership, the proponent intends that Footnote (m) be specified for the uniform live load at roofs used for assembly purposes but that all other changes to Item 29 in this proposal be disregarded.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S45-T1607.1

S61–09/10
Table 1607.1; IRC Table R301.5

Proponent: Gary Ehrlich, PE, National Association of Home Builders (NAHB)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS[g]

(Table remains unchanged)

(No change to footnotes a through i)

j. For attics with limited storage ~~and constructed with trusses~~, this live load need only be applied to those portions of the ceiling joist or the truss bottom chord where there are two or more adjacent trusses or rafter/ceiling joist assemblies with the same web member or purlin brace, rafter tie, or collar tie configuration capable of containing a rectangle 42 inches high by 2 feet wide or greater, located within the plane of the truss or rafter/ceiling joist assembly. The rectangle shall fit between the top of the bottom chord and the bottom of any other truss member, or the top of ceiling joist and bottom of any other roof framing member, provided that each of the following criteria is met:

i. The attic area is accessible by a pull-down stairway or framed opening in accordance with Section 1209.2, and

ii. The truss shall have a bottom chord pitch less than 2:12.
iii. Bottom chords of trusses shall be designed for the greater of actual imposed dead load or 10 psf, uniformly distributed over the entire span.

(No change to footnotes k and l)

PART II – IRC BUILDING/ENERGY

TABLE R301.5
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS
(in pounds per square foot)
(Table remains unchanged)

(No change to footnotes a through f)

g. For attics with limited storage ~~and constructed with trusses~~, this live load need be applied only to those portions of the ceiling joist or the truss bottom chord where there are two or more adjacent trusses or rafter/ceiling joist assemblies with the same web member or purlin brace, rafter tie, or collar tie configuration capable of containing a rectangle 42 inches high by 2 feet wide or greater, located within the plane of the truss or rafter/ceiling joist assembly. The rectangle shall fit between the top of the bottom chord and the bottom of any other truss member, or the top of ceiling joist and bottom of any other roof framing member, provided that each of the following criteria is met:
1. The attic area is accessible by a pull-down stairway or framed opening in accordance with Section 807.1.
2. The truss shall have a bottom chord pitch, or the ceiling joist shall have a slope, less than 2:12.
3. Required insulation depth is less than the bottom chord member or ceiling joist depth.

Bottom chords of trusses, and ceiling joists, meeting the above criteria for limited storage shall be designed for the greater of actual imposed dead load or 10 psf, uniformly distributed over the entire span.

(No change to footnote h)

Reason: (IBC) The purpose of this proposal is to allow the relaxed attic storage live load requirement to be applied to roof rafter/ceiling joist assemblies as well as trusses. Rafter/ceiling joist assemblies constructed in accordance with either Section 2308.10.4 are required to have collar ties (per Section 2308.10.4.1) and may have rafter ties (also per Section 2308.10.4.1) and purlin braces (per Section 2308.10.5). Similar requirements would apply for a roof assembly constructed in accordance with the AF&PA WFCM. It is possible these conventionally-framed assemblies can meet the same geometric criteria applied in footnote "f" for trusses. Therefore, it makes sense to permit the same relaxation to be applied to rafter/ceiling joist assemblies. This may be particularly useful in renovations where it is desired to add access to an existing attic, which might otherwise trigger extensive strengthening or replacement of the ceiling joists.
(IRC) The purpose of this proposal is to allow the relaxed attic storage live load requirement to be applied to roof rafter/ceiling joist assemblies as well as trusses. Rafter/ceiling joist assemblies constructed in accordance with Section R802 are required to have collar ties (per Section R802.3.1) and may have rafter ties (per Section R802.3.1) and purlin braces (per Section R802.5.1). It is possible these conventionally-framed assemblies can meet the same geometric criteria applied in footnote "g" for trusses. Therefore, it makes sense to permit the same relaxation to be applied to rafter/ceiling joist assemblies. This may be particularly useful in renovations where it is desired to add access to an existing attic, which might otherwise trigger extensive strengthening or replacement of the ceiling joists.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Ehrlich-S2-T1607 1

S62–09/10
Table 1607.1; IRC Table R301.5

Proponent: John England, MCO, England Enterprises Inc., representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS[g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
5. Balconies (exterior) and decks[h]	~~Same as occupancy served~~ 60 minimum or same as occupancy served-whichever is greater	—

(Portions of table not shown remain unchanged)
(No change to footnotes)

PART II – IRC BUILDING/ENERGY

Revise as follows:

TABLE R310.5
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS
(in pounds per square foot)

USE	LIVE LOAD
Balconies (exterior) and decks[e]	~~40~~ 60

(Portions of table not shown remain unchanged)
(No change to footnotes)

Reason: Decks have been collapsing in residential occupancies and a 60# live load is not unreasonable. Hot tubs, and large groups of people are on decks having parties --the 60# live load will provide more life safety to the occupants on the decks

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: England-S2-T1607.1

S63–09/10
202

Proponent: Edwin Huston, National Council of Structural Engineers Associations- Code Advisory Committee - General Requirements Subcommittee

Revise text as follows:

SECTION 202
DEFINITIONS

AWNING. An architectural projection that provides weather protection, identity or decoration and is partially or wholly supported by the building to which it is attached. An *awning* is comprised of a lightweight frame structure over which a covering is attached

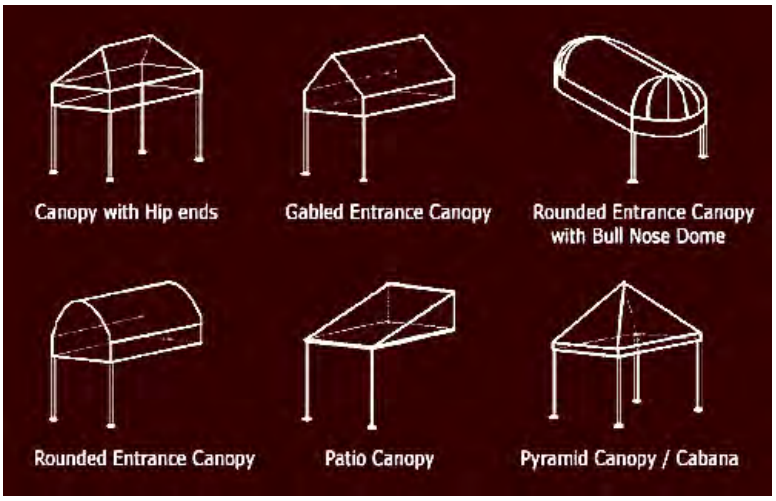
CANOPY. A permanent structure or architectural projection of rigid construction over which a covering is attached that provides weather protection, identity or decoration.~~,~~ A canopy is permitted to ~~and shall~~ be structurally independent or supported by attachment to a building ~~on one end and by not less than one stanchion on the outer end~~ on one or more sides. Canopies shall be sloped more than 25 degrees from the horizontal or so constructed so as to inhibit access other than for maintenance functions.

CORNICE. A projection at the top of a wall or a projecting element over an architectural feature, such as a doorway. Portions of a cornice which are sloped less than 25 degrees from the horizontal and are less than 10 feet (3.05 m) above the ground, more than 10 feet (3.05 m) below an adjacent roof, or located less than 10 feet (3.05 m) from operable openings above or adjacent to the level of the cornice, shall be designed for the live load from Table 1607.1.

MARQUEE. A permanent roofed structure attached to and supported by the building on one or more sides ~~and~~ that ~~projects into the public right-of-way~~ has a top surface which is sloped less than 25 degrees from the horizontal. A marquee shall be less than 10 feet (3.05 m) above the ground, more than 10 feet (3.05 m) below an adjacent roof, or located less than 10 feet (3.05 m) from operable openings above or adjacent to the level of the marquee.

Reason: The current definitions for Awning, canopy and marquee are not adequate.

Lightweight, fabric covered, frame structures also have stanchion(s), in which case the awning definition would not apply. This doesn't make them canopies. Awnings are listed in Table 1607.1, Item 11 with a live load of 5 psf.



Architectural projections of rigid construction over which a covering is attached don't always have stanchion(s). If they do not, they are not defined in the IBC. What if, instead of a stanchion, the canopy cantilevers from the building, or has a hanger rod, chain or cable suspension system?


Copywrited MMP

Cornices are not defined in the IBC, yet they are listed in Table 1607.1, Item 11 with a live load of 60 psf.

Currently, a Marquee must project over the public right-of-way. It is listed in Table 1607.1, Item 24 with a live load of 75 psf. If it doesn't project over the public right-of-way, what is it and what live load should it be designed for? The chapter-by-chapter synopsis for Chapter 32 on page xii of the 2009 IBC notes that "steps, columns, awnings, canopies, marquees, signs, windows, balconies and similar architectural features above grade" can all encroach into the public right-of-way. This effectively negates the definition of a marquee.

With these problems, the definitions in the IBC are not enforceable.

The definition of an "Awing" is retained. However, it can now have a stanchion. The proposed definition, which is tied to a 5 psf live load in Table 1607.1, is now keyed to the lightweight frame structure.

The definition of a "Canopy" is retained. However, instead of relying on a stanchion for its defining characteristic, it is defined by its permanent, rigid construction and its function of providing weather protection, identity or decoration.

From the position of structural engineers, architects and building officials, these definitions need to be able to be tied to Table 1607.1. The proposed revisions do this and include a discernable intent to allow for better code interpretation for other, undefined situations.

That is, when the canopy is like a roof, it is designed for 20 psf, like a roof structure. If a canopy, marquee or cornice has a reasonably flat surface, and is accessible, such as by a short ladder or an operable opening, so that the public might be inclined to get onto it, then it should be designed for a more robust live load.

Cost Impact: This code change proposal will not increase the cost of construction.

S64–09/10
202, Table 1607.1

Proponent: Edwin Huston, National Council of Structural Engineers Associations- Code Advisory Committee - General Requirements Subcommittee

Revise as follows:

SECTION 202
DEFINITIONS

AWNING. An architectural projection that provides weather protection, identity or decoration and is partially or wholly supported by the building to which it is attached. An *awning* is comprised of a lightweight frame structure over which a covering is attached

CANOPY. A permanent structure or architectural projection of rigid construction over which a covering is attached that provides weather protection, identity or decoration.~~,~~ A canopy is permitted to ~~and shall~~ be structurally independent or supported by attachment to a building ~~on one end and by not less than one stanchion on the outer end~~ on one or more sides. Canopies shall be sloped more than 25 degrees from the horizontal or so constructed so as to inhibit access other than for maintenance functions.

CORNICE. A projection at the top of a wall or a projecting element over an architectural feature, such as a doorway.

MARQUEE. A permanent roofed structure attached to and supported by the building on one or more sides ~~and projects into the public right-of-way~~.

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS[g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
11. Cornices[m]	60	—
24. Marquees[n]	75	—

(Remainder of Table remains unchanged)

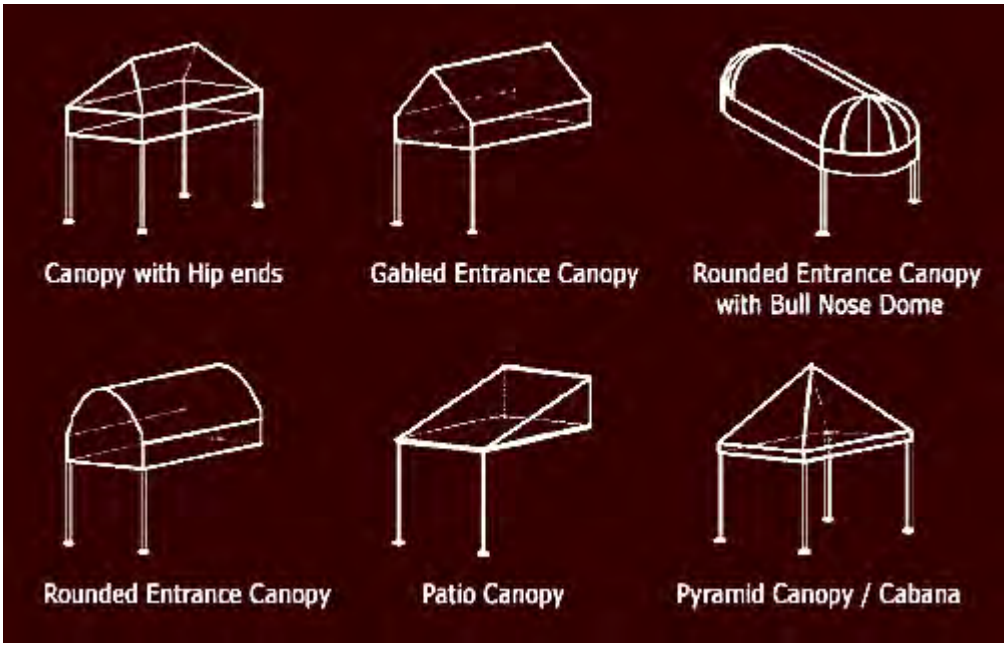
a. through l. (No change to text.)

m. Imposed live load for portions of a cornice which are sloped less than 25 degrees from the horizontal and are less than 10 feet above the ground, more than 10 feet below an adjacent roof, or located less than 10 feet from operable openings above or adjacent to the level of the cornice, shall be designed for the live load from Table 1607.1.

n. Imposed live load for portions of a marquee which are sloped less than 25 degrees from the horizontal. A marquee shall be less than 10 feet above the ground, more than 10 feet below an adjacent roof, or located less than 10 feet from operable openings above or adjacent to the level of the marquee.

Reason: The current definitions for Awning, canopy and marquee are not adequate.

Lightweight, fabric covered, frame structures also have stanchion(s), in which case the awning definition would not apply. This doesn't make them canopies. Awnings are listed in Table 1607.1, Item 11 with a live load of 5 psf.



Architectural projections of rigid construction over which a covering is attached don't always have stanchion(s). If they do not, they are not defined in the IBC. What if, instead of a stanchion, the canopy cantilevers from the building, or has a hanger rod, chain or cable suspension system?


Copywrited MMP

Cornices are not defined in the IBC, yet they are listed in Table 1607.1, Item 11 with a live load of 60 psf.

Currently, a Marquee must project over the public right-of-way. It is listed in Table 1607.1, Item 24 with a live load of 75 psf. If it doesn't project over the public right-of-way, what is it and what live load should it be designed for? The chapter-by-chapter synopsis for Chapter 32 on page xii of the 2009 IBC notes that "steps, columns, awnings, canopies, marquees, signs, windows, balconies and similar architectural features above grade" can all encroach into the public right-of-way. This effectively negates the definition of a marquee.

With these problems, the definitions in the IBC are not enforceable.

The definition of an "Awing" is retained. However, it can now have a stanchion. The proposed definition, which is tied to a 5 psf live load in Table 1607.1, is now keyed to the lightweight frame structure.

The definition of a "Canopy" is retained. However, instead of relying on a stanchion for its defining characteristic, it is defined by its permanent, rigid construction and its function of providing weather protection, identity or decoration.

From the position of structural engineers, architects and building officials, these definitions need to be able to be tied to Table 1607.1. The proposed revisions do this and include a discernable intent to allow for better code interpretation for other, undefined situations.

That is, when the canopy is like a roof, it is designed for 20 psf, like a roof structure. If a canopy, marquee or cornice has a reasonably flat surface, and is accessible, such as by a short ladder or an operable opening, so that the public might be inclined to get onto it, then it should be designed for a more robust live load. This version of this code change proposal accomplishes this through footnotes to Table 1607.1.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: HUSTON-S6-Table 1607.1

S65–09/10
Table 1607.1

Proponent: Larry Wainright, Qualtim, Inc., representing the Structural Building Components Association (SBCA)

Revise as follows:

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS[g]
(Portions of table and footnotes not shown remain unchanged)

j. For attics with limited storage and constructed with trusses, this live load need only be applied to those portions of the bottom chord where there are two or more adjacent trusses with the same web configuration capable of containing a rectangle 42 inches high by 2 feet wide or greater, located within the plane of the truss. The rectangle shall fit between the top of the bottom chord and the bottom of any other truss member, provided that each of the following criteria is met:

i. The attic area is accessible by a pull-down stairway or framed opening in accordance with Section 1209.2 and
ii. The truss shall have a bottom chord pitch less than 2:12, and
iii. Required insulation depth is less than the bottom chord member depth.

Bottom chords of trusses meeting the above criteria for limited storage shall be designed for the greater of actual imposed dead load or 10 psf, uniformly distributed over the entire span.

Reason: The purpose of the code change is to update the code language in the IBC by harmonizing it with the language currently in the IRC. Table R301.5, footnote g states:

For attics with limited storage and constructed with trusses, this live load need be applied only to those portions of the bottom chord where there are two or more adjacent trusses with the same web configuration capable of containing a rectangle 42 inches high or greater by 2 feet wide or greater, located within the plane of the truss. The rectangle shall fit between the top of the bottom chord and the bottom of any other truss member, provided that each of the following criteria is met.

1. The attic area is accessible by a pull-down stairway or framed in accordance with Section R807.1.
2. The truss has a bottom chord pitch less than 2:12.
3. Required insulation depth is less than the bottom chord member depth.

The bottom chords of trusses meeting the above criteria for limited storage shall be designed for the greater of the actual imposed dead load or 10 psf, uniformly distributed over the entire span.

Cost Impact: This proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: WAINRIGHT-S1- TABLE 1607.1

S66–09/10
Table 1607.1; IRC Table R301.5

Proponent: Larry Wainright, Qualtim, Inc., representing the Structural Building Components Association (SBCA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC-STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS[g]
(No changes to the Table)

(No change to footnotes a through i)

j. For attics with limited storage and constructed with trusses, this live load need only be applied to those portions of the bottom chord where there are two or more adjacent trusses with the same web configuration capable of containing a rectangle 42 inches high by 2 feet wide or provided that each of the following criteria is met:
   i. The attic area is accessible by a pull-down stairway or framed opening in accordance with Section 1209.2 and
   ii. The truss shall have a bottom chord pitch less than 2:12.
   ~~iii.~~ Bottom chords of trusses meeting the above criteria for limited storage shall be designed ~~for the greater of actual imposed dead load or 10 psf, uniformly distributed over the entire span~~ in accordance with Section 1606.2.

(No change to footnotes l and l)

PART II – IRC BUILDING/ENERGY

Revise as follows:

TABLE R301.5
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS
(in pounds per square foot)

(Portions of table not shown remain unchanged)

(No change to footnotes a through f)

g. For attics with limited storage and constructed with trusses, this live load need be applied only to those portions of the bottom chord where there are two or more adjacent trusses with the same web configuration capable of containing a rectangle 42 inches high or greater by 2 feet wide or greater, located within the plane of the truss. The rectangle shall fit between the top of the bottom chord and the bottom of any other truss member, provided that each of the following criteria is met:
   1. The attic area is accessible by a pull-down stairway or framed opening in accordance with Section R807.1.
   2. The truss has a bottom chord pitch less than 2:12.
   3. Required insulation depth is less than the bottom chord member depth.

   The bottom chords of trusses meeting the above criteria for limited storage shall be designed ~~for the greater of the actual imposed dead load or 10 psf, uniformly distributed over the entire span.~~ in accordance with Section R301.4

(No change to footnotes h and i)

Reason:
PART I- The requirement for a minimum 10 pound load is contrary to Section 1606.2 which requires buildings to be designed for the actual dead load imposed.

1606.2 Design dead load. For purposes of design, the actual weights of materials of construction and fixed service equipment shall be used. In the absence of definite information, values used shall be subject to the approval of the building official.

Trusses should not be subject to different loading conditions than other building elements. Accepted engineering practice and the building code already stipulate that the use of the actual dead loads is appropriate.

PART II- The requirement for a minimum 10 pound load is unnecessary and places attics with limited storage and constructed with trusses at a competitive disadvantage with other framing methods. Section R301.4 requires the use of actual dead loads.

R301.4 Dead load. The actual weights of materials and construction shall be used for determining dead load with consideration for the dead load of fixed service *equipment*.

Trusses should not be subject to different loading conditions than other framing methods. Accepted engineering practice and the building code already stipulate the use of the actual dead loads is appropriate.

Cost Impact: This code change proposal will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WAINRIGHT-S2-1607.1

S67–09/10

1602.1, 1607.4, 1607.7.1-1607.7.1.2, 1607.7.2, 1607.7.3, 1607.8, 1607.9.1, 1607.10, 1607.11.2.1, 1607.11.2.2, 1607.12.3, Table 1607.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1602.1 Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

VEHICLE BARRIER SYSTEM. A system of ~~building~~ components near open sides of a garage floor or ramp or building walls that act as restraints for vehicles.

1607.4 Concentrated loads. Floors and other similar surfaces shall be designed to support the uniformly distributed live loads prescribed in Section 1607.3 or the concentrated load, in pounds (kilonewtons), given in Table 1607.1, whichever produces the greater load effects. Unless otherwise specified, the indicated concentration shall be assumed to be uniformly distributed over an area 2-1/2 feet by 2-1/2 feet ~~[6-1/4 square feet (0.58 m^2)]~~ (762 mm by 762 mm) and shall be located so as to produce the maximum load effects in the ~~structural~~ members.

1607.7.1 Handrails and guards. Handrails and guards shall be designed to resist a load of 50 pounds per linear foot (plf) (0.73 kN/m) applied in any direction ~~at the top~~ along the handrail or top rail and to transfer this load through the supports to the structure. Glass handrail assemblies and guards shall also comply with Section 2407.

Exceptions:

1. For one- and two-family dwellings, only the single concentrated load required by Section 1607.7.1.1 shall be applied.
2. In Group I-3, F, H and S occupancies, for areas that are not accessible to the general public and that have an occupant load less than 50, the minimum load shall be 20 pounds per foot (0.29 kN/m).

1607.7.1.1 Concentrated load. Handrails and guards shall be ~~able~~ designed to resist a single concentrated load of 200 pounds (0.89 kN), applied in any direction at any point ~~along the top~~ on the handrail or top rail so as to produce the maximum load effects, and to transfer this load through the supports to the structure. This load need not be assumed to act concurrently with the loads specified in Section 1607.7.1.

1607.7.1.2 ~~Components~~ Intermediate rails. Intermediate rails (all those except the handrail and top rail), balusters and panel fillers shall be designed to withstand a horizontally applied normal load of 50 pounds (0.22 kN) on an area ~~equal to 1 square foot (0.093m^2)~~ not to exceed 12 inches by 12 inches (305 m by 305 m), including openings and space between rails, and located so as to produce the maximum load effects. Reactions due to this loading are not required to be superimposed with ~~those of~~ the loads specified in Section 1607.7.1 or 1607.7.1.1.

1607.7.2 Grab bars, shower seats and dressing room bench seats. Grab bars, shower seats and dressing room bench seat systems shall be designed to resist a single concentrated load of 250 pounds (1.11 kN) applied in any direction at any point on the grab bar or seat so as to produce the maximum load effects.

1607.7.3 Vehicle barrier systems. Vehicle barrier systems for passenger vehicles shall be designed to resist a single load of 6,000 pounds (26.70 kN) applied horizontally in any direction to the barrier system and shall have anchorage or attachment capable of transmitting this load to the structure. For design of the system, two loading conditions shall be analyzed. The first condition shall apply the load at a height of 1 foot, 6 inches (457 mm) above the floor or ramp surface. The second loading condition shall apply the load at 2 feet, 3 inches (686 mm) above the floor or ramp surface. The more severe load condition shall govern the design of the barrier restraint system. The load shall be assumed to act on an area not to exceed ~~1 square foot (305 mm^2)~~ 12 inches by 12 inches (305 mm by 305 mm), and located so as to produce the maximum load effects. This load is not required to ~~be assumed to~~ act concurrently with any handrail or guard loadings specified in Section 1607.7.1. Garages accommodating trucks and buses shall be designed in accordance with an approved method that contains provision for traffic railings.

1607.8 Impact loads. The live loads specified in Section ~~1607.3~~ 1607.2 shall be assumed to include adequate allowance for ordinary impact conditions. Provisions shall be made in the structural design for uses and loads that involve unusual vibration and impact forces.

1607.9.1 General. Subject to the limitations of Sections 1607.9.1.1 through 1607.9.1.4, members for which a valueof $K_{LL}\ A_T$ is 400 square feet (37.16 m^2) or more are permitted to be designed for a reduced live load in accordance with the following equation:

$L = L_o\ [0.25 + 15 / (\sqrt{K_{LL}\ A_T})]$ **(Equation 16-22)**

In SI: $L = L_o\ [0.25 + 4.57 / (\sqrt{K_{LL}\ A_T})]$

where:

L = Reduced design live load per square foot (~~meter~~ m^2) of area supported by the member.
L_o = Unreduced design live load per square foot (~~meter~~ m^2) of area supported by the member (see Table 1607.1).
K_{LL} = Live load element factor (see Table 1607.9.1).
A_T = Tributary area, in square feet (~~square meters~~ m^2).

L shall not be less than 0.50 L_o for members supporting one floor and L shall not be less than 0.40 L_o for members supporting two or more floors.

1607.10 Distribution of floor loads. Where uniform floor live loads are involved in the design of structural members arranged so as to create continuity, the minimum applied loads shall be the full dead loads on all spans in combination with the floor live loads on spans selected to produce the greatest load effect at each location under consideration. It shall be permitted to reduce floor live loads in accordance with Section 1607.9.

1607.11.2.1 Flat, pitched and curved roofs. Ordinary flat, pitched and curved roofs, and awnings and canopies other than of fabric construction supported by a ~~lightweight rigid~~ skeleton structure~~s~~, are permitted to be designed for a reduced roof live load as specified in the following equations or other controlling combinations of loads as specified in Section 1605, whichever produces the greater load effect.

In structures such as greenhouses, where special scaffolding is used as a work surface for workers and materials during maintenance and repair operations, a lower roof load than specified in the following equations shall not be used unless approved by the building official. Such structures shall be designed for a minimum roof live load of 12 psf (0.58 kN/m^2).

$L_r = L_{ro}\ R_1\ R_2$ **(Equation 16-25)**

where: $12 \le L_r \le 20$

For SI: $L_r = L_{ro}\ R_1\ R_2$

where: $0.58 \le L_r \le 0.96$

L_{ro} = Unreduced roof live load per square foot (m^2) of horizontal projection supported by the member (see Table 1607.1).
L_r = Reduced roof live load per square foot (m^2) of horizontal projection ~~in pounds per square foot (kN/m^2)~~ supported by the member.

The reduction factors R_1 and R_2 shall be determined as follows:

R_1 = 1 for $A_t \le$ 200 square feet (18.58 m^2) **(Equation 16-26)**

$R_1 = 1.2 - 0.001\ A_t$ for 200 square feet $< A_t <$ 600 square feet **(Equation 16-27)**

For SI: $1.2 - 0.011\ A_t$ for 18.58 square meters $< A_t <$ 55.74 square meters

R_1 = 0.6 for $A_t \ge$ 600 square feet (55.74 m^2) **(Equation 16-28)**

where:

A_t = Tributary area (span length multiplied by effective width) in square feet (m^2) supported by ~~any structural~~ the member, and
R_2 = 1 for $F \le 4$ **(Equation 16-29)**

R_2 = 1.2 – 0.05 F for 4 < F < 12 **(Equation 16-30)**

R_2 = 0.6 for $F \geq 12$ **(Equation 16-31)**

where:

F = For a sloped roof, the number of inches of rise per foot (for SI: F = 0.12 x slope, with slope expressed as a percentage), and or for an arch or dome, rise-to-span ratio multiplied by 32.

1607.11.2.2 Special-purpose roofs. Roofs used for promenade purposes, roof gardens, assembly purposes or other special purposes, and marquees, shall be designed for a minimum live load, L_o, as specified in Table 1607.1. Such live loads are permitted to ~~be~~ have their uniformly distributed live loads reduced in accordance with Section 1607.9. Live loads of 100 psf or more at areas of roofs classified as Group A occupancies shall not be reduced.

1607.12.3 Lateral force. The lateral force on crane runway beams with electrically powered trolleys shall be calculated as 20 percent of the sum of the rated capacity of the crane and the weight of the hoist and trolley. The lateral force shall be assumed to act horizontally at the traction surface of a runway beam, in either direction perpendicular to the beam, and shall be distributed ~~according~~ with due regard to the lateral stiffness of the runway beam and supporting structure.

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS [g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
4. Assembly areas ~~and theaters~~		
Fixed seats (fastened to floor)	60	
Follow spot, projections and control rooms	50	
Lobbies	100	–
Movable seats	100	
Stages and platforms	125	
Other assembly areas	100	
5. Balconies ~~(exterior)~~ and decks [h]	Same as occupancy served	–
7. Catwalks for maintenance access	40	300
9. Corridors~~, except as otherwise indicated~~		
First floor	100	–
Other floors	Same as occupancy served except as indicated	
13. Elevator machine room grating (on area of ~~4 in^2~~ 2 inches by 2 inches)	–	300
14. Finish light floor plate construction (on area of ~~1 in^2~~ 1 inch by 1 inch)	–	200
18. Gymnasiums~~, main floors and balconies~~	100	–
29. Roofs:		
All roof surfaces subject to maintenance workers		300
Awnings and canopies:		
Fabric construction supported by a ~~lightweight rigid~~ skeleton structure	5 nonreducible	
All other construction	20	
Ordinary flat, pitched, and curved roofs	20	
Primary roof members, exposed to a work floor:		
Single panel point of lower chord of roof trusses or any point along primary structural members supporting roofs over manufacturing, storage warehouses, and repair garages		
All other ~~occupancies~~ primary roof members		2,000
Roofs used for other special purposes		300
Roofs used for promenade purposes	Note l	Note l
Roofs used for roof gardens or assembly purposes	60	
	100	
35. Stairs and exits		~~Note f~~
One- and two-family dwellings	40	300 [f]
All other	100	300 [f]

(Portions of table not show are unchanged)

a. Floors in garages or portions of buildings used for the storage of motor vehicles shall be designed for the uniformly distributed live loads of Table 1607.1 or the following concentrated loads: (1) for garages restricted to passenger vehicles accommodating not more than nine passengers, 3,000 pounds acting on an area of 4.5 inches by 4.5 inches; (2) for mechanical parking structures without slab or deck ~~which~~ that are used for storing passenger vehicles only, 2,250 pounds per wheel.

d. Other uniform loads in accordance with an approved method ~~which contains~~ containing provisions for truck loadings shall also be considered where appropriate.

f. The minimum concentrated load on stair treads ~~(~~shall be applied on an area of ~~4 square~~ 2 inches by 2 inches~~) is 300 pounds~~. This load need not be assumed to act concurrently with the uniform load.

(Footnotes not shown are unchanged)

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. The need for correlation is due to ASCE 7 Proposals LLSC-LL6, LLSC-LL9 and LLSC-LL11, which were approved by the Live Load Subcommittee (LLSC) and are being balloted by the Main Committee (Items #1, #3, #5 and #6 of the Second Main Committee Ballot on Live/Dead Load Provisions). It is expected that the Main Committee will approve the proposals.

The proposed changes are seen as editorial. The addition of a definition for the symbol of unreduced roof live load in Section 1607.11.2.1, along with the current definition for the symbol of reduced roof live load, is done for consistency with the current definitions for the symbols of unreduced and reduced live load in Section 1607.9. In Table 1607.1, the addition of "for maintenance access" after "catwalks" and the addition of separate items for the first floor and other floor at "corridors" is done for consistency with the current text in Table 4-1 of ASCE 7-05, which will remain unchanged in ASCE 7-10.

The addition of footnote (c) to the 60 psf uniform load for fixed seats (fastened to the floor) in Item #4 on assembly areas for consistency with the same footnote at bleachers and fixed seats (fastened to the floor) in Item #34 on stadiums and arenas. This was suggested as an additional revision to Proposal LLSC-LL9 for the same item in Table 4-1 of ASCE 7. The LLSC considered the suggestion to have merit but it was determined to be a technical change and beyond the scope of what was intended to be an editorial proposal. In spite of this, The ICC Structural Committee may wish to consider adding it to IBC Table 1607.1.

A separate proposal also revises Section 1607.7.1.2. These revisions are not repeated in this proposal but, should both proposals be approved by the membership, the proponent intends that the addition of "and top rail" in Section 1607.7.1.2 of this proposal be disregarded.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S50-1607.4

S68–09/10
1607.5, 1607.13, 1607.13.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1607.5 Partition loads. In office buildings ~~and in~~ or other buildings where partitions ~~locations are subject to change~~ will be erected or rearranged, provision~~s~~ for partition ~~weight~~ live load shall be made, whether or not partitions are shown on the construction documents, unless the specified live load exceeds 80 psf (3.83 kN/m^2). The partition live load shall not be less than a uniformly distributed live load of 15 psf (~~0.74~~ 0.72 kN/m^2).

1607.13 Interior walls and partitions. Interior walls and partitions that exceed 6 feet (1829 mm) in height, including their finish materials, shall have adequate strength to resist the loads to which they are subjected but not less than a uniformly distributed horizontal live load of 5 psf (0.24 kN/m^2) applied normal to the plane of the partition.

Exception: Fabric partitions complying with Section 1607.13.1 shall not be required to resist the minimum horizontal live load of 5 psf (0.24 kN/m^2).

1607.13.1 Fabric partitions. Fabric partitions that exceed 6 feet (1829 mm) in height, including their finish materials, shall have adequate strength to resist the following load conditions:

1. A uniformly distributed horizontal ~~distributed~~ live load of 5 psf (0.24 kN/m^2) applied to the partition framing. The total area used to determine the ~~distributed~~ live load shall be the area of the fabric face between the framing members to which the fabric is attached. The total ~~distributed~~ live load shall be ~~uniformly~~ applied to such framing members in proportion to the length of each member.
2. A concentrated live load of 40 pounds (0.176 kN) applied ~~to an 8-inch (203 mm) diameter area [50.3 square inches (32 452 mm^2)]~~ on an area of the fabric face a maximum of 8 inches in diameter (32.43 m^2) and at a minimum height of 54 inches (1372 mm) above the floor.

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. The need for correlation is due to ASCE 7 Proposal SSC TC-2-CH4,5,11,12-01, which was approved by the Seismic Subcommittee on February 20, 2009 and is being balloted by the Main Committee (Item #1 of the Fourth Main Committee Ballot on Seismic Provisions). It is expected that the Main Committee will approve the proposal.
The proposed changes to Section 1607.5 are intended to reduce confusion over whether this load is a live load or a dead load and how it affects the determination of effective seismic weight. This load acts as a budget to account for partitions that may be installed during the life of the building or structure but are not typically installed when the building or structure is first constructed. The ASCE 7 proposal makes the same changes in Section 4.2.2 of ASCE 7 and also makes a correlating change in Item #2 of Section 12.7.2 in ASCE 7 by specifying the partition load as a live load.
The changes to Sections 1607.13 and 1607.13.1 are seen as editorial and are proposed for consistency with the format of similar provisions in ASCE 7.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S43-1607.5

S69–09/10
1602.1, 1605.4, 1607.6 (New), Table 1607.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

1. Add new definition as follows:

1602.1 Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

HELIPAD. A structural surface that is used for the landing, taking off, taxiing and parking of helicopters.

2. Revise as follows:

~~1605.4~~ 1607.6 ~~Heliports and helistops~~ Helipads. ~~Heliport and helistop landing areas~~ Helipads shall be designed for the following live loads~~, combined in accordance with Section 1605~~:

1. ~~Dead load, *D*, plus the gross weight of the helicopter, D_h, plus snow load, *S*.~~
2. ~~3~~ 1. ~~Dead load, *D*, plus~~ A uniform live load, *L*, ~~of:~~ as specified below. This load shall not be reduced.
   - 1.1. ~~100~~ 40 psf (~~4.79~~ 1.92 kN/m^2) where the design basis helicopter has a maximum take-off weight of 3,000 pounds (13.35 kN) or less.
   - 1.2. 60 psf (2.87 kN/m^2) where the design basis helicopter has a maximum take-off weight greater than 3,000 pounds (13.35 kN).
3. A single concentrated live load, *L*, of 3,000 pounds (13.35 kN) applied over an area of 4.5 inches by 4.5 inches (114 mm by 114 mm) and located so as to produce the maximum load effects on the structural elements under consideration. The concentrated load need not be assumed to act concurrently with other uniform or concentrated live loads.
4. ~~2~~ 3. ~~Dead load, *D*, plus~~ Two single concentrated ~~impact~~ live loads, *L*, ~~approximately~~ 8 feet (2438 mm) apart applied ~~anywhere~~ on the ~~touchdown~~ landing pad (representing ~~each of~~ the helicopter's two main landing gear, whether skid type or wheeled type), each having a magnitude of 0.75 times the ~~gross~~ maximum take-off weight of the helicopter, and located so as to produce the maximum load effects on the structural elements under consideration. ~~Both loads acting together total 1.5 times the gross weight of the helicopter.~~ The concentrated loads shall be applied over an area of 8 inches by 8 inches (203 mm by 203 mm) and need not be assumed to act concurrently with other uniform or concentrated live loads.

   ~~Exception:~~ Landing areas designed for a design basis helicopter~~s~~ with ~~gross~~ maximum take-off weight~~s~~ not exceeding 3,000 pounds (13.3~~5~~ kN) ~~in accordance with Items 1 and 2 shall be permitted to be designed using a 40 psf (1.92 kN/m^2) uniform live load in Item 3, provided the landing area is~~ shall be identified with a 3,000 pound (13.34 kN) weight limitation. ~~This 40 psf (1.92 kN/m^2) uniform live load shall not be reduced.~~ The landing area weight limitation shall be indicated by the numeral "3" (kips) located in the bottom right corner of the landing area as viewed from the primary approach path. The indication for the landing area weight limitation shall be a minimum 5 feet (1524 mm) in height.

(Renumber subsequent sections)

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS [g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
20. Helipads	See Section 1607.6	

(Portions of table not shown are unchanged)

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. The need for correlation is due to ASCE 7 Proposal LLSC-LL-7, which has been approved by the Live Load Subcommittee and is being balloted by the Main Committee (Item #4 of the Second Main Committee Ballot on Live/Dead Load Provisions). It is expected that the Main Committee will approve the proposal.

The listing of loads other than live loads and the requirement in the charging text that the listed loads be combined in accordance with Section 1605 are deleted to eliminate conflicts with the load combinations of Section 1605. Current Items #1 through #3 appear to specify certain load combinations, not loads, and it is not clear whether these load combinations are in addition to, are intended to modify, or are intended to replace the load combinations of Section 1605. Sections 1605.1 through 1605.3.2.1 specify load combinations for buildings and other structures, and portions thereof, which would include helipads. If the current charging text intends to specify loads that shall be combined in accordance with Section 1605, the items listing loads should be limited to those loads unique to helipads. In this regard, references to the dead load, *D*, and snow load, *S*, serve no purpose. The loading provisions are also relocated to Section 1607.6 on live loads.

The change from “heliports and helistops” to “helipads” is for consistency with the same change being made in ASCE 7-10 and will have the effect of providing a term unique to the structural chapters of the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S7-1602.1

S70–09/10

1607.6, 1607.6.1, 1607.6.2-1607.6.5 (New), Table 1607.6

Proponent: Edwin Huston, National Council of Structural Engineers Associations- Code Advisory Committee - General Requirements Subcommittee

1. Delete and Substitute as follows:

~~**1607.6 Truck and bus garages.** Minimum live loads for garages having trucks or buses shall be as specified in Table 1607.6, but shall not be less than 50 psf (2.40 kN/m2), unless other loads are specifically justified and *approved* by the *building official*. Actual loads shall be used where they are greater than the loads specified in the table.~~

~~**1607.6.1 Truck and bus garage live load application.** The concentrated load and uniform load shall be uniformly distributed over a 10-foot (3048 mm) width on a line normal to the centerline of the lane placed within a 12-foot-wide (3658 mm) lane. The loads shall be placed within their individual lanes so as to produce the maximum stress in each structural member. Single spans shall be designed for the uniform load in Table 1607.6 and one simultaneous concentrated load positioned to produce the maximum effect. Multiple spans shall be designed for the uniform load in Table 1607.6 on the spans and two simultaneous concentrated loads in two spans positioned to produce the maximum negative moment effect. Multiple span design loads, for other effects, shall be the same as for single spans.~~

1607.6 Heavy Vehicle Loads. Structures or portions of structures which are subject to heavy vehicle loads shall be designed for the loads from Section 1607.6.1.

1607.6.1 Truck and bus loads. Where any structure does not have provisions to restrict access for trucks and buses that exceed the weight limitations set forth in Table 1607.1 footnote a, those portions of the structure subject to such loads shall be designed using the vehicular live loads, including consideration of impact and fatigue, in accordance with the codes and specifications required by the jurisdiction having authority for the design and construction of the roadways and bridges in the same location of the structure.

2. Add new text as follows:

1607.6.2 Fire truck loading. Where fire department access requires travel over or loading of a structure by fire department vehicles or similar emergency vehicles, the structure shall be designed for the greater of the following loads:

1607.6.2.1 Fire truck operational loads. The actual operational loads (including out rigger reactions and contact areas) of the vehicles as stipulated and / or approved by the local Fire Department or Building Official having jurisdiction for the structure.

1607.6.2.2 Truck and bus loads. The live loading required by section 1607.6.1.

1607.6.3 Truck and bus garages. Garages designed specifically to allow trucks or buses that exceed the weight limitations for passenger vehicles as set forth in Table 1607.1 footnote a, shall be designed using the vehicular live loads, per the Codes and Specifications required by the jurisdiction having authority for the design and construction of the roadways and bridges in the same location of the structure. (Note: design for impact and fatigue in a garage is not required).

Exception: The design live loads and load placement are allowed to be determined using the actual vehicle weights for the vehicles allowed onto the garage floors, provided such loads and placement are based on rational engineering principles and are approved by the Building Official, but shall not be less than 50 psf (this live load shall not be reduced).

1607.6.4 Forklifts and moveable equipment. Where a structure is intended to have forklifts or other moveable equipment present, the structure shall be designed for the total vehicle load and the individual wheel loads for the anticipated vehicles as specified by the owner of the facility. These loads shall be posted per Section 1607.6.5.

1607.6.4.1 Impact and fatigue. Due to the nature of the operations of a facility with forklifts and other moveable equipment, impact loads and fatigue loading must be considered in the design of the supporting structure. This must include consideration for relative stiffness and differential deflections between adjacent framing members; positive and negative moments induced by a moving live load; effects of multiple vehicle loads in the same vicinity; and the punching shear on a slab based on the actual contact area of the wheel loads for the specific vehicle to be used. For the purposes of design, the vehicle and wheel loads shall be increased by 30 percent to account for impact.

1607.6.5 Posting. The maximum weight of the vehicles allowed into or on a garage or other structure shall be conspicuously posted by the owner in accordance with Section 106.1.

3. Delete without substitution:

~~**TABLE 1607.6**~~
~~**UNIFORM AND CONCENTRATED LOADS**~~

~~LOADING CLASSa~~	~~UNIFORM LOAD (pounds/linear foot of lane)~~	~~CONCENTRATED LOAD (pounds)b~~	
		~~For moment design~~	~~For shear design~~
~~H20-44 and HS20-44~~	~~640~~	~~18,000~~	~~26,000~~
~~H15-44 and HS15-44~~	~~480~~	~~13,500~~	~~19,500~~

~~For SI: 1 pound per linear foot = 0.01459 kN/m, 1 pound = 0.004448 kN, 1 ton = 8.90 kN.~~

~~a. An H loading class designates a two-axle truck with a semitrailer. An HS loading class designates a tractor truck with a semitrailer. The numbers following the letter classification indicate the gross weight in tons of the standard truck and the year the loadings were instituted.~~

~~b. See Section 1607.6.1 for the loading of multiple spans.~~

Reason: The current Section 1607.6 Truck and bus garages, is addressing truck and bus loads in garages only and does not give direction for heavy vehicle loads in other conditions outside of a "garage". The current section lists loading criteria that appears to be extracted from the live load section from the AASHTO (American Association of State Highway and Transportation Officials) Code. AASHTO is not a referenced standard in the IBC. The current section however does not give other critical loading criteria such as spacing of the concentrated loads or impact requirements. Buildings designed for repair or storage may need to be designed for higher levels of loading than are currently prescribed by Table 1607.6 due to tighter spacing requirements This new section clarifies that for conditions where heavy highway type vehicles have access onto a structure, then that structure will need to be designed using the same code and requirements that the roadways in that jurisdiction are designed under. This loading may in fact be the loading from AASHTO, or the loading for other elements such as lids of large detention tanks or utility vaults. It will likely vary from one Jurisdiction to another. Thus the RDP should consult with the Jurisdiction for design loads for these special conditions. The new language also gives criteria for addressing other heavy vehicle loads (Fire trucks and forklifts), which is currently absent in the current code, and is only mentioned under Section 1607.2 Loads not specified.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: HUSTON-S7-1607.6

S71–09/10

1012.1, 1013.1, 1013.1.1, 1602.1, Table 1607.1, 1607.7, 1607.7.1, 1607.7.1.1, 1607.7.1.2, 1607.7.2, 1607.7.3

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

1. Add new definitions as follows:

1602.1 Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

GRAB BAR SYSTEM. A bar and associated anchorages and attachments to the structural system for the support of body weight in locations such as toilets, showers and tub enclosures.

GUARDRAIL SYSTEM. A system of components, including anchorages and attachments to the structural system, near open sides of an elevated surface for the purpose of minimizing the possibility of a fall from the elevated surface by people, equipment or material.

HANDRAIL SYSTEM. A rail grasped by hand for guidance and support, and associated anchorages and attachments to the structural system.

2. Revise as follows:

1602.1 Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

VEHICLE BARRIER SYSTEM. A system of ~~building~~ components, including anchorages and attachments to the structural system, near open sides of a garage floor or ramp or building walls that act as restraints for vehicles.

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS[g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
19. Handrail, guardrail and grab bar systems ~~Handrails, guards and grab bars~~	See Section 1607.7	

(Portions of table not shown remain unchanged)

1607.7 Loads on handrail~~s~~, ~~guards~~ guardrail, grab bar~~s~~, seat~~s~~ and vehicle barrier systems. ~~Handrails~~ Handrail, ~~guards~~ guardrail, grab bar ~~bars~~, accessible seat ~~seats~~, accessible bench ~~benches~~ and vehicle barrier systems shall be designed and constructed to the structural loading conditions set forth in this section.

1607.7.1 Handrail~~s~~ and ~~guards~~ guardrail systems. Handrail ~~Handrails~~ and ~~guards~~ guardrail systems shall be designed to resist a load of 50 plf (0.73 kN/m) applied in any direction at the top ~~and to transfer this load through the supports to the structure~~. Glass handrail ~~assemblies~~ and ~~guards~~ guardrail systems shall also comply with Section 2407.

Exceptions:

1. For one- and two-family dwellings, only the single concentrated load required by Section 1607.7.1.1 shall be applied.
2. In Group I-3, F, H and S occupancies, for areas that are not accessible to the general public and that have an occupant load less than 50, the minimum load shall be 20 pounds per foot (0.29 kN/m).

1607.7.1.1 Concentrated load. Handrail ~~Handrails~~ and ~~guards~~ guardrail systems shall be able to resist a single concentrated load of 200 pounds (0.89 kN), applied in any direction at any point along the top~~, and to transfer this load through the supports to the structure~~. This load need not be assumed to act concurrently with the loads specified in Section 1607.7.1.

1607.7.1.2 Components. Intermediate rails (all those except the handrail), balusters and panel fillers shall be designed to withstand a horizontally applied normal load of 50 pounds (0.22 kN) on an area equal to 1 square foot ($0.093 m^2$), including openings and space between rails. Reactions due to this loading are not required to be superimposed with those of Section 1607.7.1 or 1607.7.1.1.

1607.7.2 Grab bar~~s~~, shower seat~~s~~ and dressing room bench seat~~s~~ systems. Grab bar ~~bars~~, shower seat ~~seats~~ and dressing room bench seat systems shall be designed to resist a single concentrated load of 250 pounds (1.11 kN) applied in any direction at any point.

1607.7.3 Vehicle barrier systems. Vehicle barrier systems for passenger vehicles shall be designed to resist a single load of 6,000 pounds (26.70 kN) applied horizontally in any direction to the barrier system ~~and shall have anchorage or attachment capable of transmitting this load to the structure~~. For design of the system, two loading conditions shall be analyzed. The first condition shall apply the load at a height of 1 foot, 6 inches (457 mm) above the floor or ramp surface. The second loading condition shall apply the load at 2 feet, 3 inches (686 mm) above the floor or ramp surface. The more severe load condition shall govern the design of the vehicle barrier ~~restraint~~ system. The load shall be assumed to act on an area not to exceed 1 square foot ($305 mm^2$), and is not required to be assumed to act concurrently with any handrail or guardrail system loadings specified in Section 1607.7.1. Garages accommodating trucks and buses shall be designed in accordance with an approved method that contains provision for traffic railings.

1012.1 Where required. *Handrails* for *stairways* and *ramps* shall be adequate in strength and attachment in accordance with Section 1607.7 for handrail systems. *Handrails* required for *stairways* by Section 1009.12 shall comply with Sections 1012.2 through 1012.9. *Handrails* required for *ramps* by Section 1010.8 shall comply with Sections 1012.2 through 1012.8.

1013.1 Where required. *Guards* shall be located along open-sided walking surfaces, including *mezzanine*s, *equipment platforms*, *stairs*, *ramps* and landings that are located more than 30 inches (762 mm) measured vertically to the floor or grade below at any point within 36 inches (914 mm) horizontally to the edge of the open side. *Guards* shall be adequate in strength and attachment in accordance with Section 1607.7 for guardrail systems.

Exception: *Guards* are not required for the following locations:

1. On the loading side of loading docks or piers.
2. On the audience side of stages and raised platforms, including steps leading up to the stage and raised platforms.
3. On raised stage and platform floor areas, such as runways, ramps and side stages used for entertainment or presentations.
4. At vertical openings in the performance area of stages and platforms.
5. At elevated walking surfaces appurtenant to stages and platforms for access to and utilization of special lighting or equipment.
6. Along vehicle service pits not accessible to the public.
7. In assembly seating where *guards* in accordance with Section 1028.14 are permitted and provided.

1013.1.1 Glazing. Where glass is used to provide a *guard* or as a portion of the *guard* system, the *guard* shall also comply with Section 2407. Where the glazing provided does not meet the strength and attachment requirements of Section 1607.7 for guardrail systems, complying *guards* shall also be located along glazed sides of open-sided walking surfaces.

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. The need for correlation is due to ASCE 7 Proposal LLSC-LL9, which was approved by the Live Load Subcommittee and is being balloted by the Main Committee (Item #5 of the Second Main Committee Ballot on Live/Dead Load Provisions). It is expected that the Main Committee will approve the proposal.

This proposal takes into account the definitions of "guard" and "handrail" in the IBC by limiting the applicability of the proposed definitions in this proposal to Chapter 16, whereas the definitions of "guard" and "handrail" apply throughout the IBC. The definitions in this proposal will establish grab bar, guardrail and handrail systems as structural systems that are required to resist structural design loads and transfer these loads to the supporting structure. This will contrast with guards and handrails whose definitions are primarily utilized in code provisions related to egress and accessibility.

All instances of "guard" in the structural chapters, and all references to Section 1607.7 in the nonstructural chapters, of the 2009 IBC are included in this proposal.

This proposal was prepared in conjunction with a proposal to editorially correlate IBC Section 1607 with Chapter 4 of ASCE 7-10 and is intended to further revise Section 1607 without any overlapping or conflicting changes between the two proposals.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S25-1607.7

S72–09/10
1607.7.1.2

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1607.7.1.2 Components. ~~Intermediate~~ Rails, ~~(all those except the handrail), balusters~~ other than handrails and the top rails of guards, and panel fillers shall be designed to withstand a horizontally applied normal load of 50 pounds (0.22 kN) on an area equal to 1 square foot (0.093m^2), including openings and space between rails. Reactions due to this loading are not required to be superimposed with those of Section 1607.7.1 or 1607.7.1.1.

Reason: This proposal serves two purposes. The first is to replace parenthetical text, which is often viewed as commentary, with mandatory text that is also more comprehensive. The current text is extracted from ASCE 7-05 and is the source of the parenthetical "all those except the handrails."

The second purpose is to revise text that is not comprehensive in that it requires intermediate rails, balusters and panel fillers to be designed for a load of 50 pounds and includes openings and space between the rails but not between the rails and balusters. This was brought to the attention of the Live Load Subcommittee, which chose to delete balusters rather than add them at the end of the first sentence after "rails." The

Subcommittee also chose to retain the parenthetical text. The proposal revises the charging text so that specifying balusters will not be necessary by specifying all rails except handrails and the top rails of guards.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S9-1607.7.1.2

S73-09/10
1607.7.3

Proponent: Philip Brazil, PE, SE, representing self

Revise as follows:

1607.7.3 Vehicle barrier systems. Vehicle barrier systems for passenger vehicles shall be designed to resist a single load of 6,000 pounds (26.70 kN) applied horizontally in any direction to the barrier system and shall have anchorage or attachment capable of transmitting this load to the structure. For design of the system, ~~two loading conditions shall be analyzed. The first condition shall apply~~ the load shall be assumed to act at ~~a~~ heights of ~~1 foot, 6~~ 18 to 27 inches (457 to 686 mm) above the floor or ramp surface, located so as to produce the maximum load effects. ~~The second loading condition shall apply the load at 2 feet, 3 inches (686 mm) above the floor or ramp surface. The more severe load condition shall govern the design of the barrier restraint system.~~ The load shall be ~~assumed to act~~ applied on an area not to exceed ~~1 square foot (305 mm^2), and~~ 12 inches by 12 inches (305 mm by 305 mm). The load is not required to ~~be assumed to~~ act concurrently with any handrail or guard loadings specified in Section 1607.7.1. Garages accommodating trucks and buses shall be designed in accordance with an approved method that contains provision for traffic railings.

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. The need for correlation is due to an ASCE 7 Proposal LLSC-LL14, which has been approved by the Live Load Subcommittee. It is expected that the Main Committee will ballot and approve the proposal.

The proposed text will better define the design loads appropriate for vehicle barrier systems. The current text specifies the application of a horizontal load at two heights above the floor or ramp surface: 18 inches and 27 inches. These loads do not adequately account for the range of heights where passenger vehicles will impact a vehicle barrier system or the range of designs utilized for vehicle barrier systems, which include steel cables spanning horizontally between vertical supports. With the current text, it is possible for a vehicle barrier system to be designed with two horizontally spanning steel cables with heights above the floor or ramp surface of 18 inches and 27 inches, respectively. Such an arrangement does not adequately provide for vehicles whose impact with a vehicle barrier system will be between these heights. The proposed text will ensure that all heights between 18 and 27 inches are considered in the design of the vehicle barrier system and that each element of the system is designed for the maximum load effect.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: Brazil-S4-1607.7.3

S74–09/10
1607.7.3

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing self

Revise as follows:

1607.7.3 Vehicle barrier systems. Vehicle barrier systems for passenger vehicles shall be designed to resist a single service load of 6,000 pounds (26.70 kN) applied horizontally in any direction to the barrier system and shall have anchorage or attachment to the structure that shall not fail at less than 2.5 times this load. ~~capable of transmitting this load to the structure.~~ For design of the system, two loading conditions shall be analyzed. The first condition shall apply the load at a height of 1 foot, 6 inches (457 mm) above the floor or ramp surface. The second loading condition shall apply the load at 2 feet, 3 inches (686 mm) above the floor or ramp surface. The more severe load condition shall govern the design of the barrier restraint system. The load shall be assumed to act on an area not to exceed 1 square foot (0.0929 m^2), and is not required to be assumed to act concurrently with any handrail or guard loadings specified in Section 1607.7.1. Garages accommodating trucks and buses shall be designed in accordance with an approved method that contains provision for traffic railings.

Reason: In the prior code cycle (IBC S73-07/08), significant and convincing evidence was presented by the Parking Consultants Council of the National Parking Association (PCCNPA) that demonstrated that vehicles are generally heavier than when the provisions for vehicle barriers were first introduced into the code and that nonductile failure of connections was a potential problem. Consequently, the existing requirement in the International Building Code is potentially unconservative.

This proposal addresses two issues:

First, this proposal clarifies that the design load of 6,000 pounds is a service load as opposed to an ultimate load. If an engineer is using strength design or load and resistance factor design, the load should be increased by the appropriate live load factor.

Second, this proposal requires that the design have significant overstrength in the connection design. As it is currently worded, the code only requires that the connections be able to transmit the 6,000 pound load to the structure, potentially resulting in designs that are more likely to fail at the connections. Last cycle's proposal (IBC S73-07/08) to add a requirement that the anchorages be ductile and extend and deform to absorb impact energy prior to ultimate failure was deemed by the Committee to be too vague and unworkable for code language. This proposal will require that the minimum factor of safety for the connections will be 2.5 and will make it more likely that the vehicle barrier will deform and fail within the body of the system, consequently increasing the likelihood that the failure will be ductile and will dissipate more energy than if the failure occurs in the connections of the system to the structure.

The prior code change proposal (S73-07/08 by PCCNPA) and the relevant technical back-up can be found here:
http://www.iccsafe.org/cs/codes/2007-08cycle/ProposedChanges/V1_S70-147.pdf

Cost Impact: There may be a small increase in the cost of construction of vehicle barrier systems if this proposal is approved

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Searer-S1-1607.2.3

S75-09/10
1607.8, 1607.8.1, 1607.8.2

Proponent: Philip Brazil, PE, SE, representing self

1. Revise as follows:

1607.8 Impact loads. The live loads specified in Sections 1607.3 through 1607.7 shall be assumed to include adequate allowance for ordinary impact conditions. Provisions shall be made in the structural design for uses and loads that involve unusual vibration and impact forces.

1607.8.1 Elevators. ~~Elevator loads~~ Members, elements and components subject to dynamic loads from elevators shall be ~~increased by 100 percent~~ designed for impact loads and ~~the structural supports shall be designed within the limits of~~ deflection limits prescribed by ASME A17.1.

1607.8.2 Machinery. For the purpose of design, the weight of machinery and moving loads shall be increased as follows to allow for impact: (1) ~~elevator machinery, 100 percent; (2)~~ light machinery, shaft- or motor-driven, 20 percent; ~~(3)~~ and (2) reciprocating machinery or power-driven units, 50 percent~~; (4) hangers for floors or balconies, 33 percent~~. Percentages shall be increased where specified by the manufacturer.

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. The need for correlation is due to ASCE 7 Proposal LLSC-LL-10, which has been approved by the Live Load Subcommittee. It is expected that the Main Committee will ballot and approve the proposal. The changes in Section 1607.8 are for consistency with the corresponding Section 4.6 of ASCE 7-10.

The changes in Section 1607.8.1 clarify that the impact load from elevators applies specifically to members, elements and components subject to dynamic loading from the elevator mechanism and direct the code user to the elevator standard (ASME A17.1) to determine the increases.

In Section 1607.8.2, elevator machinery is deleted because it is covered by Section 1607.8.1. Hangers for floors or balconies are deleted because live loads should be determined based on their occupancy or use with due consideration for dynamic effects as specified in Section 1607.8. The 33 percent increase has been determined to be an archaic application for a23 perceived lack of redundancy in the structural system. Such an increase should not be imposed on the load side of design equations and, instead, should be a consideration in material standards (e.g., resistance side of design equations).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: Brazil-S6-1607.8

S76-09/10
1607.9-1607.9.2

Proponent: Philip Brazil, PE, SE, representing self

1. Revise as follows:

1607.9 Reduction in live loads. Except for uniform live loads at roofs, all other minimum uniformly distributed live loads, L_o, in Table 1607.1 are permitted to be reduced in accordance with Sections 1607.9.1 ~~or 1607.9.2~~ through 1607.9.6. Roof uniform live loads, other than special purpose roofs of Section 1607.11.2.2 are permitted to be reduced in accordance with Section 1607.11.2. Roof uniform live loads of special purpose roofs are permitted to be reduced in accordance with Sections 1607.9.1 ~~or 1607.9.2~~ through 1607.9.6.

1607.9.1 General. Subject to the limitations of Sections ~~1607.9.1.1~~ 1607.9.2 through ~~1607.9.1.4~~ 1607.9.6, members for which a value of $K_{LL}\,A_T$ is 400 square feet (37.16 m^2) or more are permitted to be designed for a reduced live load in accordance with the following equation:

$$L = L_o\left(0.25 + \frac{15}{\sqrt{K_{LL}A_T}}\right) \qquad \textbf{Equation 16-22)}$$

$$\text{For SI: } L = L_o\left(0.25 + \frac{4.57}{\sqrt{K_{LL}A_T}}\right)$$

where:

L = Reduced design live load per square foot (meter) of area supported by the member.
L_o = Unreduced design live load per square foot (meter) of area supported by the member (see Table1607.1).
K_{LL} = Live load element factor (see Table 1607.9.1).
A_T = Tributary area, in square feet (square meters).

L shall not be less than 0.50 L_o for members supporting one floor and L shall not be less than 0.40 L_o for members supporting two or more floors.

~~**1607.9.1.1**~~ **1607.9.2 One-way slabs.** The tributary area, A_T, for use in Equation 16-22 for one-way slabs shall not exceed an area defined by the slab span times a width normal to the span of 1.5 times the slab span.

~~**1607.9.1.2**~~ **1607.9.3 Heavy live loads.** Live loads that exceed 100 psf (4.79 kN/m^2) shall not be reduced.

Exceptions:

1. The live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20 percent, but the live load shall not be less than L as calculated in Section 1607.9.1.
2. For uses other than storage, where approved, additional live load reductions shall be permitted where shown by the registered design professional that a rational approach has been used and that such reductions are warranted.

~~**1607.9.1.3**~~ **1607.9.4 Passenger vehicle garages.** The live loads shall not be reduced in passenger vehicle garages.

Exception: The live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20 percent, but the live load shall not be less than L as calculated in Section 1607.9.1.

~~**1607.9.1.4**~~ **1607.9.5 Group A occupancies.** Live loads of 100 psf (4.79 kN/m^2) and at areas where fixed seats are located shall not be reduced in Group A occupancies.

~~**1607.9.1.6**~~ **1607.9.6 Roofs members.** Live loads of 100 psf (4.79 kN/m^2) or less shall not be reduced for roof members except as specified in Section 1607.11.2.

2. Delete without substitution:

~~**1607.9.2 Alternate floor live load reduction.** As an alternative to Section 1607.9.1, floor live loads are permitted to be reduced in accordance with the following provisions. Such reductions shall apply to slab systems, beams, girders, columns, piers, walls and foundations.~~

~~1. A reduction shall not be permitted in Group A occupancies.~~
~~2. A reduction shall not be permitted when the live load exceeds 100 psf (4.79 kN/m^2) except that the design live load for members supporting two or more floors is permitted to be reduced by 20 percent.~~

~~**Exception:** For uses other than storage, where approved, additional live load reductions shall be permitted where shown by the registered design professional that a rational approach has been used and that such reductions are warranted.~~

~~3. A reduction shall not be permitted in passenger vehicle parking garages except that the live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20 percent.~~
~~4. For live loads not exceeding 100 psf (4.79 kN/m^2), the design live load for any structural member supporting 150 square feet (13.94 m^2) or more is permitted to be reduced in accordance with the following equation:~~
~~5. For one-way slabs, the area, *A*, for use in Equation 16-23 shall not exceed the product of the slab span and a width normal to the span of 0.5 times the slab span.~~

~~$R = 0.08 (A - 150)$~~ **~~(Equation 16-23)~~**
~~For SI: $R = 0.861 (A - 13.94)$~~

~~Such reduction shall not exceed the smallest of:~~

~~1. 40 percent for horizontal members,~~
~~2.~~ 60 percent for vertical members, or
~~3. *R* as determined by the following equation:~~

~~$R = 23.1 (1 + D / L_o)$~~ **~~(Equation 16-24)~~**

~~where:~~

~~A = Area of floor supported by the member, square feet (m^2).~~
~~D = Dead load per square foot (m^2) of area supported.~~
~~L_o = Unreduced live load per square foot (m^2) of area supported.~~
~~R = Reduction in percent.~~

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. Most of the provisions being deleted were the product of a legacy code. They have not appeared in recent editions of ASCE 7 nor are they likely to appear in the 2010 edition.
The provisions of IBC Sections 1607.9.1 for the basic procedures to reduce live load on floors and roofs serving an occupancy function are based on Section 4.8 of ASCE 7 (Reduction in Live Loads). The ASCE 7 Committee develops and maintains the provisions of Section 4.8 and has not chosen not to add alternative procedures for the reduction of live loads. The differences between the basic and alternative procedures are such that structural performance of buildings and other structures can be expected to differ depending on which set of procedures are utilized in the design. The ICC code development process does not provide the means for adequate deliberation over the merits of each set of procedures in providing adequate levels of public safety. This deliberation should be done by the ASCE 7 Committee.

A separate proposal further aligns IBC Section 1607 on roof live load reduction with Chapter 4 of ASCE 7-10. That proposal deletes Section 1607.9.1.5 and the last sentence of Section 1607.9 and revises the second sentence of Section 1607.9. The deletions and revisions are not repeated in this proposal but, should both proposals be approved by the membership, the proponent intends that the last sentence of Section 1607.9 be deleted, not revised as indicated in this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: Brazil-S5-1607.9

S77–09/10
1607.9, 1607.9.1.5, 1607.11.2, 1607.11.2.1, 1607.11.2.2, Table 1607.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

1. Revise as follows:

1607.9 Reduction in live loads. Except for uniform live loads at roofs, all other minimum uniformly distributed live loads, L_o, in Table 1607.1 are permitted to be reduced in accordance with Section 1607.9.1 or 1607.9.2. ~~Roof~~ Uniform live loads~~, other than special purpose roofs of Section 1607.11.2.2~~ at roofs are permitted to be reduced in accordance with Section 1607.11.2. ~~Roof uniform live loads of special purpose roofs are permitted to be reduced in accordance with Section 1607.9.1 or 1607.9.2~~.

~~**1607.9.1.5 Roofs members.** Live loads of 100 psf (4.79 kN/m^2) or less shall not be reduced for roof members except as specified in Section 1607.11.2.~~

1607.11.2 ~~Reduction in roof live loads~~ General. The minimum uniformly distributed live loads of roofs and marquees, L_o, in Table 1607.1 are permitted to be reduced in accordance with Section 1607.11.2.1 or 1607.11.2.2.

1607.11.2.1 ~~Flat, pitched and curved~~ Ordinary roofs, awnings and canopies. Ordinary flat, pitched and curved roofs, and awnings and canopies other than of fabric construction supported by lightweight rigid skeleton structures, are permitted to be designed for a reduced uniformly distributed roof live load, L_r, as specified in the following equations or other controlling combinations of loads in Section 1605, whichever produces the greater load.

In structures such as greenhouses, where special scaffolding is used as a work surface for workers and materials during maintenance and repair operations, a lower roof load than specified in the following equations shall not be used unless approved by the building official. Such structures shall be designed for a minimum roof live load of 12 psf (0.58 kN/m^2).

$L_r = L_o R_1 R_2$ **(Equation 16-25)**

where: $12 \le L_r \le 20$

For SI: $L_r = L_o R_1 R_2$

where: $0.58 \le L_r \le 0.96$

L_r = Reduced live load per square foot (m^2) of horizontal projection in pounds per square foot (kN/m^2).

The reduction factors R_1 and R_2 shall be determined as follows:

$R_1 = 1$ for $A_t \le 200$ square feet (18.58 m^2) **(Equation 16-26)**

$R_1 = 1.2 - 0.001 A_t$ for 200 square feet $< A_t <$ 600 square feet **(Equation 16-27)**
For SI: $1.2 - 0.011 A_t$ for 18.58 square meters $< A_t <$ 55.74 square meters

$R_1 = 0.6$ for $A_t \ge 600$ square feet (55.74 m^2) **(Equation 16-28)**

where:

A_t = Tributary area (span length multiplied by effective width) in square feet (m^2) supported by any structural member, and

$R_2 = 1$ for $F \le 4$ **(Equation 16-29)**
$R_2 = 1.2 - 0.05 F$ for $4 < F < 12$ **(Equation 16-30)**
$R_2 = 0.6$ for $F \ge 12$ **(Equation 16-31)**

where:

F = For a sloped roof, the number of inches of rise per foot (for SI: F = 0.12 x slope, with slope expressed as a percentage), or for an arch or dome, rise-to-span ratio multiplied by 32.

1607.11.2.2 ~~Special-purpose roofs~~ Roof areas serving occupancy functions. Areas of roofs ~~used for promenade purposes,~~ that serve occupancy functions, such as roof gardens, or for assembly ~~purposes~~ or other ~~special~~ similar purposes, and marquees~~, shall be designed for a minimum live load, L_o, as specified in Table 1607.1. Such live loads~~ are permitted to ~~be~~ have their uniformly distributed live loads reduced in accordance with Section 1607.9. Live loads of 100 psf or more at areas of roofs classified as Group A occupancies shall not be reduced.

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS [g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
29. Roofs:		
All roof surfaces subject to maintenance workers		300
Awnings and canopies:		
Fabric construction supported by a lightweight rigid skeleton structure	5 nonreduceable	
All other construction	20	
Ordinary flat, pitched, and curved roofs (not serving an occupancy function)	20	
Primary roof members, exposed to a work floor:		
Single panel point of lower chord of roof trusses or any point along primary structural members supporting roofs over manufacturing, storage warehouses, and repair garages		2,000
All other occupancies		300
~~Roofs used for other special purposes~~	~~Note l~~	~~Note l~~
~~Roofs used for promenade purposes~~	~~60~~	
~~Roofs used for roof gardens or assembly purposes~~	~~100~~	
Roofs serving an occupancy function:		
Roof gardens	60	
Assembly areas	100	
All other similar areas	Note l	Note l

(Portions of Table not show, remain unchanged)

(No change to footnotes a through f)

g. Where snow loads occur that are in excess of the design conditions, the structure shall be designed to support the loads due to the increased loads caused by drift buildup or a greater snow design determined by the building official (see Section 1608). ~~For special-purpose roofs, see Section 1607.11.2.2.~~

(No change to footnotes h through k)

l. ~~Roofs used for other special purposes~~ Areas of roofs serving on occupancy function, other than roof gardens and assembly areas, shall be designed for appropriate loads as approved by the building official.

2. Re-organize Table 1607.1 as follows:

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS [g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
29. Roofs:		
Ordinary flat, pitched, and curved roofs (not serving an occupancy function)	20	
Awnings and canopies:		
Fabric construction supported by a lightweight rigid skeleton structure	5 nonreducible	
All other construction	20	
~~Roofs used for other special purposes~~	~~Note l~~	~~Note l~~
~~Roofs used for promenade purposes~~	~~60~~	
~~Roofs used for roof gardens or assembly purposes~~	~~100~~	
Roofs serving an occupancy function:		
Roof gardens	60	
Assembly areas	100	
All other similar areas	Note l	Note l

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
Primary roof members, exposed to a work floor:		
Single panel point of lower chord of roof trusses or any point along primary structural members supporting roofs over manufacturing, storage warehouses, and repair garages		2,000
All other occupancies		300
All roof surfaces subject to maintenance workers		300

(Portions of Table not show, remain unchanged)

Reason This proposal was prepared in conjunction with a proposal to editorially correlate IBC Section 1607 with the provisions of Chapter 4 of ASCE 7-10 related to floor live load reduction. This proposal focuses on editorial correlation for roof live load reduction and is intended to further align IBC Section 1607 with Chapter 4 of ASCE 7-10 without any overlapping or conflicting changes between the two proposals. The changes in this proposal are seen as largely editorial.

The items under "roofs" in Table 1607.1 are reorganized to align them with Section 1607.11.2 on the reduction of live loads at roofs. Section 1607.11.2 permits reductions in uniform live loads at roofs and marquees "in accordance with Section 1607.11.2.1 or 1607.11.2.2." These sections, in turn, refer to items under "roofs" in Table 1607.1 except for marquees, which are separately listed in the table. The reorganization of the items under "roofs" is intended to reduce confusion over the applicability of roof live load reduction at "ordinary flat, pitched and curved roofs" in Section 1607.11.2.1, which applies to roofs that do not serve an occupancy function but are susceptible to loads from maintenance workers, and at roofs that serve an occupancy function in Section 1607.11.2.2, which are the structural equivalent of floors. Section 1607.11.2.1 also applies to awnings and canopies and the title of the section is changed accordingly. Table 1607.1 is reorganized so that it aligns with these sections.

The changes to Section 1607.9 and the deletion of Section 1607.9.1.5 eliminate superfluous text. Section 1607.9 provides the charging text for reduction of uniformly distributed live loads at floors. The changes retain the reference to Section 1607.11.2 on roof live load reduction but delete the text referring to special purpose roofs in favor of the charging text in Section 1607.11.2.

Section 1607.11.2.2 is changed to align it with the corresponding provisions in Section 4.8.2 of ASCE 7-10. Section 4.9.2 of ASCE 7-05 currently specifies roofs "that have an occupancy function" but the title of the section is "special purpose roofs." The proponent is requesting the title be changed to "roof areas serving an occupancy function" in Section 4.8.2 of ASCE 7-10 and IBC Section 1607.11.2.2 is changed accordingly. Section 4.8.2 of ASCE 7-10 specifies roof gardens and areas used for "assembly or other similar purposes" as examples of roof areas that serve occupancy functions. Section 4.9.2 of ASCE 7-05 is similar. Table 4-1 of ASCE 7-05, however, lists roofs used for promenade purposes along with roofs used for roof gardens or for assembly or other special purposes. This listing of roofs used for promenade purposes is deleted in Table 4-1 of ASCE 7-10 and IBC Table 1607.1 is changed accordingly.

The proponent is requesting "other special purposes" be changed to "other similar purposes" in Section 4.8.2 and Table 4-1 of ASCE 7-10 in conjunction with the requested change in the title of Section 4.8.2 from "special purpose roofs" to "roof areas serving an occupancy function." IBC Section 1607.11.2.2 and Table 1607.1 are changed accordingly. Note that the uniform live load at roofs used for other special purposes in Table 4-1 of ASCE 7-05 and 2009 IBC Table 1607.1, and at other similar areas of roofs serving an occupancy function in IBC Table 1607.1 of this proposal, is not specified in favor of a footnote specifying appropriate loads as approved by the authority having jurisdiction (ASCE 7) or building official (IBC) and is not affected by this proposal.

Footnotes (g) and (l) to Table 1607.1 are revised for consistency with the changes to Section 1607.11.2.2 above. The deletion in Footnote (g) also eliminates a superfluous cross-reference.

A separate proposal correlates the IBC with changes to the provisions of ASCE 7-10 where reduction of live loads at floors and occupied roofs is restricted or prohibited. That proposal adds Footnote (m) to "100 psf" at "roofs used for assembly purposes" in the item for roofs in Table 1607.1. The addition of the footnote is not repeated in this proposal but, should this proposal and the proposal adding the footnote be approved by the membership, the proponent intends that Footnote (m) be specified with "100 psf" at "assembly areas" under "roofs serving an occupancy function" in the item for roofs in Table 1607.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S14-1607.9

S78–09/10
1607.9.2

Proponent: Matt Rescorla, PE, Cubic Designs, Inc., representing self

Revise as follows:

1607.9.2 Alternate floor live load reduction. As an alternative to Section 1607.9.1, floor live loads are permitted to be reduced in accordance with the following provisions. Such reductions shall apply to slab systems, beams, girders, columns, piers, walls and foundations.

1. A reduction shall not be permitted in Group A occupancies.
2. A reduction shall not be permitted where the live load exceeds 100 psf (4.79 kN/m^2) except that the design live load for columns ~~members supporting 2 or more floors~~ is permitted to be reduced by a maximum of 20 percent where shown by the registered design professional that a rational approach has been used and that such reductions are warranted.

Exception: For uses other than storage, where *approved*, additional live load reductions shall be permitted where shown by the *registered design professional* that a rational approach has been used and that such reductions are warranted.

3. A reduction shall not be permitted in passenger vehicle parking garages except that the live loads for members supporting two or more floors are permitted to be reduced by a maximum of 20 percent.
4. For live loads not exceeding 100 psf (4.79 kN/m^2), the design live load for any structural member supporting 150 square feet (13.94 m^2) or more is permitted to be reduced in accordance with Equation 16-23.
5. For one-way slabs, the area, *A*, for use in Equation 16-23 shall not exceed the product of the slab span and a width normal to the span of 0.5 times the slab span.

$R = 0.08(A - 150)$ **(Equation 16-23)**
For SI: $R = 0.861(A - 13.94)$

Such reduction shall not exceed the smallest of:

1. 40 percent for horizontal members;
2. 60 percent for vertical members; or
3. *R* as determined by the following equation.

$R = 23.1(1 + D/L_o)$ **(Equation 16-24)**

where:

A = Area of floor supported by the member, square feet (m2).
D = Dead load per square foot (m^2) of area supported.
L_o = Unreduced live load per square foot (m^2) of area supported.
R = Reduction in percent.

Reason: Typical minimum uniformly distributed live loads for Mezzanine design are dictated by Table 1607.1, under the loads of "Light Storage" at 125 psf. Leeway should be given to professional judgment in regards to live load reduction. Twenty years of professional experience has shown, the standard mezzanine (used for storage and designed for 125 psf) experiences a load ranging from 75-90 psf. A mezzanine used for production and experiencing loads from permanent equipment greater than or equal to 125 psf would not receive a reduction to its load.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RESCORIA-S1-1607.9.2

S79–09/10
1602.1, Table 1607.1, 1607.11.3

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1602.1 Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

DEAD LOADS. The weight of materials of construction incorporated into the building, including but not limited to walls, floors, roofs, ceilings, stairways, built-in partitions, finishes, cladding, landscaping materials and other similarly incorporated architectural and structural items, and the weight of fixed service equipment, such as cranes, plumbing stacks and risers, electrical feeders, heating, ventilating and air-conditioning systems and automatic sprinkler systems.

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS [g]

OCCUPANCY OR USE	UNIFORM (psf)	CONCENTRATED (lbs.)
29. Roofs		
All roof surfaces subject to maintenance workers		300
Awnings and canopies		
Fabric construction supported by a lightweight rigid skeleton structure	5 nonreduceable	
All other construction	20	
Ordinary flat, pitched, and curved roofs	20	
Primary roof members, exposed to a work floor		
Single panel point of lower chord of roof trusses or any point along primary structural members supporting roofs over manufacturing, storage warehouses, and repair garages		2,000
All other occupancies		300
Roofs used for other special purposes	Note l	Note l
Roofs used for promenade purposes	60	
Roofs used for roof gardens	60	
Roofs used for ~~roof gardens or~~ assembly purposes	100	

(Portions of Table not shown, remain unchanged. No changes to footnotes)

1607.11.3 Landscaped roofs. Where ~~roofs~~ areas of the roof are to be landscaped, the landscaped areas shall be designed to resist a uniform design live load ~~in the landscaped area shall be~~ of 20 psf (0.958 kN/m^2). The weight of the landscaping materials shall be considered as dead load and shall be computed on the basis of saturation of the soil. Adjacent areas without landscaping that are occupiable shall be designed to resist the live loads specified in Table 1607.1 for roof gardens.

Reason: The purpose for this proposal is to revise the IBC for consistency with an ASCE 7 proposal being considered by the Live Load Subcommittee. The proposed text will better define the design loads appropriate for roofs with landscaping. Such roofs typically consist of landscaped areas, which are not occupiable except by maintenance workers, and occupiable areas adjacent to the landscaped areas. Table 1607.1 does not currently distinguish between them except to specify a live load of 100 psf for roof gardens. A live load of 100 psf is not justified for landscaped areas. It is excessive for occupiable areas except where they are used for assembly purposes.

The proposal distinguishes between landscaped areas and adjacent areas without landscaping that are occupiable. A live load of 20 psf, the same as the unreduced live load for ordinary, flat, pitched and curved roofs, is currently specified in Section 1607.11.3 for roofs that are to be landscaped. The proposal revises this to areas of the roof that are to be landscaped. An entire roof devoted to landscaping should not be necessary before the structural demands due to landscaping areas are required to be considered. Section 1607.11.3 currently specifies the saturated weight of the landscaping materials as dead load. The proposal adds landscaping materials to the definition of "dead load" in Section 1602.1 for consistency.

For adjacent areas without landscaping that are occupiable, the proposal adds to Section 1607.11.3 the requirement that these areas be designed to resist the live loads specified in Table 1607.1 for roof gardens. The live load for roof gardens in Table 1607.1 is reduced to 60 psf. The listing in Table 1607.1 of 100 psf for assembly areas is retained to account for areas without landscaping that are used for assembly purposes.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Brazil-S28-T1607.1

S80–09/10
Table 1607.1, 1607.11.2, 1607.11.2.2, 1607.11.3

Proponent: Traxler, City of Seattle representing Seattle Dept of Planning & Development

Revise as follows:

TABLE 1607.1
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS, L_o, AND MINIMUM CONCENTRATED LIVE LOADS~~g~~
(*No change to table)*

(No change to footnotes a through k)

l. Roofs used for other special purposes shall be designed for appropriate loads as approved by the building official. Unoccupied landscaped areas of roofs shall be designed in accordance with Section 1607.11.3.

1607.11.2 Reduction in roof live loads. The minimum uniformly distributed live loads of roofs and marquees, L_o, in Table 1607.1 are permitted to be reduced in accordance with Section 1607.11.2.1 ~~or 1607.11.2.2~~.

1607.11.3. ~~1607.11.2.2~~ Special-purpose roofs. Roofs used for promenade purposes, roof gardens, assembly purposes or other special purposes, and marquees, shall be designed for a minimum live load, L_o, as specified in Table 1607.1. Such live loads are permitted to be reduced in accordance with Section 1607.9. Live loads of 100 psf (4.79 kN/m^2) or more at areas of roofs classified as Group A occupancies shall not be reduced.

1607.11.3.1 Landscaped roofs. ~~Where roofs are to be landscaped, the~~ The uniform design live load in ~~the~~ unoccupied landscaped areas on roofs shall be 20 psf (0.958 kN/m^2). The weight of ~~the~~ all landscaping materials shall be considered as dead load and shall be computed on the basis of saturation of the soil.

Reason: Roofs used for roof gardens, commonly referred to as "green roofs", have generated many questions as to the appropriate load requirements. There has been confusion over what live loads are to be used for the landscaped versus non-landscaped portions of the roofs, and about how the "roof garden" provisions of Table 1607.1 row 29 coordinate with Section 1607.11.3. We are proposing an amendment that separates "special purpose roofs", including roof gardens, from the section on reduction of roof loads, and clarifying that the provisions for landscaped roofs only applies to unoccupied areas; occupied areas should be designed for loads appropriate to the particular occupancy. Note that the last sentence of what becomes Section 1607.11.3.1 in this proposal could be relocated to Section 1606.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Traxler-S2-T1607.1

S81–09/10
1607.13

Proponent: Stephen Kerr, PE, SE, representing self

Revise as follows:

1607.13 Interior walls and partitions. Interior walls and partitions that exceed 6 feet (1829 mm) in height, including their finish materials, shall have adequate strength to resist the loads to which they are subjected but not less than a horizontal load of 5 psf (0.240 kN/m^2). For the purposes of calculating deflection, the loading of this section shall be treated as a wind load in accordance with Table 1604.3.

> **Exception:** Fabric partitions complying with Section 1607.13.1 shall not be required to resist the minimum horizontal load of 5 psf (0.240 kN/m^2).

Reason: Currently, Table 1604.3 does not have deflection limits for Live Loads on Interior walls. The 5.0 psf requirement in section 1607.13 is classified as a live load and would not require a deflection check. Under the legacy Uniform Building Code this load was treated as an "other load" and was required to meet the defection limits identical to those in IBC Table 1604.3. To avoid confusion for walls, and to require deflection checks on interior walls, the proposed code change is necessary.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KERR-S3-1607.13

S82–09/10
1607.14 (New)

Proponent: Dennis Richardson PE, dbr group inc., representing self

Add new text as follows:

1607.14 Fire-resistance-rated exterior walls. Fire-resistance rated exterior walls required by Section 705.6 to have sufficient structural stability such that it will remain in place for the duration of time indicated by the required fire-resistance rating shall have adequate strength to resist the loads to which they are subjected but not less than a horizontal load of 10 psf (0.48 kN/m^2) applied perpendicular to the plane of the wall.

Reason: Design criteria do not exist for the current requirement found in Section 705.6 to justify the performance requirement for the out of plane structural support of fire-resistance rated exterior walls. A code change proposal has been submitted to provide proscriptive exceptions to the current performance related language found in the 2009 IBC. There needs to be some design criteria when the exceptions do not apply. Because of the uncertainty and dynamic nature of fire conditions, it is felt the interior partition wall load of 5 psf would be too low for the design of free standing exterior fire resistance rated walls expected to perform adequately during fire conditions. Because fires do have associated impact loads and air pressure associated with collapsing elements, a minimum out of plane loading of 10 psf is proposed as a lower bound when exterior fire resistance rated walls are required to be justified.

Cost Impact: Since this code change requires a minimum level of strength where the current code states vague performance objectives, this proposed change could increase construction cost.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Richardson-S1-1607.14

S83–09/10
1602.1, 1608.3 (New), 1611.2

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

1. Add new definition as follows:

1602.1 Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

SUSCEPTIBLE BAY. A roof or portion thereof with (1) a slope less than 1/4-inch per foot (0.0208 rad), or (2) where water will be impounded upon it, in whole or in part, and the secondary drainage system is functional but the primary drainage system is not functional. A roof surface with a slope of 1/4-inch per foot (0.0208 rad) or greater towards points of free drainage is not a susceptible bay.

2. Add new text as follows:

1608.3 Ponding instability. Susceptible bays of roofs shall be evaluated for ponding instability in accordance with Section 7.11 of ASCE 7.

3. Revise as follows:

1611.2 Ponding instability. ~~For~~ Susceptible bays of roofs ~~with a slope less than 1/4 inch per foot [1.19 degrees (0.0208 rad)], the design calculations~~ shall ~~include verification of~~ be investigated by structural analysis to ensure that they possess adequate stiffness to preclude progressive deflection in accordance with Section 8.4 of ASCE 7.

Reason: The purpose for the proposal is to correlate the IBC with the 2010 edition of ASCE 7. The need for correlation is due to an ASCE 7 proposal on ponding instability, which was approved by the Snow/Rain Subcommittee and is being balloted by the Main Committee (Item #3 of the ASCE 7 Third Main Committee Ballot on Snow and Rain Provisions). It is expected that the Main Committee will approve the proposal.

Susceptible bays of roofs are required to meet the technical provisions of ASCE 7-10 for precluding progressive deflection. A "susceptible bay" is defined in Section 8.4 of ASCE 7-10 and this definition is being added to the IBC. Having a definition of "susceptible bay" in the IBC will provide a technical basis for determining which bays of a roof are susceptible bays and, thus, are required to meet the technical provisions of ASCE 7-10 for them. All bays of roofs other than susceptible bays are not required to meet these technical provisions.

Without the definition, the IBC will be without effective charging text. IBC Sections 1608.3 and 1611.2 rely on the determination of which bays are susceptible bays in order to determine the need to comply with the applicable provisions of ASCE 7. That determination is not possible unless a definition of "susceptible bay" is included in the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S37-1602.1

S84–09/10
1602, 1609.1.2.2-1710.3

Proponent: Jim Rossberg, SEI of ASCE, representing self

1. Add new text as follows:

SECTION 1602
DEFINITIONS AND NOTATIONS

NOTATIONS.

V_{asd} = nominal design wind speed (3-sec gust), miles per hour (mph) (km/hr) where applicable.

V_{ult} = ultimate design wind speeds (3-sec gust), miles per hour (mph) (km/hr) determined from Figures 1609A, 1609B, or 1609C or ASCE 7.

2. Revise as follows:

1603.1 General. Construction documents shall show the size, section and relative locations of structural members with floor levels, column centers and offsets dimensioned. The design loads and other information pertinent to the structural design required by Sections 1603.1.1 through 1603.1.9 shall be indicated on the *construction documents*.

Exception: *Construction documents* for buildings constructed in accordance with the *conventional light-frame construction* provisions of Section 2308 shall indicate the following structural design information:

1. Floor and roof live loads.
2. Ground snow load, P_g.
3. ~~Basic~~ Ultimate design wind speed, V_{ult} , (3-second gust), miles per hour (mph) (km/hr) and nominal design wind speed, V_{asd}, as determined in accordance with Section 1609.3.1 and wind exposure.
4. *Seismic design category* and *site class*.
5. Flood design data, if located in *flood hazard areas* established in Section 1612.3.
6. Design load-bearing values of soils.

1603.1.4 Wind design data. The following information related to wind loads shall be shown, regardless of whether wind loads govern the design of the lateral-force-resisting system of the building:

1. ~~Basic~~ Ultimate design wind speed, V_{ult}, (3-second gust), miles per hour (km/hr) and nominal design wind speed, V_{asd} , as determined in accordance with Section 1609.3.1.
2. Wind importance factor, *I*, and *occupancy category*.
3. Wind exposure. Where more than one wind exposure is utilized, the wind exposure and applicable wind direction shall be indicated.
4. The applicable internal pressure coefficient.
5. Components and cladding. The design wind pressures in terms of psf (kN/m2) to be used for the design of exterior component and cladding materials not specifically designed by the *registered design professional*

TABLE 1604.3
DEFLECTION LIMITS[a,b,c,h,i]
(No change to table)

(No change to footnotes a-e)

f. The wind load is permitted to be taken as 0.42 ~~0.7~~ times the "component and cladding" loads for the purpose of determining deflection limits herein.

(No change to footnotes g-i)

1605.2.1 Basic load combinations. Where strength design or *load and resistance factor design* is used, structures and portions thereof shall resist the most critical effects from the following combinations of factored loads:

1.4 (*D*+*F*) **(Equation 16-1)**

1.2(*D* + *F* + *T*) + 1.6(*L* + *H*) + 0.5 (L_r or *S* or *R*) **(Equation 16-2)**

1.2D+ 1.6(L_r or S or R) + (f_1L or ~~0.8W~~ 0.5W) **(Equation 16-3)**

1.2D+ ~~1.6~~ 1.0W+ f_1L + 0.5(L_r or S or R) **(Equation 16-4)**

1.2D+ 1.0E+ f_1L + f_2S **(Equation 16-5)**

0.9D+ ~~1.6~~ 1.0W+ 1.6H **(Equation 16-6)**
0.9D+ 1.0E+ 1.6H **(Equation 16-7)**

where:

f_1 = 1 for floors in places of public assembly, for live loads in excess of 100 pounds per square foot (4.79 kN/m^2), and for parking garage live load, and
= 0.5 for other live loads.
f_2 = 0.7 for roof configurations (such as saw tooth) that do not shed snow off the structure, and
= 0.2 for other roof configurations.

Exception: Where other factored load combinations are specifically required by the provisions of this code, such combinations shall take precedence.

1605.3.1 Basic load combinations. Where *allowable stress design* (working stress design), as permitted by this code, is used, structures and portions thereof shall resist the most critical effects resulting from the following combinations of loads:

D+F **(Equation 16-8)**

D+H+F+ L + T **(Equation 16-9)**

D+H+F+ (L_r or S or R) **(Equation 16-10)**

D + H + F + 0.75(L + T) +
0.75 (L_r or S or R) **(Equation 16-11)**

D+H+F+(0.6W or 0.7E) **(Equation 16-12)**

D + H + F + 0.75(0.6W or 0.7E) +
0.75L + 0.75 (L_r or S or R) **(Equation 16-13)**

0.6D+ 0.6W+H **(Equation 16-14)**

0.6D+ 0.7E+H **(Equation 16-15)**

Exceptions:

1. Crane hook loads need not be combined with roof live load or with more than three-fourths of the snow load or one-half of the wind load.
2. Flat roof snow loads of 30 psf (1.44 kN/m^2) or less and roof live loads of 30 psf or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf (1.44 kN/m^2), 20 percent shall be combined with seismic loads.

1605.3.2 Alternative basic load combinations. In lieu of the basic load combinations specified in Section 1605.3.1, structures and portions thereof shall be permitted to be designed for the most critical effects resulting from the following combinations. When using these alternative basic load combinations that include wind or seismic loads, allowable stresses are permitted to be increased or load combinations reduced where permitted by the material chapter of this code or the referenced standards. For load combinations that include the counteracting effects of dead and wind loads, only two-thirds of the minimum dead load likely to be in place during a design wind event shall be used. Where wind loads are calculated in accordance with Chapters 26 through 31 ~~Chapter 6~~ of ASCE 7, the coefficient . in the following equations shall be taken as 0.78 ~~1.3~~. For other wind loads, shall be taken as 1. When using these alternative load combinations to evaluate sliding, overturning and soil bearing at the soil-structure interface, the reduction of foundation overturning from Section 12.13.4 in ASCE 7 shall not be used. When using these

alternative basic load combinations for proportioning foundations for loadings, which include seismic loads, the vertical seismic *load effect*, E_v, *i*n Equation 12.4-4 of ASCE 7 is permitted to be taken equal to zero.

$D + L + (L_r \text{ or } S \text{ or } R)$ **(Equation 16-16)**

$D + L + (\omega W)$ **(Equation 16-17)**

$D + L + \omega W + S/2$ **(Equation 16-18)**
$D + L + S + \omega W/2$ **(Equation 16-19)**

$D + L + S + E/1.4$ **(Equation 16-20)**

$0.9D + E/1.4$ **(Equation 16-21)**

Exceptions:

1. Crane hook loads need not be combined with roof live loads or with more than three-fourths of the snow load or one-half of the wind load.
2. Flat roof snow loads of 30 psf (1.44 kN/m^2) or less and roof live loads of 30 psf or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf (1.44 kN/m^2), 20 percent shall be combined with seismic loads.

1609.1.1 Determination of wind loads. Wind loads on every building or structure shall be determined in accordance with Chapters 26 to 30 ~~6~~ of ASCE 7 ~~or provisions of the alternate all-heights method in Section 1609.6~~. The type of opening protection required, the ~~basic~~ ultimate design wind speed, V_{ult}, and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions:

1. Subject to the limitations of Section 1609.1.1.1, the provisions of ICC 600 shall be permitted for applicable Group R-2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of the AF&PA WFCM.
3. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AISI S230.
4. Designs using NAAMM FP 1001.
5. Designs using TIA-222 for antenna-supporting structures and antennas.
6. Wind tunnel tests in accordance with Chapter 31 ~~Section 6.6~~ of ASCE 7~~, subject to the limitations in Section 1609.1.1.2~~.

The wind speeds in Figure 1609A, 1609B and 1609C are ultimate design wind speeds, V_{ult}, and shall be converted in accordance with Section 1609.3.1 to nominal design wind speeds, V_{asd}, when the provisions of the standards referenced in Exceptions 1 through 5 are used.

4. Delete without substitution as follows:

~~**1609.1.1.2 Wind tunnel test limitations.** The lower limit on pressures for main wind-force-resisting systems and components and cladding shall be in accordance with Sections 1609.1.1.2.1 and 1609.1.1.2.2.~~

~~**1609.1.1.2.1 Lower limits on main wind-force-resisting system.** Base overturning moments determined from wind tunnel testing shall be limited to not less than 80 percent of the design base overturning moments determined in accordance with Section 6.5 of ASCE 7, unless specific testing is performed that demonstrates it is the aerodynamic coefficient of the building, rather than shielding from other structures, that is responsible for the lower values. The 80-percent limit shall be permitted to be adjusted by the ratio of the frame load at critical wind directions as determined from wind tunnel testing without specific adjacent buildings, but including appropriate upwind roughness, to that determined in Section 6.5 of ASCE 7.~~

~~**1609.1.1.2.2 Lower limits on components and cladding.** The design pressures for components and cladding on walls or roofs shall be selected as the greater of the wind tunnel test results or 80 percent of the pressure obtained for Zone 4 for walls and Zone 1 for roofs as determined in Section 6.5 of ASCE 7, unless specific testing is performed that demonstrates it is the aerodynamic coefficient of the building, rather than shielding from nearby structures, that is~~

~~responsible for the lower values. Alternatively, limited tests at a few wind directions without specific adjacent buildings, but in the presence of an appropriate upwind roughness, shall be permitted to be used to demonstrate that the lower pressures are due to the shape of the building and not to shielding.~~

5. Revise as follows:

1609.1.2 Protection of openings. In *wind-borne debris regions*, glazing in buildings shall be impact resistant or protected with an impact-resistant covering meeting the requirements of an *approved* impact-resistant standard or ASTM E 1996 and ASTM E 1886 referenced herein as follows:

1. Glazed openings located within 30 feet (9144 mm) of grade shall meet the requirements of the Large Missile Test of ASTM E 1996.
2. Glazed openings located more than 30 feet (9144 mm) above grade shall meet the provisions of the small missile test of ASTM E 1996.

Exceptions:

1. Wood structural panels with a minimum thickness of $7/16$ inch (11.1 mm) and maximum panel span of 8 feet (2438 mm) shall be permitted for opening protection in one- and two-story buildings classified as Group R-3 or R-4 occupancy. Panels shall be precut so that they shall be attached to the framing surrounding the opening containing the product with the glazed opening. Panels shall be predrilled as required for the anchorage method and shall be secured with the attachment hardware provided. Attachments shall be designed to resist the components and cladding loads determined in accordance with the provisions of ASCE 7, with corrosion-resistant attachment hardware provided and anchors permanently installed on the building. Attachment in accordance with Table 1609.1.2 with corrosion-resistant attachment hardware provided and anchors permanently installed on the building is permitted for buildings with a mean roof height of 45 feet (13 716 mm) or less where V_{asd} determined in accordance with Section 1609.3.1 ~~wind speeds do~~ does not exceed 140 mph (63 m/s).
2. Glazing in *Occupancy Category* I buildings as defined in Section 1604.5, including greenhouses that are occupied for growing plants on a production or research basis, without public access shall be permitted to be unprotected.
3. Glazing in *Occupancy Category* II, III or IV buildings located over 60 feet (18 288 mm) above the ground and over 30 feet (9144 mm) above aggregate surface roofs located within 1,500 feet (458 m) of the building shall be permitted to be unprotected.

6. Add new text as follows:

1609.1.2.2. Modifications to ASTM E 1996. Section 6.2.2 of ASTM E 1996 shall be modified as follows:

6.2.2 Unless otherwise specified, select the wind zone based on the strength design wind speed, V_{ult}, as follows:
6.2.2.1 *Wind Zone 1* - 130 mph ≤ ultimate design wind speed, V_{ult} < 140 mph.
6.2.2.2 *Wind Zone 2* - 140 mph ≤ ultimate design wind speed, V_{ult} < 150 mph at greater than 1.6 km (one mile) from the coastline. The coastline shall be measured from the mean high water mark.
6.2.2.3 *Wind Zone 3* - ultimate design wind speed, V_{ult} ≥ 150 mph, or the ultimate design wind speed, V_{ult} ≥ 140 mph and within 1.6 km (one mile) of the coastline. The coastline shall be measured from the mean high water mark.

7. Revise as follows:

1609.2 Definitions. The following words and terms shall, for the purposes of Section 1609, have the meanings shown herein.

HURRICANE-PRONE REGIONS. Areas vulnerable to hurricanes defined as:

1. The U. S. Atlantic Ocean and Gulf of Mexico coasts where the ~~basic~~ ultimate design wind speed, V_{ult}, for Occupancy Category II buildings is greater than 115 ~~90~~ mph (40 m/s) and
2. Hawaii, Puerto Rico, Guam, Virgin Islands and American Samoa.

WIND-BORNE DEBRIS REGION. Areas within ~~Portions of~~ *hurricane- prone regions* located: ~~that are~~

1. W~~w~~ithin 1 mile (1.61 km) of the coastal mean high water line where the ~~basic~~ ultimate design wind speed V_{ult} is 130 ~~110 mph~~ (48 m/s) or greater; or
2. In areas ~~portions of *hurricane prone regions*~~ where the ~~basic~~ ultimate design wind speed is V_{ult} 140 ~~120~~ mph (53 m/s) or greater~~; or Hawaii.~~

For Occupancy Category II buildings and structures and Occupancy Category III buildings and structures, except health care facilities, the windborne debris region shall be based on Figure 1609b. For Occupancy Category IV buildings and structures and Occupancy Category III health care facilities, the windborne debris region shall be based on Figure 1609c.

8. Add new definitions as follows:

1609.2 Definitions.

WIND SPEED, V_{ult}. Ultimate design wind speeds.

WIND SPEED, V_{asd}. Nominal design wind speeds.

9. Revise as follows:

1609.3 Basic wind speed. The ~~basic~~ ultimate design wind speed V_{ult}, in mph, for the determination of the wind loads shall be determined by ~~Figure 1609~~ Figures 1609A, 1609B and 1609C. The ultimate design wind speed, V_{ult}, for use in the design of Occupancy Category II buildings and structures shall be obtained from Figure 1609A. The ultimate design wind speed, V_{ult}, for use in the design of Occupancy Category III and IV buildings and structures shall be obtained from Figure 1609B. The ultimate design wind speed, V_{ult}, for use in the design of Occupancy Category I buildings and structures shall be obtained from Figure 1609C. ~~Basic~~ The ultimate design wind speed, V_{ult}, for the special wind regions indicated, near mountainous terrain and near gorges shall be in accordance with local jurisdiction requirements. ~~Basic~~ The ultimate design wind speeds, V_{ult}, determined by the local jurisdiction shall be in accordance with Section 26.5.1 ~~6.5.4~~ of ASCE 7.

In nonhurricane-prone regions, when the ~~basic~~ ultimate design wind speed, V_{ult}, is estimated from regional climatic data, the ~~basic~~ ultimate design wind speed, V_{ult}, shall be ~~not less than the wind speed associated with an annual probability of 0.02 (50-year mean recurrence interval), and the estimate shall be adjusted for equivalence to a 3-second gust wind speed at 33 feet (10 m) above ground in Exposure Category C. The data analysis shall be performed~~ determined in accordance with Section 26.5.3 ~~6.5.4.2~~ of ASCE 7.

10. Delete and substitute as follows:

~~FIGURE 1609~~
~~BASIC WIND SPEED (3-SECOND GUST)~~

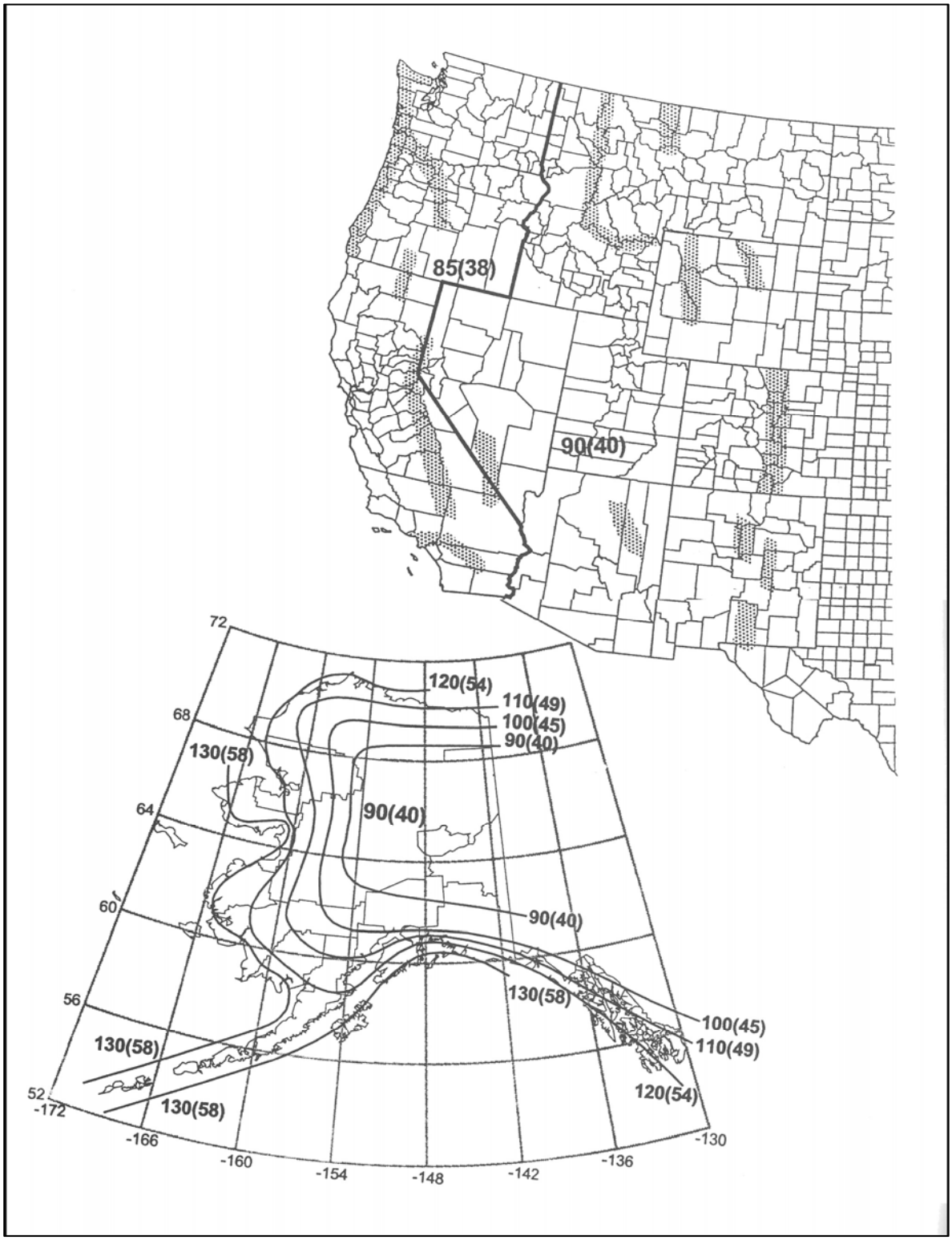
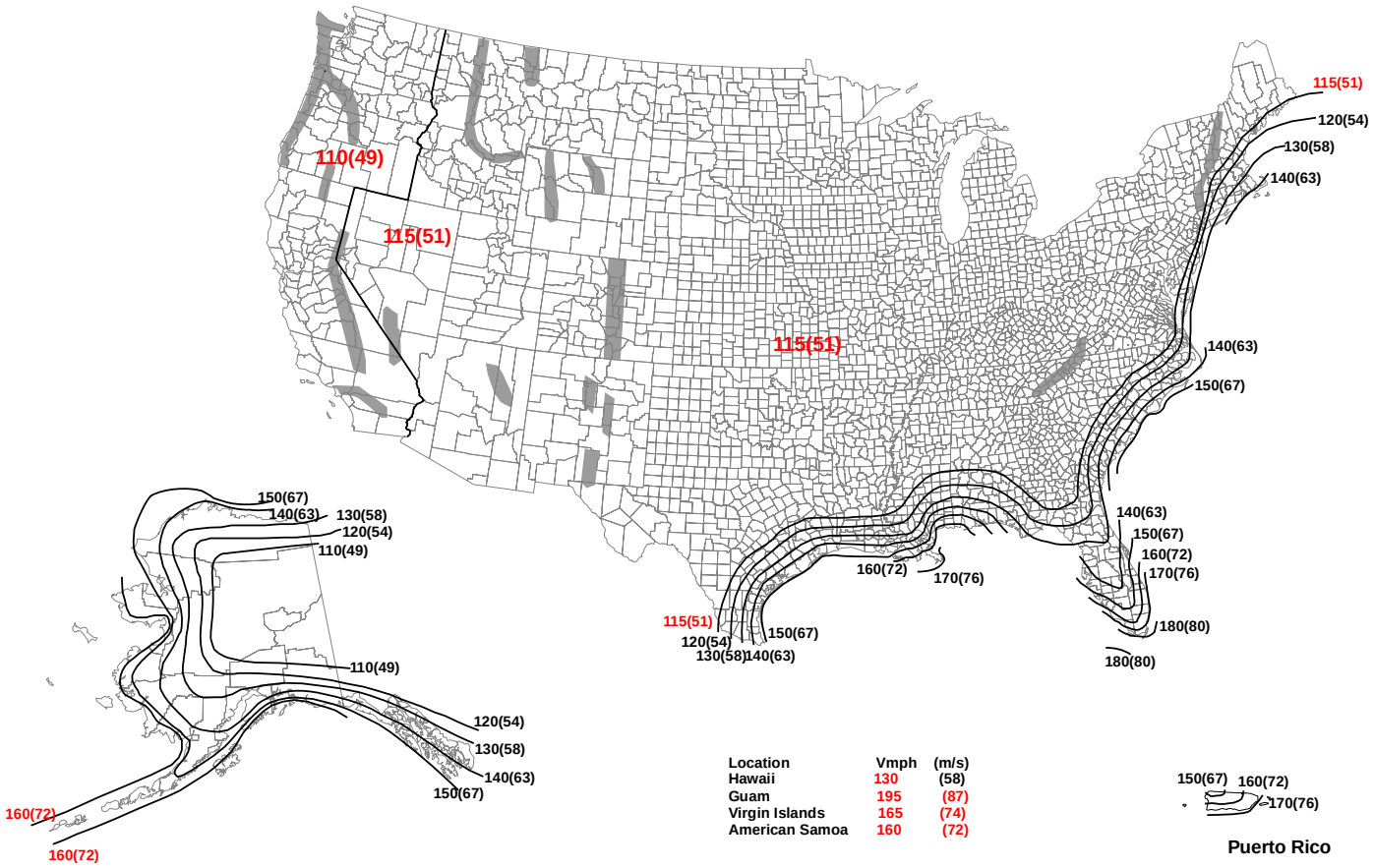


FIGURE 1609A
ULTIMATE DESIGN WIND SPEEDS, V_{ULT}, FOR OCCUPANCY CATEGORY II BUILDINGS AND OTHER STRUCTURES

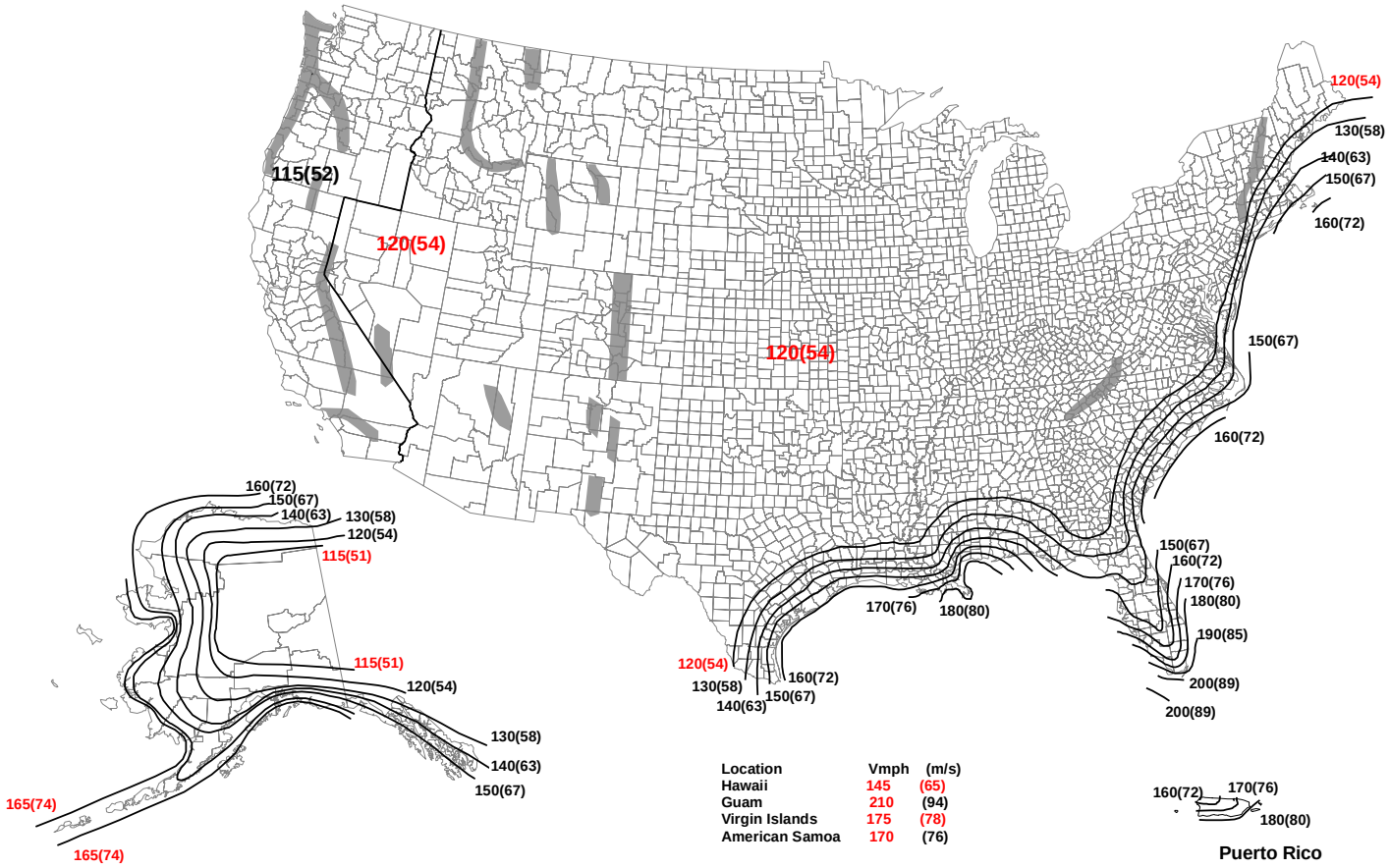


Notes:

1. **Values are nominal design 3-second gust wind speeds in miles per hour (m/s) at 33 ft (10m) above ground for Exposure C category.**
2. **Linear interpolation between contours is permitted.**
3. **Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.**
4. **Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.**
5. **Wind speeds correspond to approximately a 7% probability of exceedance in 50 years.**

Location	V mph	(m/s)
Hawaii - Special Wind Region Statewide	130	(58)
Guam	195	(87)
Virgin Islands	165	(74)
American Samoa	160	(72)

FIGURE 1609B
ULTIMATE DESIGN WIND SPEEDS, V_{ULT}, FOR OCCUPANCY CATEGORY III AND IV BUILDINGS AND OTHER STRUCTURES

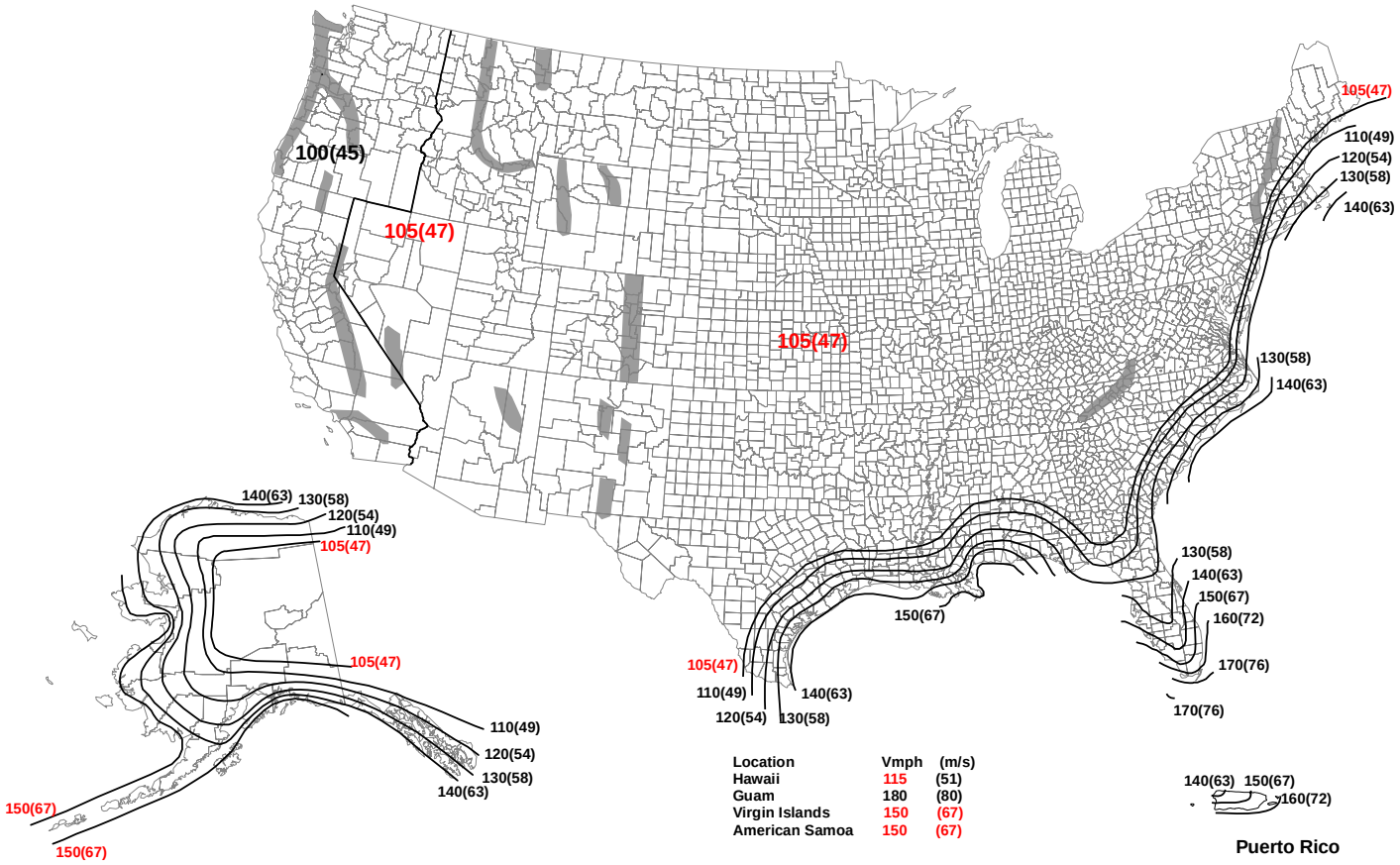


Notes:

1. Values are nominal design 3-second gust wind speeds in miles per hour (m/s) at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation between contours is permitted.
3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
4. Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.
5. Wind speeds correspond to approximately a 3% probability of exceedance in 50 years.

Location	V mph	(m/s)
Hawaii - Special Wind Region	145	(65)
Statewide Guam	210	(94)
Virgin Islands	175	(78)
American Samoa	170	(76)

FIGURE 1609C
ULTIMATE DESIGN WIND SPEEDS, V_{ULT}, FOR OCCUPANCY CATEGORY I BUILDINGS AND OTHER STRUCTURES



Notes:
1. **Values are nominal design 3-second gust wind speeds in miles per hour (m/s) at 33 ft (10m) above ground for Exposure C category.**
2. **Linear interpolation between contours is permitted.**
3. **Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.**
4. **Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.**
5. **Wind speeds correspond to approximately a 15% probability of exceedance in 50 years.**

Location	V mph	(m/s)
Hawaii - Special Wind Region	115	(51)
Statewide		
Guam	180	(80)
Virgin Islands	150	(67)
American Samoa	150	(67)

11. Revise as follows:

1609.3.1 Wind speed conversion. When required, the ~~3-second gust basic~~ ultimate design wind speeds of Figure 1609A, B and C shall be converted to nominal design wind speeds, V_{asd}. ~~fastest-mile wind speeds, V_{fm}~~, using Table 1609.3.1 or Equation 16-32.

~~$V_{fm} = \frac{V_{ult} \sqrt{I_e}}{1.06}$~~ **(Equation 16-32)**

~~where:~~

~~V_{3S} = 3-second gust basic wind speed from Figure 1609.~~

$V_{asd} = V_{ult}\sqrt{0.6}$

Where:
V_{asd} = nominal design wind speed applicable to methods specified in Exceptions 1 through 5 of Section 1609.1.1
V_{ult} = ultimate design wind speeds determined from Figures 1609A, 1609B, or 1609C

12. Delete and substitute as follows:

~~TABLE 1609.3.1~~
~~EQUIVALENT BASIC WIND SPEEDS[a,b,c]~~

~~V_{3S}~~	~~85~~	~~90~~	~~100~~	~~105~~	~~110~~	~~120~~	~~125~~	~~130~~	~~140~~	~~145~~	~~150~~	~~160~~	~~170~~
~~V_{fm}~~	~~71~~	~~76~~	~~85~~	~~90~~	~~95~~	~~104~~	~~109~~	~~114~~	~~123~~	~~128~~	~~133~~	~~142~~	~~152~~

~~For SI: 1 mile per hour = 0.44 m/s.~~
~~a. Linear interpolation is permitted.~~
~~b. *V3S* is the 3-second gust wind speed (mph).~~
~~c. *Vfm* is the fastest mile wind speed (mph).~~

TABLE 1609.3.1
WIND SPEED CONVERSIONS[a,b,c]

V_{ul}	100	110	120	130	140	150	160	170	180	190	200
V_{asd}	78	85	93	101	108	116	124	132	139	147	155

a. Linear interpolation is permitted
b. V_{asd} = nominal design wind speed applicable to methods specified in Exceptions 1 through 5 of Section 1609.1.1
c. V_{ult} = ultimate design wind speeds determined from Figures 1609A, 1609B, or 1609C

13. Revise as follows:

1609.4.2 Surface roughness categories. A ground surface roughness within each 45-degree (0.79 rad) sector shall be determined for a distance upwind of the site as defined in Section 1609.4.3 from the categories defined below, for the purpose of assigning an exposure category as defined in Section 1609.4.3.

Surface Roughness B. Urban and suburban areas, wooded areas or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger.

Surface Roughness C. Open terrain with scattered obstructions having heights generally less than 30 feet (9144 mm). This category includes flat open country~~,~~ and grasslands~~, and all water surfaces in *hurricane-prone regions*~~.

Surface Roughness D. Flat, unobstructed areas and water surfaces ~~outside *hurricane-prone regions*~~. This category includes smooth mud flats, salt flats and unbroken ice.

1609.4.3 Exposure categories. An exposure category shall be determined in accordance with the following:

Exposure B. For buildings with a mean roof height of less than or equal to 30 feet, Exposure B shall apply where the ground surface roughness ~~condition~~, as defined by Surface Roughness B, prevails in the upwind direction for a distance of at least 1,500 feet (457 m). For buildings with a mean roof height greater than 30 feet, Exposure B shall apply where Surface Roughness B prevails in the upwind direction for a distance of at least 2,600 feet (792 m) or 20 times the height of the building, whichever is greater.

~~**Exception:** For buildings whose mean roof height is less than or equal to 30 feet (9144 mm), the upwind distance is permitted to be reduced to 1,500 feet (457 m).~~

Exposure C. Exposure C shall apply for all cases where Exposures B or D do not apply.

Exposure D. Exposure D shall apply where the ground surface roughness, as defined by Surface Roughness D, prevails in the upwind direction for a distance of at least 5,000 feet (1524 m) or 20 times the height of the building, whichever is greater. Exposure D shall also apply where the ground surface roughness immediately upwind of the site is B or C, and the site is within a distance of 600 feet (183 m) or 20 times the building height, whichever is

greater, from an exposure D condition as defined in the previous sentence. ~~Exposure D shall extend inland from the shoreline for a distance of 600 feet (183 m) or 20 times the height of the building, whichever is greater.~~

1609.5.3 Rigid tile. Wind loads on rigid tile roof coverings shall be determined in accordance with the following equation:

$$M_a = q_h C_L b L L_a [1.0 - G C_p] \qquad \textbf{(Equation 16-33)}$$

$$\text{For SI: } M_a = \frac{q_h C_L b L L_a [1.0 - G C_p]}{1{,}000}$$

where:

b = Exposed width, feet (mm) of the roof tile.
CL = Lift coefficient. The lift coefficient for concrete and clay tile shall be 0.2 or shall be determined by test in accordance with Section 1716.2.
GC_p = Roof pressure coefficient for each applicable roof zone determined from Chapter 30 ~~6~~ of ASCE 7. Roof coefficients shall not be adjusted for internal pressure.
L = Length, feet (mm) of the roof tile.
L_a = Moment arm, feet (mm) from the axis of rotation to the point of uplift on the roof tile. The point of uplift shall be taken at 0.76*L* from the head of the tile and the middle of the exposed width. For roof tiles with nails or screws (with or without a tail clip), the axis of rotation shall be taken as the head of the tile for direct deck application or as the top edge of the batten for battened applications. For roof tiles fastened only by a nail or screw along the side of the tile, the axis of rotation shall be determined by testing. For roof tiles installed with battens and fastened only by a clip near the tail of the tile, the moment arm shall be determined about the top edge of the batten with consideration given for the point of rotation of the tiles based on straight bond or broken bond and the tile profile.
Ma = Aerodynamic uplift moment, feet-pounds (N-mm) acting to raise the tail of the tile.
q_h = Wind velocity pressure, psf (kN/m_2) determined from Section 27.3.2 ~~6.5.10~~ of ASCE 7.

Concrete and clay roof tiles complying with the following limitations shall be designed to withstand the aerodynamic uplift moment as determined by this section.

1. The roof tiles shall be either loose laid on battens, mechanically fastened, mortar set or adhesive set.
2. The roof tiles shall be installed on solid sheathing which has been designed as components and cladding.
3. An underlayment shall be installed in accordance with Chapter 15.
4. The tile shall be single lapped interlocking with a minimum head lap of not less than 2 inches (51 mm).
5. The length of the tile shall be between 1.0 and 1.75 feet (305 mm and 533 mm).
6. The exposed width of the tile shall be between 0.67 and 1.25 feet (204 mm and 381 mm).
7. The maximum thickness of the tail of the tile shall not exceed 1.3 inches (33 mm).
8. Roof tiles using mortar set or adhesive set systems shall have at least two-thirds of the tile's area free of mortar or adhesive contact.

14. Delete without substitution:

~~**1609.6 Alternate all-heights method.** The alternate wind design provisions in this section are simplifications of the ASCE 7 Method 2—Analytical Procedure.~~

~~**1609.6.1 Scope.** As an alternate to ASCE 7 Section 6.5, the following provisions are permitted to be used to determine the wind effects on regularly shaped buildings, or other structures that are regularly shaped, which meet all of the following conditions:~~

~~1. The building or other structure is less than or equal to 75 feet (22 860 mm) in height with a height-to-leastwidth ratio of 4 or less, or the building or other structure has a fundamental frequency greater than or equal to 1 hertz.~~
~~2. The building or other structure is not sensitive to dynamic effects.~~
~~3. The building or other structure is not located on a site for which channeling effects or buffeting in the wake of upwind obstructions warrant special consideration.~~
~~4. The building shall meet the requirements of a simple diaphragm building as defined in ASCE 7 Section 6.2, where wind loads are only transmitted to the main wind-force-resisting system (MWFRS) at the diaphragms.~~

5. For open buildings, multispan gable roofs, stepped roofs, sawtooth roofs, domed roofs, roofs with slopes greater than 45 degrees (0.79 rad), solid free-standing walls and solid signs, and rooftop equipment, apply ASCE 7 provisions.

1609.6.1.1 Modifications. The following modifications shall be made to certain subsections in ASCE 7: in Section 1609.6.2, symbols and notations that are specific to this section are used in conjunction with the symbols and notations in ASCE 7 Section 6.3.

1609.6.2 Symbols and notations. Coefficients and variables used in the alternate all-heights method equations are as follows:

Cnet = Net-pressure coefficient based on *Kd* [(*G*) (*Cp*) – (*GCpi*)], in accordance with Table 1609.6.2(2).
G = Gust effect factor for rigid structures in accordance with ASCE 7 Section 6.5.8.1.
Kd = Wind directionality factor in accordance with ASCE 7 Table 6-4.
Pnet = Design wind pressure to be used in determination of wind loads on buildings or other structures or their components and cladding, in psf (kN/m2).
qs = Wind stagnation pressure in psf (kN/m2) in accordance with Table 1609.6.2(1).

1609.6.3 Design equations. When using the alternate all-heights method, theMWFRS,and components and cladding of every structure shall be designed to resist the effects of wind pressures on the building envelope in accordance with Equation 16-34.

Pnet = *qsKzCnet* [*IKzt*] **(Equation 16-34)**

Design wind forces for theMWFRSshall not be less than 10 psf (0.48 kN/m2) multiplied by the area of the structure projected on a plane normal to the assumed wind direction (see ASCE 7 Section 6.1.4 for criteria). Design net wind pressure for components and cladding shall not be less than 10 psf (0.48 kN/m2) acting in either direction normal to the surface.

1609.6.4 Design procedure. The MWFRS and the components and cladding of every building or other structure shall be designed for the pressures calculated using Equation 16-34.

1609.6.4.1 Main wind-force-resisting systems. The MWFRS shall be investigated for the torsional effects identified in ASCE 7 Figure 6-9.

1609.6.4.2 Determination of *Kz* and *Kzt*. Velocity pressure exposure coefficient, *Kz*, shall be determined in accordance with ASCE 7 Section 6.5.6.6 and the topographic factor, *Kzt*, shall be determined in accordance with ASCE 7 Section 6.5.7.

1. For the windward side of a structure, *Kzt* and *Kz* shall be based on height *z*.
2. For leeward and sidewalls, and for windward and leeward roofs, *Kzt* and *Kz* shall be based on mean roof height *h*.

1609.6.4.3 Determination of net pressure coefficients, *Cnet*. For the design of the MWFRS and for components and cladding, the sum of the internal and external net pressure shall be based on the net pressure coefficient, *Cnet*.

1. The pressure coefficient, *Cnet*, for walls and roofs shall be determined from Table 1609.6.2(2).
2. Where *Cnet* has more than one value, the more severe wind load condition shall be used for design.

1609.6.4.4 Application of wind pressures. When using the alternate all-heights method, wind pressures shall be applied simultaneously on, and in a direction normal to, all building envelope wall and roof surfaces.

1609.6.4.4.1 Components and cladding. Wind pressure for each component or cladding element is applied as follows using *Cnet* values based on the effective wind area, *A*, contained within the zones in areas of discontinuity of width and/or length "a," "2a" or "4a" at: corners of roofs and walls; edge strips for ridges, rakes and eaves; or field areas onwalls or roofs as indicated in figures in tables in ASCE 7 as referenced in Table 1609.6.2(2) in accordance with the following:

1. Calculated pressures at local discontinuities acting over specific edge strips or corner boundary areas.
2. Include "field" (Zone 1, 2 or 4, as applicable) pressures applied to areas beyond the boundaries of the areas of discontinuity.

~~3. Where applicable, the calculated pressures at discontinuities (Zones 2 or 3) shall be combined with design pressures that apply specifically on rakes or eave overhangs.~~

15. Revise as follows:

1405.14 Vinyl siding. Vinyl siding conforming to the requirements of this section and complying with ASTM D 3679 shall be permitted on exterior walls of buildings located in areas where ~~the~~ V_{asd} as determined in accordance with Section 1609.3.1 ~~basic wind speed specified in Chapter 16~~ does not exceed 100 miles per hour (45 m/s) and the *building height* is less than or equal to 40 feet (12 192 mm) in Exposure C. Where construction is located in areas where ~~the~~ V_{asd} as determined in accordance with Section 1609.3.1 ~~basic wind speed~~ exceeds 100 miles per hour (45 m/s), or building heights are in excess of 40 feet (12 192 mm), tests or calculations indicating compliance with Chapter 16 shall be submitted. Vinyl siding shall be secured to the building so as to provide weather protection for the exterior walls of the building.

1504.5 Edge securement for low-slope roofs. Low-slope membrane roof system metal edge securement, except gutters, shall be designed and installed for wind loads in accordance with Chapter 16 and tested for resistance in accordance with ANSI/SPRI ES-1, except ~~the basic~~ V_{ult} wind speed shall be determined from Figure 1609A, 1609B, or 1609C as applicable.

TABLE 1504.8
MAXIMUM ALLOWABLE MEAN ROOF HEIGHT PERMITTED FOR BUILDINGS WITH AGGREGATE ON THE ROOF IN AREAS OUTSIDE A HURRICANE-PRONE REGION

V_{asd} determined in accordance with Section 1609.3.1 ~~BASIC WIND SPEED FROM FIGURE 1609 (mph)b~~	MAXIMUM MEAN ROOF HEIGHT (ft)a,c		
	Exposure category		
	B	C	D
85	170	60	30
90	110	35	15
95	75	20	NP
100	55	15	NP
105	40	NP	NP
110	30	NP	NP
115	20	NP	NP
120	15	NP	NP
Greater than 120	NP	NP	NP

a. Mean roof height as defined in ASCE 7.
b. For intermediate values of V_{asd} ~~basic wind speed~~, the height associated with the next higher value of V_{asd} ~~wind speed~~ shall be used, or direct interpolation is permitted.
c. NP = gravel and stone not permitted for any roof height.

TABLE 1507.2.7.1(1)
CLASSIFICATION OF ASPHALT ROOF SHINGLES PER ASTM D 7158[a]

V_{asd} determined in accordance with Section 1609.3.1 ~~MAXIMUM BASIC WIND SPEED FROM FIGURE 1609~~	CLASSIFICATION REQUIREMENT

(Portions of Table not shown, remain unchanged)

TABLE 1507.2.7.1(2)
CLASSIFICATION OF ASPHALT SHINGLES PER ASTM D 3161

V_{asd} determined in accordance with Section 1609.3.1 ~~MAXIMUM BASIC WIND SPEED FROM FIGURE 1609~~	CLASSIFICATION REQUIREMENT

(Portions of Table now shown, remain unchanged)

1507.2.8.1 High wind attachment. Underlayment applied in areas subject to high winds (V_{asd} greater than 110 mph as determined in accordance with Section 1609.3.1 ~~in accordance with Figure 1609~~) shall be applied with corrosion-resistant fasteners in accordance with the manufacturer's instructions. Fasteners are to be applied along the overlap at a maximum spacing of 36 inches (914 mm) on center.

TABLE 1507.3.7
CLAY AND CONCRETE TILE ATTACHMENT[a, b, c]

GENERAL — CLAY OR CONCRETE ROOF TILE				
Maximum V_{asd} determined in accordance with Section 1609.3.1 ~~basic wind speed (mph)~~	**Mean roof height (feet)**	**Roof slope up to < 3:12**	**Roof slope 3:12 and over**	
INTERLOCKING CLAY OR CONCRETE ROOF TILE WITH PROJECTING ANCHOR LUGS[d, e] (Installations on spaced/solid sheathing with battens or spaced sheathing)				
Maximum V_{asd} determined in accordance with Section 1609.3.1 ~~basic wind speed (mph)~~	**Mean roof height (feet)**	**Roof slope up to <5:12**	**Roof slope 5:12 < 12:12**	**Roof slope 12:12 and over**
INTERLOCKING CLAY OR CONCRETE ROOF TILE WITH PROJECTING ANCHOR LUGS (Installations on solid sheathing without battens)				
Maximum V_{asd} determined in accordance with Section 1609.3.1 ~~basic wind speed (mph)~~	**Mean roof height (feet)**	**All roof slopes**		

(Portions of Table not shown, remain unchanged)

1705.4 Wind resistance. The statement of special inspections shall include wind requirements for structures constructed in the following areas:

1. In wind Exposure Category B, where ~~the~~ V_{asd} as determined in accordance with Section 1609.3.1 ~~3-second-gust basic wind speed~~ is 120 miles per hour (mph) (52.8 m/s) or greater.
2. In wind Exposure Category C or D, where ~~the~~ V_{asd} as determined in accordance with Section 1609.3.1 ~~3-second- gust basic wind speed~~ is 110 mph (49 m/s) or greater.

1706.1 Special inspections for wind requirements. *Special inspections* itemized in Sections 1706.2 through 1706.4, unless exempted by the exceptions to Section 1704.1, are required for buildings and structures constructed in the following areas:

1. In wind Exposure Category B, where ~~the~~ V_{asd} as determined in accordance with Section 1609.3.1 ~~3-second-gust basic wind speed~~ is 120 miles per hour (52.8 m/sec) or greater.
2. In wind Exposure Categories C or D, where ~~the~~ V_{asd} as determined in accordance with Section 1609.3.1 ~~3-second-gust basic wind speed~~ is 110 mph (49 m/sec) or greater.

1710.3 Structural observations for wind requirements. Structural observations shall be provided for those structures sited where ~~the~~ V_{asd} as determined in accordance with Section 1609.3.1 ~~basic wind speed~~ exceeds 110 mph (49 m/sec) ~~determined from Figure 1609~~, where one or more of the following conditions exist:

1. The structure is classified as *Occupancy Category* III or IV in accordance with Table 1604.5.
2. The *building height* of the structure is greater than 75 feet (22 860 mm).
3. When so designated by the *registered design professional* responsible for the structural design.
4. When such observation is specifically required by the *building official*.

2109.1.1 Limitations. The use of empirical design of masonry shall be limited as noted in Section 5.1.2 of TMS 402/ACI 530/ASCE 5. The use of dry-stacked, surface-bonded masonry shall be prohibited in *Occupancy Category* IV structures. In buildings that exceed one or more of the limitations of Section 5.1.2 of TMS 402/ACI 530/ASCE 5, masonry shall be designed in accordance with the engineered design provisions of Section 2101.2.1, 2101.2.2 or 2101.2.3 or the foundation wall provisions of Section 1807.1.5.

Section 5.1.2.2 of TMS 402/ACI 530/ASCE 5 shall be modified as follows:

5.1.2.2 *Wind* – Empirical requirements shall not apply to the design or construction of masonry for buildings, parts of buildings, or other structures to be located in areas where V_{asd} as determined in accordance with Section 1609.3.1 of the *International Building Code* exceeds 110 mph.

TABLE 2304.6.1
MAXIMUM V_{asd} determined in accordance with Section 1609.3.1
~~BASIC WIND SPEED~~ (mph) (3-SECOND GUST) PERMITTED FOR
WOOD STRUCTURAL PANEL WALL SHEATHING USED TO RESIST WIND PRESSURESa,b,c

MINIMUM NAIL		MINIMUM WOOD STRUCTURAL PANEL SPAN RATING	MINIMUM NOMINAL PANEL THICKNESS (inches)	MAXIMUM WALL STUD SPACING (inches)	PANEL NAIL SPACING		MAXIMUM V_{asd} DETERMINED IN ACCORDANCE WITH SECTION 1609.3.1 ~~WIND SPEED (MPH)~~		
							Wind exposure category		
Size	Penetration (inches)				Edges (inches o.c.)	Field (inches o.c.)	B	C	D

(Portions of Table not shown, remain unchanged)

a. Panel strength axis shall be parallel or perpendicular to supports. Three-ply plywood sheathing with studs spaced more than 16 inches on center shall be applied with panel strength axis perpendicular to supports.
b. The table is based on wind pressures acting toward and away from building surfaces in accordance with Section 30.7 ~~6.4.2.2~~ ofASCE7. Lateral requirements shall be in accordance with Section 2305 or 2308.
c. Wood structural panels with span ratings ofwall-16 orwall-24 shall be permitted as an alternate to panels with a 24/0 span rating. Plywood siding rated 16 o.c. or 24 o.c. shall be permitted as an alternate to panels with a 24/16 span rating.Wall-16 and plywood siding 16 o.c. shall be used with studs spaced a maximum of 16 inches o.c.

2308.2 Limitations. Buildings are permitted to be constructed in accordance with the provisions of *conventional light-frame construction*, subject to the following limitations, and to further limitations of Sections 2308.11 and 2308.12.

1. Buildings shall be limited to a maximum of three *stories above grade plane*. For the purposes of this section, for buildings in *Seismic Design Category* D or E as determined in Section 1613, cripple stud walls shall be considered to be a *story*.

   Exception: Solid blocked cripplewalls not exceeding 14 inches (356 mm)in height need not be considered a *story*.

2. Maximum floor-to-floor height shall not exceed 11 feet, 7 inches (3531 mm). Bearing wall height shall not exceed a stud height of 10 feet (3048 mm).
3. Loads as determined in Chapter 16 shall not exceed the following:
   3.1. Average dead loads shall not exceed 15 psf (718 N/m^2) for combined roof and ceiling, exterior walls, floors and partitions.

   Exceptions:

   1. Subject to the limitations of Sections 2308.11.2 and 2308.12.2, stone or masonry veneer up to the lesser of 5 inches (127 mm) thick or 50 psf (2395 N/m^2) and installed in accordance with Chapter 14 is permitted to a height of 30 feet (9144 mm) above a noncombustible foundation, with an additional 8 feet (2438 mm) permitted for gable ends.
   2. Concrete or masonry fireplaces, heaters and chimneys shall be permitted in accordance with the provisions of this code.

   3.2. Live loads shall not exceed 40 psf (1916 N/m^2) for floors.
   3.3. Ground snow loads shall not exceed 50 psf (2395 N/m^2).

4. V_{asd} as determined in accordance with Section 1609.3.1 ~~Wind speeds~~ shall not exceed 100 miles per hour (mph) (44 m/s) (3-second gust).

Exception: V_{asd} as determined in accordance with Section 1609.3.1 ~~Wind speeds~~ shall not exceed 110 mph (48.4 m/s) (3-second gust) for buildings in Exposure Category B that are not located in a *hurricane-prone region*.

5. Roof trusses and rafters shall not span more than 40 feet (12 192 mm) between points of vertical support.
6. The use of the provisions for *conventional light-frame construction* in this section shall not be permitted for *Occupancy Category* IV buildings assigned to *Seismic Design Category* B, C, D, E or F, as determined in Section 1613.
7. *Conventional light-frame construction* is limited in irregular structures in *Seismic Design Category* D or E, as specified in Section 2308.12.6.

2308.2.1 Basic wind speed greater than 100 mph (3-second gust). Where the V_{asd} as determined in accordance with Section 1609.3.1 ~~basic wind speed~~ exceeds 100 mph (3-second gust), the provisions of either AF&PAWFCM, or the ICC 600 are permitted to be used. Wind speeds in Figure 1609A, 1609B, and 1609C shall be converted in accordance with Section 1609.3.1 for use with AF&PAWFCM or ICC 600.

TABLE 2308.10.1
REQUIRED RATING OF APPROVED UPLIFT CONNECTORS (pounds)[a,b,c,e,f,g,h,l]

V_{asd} determined in accordance with Section 1609.3.1 **~~BASIC WIND SPEED (3-second gust)~~**	**ROOF SPAN (feet)**							**OVERHANGS (pounds/feet)d** **OVERHANGS (pounds/feet)[d]**
	12	**20**	**24**	**28**	**32**	**36**	**40**	

(Portions of Table not shown, remain unchanged)

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 1.61 km/hr, 1 pound = 0.454 Kg, 1 pound/foot = 14.5939 N/m.

a. The uplift connection requirements are based on a 30-foot mean roof height located in Exposure B. For ExposureC orD and for other mean roof heights, multiply the above loads by the adjustment coefficients below.

	Mean Roof Height (feet)									
EXPOSURE	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**55**	**60**
B	**1.00**	**1.00**	**1.00**	**1.00**	**1.05**	**1.09**	**1.12**	**1.16**	**1.19**	**1.22**
C	**1.21**	**1.29**	**1.35**	**1.40**	**1.45**	**1.49**	**1.53**	**1.56**	**1.59**	**1.62**
D	**1.47**	**1.55**	**1.61**	**1.66**	**1.70**	**1.74**	**1.78**	**1.81**	**1.84**	**1.87**

b. he uplift connection requirements are based on the framing being spaced 24 inches on center. Multiply by 0.67 for framing spaced 16 inches on center and multiply by 0.5 for framing spaced 12 inches on center.

c. The uplift connection requirements include an allowance for 10 pounds of dead load.

d. The uplift connection requirements do not account for the effects of overhangs. The magnitude of the above loads shall be increased by adding the overhang loads found in the table. The overhang loads are also based on framing spaced 24 inches on center. The overhang loads given shall be multiplied by the overhang projection and added to the roof uplift value in the table.

e. The uplift connection requirements are based upon wind loading on end zones as defined in Figure 28.6.3 ~~6-2~~ of ASCE 7. Connection loads for connections located a distance of 20 percent of the least horizontal dimension of the building from the corner of the building are permitted to be reduced by multiplying the table connection value by 0.7 and multiplying the overhang load by 0.8.

f. For wall-to-wall and wall-to-foundation connections, the capacity of the uplift connector is permitted to be reduced by 100 pounds for each full wall above. (For example, if a 500-pound rated connector is used on the roof framing, a 400-pound rated connector is permitted at the next floor level down).

g. Interpolation is permitted for intermediate values of V_{asd} ~~basic wind speeds~~ and roof spans.

h. The rated capacity of approved tie-down devices is permitted to include up to a 60-percent increase for wind effects where allowed by material specifications.

CHAPTER 35
REFERENCED STANDARDS

ASCE/SEI
American Society of Civil Engineers/Structural Engineering Institute
1801 Alexander Bell Drive
Reston, VA 20191-440

7-10 ~~7-05~~ Minimum Design Loads for Buildings and Other Structures ~~including Supplements No. 1 and 2, excluding Chapter 14 and Appendix 11A~~

Reason: The purpose of ths proposal is to update and coordinate the provisions of the 2012 IBC with those of the 2010 edition of ASCE 7 for the determination of wind loads. Although consisting of 30 small parts, the underlying reason for this change is to adopt into the 2012 IBC the new wind speed maps that have been adopted into ASCE 7.

Over the past 10 years, new data and research has been performed that indicates that the hurricane wind speeds provided in the current maps of the IBC-09 and ASCE-05 are too conservative and need to be adjusted downward. Significantly more hurricane data have become available thereby allowing for substantial improvements in the hurricane simulation model that is used to create the wind speed maps.
These new data have resulted in an improved representation of the hurricane wind field, including the modeling of the sea-land transition and the hurricane boundary layer height; new models for hurricane weakening after landfall; and an improved statistical model for the Holland *B* parameter which controls the wind pressure relationship. The new hurricane hazard model yields hurricane wind speeds that are lower than those given in ASCE 7-05 and IBC-09 even though the overall rate of intense storms (as defined by central pressure) produced by the new model is increased compared to those produced by the hurricane simulation model used to develop previous maps.

In preparing the new maps, the ASCE 7 standards committee decided to use multiple ultimate event or strength design maps in conjunction with a wind load factor of 1.0 for strength design – for allowable stress design, the factor was reduced from 1.0 to 0.6. Several factors that are important to an accurate wind load standard led to this decision:

(i) An ultimate event or strength design wind speed map makes the overall approach consistent with that used in seismic design in that they both map ultimate events and use a load factor of 1.0 for strength design.

(ii) Utilizing different maps for the different Occupancy Categories eliminates the problems associated with using “importance factors” that vary with category. The difference in the importance factors in hurricane prone and non-hurricane prone regions for Category I structures prompted many questions and have been removed from ASCE 7-10.

(iii) The use of multiple maps eliminates the confusion associated with the recurrence interval associated with the existing map - the map was not a uniform fifty year return period map. This therefore created a situation where the level of safety provided for within the overall design was not consistent along the hurricane coast.

Utilizing the new wind speed maps and integrating their use into the IBC necessitated the introduction of the terms V_{ult} and V_{asd} to be associated with the “ultimate” design wind speed and the “nominal” design wind speed. Because of the number of different provisions which use the wind speed map to “trigger” different requirements it was necessary to modify the conversion section (1609.3.1) so that those provisions were not changed. The terms “ultimate design wind speed” and “nominal design wind speed” were incorporate in numerous locations to aid in drawing the users attention to the different types of wind speeds – similar to what was done with the change from fastest mile to 3-second gust wind speeds.

Beyond the adoption of the new strength design wind speed maps, the 2010 edition of ASCE 7 also includes a new simplified method for use in the determination of wind loads for buildings up to 160’ in height. In addition, the wind load calculation provisions have been removed from Chapter 6 of ASCE 7 and been reorganized into 6 separate chapters (26 thru 31) for the sake of clarity and ease of use. This of course necessitated multiple coordination revisions with the IBC text.

ASCE/SEI 7 has been a referenced standard of the IBC since its inception and as such it is well known to the building community. ASCE/SEI 7 is published and maintained by the Structural Engineering Institute of the American Society of Civil Engineers (SEI/ASCE). The document is a nationally recognized consensus standard developed in full compliance with the ASCE *Rules for Standards Committees*. The ASCE standards process is fully accredited by the American National Standards Institute (ANSI).

As of the submission date of this code change, the ASCE 7 Standards Committee is completing the committee balloting portion of the 2010 edition of ASCE/SEI 7. The document is designated ASCE/SEI 7-10 *Minimum Design Loads for Buildings and Other Structures* and it is expected that it will be completed and available for purchase prior to the ICC Final Action Hearings in May of 2010 . Any person interested in obtaining a public comment copy of ASCE/SEI 7-10 may do so by contacting the proponent at jrossberg@asce.org .

Cost Impact: The overall, national cost impact is believed to be neutral.

Public Hearing: Committee:	AS	AM	D	
Assembly:	ASF	AMF	DF	

ICCFILENAME: ROSSBERG-S1-1602 NOTATIONS

S85–09/10
1609.1.1, 3108.1

Proponent: Scott Beard PE, SE, City of Tacoma, representing the Structural Engineers Association of Washington.

Revise as follows:

1609.1.1 Determination of wind loads. Wind loads on every building or structure shall be determined in accordance with Chapter 6 of ASCE 7 or provisions of the alternate all-heights method in Section 1609.6. The type of opening protection required, the basic wind speed and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions:

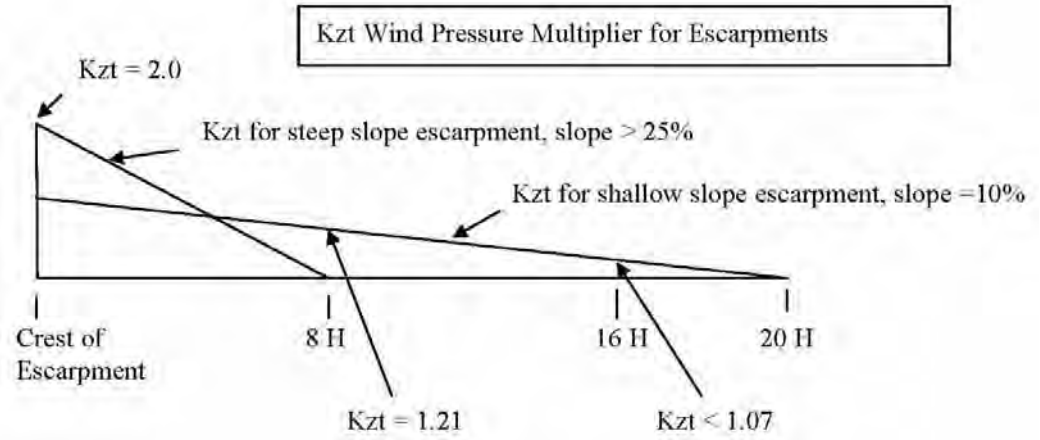
1. Subject to the limitations of Section 1609.1.1.1, the provisions of ICC 600 shall be permitted for applicable Group R-2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of the AF&PA WFCM.
3. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AISI S230.
4. Designs using NAAMM FP 1001.

5. Designs using TIA-222 for antenna-supporting structures and antennas, provided the extent of Topographic Category 2, escarpments, in Section 2.6.6.2 of TIA-222 shall extend 16 times the height of the escarpment.
6. Wind tunnel tests in accordance with Section 6.6 of ASCE 7, subject to the limitations in Section 1609.1.1.2.

3108.1 General. Towers shall be designed and constructed in accordance with the provisions of TIA-222. In Section 2.6.6.2 of TIA-222, the extent of Topographic Category 2, escarpments, shall extend 16 times the height of the escarpment

Exception: Single free-standing poles used to support antennas not greater than 75 feet (22 860 mm), measured from the top of the pole to grade, shall not be required to be noncombustible

Reason: The TIA 222-G standard attempted to simplify the Topographic Wind Speedup Effect.
They made a mistake in their application to escarpments. They missed a controlling condition:



TIA correctly found the worst case wind speed-up at the crest for a steep slope, but did not realize that lesser sloped escarpments create pressure increases that cannot be safely ignored, beyond the "steep slope" influence. TIA stopped considering the topographic wind speed-up effect at 8H from the crest. At this location, a shallow slope can still produce a 21% increase in wind pressure.

We checked with TIA, since there are several ways to address this situation. Their preference is to change the 8H value in the standard, to 16H. They say that they will address this in a future revision to the Standard, but in the meantime we need to cover this situation for safety reasons.

The reason that 16H was chosen, rather than 20H, is that there is an equivalent cutoff in the ASCE 7 formula on the face of the escarpment. The cutoff value is within a reasonable engineering value.

Per the TIA 222-G standard, a designer may use the full topographic wind speed-up method of ASCE 7, if they wish to avoid any conservatism created by the simplified method. This revision simply makes sure that the simplified method is safe in all cases.

I attached a copy of the correspondence between the SEAW Wind Committee and the TIA standards committee confirming that changing 8H to 16H would be the preferred way to modify the section.

Cost Impact: This will not increase costs if the designer makes use of all of the design options provided by the Standard It will increase costs in some situations, if the simplified method is used, but costs will still be less than when this mistake was introduced in the 2009 IBC.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEARD-S1-1609.1.1

S86-09/10
1609.1.1, 1609.1.1.2, Chapter 35

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC)

1. Revise as follows:

1609.1.1 Determination of wind loads: Wind loads on every building or structure shall be determined in accordance with Chapter 6 of ASCE 7 or provisions of the alternate all-heights method in Section 1609.6. The type of opening protection required, the basic wind speed and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions:

1. Subject to the limitations of Section 1609.1.1.1, the provisions of ICC 600 shall be permitted for applicable Group R-2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of the AF&PA WFCM.
3. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AISI 230.
4. Designs using NAAMM FP 1001.
5. Designs using TIA/EIA-222 for antenna-supporting structures and antennas.
6. Wind tunnel tests in accordance with Section 6.6 of ASCE 7, subject to the limitations in Section 1609.1.1.2.
7. Wind tunnel tests in accordance with ASCE/SEI 49, subject to the limitations in Section 1609.1.1.2.

1609.1.1.2 Wind tunnel test limitations. The lower limit on pressures for main wind-force-resisting systems and components and cladding shall be in accordance with Sections 1609.1.1.2.1 and 1609.1.1.2.2. The minimum design wind load shall not be less than the minimum prescribed in Chapter 6 of ASCE 7.

2. Add standard to Chapter 35 as follows:

American Society of Civil Engineers/Structural Engineering Institute
49-09 Wind Tunnel Testing for Buildings and Other Structures

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html Since its inception in April/2005, the CTC has held twelve meetings - all open to the public.

This proposed change is a follow-up to S81-07/08 which was a result of the CTC's investigation of the area of study entitled "Review of NIST WTC Recommendations". The scope of the activity is noted as:

Review the recommendations issued by NIST in its report entitled "Final Report on the Collapse of the World Trade Center Towers", issued September 2005, for applicability to the building environment as regulated by the I-Codes.

The reason this code change was not approved was due to the lack of completion/availability of the standard ASCE/SEI 49 entitled "Wind Tunnel Testing for Buildings and Other Structures". At the time this code change is submitted, the standard has gone through the requiste comment process and the standard is under appeal. As such, this proposal is submitted in anticipation of the standard being completed by the Final Action Hearings.

This proposal is intended to address NIST recommendation 2. For this specific proposed change, CTC is working in cooperation with the NIBS/MMC Committee to Translate the NIST World Trade Center Investigation Recommendations for the Model Codes. The CTC notes in their investigation that many of the recommendations contained in the NIST report require additional information for the CTC to further investigate. As such, CTC intends to continue to study the other NIST recommendations.

NIST Recommendation 2 recommends that nationally accepted performance standards be developed for: (1) conducting wind tunnel testing of prototype structures based on sound technical methods that result in repeatable and reproducible results among testing laboratories; and (2) estimating wind loads and their effects on tall buildings for use in design, based on wind tunnel testing data and directional wind speed data.

The IBC requires that wind loads be determined in accordance with Chapter 6 of ASCE 7, with specific exceptions depending on the size, configuration and location of the building. Section 6.1 of ASCE 7-05 provides three procedures to determine design wind loads: Method 1- Simplified Procedure; Method 2- Analytical Procedure; and Method 3- Wind Tunnel Procedure. Due to unique wind load considerations for certain building configurations and locations, Section 6.5.2 of ASCE 7 - 05 further mandates compliance with either the wind tunnel procedure of Section 6.6 of ASCE 7 or requires the design to be based on recognized literature documenting the wind load effects. Section 6.6 of ASCE does not currently prescribe specific wind tunnel test procedures. These are being developed by an ASCE Wind Tunnel Testing standard committee.

The purpose of this change is not to mandate wind tunnel testing in the IBC, but rather to achieve uniformity in results where the design involves wind tunnel testing – either as required by ASCE 7 or where the designer determines that wind tunnel testing is to be used to determine the wind loads.

The proposed revision that stipulates that the minimum design loads can not be less than the minimums of ASCE 7 (10 psf) is in response to the committees concern stated in the reason for disapproval of S16 -06/07. It is CTC's understanding that the standard will have been completed by the 2009 Baltimore Code Development Hearings.

References:
Interim Report No. 1 of the CTC, Area of Study – Review of NIST WTC Recommendations, March 9, 2006.
National Institute of Standards and Technology. Final Report of the National Construction Safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Cost Impact: The code change proposal will not increase the cost of construction

Analysis: A review of the standard(s) proposed for inclusion in the code, ACSE49-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: HEILSTEDT-S1-1609.1.1

S87–09/10
1609.1.1, 1609.1.1.1, Chapter 35; IRC R301.1.1, R301.2.1.1, Chapter 44

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards and Phil Samblanet, The Masonry Society, representing The Masonry Society.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC-STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

1. Revise as follows:

1609.1.1 Determination of wind loads. Wind loads on every building or structure shall be determined in accordance with Chapter 6 of ASCE 7 or provisions of the alternate all-heights method in Section 1609.6. The type of opening protection required, the basic wind speed and the exposure category for a site is permitted to be determined in accordance with Section 1609 or ASCE 7. Wind shall be assumed to come from any horizontal direction and wind pressures shall be assumed to act normal to the surface considered.

Exceptions:

1. Subject to the limitations of Section 1609.1.1.1, the provisions of ICC 600 shall be permitted for applicable Group R-2 and R-3 buildings.
2. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of the AF&PA WFCM.
3. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of AISI S230.
4. Designs using NAAMM FP 1001.
5. Designs using TIA-222 for antenna-supporting structures and antennas.
6. Wind tunnel tests in accordance with Section 6.6 of ASCE 7, subject to the limitations in Section 1609.1.1.2.
7. Subject to the limitations of Section 1609.1.1.1, residential structures using the provisions of TMS 404.

1609.1.1.1 Applicability. The provisions of ICC 600 are applicable only to buildings located within Exposure B or C as defined in Section 1609.4. The provisions of ICC 600, AF&PA WFCM, TMS 404, and AISI S230 shall not apply to buildings sited on the upper half of an isolated hill, ridge or escarpment meeting the following conditions:

1. The hill, ridge or escarpment is 60 feet (18 288 mm) or higher if located in Exposure B or 30 feet (9144 mm) or higher if located in Exposure C;
2. The maximum average slope of the hill exceeds 10 percent; and
3. The hill, ridge or escarpment is unobstructed upwind by other such topographic features for a distance from the high point of 50 times the height of the hill or 1 mile (1.61 km), whichever is greater.

2. Add standard to Chapter 35 as follows:

TMS
404-09 Standard for Masonry High Wind Residential Construction

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

R301.1.1 Alternative provisions. As an alternative to the requirements in Section R301.1 the following standards are permitted subject to the limitations of this code and the limitations therein. Where engineered design is used in conjunction with these standards, the design shall comply with the *International Building Code*.

1. American Forest and Paper Association (AF&PA) *Wood Frame Construction Manual* (WFCM).
2. American Iron and Steel Institute (AISI) *Standard for Cold-Formed Steel Framing—Prescriptive Method for One- and Two-Family Dwellings* (AISI S230).
3. ICC-400 *Standard on the Design and Construction of Log Structures*.

4. TMS 404 *Standard for Masonry High Wind Residential Construction*,

R301.2.1.1 Design criteria. In regions where the basic wind speeds from Figure R301.2(4) equal or exceed 100 miles per hour (45 m/s) in *hurricane-prone regions*, or 110 miles per hour (49 m/s) elsewhere, the design of buildings shall be in accordance with one of the following methods. The elements of design not addressed by those documents in Items 1 through ~~4~~5 shall be in accordance with this code.

1. American Forest and Paper Association (AF&PA) *Wood Frame Construction Manual for One- and Two-Family Dwellings* (WFCM); or
2. International Code Council (ICC) *Standard for Residential Construction in High Wind Regions* (ICC-600); or
3. *Minimum Design Loads for Buildings and Other Structures* (ASCE-7); or
4. American Iron and Steel Institute (AISI), *Standard for Cold-Formed Steel Framing—Prescriptive Method For One- and Two-Family Dwellings* (AISI S230)~~.~~; or
5. The Masonry Society (TMS) *Standard for Masonry High Wind Residential Construction* (TMS 404).
6~~5~~. Concrete construction shall be designed in accordance with the provisions of this code.
7~~6~~. Structural insulated panel (SIP) walls shall be designed in accordance with the provisions of this code.

2. Add standard to Chapter 44 as follows:

TMS
404-09 Standard for Masonry High Wind Residential Construction

Reason: This modification proposes to introduce a standard for design and construction of masonry residential structures in high wind areas based on a new, mandatory language reference standard TMS 404, *Standard for Masonry High Wind Residential Construction*. The methodology used to develop the *Standard for Masonry High Wind Residential Construction* is based upon the strength design provisions of the 2005 and 2008 editions of the TMS 402/ACI 530/ASCE 5, *Building Code Requirements for Masonry Structures* and the factored combinations of dead and wind loads in accordance with the 2005 edition of ASCE 7, *Minimum Design Loads for Buildings and Other Structures*.

This new design standard is a corollary to the American Forest and Paper Association (AF&PA) *Wood Frame Construction Manual for One- and Two-Family Dwellings* (WFCM) and the American Iron and Steel Institute (AISI), *Standard for Cold-Formed Steel Framing—Prescriptive Method For One- and Two-Family Dwellings (COFS/PM.* The Standard provides minimum requirements for structural component survivability during high wind events of masonry walled residential one and two-family structures up to and including 30 ft. in height for design wind speeds of 100 to 150 mph, 3 second gust as defined by ASCE 7-05. The standard is an alternative to the ICC-600 *Standard for Residential Construction in High Wind Regions* adopted in the 2009 Edition of the IBC. The TMS 404 Standard is also more flexible than the ICC-600 Standard in that it allows actual design of the masonry sections through a series of tables that determines applied loads that are then used in design tables to determine the size and spacing of reinforcement for walls, lintels, and bond beams. The ICC-600 is a prescriptive standard that lists reinforcement configurations based on wind zone and building size.

Those interested in reviewing a draft of the TMS 404 Standard for Masonry High Wind Residential Construction are encouraged to download a working draft of the document at the following link:
http://www.masonrysociety.org/html/resources/TMS-404/TMS404.htm

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, TMS404-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THOMPSON-SAMBLANET-S3-1609.1.1

S88–09/10
1609.1.2

Proponent: Kurt Roeper, representing Ingersoll Rand

Revise as follows:

1609.1.2 Protection of openings. In wind-borne debris regions, glazing in buildings shall be impact-resistant or protected with an impact-resistant covering meeting the impact requirements of ICC 500, an approved impact-resistant standard or ASTM E 1996 and ASTM E 1886 referenced herein as follows:

1. Glazed openings located within 30 feet (9144 mm) of grade shall meet the requirements of the large missile test of ASTM E 1996.
2. Glazed openings located more than 30 feet (9144 mm) above grade shall meet the provisions of the small missile test of ASTM E 1996.

Exceptions:

1. Wood structural panels with a minimum thickness of 7/16 inch (11.1 mm) and maximum panel span of 8 feet (2438 mm) shall be permitted for opening protection in one- and two-story buildings classified as Group R-3 or R-4 occupancy. Panels shall be precut so that they shall be attached to the framing surrounding the opening containing the product with the glazed opening. Panels shall be predrilled as required for the anchorage method and shall be secured with the attachment hardware provided. Attachments shall be designed to resist the components and cladding loads determined in accordance with the provisions of ASCE 7, with corrosion-resistant attachment hardware provided and anchors permanently installed on the building. Attachment in accordance with Table 1609.1.2 with corrosion-resistant attachment hardware provided and anchors permanently installed on the building is permitted for buildings with a mean roof height of 45 feet (13 716 mm) or less where wind speeds do not exceed 140 mph (63 m/s).
2. Glazing in *Occupancy Category* I buildings as defined in Section 1604.5, including greenhouses that are occupied for growing plants on a production or research basis, without public access shall be permitted to be unprotected.
3. Glazing in *Occupancy Category* II, III or IV buildings located over 60 feet (18 288 mm) above the ground and over 30 feet (9144 mm) above aggregate surface roofs located within 1,500 feet (458 m) of the building shall be permitted to be unprotected.

Reason: The design provision for wall pier detailing was originally introduced by SEAOC in 1987 to legacy Uniform Building Code and was included in 1988 UBC through 1997 UBC. The wall pier detailing provision prescribed under Section 1908.1.4 was intended for high seismic zones equivalent to current SDC D, E or F. 1908.1.3 was added as a complement of wall pier detailing in SDC C (formerly seismic zones 2A and 2B under legacy model code.) ACI 318 Commentary R 21.1.1 emphasized "*it is essential that structures assigned to higher SDC's possess a higher degree of toughness*", and further encourages practitioners to use special structural wall system in regions of high seismic risk. ASCE 7 Table 12.2-1 permits intermediate precast structural wall system in SDC D, E or F. Current Section 1908.1.3 does not limit to just structures assigned to SDC C. The required shear strength under 21.3.3, referenced in current Sec. 21.4.5, is based on V_u under either nominal moment strength or two times the code prescribed earthquake force. The required shear strength in 21.6.5.1, referenced in Sec. 21.9.10.2 (IBC 1908.1.4), is based on the probable shear strength, V_e under the probable moment strength, M_{pr}. In addition, the spacing of required shear reinforcement is 8 inches on center under current 21.4.5 instead of 6 inches on center with seismic hooks at both ends under 21.9.10.2. Requirement of wall pier under 21.9.10.2 would enhance better ductility.

Current practice in commercial buildings constructed using precast panels wall system have large window and door openings and/or narrow wall piers. Wall panels varying up to three stories high with openings resembles wall frame which is not currently recognized under any of the defined seismic-force resisting systems other than consideration of structural wall system. Conformance to special structural wall system design and detailing of wall piers ensures minimum life safety performance in resisting earthquake forces for structures in SDC D, E or F. Proposed modification separates wall piers designed for structures assigned to SDC C from those assigned to SDC D, E or F.

Cost Impact: The code change proposal will not increase the cost of construction for typical tilt-up buildings in higher SDC.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROEPER-S1-1609.1.2

S89–09/10
1609.1.2

Proponent: John Woestman, The Kellen Company representing the Door Safety Council (DSC)

Revise as follows:

1609.1.2 Protection of openings. In wind-borne debris regions, ~~glazing~~ openings in buildings shall be impact-resistant or protected with an impact-resistant covering meeting the requirements of an approved impact-resistant standard or ASTM E 1996 and ASTM E 1886 referenced herein as follows:

1. Glazed openings located within 30 feet (9144 mm) of grade shall meet the requirements of the large missile test of ASTM E 1996.
2. Glazed openings located more than 30 feet (9144 mm) above grade shall meet the provisions of the small missile test of ASTM E 1996.

Exceptions:

1. Wood structural panels with a minimum thickness of 7/16 inch (11.1 mm) and maximum panel span of 8 feet (2438 mm) shall be permitted for opening protection in one- and two-story buildings classified as Group R-3 or R-4 occupancy. Panels shall be precut so that they shall be attached to the framing surrounding the opening containing the product with the glazed opening. Panels shall be predrilled as required for the anchorage method and shall be secured with the attachment hardware provided. Attachments shall be designed to resist the components and cladding loads determined in accordance with the provisions of ASCE 7, with corrosion-resistant attachment hardware provided and anchors permanently installed on the building. Attachment in accordance with Table 1609.1.2 with corrosion-resistant attachment hardware provided and anchors permanently installed on the building is permitted for buildings with a mean roof height of 45 feet (13 716 mm) or less where wind speeds do not exceed 140 mph (63 m/s).
2. Glazing in *Occupancy Category* I buildings as defined in Section 1604.5, including greenhouses that are occupied for growing plants on a production or research basis, without public access shall be permitted to be unprotected.
3. Glazing in *Occupancy Category* II, III or IV buildings located over 60 feet (18 288 mm) above the ground and over 30 feet (9144 mm) above aggregate surface roofs located within 1,500 feet (458 m) of the building shall be permitted to be unprotected.

Reason: This proposal clarifies that openings – and not just glazing – in buildings are to be impact-resistant or protected with impact-resistant coverings in wind-borne debris regions. Non-glazed openings are vulnerable to impact by wind-borne debris which could compromise the integrity of the building envelope in preventing damage or destruction by hurricane-strength wind. Thus, non-glazed openings should be held to the same impact-resistance performance requirements as glazed openings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WOESTMAN-S3-1609.1.2

S90–09/10
1609.1.2.2, CHAPTER 35

Proponent: John Woestman, The Kellen Company, representing the Door Safety Council (DSC)

1. Add new text as follows:

1609.1.2.2 Side-hinged doors. Side-hinged door glazed opening protection for wind-borne debris shall meet the requirements of an *approved* impact-resistant standard or ANSI A250.13.

(Renumber remaining sections)

2. Add standard to Chapter 35 as follows:

ANSI
A250.13-08 Testing and Rating of Severe Windstorm Resistant Components for Swinging Door Assemblies

Reason: This proposal helps resolve performance and code compliance issues when exterior side-hinged door openings are comprised of components from multiple sources and include interchangeable elements (ie: doors, frames, hinging and latching hardware, etc.).

This proposed change allows an alternative method to demonstrate performance to impact-resistant requirements for side-hinged door openings by requiring components to be tested to ANSI A250.13-2008. ANSI A250.13 contains language that prescribes how components are to be selected to create complete door openings expected to perform equivalently to door assemblies tested to ASTM E 1996 / E 1886 for impact resistance.

Through the ANSI standards development process stake-holders comprising most major manufacturing associations, testing and certification organizations, specifiers, code officials and end users, developed a national standard for a component-based approach to testing for windstorm resistance of swinging door openings. The test procedures used in this standard represent the most severe requirements found in the windstorm resistance standards referenced in today's building codes. These procedures are designed to isolate the loads, conditions and critical performance requirements that a particular component is subjected to in full assembly tests and duplicate these specific conditions. Using a combination of worst-case scenario design and safety factors, this standard is designed to provide a component rating that relates directly to the component's ability to withstand the conditions that occur in full assembly tests.

Prior to releasing the current revision of ANSI A250.13, validation tests of the large missile impact test specified by ASTM E1886/E1996 were conducted through Intertek Testing Services, a Nationally Recognized Test Laboratory. The study was conducted to quantify the energy that would tend to shear the latch bolt in assembly tests and compare it to the energy delivered to the latch bolt in the ANSI A250.13 component test procedure which uses a relatively rigid fixture and a pendulum type impactor. The impact energy applied to the test sample was varied and the actual energy imparted to the lock and hinge was measured. The component text fixture is more efficient at transferring the energy applied to the system into the test samples than the ASTM E1996 assembly test fixture. This results in higher impact energy at the lock or hinge. For example, only 4% of the impact energy applied in the ASTM E1996 test transfers to the lock. Whereas, 15% of the impact energy is delivered to the lock mounted in the A250.13 test fixture.

Results demonstrated that this test specified in ANSI A250.13 for latches was indeed much more severe (approximately 3.75 times more) than the exposure provided in door assembly tests conducted per ASTM E1996 and similar wind borne debris impact tests. The current impact test requirements of ANSI A250.13 were therefore adjusted to be two times more severe (maintaining a 2 times safety factor) to the current requirements of ASTM E1996.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ANSI A250 13-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WOESTMAN-S1-1609.1.2.2

S91–09/10
1612.2; IEBC 202

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc.,

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

PART I- IBC STRUCTURAL

Revise as follows:

1612.2 Definitions. The following words and terms shall, for the purposes of this section, have the meanings shown herein.

SUBSTANTIAL DAMAGE. Damage of any origin sustained by a building or structure whereby the cost of restoring the building or structure to its ~~before-damaged~~ pre-damage condition would equal or exceed 50 percent of the ~~market~~ replacement value of the building or structure before the damage occurred.

SUBSTANTIAL IMPROVEMENT. Any repair, reconstruction, rehabilitation, addition or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the ~~market~~ replacement value of the building or structure before the improvement or repair is started. If the building or structure has sustained substantial damage, any repaired are considered substantial improvement regardless of the actual repair work performed. The term does not, however, include either:

1. Any project for improvement of a building or structure required to correct existing health, sanitary or safety code violations identified by the building official and that are the minimum necessary to assure safe living conditions.
2. Any alteration of a historic building or structure provided that the alteration will not preclude the ~~structure's~~ continued designation ~~as a historic structure~~ of the building or structure as historic.

(Definitions not shown are unchanged)

PART II- EXISTING BUILDING

Revise as follows:

SECTION 202
GENERAL DEFINITIONS

SUBSTANTIAL DAMAGE. For the purposes of determining compliance with the flood provisions of this code, damage of any origin sustained by a building or structure whereby the cost of restoring the building or structure to its ~~before-damaged~~ pre-damage condition would equal or exceed 50 percent of the ~~market~~ replacement value of the building or structure before the damage occurred.

SUBSTANTIAL IMPROVEMENT. For the purposes of determining compliance with the flood provisions of this code, any repair, alteration, addition or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the ~~market~~ replacement value of the building or structure~~,~~ before the improvement or repair is started. If the building or structure has sustained substantial damage, any repairs are considered substantial improvement regardless of the actual repair work performed. The term does not, however, include either:

1. Any project for improvement of a building or structure required to correct existing health, sanitary or safety code violations identified by the building official and that is the minimum necessary to assure safe living conditions, or
2. Any alteration of a historic building or structure~~,~~ provided that the alteration will not preclude the ~~structure's~~ continued designation of the building or structure as historic. ~~as a historic structure.~~

(Definitions not shown are unchanged)

Reason: This proposal does three things:
1. Adds the words "building or" and "or structure" to the definitions of substantial damage and substantial improvement.
2. Changes the term "before-damaged" to "pre-damage"
3. Changes the criteria for determining "substantial" from 50 percent of the market value to 50 percent of the replacement cost of the building or structure.

The first two changes are editorial and are intended to clarify the intended meaning of the definitions. The third change is intended to simplify the method by which substantial damage or substantial improvement are determined. Currently, the definitions require the determination as to the "market value" of a building or structure as it existed before the damage or alteration; this might arguably require the services of a real estate appraiser or real estate agent to determine the "market value". Instead, by linking the definitions to "replacement value", the engineer's job is made more simple because the replacement value can easily be determined using a nationally recognized cost estimation resource such as RS Means or National Construction Estimator.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I-IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II- IEBC:

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Searer-S2-1612-EB1-506.2.2.3

S92–09/10

IBC 801.5, 1403.5; IPC [B] 309.2; IFGC [B] 301.11; IMC [B] 301.13, 401.4, 501.2.1, [B] 602.4, [B] 603.13, 1305.2.1

Proponent: Rebecca C Quinn, RCQuinn Consulting Inc., representing Department of Homeland Security, Federal Emergency Management Agency

THIS IS A 4 PART CODE CHANGE. ALL PARTS WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

PART I – IBC

Revise as follows:

801.5 Applicability. For buildings in flood hazard areas as established in Section 1612.3, interior finishes, trim and decorative materials that extend below the elevation required by Section 1612.4 ~~design flood elevation~~ shall be flood-damage-resistant materials.

1403.5 Flood resistance. For buildings in flood hazard areas as established in Section 1612.3, exterior walls extending below the elevation required by Section 1612.4 shall be constructed with flood damage resistant materials ~~design flood elevation shall be resistant to water damage~~. Wood shall be pressure-preservative treated in accordance with AWPA U1 for the species, product and end use using a preservative listed in Section 4 of APWA U1 or decay-resistant heartwood of redwood, black locust or cedar.

PART II – IPC

Revise as follows:

[B] 309.2 Flood hazard. For structures located in flood hazard areas, the following systems and equipment shall be located ~~at or above~~ and installed as required by Section 1612.4 of the *International Building Code* ~~the design flood elevation~~.

Exception: The following systems are permitted to be located below the ~~design flood elevation~~ the elevation required by Section 1612.4 of the *International Building Code* for utilities and attendant equipment provided that the systems are designed and installed to prevent water from entering or accumulating within their components and the systems are constructed to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to up to such ~~the design flood~~ elevation.

1. All water service pipes.
2. Pump seals in individual water supply systems where the pump is located below the design flood elevation.
3. Covers on potable water wells shall be sealed, except where the top of the casing well or pipe sleeve is elevated to at least 1 foot (305 mm) above the design flood elevation.
4. All sanitary drainage piping.
5. All storm drainage piping.
6. Manhole covers shall be sealed, except where elevated to or above the design flood elevation.
7. All other plumbing fixtures, faucets, fixture fittings, piping systems and equipment.
8. Water heaters.
9. Vents and vent systems.

PART III – IFGC

Revise as follows:

[B] 301.11 Flood hazard. For structures located in flood hazard areas, the appliance, equipment and system installations regulated by this code shall be located at or above the elevation required by Section 1612.4 of the *International Building Code* for utilities and attendant equipment ~~design flood elevation and shall comply with the flood-resistant construction requirements of the *International Building Code*~~.

Exception: The appliance, equipment and system installations regulated by this code are permitted to be located below the ~~design flood~~ elevation required by Section 1612.4 of the *International Building Code* for utilities and

attendant equipment provided that they are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to such elevation. ~~the design flood elevation shall comply with the flood-resistant construction requirements of the *International Building Code*.~~

PART IV – IMC

Revise as follows:

[B] 301.13 Flood hazard. For structures located in flood hazard areas, mechanical systems, equipment and appliances shall be located at or above the elevation required by Section 1612.4 of the *International Building Code* for utilities and attendant equipment ~~design flood elevation~~.

Exception: Mechanical systems, equipment and appliances are permitted to be located below the ~~design flood~~ elevation required by Section 1612.4 of the of the *International Building Code* for utilities and attendant equipment provided that they are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding up to such elevation. ~~to the design flood elevation in compliance with the flood-resistant construction requirements of the *International Building Code*.~~

401.4 Intake opening location. Air intake openings shall comply with all of the following:
4. Intake openings on structures in flood hazard areas shall be at or above the elevation required by Section 1612.4 of the *International Building Code* for utilities and attendant equipment ~~design flood elevation~~.

501.2.1 Location of exhaust outlets. The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances:

1. For ducts conveying explosive or flammable vapors, fumes or dusts: 30 feet (9144 mm) from property lines; 10 feet (3048 mm) from operable openings into buildings; 6 feet (1829 mm) from exterior walls and roofs; 30 feet (9144 mm) from combustible walls and operable openings into buildings which are in the direction of the exhaust discharge; 10 feet (3048 mm) above adjoining grade.
2. For other product-conveying outlets: 10 feet (3048 mm) from the property lines; 3 feet (914 mm) from exterior walls and roofs; 10 feet (3048 mm) from operable openings into buildings; 10 feet (3048 mm) above adjoining grade.
3. For all *environmental air* exhaust: 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable openings into buildings for all occupancies other than Group U, and 10 feet (3048 mm) from mechanical air intakes. Such exhaust shall not be considered hazardous or noxious.
4. Exhaust outlets serving structures in flood hazard areas shall be installed at or above the elevation required by Section 1612.4 of the *International Building Code* for utilities and attendant equipment ~~design flood elevation~~.
5. For specific systems see the following sections:
   5.1. Clothes dryer exhaust, Section 504.4.
   5.2. Kitchen hoods and other kitchen exhaust *equipment*, Sections 506.3.12, 506.4 and 506.5.
   5.3. Dust stock and refuse conveying systems, Section 511.
   5.4. Subslab soil exhaust systems, Section 512.4
   5.5. Smoke control systems, Section 513.10.3
   5.6. Refrigerant discharge, Section1105.7
   5.7. Machinery room discharge, Section 1105.6.1

[B] 602.4 Flood hazard. For structures located in flood hazard areas, plenum spaces shall be located above the elevation required by Section 1612.4 of the *International Building Code* for utilities and attendant equipment ~~design flood elevation~~ or shall be designed and constructed to prevent water from entering or accumulating within the plenum spaces during floods up to such ~~the design flood~~ elevation. If the plenum spaces are located below the elevation required by Section 1612.4 of the *International Building Code* for utilities and attendant equipment ~~design flood elevation~~, they shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding up to such ~~to the design flood~~ elevation.

[B] 603.13 Flood hazard areas. For structures in flood hazard areas, ducts shall be located above the elevation required by Section 1612.4 of the *International Building Code* for utilities and attendant equipment ~~design flood elevation~~ or shall be designed and constructed to prevent water from entering or accumulating within the ducts during floods up to such ~~the design flood~~ elevation. If the ducts are located below the elevation required by Section 1612.4 of the *International Building Code* for utilities and attendant equipment ~~design flood elevation~~, the ducts shall be

capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding up to such ~~the design flood~~ elevation.

1305.2.1 Flood hazard. All fuel oil pipe, equipment and appliances located in flood hazard areas shall be located above the elevation required by Section 1612.4 of the *International Building Code* for utilities and attendant equipment ~~design flood elevation~~ or shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding up to such ~~the design flood~~ elevation.

Reason:
Part I – The purpose of this code change is to provide consistency between the elevations of buildings and structures that are specified in Section 1612.4 and the elevations below which flood damage-resistant materials are to be used. For specific elevation requirements for flood damage-resistant materials, Section 1612.4 refers to ASCE 24, *Flood Resistant Design and Construction*.
Part II - In the *International Building Code,* Section 1612.4 refers to ASCE 24, *Flood Resistant Design and Construction,* which specifies elevations as a function of flood zone and Structure Category. This proposal will result in consistency between the elevations of buildings and structures that are specified in ASCE 24 and the elevations of the plumbing systems and equipment that serve those buildings and structures, which are also specified in ASCE 24.
Part III – In the *International Building Code,* Section 1612.4 refers to ASCE 24, *Flood Resistant Design and Construction,* which specifies elevations as a function of flood zone and Structure Category and which specifies the performance under loads that needs to be provided if equipment is located below such elevations.. This proposal will result in consistency between the elevations of buildings and structures that are specified in ASCE 24 and the elevations of equipment that serve those buildings and structures, which are also specified in ASCE 24.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – IFGC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART IV – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: QUINN-S2 4 parts

S93–09/10
1612.5

Proponent: Rebecca C. Quinn, RC Quinn Consulting, Inc. representing Department of Homeland Security, Federal Emergency Management Agency

Revise as follows:

1612.5 Flood hazard documentation. The following documentation shall be prepared and sealed by a registered design professional and shall be submitted to the building official:

1. For construction in flood hazard areas not subject to high-velocity wave action:
   1.1. The elevation of the lowest floor, including basement, as required by the lowest floor elevation inspection in Section 110.3.3.
   1.2. For fully enclosed areas below the design flood elevation where provisions to allow for the automatic entry and exit of floodwaters do not meet the minimum requirements in Section 2.6.2.1, ASCE 24, construction documents shall include a statement that the design will provide for equalization of hydrostatic flood forces in accordance with Section 2.6.2.2 of ASCE 24.

1.3. For dry floodproofed nonresidential buildings, construction documents shall include a statement that the dry floodproofing is designed in accordance with ASCE 24.

2. For construction in flood hazard areas subject to high-velocity wave action:
   2.1. The elevation of the bottom of the lowest horizontal structural member as required by the lowest floor elevation inspection in Section 110.3.3.
   2.2. Construction documents shall include a statement that the building is designed in accordance with ASCE 24, including that the pile or column foundation and building or structure to be attached thereto is designed to be anchored to resist flotation, collapse and lateral movement due to the effects of wind and flood loads acting simultaneously on all building components, and other load requirements of Chapter 16.
   2.3. For breakaway walls designed to resist a nominal load of ~~less that 10 psf (0.48 kN/m^2) or~~ more than 20 psf (0.96 kN/m^2), construction documents shall include a statement that the breakaway wall is designed in accordance with ASCE 24.

Reason: In Section 4.6.1, ASCE 24, *Flood Resistant Design and Construction*, requires breakaway walls and their connections to be designed in accordance with the requirements of ASCE 7, *Minimum Design Loads for Buildings and Other Structures.* ASCE 7 does not allow such walls to be designed for less than 10 psf (see Section 5.3.2.3 in ASCE 7-02). Therefore, this code change is appropriate for consistency with both standards. In addition, the regulations of the National Flood Insurance Program do not provide for breakaway walls with a design safe loading resistance of less than 10 psf (see 44 C.F.R. §60.3(e)(5)).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: QUINN-S1-1612.5

S94–09/10
1612.6 (New), Chapter 35

Proponent: Michael Mahoney, Federal Emergency Management Agency, representing the National Tsunami Hazard Mitigation Program

1. Add a new text as follows:

1612.6 Tsunami-generated flood hazard. Construction within a Tsunami Hazard Inundation Zone shall be in accordance with this section.

1612.6.1 Definitions. The following words and terms shall, for the purposes of this section, have the meanings shown herein.

TSUNAMI HAZARD INUNDATION MAP. A map that designates the extent of inundation by a design event tsunami which is developed and provided to a community by either the State or the National Atmospheric and Oceanic Administration (NOAA) under the National Tsunami Hazard Mitigation Program, using NOAA mapping criteria.

TSUNAMI HAZARD INUNDATION ZONE. The area anticipated to be flooded or inundated by a design event tsunami as identified on a community's Tsunami Hazard Inundation Map.

1612.6.2 Establishment of Tsunami Hazard Inundation Zone. Where a community has adopted a Tsunami Hazard Inundation Map, that map shall be used to establish a community's Tsunami Hazard Inundation Zone.

1612.6.3 Construction within the Tsunami Hazard Inundation Zone. Buildings and structures designated Occupancy Category III or IV in accordance with Section 1604.5 shall be prohibited within a Tsunami Hazard Inundation Zone.

> **Exception:** A vertical evacuation tsunami refuge shall be permitted to be located in a Tsunami Hazard Inundation Zone provided it is constructed in accordance with FEMA P646.

2. Add standard to Chapter 35 as follows:

Federal Emergency Management Agency
P646- 08 *Guidelines for Design of Structures for Vertical Evacuation from Tsunamis*

Reason: For coastal communities subject to tsunami waves, where the either the State or the National Oceanic and Atmospheric Administration (NOAA) have provided a Tsunami Hazard Inundation Map and that community has adopted that Map, the Map specifies a Tsunami Hazard Inundation Zone. This Zone is subject to inundation in a design event tsunami, which can result in significant damage. Most of these maps are deterministic in nature, using historical and best available scientific data, and it is currently difficult to assign a specific probability to the design event used for mapping purposes. However, given the potentially serious life safety risk presented to structures within this zone, this is sufficient justification to limit the presence of high hazard and high occupancy structures within the Zone.

Cost Impact: The potential cost impact would be requiring new high hazard and high occupancy structures to be located outside the Tsunami Inundation Zone. Given that this land is further away from the shore and therefore normally less expensive, the cost impact is believed to be minimal.

Analysis: A review of the standard(s) proposed for inclusion in the code, FEMA P646-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAHONEY-S2-1612.6 NEW

S95–09/10
1613.1-1613.7

Proponent: Steven Winkel, FAIA, PE, and Kelly Cobeen, PE, SE, Building Seismic Safety Council (BSSC) of the National Institute of Building Sciences, representing the Federal Emergency Management Agency, BSSC Code Resource Support Committee

1. Revise as follows:

1613.1 Scope. Every structure, and portion thereof, including nonstructural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance with ASCE 7, excluding Chapters 14 and Appendix 11A. The *seismic design category* for a structure shall ~~is permitted to~~ be determined in accordance with Section 11.6 of ~~1613 or~~ ASCE 7.

Exceptions:

1. Detached one- and two-family dwellings, assigned to Seismic Design Category A, B or C, or located where the ~~mapped~~ short-period spectral response acceleration parameter, S_S, is less than 0.4g.
2. The seismic-force-resisting system of wood-frame buildings that conform to the provisions of Section 2308 are not required to be analyzed as specified by this section.
3. Agricultural storage structures intended only for incidental human occupancy.
4. Structures that require special consideration of their response characteristics and environment that are not addressed by this code or ASCE 7 and for which other regulations provide seismic criteria, such as vehicular bridges, electrical transmission towers, hydraulic structures, buried utility lines and their appurtenances and nuclear reactors.

1613.2 Definitions. The following words and terms shall, for the purpose of this section, have the meanings shown herein.

~~**DESIGN EARTHQUAKE GROUND MOTION.** The earthquake ground motion that buildings and structures are specifically proportioned to resist in Section 1613.~~

~~**MAXIMUM CONSIDERED EARTHQUAKE GROUND MOTION.** The most severe earthquake effects caused by this code.~~

MECHANICAL SYSTEMS. For the purposes of determining seismic loads in ASCE 7, mechanical systems shall include plumbing systems as specified herein.

~~**ORTHOGONAL.** To be in two horizontal directions, at 90 degrees (1.57 rad) to each other.~~

SEISMIC DESIGN CATEGORY. A classification assigned to a structure based on its occupancy category and the severity of the design earthquake ground motion at the site.

~~**SEISMIC-FORCE-RESISTING SYSTEM.** That part of the structural system that has been considered in the design to provide the required resistance to the prescribed seismic forces.~~

SITE CLASS. A classification assigned to a site based on the types of soils present and their engineering properties as defined in Secton1613.5.2.

SITE COEFFICIENTS. The values of F_a and F_v indicated in Tables 1613.5.3(1) and 1613.5.3(2) respectively.

2. Delete without substitution:

1613.3 Existing buildings. *Additions*, *alterations*, repairs or change of occupancy of existing buildings shall be in accordance with Chapter 34.

1613.4 Special inspections. Where required by Sections 1705.3 through 1705.3.5, the statement of special inspections shall include the *special inspections* required by Section 1705.3.6.

1613.5 Seismic ground motion values. Seismic ground motion values shall be determined in accordance with this section.

1613.5.1 Mapped acceleration parameters. The parameters S_s and S_1 shall be determined from the 0.2 and 1-second spectral response accelerations shown on Figures 1613.5(1) through 1613.5(14). Where S_1 is less than or equal to 0.04 and S_s is less than or equal to 0.15, the structure is permitted to be assigned to *Seismic Design Category* A.

1613.5.2 Site class definitions. Based on the site soil properties, the site shall be classified as either *Site Class* A, B, C, D, E or F in accordance with Table 1613.5.2. When the soil properties are not known in sufficient detail to determine the *site class*, *Site Class* D shall be used unless the *building official* or geotechnical data determines that *Site Class* E or F soil is likely to be present at the site.

TABLE 1613.5.2
SITE CLASS DEFINITIONS

SITE CLASS	SOIL PROFILE NAME	AVERAGE PROPERTIES IN TOP 100 feet, SEE SECTION 1613.5.5		
		Soil shear wave velocity, $\bar{v}_s$, (ft/s)	Standard penetration resistance, $\bar{N}$	Soil undrained shear strength, $\bar{s}_u$, (psf)
A	Hard rock	$\bar{v}_s > 5{,}000$	N/A	N/A
B	Rock	$2{,}500 < \bar{v}_s \leq 5{,}000$	N/A	N/A
C	Very dense soil and soft rock	$1{,}200 < \bar{v}_s \leq 2{,}500$	$\bar{N} > 50$	$\bar{s}_u \geq 2{,}000$
D	Stiff soil profile	$600 \leq \bar{v}_s \leq 1{,}200$	$15 \leq \bar{N} \leq 50$	$1{,}000 \leq \bar{s}_u \leq 2{,}000$
E	Soft soil profile	$\bar{v}_s < 600$	$\bar{N} < 15$	$\bar{s}_u < 1{,}000$
E	—	Any profile with more than 10 feet of soil having the following characteristics: 1. Plasticity index $PI > 20$, 2. Moisture content $w \geq 40\%$, and 3. Undrained shear strength $\bar{s}_u < 500$ psf		
F	—	Any profile containing soils having one or more of the following characteristics: 1. Soils vulnerable to potential failure or collapse under seismic loading such as liquefiable soils, quick and highly sensitive clays, collapsible weakly cemented soils. 2. Peats and/or highly organic clays (H > 10 feet of peat and/or highly organic clay where H = thickness of soil) 3. Very high plasticity clays (H > 25 feet with plasticity index PI > 75) 4. Very thick soft/medium stiff clays (H > 120 feet)		

For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929m^2, 1 pound per square foot = 0.0479 kPa. N/A = Not applicable

1613.5.3 Site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters. The maximum considered earthquake spectral response acceleration for short periods, S_{MS}, and at 1-second period, S_{M1}, adjusted for *site class* effects shall be determined by Equations 16-36 and 16-37, respectively:

$S_{MS} = F_a S_s$ **(Equation 16-36)**

$S_{M1} = F_v S_1$ **(Equation 16-37)**

where:

F_a = Site coefficient defined in Table 1613.5.3(1).
F_v = Site coefficient defined in Table 1613.5.3(2).
S_S = The mapped spectral accelerations for short periods as determined in Section 1613.5.1.
S_1 = The mapped spectral accelerations for a 1-second period as determined in Section 1613.5.1.

TABLE 1613.5.3(1)
VALUES OF SITE COEFFICIENT F_a [a]

SITE CLASS	MAPPED SPECTRAL RESPONSE ACCELERATION AT SHORT PERIOD				
	$S_s \le 0.25$	$S_s = 0.50$	$S_s = 0.75$	$S_s = 1.00$	$S_s \ge 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	Note b	Note b	Note b	Note b	Note b

a. Use straight-line interpolation for intermediate values of mapped spectral response acceleration at short period, *Ss*.
b. Values shall be determined in accordance with Section 11.4.7 of ASCE 7.

TABLE 1613.5.3(2)
VALUES OF SITE COEFFICIENT F_V [a]

SITE CLASS	MAPPED SPECTRAL RESPONSE ACCELERATION AT 1-SECOND PERIOD				
	$S_1 \le 0.1$	$S_1 = 0.2$	$S_1 = 0.3$	$S_1 = 0.4$	$S_1 \ge 0.5$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	Note b	Note b	Note b	Note b	Note b

a. Use straight-line interpolation for intermediate values of mapped spectral response acceleration at 1-second period, *S1*.
b. Values shall be determined in accordance with Section 11.4.7 of ASCE 7.

1613.5.4 Design spectral response acceleration parameters. Five-percent damped design spectral response acceleration at short periods, *SDS*, and at 1-second period, *SD*1, shall be determined from Equations 16-38 and 16-39, respectively:

$$S_{DS} = \frac{2}{3} S_{MS}$$ **(Equation 16-38)**

$$S_{D1} = \frac{2}{3} S_{M1}$$ **(Equation 16-39)**

where:

S_{MS} = The maximum considered earthquake spectral response accelerations for short period as determined in Section 1613.5.3.
S_{M1} = The maximum considered earthquake spectral response accelerations for 1-second period as determined in Section 1613.5.3.

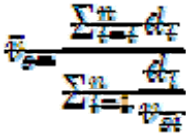
1613.5.5 Site classification for seismic design. Site classification for *Site Class* C, D or E shall be determined from Table 1613.5.5.

The notations presented below apply to the upper 100 feet (30 480 mm) of the site profile. Profiles containing distinctly different soil and/or rock layers shall be subdivided into those layers designated by a number that ranges

from 1 to *n* at the bottom where there is a total of *n* distinct layers in the upper 100 feet (30 480 mm). The symbol *i* then refers to any one of the layers between 1 and *n*.

where:

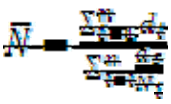
v_{si} = The shear wave velocity in feet per second (m/s).
d_i = The thickness of any layer between 0 and 100 feet (30 480 mm).



(Equation 16-40)

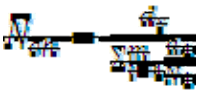
 = 100 feet (30 480 mm)

Ni is the Standard Penetration Resistance (ASTM D 1586) not to exceed 100 blows/foot (328 blows/m) as directly measured in the field without corrections. When refusal is met for a rock layer, *Ni* shall be taken as 100 blows/foot (328 blows/m).



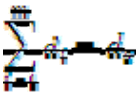
(Equation 16-41)

where *Ni* and *di* in Equation 16-41 are for cohesionless soil, cohesive soil and rock layers.

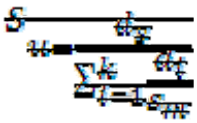


(Equation 16-42)

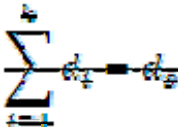
where:



Use d_i and N_i for cohesionless soil layers only in Equation 16-42.
d_s = The total thickness of cohesionless soil layers in the top 100 feet (30 480 mm).
m = The number of cohesionless soil layers in the top 100 feet (30 480 mm).
s_{ui} = The undrained shear strength in psf (kPa), not to exceed 5,000 psf (240 kPa), ASTM D 2166 or D



(Equation 16-43)



d_c = The total thickness of cohesive soil layers in the top 100 feet (30 480 mm).
k = The number of cohesive soil layers in the top 100 feet (30 480 mm).
P_I = The plasticity index, ASTM D 4318.
w = The moisture content in percent, ASTM D 2216.

TABLE 1613.5.5
SITE CLASSIFICATION[a]

SITE CLASS	$\bar{v}_s$	$\bar{N}$ or $\bar{N}_{ch}$	$\bar{s}_u$
E	< 600 ft/s	< 15	< 1,000 psf
D	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
C	1,200 to 2,500 ft/s	> 50	> 2,000

For SI: 1 foot per second = 304.8 mm per second, 1 pound per square foot = 0.0479kN/m^2.

a. If the s_u method is used and the N_{ch} and s_u criteria differ, select the category with the softer soils (for example, use Site Class E instead of D).

Where a site does not qualify under the criteria for *Site Class* F and there is a total thickness of soft clay greater than 10 feet (3048 mm) where a soft clay layer is defined by: s_u 500 psf (24 kPa), w _ 40 percent, and PI _ 20, it shall be classified as *Site Class* E.

The shear wave velocity for rock, *Site Class* B, shall be either measured on site or estimated by a geotechnical engineer or engineering geologist/seismologist for competent rock with moderate fracturing and weathering. Softer and more highly fractured and weathered rock shall either be measured on site for shearwave velocity or classified as *Site Class* C.

The hard rock category, *Site Class* A, shall be supported by shear wave velocity measurements either on site or on profiles of the same rock type in the same formation with an equal or greater degree of weathering and fracturing. Where hard rock conditions are known to be continuous to a depth of 100 feet (30 480 mm), surficial shear wave velocity measurements are permitted to be extrapolated to assess *vs* .

The rock categories, *Site Classes* A and B, shall not be used if there is more than 10 feet (3048 mm) of soil between the rock surface and the bottom of the spread footing or mat foundation.

1613.5.5.1 Steps for classifying a site.

1. Check for the four categories of *Site Class* F requiring site-specific evaluation. If the site corresponds to any of these categories, classify the site as *Site Class* F and conduct a site-specific evaluation.
2. Check for the existence of a total thickness of soft clay > 10 feet (3048 mm) where a soft clay layer is defined by: s_u < 500 psf (24 kPa), w ≥ 40 percent and PI > 20. If these criteria are satisfied, classify the site as *Site Class* E.
3. Categorize the site using one of the following three methods with v_s, N, and s_u and computed in all cases as specified.
   3.1. v_s for the top 100 feet (30 480 mm) (v_s method).
   3.2. N for the top 100 feet (30 480 mm) (N method).
   3.3. N_{ch} for cohesionless soil layers (PI < 20) in the top 100 feet (30 480 mm) and average, s_u for cohesive soil layers (PI > 20) in the top 100 feet (30 480 mm) (s_u method).

1613.5.6 Determination of seismic design category. Structures classified as *Occupancy Category* I, II or III that are located where the mapped spectral response acceleration parameter at 1-second period, S_1, is greater than or equal to 0.75 shall be assigned to *Seismic Design Category* E. Structures classified as *Occupancy Category* IV that are located where the mapped spectral response acceleration parameter at 1-second period, S_1, is greater than or equal to 0.75 shall be assigned to *Seismic Design Category* F. All other structures shall be assigned to a *seismic design category* based on their *occupancy category* and the design spectral response acceleration coefficients, S_{DS} and S_{D1}, determined in accordance with Section 1613.5.4 or the sitespecific procedures of ASCE 7. Each building and structure shall be assigned to the more severe *seismic design category* in accordance with Table 1613.5.6(1) or 1613.5.6(2), irrespective of the fundamental period of vibration of the structure, T.

TABLE 1613.5.6(1)
SEISMIC DESIGN CATEGORY BASED ON
SHORT-PERIOD RESPONSE ACCELERATIONS

VALUE OF S_{DS}	OCCUPANCY CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \le S_{DS} < 0.33g$	B	B	C
$0.33g \le S_{DS} < 0.50g$	C	C	D
$0.50g \le S_{DS}$	D	D	D

TABLE 1613.5.6(2)
SEISMIC DESIGN CATEGORY BASED ON
1-SECOND PERIOD RESPONSE ACCELERATION

VALUE OF S_{D1}	OCCUPANCY CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \le S_{D1} < 0.133g$	B	B	C
$0.133g \le S_{D1} < 0.20g$	C	C	D
$0.20g \le S_{D1}$	D	D	D

1613.5.6.1 Alternative seismic design category determination. Where S_1 is less than 0.75, the *seismic design category* is permitted to be determined from Table 1613.5.6(1) alone when all of the following apply:

1. In each of the two orthogonal directions, the approximate fundamental period of the structure, T_a, in each of the two orthogonal directions determined in accordance with Section 12.8.2.1 of ASCE 7, is less than 0.8 T_s determined in accordance with Section 11.4.5 of ASCE 7.
2. In each of the two orthogonal directions, the fundamental period of the structure used to calculate the story drift is less than T_s.
3. Equation 12.8-2 of ASCE 7 is used to determine the seismic response coefficient, C_s
4. The diaphragms are rigid as defined in Section 12.3.1 of ASCE 7 or, for diaphragms that are flexible, the distances between vertical elements of the seismic force-resisting system do not exceed 40 feet (12 192 mm).

(Renumber remaining sections)

Reason: In light of the changes to the ICC code development process and schedule, this code change is submitted as a possible last resort to avoid retention in the 2012 IBC of superseded earthquake ground motion maps and Seismic Design Category (SDC) provisions. The code change submittal schedule has made it problematic that the updated earthquake design maps developed for the 2009 *NEHRP Recommended Seismic Provisions* can be successfully moved through the full ASCE 7 consensus process in time for consideration for the 2012 IBC. Although the FEMA/BSSC Code Resource Support Committee (CRSC) would prefer that ground motion maps remain in the IBC, it has concluded that deletion of the maps from the code is a better approach than retaining maps that have been superseded. A companion FEMA/BSSC CRSC code change proposes the updated ground motion maps as currently being considered in the ASCE 7 process. It is our intention to withdrawal this proposal if ASCE 7-10 and the updated ground motion maps are approved for adoption into the IBC.

This code change proposes deletion of the earthquake ground motion maps and the associated SDC provisions, citing instead ASCE 7 for maps and SDC assignments. The definition of Seismic Design Category is retained as this term is used in Section 1613.1. The definition wording used is taken from ASCE 7-05 but the wording will be updated if needed to reflect ASCE 7-10 revisions. The definition of mechanical systems is retained. The balance of Section 1613.2 definitions are deleted as they are terms no longer used in the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: WINKEL-COBEEN-S1-1613.1

S96–09/10
1613.5.1, Figures 1613.5(1) - 1613.5(14)

Proponent: Jim Rossberg, Structural Engineering Institute of ASCE, representing self

Revise as follows:

1613.5.1 Mapped acceleration parameters. The parameters S_S and S_1 shall be determined from the 0.2 and 1 second spectral response accelerations shown on Figures ~~1613.5(1) through 1613.5(14)~~ 1613.5(1) and 1613.5(2). Where S_1, is less than or equal to 0.04 and S_S is less than or equal to 0.15, the structure is permitted to be assigned to Seismic Design Category A.

Delete Figures 1613.5(1) through 1613.5(14) and substitute as follows:

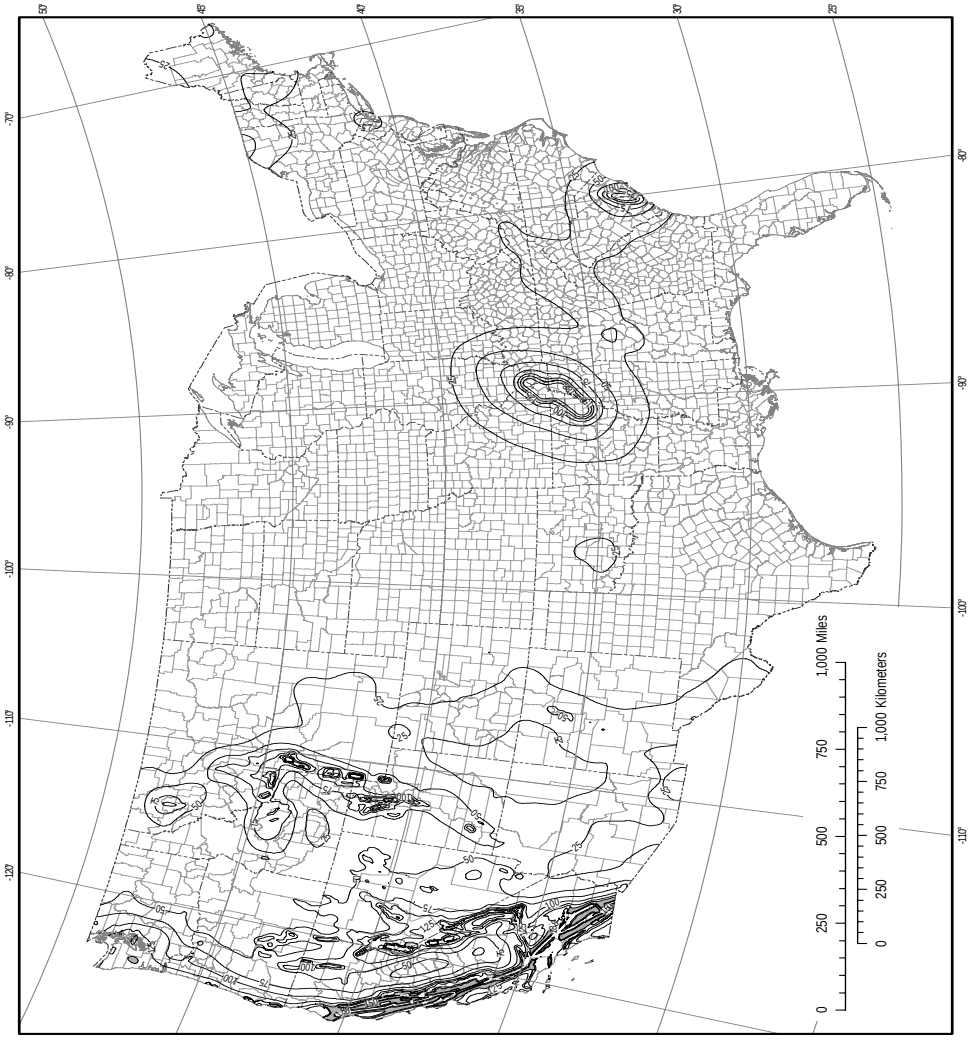
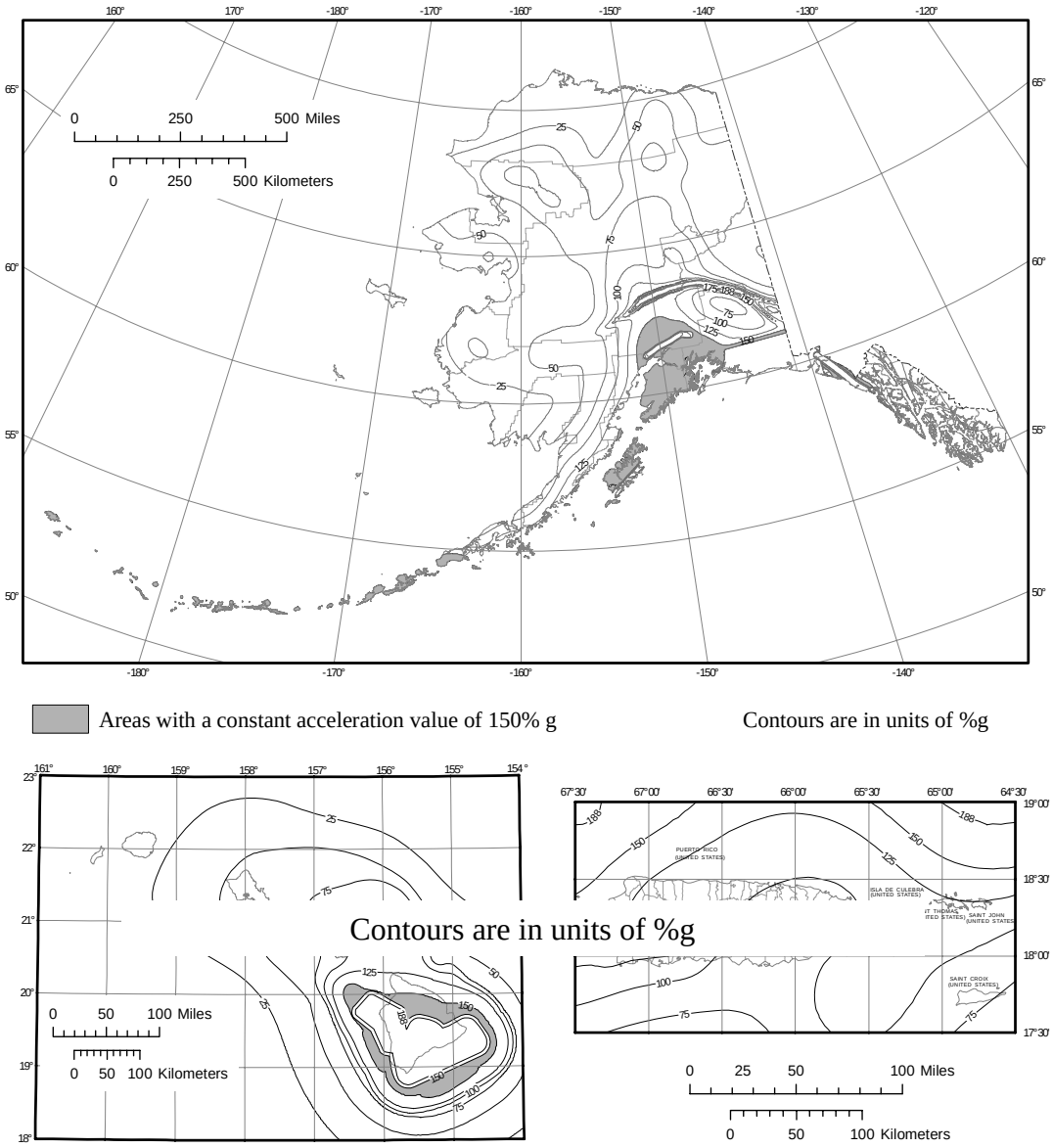


Figure 1613.5(1) Maximum Considered Earthquake (MCE) Ground Motion of 0.2 s Spectral Response Acceleration (5% of Critical Damping), Site Class B



Notes:

Ground motion values contoured on these maps incorporate risk-targeted and deterministic ground motions, and a factor of 1.1 for the maximum direction of 0.2 s spectral response acceleration. As such, they are different from those on the uniform-hazard 2008 USGS National Seismic Hazard Maps posted at http://earthquake.usgs.gov/hazmaps.

Larger, more detailed versions of these maps are not provided because it is recommended that the corresponding USGS web tool (http://earthquake.usgs.gov/designmaps)be used to determine the mapped value for a specified location.

Figure 1613.5(1) (continued) Maximum Considered Earthquake (MCE) Ground Motion of 0.2 s Spectral Response Acceleration (5% of Critical Damping), Site Class B

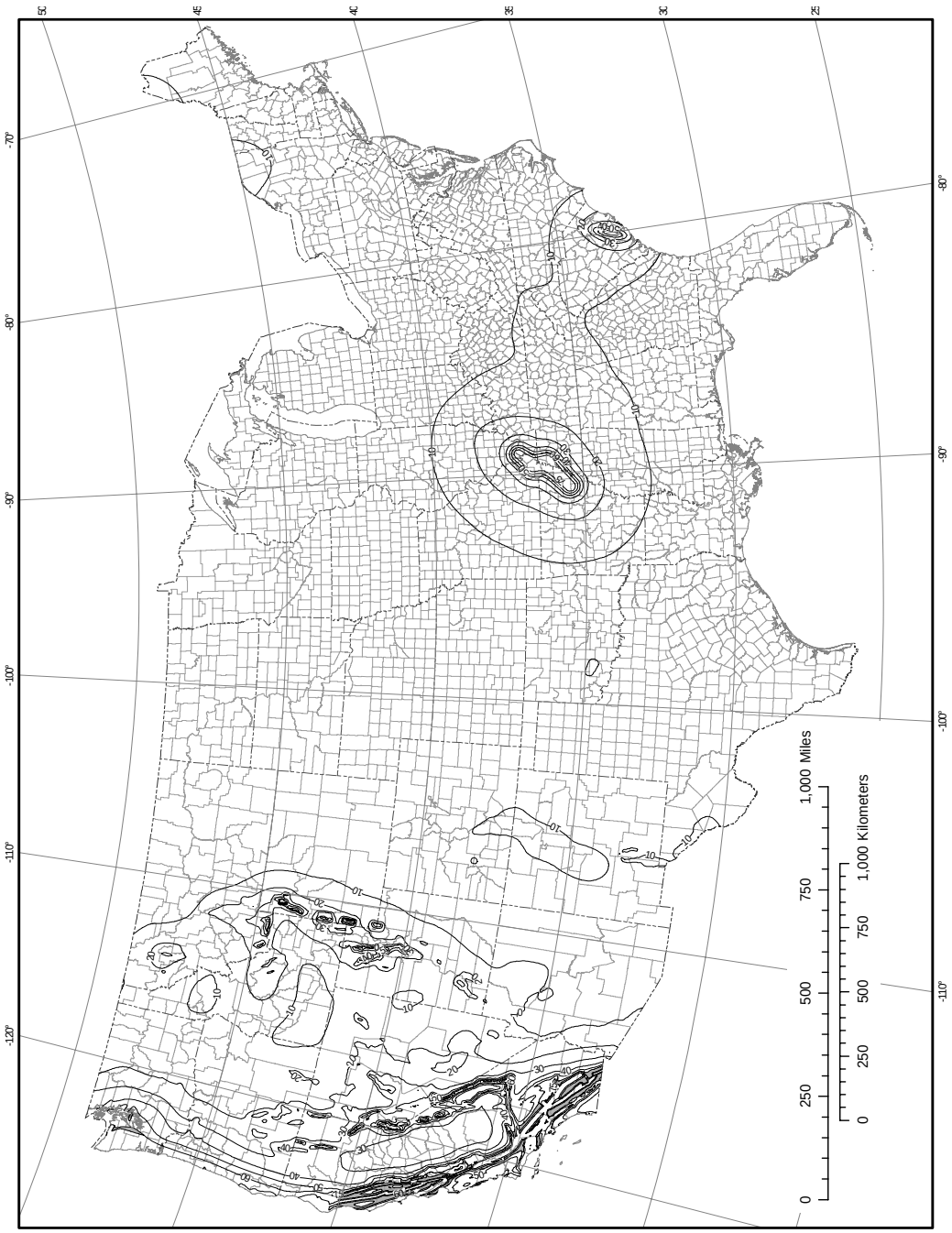
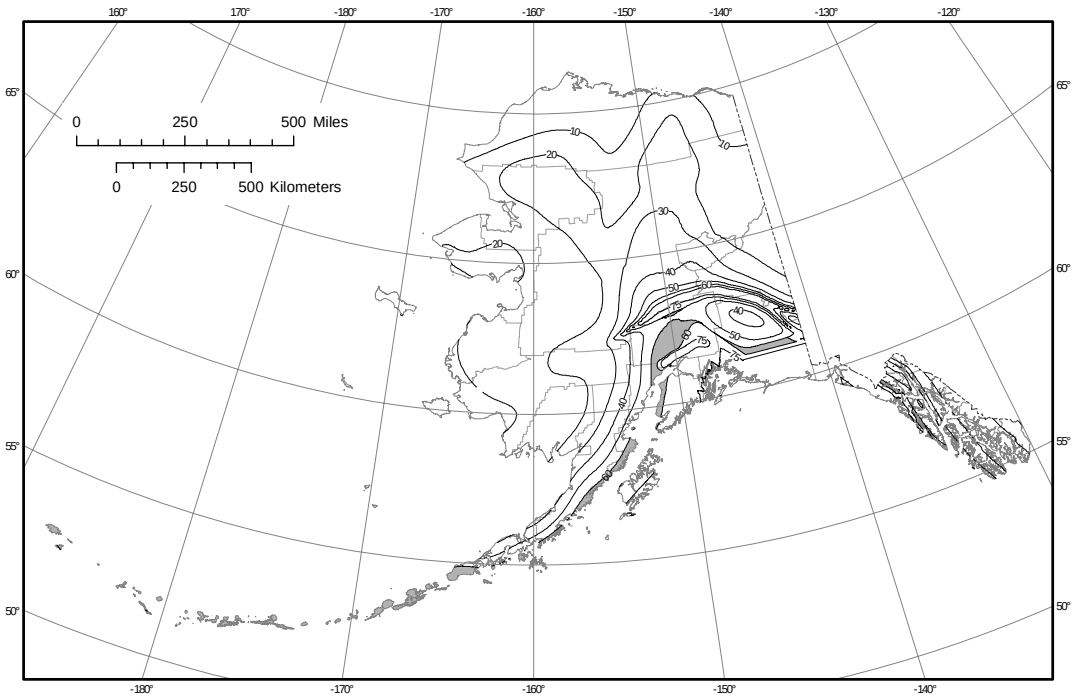
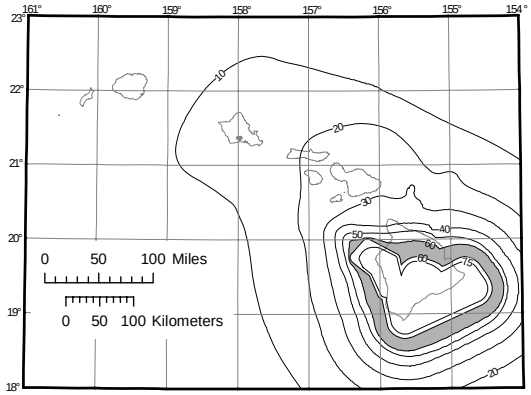
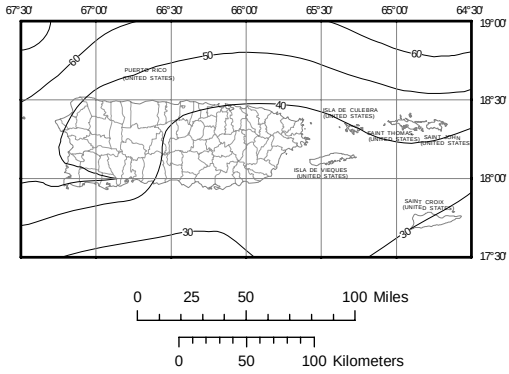


Figure 1613.5(2) Maximum Considered Earthquake (MCE) Ground Motion of 1 s Spectral Response Acceleration (5% of Critical Damping), Site Class B







Notes:

Ground motion values contoured on these maps incorporate risk-targeted and deterministic ground motions, and a factor of 1.3 for the maximum direction of 1 s spectral response acceleration. As such, they are different from those on the uniform-hazard 2008 USGS National Seismic Hazard Maps posted at http://earthquake.usgs.gov/hazmaps.

Larger, more detailed versions of these maps are not provided because it is recommended that the corresponding USGS web tool (http://earthquake.usgs.gov/designmaps) be used to determine the mapped value for a specified location.

Figure 1613.5(2) (continued) Maximum Considered Earthquake (MCE) Ground Motion of 1 s Spectral Response Acceleration (5% of Critical Damping), Site Class B

Reason: The purpose of this proposal is to make the 2012 edition of the IBC consistent with the 2010 edition of ASCE 7. The 2010 edition of ASCE 7 adopted new spectral response seismic design maps and maps of the transition period for the long-period portion of a design response spectrum. These maps were prepared by the United States Geological Survey (USGS) through the support and encouragement of the Federal Emergency Management Agency (FEMA) and in collaboration with the ASCE 7 Seismic Subcommittee and the Building Seismic Safety Council (BSSC) Seismic Design Procedures Reassessment Group. The maps are being balloted upon for their adoption into the 2010 edition of ASCE 7. In preparing these maps, the USGS updated their seismic hazard data, incorporating new information on earthquake sources and ground motion prediction equations, such as the new Next Generation Attenuation (NGA) relations.

Another important change incorporated in these maps is the adoption of a uniform risk, as opposed to uniform hazard basis, eliminating inequities in the treatment of different regions of the conterminous U.S. inherent in the prior generation of maps. The affect of this new basis is to modestly reduce design ground motions in much of the United States, consistent with present scientific understanding of the risk associated with structures constructed in these regions. The new maps will result in a modst reduction in the cost of construction for seismic resistance in most parts of the U.S.

The USGS has also developed a companion software program that calculates spectral values for a specific site based on a site's longitude, latitude, and site soil classification. The calculated values are based on the data used to prepare these maps. The spectral values may be adjusted for Site Class effects using the Site Classifications Procedure contained in this section as well as in ASCE 7-10. The software program should be used for establishing spectral values for design because the maps proposed for adoption herein, and those found in ASCE 7, are at too large a scale to provide accurate spectral values for most sites. The software program be accessed at the USGS Web site at http://earthquake.usgs.gov/designmaps

These 2008 maps supersede versions released in 1996 and 2002. Updating the maps involved interactions with hundreds of scientists and engineers at regional and topical workshops. USGS also solicited advice from working groups, expert panels, State geological surveys, Federal agencies, and hazard experts from industry and academia. The Pacific Earthquake Engineering Research Center developed new "Next Generation Attenuation" (NGA) crustal ground-motion models; the Working Group on California Earthquake Probabilities revised the California earthquake rate model; the Western States Seismic Policy Council submitted recommendations for the Intermountain West; and three expert panels were assembled to provide advice on best available science.

The most significant changes to the 2008 maps fall into two categories, as follows:

1. Changes to earthquake source and occurrence rate models:
   In California, the source model was updated to account for new scientific information on faults. For example, models for the southern San Andreas Fault System were modified to incorporate new geologic data. The source model was also modified to better match the historical rate of magnitude 6.5 to 7 earthquakes.
   The Cascadia Subduction Zone lying offshore of northern California, Oregon, and Washington was modeled using a distribution of large earthquakes between magnitude 8 and 9. Additional weight was given to the possibility for a catastrophic magnitude-9 earthquake that ruptures, on average, every 500 years from northern California to Washington, compared to a model that allows for smaller ruptures.
   The Wasatch fault in Utah was modeled to include the possibility of rupture from magnitude 7.4 earthquakes on the fault.
   Fault steepness estimates were modified based on global observations of normal faults.
   Several new faults were included or revised in the Pacific Northwest, California, and the Intermountain West regions.
   The New Madrid Seismic Zone in the Central U.S. was revised to include updated fault geometry and earthquake information. In addition, the model was adjusted to include the possibility of several large earthquakes taking place within a few years or less, similar to the earthquake sequence of 1811–1812.
   Source models for the region near Charleston, S.C., have been modified to include offshore faults that are thought to be capable of generating earthquakes.
   A broader range of earthquake magnitudes was used for the Central and Eastern U.S.
   Earthquake catalogs and seismicity parameters were updated.

2. Changes to models of ground shaking (that show how ground motion decays with distance from an earthquake's source) for different parts of the U.S., based on new published studies:
   New NGA ground-motion prediction models developed by the Pacific Earthquake Engineering Research Center were adopted for crustal earthquakes beneath the Western U.S. These new models use shaking records from 173 global shallow crustal earthquakes to better constrain ground motion in western States.
   Several new and updated ground-shaking models for earthquakes in the Central and Eastern U.S. were implemented in the maps. One of the new ground-shaking models accounts for the possibility that ground motion decays more rapidly from the earthquake source than was previously considered.
   New ground-motion models were applied for earthquake sources along the Cascadia Subduction Zone.

The new National Seismic Hazard Maps show, with some exceptions, similar or lower ground motion compared with the 2002 edition. For example, ground motion in the Central and Eastern U.S. has been generally lowered by about 10–25 percent due to the modifications of the ground-motion models. Ground motion in the Western U.S. is as much as 30 percent lower for shaking caused by long-period (1-second) seismic waves, and ground motion is similar (within 10–20 percent) for shaking caused by short-period (0.2-second) waves.

The new 2008 maps represent the best available science as determined by the USGS from an extensive information-gathering and review process. Changes will be made in future versions of the maps as new information on earthquake sources and resulting ground motion is gathered and processed.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROSSBERG-S11-1613.5.1

S97–09/10

1613.5.1, Figure 1613.5(1) - Figure 1613.5(14); IRC Figure R301.2(2)

Proponent: Steven Winkel, FAIA, PE, Kelly Cobeen, PE, SE, and J. Daniel Dolan, PhD, PE, Building Seismic Safety Council (BSSC) of the National Institute of Building Sciences, representing the Federal Emergency Management Agency/BSSC Code Resource Support Committee

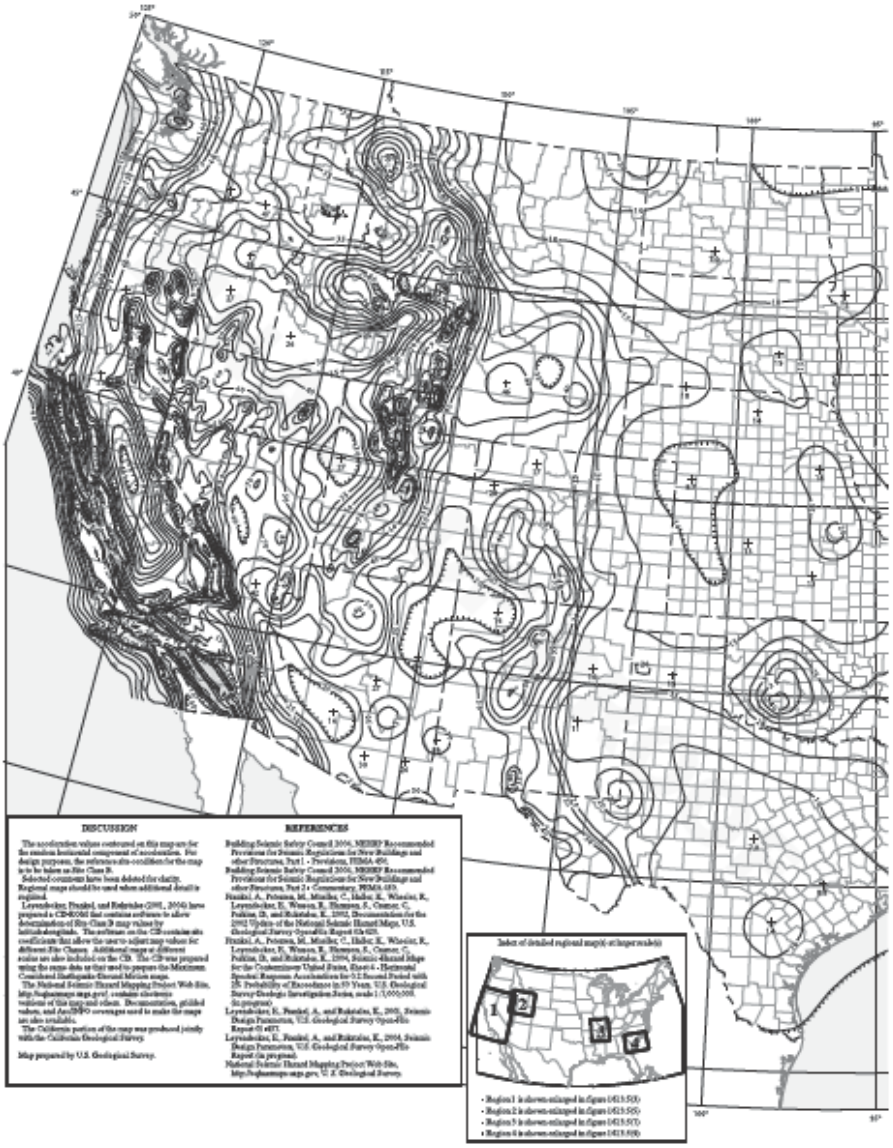
THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC-STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

1613.5.1 Mapped Acceleration Parameters. The parameters S_S and S_1 shall be determined from the 0.2 and 1 s spectral response accelerations shown on Figures 1613.5(1) and 1613.5(2) ~~through 1613.5(14), respectively~~. Where S_1 is less than or equal to 0.04 and S_S is less than or equal to 0.15, the structure is permitted to be assigned to Seismic Design Category A.

2. Delete and substitute as follows:



~~FIGURE 1613.5(1) MAXIMUM CONSIDERED EARTHQUAKE GROUND MOTION FOR THE CONTERMINOUS UNITED STATES OF 0.2 SEC SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B~~

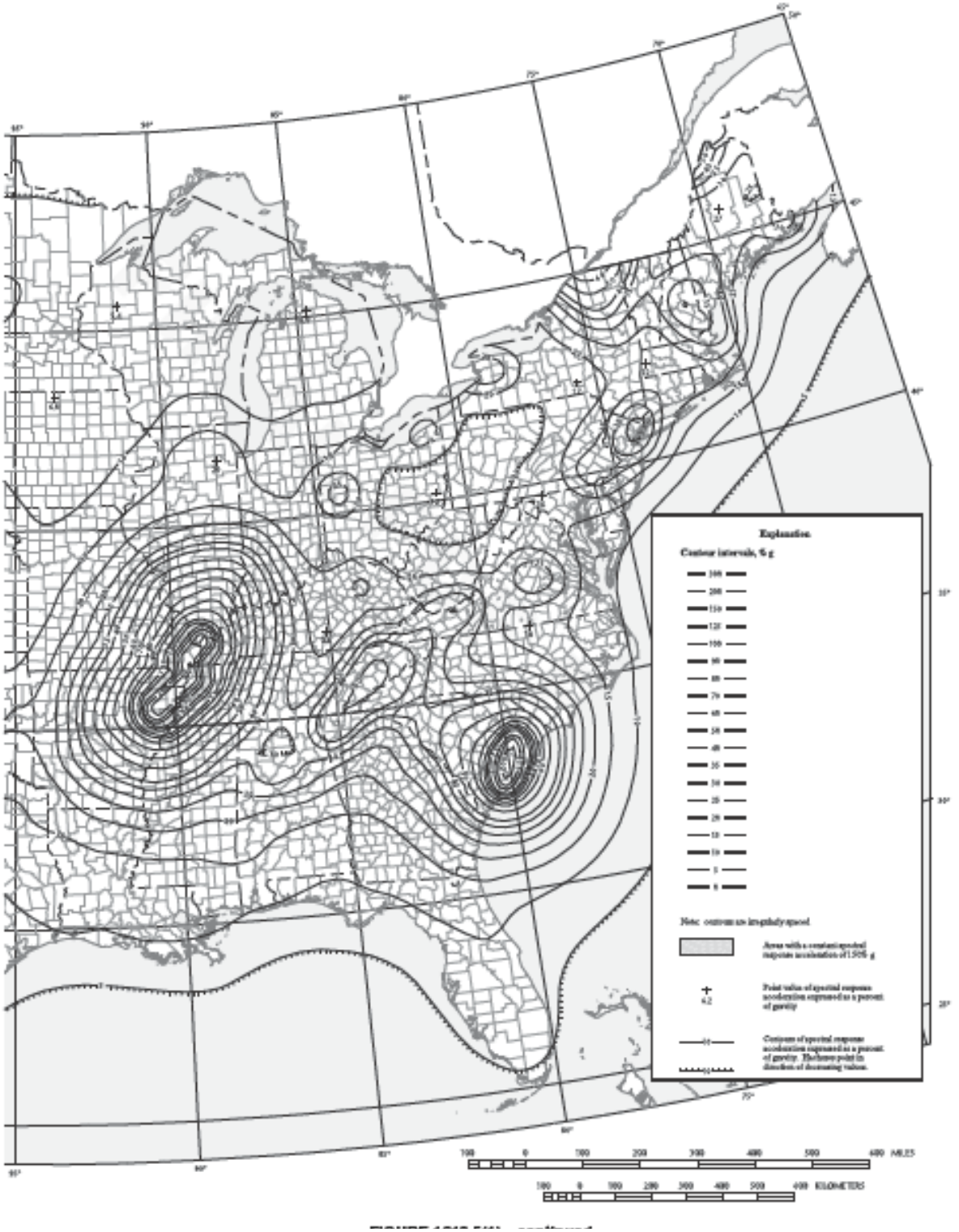


FIGURE 1613.5(1)—continued
MAXIMUM CONSIDERED EARTHQUAKE GROUND MOTION FOR THE CONTERMINOUS UNITED STATES OF 0.2 SEC SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B

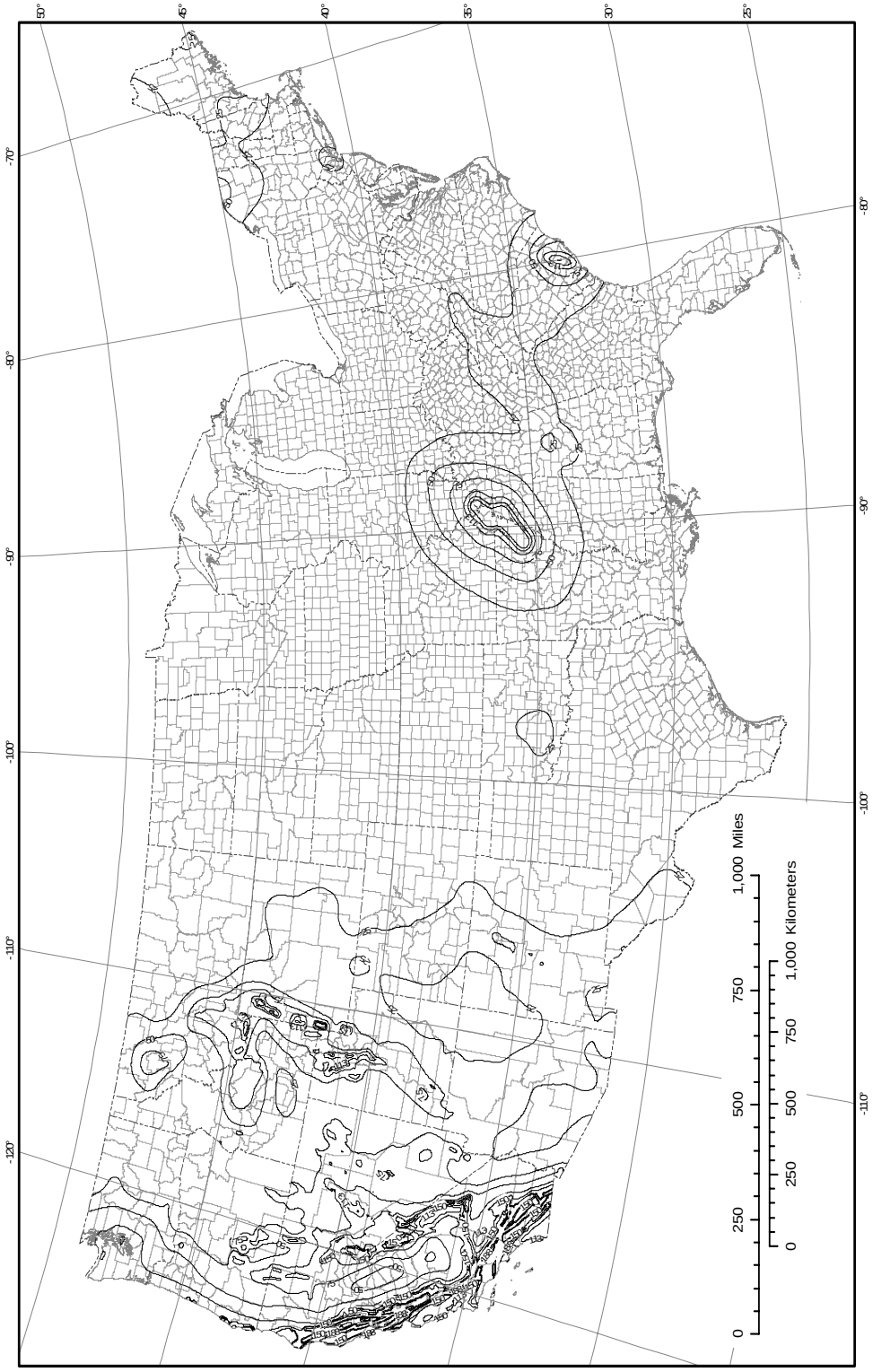
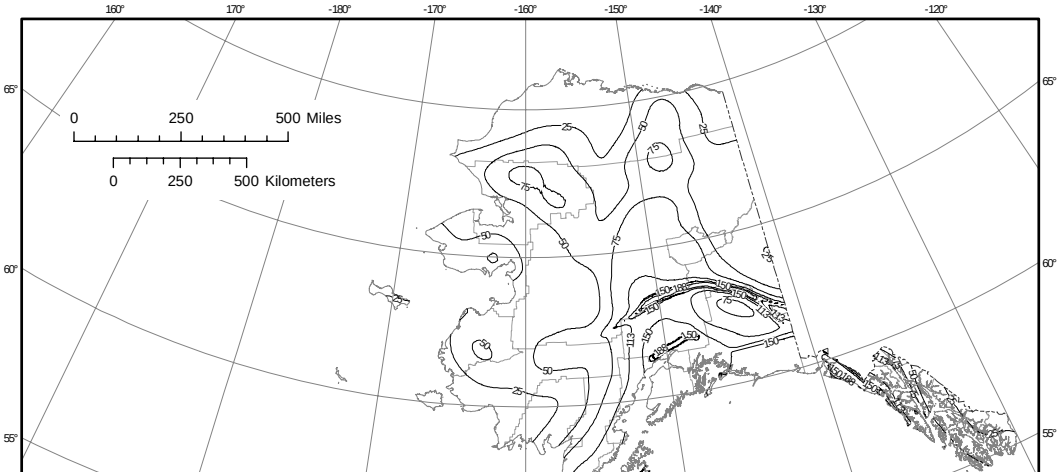
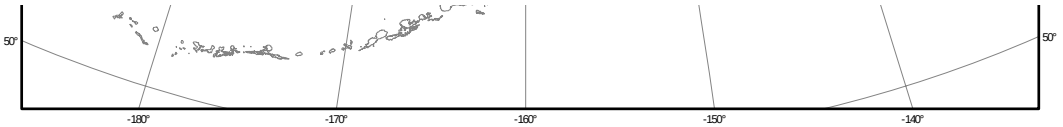
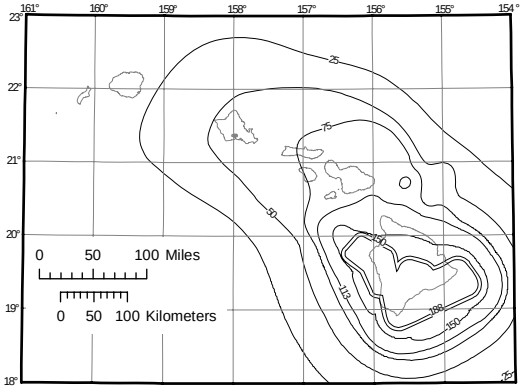


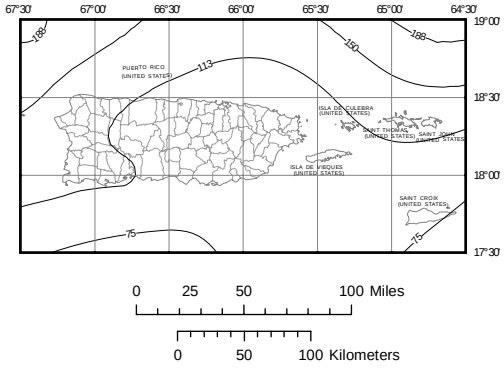
FIGURE 1613.5(1)
MAXIMUM CONSIDERED EARTHQUAKE (MCE) GROUND MOTION OF 0.2 S SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B



Contours are in units of %g







Notes:

Maps prepared by United States Geological Survey (USGS) in collaboration with the Federal Emergency Management Agency funded work of the Building Seismic Safety Council (BSSC) and with the American Society of Civil Engineers (ASCE) 7 Seismic Subcommittee.

Ground motion values contoured on these maps incorporate risk-targeted and deterministic ground motions and a factor of 1.1 for the maximum direction of 0.2 s spectral response acceleration. As such, they are different from those on the uniform-hazard-based 2008 USGS National Seismic Hazard Maps posted at http://earthquake.usgs.gov/research/hazmaps/.

Larger, more detailed versions of these maps are not provided because it is recommended that a corresponding USGS web tool at http://earthquake.usgs.gov/research /hazmaps/design/ be used to determine the mapped value for specific locations.

FIGURE 1613.5(1) (CONTINUED)
MAXIMUM CONSIDERED EARTHQUAKE (MCE) GROUND MOTION OF 0.2 S SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B

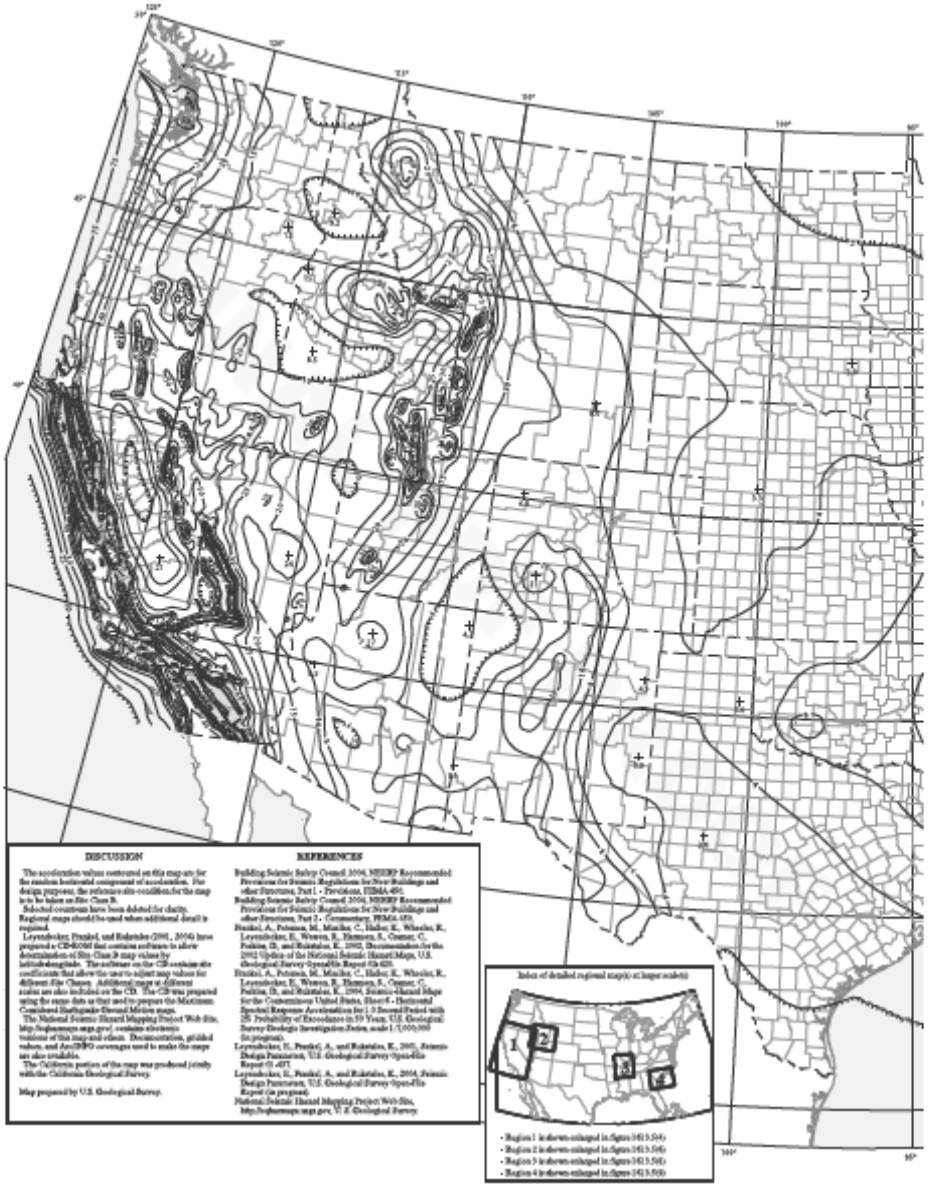
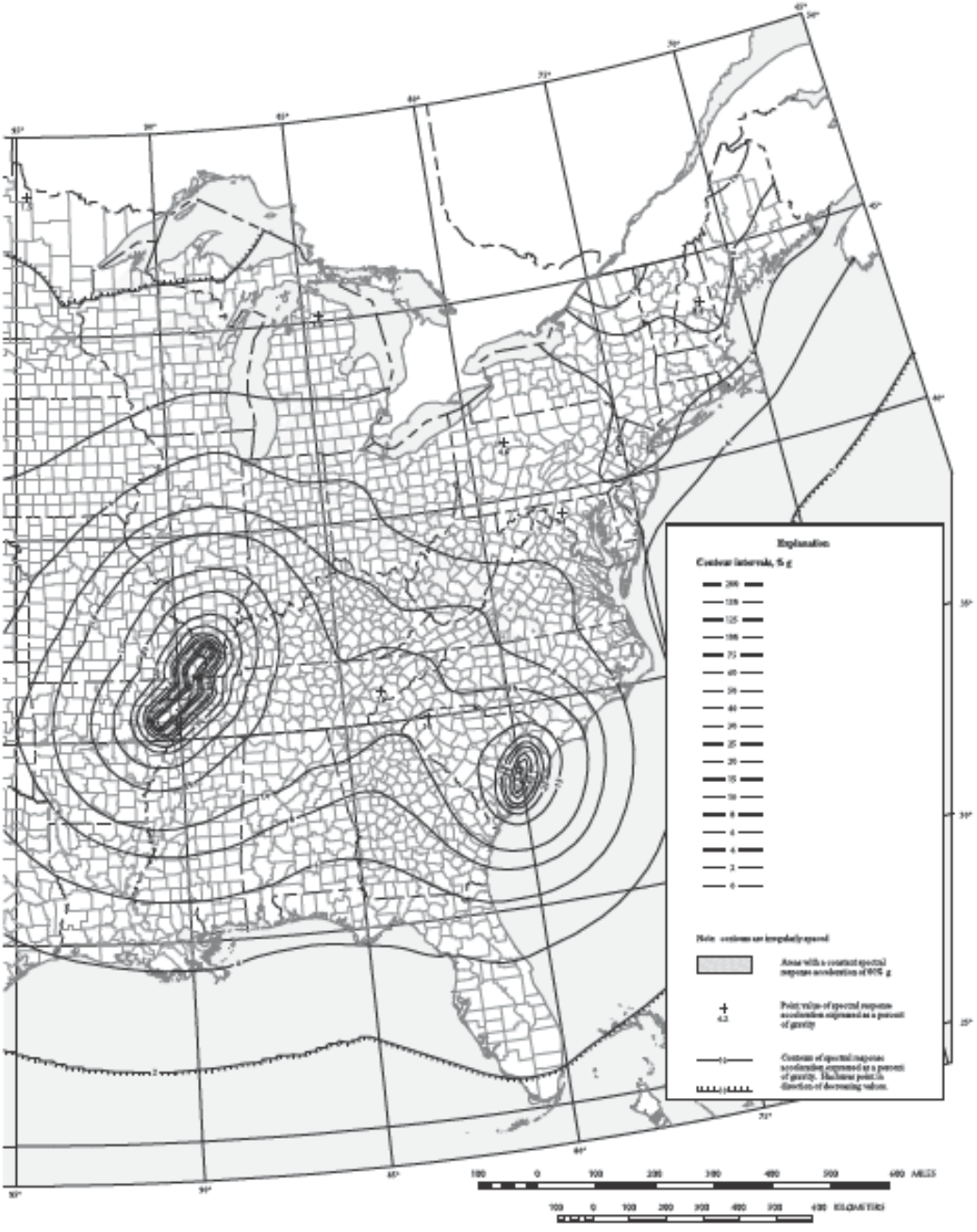


FIGURE 1613.5(2)
MAXIMUM CONSIDERED EARTHQUAKE GROUND MOTION FOR THE CONTERMINOUS UNITED STATES OF 1.0 SEC SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B



~~FIGURE 1613.5(2)—continued~~
~~MAXIMUM CONSIDERED EARTHQUAKE GROUND MOTION FOR THE CONTERMINOUS UNITED STATES OF 1.0 SEC SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B~~

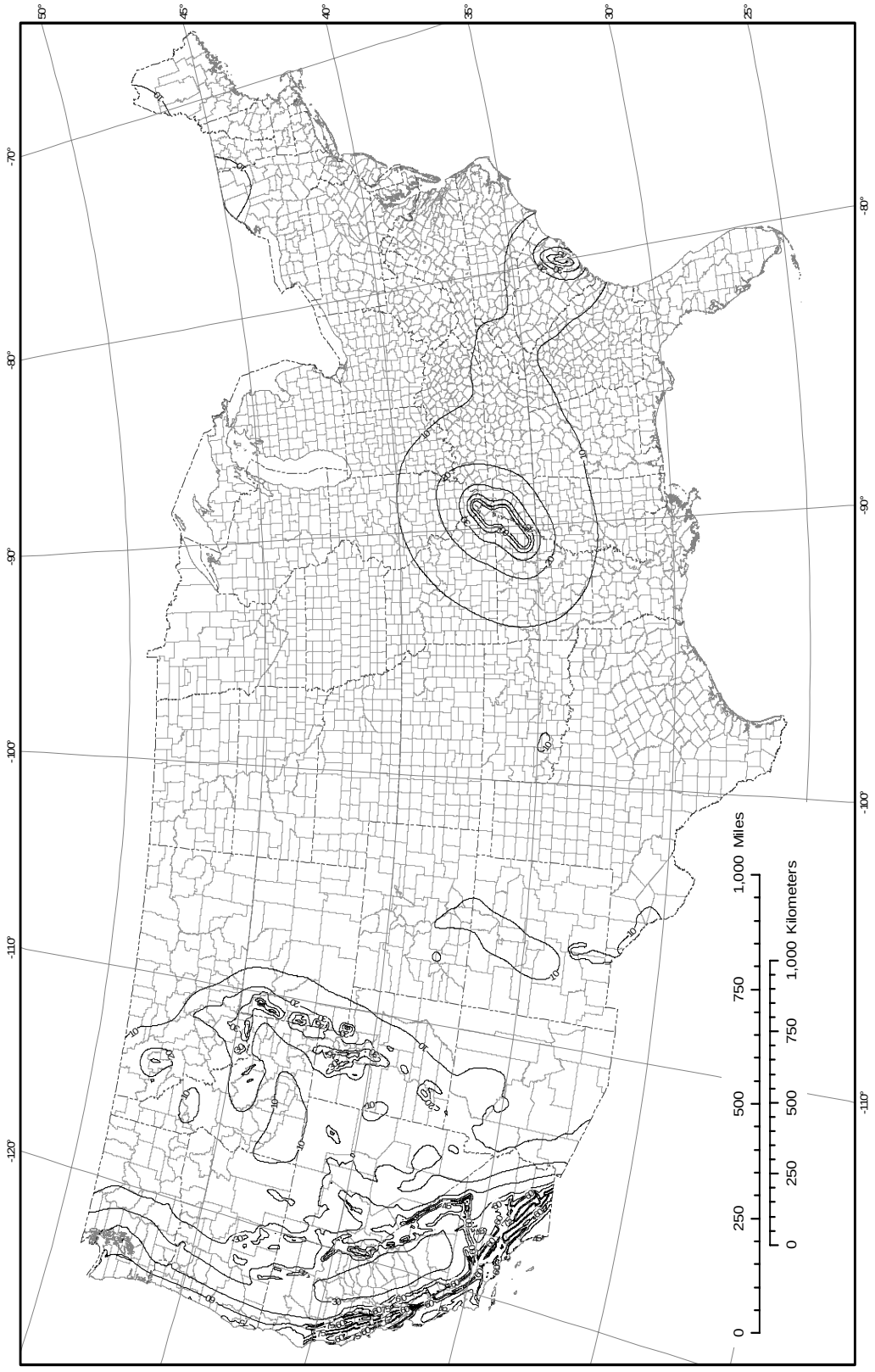
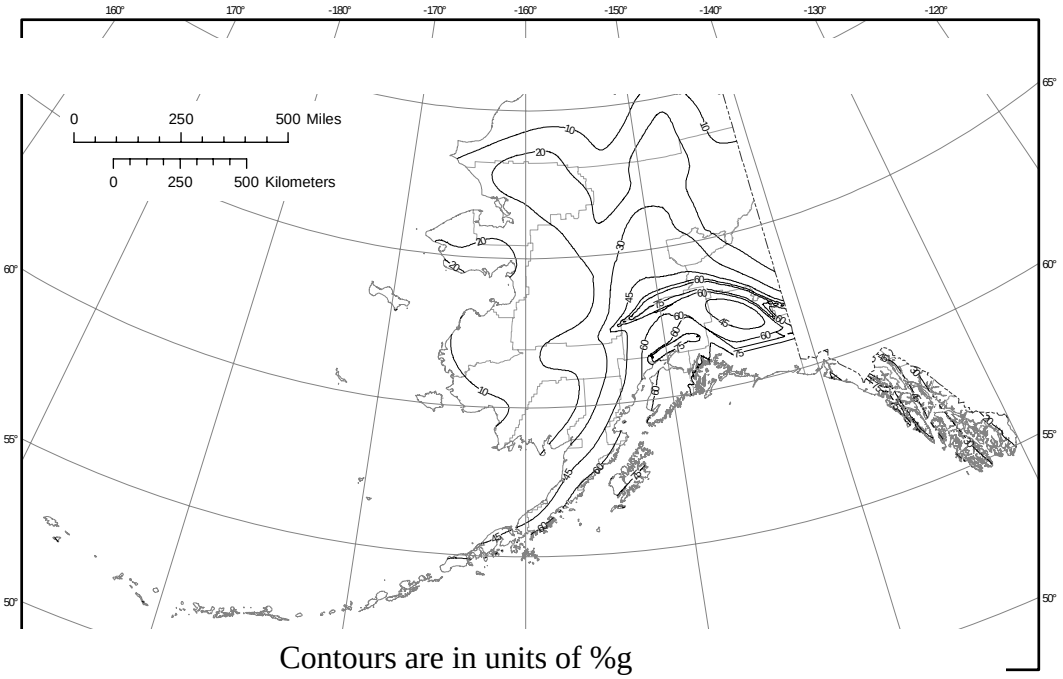
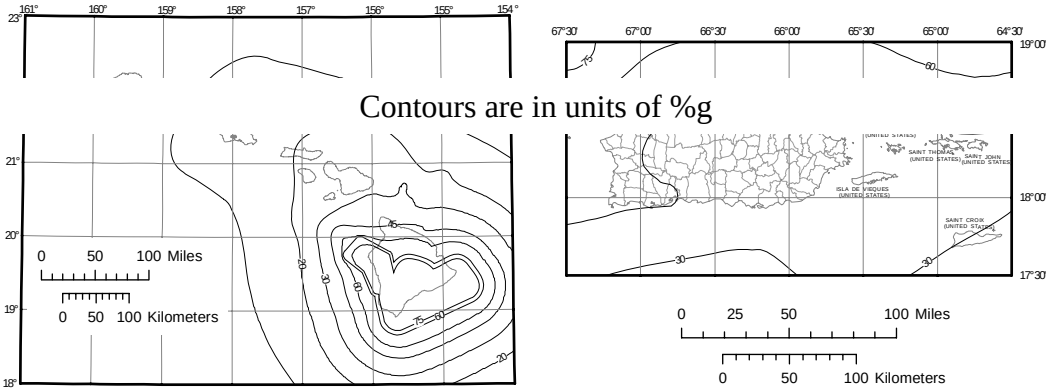


FIGURE 1613.5(2)
MAXIMUM CONSIDERED EARTHQUAKE (MCE) GROUND MOTION OF 1 S SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B



Contours are in units of %g



Contours are in units of %g

Notes:

Maps prepared by United States Geological Survey (USGS) in collaboration with the Federal Emergency Management Agency funded work of the Building Seismic Safety Council (BSSC) and with the American Society of Civil Engineers (ASCE) 7 Seismic Subcommittee.

Ground motion values contoured on these maps incorporate risk-targeted and deterministic ground motions and a factor of 1.3 for the maximum direction of 1.0 s spectral response acceleration. As such, they are different from those on the uniform-hazard-based 2008 USGS National Seismic Hazard Maps posted at http://earthquake.usgs.gov/research/hazmaps/.

Larger, more detailed versions of these maps are not provided because it is recommended that a corresponding USGS web tool at http://earthquake.usgs.gov/research /hazmaps/design/ be used to determine the mapped value for specific locations.

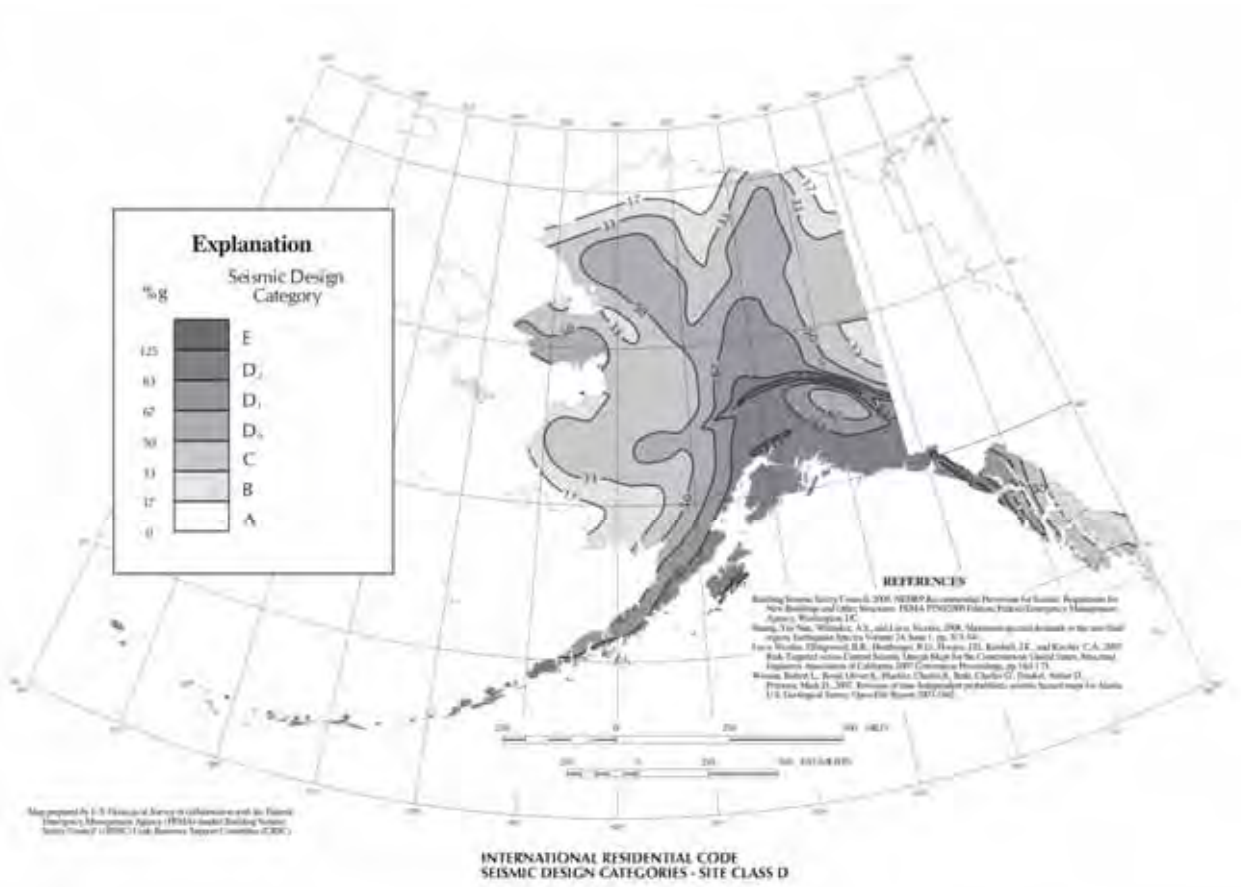
FIGURE 1613.5(2) (CONTINUED)
MAXIMUM CONSIDERED EARTHQUAKE (MCE) GROUND MOTION OF 1 S SPECTRAL RESPONSE ACCELERATION (5% OF CRITICAL DAMPING), SITE CLASS B

Delete Figures 1613.5(3) through 1613.5(14) without substitution.

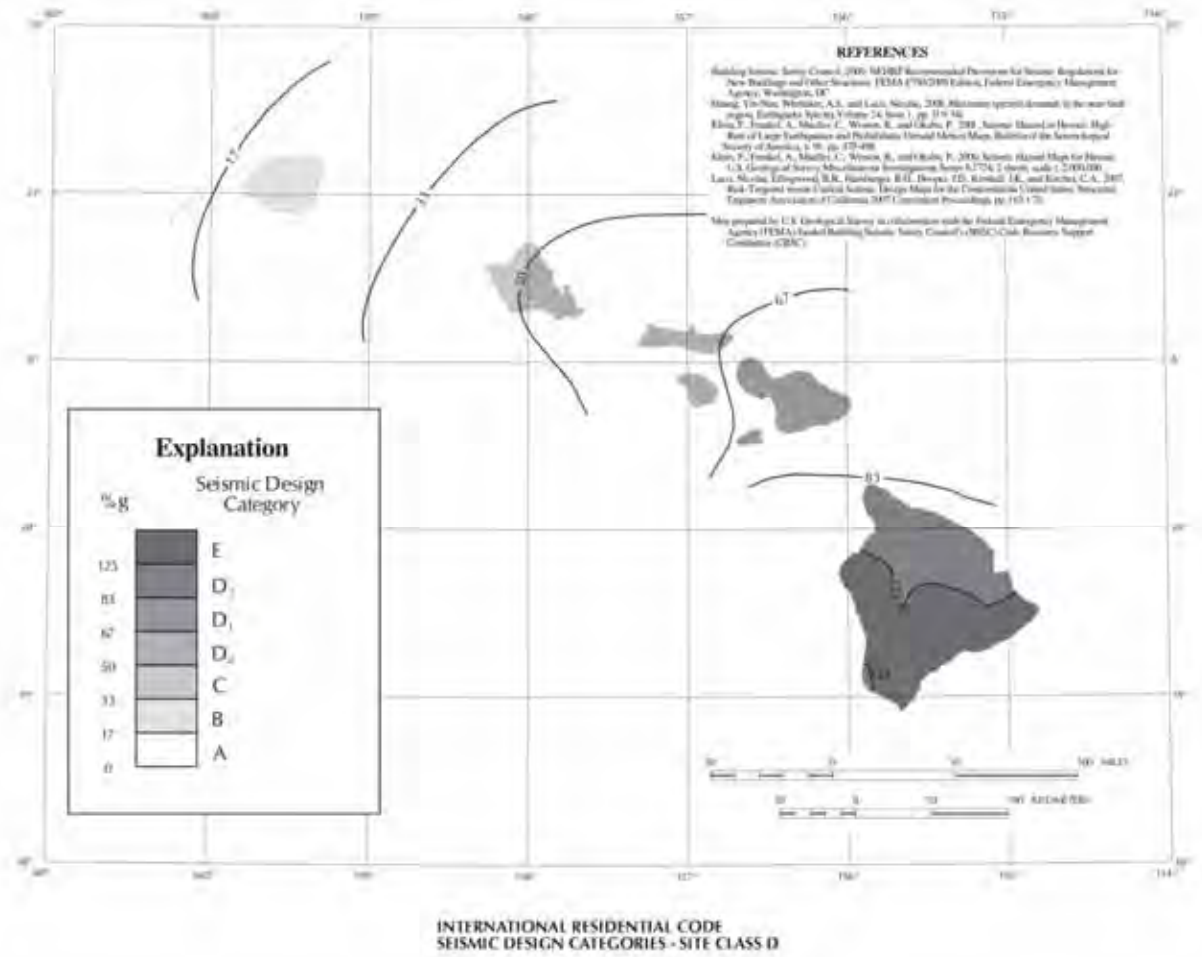
PART II – IRC BUILDING/ENERGY

Delete Figure R301.2(2) and substitute as follows:

FIGURE R301.2(2)
SEISMIC DESIGN CATEGORIES -- SITE CLASS D

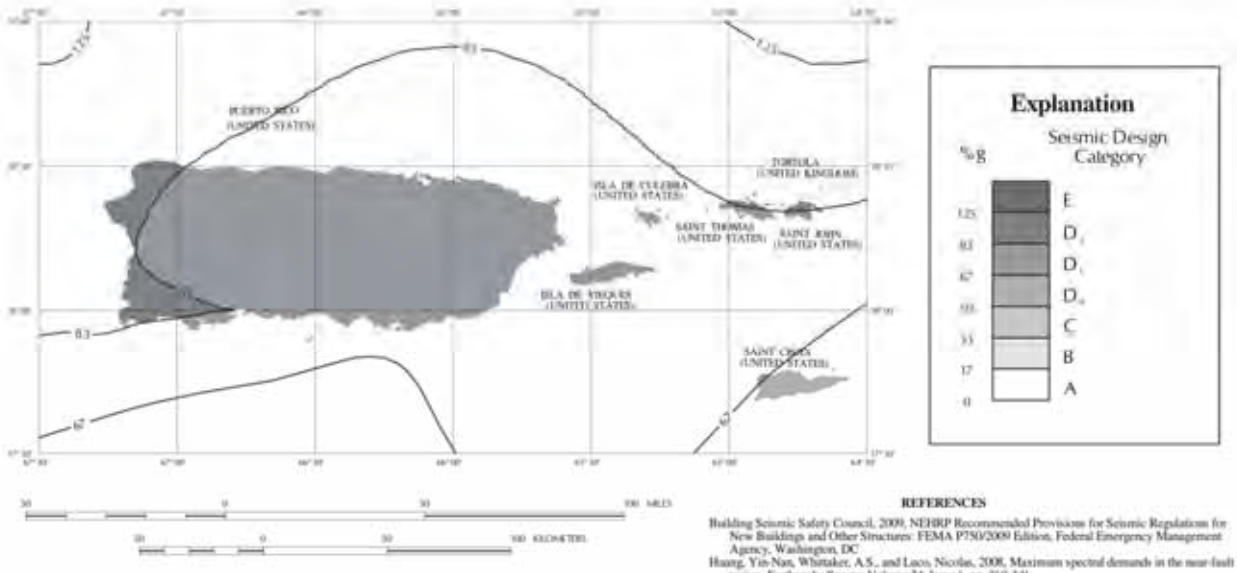


INTERNATIONAL RESIDENTIAL CODE
SEISMIC DESIGN CATEGORIES - SITE CLASS D



INTERNATIONAL RESIDENTIAL CODE
SEISMIC DESIGN CATEGORIES - SITE CLASS D

FIGURE R301.2(2) -- continued
SEISMIC DESIGN CATEGORIES -- SITE CLASS D



INTERNATIONAL RESIDENTIAL CODE
SEISMIC DESIGN CATEGORIES - SITE CLASS D

REFERENCES

Building Seismic Safety Council, 2009, NEHRP Recommended Provisions for Seismic Regulations for New Buildings and Other Structures: FEMA P750/2009 Edition, Federal Emergency Management Agency, Washington, DC

Huang, Yin-Nan, Whittaker, A.S., and Luco, Nicolas, 2008, Maximum spectral demands in the near-fault region, Earthquake Spectra Volume 24, Issue 1, pp. 319-341.

Luco, Nicolas, Ellingwood, B.R., Hamburger, R.O., Hooper, J.D., Kimball, J.K., and Kircher, C.A., 2007, Risk-Targeted versus Current Seismic Design Maps for the Conterminous United States, Structural Engineers Association of California 2007 Convention Proceedings, pp. 163-175.

Mueller, C., Frankel, A., Petersen, M., and Leyendecker, E., 2003, Documentation for 2003 USGS Seismic Hazard Maps for Puerto Rico and the U.S. Virgin Islands, U.S. Geological Survey Open-File Report 03-379.

Map prepared by U.S. Geological Survey in collaboration with the Federal Emergency Management Agency (FEMA)-funded Building Seismic Safety Council's (BSSC) Code Resource Support Committee (CRSC).

FIGURE R301.2(2) -- continued
SEISMIC DESIGN CATEGORIES -- SITE CLASS D

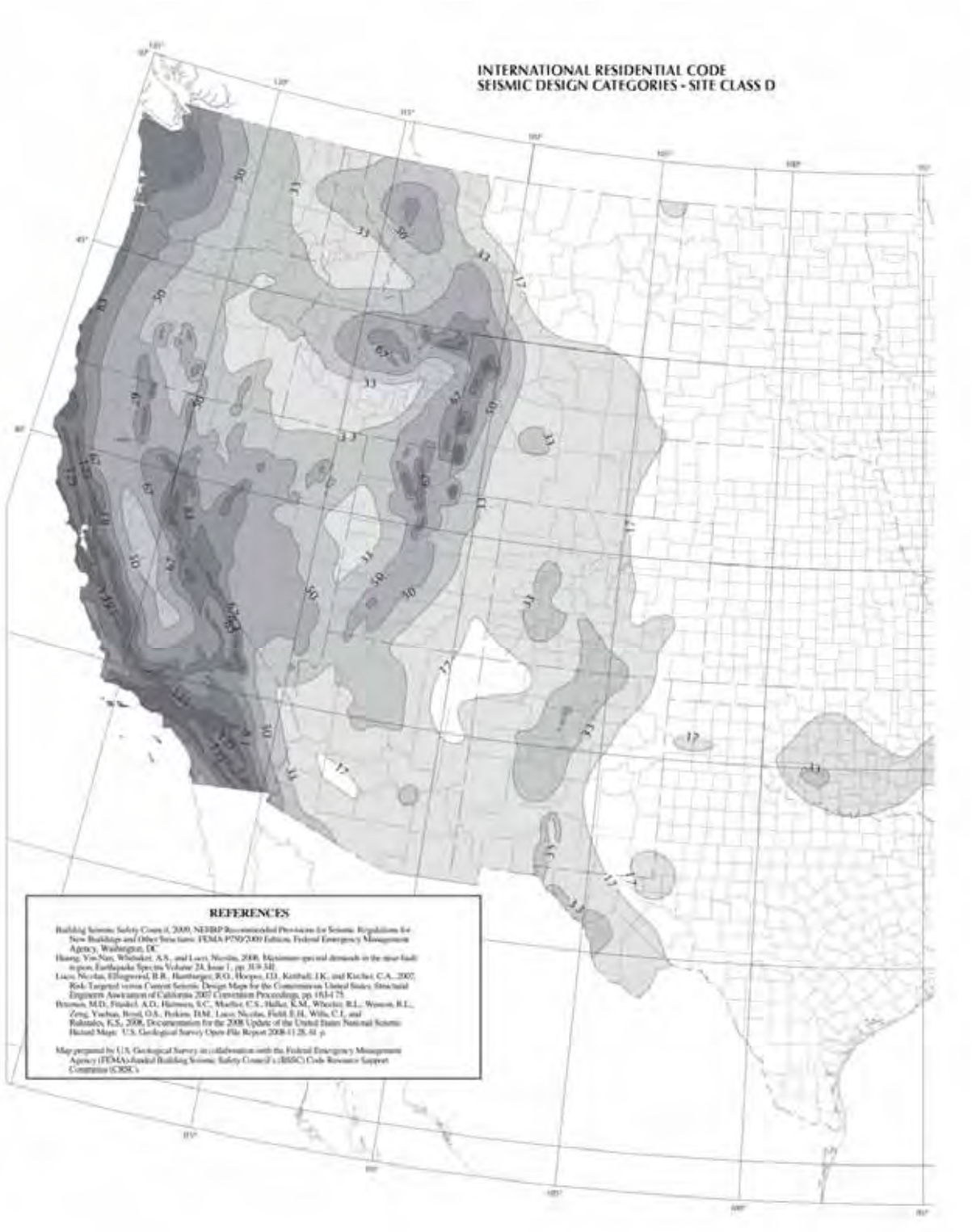


FIGURE R301.2(2) -- continued
SEISMIC DESIGN CATEGORIES -- SITE CLASS D

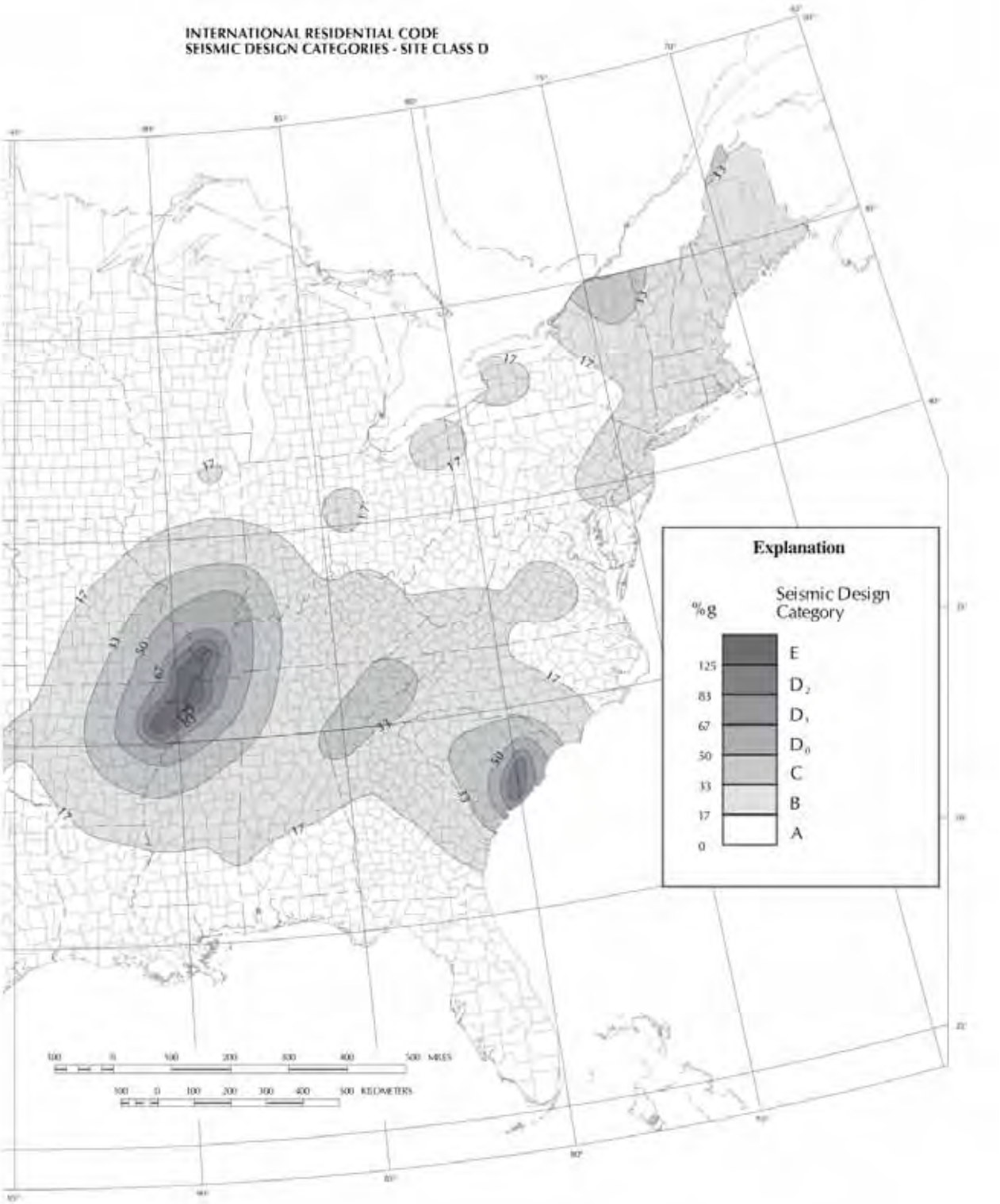


FIGURE R301.2(2) -- continued
SEISMIC DESIGN CATEGORIES -- SITE CLASS D

Reason:
PART I- This proposal incorporates updated earthquake ground motion maps that reflect the 2008 maps developed by the United States Geological Survey (USGS) National Seismic Hazard Mapping Project as well as technical changes adopted for the 2009 *NEHRP Recommended Seismic Provisions for New Buildings and Other Structures* (FEMA P750), which was developed by the Building Seismic Safety Council with funding from the Federal Emergency Management Agency. Both projects are part of federal National Earthquake Hazard Reduction Program's (NEHRP) ongoing

efforts to make the most current earthquake hazard information available to the building codes. If this code change is not moved forward, the ground motion maps in the IBC will reflect superseded seismic hazard information.
The 2008 USGS seismic hazard maps incorporate new information on earthquake sources and ground motion prediction equations including the new Next Generation Attenuation (NGA) relations. The ground motion maps proposed for the IBC further incorporate technical changes adopted for the 2009 *NEHRP Provisions* that include use of: (1) risk-targeted ground motions, (2) maximum direction ground motions, and (3) near-source 84th percentile ground motions.

The proposed ground motion maps for the IBC also reflect a current draft proposal for change to the ASCE 7 (Minimum Design Loads for Buildings and other Structures) standard update process. Under normal circumstances, ASCE 7 would adopt ground motion map related changes drawn from the most current edition of the *NEHRP Recommended Seismic Provisions* prior to incorporation of the maps into the IBC*;* however, the recent changes to the ICC code development process and schedule have made it necessary to submit this working version of the ASCE 7 proposal in an effort to provide the regulatory community with the most up-to-date information available. It should be understood that, to the extent possible, this proposal will be updated to reflect any modifications to maps, maps titles or other Section 1613 content made during the ASCE 7 consensus standard process so the consistency between ASCE 7 and the IBC is maintained. In the NEHRP update process the title for these maps was revised from "Maximum Considered Earthquake (MCE) Ground Motions" to "Risk-Targeted Earthquake (RTE) Ground Motions." This proposal retains the MCE terminology because it is retained in the working version of the ASCE 7 proposal.

This proposal also reduces the number of printed maps to appear in the IBC from 14 to 2. Twelve of the maps included in earlier editions of the IBC provided enlargements of portions of two maps that covered the entire United States; this proposal eliminates the enlargements. This is being recommended because the maps printed in former editions of the IBC, while generally illustrative of the earthquake hazard, could not to be read clearly enough to provide exact design values for specific building sites. Those in need of precise design values can easily obtain them from a USGS web site (http://earthquake.usgs.gov/research/hazmaps/design/index.php) using the longitude and latitude of the building site, obtained from GPS mapping programs or web sites.

Detailed descriptions of changes made for the 2009 *NEHRP Recommended Seismic Provisions* are available at www.bssconline.org under the explanation of changes made for the 2009 edition of the *Provisions.*

PART II- This proposal reflects new seismic hazard data developed by the U.S. Geological Survey (USGS) as part of its National Seismic Hazard Mapping Project and related technical changes developed by the Building Seismic Safety Council's (BSSC) Seismic Design Procedures Reassessment Group (SDPRG) as part of its work for the Federal Emergency Management Agency (FEMA).

The USGS and the FEMA-funded SDPRG worked together to update the seismic design maps and procedures for the 2009 edition of the NEHRP (National Earthquake Hazards Reduction Program) Recommended Seismic Provisions for New Building and Other Structures. The products of this collaboration are new design maps that appear in the 2009 *Provisions* and a similar version that is proposed for inclusion in ASCE 7-10. Although the terminology used in the *Provisions* is slightly different from that proposed for ASCE 7-10, the substance of the mapping changes is the same for both. The new design maps are based on USGS updates to their seismic hazard data and ground motion attenuation formulas as well as the SDPRG's use of risk-targeted ground motions, maximum direction ground motions, and near-source 84th percentile ground motions.

Code updates to the seismic maps and seismic resistant design requirements normally are drawn from ASCE 7 (*Minimum Design Loads for Buildings and Other Structures*) which is, in turn, based on the *NEHRP Recommended Provisions*. This proposal reflects material developed under the 2009 *NEHRP Recommended Provisions* as presented in the current draft proposal for ASCE 7-10. The ICC code change submittal schedule makes it necessary to submit this working version with the understanding that it will be updated to the extent possible to reflect any modifications made by ASCE 7. Note that the maps included in this proposal are based on the maps proposed for inclusion in the IBC. If this code change is not moved forward, the IRC will retain superseded seismic hazard mapping information, thereby potentially being in conflict with the IBC.

These new IRC maps are different from earlier versions in that the division between Seismic Design Categories D2 and E has been changed from 118% g to 125% g. The 125% g contour would have been used in earlier maps but the mapping technology then available for drawing the IRC maps did not permit this to be done. The result of this change and the improved seismic hazard data generated by the USGS over the past 10 years is that the geographic region affected by the Seismic Design Category E designation is smaller. This occurs primarily in the region around Charleston, South Carolina, but is also evident in Seismic Design Category E regions in other parts of the United States. As noted above, maps developed on the same basis have been proposed for the IBC which will allow engineers to design components of the building that are outside of the scope of the IRC with compatible seismic loads.

Cost Impact: (IBC) The new maps may lower costs in some locations but may increase them in others. (IRC) This proposal will not increase the cost of construction and will reduce the cost in some regions.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WINKEL-COBEEN-S2-1613.5.1

S98–09/10

1613.5.2, 1613.5.5, 1613.5.5.1, Table 1613.5.2, Table 1613.5.5

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

1. Revise as follows:

1613.5.2 Site class definitions. Based on the site soil properties, the site shall be classified as ~~either~~ Site Class A, B, C, D, E or F in accordance with ~~Table 1613.5.2~~ Chapter 20 of ASCE 7. ~~When~~ Where the soil properties are not known

in sufficient detail to determine the site class, Site Class D shall be used unless the building official or geotechnical data determines ~~that~~ Site Class E or F soil<u>s</u> ~~is likely to be~~ <u>are</u> present at the site.

2. Delete without substitution:

~~TABLE 1613.5.2~~
~~SITE CLASS DEFINITIONS~~

~~SITE CLASS~~	~~SOIL PROFILE NAME~~	~~AVERAGE PROPERTIES IN TOP 100 feet, SEE SECTION 1613.5.5~~		
		~~Soil shear wave velocity, $\bar{v}_s$, (ft/s)~~	~~Standard penetration resistance, $\bar{N}$~~	~~Soil undrained shear strength, $\bar{s}_u$, (psf)~~
~~A~~	~~Hard rock~~	~~$\bar{v}_s > 5{,}000$~~	~~N/A~~	~~N/A~~
~~B~~	~~Rock~~	~~$2{,}500 < \bar{v}_s \leq 5{,}000$~~	~~N/A~~	~~N/A~~
~~C~~	~~Very dense soil and soft rock~~	~~$1{,}200 < \bar{v}_s \leq 2{,}500$~~	~~$\bar{N} > 50$~~	~~$\bar{s}_u \geq 2{,}000$~~
~~D~~	~~Stiff soil profile~~	~~$600 \leq \bar{v}_s \leq 1{,}200$~~	~~$15 \leq \bar{N} \leq 50$~~	~~$1{,}000 \leq \bar{s}_u \leq 2{,}000$~~
~~E~~	~~Soft soil profile~~	~~$\bar{v}_s < 600$~~	~~$\bar{N} < 15$~~	~~$\bar{s}_u < 1{,}000$~~
~~E~~	—	~~Any profile with more than 10 feet of soil having the following characteristics:~~ ~~1. Plasticity index $PI > 20$,~~ ~~2. Moisture content $w \geq 40\%$, and~~ ~~3. Undrained shear strength $\bar{s}_u < 500$ psf~~		
~~F~~	—	~~Any profile containing soils having one or more of the following characteristics:~~ ~~1. Soils vulnerable to potential failure or collapse under seismic loading such as liquefiable soils, quick and highly sensitive clays, collapsible weakly cemented soils.~~ ~~2. Peats and/or highly organic clays (H > 10 feet of peat and/or highly organic clay where H = thickness of soil)~~ ~~3. Very high plasticity clays (H > 25 feet with plasticity index PI > 75)~~ ~~4. Very thick soft/medium stiff clays (H > 120 feet)~~		

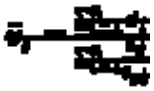
~~For SI: 1 foot = 304.8 mm, 1 square foot = 0.0929m2, 1 pound per square foot = 0.0479 kPa. N/A = Not applicable~~

~~**1613.5.5 Site classification for seismic design.** Site classification for Site Class C, D or E shall be determined from Table 1613.5.~~

~~The notations presented below apply to the upper 100 feet (30 480 mm) of the site profile. Profiles containing distinctly different soil and/or rock layers shall be subdivided into those layers designated by a number that ranges from 1 to n at the bottom where there is a total of n distinct layers in the upper 100 feet (30 480 mm). The symbol i then refers to any one of the layers between 1 and n.~~

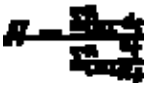
~~where:~~

~~v_{si} = The shear wave velocity in feet per second (m/s).~~
~~d_i = The thickness of any layer between 0 and 100 feet (30 480 mm).~~



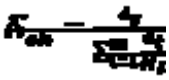
~~**(Equation 16-40)**~~

~~N_i is the Standard Penetration Resistance (ASTM D 1586) not to exceed 100 blows/foot (328 blows/m) as directly measured in the field without corrections. When refusal is met for a rock layer, N_i shall be taken as 100 blows/foot (328 blows/m).~~



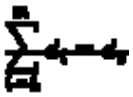
(Equation 16-41)

where N_i and d_i in Equation 16-41 are for cohesionless soil, cohesive soil and rock layers.



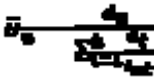
(Equation 16-42)

where:



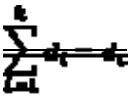
Use d_i and N_i for cohesionless soils layers only in Equation 16-42.

d_s = The total thickness of cohesionless soil layers in the top 100 feet (30 480 mm).
m = The number of cohesionless soil layers in the top 100 feet (30 480 mm).
s_{ui} = The undrained shear strength in psf (kPa), not to exceed 5,000 psf (240 kPa), ASTM D 2166 or D 2850.



(Equation 16-43)

where:



d_c = The total thickness of cohesive soil layers in the top 100 feet (30 480 mm).
k = The number of cohesive soil layers in the top 100 feet (30 480 mm).
PI = The plasticity index, ASTM D 4318.
w = The moisture content in percent, ASTM D 2216.

Where a site does not qualify under the criteria for Site Class F, and there is a total thickness of soft clay greater than 10 feet (3,048 mm) where a soft clay layer is defined by: s_u < 500 psf (25 kPa), w ≥ 40 percent and PI > 20, it shall be classified as Site Class E.

The shear wave velocity for rock, Site Class B, shall be either measured on site or estimated by a geotechnical engineer or engineering geologist/seismologist for competent rock with moderate fracturing and weathering. Softer and more highly fractured and weathered rock shall either be measured on site for shear wave velocity or classified as Site Class C.

The hard rock category, Site Class A, shall be supported by shear wave velocity measurements either on site or on profiles of the same rock type in the same formation with an equal or greater degree of weathering and fracturing. Where hard rock conditions are known to be continuous to a depth of 100 feet (30 480 mm), surficial shear wave velocity measurements are permitted to be extrapolated to assess v_s.

The rock categories, Site Classes A and B, shall not be used if there is more than 10 feet (3048 mm) of soil between the rock surface and the bottom of the spread footing or mat foundation.

TABLE 1613.5.5
SITE CLASSIFICATION [a]

SITE CLASS	v_s	N or N_{ch}	s_u
E	< 600 ft/s	< 15	< 1,000 psf
D	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
C	1,200 to 2,500 ft/s	> 50	> 2,000

For SI: 1 foot per second = 304.8 mm per second, 1 pound per square foot = 0.0479 kN/m^2.
a. If the s_u method is used and the N_{CH} and s_u criteria differ, select the category with the softer soils (for example, use Site Class E instead of D).

1613.5.5.1 Steps for classifying a site.

~~1. Check for the four categories of Site Class F requiring site-specific evaluation. If the site corresponds to any of these categories, classify the site as Site Class F and conduct a site-specific evaluation.~~

~~2. Check for the existence of a total thickness of soft clay > 10 feet (3048 mm) where a soft clay layer is defined by: s_u < 500 psf (25 kPa), $w \geq$ 40 percent, and PI > 20. If these criteria are satisfied, classify the site as Site Class E.~~

~~3. Categorize the site using one of the following three methods with v_s, N, and s_u computed in all cases as specified.~~

~~3.1. v_s for the top 100 feet (30 480 mm) (v_s method).~~

~~3.2. N for the top 100 feet (30 480 mm) (N method).~~

~~3.3. N_{ch} for cohesionless soil layers (PI < 20) in the top 100 feet (30 480 mm) and average, s_u, for cohesive soil layers (PI > 20) in the top 100 feet (30 480mm) (s_u method).~~

Reason: The purpose for this proposal is to delete text from the IBC related to site class definitions and site classifications in favor of referencing the applicable text in ASCE 7. This will have the benefit of eliminating from the IBC text that is duplicated in ASCE 7 and may also conflict with the corresponding text in ASCE 7.

IBC Section 1613.5.2 relies on Table 16.13.5.2 for classifying sites by site class based on the types of soils present and their properties. In ASCE 7-05 (and 7-10), however, this is accomplished by Chapter 20. This chapter includes Table 20.3-1, which corresponds roughly to IBC Table 16.13.5.2, but also contains additional information not contained in the IBC table. This information is found in Section 20.3 of ASCE 7-05. In Section 20.3.1 for Site Class F, there is an exception to Item #1, which is not found in IBC Table 1613.5.2. Also in Section 20.3.1, there is a second condition for Item 4 (s_u < 1000psf), that is not found in IBC Table 1613.5.2. Sections 20.3.2 and 20.3.4 on Site Classes E and B, respectively, contain criteria for classifying a site by site class but this information is not found in IBC Table 1613.5.2. The text from Section 20.3.3 on Site Classes C, D and E is not found in the IBC. Finally, Table 20.3-1 of ASCE 7-05 lists Site Class E soil as "soft clay soil" and includes N and N_{ch} for penetration resistance but IBC Table 1613.5.2 lists Site Class E soil as "soft soil" and only includes N.

IBC Section 1613.5.2 requires classification of sites based on the types of soils present and their properties as Site Class A, B, C, D, E or F in accordance with Table 1613.5.2. Section 161.3.5.5, however, requires classification of sites for Site Class C, D or E to be determined from Table 1613.5.5, which is a simplified version of Table 1613.5.2. The charging text of Section 1613.5.5 appears to limit the provisions in the section to Site Classes C, D and E but there are paragraphs at the end of Section 1613.5.5 for Site Classes A and B.

The classification of sites into site classes based on soil properties demands the expertise of a registered design professional qualified to practice the profession of geotechnical engineering and that profession is not well served by duplicative and potentially conflicting provisions in the IBC and ASCE 7.

In IBC Section 1613.5.2, editorial changes are also made for consistency with Section 11.4.2 of ASCE 7-10, which is the source of the provisions in the section.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S12-1613.5.2

S99–09/10

1613.5.5, Chapter 35

Proponent: Ronald J. Ebelhar, HC NUTTING I A Terracon Company, representing self

1. Revise as follows:

1613.5.5 Site classification for seismic design. Site classification for Site Class C, D or E shall be determined from Table 1613.5.5. The notations presented below apply to the upper 100 feet (30 480 mm) of the site profile. Profiles containing distinctly different soil and/or rock layers shall be subdivided into those layers designated by a number that ranges from 1 to n at the bottom where there is a total of n distinct layers in the upper 100 feet (30 480 mm). The symbol i then refers to any one of the layers between 1 and n.

where:

v_{si} = The shear wave velocity in feet per second (m/s), <u>in accordance with ASTM D 4428 or ASTM D 7400.</u>
d_i = The thickness of any layer between 0 and 100 feet (30 480 mm)

where:

$$v_s = \frac{\sum_{i=1}^{n} d_i}{\sum_{i=1}^{n} \frac{d_i}{v_{si}}}$$ **(Equation 16-40)**

$$\sum_{i=1}^{n} d_i = 100 \text{ feet } (30\,480\text{mm})$$

(Remainder of section unchanged)

2. Add new standard to Chapter 35 as follows:

ASTM

D 4428/D 4428M-07	Standard Test Methods for Crosshole Seismic Testing
D 7400-08	Standard Test Methods for Downhole Seismic Testing

Reason: There is currently no guidance in the IBC for example methods or standards to measure the shear wave velocity in the field. There is guidance for measuring the Standard Penetration Resistance and the undrained shear strength.

Cost Impact: The code change proposal may potentially have a limited impact on the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ACSE49-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EBELHAR-S1-1613.5.5

S100–09/10
1613.6.1, 1602.1

Proponent: Jim Rossberg, SEI of ASCE, representing self

1. Delete without substitution:

~~**1613.6.1 Assumption of flexible diaphragm.** Add the following text at the end of Section 12.3.1.1 of ASCE 7.~~

~~Diaphragms constructed of wood structural panels or untopped steel decking shall also be permitted to be idealized as flexible, provided all of the following conditions are met:~~

1. ~~Toppings of concrete or similar materials are not placed over wood structural panel diaphragms except for nonstructural toppings no greater than 1-1/2 inches (38 mm) thick.~~
2. ~~Each line of vertical elements of the seismic-force-resisting system complies with the allowable story drift of Table 12.12-1.~~
3. ~~Vertical elements of the seismic-force-resisting system are light-framed walls sheathed with wood structural panels rated for shear resistance or steel sheets.~~
4. ~~Portions of wood structural panel diaphragms that cantilever beyond the vertical elements of the lateral-force-resisting system are designed in accordance with Section 4.2.5.2 of AF&PA SDPWS.~~

(Renumber subsequent sections)

2. Revise as follows:

1602.1 Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

Diaphragm flexible. A diaphragm is flexible for the purpose of distribution of story shear and torsional moment where so indicated in Section 12.3.1 of ASCE 7~~, as modified in Section 1613.6.1~~.

(Definitions not shown are unchanged)

Reason: This provision has been considered and approved by the Seismic Subcommittee of ASCE 7 for inclusion into the 2010 edition of ASCE 7 hence with the adoption of ASCE 7-10 by reference this provision becomes duplicative. As of the submission date of this code change, the ASCE 7 Standards Committee is completing the committee balloting portion of the 2010 edition of ASCE/SEI 7. The document is designated ASCE/SEI 7-10 *Minimum Design Loads for Buildings and Other Structures* and it is expected that it will be completed and available for purchase prior to the ICC Final Action Hearings in May of 2010 . Any person interested in obtaining a public comment copy of ASCE/SEI 7-10 may do so by contacting the proponent at jrossberg@asce.org.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROSSBERG-S10-1613.6.1

S101–09/10
1613.6.3

Proponent: Jim Rossberg, SEI of ASCE, representing self

Delete without substitution:

~~**1613.6.3 Automatic sprinkler systems.** Automatic sprinkler systems designed and installed in accordance with NFPA 13 shall be deemed to meet the requirements of Section 13.6.8 of ASCE 7.~~

Reason: This provision has been considered and approved by the Seismic Subcommittee of ASCE 7 for inclusion into the 2010 edition of ASCE 7 hence with the adoption of ASCE 7-10 by reference this provision becomes duplicative. As of the submission date of this code change, the ASCE 7 Standards Committee is completing the committee balloting portion of the 2010 edition of ASCE/SEI 7. The document is designated ASCE/SEI 7-10 *Minimum Design Loads for Buildings and Other Structures* and it is expected that it will be completed and available for purchase prior to the ICC Final Action Hearings in May of 2010 . Any person interested in obtaining a public comment copy of ASCE/SEI 7-10 may do so by contacting the proponent at jrossberg@asce.org.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROSSBERG-S9-1613.6.3

S102–09/10
1613.6.4

Proponent: Philip Brazil, Reid Middleton, Inc. representing self
Jason Thompson, National Concrete Masonry Association, representing the Masonry Alliance for Codes and Standards, Phil Samblanet, The Masonry Society
Jim Rossberg, SEI of ASCE, representing self

Delete without substitution:

~~**1613.6.4 Autoclaved aerated concrete (AAC) masonry shear wall design coefficients and system limitations.** Add the following text at the end of Section 12.2.1 of ASCE 7:~~

~~For ordinary reinforced AAC masonry shear walls used in the seismic force-resisting system of structures, the response modification factor, R, shall be permitted to be taken as 2, the deflection application factor, C_d, shall be permitted to be taken as 2, and the system overstrength factor, Ω_o, shall be permitted to be taken as 2-1/2. Ordinary reinforced AAC masonry shear walls shall not be limited in height for buildings assigned to Seismic Design Category B , shall be limited in height to 35 feet (10 668 mm) for buildings assigned to Seismic Design Category C, and are not permitted for buildings assigned to Seismic Design Categories D, E and F.~~

~~For ordinary plain (unreinforced) AAC masonry shear walls used in the seismic-force-resisting system of structures, the response modification factor, R, shall be permitted to be taken as 1½, the deflection application factor, C_d, shall be permitted to be taken as 1-1/2, and the system overstrength factor, Ω_o, shall be permitted to be taken as 2-1/2. Ordinary plain (unreinforced) AAC masonry shear walls shall not be limited in height for buildings assigned to Seismic Design Category B and are not permitted for buildings assigned to Seismic Design Categories C, D, E and F.~~

(Renumber remaining sections)

Reason:
(Brazil)- The purpose for this proposal is to delete a revision to ASCE 7-05 that will no longer be needed because the revision will have been incorporated into the 2010 edition of ASCE 7. This is being accomplished by ASCE 7 Proposal TC-5-CH14-12, which is being balloted by the Main Committee (Item #12 of the Eighth Main Committee Ballot on Seismic Provisions). It is expected that the Main Committee will approve the proposal.
(Thompson-Samblanet) -This modification to ASCE 7-05 was added because ASCE 7 did not have time to adequately consider seismic design coefficients for Autoclaved Aerated Concrete masonry during its last revision cycle. Since that time, the Building Seismic Safety Council has approved similar seismic design coefficients and requirements for AAC masonry. Revisions to the 2010 edition of ASCE 7 that are technically identical to the modifications proposed for deletion here are under review by the ASCE 7 Committee. If adopted into ASCE 7-10, these modifications will no longer be necessary and as such are proposed for deletion from the IBC.
(Rossberg)- This provision is being considered for approval by the Seismic Subcommittee of ASCE 7 for inclusion into the 2010 edition of ASCE 7 hence with the adoption of ASCE 7-10 by reference this provision becomes duplicative. As of the submission date of this code change, the ASCE 7 Standards Committee is completing the committee balloting portion of the 2010 edition of ASCE/SEI 7. The document is designated ASCE/SEI 7-10 *Minimum Design Loads for Buildings and Other Structures* and it is expected that it will be completed and available for purchase prior to the ICC Final Action Hearings in May of 2010 . Any person interested in obtaining a public comment copy of ASCE/SEI 7-10 may do so by contacting the proponent at jrossberg@asce.org.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BRAZIL-ROSSBERG-THOMPSON-SAMBLANET-S1-1613.6.4

S103–09/10
1613.6.5

Proponent: Jim Rossberg, SEI of ASCE, representing self

Delete without substitution:

~~**1613.6.5 Seismic controls for elevators.** Seismic switches in accordance with Section 8.4.10 of ASME A17.1 shall be deemed to comply with Section 13.6.10.3 of ASCE 7.~~

Reason: This provision has been considered and approved by the Seismic Subcommittee of ASCE 7 for inclusion into the 2010 edition of ASCE 7 hence with the adoption of ASCE 7-10 by reference this provision becomes duplicative. As of the submission date of this code change, the ASCE 7 Standards Committee is completing the committee balloting portion of the 2010 edition of ASCE/SEI 7. The document is designated ASCE/SEI 7-10 *Minimum Design Loads for Buildings and Other Structures* and it is expected that it will be completed and available for purchase prior to the ICC Final Action Hearings in May of 2010 . Any person interested in obtaining a public comment copy of ASCE/SEI 7-10 may do so by contacting the proponent at jrossberg@asce.org.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROSSBERG-S7-1613.6.5

S104–09/10
1613.6.6

Proponent: Bonnie Manley, representing American Iron and Steel Institute,
Jim Rossberg, SEI of ASCE

Delete without substitution as follows:

~~**1613.6.6 Steel plate shear wall height limits.** Modify Section 12.2.5.4 of ASCE 7 to read as follows:~~

> ~~**12.2.5.4 Increased building height limit for steel-braced frames, special steel plate shear walls and special reinforced concrete shear walls.** The height limits in Table 12.2-1 are permitted to be increased from 160 feet (48 768 mm) to 240 feet (75 152 mm) for structures assigned to *Seismic Design Category* D or E and from 100 feet (30 480 mm) to 160 feet (48 768 mm) for structures assigned to *Seismic Design Category* F that have steel-braced frames, special steel plate shear walls or special reinforced concrete cast-in-place shear walls and that meet both of the following requirements:~~

1. ~~The structure shall not have an extreme torsional irregularity as defined in Table 12.2-1 (horizontal structural irregularity Type 1b).~~
2. ~~The braced frames or shear walls in any one plane shall resist no more than 60 percent of the total seismic forces in each direction, neglecting accidental torsional effects.~~

Reason:
(MANLEY) This section was added to the 2009 IBC (Proposal S94-07/08) to correct an oversight in the development of ASCE 7-05. The correction has been made to Section 12.2.5.4 of the 2010 edition of ASCE 7, so this modification is no longer necessary.
(ROSSBERG) This provision has been considered and approved by the Seismic Subcommittee of ASCE 7 for inclusion into the 2010 edition of ASCE 7 hence with the adoption of ASCE 7-10 by reference this provision becomes duplicative. As of the submission date of this code change, the ASCE 7 Standards Committee is completing the committee balloting portion of the 2010 edition of ASCE/SEI 7. The document is designated ASCE/SEI 7-10 *Minimum Design Loads for Buildings and Other Structures* and it is expected that it will be completed and available for purchase prior to the ICC Final Action Hearings in May of 2010 . Any person interested in obtaining a public comment copy of ASCE/SEI 7-10 may do so by contacting the proponent at jrossberg@asce.org.

Cost Impact:
(MANLEY)-There is no anticipated impact on the cost of construction.
(ROSSBERG)- The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

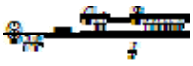
ICCFILENAME: Manley- Rossberg-S12-1613.6.6

S105–09/10
1613.6.7

Proponent: Jim Rossberg, SEI of ASCE, representing self

Delete without substitution:

~~1613.6.7 Minimum distance for building separation.~~ ~~All buildings and structures shall be separated from adjoining structures. Separations shall allow for the maximum inelastic response displacement (δ_M). δ_M shall be determined at critical locations with consideration for both translational and torsional displacements of the structure using Equation 16-44.~~

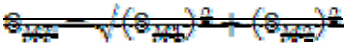


~~(Equation 16-44)~~

~~Where~~

~~C_d = Deflection amplification factor in Table 12.2-1 of ASCE 7.~~
~~δ_{max} = Maximum displacement defined in Section 12.8.4.3 of ASCE 7.~~
~~I = Importance factor in accordance with Section 11.5.1 of ASCE 7~~

~~Adjacent buildings on the same property shall be separated by a distance not less than δ_{MT}, determined by Equation 16-45.~~



~~(Equation 16-45)~~

~~where~~

~~δ_{M1}, δ_{M2} = The maximum inelastic response displacements of the adjacent buildings in accordance with Equation 16-44.~~

~~Where a structure adjoins a property line not common to a public way, the structure shall also be set back from the property line by not less than the maximum inelastic response displacement, δ_M, of that structure.~~

~~Exceptions:~~

1. ~~Smaller separations or property line setbacks shall be permitted when justified by rational analyses.~~
2. ~~Buildings and structures assigned to the Seismic Design Category A, B or C.~~

Reason: This provision has been considered and approved by the Seismic Subcommittee of ASCE 7 for inclusion into the 2010 edition of ASCE 7 hence with the adoption of ASCE 7-10 by reference this provision becomes duplicative. As of the submission date of this code change, the ASCE 7 Standards Committee is completing the committee balloting portion of the 2010 edition of ASCE/SEI 7. The document is designated ASCE/SEI 7-10 *Minimum Design Loads for Buildings and Other Structures* and it is expected that it will be completed and available for purchase prior to the ICC Final Action Hearings in May of 2010 . Any person interested in obtaining a public comment copy of ASCE/SEI 7-10 may do so by contacting the proponent at jrossberg@asce.org.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: ROSSBERG-S5-1613.6.7

S106–09/10
1613.6.8

Proponent: Jim Rossberg, SEI of ASCE, representing self

Delete without substitution:

~~**1613.6.8 HVAC Ductwork with I_p = 1.5.** Seismic supports are not required for HVAC ductwork with I_p = 1.5 if either of the following conditions is met for the full length of each duct run:~~

1. ~~HVAC ducts are suspended from hangers 12 inches (305 mm) or less in length with hangers detailed to avoid significant bending of the hangers and their attachments, or~~
2. ~~HVAC ducts have a cross-sectional area of less than 6 square feet (0.557 m^2).~~

Reason: This provision has been considered and approved by the Seismic Subcommittee of ASCE 7 for inclusion into the 2010 edition of ASCE 7 hence with the adoption of ASCE 7-10 by reference this provision becomes duplicative. As of the submission date of this code change, the ASCE 7 Standards Committee is completing the committee balloting portion of the 2010 edition of ASCE/SEI 7. The document is designated ASCE/SEI 7-10 *Minimum Design Loads for Buildings and Other Structures* and it is expected that it will be completed and available for purchase prior to the ICC Final Action Hearings in May of 2010 . Any person interested in obtaining a public comment copy of ASCE/SEI 7-10 may do so by contacting the proponent at jrossberg@asce.org.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: ROSSBERG-S4-1613.6.8

S107–09/10
1613.6.9 (New), CHAPTER 35

Proponent: Bonnie Manley, American Iron and Steel Institute representing American Iron and Steel Institute

1. Add new text as follows:

1613.6.9 Seismic design parameters for cold-formed steel special bolted moment frames. Add a new line, #C12 in ASCE 7, Table 12.2-1 for "Cold-formed Steel – Special Bolted Moment Frame" as follows:

Seismic Force Resisting System	ASCE 7 Section where Detailing Requirements are Specified	Response Modification Coefficient, R	System Overstrength Factor,	Deflection Amplification Factor, C_d	Structural System Limitations and Building Height (ft) Limit				
					Seismic Design Category				
					B	C	D	E	F
C12. Cold-Formed Steel – Special Bolted Moment Frame[b]	14.1	3.5	3.0[a]	3.5	35	35	35	35	35

a. Alternatively, the seismic load effect with overstrength, E_{mh}, can be based on the expected strength determined in accordance with AISI S110.
b. Cold-formed steel – special bolted moment frames shall be limited to one-story in height in accordance with AISI S110.

2. Add standard to Chapter 35 as follows:

AISI
S110-07 Standard for Seismic Design Of Cold-Formed Steel Structural Systems – Special Bolted Moment Frames.

Reason: This proposal introduces the seismic design parameters for a new system, "Cold-formed Steel – Special Bolted Moment Frame" or CFS-SBMFs. This system has been vetted through the BSSC process (Proposal 6-4R) and will be included in Part I of the 2009 NEHRP Provisions. Additionally, it has been introduced for consideration in the 2010 edition of ASCE 7 (Proposal TC-6-CH12-102-R3). Processing for ASCE 7-10 is not yet complete and, because of its shorten cycle, the ASCE 7 Main Committee may not be able to complete its action on the proposal. Consequently, the necessary modifications to ASCE 7 are being introduced here. If action is taken on Proposal TC-6-CH12-102-R3 in time for inclusion in the 2010 edition of ASCE 7, then this proposal will be withdrawn.

Please note, this proposal serves as a companion proposal to an IBC Chapter 22 modification which introduces a reference to the first edition of AISI S110, *Standard For Seismic Design Of Cold- Formed Steel Structural Systems – Special Bolted Moment Frames*. This document is based upon research conducted by Drs. Uang and Sato at UCSD (2007). Specifically, the CFS-SBMF system is expected to experience substantial inelastic deformation during significant seismic events. It is intended that most of the inelastic deformation will take place at the bolted connections, due to slip and bearing. In order to develop the designated mechanism, requirements based on capacity design principles are provided in AISI S110 for the design of the beams, columns and associated connections. Additionally, AISI S110 has specific requirements for the application of quality assurance and quality control procedures.

As a first pass, Appendix 1 of AISI S110 makes recommendations on the seismic design coefficients of the CFS-SBMF system. These parameters have been introduced for consideration in the ASCE 7-10 proposal. The Response Modification Coefficient, R, is set at 3.5. Cyclic testing has shown that CFS-SBMFs have very large ductility capacity and significant hardening. This justifies the use of a value of 3.5 for the R-factor. The derivation of the deflection amplification factor, C_d, can be found in the AISI S110 Commentary, Section D1.3. Furthermore, a capacity design procedure has been provided in Section D1.5 of AISI S110 Commentary so that the designer can explicitly calculate the seismic load effect with overstrength, E_{mh},. at the design story drift level. Alternatively, a conservative system overstrength factor, , is also provided to be compatible with the conventional approach to compute E_{mh} in ASCE 7. Finally the height limitation of 35 feet for all SDCs is based on practical use only and not from any limits on the CFS-SBMF system strength.

Cost Impact: There is no anticipated impact on the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, AISI S110-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Manley-S1-1613.6.9

S108–09/10

1613.8 (New), Appendix L (New)

Proponent: Robert E. Bachman, SE, Robert E Bachman Consulting Structural Engineers, representing The Consortium of Organizations for Strong-Motion Observation Systems

Add new text as follows:

1613.8 Earthquake-recording instrumentations. For earthquake-recording instrumentations, see Appendix L.

APPENDIX L

EARTHQUAKE RECORDING INSTRUMENTATIONS

SECTION L101
GENERAL

L101.1 General. Every building located where the 1-second spectral response acceleration, S_1, in accordance with Section 1613.5 is greater than 0.40 that either 1) exceeds six stories above grade plane with an aggregate floor area of 60,000 square feet (5574 m^2) or more, or 2) exceeds 10 stories above grade plane regardless of floor area, shall be provided with not less than three approved recording accelerographs.

The accelerographs shall be interconnected for common start and common timing.

L 101.2 Location. As a minimum, instruments shall be located at the lowest level, midheight, and near the top of the building. Each instrument shall be located so that access is maintained at all times and is unobstructed by room contents. A sign stating MAINTAIN CLEAR ACCESS TO THIS INSTRUMENT shall be posted in a conspicuous location.

L 101.3 Maintenance. Maintenance and service of the instrumentation shall be provided by the owner of the building, subject to the approval of the building official. Data produced by the instrument shall be made available to the building official on request.

Reason: Earthquake Recording Instrumentation measurements provide fundamental information needed to cost effectively improve the seismic performance of buildings. The wording of the added Section is taken from Section 1652 and Appendix Chapter 16, Division II of the 1997 UBC.

When the IBC was created, this section was apparently inadvertently not included. The code change proposal is intended to correct this oversight. The proposed change only covers instrumentation in newly constructed buildings. This proposal was submitted in the last cycle as a mandatory requirement in Chapter 1613. The Structural Committee suggested it be resubmitted as a non-mandatory Appendix during this cycle.

Cost Impact: Because this is an optional Appendix, this change will only have a cost impact in Jurisdictions in which it is adopted. In Jurisdictions where it is adopted, the cost impact will depend on whether similar ordinances are already in place. If ordinances are already in place, the cost impact will be negligible. For jurisdictions that adopt where ordinances are not in place, the cost impact, would be very small (less than 0.1% of the cost of the new construction) and only apply to very few structures in the high areas of seismic activity.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Bachman-S1-1613.8-App L

S109–09/10
1602.1, 1605.2.2, 1605.3.1.2, 1614 (New)

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

1. Add new definition as follows:

1602.1 Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

ICE-SENSITIVE STRUCTURE: A structure for which the effect of an atmospheric ice load governs the design of a structure or portion thereof. This includes, but is not limited to, lattice structures, guyed masts, overhead lines, light suspension and cable-stayed bridges, aerial cable systems (e.g., for ski lifts or logging operations), amusement rides, open catwalks and platforms, flagpoles and signs.

2. Revise as follows:

NOTATIONS.

D	=	Dead load.
D_i	=	Weight of ice in accordance with Chapter 10 of ASCE 7.
E	=	Combined effect of horizontal and vertical earthquake induced forces as defined in Section 12.4.2 of ASCE 7.
F	=	Load due to fluids with well-defined pressures and maximum heights.
F_a	=	Flood load in accordance with Chapter 5 of ASCE 7.
H	=	Load due to lateral earth pressures, ground water pressure or pressure of bulk materials.
L	=	Live load, except roof live load, including any permitted live load reduction.
L_r	=	Roof live load including any permitted live load reduction.
R	=	Rain load.
S	=	Snow load.
T	=	Self-straining force arising from contraction or expansion resulting from temperature change, shrinkage, moisture change, creep in component materials, movement due to differential settlement or combinations thereof.
W	=	Load due to wind pressure.
W_i	=	Wind-on-ice in accordance with Chapter 10 of ASCE 7.

1605.2.2 ~~Flood~~ Other loads. Where flood loads, F_a, are to be considered in the design, the load combinations of Section 2.3.3 of ASCE 7 shall be used. Where an ice-sensitive structure is subjected to loads due to atmospheric icing, the load combinations of Section 2.3.4 of ASCE 7 shall be considered.

1605.3.1.2 ~~Flood~~ Other loads. Where flood loads, F_a, are to be considered in design, the load combinations of Section 2.4.2 of ASCE 7 shall be used. Where an ice-sensitive structure is subjected to loads due to atmospheric icing, the load combinations of Section 2.4.3 of ASCE 7 shall be considered.

3. Add new text as follows:

SECTION 1614
ATMOSPHERIC ICE LOADS

1614.1 General. Ice-sensitive structures shall be designed for atmospheric ice loads in accordance with Chapter 10 of ASCE 7.

(Renumber remaining sections)

Reason: The purpose for the proposal is to provide charging text in the IBC in conjunction with technical provisions of ASCE 7 for atmospheric ice loads. It is not expected that the ongoing balloting for the 2010 edition of ASCE 7 will affect this proposal.

Note that the statements being added to Sections 1605.2.2 and 1605.3.1.2 for ice-sensitive structures do not constitute charging text. They are cross references to Section 2.3.5 of ASCE 7-10 for Strength/LRFD load combinations and Section 2.4.4 of ASCE 7 for ASD load combinations, which only serve to modify the load combinations for strength design in Section 2.3.2 of ASCE 7-10 and the load combinations for allowable stress design in Section 2.4.4 of ASCE 7.

The statements in Sections 1605.2.2 and 1605.3.1.2 on flood loads, F_a, also do not constitute charging text but Section 1612.1 serves as the charging text for flood loads in the IBC in that it requires buildings, structures and portions thereof to be designed and constructed to resist the effects of flood loads in flood hazard areas. In that regard, Section 1614.1 is added to provide charging text for ice-sensitive structures in the same manner as is provided for flood load.

Section 10.1 of ASCE 7-10 requires atmospheric ice loads to be considered in the design of ice-sensitive structures. An "ice-sensitive structure" is defined in Section 10.2 of ASCE 7-10 and this definition is being added to the IBC. Having a definition of "ice-sensitive structure" in the IBC will provide a technical basis for determining which structures are ice-sensitive structures and, thus, are required to meet the technical provisions of ASCE 7-10 for them. All structures other than ice-sensitive structures are not required to meet these technical provisions. Without the definition, the IBC will be without effective charging text. IBC Section 1614.1 relies on the determination of which structures are ice-sensitive structures in order to determine the need to comply with the applicable provisions of ASCE 7. That determination is not possible unless a definition of "ice-sensitive structure" is included in the IBC.

Note that this proposal does not contain similar changes to the alternative basic load combinations in Section 1605.3.2. The references to the load combinations in Sections 2.3.5 and 2.4.4 of ASCE 7 are an essential part of this proposal but these sections are not compatible with the alternative basic load combinations of the IBC. Revisions to the alternative basic load combinations for compatibility with the requirements for ice-sensitive structures in ASCE 7-10 should be pursued by others. The deletion of the alternative basic load combinations is the subject of a separate proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S48-1605.2.2

S110–09/10
1614.3.1, 1614.4.1

Proponent: Matthew Senecal, PE, representing American Concrete Institute

Revise as follows:

1614.3.1 Concrete frame structures. Frame structures constructed primarily of reinforced or prestressed concrete, either cast-in-place or precast, or a combination of these, shall conform to the requirements of ACI 318 ~~Sections 7.13, 13.3.8.5, 13.3.8.6, 16.5 and 18.12.6, b18.12.7 and 18.12.8 as applicable~~. Where ACI 318 requires that nonprestressed reinforcing or prestressing steel pass through the region bounded by the longitudinal column reinforcement, that reinforcing or prestressing steel shall have a minimum nominal tensile strength equal to two-thirds of the required one-way vertical strength of the connection of the floor or roof system to the column in each direction of beam or slab reinforcement passing through the column.

Exception: Where concrete slabs with continuous reinforcing having an area not less than 0.0015 times the concrete area in each of two orthogonal directions are present and are either monolithic with or equivalently bonded to beams, girders or columns, the longitudinal reinforcing or prestressing steel passing through the column reinforcement shall have a nominal tensile strength of one-third of the required one-way vertical strength of the connection of the floor or roof system to the column in each direction of beam or slab reinforcement passing through the column.

1614.4.1 Concrete wall structures. Precast bearing wall structures constructed solely of reinforced or prestressed concrete, or combinations of these shall conform to the requirements of ~~Sections 7.13, 13.3.8.5 and 16.5 of~~ ACI 318.

Reason: ACI is in the process of completely reorganizing ACI 318, *Building Code Requirements for Structural Concrete*. This process was formally initiated in the spring of 2008 and was scheduled to be completed by January 1, 2014 so that it would be available for reference by the 2015 IBC. This 2015 IBC schedule was assumed to be the same as traditional ICC meeting schedules.

The reorganized ACI 318 will be significantly different in structure than 318-08. The code will include several new chapters that are based on member design. The 318-08 chapters will be significantly reworked to support the member chapters. Some provisions have been divided sometimes into several chapters and at other provisions combined.

The new schedules released in February 2009 by the ICC require that reorganized ACI 318 be completed by January 3, 2012 for changes to the IBC (Group A) that require textual changes to the body of the IBC. ACI committee 318 will likely not be done with the revisions by that time and thus not have a revised standard to submit for the 2015 IBC if it remains in Group A. ICC's CP 28-05 states that, if no textual changes are required and that the change to the code is in reference only, the revision may be considered by the administrative code committee prior to the Final Action Hearing in Group B.

In this code change proposal, ACI proposes to remove all references to specific sections in ACI 318 from the IBC, but not change the technical intent of any provision. This removal would allow ACI to submit an administrative change in Group B and give ACI Committee 318 one more year to complete their task of reorganization.

In some cases, the referenced section numbers that are removed are replaced with language from ACI 318 (usually the section heading) that will allow the user to easily locate the appropriate section. In some cases, the referenced information in ACI 318 is transcribed into the IBC. The use of words in place of section numbers may require some editorial revisions in the 2012/2013 ICC cycle, if the headings are changed through the reorganization.

The following explanations are given to for the revised Sections stated above:

1614.3.1 and 1614.4.1	The list of sections is the majority of the structural integrity requirements but not all that are related to these topics. A singular reference to ACI 318 is a more accurate statement. In addition, the provisions in ACI 318 apply to all concrete buildings; whereas, the scope of Section 1614 is limited to a few buildings. Therefore, some may interpret from Sections 1614.3.1 and 1614.4.1 as presently worded that the sections of ACI 318 that are cited only apply to the buildings within the scope of Section 1614. Deletion of the references to these specific sections will eliminate this potential incorrect interpretation.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: SENECAL-S1-1614.3.1

S111–09/10
1702.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1702.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

SPECIAL INSPECTION, CONTINUOUS. The ~~full-time~~ observation of construction or work requiring special inspection by an approved special inspector who is continuously present in the area when and where the construction or work is being performed.

SPECIAL INSPECTION, PERIODIC. The ~~part-time or intermittent~~ observation of construction or work requiring special inspection by an approved special inspector who is intermittently present in the area when and where the construction or work ~~has been or~~ is being performed ~~and at the completion of the work~~.

Reason: The purpose for this proposal is to adjust the definitions for "continuous special inspection" and "periodic special inspection" for consistency with the requirements for special inspection elsewhere in Chapter 17. These requirements typically specify special inspections as either continuous or periodic. The only means in the IBC for determining what is required of a special inspector to perform continuous or periodic special inspection is their respective definitions in Section 1702.1. The definitions should be such that the special inspector is able to arrive at the site in time to observe the construction or work sufficiently to enable a determination of whether the construction complies with applicable requirements in the building code and its reference standards and is in accordance with the approved construction documents.

The definitions need to account for two primary aspects of special inspection: extent and frequency. Frequency can be seen as the number of times a special inspector inspects; extent can be seen as the degree to which a special inspector inspects. Neither can be comprehensively accounted for in a definition and this proposal does not attempt to do so. However, adjustments to the definitions are proposed to improve their correlation with the extent and frequency assumed for the special inspections where continuous or periodic special inspection is specified.
In both definitions, "construction" is added before "work" for consistency with the same phrase in Section 110.1 on inspections by the building official. Also in both definitions, "when" is added before "where" to indicate that the special inspector is expected be in the area while the work is being performed, not before or after the work is being performed, which is possible with the current definitions.

In the definition of periodic special inspection, "has been" is deleted so that the definition is silent on whether performing special inspections after the construction or work is completed constitutes periodic special inspection. It is conceivable that certain special inspection are possible after completion of the construction or work but this should be agreed upon by all affected parties, including, but not limited to, the owner or owner's representative, contractor, special inspector and the building official. Retaining "has been" in the definition, however, implies that special inspection after the construction or work is completed always constitutes periodic special inspection and there are certain special inspections identified as periodic elsewhere in Chapter 17 for which such inspection may not be sufficient.

Also in the definition of periodic special inspection, "at the completion of work" is deleted. Where periodic special inspection is warranted, whether the special inspector is present "at the completion of work" is irrelevant. An intermittent presence permits time gaps between actions or observations by the special inspector, which includes a period of time between the last action or observation by the special inspector and the completion of the work. Where this is not considered to be a sufficient presence by the special inspector, periodic special inspection is not warranted.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Brazil-S41-1702.1

S112–09/10
1702

Proponent: John England, MCO, England Enterprises Inc. representing self

Add new text as follows:

STATEMENT OF SPECIAL INSPECTIONS. A separate document presented to the building official at time of plan submittal, detailing the special inspections required on the project, with details on how and when the inspections are to be carried out and to what extent. The Building Official has the authority to approve, reject or ask for more information on any part of the *statement of special inspections*.

Reason: The code relates to the *statement of special inspections* but never defines it. A separate document from the specifications on large projects would make it easier for an inspection in the field to figure out who is doing what.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: England-S1-1702

S113–09/10
1702.1

Proponent: D. Kirk Harman, The Harman Group, representing The National Council of Structural Engineers Associations (NCSEA) Code Advisory Committee, Quality Assurance and Special Inspection Subcommittee

Add new definition as follows:

1702.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

SPECIAL INSPECTOR. An individual qualified in accordance with Section 1704.1 of this code, employed or retained by the *approved agency* and assigned to execute the *special inspections* or tests required by the statement of special inspections.

Reason: The term Special Inspector is used many times throughout the chapter but is currently not defined. Approved Agency is defined as the entity that provides inspection but the inspections are actually accomplished by the "special inspector". Both should be defined.

Cost Impact: This proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Harman-S1-1702.1

S114-09/10
1702.1

Proponent: D. Kirk Harman, The Harman Group, representing The National Council of Structural Engineers Associations (NCSEA) Code Advisory Committee, Quality Assurance and Special Inspection Subcommittee

Revise as follows:

1702.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

SPECIAL INSPECTION, CONTINUOUS. The full-time observation of work items that require ~~requiring~~ special inspection during their construction or installation process by an approved special inspector, in accordance with the statement of special inspections. ~~who is present in the area where the work is being performed.~~

SPECIAL INSPECTION, PERIODIC. The ~~part-time or~~ intermittent observation of work items that can be observed during or after installation that require ~~requiring~~ *special inspection* by an *approved* special inspector, in accordance with the statement of special inspections. ~~who is present in the area where the work has been or is being performed and at the completion of the work.~~

Reason: The current definitions are unclear and do not convey the intent of the difference between continuous and periodic special inspection. This proposal is intended to align the definitions with the requirements of the statement of special inspections. Continuous inspections are required for only those construction items that must be observed during the process of installation, such as multiple pass welds, or concrete placement. Periodic inspections are appropriate for most items that may or must be observed after they are in place, such as reinforcing placement or beam locations.

Also, it does not seem appropriate that the code should require the special inspector to just be "present in the area where the work is being performed". The revisions rely on the definition of *special inspection* and the requirements of Chapter 17 to define the activities of the s*pecial inspector*.

The word "items" is added ("work items") because the word work alone is too broad and there are many individual items that require different levels of inspection in what may be construed as the "work".

Cost Impact: This proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: Harman-S5-1702.1-2

S115–09/10

202, 1702, 1703, 1704.17 (New), 1708.1, 1708.4, 1708.4.1 (New), 1708.6 (New), Chapter 35

Proponent: James A Carlson, Seismic Source Company

1. Revise as follows:

SECTION 202
DEFINITIONS

LABEL. An identification applied on a product by the manufacturer or certificate of compliance that contains the name of the manufacturer, the function and performance characteristics of the product or material, and the name and identification of an accredited ~~approved~~ agency ~~and~~ that indicates that the representative sample of the product or material has been ~~tested~~ qualified by test or analysis and evaluated to industry standards and the manufacturers quality program is accepted by an accredited ~~approved~~ agency ~~(see Section 1703.5 and "Inspection certificate," "Manufacturer's designation" and "Mark")~~(A logo is used as a label on documents and equipment information name plate tags).

2. Delete without substitution:

~~**MANUFACTURER'S DESIGNATION.** An identification applied on a product by the manufacturer indicating that a product or material complies with a specified standard or set of rules (see also "Inspection certificate," "Label" and "Mark").~~

~~**MARK.** An identification applied on a product by the manufacturer indicating the name of the manufacturer and the function of a product or material (see also "Inspection certificate," "Label" and "Manufacturer's designation").~~

3. Add new definitions as follows:

SECTION 1702
DEFINITIONS

ACCREDITED AGENCY. Accreditation refers to the formal recognition by a specialized body – an accreditation body.

ACCREDITED SPECIAL INSPECTIONS AGENCY. Agencies that perform field inspections of a building under construction.

ACCREDITED INSPECTION BODIES. Agencies that provide review of the manufacturers' quality process which entails a review of the quality program and onsite verification that records confirm the quality program is being implemented.

4. Delete without substitution:

~~**APPROVED AGENCY.** An established and recognized agency regularly engaged in conducting tests or furnishing inspection services, when such agency has been approved.~~

~~**APPROVED FABRICATOR.** An established and qualified person, firm or corporation approved by the building official pursuant to Chapter 17 of this code.~~

~~**INSPECTION CERTIFICATE.** An identification applied on a product by an approved agency containing the name of the manufacturer, the function and performance characteristics, and the name and identification of an approved agency that indicates that the product or material has been inspected and evaluated by an approved agency (see Section 1703.5 and "Label," "Manufacturer's designation" and "Mark").~~

5. Delete and substitute as follows:

~~**1703.1 Approved agency.** An approved agency shall provide all information as necessary for the building official to determine that the agency meets the applicable requirements.~~

1703.1 Building official approval. Material, products, and reports are approved by the building official.

6. Delete without substitution:

~~**1703.1.1 Independent.** An approved agency shall be objective and competent. The agency shall also disclose possible conflicts of interest so that objectivity can be confirmed.~~

~~**1703.1.2 Equipment.** An approved agency shall have adequate equipment to perform required tests. The equipment shall be periodically calibrated.~~

~~**1703.1.3 Personnel.** An approved agency shall employ experienced personnel educated in conducting, supervising and evaluating tests and/or inspections.~~

7. Revise as follows:

1703.2 Written approval. Any material, appliance, equipment, system or method of construction meeting the requirements of this code shall be submitted for written approval by the building official during the plan check process ~~approved in writing after satisfactory completion of the required tests and submission of required test reports~~.

1703.4 Performance. Specific information ~~consisting of test reports conducted by an approved testing agency in accordance with standards referenced in Chapter 35, or other such information as necessary,~~ shall be provided for the building official to determine that the material meets the applicable code requirements and for approval.

8. Delete without substitution:

~~**1703.4.1 Research and investigation.** Sufficient technical data shall be submitted to the building official to substantiate the proposed use of any material or assembly. If it is determined that the evidence submitted is satisfactory proof of performance for the use intended, the building official shall approve the use of the material or assembly subject to the requirements of this code. The costs, reports and investigations required under these provisions shall be paid by the permit applicant.~~

~~**1703.4.2 Research reports.** Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.~~

9. Revise as follows:

1703.5 Labeling. Where materials or assemblies are required by this code to be labeled, such materials and assemblies shall be labeled by an accredited ~~approved~~ agency ~~in accordance with Section 1703~~. Products and materials required to be labeled shall be labeled in accordance with the procedures set forth in Sections 1703.5.1 through 1703.5.3.

1703.5.1 Testing. ~~An approved agency~~ A test lab shall ~~test~~ verify a representative sample of the product or material being labeled to the relevant standard or standards. ~~The approved agency shall maintain a record of the tests performed.~~ The record shall provide sufficient detail to verify compliance with the test standard.

1703.5.2 Inspection and identification. The accredited ~~approved~~ agency shall periodically perform an inspection, which shall be in-plant if necessary, of the product or material that is to be labeled. The inspection shall verify that the labeled product or material is representative of the product or material tested.

1703.5.3 Label information. The label shall contain the manufacturer's or distributor's identification, model number, serial number or definitive information describing the product or material's performance characteristics and accredited ~~approved~~ agency's identification.

10. Add new text as follows:

1704.17 Special Inspection for force-resisting-systems and designated seismic systems. Special inspections shall be performed for force-resisting systems as identified in Sections 1705.3 and 1707.8 required by the building official. Special inspections shall be performed for designated seismic system as identified in Section 1707.9 as required by the building official. Inspection frequency shall be in accordance with Table 1704.17.

1704.17.1 Qualifications. Special inspection agencies shall have expertise in seismic restraint design as required by Chapter 13 of ASCE 7, knowledge of shake table testing qualification of equipment, and obtain special inspection accreditation.

TABLE 1704.17
REQUIRED VERIFICATION AND INSPECTION OF NONSTRUCTURAL COMPONENTS

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCE STANDARDS	IBC REFERENCE
1. Verification of seismic supports	-	X	-	1707.7
2. Verification of equipment anchorage and certification of compliance for designated seismic systems	-	X	-	1707.8
3. Verification of isolation systems	-	X	-	1707.9

11. Revise as follows:

1708.1 Testing and qualification for seismic resistance. The testing and qualification specified in Sections 1708.2 through 1708.5, unless exempted from *special inspections* by the exceptions of Section 1704.1, 1705.3 or 1705.3.1 are required as follows:

1. The seismic-force-resisting systems in structures assigned to *Seismic Design Category* C, D, E or F, as determined in Section 1613 shall meet the requirements of Sections 1708.2 and 1708.3, as applicable. Testing of systems or system components shall be performed in accordance with ASHRAE Standard 171 or standards approved by the building official.
2. Designated seismic systems in structures assigned to *Seismic Design Category* C, D, E or F subject to the special certification requirements of ASCE 7 Section 13.2.2 are required to be tested in accordance with Section 1708.4.
3. Architectural, mechanical and electrical components in structures assigned to *Seismic Design Category* C, D, E or F with an I_p = 1.0 are required to be tested in accordance with Section 1708.4 where the general design requirements of ASCE 7 Section 13.2.1, Item 2 for manufacturer's certification are satisfied by testing.
4. The seismic isolation system in seismically isolated structures shall meet the testing requirements of Section 1708.5

1708.4 Seismic certification of nonstructural components. The *registered design professional* shall state the applicable seismic certification requirements for nonstructural components and designated seismic systems on the *construction documents*.

1. The manufacturer of each designated seismic system component subject to the provisions of ASCE 7 Section 13.2.2 shall test or analyze the component and its mounting system or anchorage and submit a *certificate of compliance* for review and acceptance by the *registered design professional* responsible for the design of the designated seismic system and for approval by the *building official*. Certification shall be based on an actual

test on a shake table, by three-dimensional shock tests, by an analytical method using dynamic characteristics and forces, by the use of experience data (i.e., historical data demonstrating acceptable seismic performance) or by more rigorous analysis providing for equivalent safety. Use of analysis for active or energized components is not permitted unless a comparison is made to components that have been otherwise deemed as rugged. For complex components, testing or experience may be the only practical way to ensure that the equipment will be operable following a design earthquake. Active simple products such as dampers of fans shall be permitted to be certified by analysis.

2. Manufacturer's certification of compliance for the general design requirements of ASCE 7 Section 13.2.1 shall be based on analysis, testing or experience data.

12. Add new text as follows:

1708.4.1 Hazardous applications. Components with hazardous contents shall be certified by the manufacturer as maintaining containment following the design earthquake by (1) analysis, (2) approved shake table testing, or (3) experience data in accordance. Evidence demonstrating compliance of this requirement shall be submitted to the building official after review and acceptance by the registered design professional.

1708.6 Anchors. For required anchorage testing, see ASCE 7.

13. Add reference standard to Chapter 35 as follows:

ASHRAE
Standard 171-08 Method of Testing Seismic Restraint Devices for HVAC&R Equipment

Reason: (***1702 Definitions)*** Definitions need to be changed to correlate with the current philosophy associated with the implementation of code requirements. In the late 90's, shop drawings used to be stamped with approval by the registered design professional. Now the stamp says reviewed by the design professional and the shop drawings are then approved by the building official. The term "approved agency" has been replaced with "accredited agency" as defined in the ISO standards. The building officials have approved the design and equipment to be installed in buildings, but the building official does not approve design agencies. Even the ES criteria have been updated to delete any reference to "approved agency".
I have performed significant research on this subject. I have yet to find an "approved agency". I have a temporary accreditation as an "accredited" Inspection Body by IAS awaiting final payment. IAS does not accredit fabrication agencies. I am pursuing the idea of becoming an accredited IBC special inspector to fulfill inspection requirements by New York City. This will require significant insurance implications. I am however, providing a listing service for seismic qualified equipment supported by the accredited inspection body services that review the QA program of the manufacturer and is accepted by OSHPD.

Based on the above discussion the following additional changes to the definitions are required.

Delete inspection certificate. The only references are from other definitions. Any certificate reference in the body of text in chapter 17 refers to a certificate of compliance. Special inspections are required and the end product of special inspection is a report not a certificate. Inspection certificate has no use.

Label has been modified to clearly discuss the current process for a certificate of compliance and approval by the building official. Testing of the product is not required by AC 156 to be an accredited test lab. There is an option to use an unaccredited test lab if the test is witnessed by an accredited inspection body. Also, analysis may be an acceptable method to qualify the product. So my listing agency does list Certified Seismic Qualification Agencies that perform analysis or arrange for testing by a subcontractor. My IB services verify that their quality system is acceptable to ISO 9001 standards to control the qualification of equipment. I certify the qualification agencies management system as defined by ISO, see appendix A.

Manufacturers' designation and mark definitions are no longer valid.

(1703 Approvals) All of 1703.1 deals with approved agency. From the discussion above, approved agency has been removed from chapter 17. Since this section is approvals, that 1703.1 was replaced with building official approval. This is a simple definition and can be expanded in later revisions of the IBC.
1703.2 and 1703.4 have been edited to reflect the current plan check process and approved by the building official. 1703.4 shall be combined into one paragraph. 1703.4.2 is no longer required. Research report requirements are provided in industry standards (AC 156, ASHRAE 171, and AHRI Seismic Qualification Standard - draft. I have a contract with AHRI to prepare the standard. A 90% draft is in review and will be completed by October 2009. These new standards reflect the state of art and replace the need for the code to provide criteria.

1703.5 has been updated to reflect the new term accredited agency.

1704 did not contain any requirements for non structural components. I added Section 1704.15 to address this issue and refer to 1707 where requirements are defined. Actually the requirements for special inspections of non structural components are included in 1705, 1707 and 1708. These requirements are duplicate in nature and need thorough review and update. But at a minimum, the addition of 1704.15 is the first step in the revision process. I would be happy to further evaluate this issue in detail and provide further proposals.

1708.1 and 1708.4 have been updated to use the language developed for ASCE 7. I am a member of the Seismic Subcommittee of ASCE 7 and specifically TS-8. I have successfully provided many changes to ASCE 7 that make the requirements clear and concise to resolve industry issues. One change represented changes to the requirements for equipment qualification. The changes to 1708 reflect the current accepted language changes to ASCE 7.

Cost Impact: The proposal will not increase the cost of construction.

Analysis: New wording in Section 1708.4 "For complex components, testing or experience may be the only practical way to ensure that the equipment will be operable following a design earthquake" should be rewritten as a mandatory requirement. A review of the standard(s) proposed for inclusion in the code, ASHRAE 171-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CARLSON-S1-1702

S116-09/10
1704, 1705, 1706, 1707, 1708, 1709, 1710

Proponent: D. Kirk Harman, The Harman Group representing The National Council of Structural Engineers Associations (NCSEA) Code Advisory Committee, Quality Assurance and Special Inspection Subcommittee

Revise as follows:

1703.6.1 Follow-up inspection. The applicant shall provide for *special inspections* of fabricated items in accordance with Section ~~1704.2~~ 1704.2.3.

SECTION 1704
SPECIAL INSPECTIONS, CONTRACTOR RESPONSIBILITY AND STRUCTURAL OBSERVATIONS

1704.1 General. This section provides minimum requirements for special inspections, contractor responsibility and structural observations.

~~**1704.1 General.**~~ **1704.2 Special inspections.** Where application is made for construction as described in this section, the owner or the *registered design professional in responsible charge* acting as the owner's agent shall employ one or more *approved agencies* to perform inspections during construction on the types of work listed under Section ~~1704~~ 1705. These inspections are in addition to the inspections identified in Section 110. ~~The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the *building official*, for the inspection of the particular type of construction or operation requiring *special inspection*. The *registered design professional in responsible charge* and engineers of record involved in the design of the project are permitted to act as the *approved agency* and their personnel are permitted to act as the special inspector for the work designed by them, provided those personnel meet the qualification requirements of this section to the satisfaction of the *building official*. The special inspector shall provide written documentation to the building official demonstrating their competence and relevant experience or training. Experience or training shall be considered relevant when the documented experience or training is related in complexity to the same type of *special inspection* activities for projects of similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of this code.~~

Exceptions:

1. *Special inspections* are not required for work of a minor nature or as warranted by conditions in the jurisdiction as *approved* by the *building official*.
2. *Special inspections* are not required for building components unless the design involves the practice of professional engineering or architecture as defined by applicable state statutes and regulations governing the professional registration and certification of engineers or architects.
3. Unless otherwise required by the *building official*, *special inspections* are not required for Group U occupancies that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.

1704.2.1 Special inspector qualifications. The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the *building official*, for the inspection of the particular type of construction or operation requiring *special inspection*. The *registered design professional in responsible charge* and engineers of record involved in the design of the project are permitted to act as the *approved agency* and their personnel are permitted to act as the special inspector for the work designed by them, provided those personnel meet the qualification requirements of this section to the satisfaction of the *building official*. The special inspector shall provide written documentation to the building official demonstrating their competence and relevant experience or training. Experience or training shall be considered relevant when the documented experience or training is related in complexity to the same type of *special inspection* activities for projects of similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of this code.

~~**1704.1.1**~~ **1704.2.2 Statement of special inspections.** The applicant shall submit a statement of *special inspections* prepared by the *registered design professional in responsible charge* in accordance with Section 107.1 as a condition for issuance. This statement shall be in accordance with Section ~~1705~~ 1704.3.

Exceptions:

1. A statement of *special inspections* is not required for structures designed and constructed in accordance with the conventional construction provisions of Section 2308.
2. The statement of *special inspections* is permitted to be prepared by a qualified person *approved* by the *building official* for construction not designed by a *registered design professional*.

~~**1704.1.2**~~ **1704.2.3 Report requirement.** Special inspectors shall keep records of inspections. The special inspector shall furnish inspection reports to the *building official*, and to the *registered design professional in responsible charge*. Reports shall indicate that work inspected was or was not completed in conformance to *approved construction documents*. Discrepancies shall be brought to the immediate attention of the contractor for correction. If they are not corrected, the discrepancies shall be brought to the attention of the *building official* and to the *registered design professional in responsible charge* prior to the completion of that phase of the work. A final report documenting required *special inspections* and correction of any discrepancies noted in the inspections shall be submitted at a point in time agreed upon prior to the start of work by the applicant and the *building official*.

~~**1704.2**~~ **1704.2.4 Inspection of fabricators.** Where fabrication of structural load-bearing members and assemblies is being performed on the premises of a fabricator's shop, *special inspection* of the fabricated items shall be required by this section and as required elsewhere in this code.

~~**1704.2.1**~~ **1704.2.4.1 Fabrication and implementation procedures.** The special inspector shall verify that the fabricator maintains detailed fabrication and quality control procedures that provide a basis for inspection control of the workmanship and the fabricator's ability to conform to *approved construction documents* and referenced standards. The special inspector shall review the procedures for completeness and adequacy relative to the code requirements for the fabricator's scope of work.

Exception: *Special inspections* as required by Section ~~1704.2~~ 1704.2.4 shall not be required where the fabricator is *approved* in accordance with Section ~~1704.2.2~~ 1704.2.4.2.

~~**1704.2.2**~~ **1704.2.4.2 Fabricator approval.** *Special inspections* required by Section ~~1704~~ 1705 are not required where the work is done on the premises of a fabricator registered and *approved* to perform such work without *special inspection*. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practices by an *approved special inspection* agency. At completion of fabrication, the *approved* fabricator shall submit a *certificate of compliance* to the *building official* stating that the work was performed in accordance with the *approved construction documents*.

~~SECTION 1705~~
~~STATEMENT OF SPECIAL INSPECTIONS~~

~~**1705.1 General.**~~ **1704.3 Statement of Special Inspections.** Where *special inspection* or testing is required by Section 1704, ~~1707~~ 1705.11 or ~~1708~~ 1705.12, the *registered design professional in responsible charge* shall prepare a statement of special inspections in accordance with Section ~~1705~~ 1704.3 for submittal by the applicant (see Section ~~1704.1.1~~ 1704.2.1).

~~**1705.2**~~ **1704.3.1Content of statement of special inspections.** The statement of special inspections shall identify the following:

1. The materials, systems, components and work required to have *special inspection* or testing by the *building official* or by the *registered design professional* responsible for each portion of the work.
2. The type and extent of each *special inspection*.
3. The type and extent of each test. .
4. Additional requirements for *special inspection* or testing for seismic or wind resistance as specified in Section ~~1705.3~~ 1704.3.2, ~~1705.4~~ 1704.3.3, ~~1707~~ 1705.11or ~~1708~~1705.12.4.
5. For each type of *special inspection*, identification as to whether it will be continuous *special inspection* or periodic *special inspection*.

~~**1705.3**~~ **1704.3.2 Seismic resistance.** The statement of special inspections shall include seismic requirements for cases covered in Sections ~~1705.3.1~~ 1704.3.2.1 through ~~1705.3.5~~ 1704.3.2.5.

Exception: Seismic requirements are permitted to be excluded from the statement of special inspections for structures designed and constructed in accordance with the following:

1. The structure consists of light-frame construction; the design spectral response acceleration at short periods, S_{DS}, as determined in Section 1613.5.4, does not exceed 0.5g; and the height of the structure does not exceed 35 feet (10 668 mm) above *grade plane*; or
2. The structure is constructed using a reinforced masonry structural system or reinforced concrete structural system; the design spectral response acceleration at short periods, S_{DS}, as determined in Section 1613.5.4, does not exceed 0.5g, and the height of the structure does not exceed 25 feet (7620 mm) above *grade plane*; or
3. Detached one- or two-family dwellings not exceeding two *stories above grade plane*, provided the structure does not have any of the following plan or vertical irregularities in accordance with Section 12.3.2 of ASCE 7:
   3.1. Torsional irregularity.
   3.2. Nonparallel systems.
   3.3. Stiffness irregularity—extreme soft story and soft story.
   3.4. Discontinuity in capacity—weak story.

~~**1705.3.1**~~ **1704.3.2.1 Seismic-force-resisting systems.** The seismic force- resisting systems in structures assigned to *Seismic Design Category* C, D, E or F, in accordance with Section 1613.

Exception: Requirements for the seismic-force-resisting system are permitted to be excluded from the statement of special inspections for steel systems in structures assigned to *Seismic Design Category* C that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 or less, excluding cantilever column systems.

~~**1705.3.2**~~ **1704.3.2.2 Designated seismic systems.** Designated seismic systems in structures assigned to *Seismic Design Category* D, E or F.

~~**1705.3.3**~~ **1704.3.2.3 Seismic Design Category C.** The following additional systems and components in structures assigned to *Seismic Design Category* C:

1. Heating, ventilating and air-conditioning (HVAC) ductwork containing hazardous materials and anchorage of such ductwork.
2. Piping systems and mechanical units containing flammable, combustible or highly *toxic* materials.
3. Anchorage of electrical equipment used for emergency or standby power systems.

~~**1705.3.4**~~ **1704.3.2.4 Seismic Design Category D.** The following additional systems and components in structures assigned to *Seismic Design Category* D:

1. Systems required for *Seismic Design Category* C.
2. Exterior wall panels and their anchorage.
3. Suspended ceiling systems and their anchorage.
4. Access floors and their anchorage.
5. Steel storage racks and their anchorage, where the importance factor is equal to 1.5 in accordance with Section 15.5.3 of ASCE 7.

~~**1705.3.5**~~ **1704.3.2.5 Seismic Design Category E or F.** The following additional systems and components in structures assigned to *Seismic Design Category* E or F:

1. Systems required for *Seismic Design Categories* C and D.
2. Electrical equipment.

~~**1705.3.6**~~ **1704.3.2.6 Seismic requirements in the statement of special inspections.** When Sections ~~1705.3~~ 1704.3.2 through ~~1705.3.5~~ 1704.3.2.5 specify that seismic requirements be included, the statement of special inspections shall identify the following:

1. The designated seismic systems and seismic force- resisting systems that are subject to *special inspections* in accordance with Sections ~~1705.3~~ 1704.3.2 through ~~1705.3.5~~ 1704.3.2.5.
2. The additional *special inspections* and testing to be provided as required by Sections ~~1707~~ 1705.11 and ~~1708~~ 1705.12 and other applicable sections of this code, including the applicable standards referenced by this code.

~~1705.4~~ **1704.3.3 Wind resistance.** The statement of special inspections shall include wind requirements for structures constructed in the following areas:

1. In wind Exposure Category B, where the 3-second-gust basic wind speed is 120 miles per hour (mph) (52.8m/s) or greater.
2. In wind Exposure Category C or D, where the 3-secondgust basic wind speed is 110 mph (49 m/s) or greater.

~~1705.4.1~~ **1704.3.3.1 Wind requirements in the statement of special inspections.** When Section ~~1705.4~~ 1704.3.3 specifies that wind requirements be included, the statement of special inspections shall identify the main wind-force-resisting systems and wind-resisting components subject to *special inspections* as specified in Section ~~1705.4.2~~ 1704.3.3.2.

~~1705.4.2~~ **1704.3.3.2 Detailed requirements.** The statement of special inspections shall include at least the following systems and components:

1. Roof cladding and roof framing connections.
2. Wall connections to roof and floor diaphragms and framing.
3. Roof and floor diaphragm systems, including collectors, drag struts and boundary elements.
4. Vertical wind-force-resisting systems, including braced frames, moment frames and shear walls.
5. Wind-force-resisting system connections to the foundation.
6. Fabrication and installation of systems or components required to meet the impact-resistance requirements of Section 1609.1.2.

   Exception: Fabrication of manufactured systems or components that have a *label* indicating compliance with the wind-load and impact-resistance requirements of this code.

~~**SECTION 1709**~~
~~**CONTRACTOR RESPONSIBILITY**~~

~~1709.1~~ **1704.4 Contractor responsibility.** Each contractor responsible for the construction of a main wind- or seismic-force-resisting system, designated seismic system or a wind- or seismic-resisting component listed in the statement of special inspections shall submit a written statement of responsibility to the *building official* and the owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain acknowledgement of awareness of the special requirements contained in the statement of *special inspection*.

~~**SECTION 1710**~~
~~**STRUCTURAL OBSERVATIONS**~~

~~**1710.1 General.**~~ **1704.5 Structural observations.** Where required by the provisions of Section ~~1710.2~~ 1704.5.1 or ~~1710.3~~ 1704.5.2, the owner shall employ a *registered design professional* to perform structural observations as defined in Section 1702.

Prior to the commencement of observations, the structural observer shall submit to the *building official* a written statement identifying the frequency and extent of structural observations. At the conclusion of the work included in the permit, the structural observer shall submit to the *building official* a written statement that the site visits have been made and identify any reported deficiencies which, to the best of the structural observer's knowledge, have not been resolved.

~~1710.2~~ **1704.5.1 Structural observations for seismic resistance.** Structural observations shall be provided for those structures assigned to *Seismic Design Category* D, E or F, as determined in Section 1613, where one or more of the following conditions exist:

1. The structure is classified as *Occupancy Category* III or IV in accordance with Table 1604.5.
2. The height of the structure is greater than 75 feet (22 860 mm) above the base.
3. The structure is assigned to *Seismic Design Category* E, is classified as *Occupancy Category* I or II in accordance with Table 1604.5, and is greater than two *stories above grade plane*.
4. When so designated by the *registered design professional* responsible for the structural design.
5. When such observation is specifically required by the *building official*.

~~1710.3~~ **1704.5.2 Structural observations for wind requirements.** Structural observations shall be provided for those structures sited where the basic wind speed exceeds 110 mph (49 m/sec) determined from Figure 1609, where one or more of the following conditions exist:

1. The structure is classified as *Occupancy Category* III or IV in accordance with Table 1604.5.
2. The *building height* of the structure is greater than 75 feet (22 860 mm).
3. When so designated by the *registered design professional* responsible for the structural design.
4. When such observation is specifically required by the *building official*.

SECTION 1705
REQUIRED VERIFICATION AND INSPECTION

1705.1 General. Verification and inspection of elements of buildings and structures shall be as required by this section.

~~1704.15~~ **1705.1.1 Special cases.** *Special inspections* shall be required for proposed work that is, in the opinion of the *building official*, unusual in its nature, such as, but not limited to, the following examples:

1. Construction materials and systems that are alternatives to materials and systems prescribed by this code.
2. Unusual design applications of materials described in this code.
3. Materials and systems required to be installed in accordance with additional manufacturer's instructions that prescribe requirements not contained in this code or in standards referenced by this code.

~~1704.3~~ **1705.2 Steel construction.** The *special inspections* for steel elements of buildings and structures shall be as required by Section ~~1704.3~~ 1705.2 and Table ~~1704.3~~ 1705.2.

Exceptions:

1. *Special inspection* of the steel fabrication process shall not be required where the fabricator does not perform any welding, thermal cutting or heating operation of any kind as part of the fabrication process. In such cases, the fabricator shall be required to submit a detailed procedure for material control that demonstrates the fabricator's ability to maintain suitable records and procedures such that, at any time during the fabrication process, the material specification, grade and mill test reports for the main stress-carrying elements are capable of being determined.
2. The special inspector need not be continuously present during welding of the following items, provided the materials, welding procedures and qualifications of welders are verified prior to the start of the work; periodic inspections are made of the work in progress and a visual inspection of all welds is made prior to completion or prior to shipment of shop welding.
   - 2.1. Single-pass fillet welds not exceeding 5/16 inch (7.9 mm) in size.
   - 2.2. Floor and roof deck welding.
   - 2.3. Welded studs when used for structural diaphragm.
   - 2.4. Welded sheet steel for cold-formed steel members.
   - 2.5. Welding of stairs and railing systems.

~~1704.3.1~~ **1705.2.1 Welding.** Welding inspection and welding inspector qualification shall be in accordance with this section.

~~1704.3.1.1~~ **1705.2.1.1 Structural steel.** Welding inspection and welding inspector qualification for structural steel shall be in accordance with AWS D1.1.

~~1704.3.1.2~~ **1705.2.1.2 Cold-formed steel.** Welding inspection and welding inspector qualification for cold-formed steel floor and roof decks shall be in accordance with AWS D1.3.

~~1704.3.1.3~~ **1705.2.1.3 Reinforcing steel.** Welding inspection and welding inspector qualification for reinforcing steel shall be in accordance with AWS D1.4 and ACI 318.

~~1704.3.2~~ **1705.2.2 Details.** The special inspector shall perform an inspection of the steel frame to verify compliance with the details shown on the *approved construction documents*, such as bracing, stiffening, member locations and proper application of joint details at each connection.

~~1704.3.3~~ **1705.2.3 High-strength bolts.** Installation of high-strength bolts shall be inspected in accordance with AISC 360.

~~1704.3.3.1~~ **1705.2.3.1General.** While the work is in progress, the special inspector shall determine that the requirements for bolts, nuts, washers and paint; bolted parts and installation and tightening in such standards are met. For bolts requiring pretensioning, the special inspector shall observe the preinstallation testing and calibration procedures when such procedures are required by the installation method or by project plans or specifications; determine that all plies of connected materials have been drawn together and properly snugged and monitor the installation of bolts to verify that the selected procedure for installation is properly used to tighten bolts. For joints required to be tightened only to the snug-tight condition, the special inspector need only verify that the connected materials have been drawn together and properly snugged.

~~1704.3.3.2~~ **1705.2.3.2 Periodic monitoring.** Monitoring of bolt installation for pretensioning is permitted to be performed on a periodic basis when using the turn-of-nut method with matchmarking techniques, the direct tension indicator method or the alternate design fastener (twist-off bolt) method. Joints designated as snug tight need be inspected only on a periodic basis.

~~1704.3.3.3~~ **1705.2.3.3 Continuous monitoring.** Monitoring of bolt installation for pretensioning using the calibrated wrench method or the turn-of-nut method without matchmarking shall be performed on a continuous basis.

~~1704.3.4~~ **1705.2.4 Cold-formed steel trusses spanning 60 feet or greater.** Where a cold-formed steel truss clear span is 60 feet (18 288 mm) or greater, the special inspector shall verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the *approved* truss submittal package.

TABLE ~~1704.3~~ 1705.2
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARDa	IBC REFERENCE
2. Inspection of high-strength bolting:				
a.Snug-tight joints.	—	X	AISC 360, Section M2.5	~~1704.3.3~~ 1705.2.3
b.Pretensioned and slip-critical joints using turn-of-nut with matchmarking, twist-off bolt or direct tension indicator methods of installation.	—	X		
c.Pretensioned and slip-critical joints using turn-of-nut without matchmarking or calibrated wrench methods of installation.	X	—		
5. Inspection of welding:				
a. Structural steel and cold-formed steel deck:				
1) Complete and partial joint penetration groove welds.	X	_	AWS D1.1	~~1704.3.1~~ 1705.2.1
2) Multipass fillet welds.	X	_		
3) Single-pass fillet welds ≤ 5/16”	X	_		
4) Plug and slot welds.	X	—		
5) Single-pass fillet welds ≤ 5/16”		X		
6) Floor and roof deck welds.	—	X	AWS D1.3	
b.Reinforcing steel:				
1) Verification of weldability of reinforcing steel other than ASTM A 706.	—	X	AWS D1.4 ACI 318: Section 3.5.2	—
2) Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.	X	—		

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARDa	IBC REFERENCE
3) Shear reinforcement.	X	—		
4) Other reinforcing steel.	—	X		
6. Inspection of steel frame joint details for compliance with approved construction documents:				
a. Details such as bracing and stiffening.	—	X	—	~~1704.3.2~~ 1705.2.2
b. Member locations.		—	X	
c. Application of joint details at each connection.		—	X	

(Portions of table not shown do not change)

a. Where applicable, see also Section ~~1707.1~~ 1705.11, Special inspection for seismic resistance.

~~1704.4~~ 1705.3 Concrete construction. The *special inspections* and verifications for concrete construction shall be as required by this section and Table ~~1704.4~~ 1705.3.

Exception: *Special inspections* shall not be required for:

1. Isolated spread concrete footings of buildings three stories or less above *grade plane* that are fully supported on earth or rock.
2. Continuous concrete footings supporting walls of buildings three stories or less above *grade plane* that are fully supported on earth or rock where:
   2.1. The footings support walls of light-frame construction;
   2.2. The footings are designed in accordance with Table 1809.7; or
   2.3. The structural design of the footing is based on a specified compressive strength, f'_c, no greater than 2,500 pounds per square inch (psi) (17.2 Mpa), regardless of the compressive strength specified in the *construction documents* or used in the footing construction.
3. Nonstructural concrete slabs supported directly on the ground, including prestressed slabs on grade, where the effective prestress in the concrete is less than 150 psi (1.03 Mpa).
4. Concrete foundation walls constructed in accordance with Table 1807.1.6.2.
5. Concrete patios, driveways and sidewalks, on grade.

~~1704.4.1~~ 1705.3.1 Materials. In the absence of sufficient data or documentation providing evidence of conformance to quality standards for materials in Chapter 3 of ACI 318, the building official shall require testing of materials in accordance with the appropriate standards and criteria for the material in Chapter 3 of ACI 318. Weldability of reinforcement, except that which conforms to ASTM A 706, shall be determined in accordance with the requirements of Section 3.5.2 of ACI 318.

TABLE ~~1704.4~~ 1705.3
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION
(No Change to Table)

a. Where applicable, see also Section ~~1707.1~~ 1705.11, Special inspection for seismic resistance.

~~1704.5~~ 1705.4 Masonry construction. Masonry construction shall be inspected and verified in accordance with the requirements of Sections ~~1704.5.1~~ 1705.4.1 through ~~1704.5.2~~ 1705.4.2, depending on the *occupancy category* of the building or structure.

Exception: *Special inspections* shall not be required for:

1. Empirically designed masonry, glass unit masonry or masonry veneer designed by Section 2109, 2110 or Chapter 14, respectively, or by Chapter 5, 7 or 6 of TMS 402/ACI 530/ASCE 5, respectively, when they are part of structures classified as *Occupancy Category* I, II or III in accordance with Section 1604.5.
2. Masonry foundation walls constructed in accordance with Table 1807.1.6.3(1), 1807.1.6.3(2),1807.1.6.3(3) or 1807.1.6.3(4).
3. Masonry fireplaces, masonry heaters or masonry chimneys installed or constructed in accordance with Section 2111, 2112 or 2113, respectively.

~~1704.5.1~~ **1705.4.1 Empirically designed masonry, glass unit masonry and masonry veneer in Occupancy Category IV.** The minimum *special inspection* program for empirically designed masonry, glass unit masonry or masonry veneer designed by Section 2109, 2110 or Chapter 14, respectively, or by Chapter 5, 7 or 6 of TMS 402/ACI ASCE 5, respectively, in structures classified as *Occupancy Category* IV, in accordance with Section 1604.5, shall comply with Table ~~1704.5.1~~ 1705.4.1.

~~1704.5.2~~ **1705.4.2 Engineered masonry in Occupancy Category I, II or III.** The minimum *special inspection* program for masonry designed by Section 2107 or 2108 or by chapters other than Chapter 5, 6 or 7 of TMS402/ACI 530/ASCE 5 in structures classified as *Occupancy Category* I, II or III, in accordance with Section 1604.5, shall comply with Table ~~1704.5.1~~ 1705.4.1.

~~1704.5.3~~ **1705.4.3 Engineered masonry in Occupancy Category IV.** The minimum *special inspection* program for masonry designed by Section 2107 or 2108 or by chapters other than Chapter 5, 6 or 7 of TMS402/ACI 530/ASCE 5 in structures classified as *Occupancy Category* IV, in accordance with Section 1604.5, shall comply with Table ~~1704.5.3~~ 1705.4.3.

~~1704.11~~ **1705.4.4 Vertical masonry foundation elements.** *Special inspection* shall be performed in accordance with Section ~~1704.5~~ 1705.4 for vertical masonry foundation elements.

TABLE ~~1704.5.1~~ 1705.4.1
LEVEL 1 REQUIRED VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION
(No Change to Table)

TABLE ~~1704.5.3~~ 1705.4.3
LEVEL 2 REQUIRED VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION
(No Change to Table)

~~1704.6~~ **1705.5 Wood construction.** *Special inspections* of the fabrication process of prefabricated wood structural elements and assemblies shall be in accordance with Section ~~1704.2~~ 1704.2.3. *Special inspections* of site-built assemblies shall be in accordance with this section.

~~1704.6.1~~ **1705.5.1 High-load diaphragms.** High-load diaphragms designed in accordance with Table 2306.2.1(2) shall be installed with *special inspections* as indicated in Section ~~1704.1~~ 1704.2. The special inspector shall inspect the wood structural panel sheathing to ascertain whether it is of the grade and thickness shown on the *approved* building plans. Additionally, the special inspector must verify the nominal size of framing members at adjoining panel edges, the nail or staple diameter and length, the number of fastener lines and that the spacing between fasteners in each line and at edge margins agrees with the *approved* building plans.

~~1704.6.2~~ **1705.5.2 Metal-plate-connected wood trusses spanning 60 feet or greater.** Where a truss clear span is 60 feet (18 288 mm)or greater, the special inspector shall verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the *approved* truss submittal package.

~~1704.7~~ **1705.6 Soils.** *Special inspections* for existing site soil conditions, fill placement and load-bearing requirements shall be as required by this section and Table ~~1704.7~~ 1705.6. The *approved* geotechnical report, and the *construction documents* prepared by the *registered design professionals* shall be used to determine compliance. During fill placement, the special inspector shall determine that proper materials and procedures are used in accordance with the provisions of the *approved* geotechnical report.

> **Exception:** Where Section 1803 does not require reporting of materials and procedures for fill placement, the special inspector shall verify that the in-place dry density of the compacted fill is not less than 90 percent of the maximum dry density at optimum moisture content determined in accordance with ASTM D 1557.

~~1704.8~~ **1705.7 Driven deep foundations.** *Special inspections* shall be performed during installation and testing of driven deep foundation elements as required by Table ~~1704.8~~ 1705.7. The *approved* geotechnical report, and the *construction documents* prepared by the *registered design professionals*, shall be used to determine compliance.

~~1704.9~~ **1705.8 Cast-in-place deep foundations.** *Special inspections* shall be performed during installation and testing of cast-in-place deep foundation elements as required by Table ~~1704.9~~ 1705.8. The *approved* geotechnical report, and the *construction documents* prepared by the *registered design professionals*, shall be used to determine compliance.

~~1704.10~~ **1705.9 Helical pile foundations.** *Special inspections* shall be performed continuously during installation of helical pile foundations. The information recorded shall include installation equipment used, pile dimensions, tip elevations, final depth, final installation torque and other pertinent installation data as required by the *registered design professional in responsible charge*. The *approved* geotechnical report and the documents prepared by the *registered design professional* shall be used to determine compliance.

TABLE ~~1704.7~~ 1705.6
REQUIRED VERIFICATION AND INSPECTION OF SOILS
(No Change to Table)

TABLE ~~1704.8~~ 1705.7
REQUIRED VERIFICATION AND INSPECTION OF DRIVEN DEEP FOUNDATION ELEMENTS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
5. For steel elements, perform additional inspections in accordance with Section ~~1704.3~~ 1705.2.	—	—
6. For concrete elements and concrete-filled elements, perform additional inspections in accordance with Section ~~1704.4~~ 1705.3.	—	—

(Portions of table not shown are unchanged)

TABLE ~~1704.9~~ 1705.8
REQUIRED VERIFICATION AND INSPECTION OF CAST-IN-PLACE DEEP FOUNDATION ELEMENTS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
3. For concrete elements, perform additional inspections in accordance with Section ~~1704.4~~ 1705.3.	—	—

(Portions of table not shown are unchanged)

~~SECTION 1706~~
~~SPECIAL INSPECTIONS FOR WIND REQUIREMENTS~~

~~1706.1~~ **1705.10 Special inspections for wind ~~requirements~~ resistance.** *Special inspections* itemized in Sections ~~1706.2~~ 1705.10.1 through ~~1706.4~~ 1705.10.3, unless exempted by the exceptions to Section ~~1704.1~~ 1704.2, are required for buildings and structures constructed in the following areas:

1. In wind Exposure Category B, where the 3-second-gust basic wind speed is 120 miles per hour (52.8 m/sec) or greater.
2. In wind Exposure Categories C or D, where the 3-second- gust basic wind speed is 110 mph (49 m/sec) or greater.

~~1706.2~~ **1705.10.1 Structural wood.** Continuous special inspection is required during field gluing operations of elements of the main wind-force-resisting system. Periodic special inspection is required for nailing, bolting, anchoring and other fastening of components within the main wind-force-resisting system, including wood shear walls, wood diaphragms, drag struts, braces and hold-downs.

Exception: *Special inspection* is not required for wood shearwalls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other components of the main wind-force-resisting system, where the fastener spacing of the sheathing is more than 4 inches (102 mm) on center.

~~1706.3~~ **1705.10.2 Cold-formed steel light-frame construction.** Periodic special inspection is required during welding operations of elements of the main wind-force-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of components within the main wind-force-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.

Exception: *Special inspection* is not required for cold-formed steel light-frame shear walls, braces, diaphragms, collectors (drag struts) and hold-downs where either of the following apply:

1. The sheathing is gypsum board or fiberboard.
2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c.).

~~1706.4~~ 1705.10.3 **Wind-resisting components.** Periodic special inspection is required for the following systems and components:

1. Roof cladding.
2. Wall cladding.

~~**SECTION 1707**~~
~~**SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE**~~

~~**1707.1**~~ **1705.11 Special inspections for seismic resistance.** *Special inspections* itemized in Sections ~~1707.2~~ 1705.11.1 through ~~1707.9~~ 1705.11.8, unless exempted by the exceptions of Section ~~1704.1~~ 1704.2, ~~1705.3~~ 1704.3.2, or ~~1705.3.1~~ 1704.3.2.1, are required for the following:

1. The seismic-force-resisting systems in structures assigned to *Seismic Design Category* C, D, E or F, as determined in Section 1613.
2. Designated seismic systems in structures assigned to *Seismic Design Category* D, E or F.
3. Architectural, mechanical and electrical components in structures assigned to *Seismic Design Category* C, D, E or F that are required in Sections ~~1707.6~~ 1705.11.5 and ~~1707.7~~ 1705.11.6.

~~**1707.2**~~ **1705.11.1 Structural steel.** *Special inspection* for structural steel shall be in accordance with the quality assurance plan requirements of AISC 341.

Exceptions:

1. *Special inspections* of structural steel in structures assigned to *Seismic Design Category* C that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 or less, excluding cantilever column systems.
2. For ordinary moment frames, ultrasonic and magnetic particle testing of complete joint penetration groove welds are only required for demand critical welds.

~~**1707.3**~~ **1705.11.2 Structural wood.** Continuous special inspection is required during field gluing operations of elements of the seismic- force-resisting system. Periodic special inspection is required for nailing, bolting, anchoring and other fastening of components within the seismic-force-resisting system, including wood shear walls, wood diaphragms, drag struts, braces, shear panels and hold-downs.

Exception: *Special inspection* is not required for wood shearwalls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other components of the seismic-force-resisting system, where the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c.).

~~**1707.4**~~ **1705.11.3 Cold-formed steel light-frame construction.** Periodic special inspection is required during welding operations of elements of the seismic-force-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of components within the seismic-force-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.

Exception: *Special inspection* is not required for cold-formed steel light-frame shear walls, braces, diaphragms, collectors (drag struts) and hold-downs where either of the following apply:

1. The sheathing is gypsum board or fiberboard.
2. The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) o.c.

~~**1707.5**~~ **1705.11.4 Storage racks and access floors.** Periodic *special inspection* is required during the anchorage of access floors and storage racks 8 feet (2438 mm) or greater in height in structures assigned to *Seismic Design Category* D, E or F.

~~1707.6~~ **1705.11.5 Architectural components.** Periodic *special inspection* during the erection and fastening of exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer in structures assigned to *Seismic Design Category* D, E or F.

Exceptions:

1. *Special inspection* is not required for exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer 30 feet (9144 mm) or less in height above grade or walking surface.
2. *Special inspection* is not required for exterior cladding and interior and exterior veneer weighing 5 psf (24.5 N/m^2) or less.
3. *Special inspection* is not required for interior nonbearing walls weighing 15 psf (73.5 N/m^2) or less.

~~1707.7~~ **1705.11.6 Mechanical and electrical components.** *Special inspection* for mechanical and electrical equipment shall be as follows:

1. Periodic special inspection is required during the anchorage of electrical equipment for emergency or standby power systems in structures assigned to *Seismic Design Category* C, D, E or F;
2. Periodic special inspection is required during the installation of anchorage of other electrical equipment in structures assigned to *Seismic Design Category* E or F;
3. Periodic special inspection is required during installation of piping systems intended to carry flammable, combustible or *highly toxic* contents and their associated mechanical units in structures assigned to *Seismic Design Category* C, D, E or F;
4. Periodic special inspection is required during the installation of HVAC ductwork that will contain hazardous materials in structures assigned to *Seismic Design Category* C, D, E or F; and
5. Periodic special inspection is required during the installation of vibration isolation systems in structures assigned to *Seismic Design Category* C, D, E or F where the *construction documents* require a nominal clearance of 1/4 inch (6.4 mm) or less between the equipment support frame and restraint.

~~1707.8~~ **1705.11.7 Designated seismic system verifications.** The special inspector shall examine designated seismic systems requiring seismic qualification in accordance with Section ~~1708.5~~ 1705.12.4 and verify that the *label*, anchorage or mounting conforms to the *certificate of compliance*.

~~1707.9~~ **1705.11.8 Seismic isolation system.** Periodic special inspection is required during the fabrication and installation of isolator units and energy dissipation devices that are part of the seismic isolation system.

~~**SECTION 1708**~~
~~**STRUCTURAL TESTING FOR SEISMIC RESISTANCE**~~

~~1708.1~~ **1705.12 Testing and qualification for seismic resistance.** The testing and qualification specified in Sections ~~1708.2~~ 1705.12.1 through ~~1708.5~~ 1705.12.4, unless exempted from *special inspections* by the exceptions of Section ~~1704.1~~ 1704.2, ~~1705.3~~ 1704.3.2, or ~~1705.3.1~~ 1704.3.2.1 are required as follows:

1. The seismic-force-resisting systems in structures assigned to *Seismic Design Category* C, D, E or F, as determined in Section 1613 shall meet the requirements of Sections ~~1708.2~~ 1705.12.1 and ~~1708.~~3 1705.12.2, as applicable.
2. Designated seismic systems in structures assigned to *Seismic Design Category* C, D, E or F subject to the special certification requirements of ASCE 7 Section 13.2.2 are required to be tested in accordance with Section ~~1708.4~~ 1705.12.3.
3. Architectural, mechanical and electrical components in structures assigned to *Seismic Design Category* C, D, E or F with an *Ip* = 1.0 are required to be tested in accordance with Section ~~1708.4~~ 1705.12.3 where the general design requirements of ASCE 7 Section 13.2.1, Item 2 for manufacturer's certification are satisfied by testing.
4. The seismic isolation system in seismically isolated structures shall meet the testing requirements of Section ~~1708.5~~ 1705.12.4.

~~1708.2~~ **1705.12.1 Concrete reinforcement.** Where reinforcement complying with ASTM A 615 is used to resist earthquake-induced flexural and axial forces in special moment frames, special structural walls and coupling beams connecting special structural walls, in structures assigned to *Seismic Design Category* B, C, D, E or F as determined in Section 1613, the reinforcement shall comply with Section 21.1.5.2 of ACI 318. Certified mill test reports shall be provided for each shipment of such reinforcement. Where reinforcement complying with ASTM A 615 is to be welded, chemical tests shall be performed to determine weldability in accordance with Section 3.5.2 of ACI 318.

~~1708.3~~ **1705.12.2 Structural steel.** Testing for structural steel shall be in accordance with the quality assurance plan requirements of AISC 341.

Exceptions:

1. Testing for structural steel in structures assigned to *Seismic Design Category* C that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 or less, excluding cantilever column systems.
2. For ordinary moment frames, ultrasonic and magnetic particle testing of complete joint penetration groove welds are only required for demand critical welds.

~~1708.4~~ **1705.12.3 Seismic certification of nonstructural components.** The *registered design professional* shall state the applicable seismic certification requirements for nonstructural components and designated seismic systems on the *construction documents*.

1. The manufacturer of each designated seismic system component subject to the provisions of ASCE 7 Section 13.2.2 shall test or analyze the component and its mounting system or anchorage and submit a *certificate of compliance* for review and acceptance by the *registered design professional* responsible for the design of the designated seismic system and for approval by the *building official*. Certification shall be based on an actual test on a shake table, by three-dimensional shock tests, by an analytical method using dynamic characteristics and forces, by the use of experience data (i.e., historical data demonstrating acceptable seismic performance) or by more rigorous analysis providing for equivalent safety.
2. Manufacturer's certification of compliance for the general design requirements of ASCE 7 Section 13.2.1 shall be based on analysis, testing or experience data.

~~1708.5~~ **1705.12.4 Seismically isolated structures.** For required system tests, see Section 17.8 of ASCE 7.

~~1704.12~~ **1705.13 Sprayed fire-resistant materials.** *Special inspections* for sprayed fire-resistant materials applied to floor, roof and wall assemblies and structural members shall be in accordance with Sections ~~1704.12.1~~ 1705.13.1 through ~~1704.12.6~~ 1705.13.6. *Special inspections* shall be based on the fire-resistance design as designated in the *approved construction documents*. The tests set forth in this section shall be based on samplings from specific floor, roof and wall assemblies and structural members. *Special inspections* shall be performed after the rough installation of electrical, automatic sprinkler, mechanical and plumbing systems and suspension systems for ceilings, where applicable.

~~1704.12.1~~ **1705.13.1 Physical and visual tests.** The *special inspections* shall include the following tests and observations to demonstrate compliance with the listing and the fire-resistance rating:

1. Condition of substrates.
2. Thickness of application.
3. Density in pounds per cubic foot (kg/m3).
4. Bond strength adhesion/cohesion.
5. Condition of finished application.

~~1704.12.2~~ **1705.13.2 Structural member surface conditions.** The surfaces shall be prepared in accordance with the *approved* fire-resistance design and the written instructions of *approved* manufacturers. The prepared surface of structural members to be sprayed shall be inspected before the application of the sprayed fire-resistant material.

~~1704.12.3~~ **1705.13.3 Application.** The substrate shall have a minimum ambient temperature before and after application as specified in the written instructions of *approved* manufacturers. The area for application shall be ventilated during and after application as required by the written instructions of *approved* manufacturers.

~~1704.12.4~~ **1705.13.4 Thickness.** No more than 10 percent of the thickness measurements of the sprayed fire-resistant materials applied to floor, roof and wall assemblies and structural members shall be less than the thickness required by the *approved* fire-resistance design, but in no case less than the minimum allowable thickness required by Section ~~1704.12.4.1~~ 1705.13.4.1.

~~1704.12.4.1~~ **1705.13.4.1 Minimum allowable thickness.** For design thicknesses 1 inch (25 mm) or greater, the minimum allowable individual thickness shall be the design thickness minus 1/4 inch (6.4 mm). For design thicknesses less than 1 inch (25 mm), the minimum allowable individual thickness shall be the design thickness minus 25 percent.

Thickness shall be determined in accordance with ASTM E 605. Samples of the sprayed fire-resistant materials shall be selected in accordance with Sections ~~1704.12.4.2~~ 1705.13.4.2 and ~~1704.12.4.3~~ 1705.13.4.5.

~~**704.12.4.2**~~ **1705.13.4.2 Floor, roof and wall assemblies.** The thickness of the sprayed fire-resistant material applied to floor, roof and wall assemblies shall be determined in accordance with ASTM E 605, making not less than four measurements for each 1,000 square feet (93 m2) of the sprayed area in each *story* or portion thereof.

~~**1704.12.4.2.1**~~ **1705.13.4.3 Cellular decks.** Thickness measurements shall be selected from a square area, 12 inches by 12 inches (305 mm by 305 mm) in size. A minimum of four measurements shall be made, located symmetrically within the square area.

~~**1704.12.4.2.2**~~ **1705.13.4.4 Fluted decks.** Thickness measurements shall be selected from a square area, 12 inches by 12 inches (305 mm by 305 mm) in size. A minimum of four measurements shall be made, located symmetrically within the square area, including one each of the following: valley, crest and sides. The average of the measurements shall be reported.

~~**1704.12.4.3**~~ **1705.13.4.5 Structural members.** The thickness of the sprayed fire-resistant material applied to structural members shall be determined in accordance with ASTM E 605. Thickness testing shall be performed on not less than 25 percent of the structural members on each floor.

~~**1704.12.4.3.1**~~ **1705.13.4.6 Beams and girders.** At beams and girders thickness measurements shall be made at nine locations around the beam or girder at each end of a 12-inch (305 mm) length.

~~**1704.12.4.3.2**~~ **1705.13.4.7 Joists and trusses.** At joists and trusses, thickness measurements shall be made at seven locations around the joist or truss at each end of a 12-inch (305 mm) length.

~~**1704.12.4.3.3**~~ **1705.13.4.8 Wide-flanged columns.** At wide-flanged columns, thickness measurements shall be made at 12 locations around the column at each end of a 12-inch (305 mm) length.

~~**1704.12.4.3.4**~~ **1705.13.4.9 Hollow structural section and pipe columns.** At hollow structural section and pipe columns, thickness measurements shall be made at a minimum of four locations around the column at each end of a 12-inch (305 mm) length.

~~**1704.12.5**~~ **1705.13.5 Density.** The density of the sprayed fire-resistant material shall not be less than the density specified in the *approved* fire-resistance design. Density of the sprayed fire-resistant material shall be determined in accordance with ASTM E 605. The test samples for determining the density of the sprayed fire-resistant materials shall be selected as follows:

1. From each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet ($232 m^2$) or portion thereof of the sprayed area in each *story*.
2. From beams, girders, trusses and columns at the rate of not less than one sample for each type of structural member for each 2,500 square feet ($232 m^2$) of floor area or portion thereof in each *story*.

~~**1704.12.6**~~ **1705.13.6 Bond strength.** The cohesive/adhesive bond strength of the cured sprayed fire-resistant material applied to floor, roof and wall assemblies and structural members shall not be less than 150 pounds per square foot (psf) ($7.18 kN/m^2$). The cohesive/adhesive bond strength shall be determined in accordance with the field test specified in ASTM E 736 by testing in-place samples of the sprayed fire-resistant material selected in accordance with Sections ~~1704.12.6.1~~ 1705.13.6.1 through ~~1704.12.6.3~~ 1705.13.6.3.

~~**1704.12.6.1**~~ **1705.13.6.1 Floor, roof and wall assemblies.** The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from each floor, roof and wall assembly at the rate of not less than one sample for every 2,500 square feet ($232 m^2$) of the sprayed area in each *story* or portion thereof.

~~**1704.12.6.2**~~ **1705.13.6.2 Structural members.** The test samples for determining the cohesive/adhesive bond strength of the sprayed fire-resistant materials shall be selected from beams, girders, trusses, columns and other structural members at the rate of not less than one sample for each type of structural member for each 2,500 square feet ($232 m^2$) of floor area or portion thereof in each *story*.

~~**1704.12.6.3**~~ **1705.13.6.3 Primer, paint and encapsulant bond tests.** Bond tests to qualify a primer, paint or encapsulant shall be conducted when the sprayed fire-resistant material is applied to a primed, painted or

encapsulated surface for which acceptable bond-strength performance between these coatings and the fire-resistant material has not been determined. A bonding agent *approved* by the SFRM manufacturer shall be applied to a primed, painted or encapsulated surface where the bond strengths are found to be less than required values.

~~1704.13~~ 1705.14 Mastic and intumescent fire-resistant coatings. *Special inspections* for mastic and intumescent fire-resistant coatings applied to structural elements and decks shall be in accordance with AWCI 12-B. *Special inspections* shall be based on the fire-resistance design as designated in the *approved construction documents*.

~~1704.14~~ 1705.15 Exterior insulation and finish systems (EIFS). *Special inspections* shall be required for all EIFS applications.

Exceptions:

1. *Special inspections* shall not be required for EIFS applications installed over a *water-resistive barrier* with a means of draining moisture to the exterior.
2. *Special inspections* shall not be required for EIFS applications installed over masonry or concrete walls.

~~1704.14.1~~ 1705.15.1 Water-resistive barrier coating. A *water-resistive barrier* coating complying with ASTM E 2570 requires *special inspection* of the *water-resistive barrier* coating when installed over a sheathing substrate.

[F] ~~1704.16~~ 1705.16 Special inspection for smoke control. Smoke control systems shall be tested by a special inspector.

[F] ~~1704.16.1~~ 1705.16.1 Testing scope. The test scope shall be as follows:

1. During erection of ductwork and prior to concealment for the purposes of leakage testing and recording of device location.
2. Prior to occupancy and after sufficient completion for the purposes of pressure difference testing, flow measurements and detection and control verification.

[F] ~~1704.16.2~~ 1705.16.2 Qualifications. *Special inspection* agencies for smoke control shall have expertise in fire protection engineering, mechanical engineering and certification as air balancers.

SECTION ~~1711~~ 1706
DESIGN STRENGTHS OF MATERIALS

~~1711.1~~ 1706.1 Conformance to standards. The design strengths and permissible stresses of any structural material that are identified by a manufacturer's designation as to manufacture and grade by mill tests, or the strength and stress grade is otherwise confirmed to the satisfaction of the *building official*, shall conform to the specifications and methods of design of accepted engineering practice or the *approved* rules in the absence of applicable standards.

~~1711.2~~ 1706.2 New materials. For materials that are not specifically provided for in this code, the design strengths and permissible stresses shall be established by tests as provided for in Section ~~1712~~ 1707.

SECTION ~~1712~~ 1707
ALTERNATIVE TEST PROCEDURE

~~1712.1~~ 1707.1 General. In the absence of *approved* rules or other *approved* standards, the *building official* shall make, or cause to be made, the necessary tests and investigations; or the *building official* shall accept duly authenticated reports from *approved agencies* in respect to the quality and manner of use of new materials or assemblies as provided for in Section 104.11. The cost of all tests and other investigations required under the provisions of this code shall be borne by the applicant.

SECTION ~~1713~~ 1708
TEST SAFE LOAD

~~1713.1~~ 1708.1 Where required. Where proposed construction is not capable of being designed by *approved* engineering analysis, or where proposed construction design method does not comply with the applicable material design standard, the system of construction or the structural unit and the connections shall be subjected to the tests prescribed in Section ~~1715~~ 1710. The *building official* shall accept certified reports of such tests conducted by an *approved* testing agency, provided that such tests meet the requirements of this code and *approved* procedures.

SECTION ~~1714~~ 1709
IN-SITU LOAD TESTS

~~1714.1~~ 1709.1 General. Whenever there is a reasonable doubt as to the stability or load-bearing capacity of a completed building, structure or portion thereof for the expected loads, an engineering assessment shall be required. The engineering assessment shall involve either a structural analysis or an in-situ load test, or both. The structural analysis shall be based on actual material properties and other as-built conditions that affect stability or load-bearing capacity, and shall be conducted in accordance with the applicable design standard. If the structural assessment determines that the load-bearing capacity is less than that required by the code, load tests shall be conducted in accordance with Section ~~1714.2~~ 1709.2. If the building, structure or portion thereof is found to have inadequate stability or load-bearing capacity for the expected loads, modifications to ensure structural adequacy or the removal of the inadequate construction shall be required.

~~1714.2~~ 1709.2 Test standards. Structural components and assemblies shall be tested in accordance with the appropriate material standards listed in Chapter 35. In the absence of a standard that contains an applicable load test procedure, the test procedure shall be developed by a *registered design professional* and *approved*. The test procedure shall simulate loads and conditions of application that the completed structure or portion thereof will be subjected to in normal use.

~~1714.3~~ 1709.3 In-situ load tests. In-situ load tests shall be conducted in accordance with Section ~~1714.3.1~~ 1709.3.1 or ~~1714.3.2~~ 1709.3.2 and shall be supervised by a *registered design professional*. The test shall simulate the applicable loading conditions specified in Chapter 16 as necessary to address the concerns regarding structural stability of the building, structure or portion thereof.

~~1714.3.1~~ 1709.3.1 Load test procedure specified. Where a standard listed in Chapter 35 contains an applicable load test procedure and acceptance criteria, the test procedure and acceptance criteria in the standard shall apply. In the absence of specific load factors or acceptance criteria, the load factors and acceptance criteria in Section ~~1714.3.2~~ 1709.3.2 shall apply.

~~1714.3.2~~ 1709.3.2 Load test procedure not specified. In the absence of applicable load test procedures contained within a standard referenced by this code or acceptance criteria for a specific material or method of construction, such *existing structure* shall be subjected to a test procedure developed by a *registered design professional* that simulates applicable loading and deformation conditions. For components that are not a part of the seismic-load-resisting system, the test load shall be equal to two times the unfactored design loads. The test load shall be left in place for a period of 24 hours. The structure shall be considered to have successfully met the test requirements where the following criteria are satisfied:

1. Under the design load, the deflection shall not exceed the limitations specified in Section 1604.3.
2. Within 24 hours after removal of the test load, the structure shall have recovered not less than 75 percent of the maximum deflection.
3. During and immediately after the test, the structure shall not show evidence of failure.

SECTION ~~1715~~ 1710
PRECONSTRUCTION LOAD TESTS

~~1715.1~~ 1710.1 General. In evaluating the physical properties of materials and methods of construction that are not capable of being designed by *approved* engineering analysis or do not comply with applicable material design standards listed in Chapter 35, the structural adequacy shall be predetermined based on the load test criteria established in this section.

~~1715.2~~ 1710.2 Load test procedures specified. Where specific load test procedures, load factors and acceptance criteria are included in the applicable design standards listed in Chapter 35, such test procedures, load factors and acceptance criteria shall apply. In the absence of specific test procedures, load factors or acceptance criteria, the corresponding provisions in Section ~~1715.3~~ 1710.3 shall apply.

~~1715.3~~ 1710.3 Load test procedures not specified. Where load test procedures are not specified in the applicable design standards listed in Chapter 35, the load-bearing and deformation capacity of structural components and assemblies shall be determined on the basis of a test procedure developed by a *registered design professional* that simulates applicable loading and deformation conditions. For components and assemblies that are not a part of the seismic-force-resisting system, the test shall be as specified in Section ~~1715.3.1~~ 1710.3.1. Load tests shall simulate the applicable loading conditions specified in Chapter 16.

~~1715.3.1~~ **1710.3.1Test procedure.** The test assembly shall be subjected to an increasing superimposed load equal to not less than two times the superimposed design load. The test load shall be left in place for a period of 24 hours. The tested assembly shall be considered to have successfully met the test requirements if the assembly recovers not less than 75 percent of the maximum deflection within 24 hours after the removal of the test load. The test assembly shall then be reloaded and subjected to an increasing superimposed load until either structural failure occurs or the superimposed load is equal to two and one-half times the load at which the deflection limitations specified in Section ~~1715.3.2~~ 1710.3.2 were reached, or the load is equal to two and one-half times the superimposed design load. In the case of structural components and assemblies for which deflection limitations are not specified in Section ~~1715.3.2~~ 1710.3.2, the test specimen shall be subjected to an increasing superimposed load until structural failure occurs or the load is equal to two and one-half times the desired superimposed design load. The allowable superimposed design load shall be taken as the lesser of:

1. The load at the deflection limitation given in Section ~~1715.3.2~~ 1710.3.2.
2. The failure load divided by 2.5.
3. The maximum load applied divided by 2.5.

~~1715.3.2~~ **1710.3.2 Deflection.** The deflection of structural members under the design load shall not exceed the limitations in Section 1604.3.

~~1715.4~~ **1710.4 Wall and partition assemblies.** *Load-bearing wall* and partition assemblies shall sustain the test load both with and without window framing. The test load shall include all design load components. Wall and partition assemblies shall be tested both with and without door and window framing.

~~1715.5~~ **1710.5 Exterior window and door assemblies.** The design pressure rating of exterior windows and doors in buildings shall be determined in accordance with Section ~~1715.5.1~~ 1710.5.1 or ~~1715.5.2~~ 1710.5.2.

Exception: Structural wind load design pressures for window units smaller than the size tested in accordance with Section ~~1715.5.1~~ 1710.5.1 or ~~1715.5.2~~ 1710.5.2 shall be permitted to be higher than the design value of the tested unit provided such higher pressures are determined by accepted engineering analysis. All components of the small unit shall be the same as the tested unit. Where such calculated design pressures are used, they shall be validated by an additional test of the window unit having the highest allowable design pressure.

~~1715.5.1~~ **1710.5.1 Exterior windows and doors.** Exterior windows and sliding doors shall be tested and labeled as conforming to AAMA/WDMA/CSA101/I.S.2/A440. The *label* shall state the name of the manufacturer, the *approved* labeling agency and the product designation as specified in AAMA/ WDMA/CSA101/I.S.2/A440. Exterior side-hinged doors shall be tested and *labeled* as conforming to AAMA/WDMA/CSA101/I.S.2/A440 or comply with Section ~~1715.5.2~~ 1710.5.2. Products tested and labeled as conforming to AAMA/WDMA/CSA 101/I.S.2/A440 shall not be subject to the requirements of Sections 2403.2 and 2403.3.

~~1715.5.2~~ **1710.5.2 Exterior windows and door assemblies not provided for in Section ~~1715.5.1~~ 1710.5.1.** Exterior window and door assemblies shall be tested in accordance with ASTM E 330. Structural performance of garage doors shall be determined in accordance with either ASTM E 330 or ANSI/DASMA 108, and shall meet the acceptance criteria of ANSI/DASMA 108. Exterior window and door assemblies containing glass shall comply with Section 2403. The design pressure for testing shall be calculated in accordance with Chapter 16. Each assembly shall be tested for 10 seconds at a load equal to 1.5 times the design pressure.

~~1715.6~~ **1710.6 Test specimens.** Test specimens and construction shall be representative of the materials, workmanship and details normally used in practice. The properties of the materials used to construct the test assembly shall be determined on the basis of tests on samples taken from the load assembly or on representative samples of the materials used to construct the load test assembly. Required tests shall be conducted or witnessed by an *approved agency*.

SECTION ~~1716~~ 1711
MATERIAL AND TEST STANDARDS

~~1716.1~~ **1711.1 Test standards for joist hangers and connectors.**

~~1716.1.1~~ **1711.1.1Test standards for joist hangers.** The vertical load-bearing capacity, torsional moment capacity and deflection characteristics of joist hangers shall be determined in accordance with ASTM D 1761 using lumber having a specific gravity of 0.49 or greater, but not greater than 0.55, as determined in accordance with AF&PA NDS for the joist and headers.

Exception: The joist length shall not be required to exceed 24 inches (610 mm).

~~1716.1.2~~ **1711.1.2 Vertical load capacity for joist hangers.** The vertical load capacity for the joist hanger shall be determined by testing a minimum of three joist hanger assemblies as specified in ASTM D 1761. If the ultimate vertical load for any one of the tests varies more than 20 percent from the average ultimate vertical load, at least three additional tests shall be conducted. The allowable vertical load of the joist hanger shall be the lowest value determined from the following:

1. The lowest ultimate vertical load for a single hanger from any test divided by three (where three tests are conducted and each ultimate vertical load does not vary more than 20 percent from the average ultimate vertical load).
2. The average ultimate vertical load for a single hanger from all tests divided by three (where six or more tests are conducted).
3. The average from all tests of the vertical loads that produce a vertical movement of the joist with respect to the header of 1/8 inch (3.2 mm).
4. The sum of the allowable design loads for nails or other fasteners utilized to secure the joist hanger to the wood members and allowable bearing loads that contribute to the capacity of the hanger.
5. The allowable design load for the wood members forming the connection.

~~1716.1.3~~ **1711.1.3 Torsional moment capacity for joist hangers.** The torsional moment capacity for the joist hanger shall be determined by testing at least three joist hanger assemblies as specified in ASTM D 1761. The allowable torsional moment of the joist hanger shall be the average torsional moment at which the lateral movement of the top or bottom of the joist with respect to the original position of the joist is 1/8 inch (3.2 mm).

~~1716.1.4~~ **1711.1.4 Design value modifications for joist hangers.** Allowable design values for joist hangers that are determined by Item 4 or 5 in Section ~~1716.1.2~~ 1711.1.2 shall be permitted to be modified by the appropriate duration of loading factors as specified in AF&PA NDS but shall not exceed the direct loads as determined by Item 1, 2 or 3 in Section ~~1716.1.2~~ 1711.1.2. Allowable design values determined by Item 1, 2 or 3 in Section ~~1716.1.2~~ 1711.1.2 shall not be modified by duration of loading factors.

~~1716.2~~ **1711.2 Concrete and clay roof tiles.**

~~1716.2.1~~ **1711.2.1 Overturning resistance.** Concrete and clay roof tiles shall be tested to determine their resistance to overturning due to wind in accordance with SBCCI SSTD 11 and Chapter 15.

~~1716.2.2~~ **1711.2.2 Wind tunnel testing.** When roof tiles do not satisfy the limitations in Chapter 16 for rigid tile, a wind tunnel test shall be used to determine the wind characteristics of the concrete or clay tile roof covering in accordance with SBCCI SSTD 11 and Chapter 15.

Reason: The current chapter organization includes actual construction material inspection requirements (e.g. concrete inspection) sandwiched between sections related to the statement of special inspection and other procedural requirements. The result is difficulty in implementing a project specific special inspection program and potential for misinterpretation. This proposal relocates provisions contained in sections 1705, 1709, and 1710 into 1704 to increase clarity of intent and provide more ease of use. Note that current sections 1709 (Contractor Responsibility) and 1710 (Structural Observations) are included in the new 1704 since they are part of the overall program to assure that construction is in accordance with the design intent. The reorganization renames two sections to reflect updated content within the sections and renumbers sections following 1704, but does not make changes to tables or overall chapter content. This reorganization follows a more logical and consistent order as follows:

1701 GENERAL – unchanged
1702 DEFINITIONS – unchanged
1703 APPROVALS – unchanged
1704 SPECIAL INSPECTIONS, CONTRACTOR RESPONSIBILITY AND STRUCTURAL OBSERVATIONS – outlines the requirements for special inspection, the Statement of Special Inspections, Contractor Responsibility and Structural Observation, prior to the listing of the actual special inspections required by material. This Section now includes portions of old 1704, and all of old 1705, 1709 and 1710
1705 – REQUIRED VERIFICATION AND INSPECTION – outlines the material-specific inspections and testing requirements. It will include most of old Section1704 as well as all of old Sections 1706, 1707 and 1708.
1706 – DESIGN STRENGTHS OF MATERIALS – old Section 1711 unchanged
1707 – ALTERNATIVE TESTING PROCEDURE – old Section 1712 unchanged
1708 – TEST SAFE LOAD – old Section 1713 unchanged
1709 – IN-SITU LOAD TESTS - old Section 1714 unchanged
1710 - PRECONSTRUCTION LOAD TESTS - old Section 1715 unchanged
1711 – MATERIAL AND TEST STANDARDS - old Section 1716 unchanged

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: HARMAN-S6-CHAPTER 17

S117–09/10
1704.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1704.1 General. Where application is made for construction as described in this section, the owner or the registered design professional in responsible charge acting as the owner's agent shall employ one or more approved agencies to perform inspections during construction on the types of work listed under Section 1704. These inspections are in addition to the inspections specified in Section 109.

The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for the inspection of the particular type of construction or operation requiring special inspection. The registered design professional in responsible charge and engineers of record involved in the design of the project are permitted to act as the approved agency and their personnel are permitted to act as the special inspector for the work designed by them, provided those personnel meet the qualification requirements of this section to the satisfaction of the building official. The special inspector shall provide written documentation to the building official demonstrating his or her competence and relevant experience or training. Experience or training shall be considered relevant when the documented experience or training is related in complexity to the same type of special inspection activities for projects of similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of this code.

Exceptions:

1. Special inspections are not required for work of a minor nature or as warranted by conditions in the jurisdiction as approved by the building official.
2. ~~Special inspections are not required for building components unless the design involves the practice of professional engineering or architecture as defined by applicable state statutes and regulations governing the professional registration and certification of engineers or architects.~~
3. 2. Unless otherwise required by the building official, special inspections are not required for Group U occupancies that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.

.

Reason: Exception #2 of Section 1704.1 exempts from special inspection building components not designed by a registered design professional such as an architect or structural engineer. The exception is being deleted because "building component" is not defined, its meaning is vague and its application is subject to a wide variation in interpretation. If an exception for building components was warranted for which justification is not apparent, it would appear that building components designed by a registered design professional would be exempt due to the expertise provided by the registered design professional in its design; building components designed by other than a registered design professional would not be exempt. The need for special inspection of a building component should be determined based on the current requirements for special inspection in Sections 1704, 1706, 1707 and 1708. Special inspection for a building component may not be warranted but that determination should be made by applying Exception #1 of Section 1704.1 for work of a minor nature or as warranted by local conditions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S22-1704.1

S118–09/10
1704.1

Proponent: Gary J. Ehrlich, PE, representing National Association of Home Builders

Revise as follows:

1704.1 General. Where application is made for construction as described in this section, the owner or the *registered design professional in responsible charge* acting as the owner's agent shall employ one or more *approved agencies* to perform inspections during construction on the types of work listed under Section 1704. These inspections are in addition to the inspections identified in Section 110.

The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the *building official*, for the inspection of the particular type of construction or operation requiring *special inspection*. The *registered design professional in responsible charge* and engineers of record involved in the design of the project are permitted to act as the *approved agency* and their personnel are permitted to act as the special inspector for the work designed by them, provided those personnel meet the qualification requirements of this section to the satisfaction of the *building official*. The special inspector shall provide written documentation to the building official demonstrating their competence and relevant experience or training. Experience or training shall be considered relevant when the documented experience or training is related in complexity to the same type of *special inspection* activities for projects of similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of this code.

Exceptions:

1. *Special inspections* are not required for work of a minor nature or as warranted by conditions in the jurisdiction as *approved* by the *building official*.
2. *Special inspections* are not required for building components unless the design involves the practice of professional engineering or architecture as defined by applicable state statutes and regulations governing the professional registration and certification of engineers or architects.
3. Unless otherwise required by the *building official*, *special inspections* are not required for Group U occupancies that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.
4. Special inspections are not required for portions of structures designed and constructed in accordance with the conventional light-frame construction provisions of Section 2308.

Reason: The purpose of this proposal is to add an exemption from third-party special inspections for portions of wood-frame dwellings or other simple wood-frame structures constructed under prescriptive provisions within the International Building Code (IBC). Without this exception, a building official may require a builder to contract with a third-party inspector, with the expense passed on to the homeowner.

A change made to the IBC during the 2006-07 Code Development Cycle (S31-06/07) struck the exemption for Residential R-3 structures, and now subjects one- and two-family dwellings and townhouses designed under the IBC to the requirements for special inspections. These inspections are in addition to the standard inspections performed by the building department. Also, other structures classified as R-3 occupancies (group homes, day care) will be subject to these special inspections for all elements of their construction. As justification for the original code change, the proponent claimed R 3 structures often contain complicated roof truss systems, structural steel framing, reinforced masonry and other complex elements or unusual construction materials and methods requiring the qualifications and experience of a special inspector.

But, IBC Section 1704.1.1 exempts the registered design professional from needing to prepare, and the permit applicant from needing to submit, a statement of special inspections for structures designed and constructed per Section 2308. This clearly implies that structures built under Section 2308 do not need special inspections for any element, including the wood wall framing, roof and floor trusses, concrete or masonry foundations, and any miscellaneous masonry or steel framing inside the structure. In a structure designed to the conventional construction provisions, these elements are not likely to be as complex as those in a fully-engineered structure.

Building departments are more than capable of reviewing and inspecting these simple structures. In the case of items such as trusses and miscellaneous steel framing that may occur in a structure otherwise designed using conventional construction provisions, shop drawings will be submitted to the building official for their review and use in inspections. The building department does not need a special inspector to do their work for them in reviewing and inspecting these structures and elements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Ehrlich-S1-1704 1

S119–09/10
1704.1.1 (New)

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Add new text as follows:

1704.1.1 Access for special inspection. The construction or work for which special inspection is required shall remain accessible and exposed for special inspection purposes until completion of the required special inspections.

(Renumber subsequent sections)

Reason: Section 110.1 requires construction or work requiring inspection to remain accessible and exposed for inspection purposes until approved. The IBC does not have a comparable statement for special inspections and this proposal provides it.

For inspections by the building official, the requirement that the construction or work remain accessible and exposed until approved is derived from the powers and duties entrusted to building officials by the jurisdictions they serve and which are specified in Section 104. A special inspector, however, is typically not a public official but a private individual providing third-party special inspection services to an owner or owner's authorized

agent. A special inspector is typically not authorized to approve construction or work and relies on the building official for that authority. The lack of the authority by the special inspector to approve construction or work is why the requirement for construction or work to remain accessible and exposed is being proposed.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S26-1704.1.1

S120–09/10
1704.1.1, 1705.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1704.1.1 Statement of special inspections. The applicant shall submit a statement of special inspections ~~prepared by the registered design professional in responsible charge~~ in accordance with Section 107.1 as a condition for permit issuance. This statement shall be in accordance with Section 1705.

Exceptions~~:~~

1. ~~1.~~ A statement of special inspections is not required for structures designed and constructed in accordance with the conventional construction provisions of Section 2308.
2. ~~2. The statement of special inspections is permitted to be prepared by a qualified person approved by the building official for construction not designed by a registered design professional.~~

1705.1 General. Where special inspection or testing is required by Section 1704, 1707 or 1708, the registered design professional in responsible charge shall prepare a statement of special inspections in accordance with Section ~~1705~~ 1705.2 for submittal by the applicant ~~(see~~ in accordance with Section 1704.1.1~~)~~.

Exception: The statement of special inspections is permitted to be prepared by a qualified person approved by the building official for construction not designed by a registered design professional.

Reason: The purpose for this proposal is to improve the scoping provisions applicable to the statement of special inspections. Section 1705.1 requires the statement of special inspections to be prepared by the registered design professional in responsible charge where special inspection or testing is required elsewhere in Chapter 17. Exception #2 of Section 1704.1.1, however, permits the statement to be prepared by a qualified person approved by the building official for construction not designed by a registered design professional. The charging text of Section 1704.1.1 requires submittal of a statement of special inspections prepared by the registered design professional in responsible charge "in accordance with Section 107.1." Section 107.1, however, contains requirements for submission of documents with each permit application.

The proposal deletes from the charging text of Section 1704.1.1 preparation of the statement of special inspections by the registered design professional in responsible charge because the requirements for preparation are in Section 1705 and Section 1704.1.1 references Section 1705. Section 1704.1.1, then, becomes a requirement for submittal of the statement of special inspections in accordance with Section 107.1. Exception #1 of Section 1704.1.1 is retained because it exempts structures designed and constructed in accordance with the conventional construction provisions of Section 2308 from the requirement for **submittal** (emphasis mine) of a statement of special inspections. Exception #2, however, is relocated to Section 1705.1 because it exempts structures not designed by a registered design professional from the requirement for **preparation** (emphasis mine) of a statement of special inspections by the registered design professional in responsible charge.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S32-1704.1.1

S121–09/10
1704.3-1704.3.3.3, Table 1704.3

Proponent: Bonnie Manley, American Iron and Steel Institute, representing American Institute of Steel Construction

1. Revise as follows:

1704.3 Steel construction. The *special inspections* for steel elements of buildings and structures shall be as required in this Section ~~by Section 1704.3 and Table 1704.3~~.

Exceptions:

1. *Special inspection* of the steel fabrication process shall not be required where the fabricator does not perform any welding, thermal cutting or heating operation of any kind as part of the fabrication process. In such cases, the fabricator shall be required to submit a detailed procedure for material control that demonstrates the fabricator's ability to maintain suitable records and procedures such that, at any time during the fabrication process, the material specification, and grade and mill test reports for the main stress-carrying elements are capable of being determined. Mill test reports shall be identifiable to the main stress-carrying elements when required by the approved construction documents.
2. The special inspector need not be continuously present during welding of the following items, provided the materials, welding procedures and qualifications of welders are verified prior to the start of the work; periodic inspections are made of the work in progress and a visual inspection of all welds is made prior to completion or prior to shipment of shop welding.
   2.1. Single-pass fillet welds not exceeding 5/16 inch (7.9 mm) in size.
   2.2. Floor and roof deck welding.
   2.3. Welded studs when used for structural diaphragm.
   2.4. Welded sheet steel for cold-formed steel members.
   2.5. Welding of stairs and railing systems.

1704.3.1 Structural steel. Special inspection for structural steel shall be in accordance with the quality assurance inspection requirements of AISC 360.

1704.3.2 Steel construction other than structural steel. Special inspection for steel construction other than structural steel shall be in accordance with Table 1704.3 and this section.

1704.3.1 1704.3.2.1 Welding. Welding inspection and welding inspector qualification shall be in accordance with this section.

1704.3.1.1 Structural steel. Welding inspection and welding inspector qualification for structural steel shall be in accordance with AWS D1.1.

1704.3.1.2 1704.3.2.1.1 Cold-formed steel. Welding inspection and welding inspector qualification for cold-formed steel floor and roof decks shall be in accordance with AWS D1.3.

1704.3.1.3 1704.3.2.1.2 Reinforcing steel. Welding inspection and welding inspector qualification for reinforcing steel shall be in accordance with AWS D1.4 and ACI 318.

2. Delete without substitution:

1704.3.2 Details. The special inspector shall perform an inspection of the steel frame to verify compliance with the details shown on the *approved construction documents*, such as bracing, stiffening, member locations and proper application of joint details at each connection.

1704.3.3 High-strength bolts. Installation of high-strength bolts shall be inspected in accordance with AISC 360.

1704.3.3.1 General. While the work is in progress, the special inspector shall determine that the requirements for bolts, nuts,washers and paint; bolted parts and installation and tightening in such standards are met. For boltsrequiring pretensioning, the special inspector shall observe the preinstallation testing and calibration procedures when such procedures are required by the installation method or by project plans or specifications; determine that all plies of connected materials have been drawn together and properly snugged and monitor the installation of bolts to verify that the selected procedure for installation is properly used to tighten bolts. For joints required to be tightened only to the snug-tight condition, the special inspector need only verify that the connected materials have been drawn together and properly snugged.

1704.3.3.2 Periodic monitoring. Monitoring of bolt installation for pretensioning is permitted to be performed on a periodic basis when using the turn-of-nut method with matchmarking techniques, the direct tension indicator method or the alternate design fastener (twist-off bolt) method. Joints designated as snug tight need be inspected only on a periodic basis.

1704.3.3.3 Continuous monitoring. Monitoring of bolt installation for pretensioning using the calibrated wrench method or the turn-of-nut method without matchmarking shall be performed on a continuous basis.

3. Revise as follows:

~~1704.3.4~~ **1704.3.2.2 Cold-formed steel trusses spanning 60 feet or greater.** Where a cold-formed steel truss clear span is 60 feet (18 288 mm) or greater, the special inspector shall verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the *approved* truss submittal package.

TABLE 1704.3
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]	IBC REFERENCE
~~1. Material verification of high-strength bolts, nuts and washers:~~				
~~a. Identification markings to conform to ASTM standards specified in the approved construction documents.~~	~~—~~	~~X~~	~~AISC 360, Section A3.3 and applicable ASTM material standards~~	~~—~~
~~b. Manufacturer's certificate of compliance required.~~	~~—~~	~~X~~	~~—~~	~~—~~
~~2. Inspection of high-strength bolting:~~				
~~a.Snug-tight joints.~~	~~—~~	~~X~~	~~AISC 360, Section M2.5~~	~~1704.3.3~~
~~b. Pretensioned and slip-critical joints using turn-of-nut with matchmarking, twist-off bolt, or direct tension indicator methods of installation.~~	~~—~~	~~X~~		
~~c. Pretensioned and slip-critical joints using turn-of-nut without matchmarking or calibrated wrench methods of installation.~~	~~X~~	~~—~~		
1~~3~~. Material verification of ~~structural steel and~~ cold-formed steel deck:				
~~a. For structural steel, identification markings to conform to AISC 360.~~	~~—~~	~~X~~	~~AISC 360, Section M5.5~~	
a.~~b. For other steel, i~~Identification markings to conform to ASTM standards specified in the approved construction documents.	—	X	Applicable ASTM material standards	
b~~c~~. Manufacturers' certified test reports.	—	X		
~~4. Material verification of weld filler materials:~~				
~~a. Identification markings to conform to AWS specification in the approved construction documents.~~	~~—~~	~~X~~	~~AISC 360, Section A3.5 and Applicable AWS A5 documents~~	~~—~~
~~b. Manufacturer's certificate of compliance required.~~	~~—~~	~~X~~	~~—~~	~~—~~
2~~5~~. Inspection of welding: a. ~~Structural steel and c~~Cold-formed steel deck:				
~~1) Complete and partial joint penetration groove welds.~~	~~X~~	~~—~~	~~AWS D1.1~~	~~1704.3.1~~
~~2) Multipass fillet welds.~~	~~X~~	~~—~~		
~~3) Single-pass fillet welds >5/16"~~	~~X~~	~~—~~		
~~4) Plug and slot welds~~	~~X~~	~~—~~		
~~5) Single-pass fillet welds ≤5/16"~~	~~—~~	~~X~~		
1~~6~~) Floor and roof deck welds.	—	X	AWS D1.3	
b. Reinforcing steel:				

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]	IBC REFERENCE
1) Verification of weldability of reinforcing steel other than ASTM A 706.	—	X	AWS D1.4 or ACI 318: Section 3.5.2	—
2) Reinforcing steel-resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special reinforced concrete shear walls and shear reinforcement.	X	—		
3) Shear reinforcement.	X	—		
4) Other reinforcing steel.	—	X		
~~6. Inspection of steel frame joint details for compliance with approved construction documents:~~				
~~a. Details such as bracing and stiffening.~~	~~—~~	~~X~~	~~—~~	~~1704.3.2~~
~~b. Member locations.~~	~~—~~	~~X~~		
~~c. Application of joint details at each connection.~~	~~—~~	~~X~~		

For SI: 1 inch = 25.4 mm.

a. Where applicable, see also Section 1707.1, Special inspection for seismic resistance.

Reason: The 2010 edition of ANSI/AISC 360, *Specification for Structural Steel Buildings,* incorporates a new Chapter N, which addresses comprehensive quality control and quality assurance requirements for all structural steel construction. These requirements are similar in nature to those that were incorporated into the 2005 edition of AISC 341, Appendix Q. Those AISC 341 requirements are currently referenced in the 2009 edition of the IBC, Sections 1707 and 1708 for special inspection requirements in high-seismic applications. AISC 360-10, Chapter N provisions provide the foundation for the quality control and quality assurance requirements for general structural steel construction, with AISC 341-10, Chapter I (previously contained in AISC 341-05, Appendix Q) extending specific requirements to high-seismic applications.

AISC 360, Chapter N covers quality control requirements on the part of the structural steel fabricator and erector, as well as quality assurance requirements on the part of the owners inspecting and or testing agents. While AISC 360 addresses the total quality aspects of the structural steel project, the inspection requirements of the Quality Assurance Inspector can be equated to those specified for the Special Inspector under IBC Chapter 17.

The present Section 1704.3 addresses all forms of steel construction. The majority of the requirements in this section and Table 1704.3 pertain to structural steel construction. However, there are a few items which refer to cold-formed steel construction and rebar welding, which are not covered by AISC 360. The current special inspection requirements for structural steel as covered in Section 1704.3 and Table 1704.3 are recommended for deletion by this proposal; and, instead, a direct reference is made to the more detailed requirements of AISC 360, Chapter N. Requirements for special inspection of other forms of steel construction are left in a separate section of Section 1704.3.2, and in a reduced Table 1704.3, *Steel Construction Other than Structural Steel*.

Specifically, the topics currently in IBC Section 1704.3 are covered in AISC 360, Chapter N as follows:

Section 1704.3, Exception 2: The structural steel items are covered in AISC 360, Section N5.5. As for the cold formed steel exception applicable to roof and floor deck, it really is not correct and is recommended for deletion. Shop welding is typically used for a multi-skin closed cell deck, which would be a violation of the AWS D1.3 requirement that arc spot is only valid for deck to underlying structural members (D1.3, Clause 1.5.4). Multi-skin deck within itself appears to fall outside of the code itself and requires direct qualification by the manufacturer of their processes, potentially through testing rather than calculations. In reality, cold formed steel deck is sufficiently covered in Section 1704.3.2.1.1, Table 1704.3, and the reference to AWS D1.3.

Section 1704.3.2: AISC 360, Section N5.8.

Section 1704.3.3: AISC 360, Section N5.7(3)

Additionally, the topics currently in IBC Table 1704.3 are covered as in AISC 360, Chapter N as follows:

Table 1704.3, Item 1: AISC 360, Section N5.7 and Table N5.7-1.

Table 1704.3, Item 2: AISC 360, Section N5.7

Table 1704.3, Item 3a: AISC 360, Section N3.2 requires that the MTRs, as well as numerous other documents be made available for EOR review.

Table 1704.3, Item 4: AISC 360, Section N5.5 and Table N5.5-1

Table 1704.3, Item 5: AISC 360, Section N5.5

Table 1704.3, Item 6: AISC 360, Section N5.8

Also, Section 1704.3, Exception 1 is retained and modified to clarify the requirements. Often in practice, the "representative mill test reports" are supplied as described in the AISC Code of Standard practice. The added sentence on mill test reports allows for traceability when required by the construction documents, and defers to AISC 360 in other cases.

Please note, public review drafts of the 2010 AISC documents can be found on the AISC website (www.aisc.org). The public review period for AISC 360-10 is currently scheduled for 8/14/09 through 9/28/09 and the public review period for AISC 341-10 is currently scheduled for 9/11/09 through 10/26/09. It is anticipated that the 2010 editions of both AISC 360 and AISC 341 will be technically complete by the end of October 2009, with ANSI approval in March 2010 and publication in August 2010.

Cost Impact: There is no anticipated impact on the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Manley-S13-1704.3

S122–09/10
Table 1704.4

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

TABLE 1704.4
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTIN-UOUS	PERIODIC	REFERENCED STANDARD [a]	IBC REFERENCE
3. Inspection of ~~bolts to be installed in concrete prior to and during placement of~~ anchors cast in concrete where allowable loads have been increased or where strength design is used.	~~X~~ —	— X	ACI 318; 8.1.3, 21.2.8	1911.5, 1912.1
4. Inspection of anchors ~~installed in~~ post-installed in hardened concrete members and designed in accordance with Section 1912. [b]	X	~~X~~ —	ACI 318; 3.8.6, 8.1.3, 21.2.8	1912.1
5. Inspection of anchors post-installed in hardened concrete members and qualified for installation through Section 104.11.	Note b	Note b		

(Portions of table not shown do not change)

a. Where applicable, see also Section 1707.1, Special inspection for seismic resistance.
b. Special inspection of anchors qualified for installation through Section 104.11 shall be conducted in accordance with the requirements specified in the report of qualification, such as an evaluation report issued by the ICC Evaluation Service.

Reason: The purpose for this proposal is to adjust the required extent of special inspection for concrete anchors to be more consistent with the access available for special inspectors to perform their duties. Anchors that are cast into concrete are visible for inspection from their installation until the concrete is placed. In this regard, their inspection is similar to that of concrete reinforcement for which Table 1704.3 currently specifies periodic special inspection. It is sufficient for special inspectors to be present intermittently during installation of the cast-in anchors, provided they are able to perform their inspections prior to placement of the concrete after which effective inspection is severely diminished.

Anchors that are post-installed into hardened concrete, however, require the presence of the special inspector during their installation to verify that the anchors are installed in accordance with the construction documents, the project specifications and installation instructions by the manufacturer of the anchors. In this regard, their inspection is similar to that of concrete placement for which Table 1704.3 currently specifies continuous special inspection. They may not need to be present continuously during installation of all the post-installed anchors but their presence is needed during the installation of a certain percentage of them and the extent and frequency of the special inspection should be agreed upon beforehand by all affected parties, including, but not limited to, the owner or owner's representative, contractor, special inspector and the building official.

Item #3 on bolts to be installed in concrete currently applies to bolts designed using (1) allowable stress design procedures and increases in allowable loads, which is primarily intended for increases permitted by IBC Section 1911.5, and (2) strength design procedures for which IBC Section 1912.1 requires compliance with Appendix D of ACI 318 as modified therein. The references to IBC Sections 1911.5 and 1912.1 at the column of IBC references account for this. Section 1912.1 governs the "strength design of anchors installed in concrete for purposes of transmitting structural loads from one connected element to the other." Compliance with Appendix D of ACI 318 is required for anchors that are within its scope. For all other anchors, design "in accordance with an approved procedure" is required.

Item #3 is changed to "anchors cast in concrete" for consistency with similar terms used in IBC Sections 1911.5 and 1912.1 and Appendix D of ACI 318 and because it is seen as a more general term than "bolts to be installed in concrete." The requirement for continuous special inspection is changed to periodic special inspection as discussed in the first paragraph of this statement. Section D.1 in Appendix D of ACI 318 defines "cast-in anchor" as "a headed bolt, headed stud or hooked bolt installed before placing concrete" and Section D2.2 includes post-installed anchors in its scoping statement. Section D.1 of Appendix D also defines "anchor" as "a steel element either cast into concrete or post-installed into a hardened concrete member and used to transmit applied loads, including headed bolts, hooked bolts (J- or L-bolt), headed studs, expansion anchors or undercut anchors."

Item #4 on anchors installed in hardened concrete applies to anchors complying with IBC Section 1912 for which Section 1912.1 requires the use of strength design procedures in accordance with Appendix D of ACI 318 as modified therein. The reference to IBC Section 1912.1 at the column of IBC references accounts for this.

Item #4 is changed to "anchors post-installed in hardened concrete" for consistency with Appendix D of ACI 318 and to more clearly distinguish them from "anchors cast in concrete." The requirement for periodic special inspection is changed to continuous special inspection as discussed in the second paragraph of this statement. Section D.1 in Appendix D of ACI 318 defines "post-installed anchor" as "an anchor installed in hardened concrete" and Section D2.2 includes cast-in anchors in its scoping statement.

Item #4 is also revised by adding a reference to IBC Section 1912.1. Adding the reference would not be necessary if Section 1912.1 applied to all post-installed anchors designed with strength design procedures and continuous special inspection as defined in Section 1702.1 was sufficient to specify the frequency and extent to which special inspection is needed. This is considered necessary for anchors post-installed into hardened concrete that are designed and installed in accordance with IBC Section 1912.1 but it is not always considered necessary for anchors post-installed into hardened concrete that are qualified for use in accordance with Section 104.11 on alternative means and methods through nationally recognized evaluation services, such as the ICC Evaluation Service (ICC-ES).

The evaluation reports issued by ICC-ES frequently identify requirements for special inspection by referencing the requirements of IBC Chapter 17 for that purpose. Some evaluation reports, however, specify in detail what is required of a special inspector. Extent and frequency are often included. As long as this is limited to the evaluation report, it improves the process of special inspection. Many of these evaluation reports with

these detailed requirements, however, also specify periodic or continuous special inspection and reference IBC Chapter 17 in the process. When this is done, compliance with applicable special inspection requirements in the report and in IBC Chapter 17 are assumed and, presumably, expected. The threshold between continuous and periodic special inspection in the IBC versus these evaluation reports, however, is different. IBC Chapter 17 relies on the definitions of "continuous special inspection" and "periodic special inspection" to distinguish between them. The evaluation reports that specify detailed special inspection requirements rely on these detailed requirements. Where these reports also specify periodic or continuous special inspection and reference IBC Chapter 17, however, they create conflicts between the report and the IBC if the threshold between continuous and periodic special inspection is different in the evaluation report than it would be if the report did not exist and the anchor was designed and installed for compliance with the IBC without the benefit of an evaluation report.

Ideally, where detailed requirements for special inspection are included in an ICC-ES evaluation report, they would be specified insufficient detail that there would be no mention of continuous or periodic special inspection. The detailed requirements would effectively serve the same purpose as the distinction between continuous and periodic special inspection serves in the IBC.

Conflicts now exist between post-installed concrete anchors qualified by Section 104.11 through an ICC-ES evaluation report versus such anchors designed and installed to meet the requirements of the IBC without the benefit of an evaluation report. Consider concrete adhesive anchors as an example. Based on the definitions in Section 1702.1, continuous special inspection is considered necessary because an inspector must be present during the installation of the anchor to effectively perform an inspection. The typical evaluation report for a concrete adhesive anchor, however, specifies periodic special inspection. Where special inspection for the anchor is conducted in accordance with the detailed requirements in such a report, effective inspection can occur. But if special inspection for the anchor is conducted in accordance with Table 1704.4 of the 2009 IBC based on the definition of periodic inspection in Section 1702.1, effective inspection can not occur because it may be too late to effectively inspect a concrete adhesive anchor once installation has begun.

Item #5 is added to (1) account for post-installed anchors qualified for use in accordance with Section 104.11 through nationally recognized evaluation services, such as the ICC Evaluation Service (ICC-ES), and to (2) distinguish between the requirements for special inspection of anchors designed to comply with the IBC alone versus those qualified for use through evaluation services such as ICC-ES.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S51-1704.4

S123-09/10
1704.5

Proponent: D. Kirk Harman, The Harman Group representing The National Council of Structural Engineers Associations (NCSEA) Code Advisory Committee, Quality Assurance and Special Inspection Subcommittee

1. Revise as follows:

1704.5 Masonry construction. Masonry construction shall be inspected and verified in accordance with TMS 402/ACI 530/ASCE 5 and TMS 602/ACI 530.1/ASCE 6 quality assurance program requirements. ~~the requirements of Sections 1704.5.1 through 1704.5.3, depending on the occupancy category of the building or structure.~~

Exception: Special inspections shall not be required for:

1. Empirically designed masonry, glass unit masonry or masonry veneer designed by Section 2109, 2110 or Chapter 14, respectively, ~~or by Chapter 5, 7 or 6 of TMS 402/ACI 530/ASCE 5, respectively,~~ when they are part of structures classified as Occupancy Category I, II or III in accordance with Section 1604.5.
2. Masonry foundation walls constructed in accordance with Table 1807.1.6.3(1), 1807.1.6.3(2), 1807.1.6.3(3) or 1807.1.6.3(4).
3. Masonry fireplaces, masonry heaters or masonry chimneys installed or constructed in accordance with Section 2111, 2112 or 2113, respectively.

1704.5.1 Empirically designed masonry, glass unit masonry and masonry veneer in Occupancy Category IV. The minimum special inspection program for empirically designed masonry, glass unit masonry or masonry veneer designed by Section 2109, 2110 or Chapter 14, respectively, ~~or by Chapter 5, 7 or 6 of TMS 402/ACI ASCE 5, respectively,~~ in structures classified as Occupancy Category IV, in accordance with Section 1604.5, shall comply with TMS 402/ACI 530/ASCE 5 Level B Quality Assurance. ~~Table 1704.5.1.~~

2. Delete without substitution:

~~**1704.5.2 Engineered masonry in Occupancy Category I, II or III.** The minimum special inspection program for masonry designed by Section 2107 or 2108 or by chapters other than Chapter 5, 6 or 7 of TMS402/ACI 530/ASCE 5 in structures classified as Occupancy Category I, II or III, in accordance with Section 1604.5, shall comply with Table 1704.5.1.~~

1704.5.3 Engineered masonry in Occupancy Category IV. The minimum special inspection program for masonry designed by Section 2107 or 2108 or by chapters other than Chapter 5, 6 or 7 of TMS402/ACI 530/ASCE 5 in structures classified as Occupancy Category IV, in accordance with Section 1604.5, shall comply with Table 1704.5.3.

TABLE 1704.5.1
LEVEL 1 REQUIRED VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION

VERIFICATION AND INSPECTION	FREQUENCY OF INSPECTION		REFERENCE FOR CRITERIA		
	CONTINUOUS	PERIODIC	IBC SECTION	TMS 402/ACI 530/ASCE 5a	TMS 602/ACI 530.1/ASCE 6a
1. Compliance with required inspection pro-visions of the construction documents and the approved submittals shall be verified.	—	X	—	—	Art. 1.5
2. Verification of f'_m and f'_{AAC} prior to con-struction except where specifically exempted by this code.	—	X	—	—	Art. 1.4B
3. Verification of slump flow and VSI as delivered to the site for self-consolidating grout.	X	—	—	—	Art. 1.5B.1.b.3
4. As masonry construction begins, the following shall be verified to ensure compliance:					
a. Proportions of site-prepared mortar.	—	X	—	—	Art. 2.6A
b. Construction of mortar joints.	—	X	—	—	Art. 3.3B
c. Location of reinforcement, connectors, prestressing tendons and anchorages.	—	X	—	—	Art. 3.4, 3.6A
d. Prestressing technique.	—	X	—	—	Art. 3.6B
e. Grade and size of prestressing tendons and anchorages.	—	X	—	—	Art. 2.4B, 2.4H
5. During construction the inspection pro-gram shall verify:					
a. Size and location of structural elements.	—	X	—	—	Art. 3.3F
b. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction.	—	X	—	Sec. 1.2.2(c), 1.16.1	—
c. Specified size, grade and type of reinforcement, anchor bolts, prestressing tendons and anchorages.	—	X	—	Sec. 1.15	Art. 2.4, 3.4
d. Welding of reinforcing bars.	X	—	—	Sec. 2.1.9.7.2, 3.3.3.4(b)	—

VERIFICATION AND INSPECTION	FREQUENCY OF INSPECTION		REFERENCE FOR CRITERIA		
	CONTINUOUS	PERIODIC	IBC SECTION	TMS 402/ACI 530/ASCE 5a	TMS 602/ACI 530.1/ASCE 6a
e. Preparation, construction and protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).	—	X	Sec. 2104.3, 2104.4		
f. Application and measurement of prestressing force.	X	—	—	—	Art. 1.8C, 1.8D
6. Prior to grouting, the following shall be verified to ensure compliance:	X	—	—	—	Art. 3.6B
a. Grout space is clean.					—
b. Placement of reinforcement and connectors, and prestressing tendons and anchorages.	—	X	—	— Sec. 1.13	Art. 3.2D Art. 3.4
c. Proportions of site-prepared grout and prestressing grout for bonded tendons.	—	X	—	—	Art. 2.6B
d. Construction of mortar joints.	—	X	—		
7. Grout placement shall be verified to ensure compliance:	X	—	—	—	Art. 3.3B
a. Grouting of prestressing bonded tendons.	X	—	—	—	Art. 3.5
8. Preparation of any required grout speci-mens, mortar specimens and/or prisms shall be observed.	—			—	Art. 3.6C

a. The specific standards referenced are those listed in Chapter 35.

TABLE 1704.5.3
LEVEL 2 REQUIRED VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCE FOR CRITERIA		
			IBC SECTION	TMS 402/ACI 530/ASCE 5a	TMS 602/ACI 530.1/ASCE 6a
1. Compliance with required inspection provisions of the construction documents and the approved submittals.	—	X	—	—	Art. 1.5
2. Verification of f'_m and f'_{AAC} prior to construction and for every 5,000 square feet during construction.	—	X	—	—	Art. 1.4B
3. Verification of proportions of materials in premixed or preblended mortar and grout as delivered to the site.	—	X	—	—	Art. 1.5B
4. Verification of slump flow and VSI as delivered to the site for self-consolidating grout.	X	—	—	—	Art. 1.5B.1.b.3
5. The following shall be verified to ensure compliance:					
a. Proportions of site-prepared mortar, grout and prestressing grout for bonded tendons.	—	X	—	—	Art. 2.6A
b. Placement of masonry units and construction of mortar joints.	—	X	—	—	Art. 3.3B
c. Placement of reinforcement, connectors and prestressing tendons and anchorages.	—	X	—	Sec. 1.15	Art. 3.4, 3.6A
d. Grout space prior to grout.	X	—	—	—	Art. 3.2D
e. Placement of grout.	X	—	—	—	Art. 3.5
f. Placement of prestressing grout.	X	—	—	—	Art. 3.6C
g. Size and location of structural elements.	—	X	—	—	Art. 3.3F
h. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction.	X	—	—	Sec.1.2.2(e), 1.16.1	—
i. Specified size, grade and type of reinforcement, anchor bolts, prestressing tendons and anchorages.	—	X	—	Sec. 1.15	Art. 2.4, 3.4
j. Welding of reinforcing bars.	X	—	—	Sec. 2.1.9.7.2, 3.3.3.4 (b)	—
k. Preparation, construction and protection of masonry during cold weather (temperature below 40°F) or hot weather (temperature above 90°F).	—	X	Sec. 2104.3, 2104.4	—	Art. 1.8C, 1.8D
l. Application and measurement of prestressing force.	X	—	—	—	Art. 3.6B
6. Preparation of any required grout specimens and/or prisms shall be observed.	X	—	Sec. 2105.2.2, 2105.3	—	Art. 1.4

For S

a. The specific standards referenced are those listed in Chapter 35.

Reason:
Synopsis: Remove IBC code requirements that are already specified in standards. TMS 402/ACI 530/ASCE 5 and TMS 602/ACI 530.1/ASCE 6 Building Code Requirements for Masonry Structures provides requirements for quality assurance of masonry construction.

Detailed Discussion: The basis for design and construction of masonry structures as provided in Chapter 21 of IBC is TMS 402/ACI 530/ASCE 5 and TMS 602/ACI 530.1/ASCE 6, Building Code Requirements for Masonry Structures. Therefore, this proposal seeks to provide the special inspection provided in these standards which is consistent with the design and construction procedures in the code. This proposal coordinates the special inspections with the design procedures that were adopted in the last code development cycle.

1. Section 1.18 of TMS 402/ACI 530/ASCE 5 Building *Code Requirements for Masonry Structures* and Article 1.6 of TMS 602/ACI 530/ASCE 6 *Specification for Masonry Structures* includes requirements for tests, inspections and verifications of masonry constructions. The tests, inspections and verifications within TMS 402 are inclusive of those tests, inspections and verifications in the current International Building Code.
2. Deletion of "or by Chapter 5, 7 or 6 of TMS 402/ACI 530/ASCE 5, respectively," referenced in the 1st exception and section 1704.5.1 is to avoid redundancy since any masonry designed in accordance with Chapters 5, 6 or 7 of TMS 402 is subject to a quality assuranceprogram specified in Section 1.18 of TMS 402.
3. Reference is made to Level B Quality Assurance requirements specified in TMS 402 for the list of tests, inspections and verifications required for masonry designed in accordance with IBC Sections 2109 2110 and Chapter 14.
4. Sections 1704.5.2 and 1704.5.3 are deleted in entirety since all masonry designed in accordance IBC Sections 2107 and 2108 must comply with Chapter 1 of TMS 402. TMS 402 Chapter 1 requires that masonry construction must be tested, inspected and verified.
5. Tables 1704.5.1 and 1704.5.3 are deleted because there is no reference to them and all tests, inspections and verifications are identified in TMS 402.

Cost Impact: This proposal does not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

FILENAME: Harman-S3-1704.5

S124–09/10

1704.6, Table 1704.6 (New), 1706.2, 1707.3, 1704.3.5 (New), Table 1704.3, 1706.3, 1707.4

Proponent: D. Kirk Harman, The Harman Group, representing The National Council of Structural Engineers Associations (NCSEA) Code Advisory Committee, Quality Assurance and Special Inspection Subcommittee

1. Revise as follows:

1704.6 Wood construction. ~~Special inspections of the fabrication process of prefabricated wood structural elements and assemblies shall be in accordance with Section 1704.2.Special inspections of site-built assemblies shall be in accordance with this section.~~ Special Inspections for prefabricated and site built wood construction and assemblies including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs shall be as required by this section and Table 1704.6.

Exceptions:

1. *Special inspection* of wood construction for buildings and structures in Occupancy Category I shall not be required.
2. *Special inspection* of wood construction for buildings and structures in Occupancy Category II that are 3 or less stories in height shall not be required.

2. Add new Table as follows:

TABLE 1704.6
REQUIRED VERIFICATION AND INSPECTION OF WOOD CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC
1. Verify that grade stamp on framing lumber, plywood and OSB panels conforms to the construction documents.		X
2. Verify that wood connections including nail quantity, size and spacing; bolt size and location anchor bolt size, spacing and location; tie down size location and configuration; beam hangers and framing anchors conform to the approved construction documents.		X
3. Inspect details of wood framing including framing layout, member sizes, blocking, bridging and bearing lengths.		X
4. Inspect diaphragms and shear walls to verify that		X

wood structural panel sheathing is of the grade and thickness indicated on the approved construction documents and the nominal size of framing members at adjoining panel edges, the nail or staple diameter and length, are as indicated on the approved construction documents.		

3. Revise as follows:

1706.2 Structural wood. Continuous special inspection is required during field gluing operations of elements of the main wind-force-resisting system. ~~Periodic special inspection is required for nailing, bolting, anchoring and other fastening of components within the main wind-force-resisting system, including wood shear walls, wood diaphragms, drag struts, braces and hold-downs.~~

~~**Exception:** *Special inspection* is not required for wood shearwalls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other components of the main wind-force-resisting system, where the fastener spacing of the sheathing is more than 4 inches (102 mm) on center.~~

1707.3 Structural wood. Continuous special inspection is required during field gluing operations of elements of the seismic-force-resisting system. ~~Periodic special inspection is required for nailing, bolting, anchoring and other fastening of components within the seismic-force-resisting system, including wood shear walls, wood diaphragms, drag struts, braces, shear panels and hold-downs.~~

~~**Exception:** Special inspection is not required for wood shearwalls, shear panels and diaphragms, including nailing, bolting, anchoring and other fastening to other components of the seismic-force-resisting system, where the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c.).~~

4. Add new text as follows:

1704.3.5 Cold-formed steel light-frame construction. Special Inspections for prefabricated and site built cold-formed steel light-frame construction and assemblies including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs shall be as required by this section and Table 1704.3.

Exceptions:

1. *Special inspection* of cold-formed steel light-frame construction for buildings and structures in Occupancy Category I shall not be required.
2. *Special inspection* of cold-formed steel light-frame construction for buildings and structures in Occupancy Category II that are 3 or less stories in height shall not be required.

5. Revise as follows:

TABLE 1704.3
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]	IBC REFERENCE
3. Material verification of structural steel, cold-formed steel light-frame construction and cold-formed steel deck:				
a. For structural steel, identification markings to conform to AISC 360	–	X	AISC 360, Section M5.5	
b. For other steel, identification markings to conform to ASTM standards specified in the approved construction documents.	–	X	Applicable ASTM material standards	
c. Manufacturer's certified test reports.	–	X		
5. Inspection of welding:				
a. Structural steel, cold-formed steel light-frame construction and cold-formed steel deck:				
1) Complete and partial joint penetration groove welds.	X	–	AWS D1.1	1704.3.1
2) Multipass fillet welds	X	–		
3) Single-pass fillet welds > 5/16"	X	–		
4) Plug and slot welds	X	–		

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]	IBC REFERENCE
5) Single-pass fillet welds ≤ 5/16"	–	X		
6) Floor and roof deck welds.	–	X	AWS D1.3	
7) Cold-formed steel light-frame construction welds		X	AWS D1.3	
6. Inspection of steel frame joint details for compliance with approved construction documents:				
a. Details such as bracing, drag struts and stiffening.	–	X	–	1704.3.2
b. Member locations.	–	X		
c. Application of joint details at each connection.	–	X		
d. Mechanical connections for cold-formed steel light-frame construction including screws, powder actuated fasteners, bolts, anchor bolts, tie downs, anchors and other fastening components		X	Applicable ASTM material standards	

(Portions of table not shown remain unchanged)

6. Delete without substitution:

~~**1706.3 Cold-formed steel light-frame construction.** Periodic special inspection is required during welding operations of elements of the main wind-force-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of components within the main wind-force-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.~~

~~**Exception:** *Special inspection* is not required for cold-formed steel light-frame shear walls, braces, diaphragms, collectors (drag struts) and hold-downs where either of the following apply:~~

1. ~~The sheathing is gypsum board or fiberboard.~~
2. ~~The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) on center (o.c.).~~

~~**1707.4 Cold-formed steel light-frame construction.** Periodic special inspection is required during welding operations of elements of the seismic-force-resisting system. Periodic special inspection is required for screw attachment, bolting, anchoring and other fastening of components within the seismic-force-resisting system, including shear walls, braces, diaphragms, collectors (drag struts) and hold-downs.~~

~~**Exception:** *Special inspection* is not required for cold-formed steel light-frame shear walls, braces, diaphragms, collectors (drag struts) and hold-downs where either of the following apply:~~

1. ~~The sheathing is gypsum board or fiberboard.~~
2. ~~The sheathing is wood structural panel or steel sheets on only one side of the shear wall, shear panel or diaphragm assembly and the fastener spacing of the sheathing is more than 4 inches (102 mm) o.c.~~

Reason: NCSEA believes that light frame construction in wood and cold formed steel have become more commonly used for load bearing applications of significant height and in regions with moderate and high seismic and wind concerns. These types of construction should be subject to Special Inspections in a similar manner and to a comparable extent as other systems such as concrete, structural steel and masonry. The Code is vague in the requirements for these systems resulting in confusion as to what special inspections and to what extent special inspection is required. This proposal clarifies requirements to be consistent across both systems and to improve the consistency of special inspections across all the major structural materials.

The emphasis of the existing special inspection requirements for wood framed construction is on shop inspection of fabricated wood assemblies rather than the field assembly of wood framing. Quality control problems with wood construction are most pronounced in the field work rather than in prefabricated components. The proposed provisions focus on the areas of wood construction that would benefit most from more comprehensive inspections. Deletion of the exception under 1707.3 coordinates with this change.

Exceptions are provided to limit the applicability of these provisions to exclude single and two family dwellings, small commercial, agricultural and buildings of lesser occupancies.

Sections 1706.2, 1706.3, 1707.3 and 1707.4 are revised because the provisions deleted from these sections are now covered in the new or revised tables. The exceptions are deleted to be consistent with the proposal.

This proposal contains provisions addressing both wood frame and cold-formed steel light-frame construction together. This is an effort to address both systems in one change therefore avoiding any perception of one system having an advantage over the other regarding special inspection.

There will be some increase in construction cost due to the increased special inspection that will take place. However, the improved field quality assurance will improve safety and reduced field errors resulting in a savings in construction cost and schedule. The improved public safety far outweighs any minor increase there may be in construction cost.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Harman-S2-1704

S125–09/10
Table 1704.7

Proponent: Lori A. Simpson, Treadwell & Rollo, Inc., representing self

Revise as follows:

TABLE 1704.7
REQUIRED VERIFICATION AND INSPECTION OF SOILS

VERIFICATION AND INSPECTION TASK	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	—	X
2. Verify excavations are extended to proper depth and have reached proper material.	—	X
3. Perform classification and testing of compacted fill materials.	—	X
4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	~~X~~	X
5. Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly.	—	X

Reason: The amount of time spent verifying use of proper materials, densities and lift thickness during placement and compaction of controlled fill should be at the discretion of the Geotechnical Engineer. Periodic visits can be sufficient to confirm relative compaction achieved on each lift. The amount of time spent on site and the number of visits will depend on the amount of fill placed per day. It is not necessary to be on site full time during grading, as part-time observation and periodic tests can sufficiently confirm the adequacy of the compaction.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: SIMPSON-S1-TABLE 1704.7

S126–09/10
1704.15 (New), 1704.15.1 (New), 1704.15.2 (New), Chapter 35

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., representing International Firestop Council

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

1. Add new text as follows:

1704.15 Fire-resistant penetrations and joints. Special inspections for through penetrations, membrane penetrations, joints, and perimeter fire barrier systems of the types specified in Sections 713.3.1.2, 713.4.1.2, 714.3 and 714.4 shall be in accordance with Sections 1704.15.1 or 1704.15.2. Special inspections shall be based on the fire-resistance design or system as designated in the approved construction documents.

1704.15.1 Fire-resistant penetrations. Penetration firestop systems in fire-resistance-rated assemblies shall not be concealed from view until inspected and approved. Inspections of penetration firestop systems of the types specified in Sections 713.3.1.2 and 713.4.1.2 are permitted to be conducted by an approved inspection agency in accordance with ASTM E2174.

1704.15.2 Fire-resistive joints. Fire resistant joint systems within, or at the perimeter of, fire-resistance-rated assemblies shall not be concealed from view until inspected and approved. Inspection of joints of the types specified in Sections 714.3 and 714.4 are permitted to be conducted by an approved inspection agency in accordance with ASTM E2393.

2. Add standard to IBC Chapter 35 as follows.

ASTM
ASTM E2174-04 Standard Practice for On-site Inspection of Installed Fire Stops
ASTM E2393-04, Standard practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers

Reason: The purpose of this proposal adds a reference to two Consensus Standards developed at ASTM for inspection of installed penetration firestop systems, fire-resistive joints, and perimeter fire barriers. The Code already mandates proper installation of penetration firestops to maintain the integrity of vertical and horizontal fire or smoke separations. Section 1704 of the *International Building Code*® (IBC) provides for special inspection agencies. Under the IBC, final authority for recognition of special inspection agencies rests with the building official having jurisdiction. These Standards identify proper methods for the field inspection of these systems, and provides consistent procedures needed to conduct and document the on-site assessment of the installations.

Substantiation: Firestop and joint system designs and materials are increasing in number and variety. The current code relies heavily on Installers, Designers, and Code Officials to verify proper system selection and installation. In response to this reality, a standard practice was developed within the ASTM process to allow inspections of through-penetration firestops, joints, and perimeter fire barrier systems to be conducted in a thorough and consistent manner, with standardized report formats, regardless of the Trade or individual conducting the inspection. Part of the impetus for the development of that standard was the recognition that jurisdictions sometimes do not have sufficient resources themselves to ensure that all penetrations and joints are firestopped properly. In any project, the number of joints and penetrations can range from hundreds to a few thousand in a single building. The addition of these new Standards to the Code would provide and identify a means for authorities having jurisdiction to have effective tools to mandate standardized inspection thoroughness and quality third party inspection agencies are used for verification of these important systems. The inclusion of consensus standards would ensure that required inspections are conducted consistently, fairly, and adequately, while also standardizing inspection reports, so that they will be of a uniform high quality.

The proposed code change would provide the code official the option of having a third party (e.g. approved inspection agency) to conduct the inspection of joints and penetrations in conformance with these Standards, while preserving the option to utilize other policies and procedures consistent with the intent of the Code.

Cost Impact: The proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM E2174-04 and ASTM E2393-04, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:CRIMI-S1-1704.15

S127–09/10
1704.15 (New), Chapter 35

Proponent: William E. Koffel, Koffel Associates, Inc., representing Glazing Industry Code Committee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

1. Add new text as follows:

1704.15 Fire-resistant penetrations and joints. In buildings assigned an Occupancy Category of III or IV in accordance with Section 1604.5, special inspections for through penetrations, membrane penetration firestops, fire resistant joint systems, and perimeter fire barrier systems of the types specified in Sections 713.3.1.2, 713.4.1.2, 714.3 and 714.4 shall be in accordance with Sections 1704.15.1 or 1704.15.2.

1704.15.1 Penetration firestops. Inspections of penetration firestop systems of the types specified in Sections 713.3.1.2 and 713.4.1.2 shall be conducted by an approved inspection agency in accordance with ASTM E 2174.

1704.15.2 Fire-resistant joint systems. Inspection of fire resistant joint systems of the types specified in Sections 714.3 and 714.4 shall be conducted by an approved inspection agency in accordance with ASTM E 2393.

2. Add standards to Chapter 35 as follows:

ASTM International

E 2174-09 Standard Practice for On-Site Inspection of Installed Fire Stops

E 2393-09 Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barrier

Reason: Through penetration and joint firestop systems are critical to maintaining the fire resistance rating of fire resistance rated construction, including fire barriers, smoke barriers, and fire resistance rated horizontal assemblies. Every construction trade has very unique requirements that are specific to that trade, with technical knowledge built through cumulative continued work in the trade. Firestopping is no different. The concept has been proposed in the past and some felt the scope was too broad. Therefore, the scope of the proposed requirement has been limited to those buildings that represent a substantial hazard to human life in the event of a system failure or that are considered to be essential facilities in accordance with Table 1604.5.

In order to meet the requirements of a listed firestop system from the UL Fire Resistance, Intertek, FM Approvals or other testing laboratory directories, a 'zero tolerance' systems installation protocol is needed, or a system can be violated and rendered ineffective. The violation can be as small as a minor annular space size variance, joint width exceeding system requirements, penetrating item size or type not as listed. There are no typical 'construction tolerances' allowed in firestopping for fire and life safety.

Firestop Systems must be selected from the listing directories, then applied in the correct manner, in the right place. With endless variations to penetrating items, hole sizes and shapes, plus the classified systems to restore the fire ratings, firestop systems selection looks easy to the untrained eye.

The UL Fire Resistance Directories have over 8,500 listed firestop systems, each with variations that multiplies possible systems for a building exponentially. Systems selection is not a 'generic process'. Systems selection is an exacting exercise by skilled contractors who submit appropriate systems for approval, then communicate these systems to the educated firestop – containment workers they employ….which becomes the inspection document for a qualified inspector of firestop systems to leading documents such as International Accreditation Services Accreditation Criteria, AC 291, section 6.11, Firestop Systems.

Should a penetration or joint condition in the field vary from the system design listing from the directories, the firestop system may not perform as intended, opening risk to the structure, and the occupants on the other side of the fire. Structurally, the floor, floor-ceiling or wall assemblies are not tested with unprotected holes with penetrating items or joints allowing fire attack to take place from both sides at once. They are tested with fire attack from one side, with all openings and penetrating items and joints firestopped.

On construction projects, there are three ways firestopping is installed currently. First, the 'he or she who pokes the hole fills it with firestopping' takes place, about 1/3 the time. A specialty firestop contractor installs for about another 1/3 of installations. The final 1/3 is a combination of specialty firestop contractors and the 'he or she who pokes the hole fills it' method. In other words, about ½ of the installations are installed by companies who most likely do not understand firestop systems selection nor the zero tolerance installation protocol. And, with the 20+ trades who potentially touch firestopping, many who perform the work as a 'sideline', the potential for a mistake increases exponentially when inexperienced companies install firestopping. However, firestopping is a complex operation, just like any other trade. Mastering more than one trade by attending a 30 minute to 16 hour class is nearly impossible for workers of any trade background.

In simple terms, inadequate firestopping makes the fire resistance rated floor or wall assembly become swiss cheese like, and not representative of testing. The risks of inadequate firestopping are apparent due to the many trades who install firestopping as a sideline…who just don't get the 'zero tolerance' systems oriented approach needed to get firestopping done right. Inspection to ASTM E 2174 and ASTM E 2393 brings a needed check to this important discipline, whether a FCIA Member specialty firestop contractor is installing or not.

Cost Impact: This will increase cost of construction when a contractor installing firestopping does not understand the zero tolerance protocol for firestopping. It will not increase the cost of construction when a contractor knowledgeable in the zero tolerance protocol for firestopping is used.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM E2174-09 and ASTME E2393-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KOFFELL-S3-1704.15 NEW

S128–09/10

1704.15 (New), Chapter 35

Proponent: William E. Koffel, Koffel Associates, Inc., representing Glazing Industry Code Committee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC FIRE SAFETY CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

1. Add new text as follows:

1704.15 Fire-resistant penetrations and joints. In buildings having occupied floors located more than 75 feet (22860 mm) above the lowest level of fire department vehicle access, special inspections for through penetrations, membrane penetration firestops, fire resistant joint systems, and perimeter fire barrier systems of the types specified in Sections 713.3.1.2, 713.4.1.2, 714.3 and 714.4 shall be in accordance with Sections 1704.15.1 or 1704.15.2.

1704.15.1 Penetration firestops. Inspections of penetration firestop systems of the types specified in Sections 713.3.1.2 and 713.4.1.2 shall be conducted by an approved inspection agency in accordance with ASTM E 2174.

1704.15.2 Fire-resistant joint systems. Inspection of fire resistant joint systems of the types specified in Sections 714.3 and 714.4 shall be conducted by an approved inspection agency in accordance with ASTM E 2393.

2. Add standards to Chapter 35 as follows:

ASTM International

E 2174-09	Standard Practice for On-Site Inspection of Installed Fire Stops
E 2393-09	Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barrier

Reason: Through penetration and joint firestop systems are critical to maintaining the fire resistance rating of fire resistance rated construction, including fire barriers, smoke barriers, and fire resistance rated horizontal assemblies. Every construction trade has very unique requirements that are specific to that trade, with technical knowledge built through cumulative continued work in the trade. Firestopping is no different. The concept has been proposed in the past and some felt the scope was too broad. Therefore, the scope of the proposed requirement has been limited to high-rise buildings.

In order to meet the requirements of a listed firestop system from the UL Fire Resistance, Intertek, FM Approvals or other testing laboratory directories, a 'zero tolerance' systems installation protocol is needed, or a system can be violated and rendered ineffective. The violation can be as small as a minor annular space size variance, joint width exceeding system requirements, penetrating item size or type not as listed. There are no typical 'construction tolerances' allowed in firestopping for fire and life safety.

Firestop Systems must be selected from the listing directories, then applied in the correct manner, in the right place. With endless variations to penetrating items, hole sizes and shapes, plus the classified systems to restore the fire ratings, firestop systems selection looks easy to the untrained eye.

The UL Fire Resistance Directories have over 8,500 listed firestop systems, each with variations that multiplies possible systems for a building exponentially. Systems selection is not a 'generic process'. Systems selection is an exacting exercise by skilled contractors who submit appropriate systems for approval, then communicate these systems to the educated firestop – containment workers they employ….which becomes the inspection document for a qualified inspector of firestop systems to leading documents such as International Accreditation Services Accreditation Criteria, AC 291, section 6.11, Firestop Systems.

Should a penetration or joint condition in the field vary from the system design listing from the directories, the firestop system may not perform as intended, opening risk to the structure, and the occupants on the other side of the fire. Structurally, the floor, floor-ceiling or wall assemblies are not tested with unprotected holes with penetrating items or joints allowing fire attack to take place from both sides at once. They are tested with fire attack from one side, with all openings and penetrating items and joints firestopped.

On construction projects, there are three ways firestopping is installed currently. First, the 'he or she who pokes the hole fills it with firestopping' takes place, about 1/3 the time. A specialty firestop contractor installs for about another 1/3 of installations. The final 1/3 is a combination of specialty firestop contractors and the 'he or she who pokes the hole fills it' method. In other words, about ½ of the installations are installed by companies who most likely do not understand firestop systems selection nor the zero tolerance installation protocol. And, with the 20+ trades who potentially touch firestopping, many who perform the work as a 'sideline', the potential for a mistake increases exponentially when inexperienced companies install firestopping. However, firestopping is a complex operation, just like any other trade. Mastering more than one trade by attending a 30 minute to 16 hour class is nearly impossible for workers of any trade background.

In simple terms, inadequate firestopping makes the fire resistance rated floor or wall assembly become swiss cheese like, and not representative of testing. The risks of inadequate firestopping are apparent due to the many trades who install firestopping as a sideline…who just don't get the 'zero tolerance' systems oriented approach needed to get firestopping done right. Inspection to ASTM E 2174 and ASTM E 2393 brings a needed check to this important discipline, whether a FCIA Member specialty firestop contractor is installing or not.

Cost Impact: This will increase cost of construction when a contractor installing firestopping does not understand the zero tolerance protocol for firestopping. It will not increase the cost of construction when a contractor knowledgeable in the zero tolerance protocol for firestopping is used.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM E2174-09 and ASTME E2393-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KOFFELL-S4-1704.15 NEW

S129–09/10

1613.4, 1705.1, 1705.2, 1705.3-1705.3.6, 1705.4-1705.4.2, 1707.1, 1708.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

1. Revise as follows:

1705.1 General. Where special inspection or testing is required by Section 1704, 1706, 1707 or 1708, the registered design professional in responsible charge shall prepare a statement of special inspections in accordance with Section 1705 for submittal by the permit applicant (see Section 1704.1.1).

1705.2 Content of statement of special inspections. The statement of special inspections shall identify the following:

1. The materials, systems, components and work required to have special inspection or testing by the building official or by the registered design professional responsible for each portion of the work.
2. The type and extent of each special inspection.
3. The type and extent of each test.
4 Additional requirements for special inspection or testing for seismic or wind resistance as specified in Sections ~~1705.3, 1705.4~~ 1706, 1707, ~~or~~ and 1708.
5. For each type of special inspection, identification as to whether it will be continuous special inspection or periodic special inspection.

2. Delete without substitution:

~~**1705.3 Seismic resistance.** The statement of special inspections shall include seismic requirements for cases covered in Sections 1705.3.1 through 1705.3.5.~~

~~**Exception:** Seismic requirements are permitted to be excluded from the statement of special inspections for structures designed and constructed in accordance with the following:~~

1. ~~The structure consists of light-frame construction; the design spectral response acceleration at short periods, S_{DS}, as determined in Section 1613.5.4, does not exceed 0.5 g; and the height of the structure does not exceed 35 feet (10 668 mm) above grade plane; or~~
2. ~~The structure is constructed using a reinforced masonry structural system or reinforced concrete structural system; the design spectral response acceleration at short periods, S_{DS}, as determined in Section 1613.5.4, does not exceed 0.5g, and the height of the structure does not exceed 25 feet (7620 mm) above grade plane; or~~
3. ~~Detached one- or two-family dwellings not exceeding two stories above grade plane, provided the structure does not have any of the following plan or vertical irregularities in accordance with Section 12.3.2 of ASCE 7:~~
   - ~~3.1. Torsional irregularity.~~
   - ~~3.2. Nonparallel systems~~
   - ~~3.3. Stiffness irregularity–extreme soft story and soft story.~~
   - ~~3.4. Discontinuity in capacity–weak story.~~

~~**1705.3.1 Seismic-force-resisting systems.** The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F, in accordance with Section 1613.~~

~~**Exception:** Requirements for the seismic-force resisting system are permitted to be excluded from the statement of special inspections for steel systems in structures assigned to Seismic Design Category C that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 or less, excluding cantilever column systems.~~

~~**1705.3.2 Designated seismic systems.** Designated seismic systems in structures assigned to Seismic Design Category D, E or F.~~

~~**1705.3.3 Seismic Design Category C.** The following additional systems and components in structures assigned to Seismic Design Category C:~~

1. ~~Heating, ventilating and air-conditioning (HVAC) ductwork containing hazardous materials and anchorage of such ductwork.~~
2. ~~Piping systems and mechanical units containing flammable, combustible or highly toxic materials.~~
3. ~~Anchorage of electrical equipment used for emergency or standby power systems.~~

~~**1705.3.4 Seismic Design Category D.** The following additional systems and components in structures assigned to Seismic Design Category D:~~

1. ~~Systems required for Seismic Design Category C.~~
2. ~~Exterior wall panels and their anchorage.~~
3. ~~Suspended ceiling systems and their anchorage.~~
4. ~~Access floors and their anchorage.~~
5. ~~Steel storage racks and their anchorage, where the importance factor is equal to 1.5 in accordance with Section 15.5.3 of ASCE 7.~~

~~**1705.3.5 Seismic Design Category E or F.** The following additional systems and components in structures assigned to Seismic Design Category E or F:~~

~~1. Systems required for Seismic Design Categories C and D.~~
~~2. Electrical equipment.~~

~~**1705.3.6 Seismic requirements in the statement of special inspections.** When Sections 1705.3 through 1705.3.6 specifies that seismic requirements be included, the statement of special inspections shall identify the following:~~

~~1. The designated seismic systems and seismic-force-resisting systems that are subject to special inspections in accordance with Sections 1705.3 through 1705.3.6.~~
~~2. The additional special inspections and testing to be provided as required by Sections 1707 and 1708 and other applicable sections of this code, including the applicable standards referenced by this code.~~

~~**1705.4 Wind resistance.** The statement of special inspections shall include wind requirements for all structures constructed in the following areas:~~

~~1. In wind Exposure Category B, where the 3-second-gust basic wind speed is 120 miles per hour (mph) (52.8 m/sec) or greater.~~
~~2. In wind Exposure Categories C or D, where the 3-second-gust basic wind speed is 110 mph (49 m/sec) or greater.~~

~~**1705.4.1 Wind requirements in the statement of special inspections.** When Section 1705.4 specifies that wind requirements be included, the statement of special inspections shall identify the main wind-force-resisting systems and wind-resisting components subject to special inspections as specified in Section 1705.4.2.~~

~~**1705.4.2 Detailed requirements.** The statement of special inspections shall include at least the following systems and components:~~

~~1. Roof cladding and roof framing connections.~~
~~2. Wall connections to roof and floor diaphragms and framing.~~
~~3. Roof and floor diaphragm systems, including collectors, drag struts and boundary elements.~~
~~4. Vertical wind-force-resisting systems, including braced frames, moment frames and shear walls.~~
~~5. Wind force-resisting system connections to the foundation.~~
~~6. Fabrication and installation of systems or components required to meet the impact-resistance requirements of Section 1609.1.2.~~

~~**Exception:** Fabrication of manufactured systems or components that have a label indicating compliance with the wind-load and impact-resistance requirements of this code.~~

3. Revise as follows:

1707.1 Special inspections for seismic resistance. Special inspections itemized in Sections 1707.2 through 1707.9, unless exempted by the exceptions of Section 1704.1~~, 1705.3 or 1705.3.1~~, are required for the following:

1. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F, as determined in Section 1613.
2. Designated seismic systems in structures assigned to Seismic Design Category D, E or F.
3. Architectural, mechanical and electrical components in structures assigned to Seismic Design Category C, D, E or F that are required in Sections 1707.6 and 1707.7.

1708.1 Testing and qualification for seismic resistance. The testing and qualification specified in Sections 1708.2 through 1708.5, unless exempted from special inspection by the exceptions of Section 1704.1, ~~1705.3 or 1705.3.1~~ are required as follows:

1. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F, as determined in Section 1613 shall meet the requirements of Sections 1708.2 and 1708.3, as applicable.
2. Designated seismic systems in structures assigned to Seismic Design Category C, D, E or F subject to the special certification requirements of ASCE 7 Section 13.2.2 are required to be tested in accordance with Section 1708.4.

3. Architectural, mechanical and electrical components in structures assigned to Seismic Design Category C, D, E or F with an I_p = 1.0 are required to be tested in accordance with Section 1708.4 where the general design requirements of ASCE 7 Section 13.2.1, Item 2 for manufacturer's certification are satisfied by testing.
4. The seismic isolation system in seismically isolated structures shall meet the testing requirements of Section 1708.5.

4. Delete without substitution:

~~**1613.4 Special inspections**. Where required by Sections 1705.3 through 1705.3.5, the statement of special inspections shall include the special inspections required by Section 1705.3.6.~~

Reason: The purpose for this proposal is to remove superfluous and conflicting text from Chapter 17. Section 1705.1 requires the registered design professional in responsible charge to prepare a statement of special inspections where special inspections or tests are required elsewhere in Chapter 17. Section 1705.2 specifies the required content of the statement of special inspections, including but not limited to: (1) the type and extent of each special inspection, (2) the type and extent of each test, (3) the additional requirements for special inspections and tests for seismic and wind resistance, and (4) for each type of special inspection, whether it is to be continuous or periodic.

Section 1704 specifies the required special inspections and tests for all structures. Sections 1707 and 1708 specify additional required special inspections and tests for structures on sites of high seismic hazard (assigned to Seismic Design Category C, D, E or F. Section 1706 specifies additional required special inspections and tests for structures on sites of high wind hazard (basic wind speed, V_{3S}, of 110 mph or greater for Exposure Categories C and D and 120 mph for Exposure Category B).

With the requirements described above, the text in Sections 1705.3 through 1705.4.2 serves no purpose other than to repeat much of what is already specified elsewhere in Chapter 17 but these sections also contain numerous conflicts. Section 1705.2 requires the type and extent of each special inspection and test to be specified in the statement of special inspections. Sections 1705.3 through 1705.4.2, however, specify numerous thresholds that must be met before certain special inspections or tests are specified and exempt several that Section 1705.2 requires to be specified in the statement. Sections 1705.3 through 1705.4.2 also create numerous potential conflicts with the required inspections in Sections 1704. 1706, 1707 and 1708 by not requiring an otherwise required special inspection or test to be included in the statement of special inspections. There are several instances where a special inspection or test is required by Section 1704. 1706, 1707 or 1708 to be performed and is required by Section 1705.2 to be included in the statement of special inspections but is not required to be included in the statement of special inspections by Section 1705.3 or 1705.4. Examples are noted below.

The charging text of Sections 1705.3 (seismic) and 1705.4 (wind) each requires the statement of special inspections to include seismic requirements and wind requirements, respectively. This can be nothing more than a requirement for what is to be specified in the statement of special inspections. It can not be a requirement for the actual special inspections or tests, which are specified in Sections 1704, 1706, 1707 and 1708.

Section 1613.4 requires the statement of special inspections to include the special inspections required by Section 1705.3.6 and Item #2 of this section requires the additional special inspections and tests of Sections 1707 and 1708 to be specified in the statement but this is superfluous in that the requirement is already specified in Item #4 of Section 1705.2.

Note that this proposal corrects inadvertent errors by adding Section 1706 to Section 1705.1 and to Item 4 of Section 1705.2.

Although Section 1705.3 is being deleted by this proposal, modifications to this section are the subject of a separate proposal. Should both proposals be approved by the ICC membership, it is the intent of the proponent to modify this section in accordance with the separate proposal, not to delete it in accordance with this proposal.

Although Sections 1705.3.6 and 1705.4.1 are being deleted by this proposal, modifications to these sections are the subject of a separate proposal. Should both proposals be approved by the ICC membership, it is the intent of the proponent to modify these sections in accordance with the separate proposal, not to delete them in accordance with this proposal.

The following are examples of conflicts between thresholds in Section 1705.3 or 1705.4 and Section 1704. 1706, 1707 or 1708:

1. Section 1705.1, Exception 1, exempts the seismic requirements of structures of light-frame construction with a maximum S_{DS} of 0.5 and a maximum height above grade plane of 35 feet from being included in the statement but Sections 1707.1(1) and 1708.1(2) exempt the seismic-force-resisting systems of all structures assigned to SDC A and B from special inspection and testing, respectively.
2. Section 1705.1, Exception 2, exempts the seismic requirements of reinforced concrete and masonry structural systems of structures with a maximum S_{DS} of 0.5 and a maximum height above grade plane of 25 feet from being included in the statement but Sections 1707.1(1) and 1708.1(2) exempt the seismic-force-resisting systems of all structures assigned to SDC A and B from special inspection and testing, respectively.
3. Section 1705.3.3(2) specifies seismic requirements for piping systems and mechanical units containing flammable, combustible or highly toxic materials be included in the statement but Section 1707.7(3) requires special inspection for piping systems and "**their associated**" (emphasis mine) mechanical units.
4. Section 1705.3.4(2) specifies seismic requirements for exterior wall panels and their anchorage be included in the statement but Section 1707.6 requires special inspection for exterior cladding, nonbearing walls and veneer greater than 30 feet above grade or a walking surface except for exterior cladding and veneer weighing 5 psf or less.
5. Section 1705.3 does not specify seismic requirements for interior wall panels be included in the statement but Section 1707.6 requires special inspection for interior nonbearing walls and veneer greater than 30 feet above grade or a walking surface except for interior veneer weighing 5 psf or less and interior nonbearing walls weighing 15 psf or less.
6. Section 1705.3.4(3) specifies seismic requirements for suspended ceiling systems and their anchorage be included in the statement but Sections 1704, 1707 1708 do not require special inspection or testing for them.
7. Section 1705.3.4(5) specifies seismic requirements for steel storage racks and their anchorage be included in the statement where the importance factor, *I*, is required by ASCE 7 Section 15.5.3 to be 1.5 (e.g., open to the public) but Section 1707.5 requires special inspection for storage rack 8 feet or greater in height.
8. Section 1705.3 does not specify seismic requirements for seismic isolation systems be included in the statement but Sections 1707.9 and 1708.5 require special inspection and testing, respectively.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S33-1613.4

S130–09/10
1705.3.1
Proponent: Bonnie Manley, representing American Iron and Steel Institute

Revise as follows:

1705.3.1 Seismic-force-resisting systems. The seismic force- resisting systems in structures assigned to *Seismic Design Category* C, D, E or F, in accordance with Section 1613.

> **Exception:** Requirements for the seismic-force-resisting system are permitted to be excluded from the statement of special inspections for steel systems in structures assigned to *Seismic Design Category* C that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 ~~or less~~, excluding cantilever column systems.

Reason: This slight modification corrects the statement to reflect only those buildings and structures designed as "Steel systems not detailed specifically detailed for seismic resistance, excluding cantilever column systems," per ASCE 7, Table 12.2-1, Line H. Similar modifications are recommended in Sections 1707.2 and 1708.3**.**

Cost Impact: There is no anticipated impact on the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Manley-S14-1705.3.1

S131–09/10
1705.3.4

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

1705.3.4 Seismic Design Category D. The following additional systems and components in structures assigned to Seismic Design Category D:

1. Systems required for Seismic Design Category C.
2. Exterior wall panels and their anchorage.
3. ~~Suspended ceiling systems and their anchorage~~.
4. Access floors and their anchorage.
5. Steel storage racks and their anchorage, where the importance factor is equal to 1.5 in accordance with Section 15.5.3 of ASCE 7.

Reason: Based upon IBC Section 1613.1 that specifically states that the building code does not adopt ASCE 7-05 Appendix Chapter 11A, where the special inspection requirements for suspended ceilings are located, it appears reasonable to omit suspended ceiling systems from the list of items that should have special inspection. The very simple and straightforward seismic requirements in ASCE 7-05 Section 13.5.6.2.2 and the ASTM and CISCA standards for installation of suspended ceilings, can easily be inspected by the traditional local government building inspectors. Finally, ICC staff written responses to inquires on this matter have indicated that the building code does not require special inspection of suspended ceiling systems because it specifically does not adopt ASCE 7 Appendix Chapter 11A.

Cost Impact: This code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAIEL-S4-1705.3.4

S132–09/10
1705.3.6, 1705.4.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

~~1705.3.6~~ 1705.3 Seismic requirements in the statement of special inspections. ~~When Sections 1705.3 through 1705.3.5 specify that~~ Where Section 1707 or 1708 specifies special inspection, testing or qualification for seismic ~~requirements be included~~ resistance, the statement of special inspections shall identify the ~~following:~~

1. ~~The~~ designated seismic systems and seismic-force-resisting systems that are subject to special inspection~~s in accordance with Sections 1705.3 through 1705.3.5~~.
2. ~~The additional special inspections and testing to be provided as required by Sections 1707 and 1708 and other applicable sections of this code, including the applicable standards referenced by this code.~~

~~1705.4.1~~ 1705.4 Wind requirements in the statement of special inspections. ~~When Section 1705.4~~ Where Section 1706 specifies ~~that~~ special inspection for wind requirements ~~be included~~, the statement of special inspections shall identify the main wind-force-resisting systems and wind-resisting components subject to special inspection~~s as specified in Section 1705.4.2~~.

Reason: This proposal is being submitted in conjunction with a proposal to delete superfluous and conflicting text from Chapter 17. That proposal deletes Sections 1705.3 through 1705.4.2, which specify certain seismic and wind requirements to be included in the statement of special inspections. However, these sections overlap or conflict with Section 1705.2, which also specifies what is to be included in the statement of special inspections, and with Sections 1704, 1706, 1707 and 1708, which specify required special inspections and tests.

In spite of this, it appears that retaining the substance of Section 1705.3.6, which requires the seismic-force-resisting systems and designated seismic systems, and Section 1705.4.1, which requires the main wind-force-resisting systems and wind-resisting components, to be identified in the statement of special inspections will contribute to a better understanding of the portions of the structural system where special inspection, testing or qualification is required.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S18-1705.3

S133–09/10
1702.1, 1707.1, 1707.8, 1707.6, 1707.5, 1707.7, 1707.9

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1702.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

DESIGNATED SEISMIC SYSTEM. Those ~~architectural, electrical and mechanical systems and their~~ nonstructural components that require design in accordance with Chapter 13 of ASCE 7 and for which the component importance factor, I_p, is greater than 1 in accordance with Section 13.1.3 of ASCE 7.

1707.1 Special inspections for seismic resistance. Special inspections itemized in Sections 1707.2 through 1707.9, unless exempted by the exceptions of Section 1704.1, 1705.3 or 1705.3.1, are required for the following:

1. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F, as determined in Section 1613, in accordance with Sections 1707.2 through 1707.4, as applicable.
2. Designated seismic systems in structures assigned to Seismic Design Category C, D, E or F in accordance with Section 1707.5.
3. Architectural, mechanical and electrical components ~~in structures assigned to Seismic Design Category C, D, E or F that are required~~ in accordance with Sections 1707.6 and 1707.7.
4. Storage racks in structures assigned to Seismic Design Category D, E or F in accordance with Section 1707.8.
5. Seismic isolation systems in accordance with Section 1707.9.

~~**1707.8**~~ **1707.5 Designated seismic system~~s~~ ~~verifications~~.** The special inspector shall examine designated seismic systems requiring seismic qualification in accordance with Section 1708.4 and verify that the label, anchorage or mounting conforms to the certificate of compliance.

~~**1707.5**~~ **1707.6.1 ~~Storage racks and~~ Access floors.** Periodic special inspection is required ~~during~~ for the anchorage of access floors ~~and storage racks 8 feet (2438 mm) or greater in height~~ in structures assigned to Seismic Design Category D, E or F.

1707.7 Mechanical and electrical components. Special inspection for mechanical and electrical ~~equipment~~ components shall be as follows:

1. Periodic special inspection is required during the anchorage of electrical equipment for emergency ~~or~~ and standby power systems in structures assigned to Seismic Design Category C, D, E or F;
2. Periodic special inspection is required during the installation of anchorage of other electrical equipment in structures assigned to Seismic Design Category E or F;
3. Periodic special inspection is required during installation of piping systems intended to carry flammable, combustible or highly toxic contents and their associated mechanical units in structures assigned to Seismic Design Category C, D, E or F;
4. Periodic special inspection is required during the installation of HVAC ductwork that will contain hazardous materials in structures assigned to Seismic Design Category C, D, E or F; and
5. Periodic special inspection is required during the installation of vibration isolation systems in structures assigned to Seismic Design Category C, D, E or F where the construction documents require a nominal clearance of 1/4 inch (6.4 mm) or less between the equipment support frame and restraint.

1707.8 Storage racks. Periodic special inspection is required for the anchorage of storage racks 8 feet (2438 mm) or greater in height in structures assigned to Seismic Design Category D, E or F.

1707.9 Seismic isolation system. Periodic special inspection ~~is required~~ shall be provided for seismic isolation systems during the fabrication and installation of isolator units and energy dissipation devices ~~that are part of the seismic isolation system~~.

Reason: The purpose for this proposal is to correlate IBC Section 1707 with ASCE 7-10. In Section 1702.1, the definition of "designated seismic system" is changed for consistency with the revised definition in Section 11.2 of ASCE 7-10.

In Item #2 of Section 1707.1 on special inspection of designated seismic systems, Seismic Design Category C is added for consistency with Item #2 of Section 1708.1 on testing of designated seismic systems, which specifies Seismic Design Category C, and references to the requirements for certification in Section 13.2.2 of ASCE 7, which also specifies Seismic Design Category C.

In Section 1707.1, Item #3 is revised to eliminate superfluous text and avoid potential conflicts. The reference to Seismic Design Category D, E or F is deleted in favor of the references to seismic design categories in Sections 1707.6 and 1707.7 and because these sections do not "require" the components as Item #3 currently states.

Section 1707.5 on storage racks and access floors is changed to Section 1707.6.1 on access floors and Section 1707.8 on storage racks because ASCE 7 identifies access floors as architectural components (Section 13.5.7) and steel storage racks as nonbuilding structures (Section 15.5.3). In Section 1707.1, Item #4 is added for storage racks, which are currently not accounted for in the items of Section 1707.1 except indirectly by Item #1 of Section 1707.1.

In Section 1707.1, Item #5 on seismic isolation systems is added because the other items do not clearly account for them. Section 1707.9 is revised because the current text is nonmandatory. It is also not clear with respect to the seismic design category and the changes will make it clear that periodic special inspection is required for seismic isolation systems in structures regardless of which seismic design category the structure is assigned.

In Section 1707.7, mechanical and electrical "equipment" is changed to "components" for consistency with Section 13.6 of ASCE 7 on mechanical and electrical components and because the items in the section are not limited to equipment but also include piping systems, HVAC ductwork and vibration isolation systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S27-1702.1

S134–09/10
1705.3, 1707.1

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1707.1 Special inspections for seismic resistance. *Special inspections* itemized in Sections 1707.2 through 1707.9, unless exempted by the exceptions of Section 1704.1, 1705.3, or 1705.3.1, are required for the following:

1. The seismic-force-resisting systems in structures assigned to *Seismic Design Category* C, D, E or F, as determined in Section 1613.
2. Designated seismic systems in structures assigned to *Seismic Design Category* D, E or F.
3. Architectural, mechanical and electrical components in structures assigned to *Seismic Design Category* C, D, E or F that are required in Sections 1707.6 and 1707.7.

~~**1705.3 Seismic resistance.** The statement of special inspections shall include seismic requirements for cases covered in Sections 1705.3.1 through 1705.3.5.~~

Exception: ~~Seismic requirements are permitted to be excluded from the statement of special inspections~~ Special inspections itemized in Sections 1707.2 through 1707.9 are not required for structures designed and constructed in accordance with one of the following:

1. The structure consists of light-frame construction; the design spectral response acceleration at short periods, S_{DS}, as determined in Section 1613.5.4, does not exceed 0.5 ~~g~~; and the building height of the structure does not exceed 35 feet (10 668 mm) ~~above grade plane; or~~.
2. The seismic-force-resisting system of the structure ~~is constructed using a~~ consists of reinforced masonry ~~structural system~~ or reinforced concrete ~~structural system~~; the design spectral response acceleration at short periods, S_{DS}, as determined in Section 1613.5.4, does not exceed 0.5 ~~g~~; and the building height of the structure does not exceed 25 feet (7620 mm) ~~above grade plane; or~~.
3. The structure is a detached one- or two-family dwelling~~s~~ not exceeding two stories above grade plane~~,~~ ~~provided the structure~~ and does not have any of the following ~~plan~~ horizontal or vertical irregularities in accordance with Section ~~12.3.2~~ 12.3 of ASCE 7:
   - 3.1. Torsional or extreme torsional irregularity.
   - 3.2. Nonparallel systems irregularity.
   - 3.3. ~~Stiffness irregularity-extreme~~ Stiffness-soft story ~~and~~ or stiffness-extreme soft story irregularity.
   - 3.4. Discontinuity in ~~capacity~~ lateral strength-weak story irregularity.

Reason: This proposal is being submitted in conjunction with a proposal to delete superfluous and conflicting text from Chapter 17. That proposal deletes Sections 1705.3 through 1705.4.2, which specify certain seismic and wind requirements to be included in the statement of special inspections. However, these sections overlap or conflict with Section 1705.2, which also specifies what is to be included in the statement of special inspections, and with Sections 1704, 1706, 1707 and 1708, which specify required special inspections and tests.

In spite of this, it appears the exceptions to Section 1705.3, which exempt the seismic requirements of certain structures from being included in the statement of special inspections, are intended to be exemptions from the special inspections for seismic resistance in Section 1707. The purpose for this proposal is to relocate these exceptions to Section 1707 so that they will serve their apparent purpose.

The proposal includes several editorial revisions. In Exceptions #1 and #2, "height" is changed to "building height" for consistency with the definition of "building height" in Section 502.1 the charging text of which makes the defined term applicable throughout the IBC, including the structural chapters. With this change, the reference to "above grade plane" becomes superfluous because it is included in the definition of "building height" and is deleted.

In Exception #2, "structural system," which has no technical meaning, is replaced with "seismic-force-resisting system," which is defined in Section 1613.2. In Exception #3, several changes are made for consistency with Tables 12.3-1 and 12.3.2 of ASCE 7-10 on horizontal and vertical structural irregularities, respectively.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S35-1705.3

S135–09/10
1707.2

Proponent: Bonnie Manley, representing American Iron and Steel Institute

Revise as follows:

1707.2 Structural steel. *Special inspection* for structural steel shall be in accordance with the quality assurance ~~plan~~ requirements of AISC 341.

Exceptions:

1. *Special inspections* of structural steel in structures assigned to *Seismic Design Category* C that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 ~~or less~~, excluding cantilever column systems.
2. For ordinary moment frames, ultrasonic and magnetic particle testing of complete joint penetration groove welds are only required for demand critical welds.

Reason: The first editorial modification tightens up the reference to AISC 341 and the second modification in the exception corrects the requirement to reflect only those buildings and structures designed as "Steel systems not detailed specifically detailed for seismic resistance, excluding cantilever column systems," per ASCE 7, Table 12.2-1, Line H. Similar modifications are recommended in Sections 1705.3.1 and 1708.3.

Cost Impact: There is no anticipated impact on the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Manley-S6-1707.2

S136–09/10
1707.2

Proponent: Bonnie Manley, American Iron and Steel Institute, representing American Institute of Steel Construction

Revise as follows:

1707.2 Structural steel. *Special inspection* for structural steel shall be in accordance with the quality assurance plan requirements of AISC 341.

Exception~~s~~:

1. ~~1.~~ *Special inspections* of structural steel in structures assigned to *Seismic Design Category* C that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 or less, excluding cantilever column systems.
2. ~~2. For ordinary moment frames, ultrasonic and magnetic particle testing of complete joint penetration groove welds are only required for demand critical welds.~~

Reason: This exception was new to the 2009 IBC and was added in the public comment on S128-07/08. Intended as a temporary solution, its purpose was to make 2009 IBC consistent with what had been proposed for the 2010 edition of AISC 341. A separate proposal recommends the adoption of the 2010 edition of AISC 341. Since AISC 341-10 now addresses this issue, the exception is no longer needed. A similar modification is recommended in Section 1708.3.

Please note, public review drafts of the 2010 AISC documents can be found on the AISC website (www.aisc.org). The public review period for AISC 360-10 is currently scheduled for 8/14/09 through 9/28/09 and the public review period for AISC 341-10 is currently scheduled for 9/11/09 through 10/26/09. It is anticipated that the 2010 editions of both AISC 360 and AISC 341 will be technically complete by the end of October 2009, with ANSI approval in March 2010 and publication in August 2010.

Cost Impact: There is no anticipated impact on the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Manley-S7-1707.2

S137–09/10
1708, 1708.1, 1708.4, 1708.5

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

SECTION 1708
~~STRUCTURAL~~ TESTING AND QUALIFICATION FOR SEISMIC RESISTANCE

1708.1 Testing and qualification for seismic resistance. The testing and qualification specified in Sections 1708.2 through 1708.5, unless exempted from special inspection by the exceptions of Section 1704.1, 1705.3 or 1705.3.1, are required as follows:

1. The seismic-force-resisting systems in structures assigned to Seismic Design Category C, D, E or F, as determined in Section 1613 shall meet the requirements of Sections 1708.2 and 1708.3, as applicable.
2. Designated seismic systems in structures assigned to Seismic Design Category C, D, E or F and subject to the ~~special~~ certification requirements of ASCE 7 Section 13.2.2 ~~are required to be tested in accordance~~ shall comply with Section 1708.4.
3. Architectural, mechanical and electrical components in structures assigned to Seismic Design Category C, D, E or F ~~with an I_p = 1.0 are required to be tested in accordance with Section 1708.4~~ and where the ~~general design~~ requirements of ASCE 7 Section 13.2.1~~, Item 2 for~~ are met by submittal of manufacturer's certification ~~are satisfied by testing~~ in accordance with Item 2 therein shall comply with Section 1708.4.
4. The seismic isolation system in seismically isolated structures shall meet the testing requirements of Section 1708.5.

1708.4 Seismic certification of nonstructural components. The registered design professional shall ~~state~~ specify on the construction documents the ~~applicable seismic certification~~ requirements for certification by analysis, testing or experience data for nonstructural components and designated seismic systems in accordance with Section 13.2 of ASCE 7, where such certification is required by Section 1708.1 ~~on the construction documents~~.

~~1. The manufacturer of each designated seismic system component subject to the provisions of ASCE 7 Section 13.2.2 shall test or analyze the component and its mounting system or anchorage and submit a certificate of compliance for review and acceptance by the registered design professional responsible for the design of the designated seismic system and for approval by the building official. Certification shall be based on an actual test on a shake table, by three-dimensional shock tests, by an analytical method using dynamic characteristics and forces, by the use of experience data (i.e., historical data demonstrating acceptable seismic performance) or by more rigorous analysis providing for equivalent safety.~~

~~2. Manufacturers certification of compliance for general design requirements of ASCE 7 Section 13.2.1 shall be based on analysis, testing or experience data.~~

1708.5 ~~Seismically isolated structures~~ Seismic isolation systems. ~~For required system tests, see~~ Seismic isolation systems shall be tested in accordance with Section 17.8 of ASCE 7.

Reason The purpose for this proposal is to correlate IBC Section 1708 with ASCE 7-10. The title of Section 1708 is changed for consistency with the title and charging text of Section 1708.1. Section 1708.5 is revised for consistency with Section 1707.9 on seismic isolation systems and because the current text is nonmandatory.

Section 1708.4 currently contains technical requirements for qualification (1) of certain architectural, mechanical and electrical components for which manufacturer's certification is utilized to comply with Section 13.2.1 of ASCE 7, and (2) of certain designated seismic systems for which manufacturer's certification is required by Section 13.2.2 of ASCE 7. Much of the IBC text, however, is duplicated in ASCE 7 and may also conflict with the corresponding text in ASCE 7. The technical requirements in ASCE 7 typically consist of analysis, shake table testing or experience data. It serves little purpose to duplicate these requirements in the IBC. The requirements for certification, however, should remain in the IBC and this proposal revises the text accordingly.

Items 2 and 3 of IBC Section 1708.1 are revised for consistency with Sections 13.2.2 and 13.2.1, respectively, of ASCE 7-10. Note that these sections have been revised in ASCE 7-10 by Proposals GPSC-5R2, SSC TC8-CH13-12-R3 and SSC TC9-CH13-01-R4.

Section 13.2.1 of ASCE 7 requires architectural, mechanical and electrical components, supports and attachments to comply with the provisions of the sections listed in Table 13.2-1 and to meet the requirements in Item 1 or Item 2 of Section 13.2.1. Item 2 requires the submittal of the manufacturer's certification that the component is seismically qualified.

Section 13.2.2 of ASCE 7 requires for certain designated seismic systems the submittal of the manufacturer's certification that the designated seismic system meets the specified requirements therein. According to its definition in IBC Section 1702.1 and Section 11.2 of ASCE 7-10, "designated seismic system" applies to architectural, mechanical and electrical components for which the component importance factor, I_p, is greater than 1.0. Designated seismic systems not required to comply with Section 13.2.2 will still be required to comply with Section 13.2.1.

The proposal was prepared in conjunction with a related proposal to correlate IBC Section 1707 with ASCE 7-10.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Brazil-S15-1708.1

S138–09/10
1708.3

Proponent: Bonnie Manley, representing American Iron and Steel Institute

Revise as follows:

1708.3 Structural steel. Testing for structural steel shall be in accordance with the quality assurance plan requirements of AISC 341.

Exceptions~~:~~:

1. Testing for structural steel in structures assigned to *Seismic Design Category* C that are not specifically detailed for seismic resistance, with a response modification coefficient, *R*, of 3 or less, excluding cantilever column systems.
2. ~~For ordinary moment frames, ultrasonic and magnetic particle testing of complete joint penetration groove welds are only required for demand critical welds.~~

Reason: This exception was new to the 2009 IBC and was added in the public comment on S137-07/08. Intended as a temporary solution, its purpose was to make 2009 IBC consistent with what had been proposed for the 2010 edition of AISC 341. A separate proposal recommends the adoption of the 2010 edition of AISC 341. Since AISC 341-10 now addresses this issue, the exception is no longer needed. A similar modification is recommended in Section 1707.2.

Please note, public review drafts of the 2010 AISC documents can be found on the AISC website (www.aisc.org). The public review period for AISC 360-10 is currently scheduled for 8/14/09 through 9/28/09 and the public review period for AISC 341-10 is currently scheduled for 9/11/09 through 10/26/09. It is anticipated that the 2010 editions of both AISC 360 and AISC 341 will be technically complete by the end of October 2009, with ANSI approval in March 2010 and publication in August 2010.

Cost Impact: There is no anticipated impact on the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Manley-S9-1708.3

S139–09/10
1710.2, 1710.3

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1710.2 Structural observations for seismic resistance. Structural observations shall be provided for those structures assigned to Seismic Design Category D, E or F, as determined in Section 1613, where one or more of the following conditions exist:

1. The structure is classified as Occupancy Category III or IV in accordance with Section 1604.5.
2. The height of the structure is greater than 75 feet (22 860 mm) above the base.
3. The structure is assigned to Seismic Design Category E, is classified as Occupancy Category I or II in accordance with Section 1604.5 and is greater than two stories above grade plane.
4. ~~When so designated by the registered design professional responsible for the structural design.~~
5. ~~When such observation is specifically required by the building official.~~

1710.3 Structural observations for wind requirements. Structural observations shall be provided for those structures sited where the basic wind speed exceeds 110 mph (49 m/sec), determined from Figure 1609, where one or more of the following conditions exist:

1. The structure is classified as Occupancy Category III or IV in accordance with Table 1604.5.
2. The building height of the structure is greater than 75 feet (22 860 mm).
3. ~~When so designated by the registered design professional responsible for the structural design,~~
4. ~~When such observation is specifically required by the building official.~~

Reason: The IBC is a model code written with mandatory text that has the force of law when adopted by a jurisdiction. Violations are subject to penalties as prescribed by the laws of the jurisdiction and as specified in Section 114. In this regard, a requirement that the owner employ a registered design professional to perform structural observations should not be imposed based on a designation by the registered design professional responsible for the structural design. If the registered design professional responsible for the structural design believes that structural observation is warranted, they should convey their belief to their clients. The building code should not contain a requirement for what is primarily a private matter between registered design professionals and their clients.

A requirement that the owner employ a registered design professional to perform structural observations should also not be imposed where it is required by the building official. Sections 1710.2 and 1710.3 specify limits based on occupancy category or building height for which structural observation is required where the limits are exceeded. These requirements provide sufficient means for the building official to determine when structural observation is required. Additional authority on the part of the building official is not warranted. If it was warranted, the limits based on occupancy category or building height could be deleted and the determination could be solely based on the requirement of the building official without regard to occupancy category or building height.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S11-1710.2

S140–09/10
1715.5.1

Proponent: Thomas D. Culp, Ph.D. Birch Point Consulting LLC, representing Aluminum Extruders Council

Revise as follows:

1715.5.1 Exterior windows and doors. Exterior windows and sliding doors shall be tested and labeled as conforming to AAMA/WDMA/CSA 101/I.S.2/A440. The label shall state the name of the manufacturer, the approved labeling agency, and the product designation as specified in AAMA/WDMA/CSA101/I.S.2/A440. Exterior side-hinged doors shall be tested and labeled as conforming to AAMA/WDMA/CSA 101/I.S.2/A440 or comply with Section 1715.5.2. Products <u>in buildings of Group R not more than three stories above grade plane</u> tested and labeled as conforming to AAMA/WDMA/CSA 101/I.S.2/A440 shall not be subject to the requirements of Sections 2403.2 and 2403.3.

Reason: Chapter 24 and ASTM E1300 require that glazing be firmly supported to prevent breakage under the design load by establishing maximum framing deflection limits. However, certain products are currently and inappropriately exempted from this requirement if they are labeled to the AAMA/WDMA/CSA 101/I.S.2/A440 standard. This proposal would remove that exemption to restore an appropriate safety margin of less than 8 in 1000 probability of glass breakage, consistent with ASTM E1300.

This proposal only applies to the IBC, and does not affect lighter products used when building to the IRC. However, in the last code cycle, the committee correctly pointed out that the IBC is also used for lowrise residential buildings, including both detached homes, townhomes, and apartments. Therefore, this proposal has been modified from last cycle to address the committee's concern by reinstating the exemption for low-rise residential buildings, but maintaining the structural deflection limit requirements for products in all other applications, as the top priority should be restoring a safety margin consistent with what is already in Chapter 24 and ASTM E1300.

Finally, the committee reason for disapproving the previous proposal stated that there is too much uncertainty to remove the exemption at this time. As the exemption increases the probability of glass breakage, we believe safety concerns would dictate that any exemption SHOULD be removed until any uncertainty is resolved.

Cost Impact: This proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CULP-S1-1714.5.1

S141–09/10
1715.5.1

Proponent: William E. Koffel, Koffel Associates, Inc., representing Glazing Industry Code Committee

Revise as follows:

1715.5.1 Exterior windows and doors. Exterior windows and sliding doors shall be tested and labeled as conforming to AAMA/WDMA/CSA 101/I.S.2/A440. The label shall state the name of the manufacturer, the approved labeling agency, and the product designation as specified in AAMA/WDMA/CSA101/I.S.2/A440. Exterior side-hinged doors shall be tested and labeled as conforming to AAMA/WDMA/CSA 101/I.S.2/A440 or comply with Section 1715.5.2. Products installed in buildings of Group R not more than three stories above grade plane that are tested and labeled as conforming to AAMA/WDMA/CSA 101/I.S.2/A440 shall not be subject to the requirements of Sections 2403.2 and 2403.3.

Reason: The purpose of this proposal is to restrict the application of the exemption that fenestration products labeled to AAMA/WDMA/CSA 101/I.S.2/A440 do not have to meet the requirements of sections 2403.2 and 2403.3, which ensure safe performance through proper support of glass. Specifically, section 2403.3 requires that the deflection of framing members supporting glass may not exceed 1/175 of the glass edge length (or ¾ inch, whichever is less) when subjected to the design load. Chapter 24 of the IBC relies on glass design curves that are contained in ASTM E 1300. This ASTM standard recognizes the importance of limiting edge deflection of the glass and also recommends a limitation of 1/175 of the glass edge length. Prior to the IBC, the legacy codes required deflection limitations of 1/175 of the span for glass holding members. It was not until the IBC was published that this exemption was allowed.

AAMA/WDMA/CSA 101/I.S.2/A440 does require testing in accordance with ASTM E330 and measurement of deflection. However, AAMA/WDMA/CSA 101/I.S.2/A440 only places a limit on the frame and sash deflection for heavy commercial (HC) and architectural products (AW), and has no requirement on deflection for residential (R), light commercial (LC), and commercial (C) products. Excessive deflection of the frame or sash can have an adverse effect on stress in the glass and could result in glass breakage at or below design loads creating a safety concern. The single ASTM E330 load test required in AAMA/WDMA/CSA 101/I.S.2/A440 is not statistically significant in ensuring that the stress does not increase the probability of breakage beyond the industry standard of eight lites per thousand when the deflection limitation of 1/175 is exceeded. Although the deflection exemption remains in the IRC for residential buildings and as proposed in the IBC for low-rise residential, it is inappropriate to have an exemption for these products when used in more diverse and larger buildings built to the IBC. This proposal would ensure that an appropriate limit on frame deflection is placed on fenestration products from all performance classes. Because the deflection is already being measured for all these products (but not limited for R, LC, and C classes), there is no cost impact except for products which do not comply with this more conservative and appropriate requirement.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KOFFELL-S1-1714.5.1

S142-09/10
1715.5.2

Proponent: Joseph R. Hetzel, Thomas Associates Inc. representing the Door & Access Systems Manufacturers Association

Revise as follows:

1715.5.2 Exterior windows and door assemblies not provide for in Section 1715.5.1. Exterior window and door assemblies shall be tested in accordance with ASTM E 330. Structural performance of garage doors and rolling doors shall be determined in accordance with either ASTM E 330 or ANSI/DASMA 108, and shall meet the acceptance criteria of ANSI/DASMA 108. Exterior window and door assemblies containing glass shall comply with Section 2403. The design pressure for testing shall be calculated in accordance with Chapter 16. Each assembly shall be tested for 10 seconds at a load equal to 1.5 times the design pressure.

Reason: The purpose of the proposed code change is to expand the sentence on “garage doors” to include reference to “rolling doors”. The scope of ANSI/DASMA 108-2005, referenced in the 2009 IBC, encompasses both garage doors and rolling doors.

Cost Impact: The proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Hetzel-G1-1714.5.2

S143–09/10
1715.5.2, Chapter 35

Proponent: John Woestman, The Kellen Company, representing the Door Safety Council (DSC)

1. Add new text as follows:

1715.5.2 Exterior windows and door assemblies not provided for in Section 1715.5.1. Exterior window and door assemblies shall be tested in accordance with ASTM E 330. Structural performance of exterior side-hinged door assemblies shall be determined in accordance with either ASTM E330 or ANSI A250.13. Structural performance of garage doors shall be determined in accordance with either ASTM E 330 or ANSI/DASMA 108, and shall meet the acceptance criteria of ANSI/DASMA 108. Exterior window and door assemblies containing glass shall comply with Section 2403. The design pressure for testing shall be calculated in accordance with Chapter 16. Each assembly shall be tested for a minimum of 10 seconds at a load equal to 1.5 times the design pressure.

2. Add new standard to Chapter 35 as follows:

ANSI
ANSI A250.13-08 Testing and Rating of Severe Windstorm Resistant Components for Swinging Door Assemblies

Reason: This proposal helps resolve performance and code compliance issues when exterior side-hinged door openings are comprised of components from multiple sources and include interchangeable elements (ie; doors, frames, hinging and latching hardware, etc.).

Through the ANSI standards development process, stake-holders, comprising most major manufacturing associations, testing and certification organizations, specifiers, code officials and end users, developed a national standard for a component-based approach to testing for windstorm resistance of swinging door openings. The test procedures used in this standard represent the most severe requirements found in the windstorm resistance standards referenced in today's building codes. These procedures are designed to isolate the loads, conditions and critical performance requirements that a particular component is subjected to in full assembly tests and duplicate these specific conditions. Using a combination of worst-case scenario design and safety factors, this standard is designed to provide a component rating that relates directly to the component's ability to withstand the conditions that occur in full assembly tests.

This proposed change allows an alternative method to demonstrate structural performance for side-hinged door openings by requiring components to be tested per ANSI A250.13-2008. A250.13 contains language that prescribes how components are to be selected to create complete swinging door openings expected to perform equivalently to those tested to ASTM E 330. ANSI A250.13 has additional requirements that are more stringent than those in the current 1714.5.2, including testing for a minimum of 30 seconds at a load equal to 1.5 times the design pressure. Currently 1714.5.2 requires testing for 10 seconds at a load equal to 1.5 times the design pressure.

Prior to releasing the current revision, validation tests were performed at three design-load levels, using the A250.13 test protocol to establish performance ratings. The study confirmed that at the same design-load level, openings comprised of such components will perform in the same manner as those in assembly based test protocols. The validation tests also showed that where an element was identified as the weakest in an opening during component testing, it would perform similarly when tested as part of an assembly at the same design-load.

Building designers will use the performance based criteria of ANSI A250.13 to select appropriate components to construct swinging door openings by conducting the presently required opening-by-opening design analysis, verify code compliance, and submit the results through the normal plans review process. Code authorities will therefore need only to verify the design load calculations and compliance analysis are correct and that ANSI A250.13 compliant products are utilized and installed in accordance with the manufacturer's instructions during construction.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ANSI A250 13-08 for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WOESTMAN-S2-1714.5.2

S144–09/10
1715.6 (New), 202; IRC R308.6.1

Proponent: Julie Ruth, PE, JRuth Code Consulting, representing American Architectural Manufacturers Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

1. Revise as follows:

SECTION 202

SKYLIGHT, UNIT. A factory-assembled, glazed fenestration unit, containing one panel of glazing material that allows for natural lighting through an opening in the roof assembly while preserving the weather-resistant barrier of the roof. Unit skylights include, but are not limited to, tubular daylighting devices (TDDs).

2. Add new text as follows:

1715.6 Skylights and sloped glazing. Unit skylights shall comply with the requirements of Section 2405. All other skylights and sloped glazing shall comply with the requirements of Chapter 24.

(Renumber subsequent sections)

PART II – IRC BUILDING/ENERGY

Revise as follows:

R308.6.1 Definitions.

~~**UNIT SKYLIGHT**~~ **SKYLIGHT, UNIT.** A factory assembled, glazed fenestration unit, containing one panel of glazing material, that allows for natural daylighting through an opening in the roof assembly while preserving the weather-resistant barrier of the roof. Unit skylights include, but are not limited to, tubular daylighting devices (TDDs).

Reason:
PART I- This proposal clarifies that tubular daylighting devices (TDDs) are unit skylights and therefore subject to the testing and labeling requirements of Section 2405 for these devices. It also points the code user to the appropriate location in the IBC for the structural requirements for unit skylights, TDDs and all other types of sloped glazing.
PART II- This proposal clarifies that tubular daylighting devices (TDDs) are unit skylights and therefore subject to the testing and labeling requirements of the IRC for same.

Cost Impact: The code change will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RUTH-G1-202

S145–09/10
1716.1, 2303.1, 2303.5, 2304.9.3

Proponent: Randall Shackelford, PE, representing Simpson Strong-Tie Co.

1. Revise as follows:

2303.1 General. Structural sawn lumber; end-jointed lumber; prefabricated wood I-joists; structural glued-laminated timber; wood structural panels, fiberboard sheathing (when used structurally); hardboard siding (when used structurally); particleboard; preservative-treated wood; structural log members; structural composite lumber; round timber poles and piles; fire-retardant-treated wood; hardwood plywood; wood trusses; ~~joist hangers;~~ nails; and staples shall conform to the applicable provisions of this section.

2304.9.3 Joist hangers and framing anchors. Connections depending on joist hangers or framing anchors, ties and other mechanical fastenings not otherwise covered are permitted where approved. ~~The vertical load-bearing capacity, torsional moment capacity and deflection characteristics of joist hangers shall be determined in accordance with Section 1716.1.~~

2. Delete without substitution:

~~**1716.1 Test standards for joist hangers and connectors.**~~

~~**1716.1.1 Test standards for joist hangers.** The vertical load-bearing capacity, torsional moment capacity and deflection characteristics of joist hangers shall be determined in accordance with ASTM D1761 using lumber having a specific gravity of 0.49 or greater, but not greater than 0.55, as determined in accordance with AF&PA NDS for the joist and headers.~~

~~**Exception:** The joist length shall not be required to exceed 24 inches (610 mm).~~

~~**1716.1.2 Vertical load capacity for joist hangers.** The vertical load capacity for the joist hanger shall be determined by testing a minimum of three joist hanger assemblies as specified in ASTM D 1761. If the ultimate vertical load for any one of the tests varies more than 20 percent from the average ultimate vertical load, at least three additional tests shall be conducted. The allowable vertical load of the joist hanger shall be the lowest value determined from the following:~~

1. ~~The lowest ultimate vertical load for a single hanger from any test divided by three (where three tests are conducted and each ultimate vertical load does not vary more than 20 percent from the average ultimate vertical load).~~
2. ~~The average ultimate vertical load for a single hanger from all tests divided by three (where six or more tests are conducted).~~
3. ~~The average from all tests of the vertical loads that produce a vertical movement of the joist with respect to the header of 0.125 inch (3.2 mm).~~
4. ~~The sum of the allowable design loads for nails or other fasteners utilized to secure the joist hanger to the wood members and allowable bearing loads that contribute to the capacity of the hanger.~~
5. ~~The allowable design load for the wood members forming the connection.~~

~~**1716.1.3 Torsional moment capacity for joist hangers.** The torsional moment capacity for the joist hanger shall be determined by testing at least three joist hanger assemblies as specified in ASTM D 1761. The allowable torsional moment of the joist hanger shall be the average torsional moment at which the lateral movement of the top or bottom of the joist with respect to the original position of the joist is 0.125 inch (3.2 mm).~~

~~**1716.1.4 Design value modifications for joist hangers.** Allowable design values for joist hangers that are determined by Item 4 or 5 in Section 1716.1.2 shall be permitted to be modified by the appropriate duration of loading factors as specified in AF&PA NDS but shall not exceed the direct loads as determined by Item 1, 2 or 3 in Section 1716.1.2. Allowable design values determined by Item 1, 2 or 3 in Section 1716.1.2 shall not be modified by duration of loading factors.~~

(Renumber subsequent sections)

~~**2303.5 Test standard for joist hangers and connectors.** For the required test standards for joist hangers and connectors, see Section 1716.1.~~

(Renumber subsequent sections)

Reason: The purpose of this code change is to delete current material that references outdated test standards.

Section 1716.1 was originally added into the code before there were ICC-ES acceptance criteria for joist hangers or other types of connectors. It was needed to give connector manufacturers guidance on how to load rate their products.

Now, however, there are several ICC-ES acceptance criteria for joist hangers and other types of connectors, so this language is no longer needed. For example, AC13 covers "joist hangers, framing anchors and similar devices".

In addition, this section references ASTM D 1761 as the test standard for joist hangers. This was the correct standard in the past. But in the 2009 IBC, ASTM D 1761 has been updated to the 2006 edition, which does not cover testing of joist hangers. Since this test standard no longer describes how to test a joist hanger, this section is not correct as written.

Joist hangers and framing anchors will still have to be approved by the Building Official per Section 2304.9.3.

Cost Impact: This proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SHACKELFORD-S1-1716.1

S146–09/10
1801.1; IEBC 1202.2

Proponent: Patrick Vandergriff, Vandergriff Code Consulting Services representing Modular Building Institute

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE STRUCTURAL COMMITTEE.

PART I- IBC STRUCTURAL

Revise as follows:

1801.1 Scope. The provisions of this chapter shall apply to building and foundation systems.

Exception: Foundations and foundation connections for temporary structures shall comply with manufacturers design details or an engineered design.

PART II- IEBC

Revise as follows:

1202.2 Foundation. The foundation system of relocated buildings shall comply with the *International Building Code* or the *International Residential Code* as applicable.

Exception: Foundations for temporary structures shall be permitted to be of any material allowed by this code in accordance with manufacturers design details or an engineered design.

1202.2.1 Connection to the foundation. The connection of the relocated building to the foundation shall comply with the *International Building Code* or the *International Residential Code* as applicable.

Exceptions:

1. Helical pier tie downs rated for sufficient resistance to uplift shall be permitted to be used on temporary structures placed on temporary foundations as permitted in the exception to Section 1202.2.
2. Other methods as provided by engineered design.

Reason:
PART I- The code addresses temporary structures, but fails to determine the foundations for temporary structures.
PART II- The change in the language provides for an exception on methods of foundation construction for temporary buildings. The temporary foundation would be allowed in accordance with the provisions, and provide sufficient foundation support for the structure while maintaining the need to insure connections that resist uplift and other forces required by the code.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I- IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II- IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: VANDERGRIFF-S1-1801.1-EB2-1202.2

S147–09/10
1803.2

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

1803.2 Investigation required. Geotechnical investigations shall be conducted in accordance with Sections 1803.3 through 1803.5.

Exceptions:

1. The building official shall be permitted to waive the requirement for a geotechnical investigation where satisfactory data from adjacent areas is available that demonstrates an investigation is not necessary for any of the conditions in Sections 1803.5.1 through 1803.5.6 and Sections 1803.5.10 and 1803.5.11.
2. Unless there are known potential geologic or seismic hazards or as required by any of the conditions in Section 1803.5.2, 1803.5.3, 1803.5.8, 1803.5.9 or 1803.5.10, the building official shall be permitted to waive the requirement for a geotechnical investigation for additions to light-frame R-3 or U occupancies, that are no more than two stories in height and have no basement, when they use the same foundation system as the structure to which they are attached,

Reason: It is an unreasonable hardship and cost to require a geotechnical report for an addition where the existing foundation system has proved to be adequate. The building official can still require a report if he/she deems that one is necessary or if known hazards exist.

Cost Impact: This code change will reduce the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAIEL-S3-1803.2

S148–09/10
1803.5.11, 1803.5.12

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

1803.5.11 Seismic Design Categories C through F. For structures assigned to Seismic Design Category C, D, E, or F in accordance with Section 1613, a geotechnical investigation shall be conducted, and shall include an evaluation of all of the following potential geologic and seismic hazards:

1. Slope instability.
2. Liquefaction.
3. Total and differential settlement.
4. Surface displacement due to faulting or seismically induced lateral spreading or lateral flow.

1803.5.12 Seismic Design Categories D through F. For structures assigned to Seismic Design Category D, E or F in accordance with Section 1613, the geotechnical investigation required by Section 1803.5.11 shall also include all of the following, as applicable:

1. The determination of dynamic seismic lateral earth pressures on foundation walls and retaining walls due to design earthquake ground motions.
2. The potential for liquefaction and soil strength loss evaluated for site peak ground acceleration~~s~~, earthquake magnitude~~s~~, and source characteristics consistent with the ~~design~~ maximum considered earthquake ground motions. Peak ground acceleration shall be ~~permitted to be~~ determined based on:
   2.1 A site-specific study ~~taking into account soil amplification effects, as specified in Chapter 21~~ in accordance with Section 11.4.7 of ASCE 7; or

2.2 ~~in the absence of such a study, peak ground accelerations shall be assumed equal to S_{DS} / 2.5, where S_{DS} is determined~~ The maximum considered earthquake geometric mean peak ground acceleration adjusted for site class in accordance with Section ~~1613.5.4~~ 11.8.3 of ASCE 7.

3. An assessment of potential consequences of liquefaction and soil strength loss, including, but not limited to:
   - 3.1 Estimation of total and differential settlement;
   - 3.2 Lateral soil movement;
   - 3.3 Lateral soil loads on foundations;
   - 3.4 Reduction in foundation soil-bearing capacity and lateral soil reaction;
   - 3.5 Soil downdrag and reduction in axial and lateral soil reaction for pile foundations;
   - 3.6 Increases in soil lateral pressures on retaining walls; and
   - 3.7 Flotation of buried structures.
4. Discussion of mitigation measures such as, but not limited to~~, ground stabilization~~:
   - 4.1 Selection of appropriate foundation type and depths;
   - 4.2 Selection of appropriate structural systems to accommodate anticipated displacements and forces;
   - 4.3 Ground stabilization; or
   - 4.4 Any combination of these measures and how they shall be considered in the design of the structure.

Reason: The purpose for this proposal is to correlate the IBC with the 2010 edition of ASCE 7. The need for correlation is due to ASCE 7 Proposal SSC TC-1-CH11-103-R2, which was approved by the Seismic Subcommittee on 5/15/09 and is being balloted by the Main Committee (Item #4 of the Sixth Main Committee Ballot on Seismic Provisions). It is expected that the Main Committee will approve the proposal.

Section 11.8.3 of ASCE 7-10 is being modified to require evaluations of liquefaction potential be made for maximum considered earthquake (MCE) ground motions rather than design earthquake (DE) ground motions to ensure that the potential occurrence and effects of liquefaction during the MCE are considered in geotechnical and structural design. This change is consistent with the risk-based targets for collapse prevention as a performance goal and other evaluations for the MCE that are specified in ASCE 7 for the performance goal of collapse-prevention during MCE loading.

Section 11.8.3 of ASCE 7-10 is also being modified to require liquefaction potential evaluations be conducted using maximum considered earthquake geometric mean peak ground acceleration (PGA) adjusted for site effects rather than the current approximation for peak ground acceleration of dividing short-period spectral acceleration by a factor of 2.5. Maps provided in ASCE 7-10 for the purpose of determining the accelerations are substantially more accurate since they are based on PGA attenuation relationships. PGA is modified for site class effects by Eq. 11.8-1 of ASCE 7-10 where the site coefficient, F_{PGA}, is obtained from Table 11.8-1 of ASCE 7-10. The values of F_{PGA} are identical to the site coefficient, F_a, in Table 11.4-1 of ASCE 7-10 but are a function of PGA rather than the mapped MCE spectral response acceleration at short periods, S_s. Because PGA is a short-period parameter (equal to zero-period spectral acceleration), it is appropriate and consistent with current practice to use the same site coefficients for PGA and S_S. It is also consistent with the original development of F_a as a function of PGA.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S8-1803.5.11

S149–09/10
1803.5.12

Proponent: Ali M. Fattah, City of San Diego, representing SD Area Chapter ICC Code Committee

Revise as follows:

1803.5.12 Seismic Design Categories D through F. For structures assigned to *Seismic Design Category* D, E or F in accordance with Section 1613, the geotechnical investigation required by Section 1803.5.11, shall also include:

1. The determination of lateral earth pressures on foundation walls and retaining walls supporting more than 12 feet (3.66 m) of backfill height, due to earthquake motions.
2. The potential for liquefaction and soil strength loss evaluated for site peak ground accelerations, magnitudes and source characteristics consistent with the design earthquake ground motions. Peak ground acceleration shall be permitted to be determined based on a site-specific study taking into account soil amplification effects, as specified in Chapter 21 of ASCE 7, or, in the absence of such a study, peak ground accelerations shall be assumed equal to S_{DS}/2.5, where S_{DS} is determined in accordance with Section 1613.5.4.
3. An assessment of potential consequences of liquefaction and soil strength loss, including estimation of differential settlement, lateral movement, lateral loads on foundations, reduction in foundation soil-bearing capacity, increases in lateral pressures on retaining walls and flotation of buried structures.
4. Discussion of mitigation measures such as, but not limited to, ground stabilization, selection of appropriate foundation type and depths, selection of appropriate structural systems to accommodate anticipated displacements and forces, or any combination of these measures and how they shall be considered in the design of the structure.

Reason: The proposed code change deletes a current requirement. The current requirement is onerous on small structures and light framed structures as well as for retaining walls. The California Building Code has had an amendment that was added in the 1990's that addresses this issue and limits the requirement to retaining walls higher than 12 ft. The amendment only applies to hospitals projects, school projects and State owned buildings (See Section 1806A.1 General, http://www.bsc.ca.gov/default.htm).

Evidence from recent earthquakes and recent experimental research results, including work recently completed at the University of California, Berkeley, CA (Al Atik and Sitar, 2008) have demonstrated that the retaining walls structures would have to move in order to develop the failure wedge postulated in the so-called Mononobe and Okabe method. This method was developed by Okabe (1926) and Mononobe & Matsuo (1929) as an extension of Coulomb's static earth pressure theory to include the inertial forces due to the horizontal and vertical back-fill accelerations. The M-O method was developed for dry cohesionless backfill retained by a gravity wall and is mainly based on the following assumptions (Seed & Whitman 1970):

1. The wall yields sufficiently to produce minimum active pressure and the soil is assumed to satisfy the Mohr-Coulomb failure criterion;
2. When the minimum active pressure is attained, a soil wedge behind the wall is at the point of incipient failure, and the maximum shear strength is mobilized along the potential sliding surface; and
3. The soil wedge behaves as a rigid body, and accelerations are constant throughout the mass.

However, this condition can only occur when the wall has already failed due to other causes and the current body of field evidence does not provide any evidence of existence of this proposed mechanism of failure.

Retaining wall backfill is what imposes the inertial forces and is controlled backfill, usually not cohesionless and is compacted.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Fattah-S2-1803.5.1.2

S150–09/10
1803.5.12

Proponent: Jim Rossberg, SEI of ASCE, representing self

Revise as follows:

1803.5.12 Seismic Design Categories D through F. For structures assigned to Seismic Design Category D, E or F in accordance with Section 1613, the geotechnical investigation required by Section 1803.5.11 shall also include:

1. The determination of lateral pressures on foundation and retaining walls due to earthquake motions.
2. The potential for liquefaction and soil strength loss evaluated for site peak ground accelerations, magnitudes, and source characteristics consistent with the design earthquake ground motions. Peak ground acceleration shall be permitted to be determined based on a site-specific study taking into account soil amplification effects, as specified in Chapter 21.5 of ASCE 7, or, in the absence of such a study, peak ground accelerations shall be ~~assumed equal to S_{DS} / 2.5, where S_{DS} is determined in accordance with Section 1613.5.4~~ taken equal to the value determined in accordance with Section 11.8.3 of ASCE 7.
3. An assessment of potential consequences of liquefaction and soil strength loss, including estimation of differential settlement, lateral movement, lateral loads on foundations, reduction in foundation soil-bearing capacity, increases in lateral pressures on retaining walls and flotation of buried structures.
4. Discussion of mitigation measures such as, but not limited to, ground stabilization, selection of appropriate foundation type and depths, selection of appropriate structural systems to accommodate anticipated displacements and forces, or any combination of these measures and how they shall be considered in the design of the structure.

Reason: This proposed change coordinates the provision of the IBC with those of the 2010 edition of ASCE 7. This provision has been considered and approved by the Seismic Subcommittee of ASCE 7 for inclusion into the 2010 edition of ASCE 7 hence with the adoption of ASCE 7-10 by reference this provision becomes duplicative. As of the submission date of this code change, the ASCE 7 Standards Committee is completing the committee balloting portion of the 2010 edition of ASCE/SEI 7. The document is designated ASCE/SEI 7-10 *Minimum Design Loads for Buildings and Other Structures* and it is expected that it will be completed and available for purchase prior to the ICC Final Action Hearings in May of 2010 . Any person interested in obtaining a public comment copy of ASCE/SEI 7-10 may do so by contacting the proponent at jrossberg@asce.org.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROSSBERG-S2-1803.5.12

S151–09/10
1807.3.2.1

Proponent: Brian Johnson, PE, representing self

Revise as follows:

1807.3.2.1 Non-constrained. The following formula shall be used in determining the depth of embedment required to resist lateral loads where no lateral constraint is provided at the ground surface, such as by a rigid floor or rigid ground surface pavement, and where no lateral constraint is provided above the ground surface, such as by a structural diaphragm.

~~$d = 0.5A\{1 + [1 + (4.36h/A)]1/2\}$~~ $d = \frac{A}{2}\left(1 + \sqrt{1 + \frac{4.36h}{A}}\right)$ **(Equation 18-1)**

where:

The constant in (Equation 18-1) is dimensionless.

~~$A = 2.34P/S_1 b.$~~ $A = \frac{2.34P}{S_1 b}$, feet (m)

B = Diameter of round post or footing or diagonal dimension of square post or footing, feet (m).
d = Depth of embedment in earth in feet (m) ~~but not over 12 feet (3658 mm) for purpose of computing lateral pressure.~~
h = Distance in feet (m) from ground surface to point of application of ~~"P."~~ P.
P = Applied lateral force in pounds (kN).
S_1 = Allowable lateral soil-bearing pressure as set forth in Section 1806.2 based on a depth of one-third the depth of embedment in pounds per square foot (psf) (kPa) but not over 12 feet (3.66 m) for purpose of computing lateral pressure.

Reason: In the IBC 2006 formula for *A* it is unclear if *b* is a divisor or a multiplier. The formula needs parentheses or better formatting to answer this question. If it is a divisor, *A* is dimensionless and so *d* has no dimensions either. Consulting UBC 1997 revealed a properly formatted formula that should replace the one in IBC 2006, etc (*b* is a divisor). I added that *A* is in feet, thus equation 18-1 gives a result in feet. I added a clarification that 0.5 (1/2) carries no dimensions so equation 18-1 now clearly results in an answer in feet or meters based on the units entered.

The restriction on *d* doesn't make sense, the restriction should be on the soil pressure, the embedment depth can exceed 12 feet, it is the soil pressure that is to be limited. Note that 12 feet limit conflicts with IBC 1804.3.1 and I have not changed this.

Cost Impact: Decrease the cost of construction by clarifying formula.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: JOHNSON-S1-1807.3.2.1.DOC

S152–09/10
1807.3.2.1, 1807.3.2.2

Proponent: Brian Johnson, PE, representing self

Revise as follows:

1807.3.2.1 Nonconstrained. The following formula shall be used in determining the depth of embedment required to resist lateral loads where no lateral constraint is provided at the ground surface, such as by a rigid floor or rigid ground surface pavement, and where no lateral constraint is provided above the ground surface, such as by a structural diaphragm.

$d = 0.5A\{1 + [1 + (4.36h/A)]^{1/2}\}$ **(Equation 18-1)**

where:

[formula is valid for SI and Imperial units]

A = $2.34P/S_1$ b.
b = Diameter of round post or footing or diagonal dimension of square post or footing, feet (m).
d = Depth of embedment in earth in feet (m) but not over 12 feet (3658 mm) for purpose of computing lateral pressure.
h = Distance in feet (m) from ground surface to point of application of "P."

P = Applied lateral force in pounds (kN).
S_1 = Allowable lateral soil-bearing pressure as set forth in Section 1806.2 based on a depth of one-third the depth of embedment in pounds per square foot (psf) (kPa).

1807.3.2.2 Constrained. The following formula shall be used to determine the depth of embedment required to resist lateral loads where lateral constraint is provided at the ground surface, such as by a rigid floor or pavement.

$$d = \sqrt{\frac{4.25Ph}{S_1 b}} \qquad \textbf{(Equation 18-2)}$$

or alternatively

$$d = \sqrt{\frac{4.25 M_g}{S_3 b}} \qquad \textbf{(Equation 18-3)}$$

where:

[formula is valid for SI and Imperial units]

M_g = Moment in the post at grade, in foot-pounds (kN-m).
S_3 = Allowable lateral soil-bearing pressure as set forth in Section 1806.2 based on a depth equal to the depth of embedment in pounds per square foot (kPa).

Reason: If formulas are valid for both Imperial and SI, I'd like it stated explicitly in the code. As near as I can tell, the units cancel in the formulas, so they're valid in both Imperial and SI.

Alternatively, it the above is not correct, all the metric equivalents should be deleted from the definitions following the formulas as follows:
b = Diameter of round post or footing or diagonal dimension of square post or footing, feet ~~(m)~~.
d = Depth of embedment in earth in feet ~~(m)~~ but not over 12 ~~(3658 mm)~~ feet for purpose of computing lateral pressure.
P = Applied lateral force in pounds ~~(kN)~~.
h = Distance in feet ~~(m)~~ from ground surface to point of application of ~~"~~P.~~"~~
S_1 = Allowable lateral soil bearing pressure as set forth in Section 1804.3 based on a depth of one-third the depth of embedment in pounds per square foot (psf) ~~(kPa)~~.
Mg = Moment in the post at grade, in foot-pounds ~~(kN-m).~~
*S*3 = Allowable lateral soil-bearing pressure as set forth in Section 1806.2 based on a depth equal to the depth of embedment in pounds per square foot ~~(kPa).~~

Cost Impact: The code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: JOHNSON-S4-1807.3.2.1-3.DOC

S153–09/10
1807.3.2.1, 1807.3.2.2

Proponent: Brian Johnson, PE, representing self

Revise as follows:

1807.3.2.1 Nonconstrained. The following formula shall be used in determining the depth of embedment required to resist lateral loads where no lateral constraint is provided at the ground surface, such as by a rigid floor or rigid ground surface pavement, and where no lateral constraint is provided above the ground surface, such as by a structural diaphragm.

$D = 0.5A\{1 + [1 + (4.36h/A)]^{1/2}\}$ **(Equation 18-1)**

where:

$A = 2.34P/S_1b$.
B = Diameter of round post or footing or diagonal dimension of square post or footing, feet (m).

d = Depth of embedment in earth in feet (m) but not over ~~12 (3658 mm)~~ 15 feet (4.57 m) for purpose of computing lateral pressure.
H = Distance in feet (m) from ground surface to point of application of "P."
P = Applied lateral force in pounds (kN).
S_1 = Allowable lateral soil-bearing pressure as set forth in Section 1806.2 based on a depth of one-third the depth of embedment in pounds per square foot (psf) (kPa).

1807.3.2.2 Constrained. The following formula shall be used to determine the depth of embedment required to resist lateral loads where lateral constraint is provided at the ground surface, such as by a rigid floor or pavement.

$$d = \sqrt{\frac{4.25Ph}{S_3 b}} \qquad \textbf{(Equation 18-2)}$$

or alternatively

$$d = \sqrt{\frac{4.25M}{S_3 b}} \qquad \textbf{(Equation 18-3)}$$

where:

d = depth of embedment in earth in feet (m) but not over 15 feet (4.57 m) for purpose of computing lateral pressure.
M_g = Moment in the post at grade, in foot-pounds (kN-m).
S_3 = Allowable lateral soil-bearing pressure as set forth in Section 1806.2 based on a depth equal to the depth of embedment in pounds per square foot (kPa).

Reason: To bring limitation to match section 1804.3.1. While we're at it, why not fix the metric dimension to something sensible. Who designs pole embedment to the millimeter?

Cost Impact: The code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: JOHNSON-S5-1807.3.2.1-4.DOC

S154–09/10
1807.3.2.2

Proponent: Brian Johnson, PE, representing self

Revise as follows:

1807.3.2.2 Constrained. The following formula shall be used to determine the depth of embedment required to resist lateral loads where lateral constraint is provided at the ground surface, such as by a rigid floor or pavement.

$$d = \sqrt{\frac{4.25Ph}{S_3 b}} \qquad \textbf{(Equation 18-2)}$$

or alternatively

$$d = \sqrt{\frac{4.25 M_g}{S_3 b}} \qquad \textbf{(Equation 18-3)}$$

where:

b = Diameter of round post or footing or diagonal dimension of square post or footing, feet (m).
d = Depth of embedment in earth in feet (m)
h = Distance in feet (m) from ground surface to point of application of P.

M_g = Moment in the post at grade, in foot-pounds (kN-m).
P = Applied lateral force in pounds (kN).
S_3 = Allowable lateral soil-bearing pressure as set forth in Section 1806.2 based on a depth equal to the depth of embedment in pounds per square foot (kPa) but not over 12 feet (3.66 m) for purpose of computing lateral pressure.

Reason: The restriction on *d* doesn't make sense [see section 1807.3.2.1 definition), the restriction should be on the soil pressure. Definitions of *b*, *d*, *h*, and *P* added to eliminate cross-reference and page flipping.

Cost Impact: Decrease the cost of construction by clarifying formula, simplifying formulas, and preventing cross-referencing.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: JOHNSON-S3-1807.3.2.2.DOC

S155–09/10
1810.3.3.1.5

Proponent: Lori A. Simpson, Treadwell & Rollo, Inc., representing self

Revise as follows:

1810.3.3.1.5 Uplift capacity of a single deep foundation element. Where required by the design, the uplift capacity of a single deep foundation element shall be determined by an *approved* method of analysis based on a minimum factor of safety of three or by load tests conducted in accordance with ASTM D 3689. The maximum allowable uplift load shall not exceed the ultimate load capacity as determined in Section 1810.3.3.1.2, using the results of load tests conducted in accordance withASTMD3689, divided by a factor of safety of two.

Exception: Where uplift is due to wind or seismic loading, the minimum factor of safety shall be two where capacity is determined by an analysis and one and one-half where capacity is determined by load tests. A factor of safety of one and one-half is allowed where uplift capacity is determined by an analysis and the local soil conditions are well understood, as substantiated in the geotechnical investigation.

Reason: It is the standard of practice in the San Francisco Bay Area to use a factor of safety of 1.5 for temporary uplift loads, such as wind or seismic. Although there can be cyclic degradation in the strength of the soil, it is offset by an increase in strength during rapid loading. With well known soil conditions, the uplift capacity is well-defined and should not be reduced by a factor of safety of 2 for temporary loading conditions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SIMPSON-S2-1810.3.3.1.5

S156–09/10
1810.3.3.1.6

Proponent: Lori A. Simpson, Treadwell & Rollo, Inc., representing self

Revise as follows:

1810.3.3.1.6 Uplift capacity of grouped deep foundation elements. For grouped deep foundation elements subjected to uplift, the allowable working uplift load for the group shall be calculated by an *approved* method of analysis. Where the deep foundation elements in the group are placed at a center-to-center spacing of at least 2.5 times the least horizontal dimension of the largest single element, the allowable working uplift load for the group is permitted to be calculated as the lesser of:

1. The proposed individual uplift working load times the number of elements in the group.
2. Two-thirds of the effective weight of the group and the soil contained within a block defined by the perimeter of the group and the length of the element, plus two-thirds of the ultimate shear resistance along the soil block.

Reason: Allowing only the weight of the piles and soil in the block is unreasonably conservative; not only the weight but also the shear resistance will be developed during an uplift loading event.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SIMPSON-S3-1810.3.3.1.6

S157–09/10
1810.3.9.7 (New)

Proponent: Michael Morgano, GRL Engineers, representing self

Add new text as follows:

1810.3.9.7 Pile integrity testing . The structural integrity of cast-in-place deep foundation elements shall be verified using pulse echo integrity testing.

Reason: Due to the installation methods required for cast-in-place piles, it is not possible to inspect the element after installation. Integrity testing via pulse echo methods is commonly available, the most economical and easily applied test.

The Federal Highway Administration "Geotechnical Engineering Circular (GEC) No. 8" specifically states in section 7.5.2 (page 184) "The most commonly available, economical, and easily applied type of integrity test is the sonic echo test. The advantage of the method is that a test can be performed rapidly, inexpensively, and without any internal instrumentation or tubes in the pile."

The Federal Highway Administration "Geotechnical Engineering Circular (GEC) No. 8" specifically states in section 8.3.12 (page 221) "Post-installation integrity tests shall be performed on a minimum of 20% of the production piles."

A copy of the Federal Highway Administration "Geotechnical Engineering Circular (GEC) No. 8"can be downloaded at no cost from the following site: www.fhwa.dot.gov/engineering/geotech/pubs/gec8.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MORGANO-S3-1810.3.9.7

S158–09/10
1810.4.8

Proponent: Michael Morgano, GRL Engineers, representing self

Revise as follows:

1810.4.8 Hollow-stem augered, cast-in-place elements. Where concrete or grout is placed by pumping through a hollow-stem auger, the auger shall be permitted to rotate in a clockwise direction during withdrawal. As the auger is withdrawn at a steady rate or in increments not to exceed 1 foot (305 mm), concreting or grouting pumping pressures shall be measured with Automated Monitoring equipment and maintained high enough at all times to offset hydrostatic and lateral earth pressures. Concrete or grout volumes shall be measured to ensure that the volume of concrete or grout placed in each element is equal to or greater than the theoretical volume of the hole created by the auger. Where the installation process of any element is interrupted or a loss of concreting or grouting pressure occurs, the element shall be redrilled to 5 feet (1524 mm) below the elevation of the tip of the auger when the installation was interrupted or concrete or grout pressure was lost and reformed. Augered cast-in-place elements shall not be installed within six diameters center to center of an element filled with concrete or grout less than 12 hours old, unless *approved* by the *building official*. If the concrete or grout level in any completed element drops due to installation of an adjacent element, the element shall be replaced.

Reason: Using current practice, it is not possible to measure and maintain the grouting pressures during the installation process. These pressures are typically measured with an analog pressure gage which is installed at the pump. These analog pressure gages provide very low resolution, poor frequency response, and have no ability to record and therefore verify that the pressure remained high enough at all times. The crane operator is the individual that needs to see these pressure readings as he has direct control over the installation process, yet with current practice the crane operator will never see these values. Furthermore, it is not possible for the crane operator (or any other individuals on site) to determine lift heights to an accuracy of 1 foot, as the standard practice is to mark the leads at approximately every 5 feet (with many rigs being totally unmarked). Without the use of Automated Monitoring Equipment, this lifting height is simply a rough estimate made by the crane operator. Additionally, as augered cast-in-place pile length increase, it is not possible for the crane operator to visually determine the lift heights accurately due to parallax.
The Federal Highway Administration "Geotechnical Engineering Circular (GEC) No. 8" specifically states in section 7.4.2 that in general, the simple manual observation and control system is not considered to provide sufficient control for transportation projects. The system that is recommended for transportation projects includes automated monitoring of the auger position; volume of grout/concrete that is delivered; pressure with which it is delivered; and rotation and lifting of the auger.

A copy of the Federal Highway Administration "Geotechnical Engineering Circular (GEC) No. 8"can be downloaded at no cost from the following site: www.fhwa.dot.gov/engineering/geotech/pubs/gec8.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MORGANO-S1-1810.4.8

S159–09/10
1810.4.8

Proponent: Michael Morgano, GRL Engineers, representing self.

Revise as follows:

1810.4.8 Hollow-stem augered, cast-in-place elements. Where concrete or grout is placed by pumping through a hollow-stem auger, the auger shall be permitted to rotate in a clockwise direction during withdrawal. As the auger is withdrawn at a steady rate or in increments not to exceed 1 foot (305 mm), concreting or grouting pumping pressures shall be measured and maintained high enough at all times to offset hydrostatic and lateral earth pressures. Concrete or grout volumes shall be measured with a magnetic flow meter as part of an Automated Monitoring system to ensure that the volume of concrete or grout placed in each element is equal to or greater than the theoretical volume of the hole created by the auger. This volume of concrete or grout shall be measured and recorded for every 2 feet (610 mm) of auger withdrawal. Where the installation process of any element is interrupted or a loss of concreting or grouting pressure occurs, the element shall be redrilled to 5 feet (1524 mm) below the elevation of the tip of the auger when the installation was interrupted or concrete or grout pressure was lost and reformed. Augered cast-in-place elements shall not be installed within six diameters center to center of an element filled with concrete or grout less than 12 hours old, unless *approved* by the *building official*. If the concrete or grout level in any completed element drops due to installation of an adjacent element, the element shall be replaced.

Reason: Manual control of the grout/concrete placement process involves counting pump strokes and assigning an approximate volume to each pump stroke. It is widely known that grout/concrete pumps do not maintain a constant volume for every pump stroke. These mechanical pumps a highly variable and it is not possible to determine with any degree of accuracy the volume associated with any particular pump stroke. Further, it is common for a mechanical pump to miss several pump strokes in succession, leaving the possibility for serious voids in the element. It is generally not possible for an individual counting pump strokes or for a mechanical stroke counter to discern when the mechanical pump operates normally and when it fails to deliver full theoretical grout/ concrete volume for any stroke. The only reliable method for determining grout/concrete volume is to measure it directly. According to the Federal Highway Administration "General Engineering Circular (GEC) No. 8" section 7.4.2 "In general, the simple manual observation and control system is not considered to provide sufficient control for transportation projects. The system recommended for transportation projects includes automated monitoring of the auger position; volume of concrete delivered (measured by an in-line flow meter that provides a reliable and accurate measure of the grout/concrete that is delivered in real time); pressure with which it is delivered; and rotation and lifting speed of the auger, with the entire process recorded as part of the documentation process.

Measuring the total volume for an element is not sufficient. There is a significant risk in only obtaining the overall volume placed as there can be voids throughout the element that can only be detected by measuring the incremental volume placed in the element. According to the Federal Highway Administration "General Engineering Circular (GEC) No. 8" section 8.3.6 " The volume of grout or concrete placed as a function of depth shall be measured at intervals not exceeding 2 ft (0.6m) using automated monitoring equipment."

A copy of the Federal Highway Administration "Geotechnical Engineering Circular (GEC) No. 8"can be downloaded at no cost from the following site: www.fhwa.dot.gov/engineering/geotech/pubs/gec8.

According to the Deep Foundation Institute's "AUGERED CAST-IN-PLACE PILE MANUAL" section 3.4.7 "The most desirable precautions that are available in the construction of ACIP piles are to: pump the specified initial grout head prior to the withdrawal of the auger, maintain grout pumping while installing the required incremental grout volume as the auger is being withdrawn, and observing grout return when the auger's depth below the ground surface is equal or greater than the specified initial grout head. The observation of these three conditions are the most useful quality control tools that can be utilized in ACIP pile construction."

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MORGANO-S2-1810.4.8

S160–09/10
1901.3 through 1901.4, 1904, 1905, 1906, 1907, 1909

Proponent: Matthew Senecal, PE, American Concrete Institute, representing American Concrete Institute

1. Delete without substitution:

~~**1901.3 Source and applicability.** The format and subject matter of Sections 1902 through 1907 of this chapter are patterned after, and in general conformity with, the provisions for structural concrete in ACI 318.~~

2. Revise as follows:

~~**1901.4**~~ **1901.3 Construction documents.** The *construction documents* for structural concrete construction shall include:

1. The specified compressive strength of concrete at the stated ages or stages of construction for which each concrete element is designed.
2. The specified strength or grade of reinforcement.
3. The size and location of structural elements, reinforcement and anchors.
4. Provision for dimensional changes resulting from creep, shrinkage and temperature.
5. The magnitude and location of prestressing forces.
6. Anchorage length of reinforcement and location and length of lap splices.
7. Type and location of mechanical and welded splices of reinforcement.
8. Details and location of contraction or isolation joints specified for plain concrete.
9. Minimum concrete compressive strength at time of posttensioning.
10. Stressing sequence for posttensioning tendons.
11. For structures assigned to *Seismic Design Category* D, E or F, a statement if slab on grade is designed as a structural diaphragm ~~(see Section 21.12.3.4 of ACI 318)~~.

(Renumber remaining sections)

3. Delete without substitution:

~~**1904.1 Water-cementitious materials ratio.** Where maximum water-cementitious materials ratios are specified in ACI 318, they shall be calculated in accordance with ACI 318, Section 4.1.~~

4. Revise as follows:

~~**1904.2**~~ **1904.1 Exposure categories and classes.** Concrete shall be assigned to exposure classes in accordance with the durability requirements of ACI 318~~, Section 4.2,~~ based on:

1. Exposure to freezing and thawing in a moist condition or deicer chemicals;
2. Exposure to sulfates in water or soil;
3. Exposure to water where the concrete is intended to have low permeability; and
4. Exposure to chlorides from deicing chemicals, salt, saltwater, brackish water, seawater or spray from these sources, where the concrete has steel reinforcement.

~~**1904.3**~~ **1904.2 Concrete properties.** Concrete mixtures shall conform to the most restrictive maximum water-cementitious materials ratios, maximum cementitious admixtures, minimum air-entrainment and minimum specified concrete compressive strength requirements of ACI 318~~, Section 4.3,~~ based on the exposure classes assigned in Section ~~1904.2~~ 1904.1.

Exception: For occupancies and appurtenances thereto in Group R occupancies that are in buildings less than four stories above grade plane, normal-weight aggregate concrete is permitted to comply with the requirements of Table ~~1904.3~~ 1904.2 based on the weathering classification (freezing and thawing) determined from Figure ~~1904.3~~ 1904.2 in lieu of the durability requirements of ACI 318~~, Table 4.3.1~~.

TABLE ~~1904.3~~ 1904.2
MINIMUM SPECIFIED COMPRESSIVE STRENGTH
No change to table

a. Concrete in these locations that can be subjected to freezing and thawing during construction shall be of air-entrained concrete in accordance with ~~1904.3~~ 1904.2 ~~Section 1904.4.1~~.
b. Concrete shall be air entrained in accordance with ACI 318 ~~Section 1904.4.1~~.
c. Structural plain concrete basement walls are exempt from the requirements for exposure conditions of Section ~~1904.3~~ 1904.2 (see Section 1909.6.1).
d. For garage floor slabs where a steel trowel finish is used, the total air content required by ACI 318 ~~Section 1904.4.1~~ is permitted to be reduced to not less than 3 percent, provided the minimum specified compressive strength of the concrete is increase to 4,000 psi.

FIGURE ~~1904.3~~ 1904.2
WEATHERING PROBABILITY MAP FOR CONCRETE [a, b, c]
(No changes to map and footnotes)

5. Delete without substitution:

~~**1904.4 Freezing and thawing exposures.** Concrete that will be exposed to freezing and thawing, in the presence of moisture, with or without deicing chemicals being present, shall comply with Sections 1904.4.1 and 1904.4.2.~~

~~**1904.4.1 Air entrainment.** Concrete exposed to freezing and thawing while moist shall be air entrained in accordance with ACI 318, Section 4.4.1.~~

~~**1904.4.2 Deicing chemicals.** For concrete exposed to freezing and thawing in the presence of moisture and deicing chemicals, the maximum weight of fly ash, other pozzolans, silica fume or slag that is included in the concrete shall not exceed the percentages of the total weight of cementitious materials permitted by ACI 318, Section 4.4.2.~~

~~**1904.5 Alternative cementitious materials for sulfate exposure.** Alternative combinations of cementitious materials for use in sulfate-resistant concrete to those listed in ACI 318, Table 4.3.1 shall be permitted in accordance with ACI 318, Section 4.5.1.~~

~~**SECTION 1905**~~
~~**CONCRETE QUALITY, MIXING AND PLACING**~~

~~**1905.1 General.** The required strength and durability of concrete shall be determined by compliance with the proportioning, testing, mixing and placing provisions of Sections 1905.1.1 through 1905.13.~~

~~**1905.1.1 Strength.** Concrete shall be proportioned to provide an average compressive strength as prescribed in Section 1905.3 and shall satisfy the durability criteria of Section 1904. Concrete shall be produced to minimize the frequency of strengths below f'_c as prescribed in Section 1905.6.3. For concrete designed and constructed in accordance with this chapter, f'_c shall not be less than 2,500 psi (17.22 MPa). No maximum specified compressive strength shall apply unless restricted by a specific provision of this code or ACI 318.~~

~~**1905.2 Selection of concrete proportions.** Concrete proportions shall be determined in accordance with the provisions of ACI 318, Section 5.2.~~

~~**1905.3 Proportioning on the basis of field experience and/or trial mixtures.** Concrete proportioning determined on the basis of field experience and/or trial mixtures shall be done in accordance with ACI 318, Section 5.3.~~

~~**1905.4 Proportioning without field experience or trial mixtures.** Concrete proportioning determined without field experience or trial mixtures shall be done in accordance with ACI 318, Section 5.4.~~

~~**1905.5 Average strength reduction.** As data become available during construction, it is permissible to reduce the amount by which the average compressive strength (f'_c) is required to exceed the specified value of f'_c in accordance with ACI 318, Section 5.5.~~

~~**1905.6 Evaluation and acceptance of concrete.** The criteria for evaluation and acceptance of concrete shall be as specified in Sections 1905.6.2 through 1905.6.5.~~

~~**1905.6.1 Qualified technicians.** Concrete shall be tested in accordance with the requirements in Sections 1905.6.2 through 1905.6.5. Qualified field testing technicians shall perform tests on fresh concrete at the job site, prepare specimens required for curing under field conditions, prepare specimens required for testing in the laboratory and record the temperature of the fresh concrete when preparing specimens for strength tests. Qualified laboratory technicians shall perform all required laboratory tests.~~

~~**1905.6.2 Frequency of testing.** The frequency of conducting strength tests of concrete and the minimum number of tests shall be as specified in ACI 318, Section 5.6.2.~~

> ~~**Exception:** When the total volume of a given class of concrete is less than 50 cubic yards (38m3), strength tests are not required when evidence of satisfactory strength is submitted to and approved by the building official.~~

~~**1905.6.3 Strength test specimens.** Specimens prepared for acceptance testing of concrete in accordance with Section 1905.6.2 and strength test acceptance criteria shall comply with the provisions of ACI 318, Section 5.6.3.~~

1905.6.4 Field-cured specimens. Where required by the building official to determine adequacy of curing and protection of concrete in the structure, specimens shall be prepared, cured, tested and test results evaluated for acceptance in accordance with ACI 318, Section 5.6.4.

1905.6.5 Low-strength test results. Where any strength test (see ACI 318, Section 5.6.2.4) falls below the specified value of f'_c, the provisions of ACI 318, Section 5.6.5, shall apply.

1905.7 Preparation of equipment and place of deposit. Prior to concrete being placed, the space to receive the concrete and the equipment used to deposit it shall comply with ACI 318, Section 5.7.

1905.8 Mixing. Mixing of concrete shall be performed in accordance with ACI 318, Section 5.8.

1905.9 Conveying. The method and equipment for conveying concrete to the place of deposit shall comply with ACI 318, Section 5.9.

1905.10 Depositing. The depositing of concrete shall comply with the provisions of ACI 318, Section 5.10.

1905.11 Curing. The length of time, temperature and moisture conditions for curing of concrete shall be in accordance with ACI 318, Section 5.11.

1905.12 Cold weather requirements. Concrete to be placed during freezing or near-freezing weather shall comply with the requirements of ACI 318, Section 5.12.

1905.13 Hot weather requirements. Concrete to be placed during hot weather shall comply with the requirements of ACI 318, Section 5.13.

SECTION 1906
FORMWORK, EMBEDDED PIPES AND CONSTRUCTION JOINTS

1906.1 Formwork. The design, fabrication and erection of forms shall comply with ACI 318, Section 6.1.

1906.2 Removal of forms, shores and reshores. The removal of forms and shores, including from slabs and beams (except where cast on the ground), and the installation of reshores shall comply with ACI 318, Section 6.2.

1906.3 Conduits and pipes embedded in concrete. Conduits, pipes and sleeves of any material not harmful to concrete and within the limitations of ACI 318, Section 6.3, are permitted to be embedded in concrete with approval of the registered design professional.

1906.4 Construction joints. Construction joints, including their location, shall comply with the provisions of ACI 318, Section 6.4.

SECTION 1907
DETAILS OF REINFORCEMENT

1907.1 Hooks. Standard hooks on reinforcing bars used in concrete construction shall comply withACI 318, Section 7.1.

1907.2 Minimum bend diameters. Minimum reinforcement bend diameters utilized in concrete construction shall comply with ACI 318, Section 7.2.

1907.3 Bending. The bending of reinforcement shall comply with ACI 318, Section 7.3.

1907.4 Surface conditions of reinforcement. The surface conditions of reinforcement shall comply with the provisions of ACI 318, Section 7.4.

1907.5 Placing reinforcement. The placement of reinforcement, including tolerances on depth and cover, shall comply with the provisions of ACI 318, Section 7.5. Reinforcement shall be accurately placed and adequately supported before concrete is placed.

1907.6 Spacing limits for reinforcement. The clear distance between reinforcing bars, bundled bars, tendons and ducts shall comply with ACI 318, Section 7.6.

~~**1907.7 Concrete protection for reinforcement.** The minimum specified concrete cover for reinforcement shall comply with Sections 1907.7.1 through 1907.7.8.~~

~~**1907.7.1 Cast-in-place concrete (nonprestressed).** Minimum specified concrete cover shall be provided for reinforcement in nonprestressed, cast-in-place concrete construction in accordance with ACI 318, Section 7.7.1.~~

~~**1907.7.2 Cast-in-place concrete (prestressed).** The minimum specified concrete cover for prestressed and nonprestressed reinforcement, ducts and end fittings in cast-in-place prestressed concrete shall comply with ACI 318, Section 7.7.2.~~

~~**1907.7.3 Precast concrete (manufactured under plant control conditions).** The minimum specified concrete cover for prestressed and nonprestressed reinforcement, ducts and end fittings in precast concrete manufactured under plant control conditions shall comply with ACI 318, Section 7.7.3.~~

~~**1907.7.4 Bundled bars.** The minimum specified concrete cover for bundled bars shall comply with ACI 318, Section 7.7.4.~~

~~**1907.7.5 Headed shear stud reinforcement.** For headed shear stud reinforcement, the minimum specified concrete cover shall comply with ACI 318, Section 7.7.5.~~

~~**1907.7.6 Corrosive environments.** In corrosive environments or other severe exposure conditions, prestressed and nonprestressed reinforcement shall be provided with additional protection in accordance with ACI 318, Section 7.7.6.~~

~~**1907.7.7 Future extensions.** Exposed reinforcement, inserts and plates intended for bonding with future extensions shall be protected from corrosion.~~

~~**1907.7.8 Fire protection.** When this code requires a thickness of cover for fire protection greater than the minimum concrete cover in Section 1907.7, such greater thickness shall be specified.~~

~~**1907.8 Special reinforcement details for columns.** Offset bent longitudinal bars in columns and load transfer in structural steel cores of composite compression members shall comply with the provisions of ACI 318, Section 7.8.~~

~~**1907.9 Connections.** Connections between concrete framing members shall comply with the provisions of ACI 318, Section 7.9.~~

~~**1907.10 Lateral reinforcement for compression members.** Lateral reinforcement for concrete compression members shall comply with the provisions of ACI 318, Section 7.10.~~

~~**1907.11 Lateral reinforcement for flexural members.** Lateral reinforcement for compression reinforcement in concrete flexural members shall comply with the provisions of ACI 318, Section 7.11.~~

~~**1907.12 Shrinkage and temperature reinforcement.** Reinforcement for shrinkage and temperature stresses in concrete members shall comply with the provisions of ACI 318, Section 7.12.~~

~~**1907.13 Requirements for structural integrity.** The detailing of reinforcement and connections between concrete members shall comply with the provisions of ACI 318, Section 7.13, to improve structural integrity.~~

(Renumber remaining sections)

6. Revise as follows:

~~**1909.1**~~ **1906.1 Scope**. The design and construction of structural plain concrete, both cast-in-place and precast, shall comply with the minimum requirements of ~~Section 1909 and~~ ACI 318, ~~Chapter 22,~~ as modified in Section ~~1908~~1905 .

~~**1909.4 Design.** Structural plain concrete walls, footings and pedestals shall be designed for adequate strength in accordance with ACI 318, Sections 22.4 through 22.8~~.

Exception: For Group R-3 occupancies and buildings of other occupancies less than two stories above grade plane of light-frame construction, the required ~~edge~~ footing thickness of ACI 318 is permitted to be reduced to 6 inches (152 mm), provided that the footing does not extend more than 4 inches (102 mm) on either side of the supported wall.

7. Delete without substitution:

~~**1909.1.1 Special structures**. For special structures, such as arches, underground utility structures, gravity walls and shielding walls, the provisions of this section shall govern where applicable.~~

~~**1909.2 Limitations.** The use of structural plain concrete shall be limited to:~~

~~1. Members that are continuously supported by soil, such as walls and footings, or by other structural members capable of providing continuous vertical support.~~
~~2. Members for which arch action provides compression under all conditions of loading.~~
~~3. Walls and pedestals.~~
~~The use of structural plain concrete columns and structural plain concrete footings on piles is not permitted. See Section 1908.1.8 for additional limitations on the use of structural plain concrete.~~

~~**1909.3 Joints.** Contraction or isolation joints shall be provided to divide structural plain concrete members into flexurally discontinuous elements in accordance with ACI 318, Section 22.3.~~

~~**1909.5 Precast members.** The design, fabrication, transportation and erection of precast, structural plain concrete elements shall be in accordance with ACI 318, Section 22.9.~~

~~**1909.6 Walls.** In addition to the requirements of this section, structural plain concrete walls shall comply with the applicable requirements of ACI 318, Chapter 22~~.

~~**1909.6.1 Basement walls.** The thickness of exterior basement walls and foundation walls shall be not less than 7-1/2 inches (191 mm).~~

~~**1909.6.2 Other walls**. Except as provided for in Section 1909.6.1, the thickness of bearing walls shall be not less than 1/24 the unsupported height or length, whichever is shorter, but not less than 5-1/2 inches (140 mm).~~

~~**1909.6.3 Openings in walls**. Not less than one No. 5 bar shall be provided around window, door and similar sized openings. The bar shall be anchored to develop f_y in tension at the corners of openings.~~

(Renumber remaining sections)

Reason: This code change proposal removes provisions in the IBC that do not add new code requirements but either inform the user where information is located in ACI 318 or repeats ACI 318 information. The change proposal is strictly editorial in nature. The current format requires users to thoroughly read these provisions to determine if the IBC modifies ACI 318. By removing these provisions, the IBC will be easier for users to understand. Additionally, by removing these provisions the job of coordination information between the IBC and ACI 318 is made much easier.

The following explanations are given to for the revised Sections stated above:

1901.3	Statement is no longer necessary due to the removal of most of this information.
1901.4	Section 21.12.3.4 states the same information that is given in Item 11. No need for additional referencing.
Section 1904	This section repeats or points to the information in ACI 318, except for the alternate durability map. This section was reduced to the minimum language that would still allow for the alternate.
Section 1905	This section repeats or points to the information in ACI 318 without exception. This section was removed.
Section 1906	This section repeats or points to the information in ACI 318 without exception. This section was removed.
Section 1907	This section repeats or points to the information in ACI 318 without exception. This section was removed.
Section 1909	This section repeats or points to the information in ACI 318. There is only one exception to the code. The section was reworked to state only the exception.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SENECAL-S6-TABLE 1704.4

S161-09/10
1903.3, Chapter 35

Proponent: Steve Heller, representing the Insulating Concrete Form Association

1. Revise as follows:

1903.3 Flat wall insulating concrete form (ICF) systems. Insulating concrete form material used for forming flat concrete walls shall conform to ASTM E 2634.

2. Add New Standard to Chapter 35 as follows:

ASTM International
E2634—08 Standard Specification for Flat Wall Insulating Concrete Form (ICF) Systems……..1903.3

Reason: This proposal adds ASTM E 2634 to the code to help users determine acceptance of Flat Wall ICF Form Systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM E2634-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

FILENAME: HELLER-S1-1903.3 NEW

S162–09/10
Table 1704.3, Table 1704.4, 1704.4.1, 1708.2, 1808.8.2, Table 1808.8.2, 1808.8.5, 1808.8.6, 1810.2.4.1, 1810.3.2.1.2, 1810.3.8.3.3, 1810.3.9.4.2.1, 1810.3.9.4.2.2, 1901.4, 1904, 1905, 1906, 1907, 1909; IRC R402.2

Proponent: Matthew Senecal, PE, American Concrete Institute, representing American Concrete Institute

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC-STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

TABLE 1704.3
REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERNCED STANDARD	IBC REFERENCE
5. Inspection of welding				
b. Reinforcing steel:				—
1) Verification of weldability of reinforcing steel other than ASTM A 706.	—	X	AWS D1.4 ACI 318~~: Section 3.5.2~~	
2) Reinforcing steel-resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.	X	—		
3) Shear reinforcement.	X	—		
4) Other reinforcing steel.	—	X		

(Remainder of table is unchanged; No changes to footnotes)

TABLE 1704.4
REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERNCED STANDARD	IBC REFERENCE
1. Inspection of reinforcing steel, including prestressing tendons, and placement.	—	X	ACI 318~~: 3.5, 7.1-7.7~~	1913.4
2. Inspection of reinforcing steel welding in accordance with Table 1704.3, Item 5b.	—	—	AWS D1.4 ACI 318~~: 3.5.2~~	—
3. Inspection of bolts to be installed in concrete prior to and during placement of concrete where allowable loads have been increased or where strength design is used.	X	—	ACI 318~~:~~ ~~8.1.3, 21.2.8~~	1911.5 1912.1
4. Inspection of anchors installed in hardened concrete.	—	X	ACI 318~~:~~ ~~3.8.6, 8.1.3, 21.2.8~~	1912.1
5. Verifying use of required design mix.	—	X	ACI 318~~:~~ ~~Ch. 4, 5.2-5.4~~	1904.2.2 1913.2 1913.3
6. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	—	ASTM C 172 ASTM C 31 ACI 318~~: 5.6, 5.8~~	1913.10
7. Inspection of concrete and shotcrete placement for proper application techniques.	X	—	ACI 318~~: 5.9, 5.10~~	1913.6 1913.7 1913.8
8. Inspection for maintenance of specified curing temperature and techniques.	—	X	ACI 318~~: 5.11-5.13~~	1913.9
9. Inspection of prestressed concrete: a. Application of prestressing forces. b. Grouting of bonded prestressing tendons in the seismic-force-resisting system.	 X X	—	ACI 318~~: 18.20~~ ~~ACI 318: 18.18.4~~	—
10. Erection of precast concrete members.	—	X	ACI 318~~: Ch. 16~~	—
11. Verification of in-situ concrete strength, prior to stressing of tendons in posttensioned concrete and prior to removal of shores and forms from beams and structural slabs.	—	X	ACI 318~~: 6.2~~	—
12. Inspect formwork for shape, location and dimensions of the concrete member being formed.	—	X	ACI 318~~: 6.1.1~~	—

(No changes to footnotes)

1704.4.1 Materials. In the absence of sufficient data or documentation providing evidence of conformance to quality standards for materials in ~~Chapter 3 of~~ ACI 318, the building official shall require testing of materials in accordance with the appropriate standards and criteria for the material in ~~Chapter 3 of~~ ACI 318. Weldability of reinforcement, except that which conforms to ASTM A 706, shall be determined in accordance with the steel reinforcement material requirements of ~~Section 3.5.2 of~~ ACI 318.

1708.2 Concrete reinforcement. Where reinforcement complying with ASTM A 615 is used to resist earthquake-induced flexural and axial forces in special moment frames, special structural walls and coupling beams connecting special structural walls, in structures assigned to *Seismic Design Category* B, C, D, E or F as determined in Section 1613, the reinforcement shall comply with deformed reinforcement material requirements ~~Section 21.1.5.2 of~~ ACI 318 for special moment frames and special structural walls. Certified mill test reports shall be provided for each shipment of such reinforcement. ~~Where reinforcement complying with ASTM A 615 is to be welded, chemical tests shall be performed to determine weldability in accordance with Section 3.5.2 of ACI 318.~~

1808.8.2 Concrete cover. The concrete cover provided for prestressed and nonprestressed reinforcement in foundations shall be no less than the largest applicable value specified in Table 1808.8.2. Longitudinal bars spaced less than 1½ inches (38 mm) clear distance apart shall be considered as bundled bars according to ACI 318 for ~~which~~ the determination of concrete cover ~~provided shall also be no less than that required by Section 7.7.4 of ACI 318~~. Concrete cover shall be measured from the concrete surface to the outermost surface of the steel to which the cover

requirements applies. Where concrete is placed in a temporary or permanent casing or a mandrel, the inside face of the casing or mandrel shall be considered the concrete surface.

TABLE 1808.8.2
MINIMUM SPECIFIED CONCRETE COVER

FOUNDATION ELEMENT OR CONDTITION	MINIMUM COVER
1. Shallow foundations	~~In accordance with Section 7.7 of~~ ACI 318
2. Precast nonprestressed deep foundation elements Exposed to seawater Not manufactured under plant conditions Manufactured under plant control conditions	 3 inches 2 inches ~~In accordance with Section 7.7.3 of~~ Cover requirements for precast concrete manufactured under plant controlled conditions per ACI 318
3. Precast prestressed deep foundation elements Exposed to seawater Other	 2.5 inches ~~In accordance with Section 7.7.3 of~~ Cover requirements for precast concrete manufactured under plant controlled conditions per ACI 318
4. Cast-in-place deep foundation elements not enclosed by a steel pipe, tube or permanent casing	2.5 inches
5. Cast-in-place deep foundation elements enclosed by a steel pipe, tube or permanent casing	1 inch
6. Structural steel core within a steel pipe, tube or permanent casing	2 inches
7. Cast-in-place drilled shafts enclosed by a stable rock socket	1.5 inches

For SI: 1 inch = 25.4 mm.

1808.8.5 Forming of concrete. Concrete foundations are permitted to be cast against the earth where, in the opinion of the *building official*, soil conditions do not require formwork. Where formwork is required, it shall be in accordance with ~~Chapter 6 of~~ ACI 318.

1808.8.6 Seismic requirements. See Section 1908 for additional requirements for foundations of structures assigned to *Seismic Design Category* C, D, E or F.

For structures assigned to *Seismic Design Category* D, E or F, provisions of ACI 318 for foundations resisting earthquake induced forces~~, Sections 21.12.1 through 21.12.4~~ shall apply where not in conflict with the provisions of Section 1808 through 1810.

Exceptions:

1. Detached one- and two-family dwellings of light-frame construction and two stories or less above *grade plane* are not required to comply with the provisions of ACI 318 for foundations resisting earthquake induced forces~~, Sections 21.12.1 through 21.12.4~~.
2. ~~Section 21.12.4.4(a) of~~ ACI 318 requirement for transverse reinforcement for foundations resisting earthquake induced forces at the top of piles, piers or caissons for at least five times the member cross-section dimension but not less than six feet below the bottom of the pile cap shall not apply.

1810.2.4.1 Seismic Design Categories D through F. For structures assigned to *Seismic Design Category* D, E or F, deep foundation elements on *Site Class* E or F sites, as determined in Section 1613.5.2, shall be designed and constructed to withstand maximum imposed curvatures from earthquake ground motions and structure response. Curvatures shall include free-field soil strains modified for soil-foundations-structure interaction coupled with foundation element deformations associated with earthquake loads imparted to the foundation by the structure.

Exception: Deep foundation elements that satisfy the following additional detailing requirements shall be deemed to comply with the curvature capacity requirements of this section.

1. Precast prestressed concrete piles detailed in accordance with Section 1810.3.8.3.3.
2. Cast-in-place deep foundation elements with a minimum longitudinal reinforcement ratio of 0.005 extending the full length of the element and with transverse reinforcement detailed in accordance with the requirements for special moment frame members subjected to bending and axial load per ~~Sections 21.6.4.2, 21.6.4.3 and 21.6.4.4 of~~ ACI 318 as required by Section 1810.3.9.4.2.2.

1810.3.2.1.2 ~~ACI 318 Equation (10-5).~~Minimum volumetric spiral ratio. Where this chapter requires ~~detailing of~~ transverse reinforcement in accordance with the requirements for special moment frame members subjected to bending and axial load per ACI 318 in concrete deep foundation elements ~~in accordance with Section 21.6.4.4 of ACI~~

~~318~~, ~~compliance with~~, the minimum volumetric spiral ratio shall be $0.12f'_c / f_{yt}$. ~~Equation (10-5) of ACI 318 shall not be required.~~

1810.3.8.3.3 Seismic reinforcement in Seismic Design Categories D through F. For structures assigned to *Seismic Design Category* D, E or F in accordance with Section 1613, precast prestressed piles shall have transverse reinforcement in accordance with the following

1. The earthquake-resistant structures ~~R~~requirements in ACI 318~~, Chapter 21,~~ need not apply, unless specifically referenced.
2. Where the total pile length in the soil is 35 feet (10 668 mm) or less, the lateral transverse reinforcement in the ductile region shall occur through the length of the pile. Where the pile length exceeds 35 feet (10 668 mm), the ductile pile region shall be taken as the greater of 35 feet (10 668 mm) or the distance from the underside of the pile cap to the point of zero curvature plus three times the least pile dimension.
3. In the ductile region, the center-to-center spacing of the spirals or hoop reinforcement shall not exceed one-fifth of the least pile dimension, six times the diameter of the longitudinal strand or 8 inches (203 mm), whichever is smallest.
4. Circular spiral reinforcement shall be spliced by lapping one full turn and bending the end of each spiral to a 90-degree hook or by use of a mechanical or welded splice complying with the general (non-seismic) splicing requirements of ~~Section 12.14.3 of~~ ACI 318.
5. Where the transverse reinforcement consists of circular spirals, the volumetric ratio of spiral transverse reinforcement in the ductile region shall comply with the following:

   $$P_s = 0.25(f'_c / f_{yh})(A_g / A_{ch} - 1.0) [0.5 + 1.4P/(f'_c A_g)] \quad \textbf{(Equation 18-6)}$$

   but not less than:

   $$P_s = 0.12(f'_c / f_{yh}) [0.5 + 1.4P/(f'_c A_g)] \geq 0.12 f'_c / f_{yh} \quad \textbf{\textit{(Equation 18-7)}}$$

   and need not exceed:

   $$P_s = 0.021 \quad \textbf{(Equation 18-8)}$$

   where:

   A_g = Pile cross-sectional area, square inches (mm^2).
   A_{ch} = Core area defined by spiral outside diameter, square inches (mm^2).
   f'_c = Specified compressive strength of concrete, psi (MPa)
   f_{yh} = Yield strength of spiral reinforcement ≤ 85,000 psi (586 MPa).
   P = Axial load on pile, pounds (kN), as determined from Equations 16-5 and 16-7.
   P_s = Volumetric ratio (vol. spiral/ vol. core).

   This required amount of spiral reinforcement is permitted to be obtained by providing an inner and outer spiral.

6. Where transverse reinforcement consists of rectangular hoops and cross ties, the total cross-sectional area of lateral transverse reinforcement in the ductile region with spacing, s, and perpendicular dimension, h_c, shall conform to:

   $$A_{sh} = 0.3s\, h_c (f'_c / f_{yh})(A_g / A_{ch} - 1.0) [0.5 + 1.4P/(f'c\, A_g)] \quad \textbf{(Equation 18-9)}$$

   but not less than:

   $$A_{sh} = 0.12s\, h_c (f'_c / f_{yh}) [0.5 + 1.4P/(f'_c A_g)] \quad \textbf{(Equation 18-10)}$$

   where:

   f_{yh} = ≤70,000 psi (483 MPa).
   h_c = Cross-sectional dimension of pile core measured center to center of hoop reinforcement, inch (mm).
   s = Spacing of transverse reinforcement measured along length of pile, inch (mm).

A_{sh} = Cross-sectional area of tranverse reinforcement, square inches (mm2).
f'_c = Specified compressive strength of concrete, psi (MPa).

The hoops and cross ties shall be equivalent to deformed bars not less than No. 3 in size. Rectangular hoop ends shall terminate at a corner with seismic hooks. Outside of the length of the pile requiring transverse confinement reinforcing, the spiral or hoop reinforcing with a volumetric ratio not less than one-half of that required for transverse confinement reinforcing shall be provided.

1810.3.9.4.2.1 Site Classes A through D. For *Site Class* A, B, C or D sites, transverse ~~confinement~~ reinforcement shall be provided in the element in accordance with the requirements for special moment frame members subjected to bending and axial load per ~~Sections 21.6.4.2, 21.6.4.3 and 21.6.4.4 of~~ ACI 318 within three times the least element dimension of the bottom of the pile cap. ~~A~~ The minimum transverse spiral reinforcement ratio shall be $0.06f'_c / f_{yt}$. ~~of not less than one-half of that required in Section 21.6.4.4(a) of ACI 318 shall be permitted.~~

1810.3.9.4.2.2 Site Classes E and F. For *Site Class* E or F sites, transverse ~~confinement~~ reinforcement shall be provided in the element in accordance with the requirements for special moment frame members subjected to bending and axial load per ~~Sections 21.6.4.2, 21.6.4.3 and 21.6.4.4 of~~ ACI 318 within seven times the least element dimension of the pile cap and within seven times the least element dimension of the interfaces of strata that are hard or stiff and strata that are liquefiable or are composed of soft- to medium-stiff clay.

1810.3.11.1 Seismic Design Categories C through F. For structures assigned to *Seismic Design Category* C, D, E or F in accordance with Section 1613, concrete deep foundation elements shall be connected to the pile cap by embedding the element reinforcement or field-placed dowels anchored in the element into the pile cap for a distance equal to their development length in accordance with ACI 318. It shall be permitted to connect precast prestressed piles to the pile cap by developing the element prestressing strands into the pile cap provided the connection is ductile. For deformed bars, the development length is the full development length for compression, or tension in the case of uplift, without reduction in development length for excess reinforcement in flexural members permitted by ~~in accordance with Section 12.2.5 of~~ ACI 318. Alternative measures for laterally confining concrete and maintaining toughness and ductile-like behavior at the top of the element shall be permitted provided the design is such that any hinging occurs in the confined regions.

The minimum transverse steel ratio for confinement shall not be less than one-half of that required for columns.

For resistance to uplift forces, anchorage of steel pipes, tubes or H-piles to the pile cap shall be made by means other than concrete bond to the bare steel section. Concrete-filled steel pipes or tubes shall have reinforcement of not less than 0.01 times the cross-sectional area of the concrete fill developed into the cap and extending into the fill a length equal to two times the required cap embedment, but not less than the development length in tension of the reinforcement.

1901.4 Construction documents. The *construction documents* for structural concrete construction shall include:

1. The specified compressive strength of concrete at the stated ages or stages of construction for which each concrete element is designed.
2. The specified strength or grade of reinforcement.
3. The size and location of structural elements, reinforcement and anchors.
4. Provision for dimensional changes resulting from creep, shrinkage and temperature.
5. The magnitude and location of prestressing forces.
6. Anchorage length of reinforcement and location and length of lap splices.
7. Type and location of mechanical and welded splices of reinforcement.
8. Details and location of contraction or isolation joints specified for plain concrete.
9. Minimum concrete compressive strength at time of posttensioning.
10. Stressing sequence for posttensioning tendons.
11. For structures assigned to *Seismic Design Category* D, E or F, a statement if slab on grade is designed as a structural diaphragm ~~(see Section 21.12.3.4 of ACI 318)~~.

1904.1 Water-cementitious materials ratio. Where maximum water-cementitious materials ratios are specified in ACI 318, they shall be calculated in accordance with ACI 318~~, Section 4.1~~.

1904.2 Exposure categories and classes. Concrete shall be assigned to exposure classes in accordance with ACI 318~~, Section 4.2,~~ based on:

1. Exposure to freezing and thawing in a moist condition or deicer chemicals;
2. Exposure to sulfates in water or soil;
3. Exposure to water where the concrete is intended to have low permeability; and
4. Exposure to chlorides from deicing chemicals, salt, saltwater, brackish water, seawater or spray from these sources, where the concrete has steel reinforcement.

1904.3 Concrete properties. Concrete mixtures shall conform to the most restrictive maximum water-cementitious materials ratios, and minimum specified concrete compressive strength requirements of ACI 318~~, Section 4.3,~~ based on the exposure classes assigned in Section 1904.2.

Exception: For occupancies and appurtenances thereto in Group R occupancies that are in buildings less than four stories above grade plane, normal-weight aggregate concrete is permitted to comply with the requirements of Table 1904.3 based on the weathering classification (freezing and thawing) determined from Figure 1904.3 in lieu of the requirements of ACI 318~~, Table 4.3.1~~.

…

1904.4.1 Air entrainment. Concrete exposed to freezing and thawing while moist shall be air entrained in accordance with ACI 318~~, Section 4.4.1~~.

1904.4.2 Deicing chemicals. For concrete exposed to freezing and thawing in the presence of moisture and deicing chemicals, the maximum weight of fly ash, other pozzolans, silica fume or slag that is included in the concrete shall not exceed the percentages of the total weight of cementitious materials permitted by ACI 318~~, Section 4.4.2~~.

1904.5 Alternative cementitious materials for sulfate exposure. Alternative combinations of cementitious materials for use in sulfate-resistant concrete to those listed in ACI 318~~, Table 4.3.1~~ shall be permitted in accordance with ACI 318~~, Section 4.5.1~~.

1905.2 Selection of concrete proportions. Concrete proportions shall be determined in accordance with the provisions of ACI 318~~, Section 5.2~~.

1905.3 Proportioning on the basis of field experience and/or trial mixtures. Concrete proportioning determined on the basis of field experience and/or trial mixtures shall be done in accordance with ACI 318~~, Section 5.3~~.

1905.4 Proportioning without field experience or trial mixtures. Concrete proportioning determined without field experience or trial mixtures shall be done in accordance with ACI 318~~, Section 5.4~~.

1905.5 Average strength reduction. As data become available during construction, it is permissible to reduce the amount by which the average compressive strength (f'_c) is required to exceed the specified value of f'_c in accordance with ACI 318~~, Section 5.5~~.

1905.6.2 Frequency of testing. The frequency of conducting strength tests of concrete and the minimum number of tests shall be as specified in ACI 318~~, Section 5.6.2~~.

Exception: When the total volume of a given class of concrete is less than 50 cubic yards ($38m^3$), strength tests are not required when evidence of satisfactory strength is submitted to and approved by the building official.

1905.6.3 Strength test specimens. Specimens prepared for acceptance testing of concrete in accordance with Section 1905.6.2 and strength test acceptance criteria shall comply with the provisions of ACI 318~~, Section 5.6.3~~.

1905.6.4 Field-cured specimens. Where required by the building official to determine adequacy of curing and protection of concrete in the structure, specimens shall be prepared, cured, tested and test results evaluated for acceptance in accordance with ACI 318~~, Section 5.6.4~~.

1905.6.5 Low-strength test results. Where any strength test ~~(see ACI 318, Section 5.6.2.4)~~ falls below the specified value of f'_c, the provisions of ACI 318~~, Section 5.6.5~~, shall apply.

1905.7 Preparation of equipment and place of deposit. Prior to concrete being placed, the space to receive the concrete and the equipment used to deposit it shall comply with ACI 318~~, Section 5.7~~.

1905.8 Mixing. Mixing of concrete shall be performed in accordance with ACI 318~~, Section 5.8~~.

1905.9 Conveying. The method and equipment for conveying concrete to the place of deposit shall comply with ACI 318~~, Section 5.9~~.

1905.10 Depositing. The depositing of concrete shall comply with the provisions of ACI 318~~, Section 5.10~~.

1905.11 Curing. The length of time, temperature and moisture conditions for curing of concrete shall be in accordance with ACI 318~~, Section 5.11~~.

1905.12 Cold weather requirements. Concrete to be placed during freezing or near-freezing weather shall comply with the requirements of ACI 318~~, Section 5.12~~.

1905.13 Hot weather requirements. Concrete to be placed during hot weather shall comply with the requirements of ACI 318~~, Section 5.13~~.

1906.1 Formwork. The design, fabrication and erection of forms shall comply with ACI 318~~, Section 6.1~~.

1906.2 Removal of forms, shores and reshores. The removal of forms and shores, including from slabs and beams (except where cast on the ground), and the installation of reshores shall comply with ACI 318~~, Section 6.2~~.

1906.3 Conduits and pipes embedded in concrete. Conduits, pipes and sleeves of any material not harmful to concrete and within the limitations of ACI 318~~, Section 6.3~~, are permitted to be embedded in concrete with approval of the registered design professional.

1906.4 Construction joints. Construction joints, including their location, shall comply with the provisions of ACI 318~~, Section 6.4~~.

1907.1 Hooks. Standard hooks on reinforcing bars used in concrete construction shall comply with ACI 318~~, Section 7.1~~.

1907.2 Minimum bend diameters. Minimum reinforcement bend diameters utilized in concrete construction shall comply with ACI 318~~, Section 7.2~~.

1907.3 Bending. The bending of reinforcement shall comply with ACI 318~~, Section 7.3~~.

1907.4 Surface conditions of reinforcement. The surface conditions of reinforcement shall comply with the provisions of ACI 318~~, Section 7.4~~.

1907.5 Placing reinforcement. The placement of reinforcement, including tolerances on depth and cover, shall comply with the provisions of ACI 318~~, Section 7.5~~. Reinforcement shall be accurately placed and adequately supported before concrete is placed.

1907.6 Spacing limits for reinforcement. The clear distance between reinforcing bars, bundled bars, tendons and ducts shall comply with ACI 318~~, Section 7.6~~.

1907.7.1 Cast-in-place concrete (nonprestressed). Minimum specified concrete cover shall be provided for reinforcement in nonprestressed, cast-in-place concrete construction in accordance with ACI 318~~, Section 7.7.1~~.

1907.7.2 Cast-in-place concrete (prestressed). The minimum specified concrete cover for prestressed and nonprestressed reinforcement, ducts and end fittings in cast-in-place prestressed concrete shall comply with ACI 318~~, Section 7.7.2~~.

1907.7.3 Precast concrete (manufactured under plant control conditions). The minimum specified concrete cover for prestressed and nonprestressed reinforcement, ducts and end fittings in precast concrete manufactured under plant control conditions shall comply with ACI 318~~, Section 7.7.3~~.

1907.7.4 Bundled bars. The minimum specified concrete cover for bundled bars shall comply with ACI 318~~, Section 7.7.4~~.

1907.7.5 Headed shear stud reinforcement. For headed shear stud reinforcement, the minimum specified concrete cover shall comply with ACI 318~~, Section 7.7.5~~.

1907.7.6 Corrosive environments. In corrosive environments or other severe exposure conditions, prestressed and nonprestressed reinforcement shall be provided with additional protection in accordance with ACI 318~~, Section 7.7.6~~.

1907.8 Special reinforcement details for columns. Offset bent longitudinal bars in columns and load transfer in structural steel cores of composite compression members shall comply with the provisions of ACI 318~~, Section 7.8~~.

1907.9 Connections. Connections between concrete framing members shall comply with the provisions of ACI 318~~, Section 7.9~~.

1907.10 Lateral reinforcement for compression members. Lateral reinforcement for concrete compression members shall comply with the provisions of ACI 318~~, Section 7.10~~.

1907.11 Lateral reinforcement for flexural members. Lateral reinforcement for compression reinforcement in concrete flexural members shall comply with the provisions of ACI 318~~, Section 7.11~~.

1907.12 Shrinkage and temperature reinforcement. Reinforcement for shrinkage and temperature stresses in concrete members shall comply with the provisions of ACI 318~~, Section 7.12~~.

1907.13 Requirements for structural integrity. The detailing of reinforcement and connections between concrete members shall comply with the provisions of ACI 318~~, Section 7.13,~~ to improve structural integrity.

1909.1 Scope. The design and construction of structural plain concrete, both cast-in-place and precast, shall comply with the minimum requirements of Section 1909 and the structural plain concrete requirements of ACI 318~~, Chapter 22,~~ as modified in Section 1908.

1909.3 Joints. Contraction or isolation joints shall be provided to divide structural plain concrete members into flexurally discontinuous elements in accordance with ACI 318~~, Section 22.3~~.

1909.4 Design. Structural plain concrete walls, footings and pedestals shall be designed for adequate strength in accordance with ACI 318~~, Sections 22.4 through 22.8~~.

> **Exception:** For Group R-3 occupancies and buildings of other occupancies less than two st*ories above grade plane* of light-frame construction, the required edge thickness of ACI 318 is permitted to be reduced to 6 inches (152 mm), provided that the footing does not extend more than 4 inches (102 mm) on either side of the supported wall.

1909.5 Precast members. The design, fabrication, transportation and erection of precast, structural plain concrete elements shall be in accordance with ACI 318~~, Section 22.9~~.

1909.6 Walls. In addition to the requirements of this section, structural plain concrete walls shall comply with the applicable requirements of ACI 318~~, Chapter 22~~.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R402.2 Concrete. Concrete shall have a minimum specified compressive strength of f'_c, as shown in Table R402.2. Concrete subject to moderate of severe weathering as indicated in Table R301.2(1) shall be air entrained as specified in Table R402.2. The maximum weight of fly ash, other pozzolans, silica fume, slag or blended cements that is included in concrete mixtures for garage floor slabs and for exterior porches, carport slabs and steps that will be exposed to deicing chemicals shall not exceed the percentages of the total weight of cementitious materials specified in the durability requirements ~~Section 4.2.3~~ of ACI 318. Materials used to produce concrete and testing thereof shall comply with the applicable standards listed in the material requirements ~~Chapter 3~~ of ACI 318 or ACI 332.

Reason:
PART I- ACI is in the process of completely reorganizing ACI 318, *Building Code Requirements for Structural Concrete*. This process was formally initiated in the spring of 2008 and was scheduled to be completed by January 1, 2014 so that it would be available for reference by the 2015 IBC. This 2015 IBC schedule was assumed to be the same as traditional ICC meeting schedules.

The reorganized ACI 318 will be significantly different in structure than 318-08. The code will include several new chapters that are based on member design. The 318-08 chapters will be significantly reworked to support the member chapters. Some provisions have been divided sometimes into several chapters and at other provisions combined.

The new schedules released in February 2009 by the ICC require that reorganized ACI 318 be completed by January 3, 2012 for changes to the IBC (Group A) that require textual changes to the body of the IBC. ACI committee 318 will likely not be done with the revisions by that time and

thus not have a revised standard to submit for the 2015 IBC if it remains in Group A. ICC's CP 28-05 states that, if no textual changes are required and that the change to the code is in reference only, the revision may be considered by the administrative code committee prior to the Final Action Hearing in Group B.

In this code change proposal, ACI proposes to remove all references to specific sections in ACI 318 from the IBC, but not change the technical intent of any provision. This removal would allow ACI to submit an administrative change in Group B and give ACI Committee 318 one more year to complete their task of reorganization.

In some cases, the referenced section numbers that are removed are replaced with language from ACI 318 (usually the section heading) that will allow the user to easily locate the appropriate section. In some cases, the referenced information in ACI 318 is transcribed into the IBC. The use of words in place of section numbers may require some editorial revisions in the 2012/2013 ICC cycle, if the headings are changed through the reorganization.

The following explanations are given to for the revised Sections stated above:

Table 1704.3 and Table 1704.4	Specific section references are removed.
Table 1704.4	Specific section references are removed.
1704.4.1	Reference to Chapter 3 is removed. "Materials" is the heading of Chapter 3 in ACI 318; therefore, no additional replacement language is needed. Section 3.5.2 is removed and replaced with language that would identify the source information in ACI 318.
1708.2	Replaced the referenced section with language that would identify the source information in ACI 318. The last sentence repeats the welding requirements of IBC 1704.4.1, therefore, it is being removed.
1808.8.2	Reference to Section 7.7.4 is removed and sentence is reworded to preserve the intent of the provision.
Table 1808.8.2	Replaced the referenced section with language that would identify the source information in ACI 318.
1808.8.5	Reference to Chapter 6 is removed. Formwork is the heading of Chapter 6 in ACI 318; therefore, no additional replacement language is needed.
1808.8.6	Replaced the referenced section with language that would identify the source information in ACI 318. Also, technical information from Section 21.14.4.4(a) of ACI 318 is transcribed to Exception 2 in order to remove the section reference.
1810.2.4.1	Replaced the referenced section with language that would identify the source information in ACI 318.
1810.3.2.1.2	Technical information from Section 21.6.4.4 of ACI 318 is transcribed to 1810.3.2.1.2 in order to remove the section reference.
1810.3.8.3.3	Reference to Chapter 21 is removed. Earthquake-Resistant Structures is the heading of Chapter 21 in ACI 318; therefore, no additional replacement language is needed. Section 12.14.3 is removed and replaced with language that would identify the source information in ACI 318.
1810.3.9.4.2.1	Replaced the referenced section with language that would identify the source information in ACI 318. Also, technical information from Section 21.14.4.4(a) of ACI 318 is transcribed to 1810.3.9.4.2.1 in order to remove the section reference.
1810.3.9.4.2.2	Replaced the referenced section with language that would identify the source information in ACI 318.
1810.3.11.1	Reference to section is removed. The sentence is self-explanatory without adding the section reference.
1901.4	Section 21.12.3.4 of ACI 318 states the same information that is given in Item 11. No need for additional referencing.
Section 1904	References to sections are removed. This chapter repeats headings and technical content directly from ACI 318. No additional language is necessary in order to remove the section reference.
Section 1905	References to sections are removed. This chapter repeats headings and technical content directly from ACI 318. No additional language is necessary in order to remove the section reference.
Section 1906	References to sections are removed. This chapter repeats headings and technical content directly from ACI 318. No additional language is necessary in order to remove the section reference.
Section 1907	References to sections are removed. This chapter repeats headings and technical content directly from ACI 318. No additional language is necessary in order to remove the section reference.
1909.1	Replaced the referenced chapter with language that would identify the source information in ACI 318.
1909.3, 1909.4, 1909.5 & 1909.6	References to sections are removed. These sections repeat headings and technical content directly from ACI 318. No additional language is necessary in order to remove the section reference.

PART II- ACI is in the process of completely reorganizing ACI 318, *Building Code Requirements for Structural Concrete*. This process was formally initiated in the spring of 2008 and was scheduled to be completed by January 1, 2014 so that it would be available for reference by the 2015 ICC Codes. This 2015 ICC schedule was assumed to be the same as traditional ICC meeting schedules.

The reorganized ACI 318 will be significantly different in structure than 318-08. The code will include several new chapters that are based on member design. The 318-08 chapters will be significantly reworked to support the member chapters. Some provisions have been divided sometimes into several chapters and at other provisions combined.

The new schedules released in February 2009 by the ICC require that reorganized ACI 318 be completed by January 3, 2012 for changes to the IBC (Group A) that require textual changes to the body of the IBC. ACI committee 318 will likely not be done with the revisions by that time and thus not have a revised standard to submit for the 2015 IBC if it remains in Group A. ICC's CP 28-05 states that, if no textual changes are required and that the change to the code is in reference only, the revision may be considered by the administrative code committee prior to the Final Action Hearing in Group B.

In this code change proposal, ACI proposes to remove all references to specific sections in ACI 318 from the IBC and IRC, but not change the technical intent of any provision. This removal would allow ACI to submit an Administrative Change in Group B and give ACI Committee 318 one more year to complete their task of reorganization.

In some cases, the referenced section numbers that are removed are replaced with language from ACI 318 (usually the section heading) that will allow the user to easily locate the appropriate section. In some cases, the referenced information in ACI 318 is transcribed into the ICC code. The use of words in place of section numbers may require some editorial revisions in the 2012/2013 ICC cycle, if the headings are changed through the reorganization.

The following explanations are given to for the revised Section stated above:

R402.2	Reference to Section 4.2.3 is removed and replaced with the chapter heading, "Durability Requirements," to aid the user in locating the source information in ACI 318. Note reference to Section 4.2.3 is incorrect in the current IRC. ACI 318 now uses a classification system from which the minimum cementitious material is determined. A more general reference to the chapter is more appropriate. Reference to Chapter 3 is removed and replaced with the chapter heading, "Materials ," to aid the user in locating the source information in ACI 318.

Cost Impact: This code change proposal will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SENECAL-S4-1901.4

S163–09/10
1908.1-1908.1.10, 1912.1

Proponent: Matthew Senecal, PE, American Concrete Institute, representing American Concrete Institute

Revise as follows:

1908.1 General. ~~The text of~~ ACI 318 shall be modified as indicated in Sections 1908.1.1 through 1908.1.10.

1908.1.1 ~~ACI 318, Section 2.2~~ Definitions. ~~Modify existing definitions and add the following definitions to ACI 318, Section 2.2.~~The following definitions either modify or are in addition to the definitions in ACI 318:

DESIGN DISPLACEMENT. Total lateral displacement expected for the design-basis earthquake*, as specified by Section 12.8.6 of ASCE 7*.

DETAILED PLAIN CONCRETE STRUCTURAL WALL. *~~A wall complying with the requirements of Chapter 22, including 22.6.7.~~ A structural plain concrete wall in accordance with ACI 318, including the requirements of Section 1908.1.7 of this code.*

ORDINARY PRECAST STRUCTURAL WALL. *~~A precast wall complying with the requirements of Chapters 1 through 18.~~ A precast wall complying with the requirements ACI 318, except the requirements for earthquake-resistant structures shall not apply.*

ORDINARY REINFORCED CONCRETE STRUCTURAL WALL. ~~A *cast-in-place* wall complying with the requirements of Chapters 1 through 18.~~ *A cast-in-place wall complying with the requirements ACI 318, except the requirements for earthquake-resistant structures shall not apply.*

ORDINARY STRUCTURAL PLAIN CONCRETE WALL. ~~A wall complying with the requirements of Chapter 22, excluding 22.6.7.~~*A structural plain concrete wall in accordance with ACI 318, excluding Section 1908.1.7 of this code.*

SPECIAL STRUCTURAL WALL. A cast-in-place or precast wall complying with the requirements for earthquake-resistant structures of ACI 318 ~~21.1.3 through 21.1.7, 21.9 and 21.10~~, as applicable, in addition to the requirements for ordinary reinforced concrete structural walls *or ordinary precast structural walls, as applicable. Where ASCE 7 refers to a "special reinforced concrete structural wall," it shall be deemed to mean a "special structural wall."*

WALL PIER. *A wall segment with a horizontal length-to-thickness ratio of at least 2.5, but not exceeding 6, whose clear height is at least two times its horizontal length.*

1908.1.2 ~~ACI 318, Section 21.1.1.~~ Structural systems. ~~Modify ACI 318 Sections 21.1.1.3 and 21.1.1.7 to read as follows:~~ Structural systems designated as part of the seismic-force-resisting system shall be restricted to those permitted by ASCE 7. Structural plain concrete is prohibited in structures assigned to Seismic Design Category C, D, E, or F, except as permitted by Section 1908.1.8 of this code.

~~21.1.1.3 – Structures assigned to Seismic Design Category A shall satisfy requirements of Chapters 1 to 19 and 22; Chapter 21 does not apply. Structures assigned to Seismic Design Category B, C, D, E or F also shall satisfy 21.1.1.4 through 21.1.1.8, as applicable. Except for structural elements of plain concrete complying with Section~~

~~*1908.1.8 of the International Building Code, structural elements of plain concrete are prohibited in structures assigned to Seismic Design Category C, D, E or F.*~~

~~*21.1.1.7 – Structural systems designated as part of the seismic-force-resisting system shall be restricted to those permitted by ASCE 7. Except for Seismic Design Category A, for which Chapter 21 does not apply, the following provisions shall be satisfied for each structural system designated as part of the seismic-force-resisting system, regardless of the Seismic Design Category:*~~

- ~~*(a) Ordinary moment frames shall satisfy 21.2.*~~
- ~~*(b) Ordinary reinforced concrete structural walls and ordinary precast structural walls need not satisfy any provisions in Chapter 21.*~~
- ~~*(c) Intermediate moment frames shall satisfy 21.3.*~~
- ~~*(d) Intermediate precast structural walls shall satisfy 21.4.*~~
- ~~*(e) Special moment frames shall satisfy 21.5 through 21.8.*~~
- ~~*(f) Special structural walls shall satisfy 21.9.*~~
- ~~*(g) Special structural walls constructed using precast concrete shall satisfy 21.10.*~~

~~*All special moment frames and special structural walls shall also satisfy 21.1.3 through 21.1.7.*~~

1908.1.3 ~~ACI 318, Section 21.4.~~ Intermediate precast structural walls. ~~Modify ACI 318, Section 21.4, by renumbering Section 21.4.3 to become 21.4.4 and adding new Sections 21.4.3, 21.4.5 and 21.4.6 to read as follows:~~ Intermediate precast structural walls shall satisfy the requirements for earthquake-resistant structures of ACI 318 and the following:

~~21.4.3~~ 1. Connections that are designed to yield shall be capable of maintaining 80 percent of their design strength at the deformation induced by the design displacement or shall use Type 2 mechanical splices.

~~21.4.4 – Elements of the connection that are not designed to yield shall develop at least 1.5 S_y.~~

~~21.4.6~~ 2. Wall segments with a horizontal length-to-thickness ratio less than 2.5 shall be designed as columns.

~~21.4.5~~ 3. Wall piers not designed as part of a moment frame shall have transverse reinforcement designed to resist the shear forces required to be resisted by intermediate moment frames ~~determined from 21.3.3~~. Spacing of transverse reinforcement shall not exceed 8 inches (203 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 inches (305 mm).

Exceptions:

1. *Wall piers that satisfy ~~21.13~~ the requirements of ACI 318 for members not designated as part of the seismic-force-resisting system.*
2. *Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segments have a total stiffness of at least six times the sum of the stiffnesses of all the wall piers.*

1908.1.4 ~~ACI 318, Section 21.9.~~ Special structural walls and coupling beams. ~~Modify ACI 318, Section 21.9, by adding new Section 21.9.10 to read as follows:~~ Special structural walls, coupling beams, wall piers and wall segments shall satisfy the requirements for earthquake-resistant structures of ACI 318 and the following:

~~*21.9.10 – Wall piers and wall segments.*~~

~~21.9.10.1 –~~ 1. Wall piers not designed as a part of a special moment frame shall have transverse reinforcement designed to satisfy the requirements in Item 2. ~~21.9.10.2.~~

Exceptions:

1. *Wall piers that satisfy ~~21.13~~ the requirements of ACI 318 for members not designated as part of the seismic-force-resisting system.*
2. *Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segments have a total stiffness of at least six times the sum of the stiffnesses of all the wall piers.*

~~21.9.10.2 –~~ 2. Transverse reinforcement with seismic hooks at both ends shall be designed to resist the shear forces required to be resisted by special moment frames subjected to bending and axial load in accordance with ACI 318 ~~determined from 21.6.5.1~~. Spacing of transverse reinforcement shall not exceed 6 inches (152 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 inches (305 mm).

~~21.9.10.3 –~~ 3. Wall segments with a horizontal length-to-thickness ratio less than 2.5 shall be designed as columns.

1908.1.5 ~~ACI 318, Section 21.10.~~ Special precast structural walls. ~~Modify ACI 318, Section 21.10.2, to read as follows:~~ Special structural walls constructed using precast concrete shall satisfy the requirements for earthquake-resistant structures of ACI 318. In addition, connections that are designed to yield shall be capable of maintaining 80 percent of their design strength at the deformation induced by the design displacement or shall use Type 2 mechanical splices.

~~21.10.2 – Special structural walls constructed using precast concrete shall satisfy all the requirements of 21.9 for cast-in-place special structural walls in addition to Sections 21.4.2 *through* 21.4.4.~~

1908.1.6 ~~ACI 318, Section 21.12.1.1~~. Foundations resisting earthquake-induced forces. ~~Modify ACI 318, Section 21.12.1.1, to read as follows:~~ In structures assigned to Seismic Design Category D, E, or F, foundations resisting earthquake-induced forces or transferring earthquake-induced forces between a structure and ground shall satisfy the requirements for earthquake-resistant structures of ACI 318, unless modified by Chapter 18 of this code.

~~21.12.1.1 – Foundations resisting earthquake-induced forces or transferring earthquake-induced forces between a structure and ground shall comply with the requirements of Section 21.12 and other applicable provisions of ACI 318 *unless modified by Chapter 18 of the International Building Code*.~~

1908.1.7 ~~ACI 318, Section 22.6.~~ Detailed plain concrete structural walls. ~~Modify ACI 318, Section 22.6, by adding new Section 22.6.7 to read as follows:~~ Detailed plain concrete structural walls shall satisfy the requirements for an ordinary structural concrete wall in ACI 318 and the following:

~~22.6.7 – Detailed plain concrete structural walls.~~

~~22.6.7.1 – Detailed plain concrete structural walls are walls conforming to the requirements of ordinary structural plain concrete walls and 22.6.7.2.~~

~~22.6.7.2 – Reinforcement shall be provided as follows:~~

~~(a)~~ 1. Vertical reinforcement of at least 0.20 square inch (129 mm^2) in cross-sectional area shall be provided continuously from support to support at each corner, at each side of each opening and at the ends of walls. The continuous vertical bar required beside an opening is permitted to substitute for one of the two No. 5 bars required by Section 1909.6.3~~22.6.6.5~~.

~~(b)~~ 2. Horizontal reinforcement at least 0.20 square inch (129 mm^2) in cross-sectional area shall be provided:

1. *Continuously at structurally connected roof and floor levels and at the top of walls;*
2. *At the bottom of load-bearing walls or in the top of foundations where doweled to the wall; and*
3. *At a maximum spacing of 120 inches (3048 mm).*

Reinforcement at the top and bottom of openings, where used in determining the maximum spacing specified in Item 3 above, shall be continuous in the wall.

1908.1.8 ~~ACI 318, Section 22.10.~~ Structural plain concrete in earthquake-resisting structures. Delete the requirements for structural plain concrete in earthquake-resisting structures in ACI 318, ~~Section 22.10,~~ and ~~replace with~~ satisfy the following:

~~22.10 – Plain concrete in structures assigned to Seismic Design Category C, D, E or F.~~

~~22.10.1 –~~ 1. Structures assigned to Seismic Design Category C, D, E or F shall not have elements of structural plain concrete, except as follows:

(a) *Structural plain concrete basement, foundation or other walls below the base are permitted in detached one- and two-family dwellings three stories or less in height constructed with stud-bearing walls. In dwellings assigned to Seismic Design Category D or E, the height of the wall shall not exceed 8 feet (2438 mm), the thickness shall not be less than 7-1/2 inches (190 mm), and the wall shall retain no more than 4 feet (1219 mm) of unbalanced fill. Walls shall have reinforcement in accordance with Section 1909.6.3. ~~22.6.6.5.~~*

(b) *Isolated footings of plain concrete supporting pedestals or columns are permitted, provided the projection of the footing beyond the face of the supported member does not exceed the footing thickness.*

***Exception**: In detached one- and two-family dwellings three stories or less in height, the projection of the footing beyond the face of the supported member is permitted to exceed the footing thickness.*

(c) *Plain concrete footings supporting walls are permitted, provided the footings have at least two continuous longitudinal reinforcing bars. Bars shall not be smaller than No. 4 and shall have a total area of not less than 0.002 times the gross cross-sectional area of the footing. For footings that exceed 8 inches (203 mm) in thickness, a minimum of one bar shall be provided at the top and bottom of the footing. Continuity of reinforcement shall be provided at corners and intersections.*

Exceptions:

1. *In detached one- and two-family dwellings three stories or less in height and constructed with stud-bearing walls, plain concrete footings without longitudinal reinforcement supporting walls are permitted.*
2. *For foundation systems consisting of a plain concrete footing and a plain concrete stemwall, a minimum of one bar shall be provided at the top of the stemwall and at the bottom of the footing.*
3. *Where a slab on ground is cast monolithically with the footing, one No. 5 bar is permitted to be located at either the top of the slab or bottom of the footing.*

1908.1.9 ~~ACI 318, Section D.3.3.~~ Anchoring to concrete. ~~Modify ACI 318, Sections D.3.3.4 and D.3.3.5 to read as follows:~~ In structures assigned to Seismic Design Category C, D, E, or F, anchors to concrete shall satisfy the earthquake-resisting requirements for anchorage in ACI 318 and Section 1908.1.10 of this code.

~~D.3.3.4 – Anchors shall be designed to be governed by the steel strength of a ductile steel element as determined in accordance with D.5.1 and D.6.1, unless either D.3.3.5 or D.3.3.6 is satisfied.~~

Exceptions:

1. *Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy the anchor steel ductility or attachment ductility requirement of ACI 318 ~~Section D.3.3.4~~.*
2. *Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy the anchor steel ductility or attachment ductility requirement of ACI 318 ~~Section D.3.3.4~~*

~~D.3.3.5 – Instead of D.3.3.4, the attachment that the anchor is connecting to the structure shall be designed so that the attachment will undergo ductile yielding at a force level corresponding to anchor forces no greater than the design strength of anchors specified in D.3.3.3.~~

~~Exceptions:~~

1. ***~~Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.5.~~***
2. ***~~Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy Section D.3.3.5.~~***

1908.1.10 ~~ACI 318, Section D.4.2.2~~. Anchor diameter and length limits. ~~Delete ACI 318, Section D.4.2.2, and replace with the following:~~ Delete the ACI 318, 2 inch diameter limit for computation of shear and tension breakout strength and 25 inch length limit for computation of tension breakout strength and replace with the following:

~~*D.4.2.2 — The concrete breakout strength requirements for anchors in tension shall be considered satisfied by the design procedure of D.5.2 provided Equation D-8 is not used for anchor embedments exceeding 25 inches. The concrete breakout strength requirements for anchors in shear with diameters not exceeding 2 inches shall be considered satisfied by the design procedure of D.6.2. For anchors in shear with diameters exceeding 2 inches, shear anchor reinforcement shall be provided in accordance with the procedures of D.6.2.9.*~~

1. Tension concrete breakout strength shall not be computed by the following equation where the anchor length exceeds 25 inches.

$$N_b = 16\lambda\sqrt{f'_c}\,h_{ef}^{\frac{5}{3}}$$

2. For anchors with diameters exceeding 2 inches, the anchor reinforcement shall be used to resist shear instead of the concrete breakout strength.

1912.1 Scope. The provisions of this section shall govern the strength design of anchors installed in concrete for purposes of transmitting structural loads from one connected element to the other. Headed bolts, headed studs and hooked (J- or L-) bolts cast in concrete and expansion anchors and undercut anchors installed in hardened concrete shall be designed in accordance with the anchoring to concrete requirements ~~Appendix D~~ of ACI 318 as modified by Sections 1908.1.9 and 1908.1.10~~, provided they are within the scope of Appendix D~~.

The strength design of anchors that are not within the scope of ~~Appendix D of~~ ACI 318, and as amended in Sections 1908.1.9 and 1908.1.10, shall be in accordance with an approved procedure.

Reason: ACI is in the process of completely reorganizing ACI 318, Building Code Requirements for Structural Concrete. This process was formally initiated in the spring of 2008 and was scheduled to be completed by January 1, 2014 so that it would be available for reference by the 2015 IBC. This 2015 IBC schedule was assumed to be the same as traditional ICC meeting schedules.

The reorganized ACI 318 will be significantly different in structure than 318-08. The code will include several new chapters that are based on member design. The 318-08 chapters will be significantly reworked to support the member chapters. Some provisions have been divided sometimes into several chapters and at other provisions combined.

The new schedules released in February 2009 by the ICC require that reorganized ACI 318 be completed by January 3, 2012 for changes to the IBC (Group A) that require textual changes to the body of the IBC. ACI committee 318 will likely not be done with the revisions by that time and thus not have a revised standard to submit for the 2015 IBC if it remains in Group A. ICC's CP 28-05 states that, if no textual changes are required and that the change to the code is in reference only, the revision may be considered by the administrative code committee prior to the Final Action Hearing in Group B.

In this code change proposal, ACI proposes to remove all references to specific sections in ACI 318 from the IBC, but not change the technical intent of any provision. This removal would allow ACI to submit an administrative change in Group B and give ACI Committee 318 one more year to complete their task of reorganization.

In some cases, the referenced section numbers that are removed are replaced with language from ACI 318 (usually the section heading) that will allow the user to easily locate the appropriate section. In some cases, the referenced information in ACI 318 is transcribed into the IBC. The use of words in place of section numbers may require some editorial revisions in the 2012/2013 ICC cycle, if the headings are changed through the reorganization.

The following explanations are given to for the revised Sections stated above:

1908.1	Section 1908 is reworked to state the exception to ACI 318; in place of providing a textual edit of ACI 318 provisions.
1908.1.1	Replaced the referenced section with language that would identify the source information in ACI 318.
1908.1.2	In the revised section 21.1.1.3, the only additional requirement is the restriction on the use of structural plain concrete in SDC C. This restriction has been reworded. The statement that Chapter 21 does not apply to SDC A is explicitly stated in the Section 21.1.7 of ACI 318 and therefore is not an exception and may be deleted. In the revised section 21.1.7, ASCE 7 is identified as the standard that defines seismic-force-resisting systems. This statement has been reworded to introduce the section. Ordinary precast structural walls are defined in the definitions section and can be deleted at this location. The addition of the word "structural" in item d was addressed in errata to ACI 318.
1908.1.3	The section has been reworked, see explanation in 1908.1. Replaced referenced sections with language that would identify the source information in ACI 318.
1908.1.4	The section has been reworked, see explanation in 1908.1. Replaced referenced sections with language that would identify the source information in ACI 318.
1908.1.5	The section has been reworked, see explanation in 1908.1. The requirement from 1908.1.3 was added here for clarity.
1908.1.6	The section has been reworked, see explanation in 1908.1. Replaced referenced sections with language that would identify the source information in ACI 318.
1908.1.7	The section has been reworked, see explanation in 1908.1. Reference to 22.6.6.5 of ACI 318 was replaced by a reference to 1909.6.3 in the IBC.
1908.1.8	The section has been reworked, see explanation in 1908.1. Reference to 22.6.6.5 of ACI 318 was replaced by a reference to 1909.6.3 in the IBC.
1908.1.9	The section has been reworked, see explanation in 1908.1.
1908.1.10	Technical information from ACI 318 is transcribed to the IBC in order to remove the section reference
1912.1	Replaced the referenced section with language that would identify the source information in ACI 318.

Cost Impact: This code change proposal will not increase the cost of construction.

S164–09/10
1908.1.2

Proponent: Alan Robinson, SE, representing Structural Engineers Association of California

Revise as follows:

1908.1.2 ACI 318, Section 21.1.1. Modify ACI 318 Sections 21.1.1.3 and 21.1.1.7 to read as follows:

21.1.1.3 – Structures assigned to Seismic Design Category A shall satisfy requirements of Chapters 1 to 19 and 22; Chapter 21 does not apply. Structures assigned to Seismic Design Category B, C, D, E or F also shall satisfy 21.1.1.4 through 21.1.1.8, as applicable. Except for structural elements of plain concrete complying with Section 1908.1.8 of the International Building Code, structural elements of plain concrete are prohibited in structures assigned to Seismic Design Category C, D, E or F.

21.1.1.7 – Structural systems designated as part of the seismic-force-resisting system shall be restricted to those *permitted by ASCE 7*. Except for *Seismic Design Category* A, for which Chapter 21 does not apply, the following provisions shall be satisfied for each structural system designated as part of the seismic-force-resisting system, regardless of the *Seismic Design Category*:

(a) Ordinary moment frames shall satisfy 21.2.
(b) Ordinary reinforced concrete structural walls *and ordinary precast structural walls* need not satisfy any provisions in Chapter 21.
(c) Intermediate moment frames shall satisfy 21.3.
(d) Intermediate precast *structural* walls shall satisfy 21.4.
(e) Special moment frames shall satisfy 21.5 through 21.8.
(f) Special structural walls shall satisfy 21.9.
(g) Special structural walls constructed using precast concrete shall satisfy 21.10.
(h) *In Seismic Design Category D, E or F, concrete tilt-up wall panels that exceed the limitations of intermediate precast structural wall system shall satisfy 21.9 in addition to 21.4.2 and 21.4.3.*

All special moment frames and special structural walls shall also satisfy 21.1.3 through 21.1.7.

Reason: Concrete tilt-up wall panels is an alternative forming system of site-cast concrete wall panels which are tilted or lifted in place. They do not qualify for special precast structural wall system, which must meet the PRESSS test protocol or ACI ITG-5.2. Unlike earlier construction of box-liked industrial buildings, current practice in commercial buildings constructed using tilt-up panel wall system commonly consists of large window and door openings in consecutive panels. Wall panels varying up to three stories high with openings in consecutive panels tend to resemble wall frame, which is not currently recognized under any of the defined seismic-force resisting systems other than consideration as one of the precast structural wall systems. While special boundary elements are probably not required by calculation if there are a number of panels in one shear line, spandrel panels often should be investigated for requirements of coupling beams.

Large tilt-up buildings with flexible diaphragm also may include isolated interior structural wall panels, either cast-in-place or precast, which are designed to resist high required shear strength demand. These isolated structural wall panels must be investigated for special boundary elements. Based on the current code language, intermediate precast structural wall are exempt from requirements of ACI 318-08 section 21.9 and thus design for boundary element, coupling beam and ductile detailing will be absent. This proposal does not affect the selection of seismic response R-factor given in ASCE 7 Table 12.2-1. This proposal gives requirement under which design and detailing need to conform to special structural wall system provisions in ACI-318 section 21.9. This proposal further enhances minimum life safety building performance under earthquake forces in SDC D, E or F.

Cost Impact: The code change proposal will not increase the cost of construction for typical tilt-up buildings in higher SDC.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROBINSON-S1-1908.1.2

S165–09/10
1908.1.3

Proponent: Alan Robinson, SE, representing Structural Engineers Association of California

Revise as follows:

1908.1.3 ACI 318, Section 21.4. Modify ACI 318, Section 21.4, by renumbering Section 21.4.3 to become 21.4.4 and adding new Sections 21.4.3, 21.4.5, ~~and~~ 21.4.6 and 21.4.7 to read as follows:

21.4.3 – Connections that are designed to yield shall be capable of maintaining 80 percent of their design strength at the deformation induced by the design displacement or shall use Type 2 mechanical splices.

21.4.4 – Elements of the connection that are not designed to yield shall develop at least 1.5 S_y.

21.4.5 - Wall piers in Seismic Design Category D, E or F shall comply with Section 1908.1.4 of the International Building Code.

~~21.4.5~~ 21.4.6– Wall piers not designed as part of a moment frame in buildings assigned to SDC C shall have transverse reinforcement designed to resist the shear forces determined from 21.3.3. Spacing of transverse reinforcement shall not exceed 8 inches (203 mm). Transverse reinforcement shall be extended beyond the pier clear height for at least 12 inches (305mm).

Exceptions:

1. *Wall piers that satisfy 21.13.*
2. *Wall piers along a wall line within a story where other shear wall segments provide lateral support to the wall piers and such segments have a total stiffness of at least six times the sum of the stiffnesses of all the wall piers.*

~~21.4.6~~ 21.4.7 –Wall segments with a horizontal length-to-thickness ratio less than 2.5 shall be designed as columns.

Reason: The design provision for wall pier detailing was originally introduced by SEAOC in 1987 to legacy Uniform Building Code and was included in 1988 UBC through 1997 UBC. The wall pier detailing provision prescribed under Section 1908.1.4 was intended for high seismic zones equivalent to current SDC D, E or F. 1908.1.3 was added as a complement of wall pier detailing in SDC C (formerly seismic zones 2A and 2B under legacy model code.) ACI 318 Commentary R 21.1.1 emphasized "*it is essential that structures assigned to higher SDC's possess a higher degree of toughness*", and further encourages practitioners to use special structural wall system in regions of high seismic risk. ASCE 7 Table 12.2-1 permits intermediate precast structural wall system in SDC D, E or F. Current Section 1908.1.3 does not limit to just structures assigned to SDC C. The required shear strength under 21.3.3, referenced in current Sec. 21.4.5, is based on V_u under either nominal moment strength or two times the code prescribed earthquake force. The required shear strength in 21.6.5.1, referenced in Sec. 21.9.10.2 (IBC 1908.1.4), is based on the probable shear strength, V_e under the probable moment strength, M_{pr}. In addition, the spacing of required shear reinforcement is 8 inches on center under current 21.4.5 instead of 6 inches on center with seismic hooks at both ends under 21.9.10.2. Requirement of wall pier under 21.9.10.2 would enhance better ductility.

Current practice in commercial buildings constructed using precast panels wall system have large window and door openings and/or narrow wall piers. Wall panels varying up to three stories high with openings resembles wall frame which is not currently recognized under any of the defined seismic-force resisting systems other than consideration of structural wall system. Conformance to special structural wall system design and detailing of wall piers ensures minimum life safety performance in resisting earthquake forces for structures in SDC D, E or F. Proposed modification separates wall piers designed for structures assigned to SDC C from those assigned to SDC D, E or F.

Cost Impact: The code change proposal will not increase the cost of construction for typical tilt-up buildings in higher SDC.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROBINSON-S2-1908.1.3

S166–09/10
1908.1.8

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

1908.1.8 ACI 318, Section 22.10. Delete ACI 318, Section 22.10, and replace with the following:

22.10 – Plain concrete in structures assigned to Seismic Design Category C, D, E or F.

22.10.1 – Structures assigned to Seismic Design Category C, D, E or F shall not have elements of structural plain concrete, except as follows:

(a) Structural plain concrete basement, foundation or other walls below the base are permitted in detached one- and two-family dwellings three stories or less in height constructed with stud-bearing walls. In dwellings assigned to Seismic Design Category D or E, the height of the wall shall not exceed 8 feet (2438 mm), the

thickness shall not be less than 71/2 inches (190 mm), and the wall shall retain no more than 4 feet (1219 mm) of unbalanced fill. Walls shall have reinforcement in accordance with 22.6.6.5.

(b) Isolated footings of plain concrete supporting pedestals or columns are permitted, provided the projection of the footing beyond the face of the supported member does not exceed the footing thickness.

Exception: In detached one- and two-family dwellings three stories or less in height, the projection of the footing beyond the face of the supported member is permitted to exceed the footing thickness.

(c) Plain concrete footings supporting walls are permitted, provided the footings have at least two continuous longitudinal reinforcing bars. Bars shall not be smaller than No. 4 and shall have a total area of not less than 0.002 times the gross cross-sectional area of the footing. For footings that exceed 8 inches (203 mm) in thickness, a minimum of one bar shall be provided at the top and bottom of the footing. Continuity of reinforcement shall be provided at corners and intersections.

Exceptions:

1. In Group U occupancies ~~detached one-and two-family dwellings three stories or less in height~~ constructed with stud-bearing walls, plain concrete footings without longitudinal reinforcement supporting walls are permitted.
2. In structures assigned to Seismic Design Categories D, E and F, ~~For~~ foundation systems consisting of a plain concrete footing and a plain concrete stemwall, a minimum of one No. 4 bar shall be provided at the top of the stemwall and at the bottom of the footing.
3. Where a slab on ground is cast monolithically with the footing, one No. 5 bar is permitted to be located at either the top of the slab or bottom of the footing.

Reason: If any occupancy warrants no reinforcing, it is a U occupancy. A three story dwelling in Seismic Design Category D, E or F should have at least 1 #4 bar at the top and bottom of the footing. Concrete cracks without reinforcing. A minimal amount of reinforcing will limit cracks during a seismic event.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAIEL-S5-1908.1.8

S167–09/10
1908.1.9

Proponent: Kevin Moore, PE, SE, SECB and Edwin Huston, PE, SE, SECB, representing National Council of Structural Engineers Associations

Revise as follows:

1908.1.9 ACI 318, Section D.3.3. Modify ACI 318, Sections D.3.3.1, D3.3.4 and D3.3.5, and add Section D.3.3.7 to read as follows:

D.3.3.1 – The provisions of Appendix D do not apply to the design of anchors in plastic hinge zones of concrete structures under earthquake forces or to anchors that meet the requirements of Section D.3.3.7.

D.3.3.4 – Anchors shall be designed to be governed by the steel strength of a ductile steel element as determined in accordance with D.5.1 and D.6.1, unless either D.3.3.5 or D.3.3.6 is satisfied.

Exceptions:

1. Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.4.
2. Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy Section D.3.3.4.

D.3.3.5 – Instead of D.3.3.4, the attachment that the anchor is connecting to the structure shall be designed so that the attachment will undergo ductile yielding at a force level corresponding to anchor forces no greater than the design strength of anchors specified in D.3.3.3.

Exceptions:

1. Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.5.
2. Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy Section D.3.3.5.

D.3.3.7 – For anchors installed in wood sill plates a maximum of 2 ½ inches (38 mm) in net thickness, the allowable lateral design values for shear in the cast-in-place anchor, parallel to the grain of the wood sill plate, are permitted to be determined in accordance with Section 2305 of the *International Building Code*, provided the anchor installation complies with all of the following:

1. Anchor nominal diameter is 5/8 inches (16 mm);
2. Anchors are embedded into concrete a minimum of 7 inches (178 mm);
3. Anchors are located a minimum of 2 ½ anchor diameters from the edge of the concrete parallel to the length of the wood sill plate; and
4. Anchors are located a minimum of 15 anchor diameters from the edge of the concrete perpendicular to the length of the wood sill plate

Reason: Current design provisions require calculation of the capacity of anchor bolt fastening wood sill plates to concrete foundations via methods promulgated in ACI 318, Appendix D. These methods result in significantly reduced capacities for this connection when compared to historical values and legacy code requirements. The state of knowledge regarding this connection is ambiguous and does not support such a large reduction for a common assembly.

Recent experimental testing and analysis indicates that actual capacities of the considered connection far exceed those historically used for design, supporting the use of wood dowel design values for the connection. The experimental data used to support this code change proposal indicates that concrete failure modes do not control the capacity of the connection, so the need to calculate the capacity of the bolt related to concrete strength for proper embedment and edge spacing is superfluous.

Reference:
W. Andrew Fennell, et al. *Report on laboratory testing of anchor bolts connecting wood sill plates to concrete with minimum edge distances.* March 29, 2009.

Cost Impact: The code change proposal will decrease the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MOORE-HUSTON-S1-1908.1.9 D.3.3.1

S168–09/10
1908.1.9

Proponent: Alan Robinson, SE, representing Structural Engineers Association of California

Revise as follows:

1908.1.9 ACI 318, Section D.3.3. Modify ACI 318, Sections D.3.3.4 and D.3.3.5 delete and replace D.3.3.6 and add D.3.3.7 to read as follows:

D.3.3.4 - Anchors shall be designed to be governed by the steel strength of a ductile steel element as determined in accordance with D.5.1 and D.6.1, unless either D.3.3.5 or D.3.3.6 is satisfied.

Exceptions:

1. Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.4.
2. Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy Section D.3.3.4.

3. In light-frame wood construction, design of anchors in concrete shall be permitted to satisfy D.3.3.7.

D.3.3.5 - Instead of D.3.3.4, the attachment that the anchor is connecting to the structure shall be designed so that the attachment will undergo ductile yielding at a force level corresponding to anchor forces no greater than the design strength of anchors specified in D.3.3.3.

Exceptions:

1. Anchors in concrete designed to support nonstructural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.5.
2. Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy Section D.3.3.5.

D.3.3.6 - As an alternative to D.3.3.4 and D.3.3.5, it shall be permitted to take the design strength of the anchors as 0.4 times the design strength determined in accordance with D.3.3.3.

D.3.3.7 – In light-frame wood structures, bearing or non-bearing walls, concrete anchors of sill plate to foundation or foundation stem wall need not satisfy D.3.3.5 and D.3.3.6 when the design strength of the anchors is determined in accordance with D.3.3.3.

Reason: Development of Appendix D was based primarily on tests of concrete anchor using steel plates with substantially larger edge distance than common practice in light-frame construction. There are insufficient tests of concrete anchors with wood sill plate at minimum side cover distance to justify the arbitrary assignment of 50 per cent reduction of the design strength stated in D.3.3.6. Additional limitation for anchorage of wood stud wall is removed from current ACI 318-08 D.3.3.6 (i.e. D.3.3.6 - As an alternative to D.3.3.4 and D.3.3.5, it shall be permitted to take the design strength of the anchors as 0.4 times the design strength determined in accordance with D.3.3.3. A new section D.3.3.7 is introduced under this proposal to further modify ACI code for concrete anchors used in light-framed wood construction.

In common construction practice of light-frame construction, bolts are centered on sill plates giving an side edge distance of $1^3/_4$ inches. Current code requirements under ACI 318 Appendix D lead to substantial reduction of design capacity based on breakout strength of a single anchor under Section D.6.2.1(c) or D.6.2.2. As an example, the design strength for 5/8 inch diameter anchor bolt strength under D.3.3.3 is 1116 lbs. Requirement under D.3.3.6 will further reduce the design strength to 558 lbs. for use in sill bolts. The ASD value would be 398 lbs. This is a substantial reduction from prior codes leading to impractical bolt spacing for most wood shear panel nail spacing range. A comparison between ACI Appendix D to IBC Table 1911.2, Allowable Service Loads on Embedded Bolts, shows the disparity of concrete anchor value.

The primary mode of failure of plywood sheathed panels attached to wood sill plate has been through nail slippage and yielding. This mode of failure together with bending of bolt offers the ductility and toughness of wood wall panels. Over-strength factor does not apply in the transfer of seismic forces from wood shear panel to concrete. Additional reduction factor is not warranted based on recent laboratory test conducted under SEAOC Seismology Committee purview. Result of the test is summarized below.

Attachment:
Excerpt from Report on laboratory testing of anchor bolts connecting wood sill plates to concrete with minimum edge distances

IBC-06 references ACI 318-05 Appendix D for the determination of anchor bolt capacity (in single-shear) when attaching wood sill plates to concrete foundations. Engineers have historically anticipated the controlling failure of this connection to occur between the anchor bolts and the wood sill plate. Under the IBC, the wind resistance values of anchor bolts are about the same as in historical practice. However, design capacities seismic forces based on break-out strength in shear determined in accordance with ACI 318-05 Appendix D are greatly reduced and less than the wood to concrete connection design capacity for small side edge distances. Many practicing engineers and building officials are mystified by the substantial reduction of anchor bolt capacities obtained from the application of Appendix D equations for wood framed construction in seismic design categories D, E and F. In the absence of available test data, members of SEAOC Seismology Committee undertook a study of typical anchor bolted connections to establish a basis for evaluating design capacities while better understanding the behavior of this traditional connection.

Test parameters and procedures were established. The testing consisted of typical anchor bolt connections found in wood framed shear walls using pressure treated wood 2x4, 3x4, 2x6 and 3x6 sill plates and 5/8 inch diameter by seven inches embedment anchor bolts with code prescribed washers. Side edge distance of 1-3/4 inches for 2x4 and 3x4 and 2-3/4 inches for 3x4 and 3x6 sill plates. This Testing Program was completed in December 2008 and the results can be downloaded on the SEAOC website: http://www.SEAOC.org/bluebook.

The load protocol adopted for the tests was a displacement-controlled load protocol. Peak loads from monotonic tests were used to establish the reference force, which was used to prescribe the load steps in the pseudo-cyclic testing. Monotonic tests were run at a sufficiently slow rate to pick up the internal flaws forming within the concrete by using impact-echo testing. The Pseudo-cyclic tests were based on the CUREE load protocol but with cycles added at low load levels. All tests were conducted without intentionally pre-cracked concrete.

Impact-echo method was used to detect concrete side break-out, if any, during the tests. When concrete deterioration was detected, the corresponding load and displacement were recorded for each specimen. It was observed that the first stage of deterioration is a series of cracks that form within the concrete propagated from the centerline of the anchor bolt and angling out towards the outer free face of the concrete. The cracks ultimately reach the outer face and became shallow spall shapes. It is important to note that the early stages of concrete deterioration are not always visually apparent. A strong correlation between the “peak” envelope values with the onset of concrete side break-out was, however, observed. Peak values were in the range of 7,200 lb to 8,500 lb.

All cyclic test data was analyzed in accordance with ASTM E 2126 Standard Test Methods for Cyclic (Reversed) Load Test for Shear Resistance of Walls for Buildings. Result of cycle test of specimen 296/ 302 is shown in Figure A-1. The positive and negative envelop curves for each specimens were combined to produce an average envelope curve used to establish peak load, displacement at peak load, ultimate load, and displacement at ultimate load and summarized in Figures A-2 and A-3.

Findings of the anchor bolt test program were as follows:

1. The results of the Anchor Bolt Testing Program has shown that wood components attached to concrete with minimum edge distances exhibited ductile behavior. The wood "yield" is the first material limit state.
2. The tests indicated that concrete cracks were not produced at service level loads. In the non-linear range of performance, delamination generally produced a decline in capacity corresponding to a wood displacement of about 0.60 inches, with the bolt experiencing considerable deformation.
3. Further excursion of the wood plate in some cases produced a complete concrete spall, however the bolt head remained intact and considerable residual strength was provided as the bolt remained in tension.
4. Cracking through the section did not occur at any point. For these reason, cracked section reduction appears overly conservative. It should also be noted that according to the available literature reductions are generally not required for shear anchorage applied perpendicular to a crack.
5. Test support design bolt values based on ACI 318 section D.3.3.3 using $0.75\Phi V_n$.

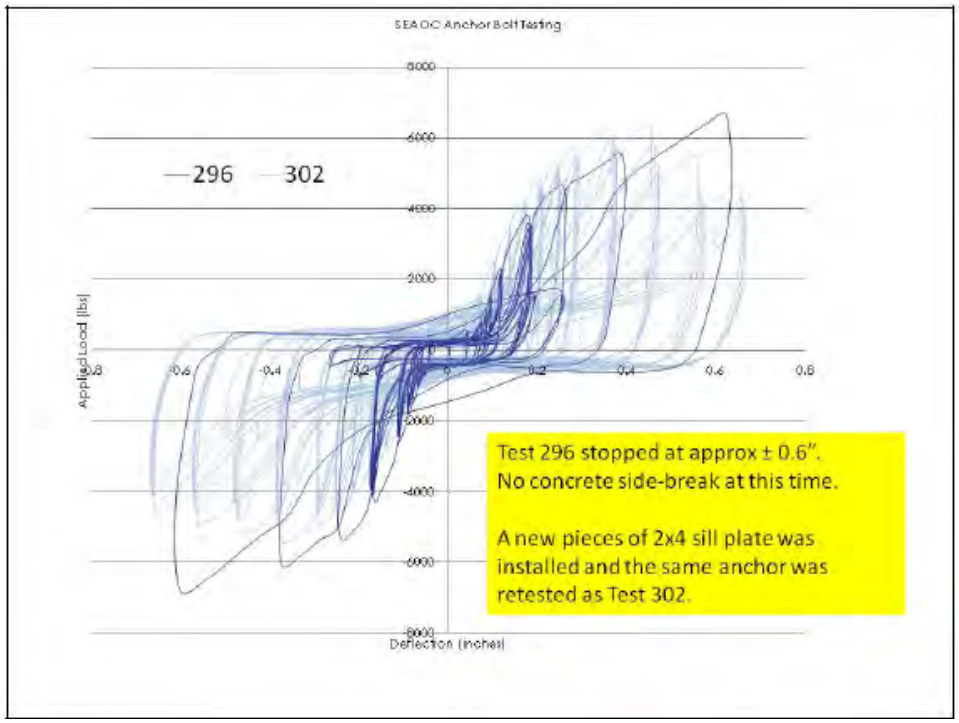


Figure A1 - Result of cycle test specimen 296 and 302

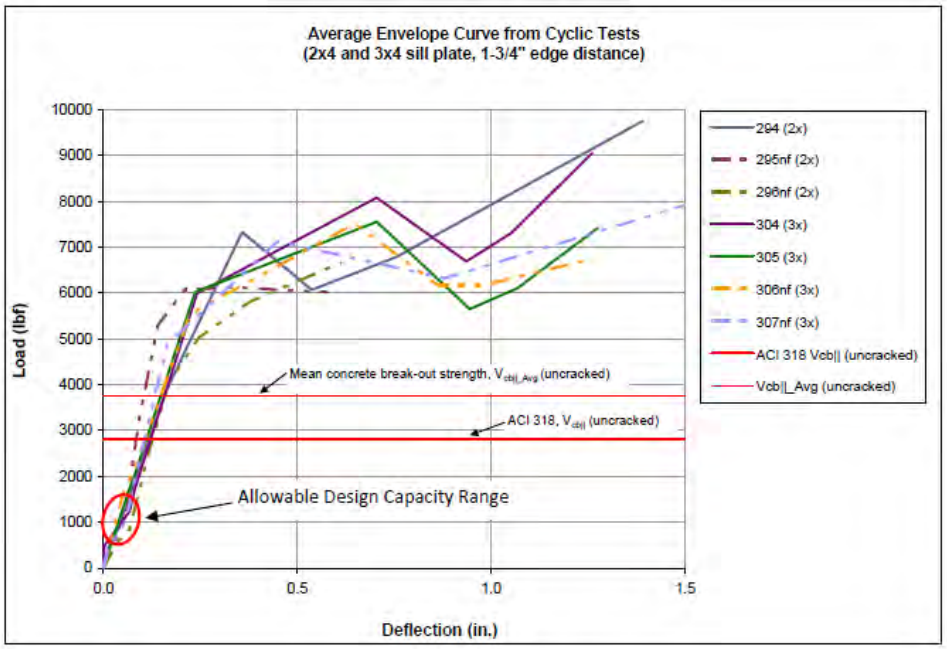


Fig. A2 – Average envelope curve of cyclic tests for concrete anchor of 2x4 and 3x4 sill plate

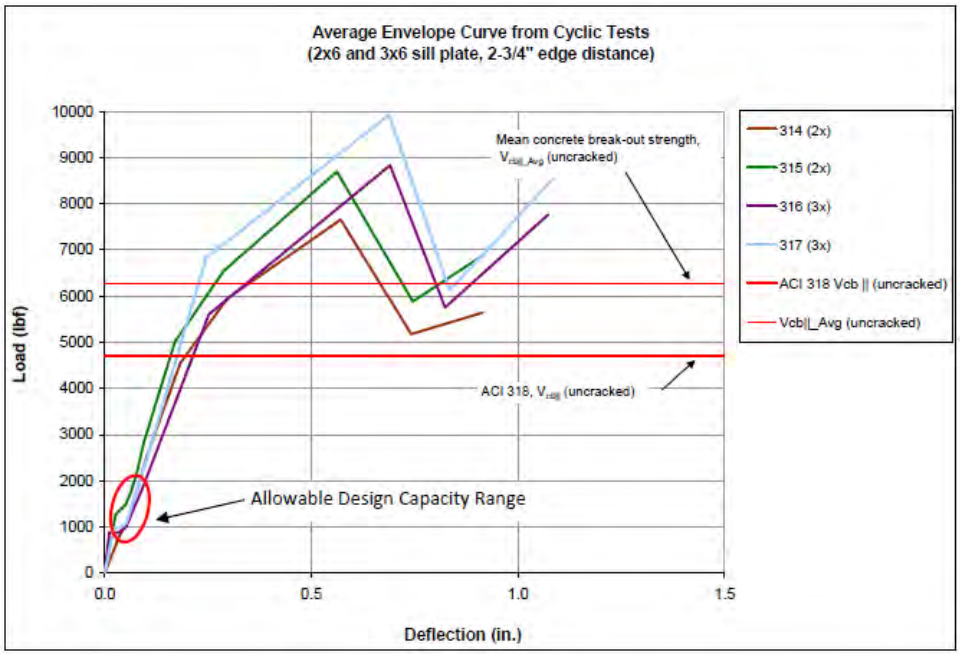


Fig. A3 – Average envelope curve of cyclic tests for concrete anchor of 2x6 and 3x6 sill plate

Ref. Fennel, Mochizuki, Moore (2008) "Report on laboratory testing of anchor bolts connection wood sill plates to concrete with minimum edge distances" SEAONC, San Francisco, CA

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROBINSON-S3-1908.1.9

S169–09/10
1910.2 (New)

Proponent: Daniel J. Walker, PE, Thomas Associates, Inc. representing the National Sunroom Association

Add new text as follows:

1910.2 Patio cover slab and footing requirements. In areas with a frost depth of zero, a *patio cover* shall be permitted to be supported on a concrete slab on grade without footings, provided the slab conforms to the provisions of Chapter 19 of this code, is not less than 3-1/2 inches (89 mm) thick and further provided that the columns do not support loads in excess of 750 pounds (3.36 kN) per column.

Reason: This language has long been included in Appendix I of the code. The requirements are specific to this section and therefore should be included here.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Walker-S2-1910.2

S170-09/10
1911.1

Proponent: Richard L. Hess, Hess Engineering Inc., representing self

Revise as follows:

1911.1 Scope. The provisions of this section shall govern the allowable stress design of headed bolts and headed stud anchors cast in normal-weight concrete for purposes of transmitting structural loads from one connected element to the other. These provisions do not apply to anchors installed in hardened concrete or where load combinations include earthquake loads or effects for structures other than buildings of light-frame construction that are no more than three stories above grade plane plus basement. The bearing area of headed anchors shall be not less than one and one-half times the shank area. Where strength design is used, or where load combinations include earthquake loads or effects for structures other than buildings of light-frame construction that are no more than three stories above grade plane plus basement, the design strength of anchors shall be determined in accordance with Section 1912. Bolts shall conform to ASTM A 307 or an approved equivalent.

Reason: Experience of over fifty years in earthquake-prone California has demonstrated that light frame buildings of three stories plus basement or less have not experienced any failure of the anchor bolts used to secure shearwalls in these buildings. In addition to this well-documented field experience, testing of light frame walls with cyclical lateral forces has shown that these connections are ductile because of yielding of the light frame sill plates before any failure of the concrete can occur.

Cost Impact: This code change proposal will substantially decrease unnecessary direct design and construction costs as well as plan checking costs due to the confusion that has been created among practicing engineers and building officials by the requirement that light frame anchor bolts be designed in accordance with provisions of ACE 318 Appendix D, which was not based on evidence of its applicability to this type of construction or on testing of anchorage of light frame elements to concrete foundations.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: HESS-S1-1911.1

S171–09/10
2101.2, 2101.2.7 (New), Chapter 35; IRC R606.1, R606.1.1, R606.12.1, R606.12.3.1, Chapter 44

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards and Phil Samblanet, The Masonry Society, representing The Masonry Society.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC-STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

1. Add new text as follows:

2101.2.7 Direct design. Masonry designed by the direct design method shall comply with the provisions of TMS 403.

2. Revise as follows:

2101.2 Design methods. Masonry shall comply with the provisions of one of the following design methods in this chapter as well as the requirements of Sections 2101 through 2104. Masonry designed by the allowable stress design provisions of Section 2101.2.1, the strength design provisions of Section 2101.2.2, ~~or~~ the prestressed masonry provisions of Section 2101.2.3, or the direct design requirements of Section 2101.2.7 shall comply with Section 2105.

3. Add standard to Chapter 35 as follows:

TMS
403-09 Direct Design Handbook for Masonry Structures

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

R606.1 General. Masonry construction shall be designed and constructed in accordance with the provisions of this section, TMS 403, or in accordance with the provisions of TMS 402/ACI 530/ASCE 5.

R606.1.1 Professional registration not required. When the empirical design provisions of TMS 402/ACI 530/ASCE 5 Chapter 5, the provisions of TMS 403, or the provisions of this section are used to design masonry, project drawings, typical details and specifications are not required to bear the seal of the architect or engineer responsible for design, unless otherwise required by the state law of the *jurisdiction* having authority.

R606.12.1 General. Masonry structures and masonry elements shall comply with the requirements of Sections R606.12.2 through R606.12.4 based on the seismic design category established in Table R301.2(1). Masonry structures and masonry elements shall comply with the requirements of Section R606.12 and Figures R606.11(1), R606.11(2) and R606.11(3) or shall be designed in accordance with TMS 402/ACI 530/ASCE 5, or TMS 403.

R606.12.3.1 Design requirements. Masonry elements other than those covered by Section R606.12.2.2.2 shall be designed in accordance with the requirements of Chapter 1 and Sections 2.1 and 2.3 of ACI TMS 402/ACI 530/ASCE 5 and shall meet the minimum reinforcement requirements contained in Sections R606.12.3.2 and R606.12.3.2.1. Otherwise, masonry shall be designed in accordance with TMS 403.

> **Exception:** Masonry walls limited to one *story* in height and 9 feet (2743 mm) between lateral supports need not be designed provided they comply with the minimum reinforcement requirements of Sections R606.12.3.2 and R606.12.3.2.1.

2. Add standard to Chapter 44 as follows:

TMS
403-09 Direct Design Handbook for Masonry Structures

Reason: This modification proposes to introduce a simplified design method for single story, concrete masonry buildings based on a new, mandatory language reference standard TMS 403, *Direct Design Handbook for Masonry Structures*. The methodology used to develop the *Direct Design Handbook for Masonry Structures* is based upon the strength design provisions of the 2005 and 2008 editions of the TMS 402/ACI 530/ASCE 5, *Building Code Requirements for Masonry Structures* and the factored combinations of dead, roof live, wind, seismic, snow, and rain loads in accordance with the 2005 edition of ASCE 7, *Minimum Design Loads for Buildings and Other Structures*.

The genesis of this new design standard was conceived in response to concerns from the design community that structural design and loading requirements have become too complicated, particularly for relatively small, non-complicated structures. The direct design procedure is a table-based structural design method that permits the user, following a specific series of steps, to design and specify relatively simple, single-story concrete masonry bearing-wall structures. While simpler to implement, the direct design method does limit a designer's flexibility to only those configurations addressed by the standard and does introduce slightly more conservatism compared to conventional design approaches as a result of the conditions and assumptions inherent to the design approach.

A few of the key design limitations include:

Snow – the ground snow load is limited to 60 lb/ft^2.

Wind – the 3-second gust basic wind speed is limited to 150 mph; wind exposure category is limited to B or C; and site topography is limited such that K_{zt} = 1.0.

Seismic – the mapped spectral acceleration for short and 1-second periods is limited to 3.0*g* and 1.25*g*, respectively and limited to site classes A, B, C, or D.

Construction – wall are limited to single story, single wythe, 8-inch concrete masonry with a maximum height of 30 feet.

Roof – while the design of roofs is not covered by the direct design method, roof diaphragms are required to be flexible, have rectangular dimensions with an aspect ratio not exceeding 4-to-1, with a maximum plan dimension of 200 feet.

Reinforcement – all reinforcing bars are limited to No. 5 Grade 60.

While the *Direct Design Handbook for Masonry Structures* cannot be used to design a masonry structure of any configuration, it is intended to capture many of the simple loadbearing masonry structures commonly designed today. Those interested in reviewing a draft of the Direct Design Handbook for Masonry Structures are encouraged to download a working draft of the document at the following link:
http://www.masonrysociety.org/html/resources/TMS-403/TMS403.htm

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, TMS 403-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: THOMPSON-SAMBLANET-S2-2101.2

S172–09/10
2101.3

Proponent: Jason Thompson, National Concrete Masonry Association, representing the Masonry Alliance for Codes and Standards

Revise as follows:

2101.3 Construction documents. The *construction documents* shall show all of the items required by this code including the following:

1. Specified size, grade, type and location of reinforcement, anchors and wall ties.
2. Reinforcing bars to be welded and welding procedure.
3. Size and location of structural elements.
4. Provisions for dimensional changes resulting from elastic deformation, creep, shrinkage, temperature and moisture.
5. Loads used in the design of masonry.
6. Specified compressive strength of masonry at stated ages or stages of construction for which masonry is designed, except where specifically exempted by this code.
7. Details of anchorage of masonry to structural members, frames and other construction, including the type, size and location of connectors.
8. Size and <u>permitted</u> location of conduits, pipes and sleeves.
9. The minimum level of testing and inspection as defined in Chapter 17, or an itemized testing and inspection program that meets or exceeds the requirements of Chapter 17.

Reason: During the 2007/2008 hearings where the above language was approved (S175-07/08), a valid point was raised regarding Item 8 that requires the location of conduits, pipes, and sleeves be indicated. Typically, plans show the general or permitted location of such items combined with typical details (in this case, the mechanical/electrical/plumbing plans) for the construction or installation of such items, which are often located on different sheets of the plans. While minor, the above modification will continue to allow the flexibility afforded by this long-standing practice used when generating plans.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: THOMPSON-S2-2101.3

S173–09/10
2102.1

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards and Phil Samblanet, The Masonry Society.

1. Revise as follows:

2102.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

AREA.

~~**Bedded**. The area of the surface of a masonry unit that is in contact with mortar in the plane of the joint.~~

Gross cross-sectional. The area delineated by the out-to-out specified dimensions of masonry in the plane under consideration.

Net cross-sectional. The area of masonry units, grout and mortar crossed by the plane under consideration based on out-to-out specified dimensions.

2. Delete without substitution:

~~**CONNECTOR.** A mechanical device for securing two or more pieces, parts or members together, including anchors, wall ties and fasteners.~~

~~**COVER.** Distance between surface of reinforcing bar and edge of member~~

3. Revise as follows:

DIMENSIONS.

~~**Actual.** The measured dimension of a masonry unit or element.~~

Nominal. The specified dimension plus an allowance for the joints with which the units are to be laid. Thickness is given first, followed by height and then length.

Specified. The dimensions specified for the manufacture or construction of masonry, masonry units, joints or any other component of a structure.

4. Delete without substitution:

~~**GROUTED MASONRY.**~~

~~**Grouted hollow-unit masonry.** That form of grouted masonry construction in which certain designated cells of hollow units are continuously filled with grout.~~

~~**Grouted multiwythe masonry.** That form of grouted masonry construction in which the space between the wythes is solidly or periodically filled with grout.~~

~~**HEIGHT, WALLS.** The vertical distance from the foundation wall or other immediate support of such wall to the top of the wall.~~

5. Revise as follows:

MASONRY UNIT. Brick, tile, stone, glass block or concrete ~~block~~ masonry unit conforming to the requirements specified in Section 2103.

~~**Clay.** A building unit larger in size than a brick, composed of burned clay, shale, fired clay or mixtures thereof.~~

~~**Concrete.** A building unit or block larger in size than 12 inches by 4 inches by 4 inches (305 mm by 102 mm by 102 mm) made of cement and suitable aggregates.~~

Hollow. A masonry unit whose net cross-sectional area in any plane parallel to the load-bearing surface is less than 75 percent of its gross cross-sectional area measured in the same plane.

Solid. A masonry unit whose net cross-sectional area in every plane parallel to the load-bearing surface is 75 percent or more of its gross cross-sectional area measured in the same plane.

6. Delete without substitution:

~~**SHELL.** The outer portion of a hollow masonry unit as placed in masonry.~~

~~**TIE, LATERAL.** Loop of reinforcing bar or wire enclosing longitudinal reinforcement.~~

~~**TILE.** A ceramic surface unit, usually relatively thin in relation to facial area, made from clay or a mixture of clay or other ceramic materials, called the body of the tile, having either a "glazed" or "unglazed" face and fired above red heat in the course of manufacture to a temperature sufficiently high enough to produce specific physical properties and characteristics.~~

~~**WEB.** An interior solid portion of a hollow masonry unit as placed in masonry.~~

(Definitions not shown are unchanged)

Reason: The terms "actual dimension", "grouted hollow-unit masonry", "grouted multiwythe masonry", "wall height", "shell", "lateral tie", and "web" are not used in Chapter 21. Several of these terms, however, (such as "actual dimension", "shell" and "wall height"), are used in other IBC chapters and the definitions in Section 2102 may be inappropriate for such use and as such should be deleted from the masonry chapter. If needed for other chapters, they should be defined for the specific use intended.

The definitions of "connector" and "cover" are inappropriate for their current use in Chapter 21. These terms are used in other masonry standards, but conflict with the usage as given in Chapter 21. For example, the definition of connector conflicts with the usage in IBC Sections 2113.11, 2113.15 and 2113.17. Likewise the definition of cover conflicts with IBC section 2113.18. As such, these definitions should be deleted to avoid additional confusion. If needed, more appropriate definitions could be considered, but the use of these terms in the noted sections is appropriate and understandable without definitions.

The definitions for "clay masonry unit", "concrete masonry units", and "tile" are inappropriate and should be deleted as they do not include all such units permitted by IBC Section 2103. For example, concrete masonry units smaller than the size noted in the definition are permitted by ASTM standards. More appropriate definitions of these terms are found in the referenced standards that are cited where these terms are used in the IBC.

The term "bedded area" is used only in Section 2105.3.2 and is defined in the standard cited in that section for the determination of compressive strength and is thus not needed in the IBC.

The term concrete block in the definition of masonry unit is being updated to the more appropriate term concrete masonry unit.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THOMPSON-SAMBLANET-S4-2102 DEFINITIONS

S174–09/10
2102.1

Proponent: Jason Thompson, National Concrete Masonry Association, representing Masonry Alliance for Codes and Standards and Phil Samblanet, The Masonry Society.

Revise as follows:

2102.1 General. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

BRICK.

Calcium silicate (sand lime brick). ~~A masonry unit made of sand and lime.~~ A pressed and subsequently autoclaved unit that consists of sand and lime, with or without the inclusion of other materials.

Clay or shale. ~~A masonry unit made of clay or shale, usually formed into a rectangular prism while in the plastic state and burned or fired in a kiln.~~ A solid or hollow masonry unit of clay or shale, usually formed into a rectangular prism, then burned or fired in a kiln; brick is a ceramic product.

Concrete. ~~A masonry unit having the approximate shape of a rectangular prism and composed of inert aggregate particles embedded in a hardened cementitious matrix.~~ A concrete masonry unit made from portland cement, water, and suitable aggregates, with or without the inclusion of other materials.

COLLAR JOINT. Vertical longitudinal ~~joint~~ space between wythes of masonry or between masonry wythe and backup construction that is permitted to be filled with mortar or grout~~.~~

DIMENSIONS.

Actual. The measured dimension of a masonry unit or element.

Nominal. The specified dimension plus an allowance for the joints with which the units are to be laid. Nominal dimensions are usually stated in whole numbers. Thickness is given first, followed by height and then length.

Specified. ~~The~~ Dimensions specified for the manufacture or construction of ~~masonry, masonry~~ a unit~~s~~, joint~~s~~ or ~~any other component of a structure~~ element.

MORTAR. A ~~plastic~~ mixture consisting of ~~*approved*~~ cementitious materials, fine aggregates, ~~and~~ water, with or without admixtures, that is used to ~~bond~~ construct unit masonry assemblies ~~or other structural units~~.

TIE, WALL. ~~A~~ Metal connector that connects wythes of masonry walls together.

WALL. A vertical element with a horizontal length-to-thickness ratio greater than three, used to enclose space.

Cavity wall. Awall built of masonry units or of concrete, or a combination of these materials, arranged to provide an airspace within the wall, and in which the inner and outer parts of the wall are tied together with metal ties.

Composite wall. A wall built of a combination of two or more masonry units bonded together, one forming the backup and the other forming the facing elements.

Dry-stacked, surface-bonded walls. A wall built of concrete masonry units where the units are stacked dry, without mortar on the bed or head joints, and where both sides of the wall are coated with a surface-bonding mortar.

Masonry-bonded hollow wall. A multiwythe wall built of masonry units ~~so~~ arranged ~~as~~ to provide an air space between the wythes ~~within the wall, and in which the facing and backing of the wall are~~ and with the wythes bonded together with masonry units.

Parapet wall. The part of any wall entirely above the roof line.

(Definitions not shown are unchanged)

Reason: The proposed modifications make these definitions consistent with those in ASTM Standards and the TMS 402 and TMS 602 standards and with their use in the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THOMPSON-SAMBLANET-S5-2102 DEFINITIONS

S175–09/10
2103.5 (New), Chapter 35

Proponent: Jason Thompson, National Concrete Masonry Association, representing the Masonry Alliance for Codes and Standards

1. Add new text as follows:

2103.5 Architectural cast stone. Architectural cast stone shall conform to ASTM C1364.

(Renumber subsequent sections accordingly)

2. Add standard to Chapter 35 as follows:

ASTM
C1364-07 Standard Specification for Architectural Cast Stone

Reason: Architectural cast stone products have been used successfully in construction for decades. In 1997, ASTM published ASTM C1364, a specification covering the minimum physical requirements, sampling, testing, and visual inspection of the manufactured cast stone intended to replicate natural stone. To ensure that these products being specified and installed meet minimum established requirements for compressive strength, freeze thaw durability, aesthetics, shrinkage, etc., this modification proposes to introduce a reference to ASTM C1364 into the IBC to help ensure consistent and safe use of these products.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM C1364-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THOMPSON-S1-2103.5

S176–09/10
2107.1, 2107.2

Proponent: Tom Young, PE, Northwest Concrete Masonry Association, representing Masonry Alliance for Codes and Standards

Revise as follows:

2107.1 General. The design of masonry structures using allowable stress design shall comply with Section 2106, Section 2107.2 and the requirements of Chapters 1 and 2 of TMS 402/ACI 530/ASCE 5 except as modified by Sections ~~2107.2~~ 2107.3 through 2107.5.

2107.2 ~~TMS 402/ACI 530/ASCE 5, Section 2.1.2,~~ Load combinations. ~~Delete Section 2.1.2.1.~~ Structures and portions thereof shall be designed to resist the most critical effects resulting from the load combinations of Section 1605.3. When using the alternative basic load combinations of Section 1605.3.2 that include wind or seismic loads, allowable stresses are permitted to be increased by one-third.

Reason: The IBC provides load combinations in Chapter 16 therefore there is no need to delete section 2.1.2.1 of TMS 402/ACI 530/ASCE 5. This code provision causes confusion for designers and is not necessary.

The additional language directs the code user to the allowable stress design load combinations in Chapter 16 and clarifies the permissible one-third increase in allowable stresses when using the alternative load combinations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: YOUNG-S1-2107.1

S177–09/10
2107.3, 2107.3.1 (New)

Proponent: Edwin Huston, National Council of Structural Engineers Associations- Code Advisory Committee - General Requirements Subcommittee

Revise as follows:

2107.3 TMS 402/ACI 530/ASCE 5, Section 2.1.9.7.1.1, lap splices. ~~Modify~~ In lieu of Section 2.1.9.7.1.1, it shall be permitted to design lap splices in accordance with Section 2107.3.1 ~~as follows~~:

~~2.1.9.7.1.1~~ 2107.3.1 Lap splices, The minimum length of lap splices for reinforcing bars in tension or compression, l_d, shall be

$l_d = 0.002 d_b f_s$ **(Equation 21-1)**

For SI: $l_d = 0.29 d_b f_s$

but not less than 12 inches (305 mm). In no case shall the length of the lapped splice be less than 40 bar diameters.

where:

d_b = Diameter of reinforcement, inches (mm).

f_s = Computed stress in reinforcement due to design loads, psi (MPa).

In regions of moment where the design tensile stresses in the reinforcement are greater than 80 percent of the allowable steel tension stress, F_s, the lap length of splices shall be increased not less than 50 percent of the minimum required length. Other equivalent means of stress transfer to accomplish the same 50 percent increase shall be permitted. Where epoxy coated bars are used, lap length shall be increased by 50 percent.

Reason: The masonry industry testing of lap splices has progressed. Some testing is still on-going. In the meantime, engineers in some portions of the country would prefer to use the provisions of the TMS 402 document. This code change proposal removes the complete prohibition of section 2.9.1.7.1.1, and replaces it with two alternative design approaches. This dual path is already used in other portions of the IBC.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HUSTON-S4-2107.3

S178–09/10
2108.3

Proponent: Matthew Senecal, PE, representing American Concrete Institute

Revise as follows:

2108.3 TMS 402/ACI 530/ASCE 5, Section 3.3.3.4, splices. Modify items (b) and (c) of Section 3.3.3.4 as follows:

3.3.3.4 (b). A welded splice shall have the bars butted and welded to develop at least 125 percent of the yield strength, f_y, of the bar in tension or compression, as required. Welded splices shall be of ASTM A 706 steel reinforcement. Welded splices shall not be permitted in plastic hinge zones of intermediate or special reinforced walls or special moment frames of masonry.

3.3.3.4 (c). Mechanical splices shall be classified as Type 1 or 2 according to ~~Section 21.2.6.1~~ in accordance with the requirements for mechanical splices in special moment frames and special structural walls of ACI 318. Type 1 mechanical splices shall not be used within a plastic hinge zone or within a beam-column joint of intermediate or special reinforced masonry shear walls or special moment frames. Type 2 mechanical splices are permitted in any location within a member.

Reason: ACI is in the process of completely reorganizing ACI 318, *Building Code Requirements for Structural Concrete*. This process was formally initiated in the spring of 2008 and was scheduled to be completed by January 1, 2014 so that it would be available for reference by the 2015 IBC. This 2015 IBC schedule was assumed to be the same as traditional ICC meeting schedules.

The reorganized ACI 318 will be significantly different in structure than 318-08. The code will include several new chapters that are based on member design. The 318-08 chapters will be significantly reworked to support the member chapters. Some provisions have been divided sometimes into several chapters and at other provisions combined.

The new schedules released in February 2009 by the ICC require that reorganized ACI 318 be completed by January 3, 2012 for changes to the IBC (Group A) that require textual changes to the body of the IBC. ACI committee 318 will likely not be done with the revisions by that time and thus not have a revised standard to submit for the 2015 IBC if it remains in Group A. ICC's CP 28-05 states that, if no textual changes are required and that the change to the code is in reference only, the revision may be considered by the administrative code committee prior to the Final Action Hearing in Group B.

In this code change proposal, ACI proposes to remove all references to specific sections in ACI 318 from the IBC, but not change the technical intent of any provision. This removal would allow ACI to submit an administrative change in Group B and give ACI Committee 318 one more year to complete their task of reorganization.

In some cases, the referenced section numbers that are removed are replaced with language from ACI 318 (usually the section heading) that will allow the user to easily locate the appropriate section. In some cases, the referenced information in ACI 318 is transcribed into the IBC. The use of words in place of section numbers may require some editorial revisions in the 2012/2013 ICC cycle, if the headings are changed through the reorganization.

The following explanations are given to for the revised Sections stated above:

2108.3	Replaced the referenced section with language that would identify the source information in ACI 318. Note that the ACI 318 reference section number is not correct since it should be Section 21.1.6.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SENECAL-S7-2108.3

S179–09/10
2109.1.1, 2308.2, 2308.2.1

Proponent: T. Eric Stafford, PE, representing Institute for Business and Home Safety

Revise as follows:

2109.1.1 Limitations. The use of empirical design of masonry shall be limited as noted in Section 5.1.2 of TMS 402/ACI 530/ASCE 5. Section 5.1.2.2 of TMS 402/ACI 530/ASCE 5 shall be modified as follows:

5.1.2.2 *Wind* – Empirical requirements shall not apply to the design or construction of masonry for buildings, parts of buildings, or other structures to be located in areas where the basic wind speed exceeds 130 mph (58 m/s) as given in ASCE 7.

The use of dry-stacked, surface-bonded masonry shall be prohibited in *Occupancy Category* IV structures. In buildings that exceed one or more of the limitations of Section 5.1.2 of TMS 402/ACI 530/ASCE 5, masonry shall be designed in accordance with the engineered design provisions of Section 2101.2.1, 2101.2.2 or 2101.2.3 or the foundation wall provisions of Section 1807.1.5.

2308.2 Limitations. Buildings are permitted to be constructed in accordance with the provisions of *conventional light-frame construction*, subject to the following limitations, and to further limitations of Sections 2308.11 and 2308.12.

1. Buildings shall be limited to a maximum of three *stories above grade plane*. For the purposes of this section, for buildings in *Seismic Design Category* D or E as determined in Section 1613, cripple stud walls shall be considered to be a *story*.

   Exception: Solid blocked cripplewalls not exceeding 14 inches (356 mm)in height need not be considered a *story*.

2. Maximum floor-to-floor height shall not exceed 11 feet, 7 inches (3531 mm). Bearing wall height shall not exceed a stud height of 10 feet (3048 mm).
3. Loads as determined in Chapter 16 shall not exceed the following:
   3.1. Average dead loads shall not exceed 15 psf (718 N/m2) for combined roof and ceiling, exterior walls, floors and partitions.

   Exceptions:

   1. Subject to the limitations of Sections 2308.11.2 and 2308.12.2, stone or masonry veneer up to the lesser of 5 inches (127 mm) thick or 50 psf (2395 N/m2) and installed in accordance with Chapter 14 is permitted to a height of 30 feet (9144 mm) above a noncombustible foundation, with an additional 8 feet (2438 mm) permitted for gable ends.
   2. Concrete or masonry fireplaces, heaters and chimneys shall be permitted in accordance with the provisions of this code.

   3.2. Live loads shall not exceed 40 psf (1916 N/m2) for floors.
   3.3. Ground snow loads shall not exceed 50 psf (2395 N/m2).

4. Wind speeds shall not exceed 130 ~~100~~ miles per hour (mph) (~~44~~ 58 m/s) (3-second gust).

   Exception: Wind speeds shall not exceed 140 ~~110~~ mph (~~48.4~~ 63 m/s) (3-second gust) for buildings in Exposure Category B that are not located in a *hurricane-prone region*.

5. Roof trusses and rafters shall not span more than 40 feet (12 192 mm) between points of vertical support.
6. The use of the provisions for *conventional light-frame construction* in this section shall not be permitted for *Occupancy Category* IV buildings assigned to *Seismic Design Category* B, C, D, E or F, as determined in Section 1613.
7. *Conventional light-frame construction* is limited in irregular structures in *Seismic Design Category* D or E, as specified in Section 2308.12.6.

2308.2.1 Basic wind speed greater than ~~100~~ 130 mph (3-second gust). Where the basic wind speed exceeds 130 ~~100~~ mph (58 m/s) (3-second gust), the provisions of either AF&PAWFCM, or the ICC 600 are permitted to be used. Wind speeds in Figure 1609A, 1609B, and 1609C shall be converted in accordance with Section 1609.3.1 for use with AF&PAWFCM or ICC 600.

Reason: The purpose of this code change is to correlate the prescriptive limits for empirical design of masonry and conventional wood frame construction with other proposals that are updating the wind speed maps in the IBC and the IRC. The wind speed maps in ASCE 7 are being updated to ultimate wind speeds as opposed to the ASD level wind speed maps that currently exist in ASCE 7 and in the IBC and IRC. See IBC code change for information on why the wind speed maps are being updated. While a way to convert the ultimate wind speeds to ASD level wind speeds is proposed in the IBC, the converted wind speeds do not match, from a geographic standpoint, the limitations the code previously imposed. Since the empirical provisions and conventional methods for wood frame construction, typically can't be calculated to equate to the lower level wind speeds at the current limit, including the fact that these provisions are missing some of the key wind resistant construction design methods (e.g. gable end wall bracing, bond beam reinforcement, vertical wall reinforcement, etc.), the proposed limitations will roughly, maintain the current limitations on empirical and conventional methods that currently exist in terms of geographic location on the wind speed map. While some areas of the country will see a reduction in areas where empirical design of masonry or conventional construction would be allowed, other areas will see in increase in areas where these methods would be allowed.

Cost Impact: The code change proposal will increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Stafford-S1-2109

S180–09/10
2113.1

Proponent: Jim Buckley, Buckley Rumford Co., representing the Masonry Alliance for Codes and Standards (MACS) & Clay Flue Lining Institute (CFLI)

Revise as follows:

2113.1 Definition. A masonry chimney is a chimney constructed of ~~concrete or masonry~~ solid masonry units, hollow masonry units grouted solid, stone or concrete, hereinafter referred to as "masonry." Masonry chimneys shall be constructed, anchored, supported and reinforced as required in this chapter.

Reason: To make language same as for fireplaces and smoke chambers and to be consistent with IRC Section R1003.1 and definitions in Chapters 3 and 4.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BUCKLEY-S1-2113.1

S181–09/10
2113.20

Proponent: Jim Buckley, Buckley Rumford Co., representing the Masonry Alliance for Codes and Standards (MACS) & Clay Flue Lining Institute (CFLI)

Revise as follows:

2113.20 Chimney fireblocking. All spaces between chimneys and floors and ceilings through which chimneys pass shall be fireblocked with noncombustible material securely fastened in place. The fireblocking of spaces between wood joists, beams or headers shall be ~~to a depth of 1 inch (25 mm) and shall only~~ self-supporting or be placed on strips of metal or metal lath laid across the spaces between combustible material and the chimney.

Reason: To be consistent with IRC Section R1003.19.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BUCKLEY-S4-2113.20

S182-09/10

2113.9.1 (New), 2113.9.3 (New); IRC R1003.9.1 (New), R1003.9.3 (New)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Jim Buckley, Buckley Rumford Co., representing the Masonry Alliance for Codes and Standards (MACS) & Clay Flue Lining Institute (CFLI)

PART I – IBC STRUCTURAL

Add new text as follows:

2113.9.1 Chimney caps. Masonry chimneys shall have a concrete, metal or stone cap, sloped to shed water, a drip edge and a caulked bond break around any flue liners in accordance with ASTM C 1283.

~~**2113.9.1**~~ **2113.9.2 Spark arrestors.**

(No change to current text)

2113.9.3 Rain caps. Where a masonry or metal rain cap is installed on a masonry chimney, the net free area under the cap shall not be less than four times the net free area of the outlet of the chimney flue it serves.

PART II – IRC BUILDING/ENERGY

Add new text as follows:

R1003.9.1 Chimney caps. Masonry chimneys shall have a concrete, metal or stone cap, sloped to shed water, a drip edge and a caulked bond break around any flue liners in accordance with ASTM C 1283.

~~**R1003.9.1**~~ **R1003.9.2 Spark arrestors.** *(No change to current text)*

R1003.9.3 Rain caps. Where a masonry or metal rain cap is installed on a masonry chimney, the net free area under the cap shall not be less than four times the net free area of the outlet of the chimney flue it serves.

Reason: New language to include provision for commonly used chimney caps and rain caps. This language will reference and be consistent with ASTM C1283 and C315.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BUCKLEY-S2-2113.9

S183–09/10
2113.12

Proponent: Jim Buckley, Buckley Rumford Co., representing the Masonry Alliance for Codes and Standards (MACS) & Clay Flue Lining Institute (CFLI)

Revise as follows:

2113.12 Clay flue lining (installation). Clay flue liners shall be installed in accordance with ASTM C 1283 and extend from a point not less than 8 inches (203 mm) below the lowest inlet or, in the case of fireplaces, from the top of the smoke chamber to a point above the enclosing walls. The lining shall be carried up vertically, with a maximum slope no greater than 30 degrees (0.52 rad) from the vertical.

Clay flue liners shall be laid in medium-duty non-water soluble refractory mortar conforming to ASTM C 199 with tight mortar joints left smooth on the inside and installed to maintain an air space or insulation not to exceed the thickness of the flue liner separating the flue liners from the interior face of the chimney masonry walls. Flue lining shall be supported on all sides. Only enough mortar shall be placed to make the joint and hold the liners in position.

Reason: To require non-water soluble refractory mortar which won't wash out of the joints in chimneys which are exposed to weather. Also to be consistent with IRC Section R1003.12

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BUCKLEY-S3-2113.12

S184–09/10
2204.2.1

Proponent: Bonnie Manley, representing American Iron and Steel Institute

Revise as follows:

2204.2.1 Anchor rods. Anchor rods shall be set in accordance with the *construction documents*~~accurately to the pattern and dimensions called for on the plans~~. The protrusion of the threaded ends through the connected material shall ~~be sufficient to fully~~ engage the threads of the nuts, but shall not be greater than the length of the threads on the bolts.

Reason: The modifications to this section are intended to be editorial in nature. In the first sentence, the defined term “construction documents” replaces the undefined term “plans”. In the second sentence, vague language is eliminated.

Cost Impact: There is no anticipated impact on the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Manley-S2-2204.2.1

S185–09/10
2206.5 (New)

Proponent: Edwin Huston, representing National Council of Structural Engineers Associations- Code Advisory Committee - General Requirements Subcommittee

Add new text as follows:

2206.5 Steel joist incidental loads. In addition to the loads required by Table 1607.1 and the loads required in Section 2206.2, steel joists shall be designed for an additional incidental load of 400 pounds (1.779 kN), of which one single concentrated load of up to 300 pounds (1.335 kN) shall be placed between any two top chord panel points and a single concentrated load of up to 100 pounds (0.445 kN) shall be placed between any two bottom chord panel points.

(Renumber subsequent sections)

Reason: Many, if not most, steel joist roof structures which are currently in service have miscellaneous incidental loads suspended from the joist's top or bottom chords. Some joist manufactures have an allowance for such loads, others do not. There are manufacturers of hardware specifically designed to allow for the suspension of such loads. This code change proposal is intended to provide an allowance for such incidental loads

Cost Impact: This code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: HUSTON-S3-2206.5

S186–09/10
2208.1

Proponent: Bonnie Manley, representing American Iron and Steel Institute

Revise as follows:

2208.1 Storage racks. The design, testing and utilization of industrial steel storage racks made of cold-formed or hot-rolled steel structural members, shall be in accordance with RMI/ANSI MH 16.1. Where required by ASCE 7, the seismic design of storage racks shall be in accordance with the additional provisions of Section 15.5.3 of ASCE 7~~, except that items (1), (2)and (3) of Section 15.5.3 of ASCE 7 do not apply when the rack design satisfies RMI/ANSI MH 16.1~~.

Reason: The exception recommended for deletion was inserted last cycle in Proposal S205-07/08 in order to coordinate the 2008 edition of RMI's ANSI/MH 16.1, *Specification for Design, Testing and Utilization of Industrial Steel Storage Racks,* with ASCE 7-05, which had originally adopted the 2002 edition of the RMI standard. The 2010 edition of ASCE 7 adopts and modifies the 2008 edition of ANSI/MH16.1. Consequently, the list of exceptions is no longer needed. Also, the word "additional" is added to emphasize that, for seismic design, steel storage racks must also be designed in accordance with the modifications contained in ASCE 7, Section 15.5.3.

Cost Impact: There is no anticipated impact on the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Manley-S4-2208.1

S187–09/10
2208.1, Chapter 35

Proponent: Bonnie Manley, American Iron and Steel Institute representing Rack Manufacturers Institute

1. Revise as follows:

2208.1 Storage racks. The design, testing and utilization of industrial steel storage racks made of cold-formed or hot-rolled steel structural members, shall be in accordance with the RMI/ANSI MH 16.1. Where required by ASCE 7, the seismic design of storage racks shall be in accordance with the additional provisions of Section 15.5.3 of ASCE 7~~,~~ except that items ~~(1),~~ (2) and (3) of Section 15.5.3 of ASCE 7 do not apply when the rack design satisfies RMI/ANSI MH 16.1.

2. Revise Chapter 35 standard as follows:

RMI
ANSI/MH 16.1-~~08~~ 11 Specification for Design, Testing and Utilization of Industrial Steel Storage Rack, 2011

Reason: This proposal updates the edition year of RMI's ANSI/MH 16.1, *Specification for Design, Testing and Utilization of Industrial Steel Storage Racks,* from 2008 to 2011. The document is expected to be completed in early 2010. The modification to the last sentence of Section 2208.1 coordinates the 2011 edition of the RMI standard with ASCE 7-10, which adopts the 2008 edition of the RMI standard. Also, the word "additional" is added to emphasize that, for seismic design, steel storage racks must also be designed in accordance with the applicable modifications contained in ASCE 7, Section 15.5.3.
Cost Impact: There is no anticipated impact on the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Manley-S5-2208.1

S188–09/10
1604.3.3, 2209.2.1

Proponent: Edwin Huston, representing National Council of Structural Engineers Associations- Code Advisory Committee - General Requirements Subcommittee

1. Delete without substitution:

~~**2209.2.1 Composite slabs on steel decks.** Composite slabs of concrete and steel deck shall be designed and constructed in accordance with ASCE 3.~~

(Renumber subsequent sections)

2. Revise as follows:

1604.3.3 Steel. The deflection of steel structural members shall not exceed that permitted by AISC 360, AISI S100, ~~ASCE 3,~~ ASCE 8, SJI CJ-1.0, SJI JG-1.1, SJI K-1.1 or SJI LH/DLH-1.1, as applicable.

Reason: The referenced standard will be 21 years old by the time the 2012 IBC is available for use. We found no evidence of recent updates. We understand that the standard development organization, ASCE/SEI is beginning the process to update the standard. Until it is updated, it should be removed as a reference standard.

Cost Impact: This code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HUSTON-S8-2209.2

S189–09/10
2209.1 through 2209.1.1.3, 2209.2 through 2209.3.6 (New)

Proponent: Bonnie Manley, American Iron and Steel Institute representing American Iron and Steel Institute

1. Revise as follows:

2209.1 General. The design of cold-formed carbon and low-alloy steel structural members shall be in accordance with AISI S100. The design of cold-formed stainless-steel structural members shall be in accordance with ASCE 8. Cold-formed steel light-frame construction shall also comply with Section 2210. Where required, the seismic design of cold-formed steel structures shall be in accordance with the additional provisions of Section 2209.2.

~~**2209.2**~~ **2209.1.1 Steel decks.** The design and construction of cold-formed steel decks shall be in accordance with this section.

~~**2209.2.1**~~ **2209.1.1.1 Composite slabs on steel decks.** Composite slabs of concrete and steel deck shall be designed and constructed in accordance with ASCE 3.

~~**2209.2.2**~~ **2209.1.1.2 Noncomposite steel floor decks.** Noncomposite steel floor decks shall be permitted to be designed and constructed in accordance with ANSI/SDI-NC1.0, as modified in Section ~~2209.2.2.1~~ 2209.1.1.2.1.

~~**2209.2.2.1**~~ **2209.1.1.2.1 ANSI/SDI-NC1.0 Section 2.4B1.** Replace Section 2.4B1 of ANSI/SDI-NC1.0 with the following:

1. General: The design of the concrete slabs shall be done in accordance with the ACI *Building Code Requirements for Reinforced Concrete*. The minimum concrete thickness above the top of the deck shall be 11/2 inches (38 mm).

~~**2209.2.3**~~ **2209.1.1.3 Steel roof deck.** Steel roof decks shall be permitted to be designed and constructed in accordance with ANSI/SDI-RD1.0.

2. Add new text as follows:

2209.2 Seismic requirements for cold-formed steel structures. Where a response modification coefficient, R, in accordance with ASCE 7, Table 12.2-1 is used for the design of cold-formed steel structures, the structures shall be designed and detailed in accordance with the requirements of AISI S100, ASCE 8, or AISI S110 as modified in Section 2209.3.

2209.3 Modifications to AISI S110. The text of AISI S110 shall be modified as indicated in Sections 2209.3.1 through 2209.3.6.

2209.3.1 AISI S110, Section D1. Modify AISI S110, Section D1 to read as follows:

D1 Cold-Formed Steel Special Bolted Moment Frames (CFS-SBMF). Cold-formed steel–special bolted moment frames (CFS-SBMF) systems shall withstand significant inelastic deformations through friction and bearing at their bolted connections. Beams, columns, and connections shall satisfy the requirements in this section. CFS-SBMF systems shall be limited to one-story structures, no greater than 35 feet in height, without column splices and satisfying the requirements in this section. The CFS-SBMF shall engage all columns supporting the roof or floor above. The single size beam and single size column with the same bolted moment connection detail shall be used for each frame. The frame is to be supported on a level floor or foundation.

2209.3.2 AISI S110, Section D1.1.1. Modify AISI S110, Section D1.1.1 to read as follows:

D1.1.1 Connection Limitations. Beam-to-column connections .in CFS-SBMF systems shall be bolted connections with snug-tight high-strength bolts. The bolt spacing and edge distance shall be in accordance with the limits of AISI S100, Section E3. The 8-bolt configuration shown in Table D1-1 shall be used. The faying surfaces of the beam and column in the bolted moment connection region shall be free of lubricants or debris.

2209.3.3 AISI S110, Section D1.2.1. Modify AISI S110, Section D1.2.1 to read as follows:

D1.2.1 Beam Limitations. In addition to the requirements of Section D1.2.3, beams in CFS-SBMF systems shall be ASTM A 653 galvanized 55 ksi (374 MPa) yield stress cold-formed steel C-sections members with lips, and designed in accordance with Chapter C of AISI S100. The beams shall have a minimum design thickness of 0.105 inches (2.67 mm). The beam depth shall be not less than 12 in (305 mm) or greater than 20 in (508 mm). The flat depth-to-thickness ratio of the web shall not exceed $6.18\sqrt{E/F_y}$.

2209.3.4 AISI S110, Section D1.2.2. Modify AISI S110, Section D1.2.2 to read as follows:

D1.2.2 Column Limitations. In addition to the requirements of D1.2.3, columns in CFS-SBMF systems shall be ASTM A 500 Grade B cold-formed steel hollow structural section (HSS) members painted with a standard industrial finished surface, and designed in accordance with Chapter C of AISI S100. The column depth shall be not less than 8 in (203 mm) or greater than 12 in (305 mm). The flat depth-to-thickness ratio shall not exceed $1.40\sqrt{E/F_y}$.

2209.3.5 AISI S110, Section D1.3. Modify AISI S110, Section D1.3 to read as follows:

D1.3 Design Story Drift. Where the applicable building code does not contain design coefficients for CSF-SBMF systems, the provisions of Appendix 1 shall apply. For structures having a period less than T_S, as defined in the applicable building code, alternate methods of computing Δ shall be permitted, provided such alternate methods are acceptable to the authority having jurisdiction.

2209.3.6 AISI S110, Section D1.5. Add a new Section D1.5 to read as follows:

D1.5 Period Determination. The fundamental period of the structure, T, in the direction under consideration shall be established in accordance with the applicable building code using the structural properties and deformational characteristics of the resisting elements in a properly substantiated analysis. Use of the approximate building period, T_a, as an alternative fundamental period shall not be permitted.

3. Add standard to Chapter 35 as follows:

AISI

S110-07 Standard for Seismic Design Of Cold-Formed Steel Structural Systems – Special Bolted Moment Frames.

Reason: This proposal introduces a reference to the first edition of AISI S110, *Standard For Seismic Design Of Cold-Formed Steel Structural Systems – Special Bolted Moment Frames*, which is based upon research conducted by Drs. Uang and Sato at UCSD (2007). Specifically, the standard focuses on providing design provisions for a newly defined seismic force resisting system entitled "Cold-formed Steel – Special Bolted Moment Frame" or CFS-SBMFs. This type of system is expected to experience substantial inelastic deformation during significant seismic events. It is intended that most of the inelastic deformation will take place at the bolted connections, due to slip and bearing. In order to develop the designated mechanism, requirements based on the capacity design principles are provided for the design of the beams, columns and associated connections. Additionally, AISI S110 has specific requirements for the application of quality assurance and quality control procedures.

This system has been vetted through the BSSC process (Proposal 6-4R) and will be included in Part I of the 2009 NEHRP Provisions. Additionally, it has been introduced for consideration in the 2010 edition of ASCE 7 (Proposal TC-6-CH12-102-R3). As a first pass, Appendix 1 of AISI S110 makes recommendations on the seismic design coefficients of the CFS-SBMF system. These parameters have been introduced for consideration in the ASCE 7-10 proposal. The Response Modification Coefficient, R, is set at 3.5. Cyclic testing has shown that CFS-SBMFs have very large ductility capacity and significant hardening. This justifies the use of a value of 3.5 for the R-factor. The derivation of the deflection amplification factor, C_d, can be found in the AISI S110 Commentary, Section D1.3. Furthermore, a capacity design procedure has been provided in Section D1.5 of AISI S110 Commentary so that the designer can explicitly calculate the seismic load effect with overstrength, E_{mh},. at the design story drift level. Alternatively, a conservative system overstrength factor, , is also provided to be compatible with the conventional approach to compute E_{mh} in ASCE 7. Finally the height limitation of 35 feet for all SDCs is based on practical use only and not from any limits on the CFS-SBMF system strength.

Modifications to AISI S110 (2007 edition) were developed primarily in the BSSC's NEHRP process and adopted by ASCE 7 in Chapter 14. Since ASCE 7, Chapter 14 is not adopted in the IBC, these modifications need to be included within this proposal. The reasons for the modifications are as follows:

In Section 2209.3.1, the language was modified to reflect that CFS-SBMF needs to use the same-size beams and same-size columns throughout. In addition, the system needs to engage all primary columns, which support the roof or floor above, and those columns need to be supported on a level floor or foundation.

In Section 2209.3.2, the modifications were made for consistency with the test database.

In Section 2209.3.3, the modifications were made to be consistent with the test database (Uang and Sato, 2007), and limitations on the beam depth, steel grade, and surface treatment are added in Section D1.2.1 of AISI S110.

In Section 2209.3.4 the language was modified to be consistent with the test database (Uang and Sato, 2007), and limitations on column depth, steel grade, and surface treatment are added in Section D1.2.2 of AISI S110. The width-thickness ratio was reduced based upon further review of the test specimens.

In Section 2209.3.5, AISI S110 is intended primarily for industrial platforms; however, the standard is not limited to these non-building structures and does not prohibit architectural attachments (such as partition walls). As approved by the BSSC PUC, Proposal 6-4R reduced the 0.05*h* drift limit in Section D1.3 of AISI S110 to 0.03*h* in order to more closely align with the 0.025*h* drift limit of ASCE 7. Also, the BSSC PUC inserted the sentence, "In no case shall the design story drift exceed 0.05h." to ensure an absolute upper bound on the drift limit. However, the ASCE 7 Seismic Subcommittee did not agree with the BSSC PUC and, instead, requested that ASCE 7, Section 12.12 not be overwritten by AISI S110. Therefore, the 0.05*h* drift limit in Section D1.3 of AISI S110 has been eliminated in deference to the design story drift limits found in ASCE 7, Section 12.12. In addition, the first sentence of the AISI S110, Section D1.3 was deleted because it was considered commentary.

Two additional modifications are presented in this proposal which are not being considered for inclusion in ASCE 7-10, Chapter 14, but were deemed important enough to be included in the IBC. These two items resulted from discussions with SEAOC. First in Section 2209.3.3, a minimum thickness for the beams was added to reflect the test database. Secondly, Section 2209.3.6 clarifies that the approximate fundamental period, T_a, in accordance with ASCE 7 Section 12.8.2.1, should not be used in the design of CFS-SBMF systems. Instead, the fundamental period of the structure, T, needs to be based upon the structural properties and deformational characteristics of the resisting elements. The approximate fundamental period in ASCE 7, Section 12.8.1 simply does not predict the period as accurately as needed for the variety of uses of this framing system.

Cost Impact: There is no anticipated impact on the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, AISI S110-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Manley-S3-2209

S190–09/10
2209.2.1

Proponent: Roy H. Reiterman, PE, representing Wire Reinforcement Institute, Inc, Technical Consultant for WRI

Revise as follows:

2209.2.1 Composite slabs on steel decks. Composite slabs of concrete and steel deck shall be designed and constructed in accordance with ASCE 3 and ACI 318.

Reason: To eliminate confusion on whether steel reinforcement is required for the above elevated slab section. We are proposing the above add/change for the next 2012 Code edition and succeeding IBC Code sections. Section 2209.2.2 is all right as it appears in the current IBC Code and as it references 2209.2.2.1

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RETIERMAN-S1-2209

S191–09/10
2209.2.1, 2209.2.1.1 (New) Chapter 35

Proponent: Thomas Sputo, Ph.D., PE, SE, Steel Deck Institute, representing Steel Deck Institute

1. Revise as follows:

2209.2.1 Composite slabs on steel decks. Composite slabs of concrete and steel deck shall be permitted to be designed and constructed in accordance with ~~ASCE 3~~ ANSI/SDI-C1.0, as modified in Section 2209.2.1.1.

2. Add new text as follows:

2209.2.1.1 ANSI/SDI-C1.0 Section 2.4B6a. Replace Section 2.4B6a of ANSI/SDI-C1.0 with the following:

a. Temperature and shrinkage reinforcement, consisting of welded wire fabric or reinforcing bars, shall have a minimum area of 0.00075 times the area of the concrete above the deck (per foot or meter of width), but shall not be less than the area provided by 6 x 6 – W1.4 x W1.4 welded wire fabric.

3. Add standard to Chapter 35 as follows:

SDI
C1.0-06 Standard for Composite Steel Floor Deck

Reason: ASCE 3-91 is proposed for deletion because it does not meet the criteria set forth in CP#28-05, revised 2/27/09 for referenced standards. Section 3.6.3.2 requires a reference standard to be maintained. This standard has not been reaffirmed since its approval by ANSI in 1992. The ASCE committee responsible for this standard has been inactive since approximately 1997 and has taken no action on this standard since then. "ASCE Rules for Standards Committees" (2006) require standards to be reaffirmed at intervals not to exceed 5 years (Section 5.8). Additionally, this standard is out-of-print and is therefore not readily available to code officials, designers, or users of the code.

ANSI/SDI C1.0 is proposed for inclusion because it is the current standard for the design of composite steel deck. This standard is readily available to code officials, designers, and other users of the code, both in print form and as a free download from the Steel Deck Institute website. Section 2.4B6a is modified to delete the option for the use of fibers because of lack of complete consensus among all interested parties on proper specification of fibers for the purpose of control of shrinkage and temperature fluctuation effects in concrete on composite steel deck.

Section 2.4B6a – Text as it appears in SDI-C1.0:

a. Temperature and shrinkage reinforcement, consisting of welded wire fabric or reinforcing bars, shall have a minimum area of 0.00075 times the area of the concrete above the deck (per foot or meter of width), but shall not be less than the area provided by 6 x 6 – W1.4 x W1.4 welded wire fabric.

Fibers shall be permitted as a suitable alternative to the welded wire fabric specified for temperature and shrinkage reinforcement. Cold-drawn steel fibers meeting the criteria of ASTM A820, at a minimum addition rate of 25 lb/cu yd (14.8 kg/cu meter), or macro synthetic fibers "Coarse fibers" (per ASTM Subcommittee C09.42), made from virgin polyolefin, shall have an equivalent diameter between 0.4 mm (0.016 in.) and 1.25 mm (0.05 in.), having a minimum aspect ratio (length/equivalent diameter) of 50, at a minimum addition rate of 4 lb./cu yd (2.4 kg/m^3) are suitable to be used as minimum temperature and shrinkage reinforcement.

Cost Impact: The code change proposal will not increase the cost of construction

Analysis: A review of the standard(s) proposed for inclusion in the code, SDI C1.0-06, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Sputo-S1-2209.2.1

S192–09/10
2209.2.1, 2209.2.1.1 (New) Chapter 35

Proponent: Thomas Sputo, Ph.D., PE, SE, Steel Deck Institute, representing Steel Deck Institute

1. Revise as follows:

2209.2.1 Composite slabs on steel decks. Composite slabs of concrete and steel deck shall be permitted to be designed and constructed in accordance with ~~ASCE 3~~ ANSI/SDI-C1.0 as modified in Section 2209.2.1.1.

2209.2.1.1 ANSI/SDI-C1.0 Section 2.4B7a. Replace Section 2.4B7a of ANSI/SDI-C1.0 with the following:

a. Temperature and shrinkage effects in the concrete shall be controlled by one of the following alternatives:

1. Welded wire reinforcement or reinforcing bars with a minimum area of 0.00075 times the area of the concrete above the deck (per foot or meter of width), but not be less than the area provided by 6 x 6 – W1.4 x W1.4 (152 x 152 – MW9 x MW9) welded wire reinforcement. Reinforcing shall be properly supported and shall not rest in contact with the steel deck.

2. Add standard to Chapter 35 as follows:

SDI
C1.0-10 Standard for Composite Steel Floor Deck

Reason: ASCE 3-91 is proposed for deletion because it does not meet the criteria set forth in CP#28-05, revised 2/27/09 for referenced standards. Section 3.6.3.2 requires a reference standard to be maintained. This standard has not been reaffirmed since its approval by ANSI in 1992. The ASCE committee responsible for this standard has been inactive since approximately 1997 and has taken no action on this standard since then. "ASCE Rules for Standards Committees" (2006) require standards to be reaffirmed at intervals not to exceed 5 years (Section 5.8). Additionally, this standard is out-of-print and is therefore not readily available to code officials, designers, or users of the code.

ANSI/SDI C-2010 (currently under development as an update to ANSI/SDI C1.0) is proposed for inclusion because it is the current standard for the design of composite steel deck. This standard, once completed, will be readily available to code officials, designers, and other users of the code, both in print form and as a free download from the Steel Deck Institute website. Section 2.4B7a is modified to delete the option for the use of fibers because of lack of complete consensus among all interested parties on proper specification of fibers for the purpose of control of shrinkage and temperature fluctuation effects in concrete on composite steel deck.

Section 2.4B7a – Text as it appears in SDI-C-2010:

a. Temperature and shrinkage effects in the concrete shall be controlled by one of the following alternatives:

1. Welded wire reinforcement or reinforcing bars with a minimum area of 0.00075 times the area of the concrete above the deck (per foot or meter of width), but not be less than the area provided by 6 x 6 – W1.4 x W1.4 (152 x 152 – MW9 x MW9) welded wire reinforcement. Reinforcing shall be properly supported and shall not rest in contact with the steel deck.

2. Concrete specified in accordance with ASTM C1116, Type I, containing steel fibers meeting the criteria of ASTM A820, Type I , Type II, or Type V, at a minimum addition rate of 25 lb/cu yd (14.8 kg/cu meter)

3. Concrete specified in accordance with ASTM C1116, Type III, containing macrosynthetic fibers made from virgin polyolefin, having an equivalent diameter between 0.012 inches (0.3 mm) and 0.050 inches (1.25 mm), and having a minimum aspect ratio (length/equivalent diameter) of 50, at a minimum addition rate of 4 lb./cu yd (2.4 kg/m3).

Cost Impact: The code change proposal will not increase the cost of construction

Analysis: A review of the standard(s) proposed for inclusion in the code, SDI C1.0-10, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Sputo-S2-2209.2.1-2

S193–09/10
2209.2.1

Proponent: Thomas Sputo, Ph.D., PE, SE, Steel Deck Institute

Delete without substitution:

~~**2209.2.1 Composite slabs on steel decks.** Composite slabs of concrete and steel deck shall be designed and constructed in accordance with ASCE 3~~

(Renumber remaining sections)

Reason: This section is proposed for deletion because ASCE 3-91 does not meet the criteria set forth in CP#28-05, revised 2/27/09 for referenced standards. Section 3.6.3.2 requires a reference standard to be maintained. This standard has not been reaffirmed since its approval by ANSI in 1992. The ASCE committee responsible for this standard has been inactive since approximately 1997 and has taken no action on this standard since then. ASCE standards activities rules require standards to be reaffirmed at intervals not to exceed 5 years. Additionally, this standard is out-of-print and is therefore not readily available to code officials, designers, or users of the code.

In lieu of this section and a reference standard, a designer would rely on alternate methods as permitted by IBC 104.11.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Sputo-S3-2209.2.1-3

S194–09/10
2209.2.2, 2209.2.2.1

Proponent: Thomas Sputo, Ph.D., PE, SE, Steel Deck Institute

Revise as follows:

2209.2.2 Noncomposite steel floor decks. Noncomposite steel floor decks shall be permitted to be designed and constructed in accordance with ANSI/SDI-NC1.0, ~~as modified in Section 2209.2.2.1.~~

Delete without substitution:

~~**2209.2.2.1 ANSI/SDI-NC1.0 Section 2.4B1.** Replace Section 2.4B1 of ANSI/SDI-NC1.0 with the following:~~

~~1. General: The design of the concrete slabs shall be done in accordance with the ACI *Building Code Requirements for Reinforced Concrete*. The minimum concrete thickness above the top of the deck shall be 1 1/2 inches (38 mm).~~

Reason: 2209.2.2.1 deleted the last sentence of ANSI/SDI-NC1.0 which read "Randomly distributed fibers or fibrous admixtures shall not be substituted for welded wire fabric tensile reinforcement. This sentence does not contradict and is in compliance with requirements of ACI 318, as referenced earlier in Section 2.4B1 of ANSI/SDI-NC1.0. As such, the deleted sentence should not be deleted.
Section 2.4B1 – Text as it appears in SDI-NC1.0:

1. **General:** The design of the concrete slabs shall be done in accordance with the ACI *Building Code Requirements for Reinforced Concrete*. The minimum concrete thickness above the top of the deck shall be 1-1/2 inches (38 mm). Randomly distributed fibers or fibrous admixtures shall not be substituted for welded wire fabric tensile reinforcement.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Sputo-S4-2209.2.2

S195–09/10
202, 2302.1, 2304.11.2.3

Proponent: Philip Brazil, PE, SE, Reid Middleton, Inc., representing self

Revise as follows:

SECTION 202
DEFINITIONS

NATURALLY DURABLE WOOD. ~~See Section 2302.1~~ The heartwood of the following species except for the occasional piece with corner sapwood, provided 90 percent or more of the width of each side on which it occurs is heartwood.

Decay resistant. ~~See Section 2302.1~~ Redwood, cedar, black locust and black walnut

Termite resistant. ~~See Section 2302.1~~ Redwood, Alaska yellow cedar, Eastern red cedar and both heartwood and all sapwood of Western red cedar.

2302.1 Definitions. The following words and terms, shall, for the purposes of this chapter, have the meanings shown herein.

~~**NATURALLY DURABLE WOOD.** The heartwood of the following species with the exception that an occasional piece with corner sapwood is permitted if 90 percent or more of the width of each side on which it occurs is heartwood.~~

~~**Decay resistant.** Redwood, cedar, black locust and black walnut.~~

~~**Termite resistant.** Redwood, Alaska yellow cedar, Eastern red cedar and both heartwood and all sapwood of Western red cedar.~~

2304.11.2.3 Exterior walls below grade. Wood framing members and furring strips attached directly to the interior of exterior masonry or concrete walls below grade shall be of ~~approved~~ naturally durable or preservative-treated wood.

Reason: The placement of the definition of "naturally durable wood" in Section 2302.1 limits its applicability to Chapter 23 as specified in Section 2302.1. Naturally durable wood, however, is also specified in Sections 1507.8.5 and 1507.9.8 as well as Tables 1507.8, 1507.8.5, 1507.8.7, 1507.9.6 and 1507.9.8. Relocating the definition of "naturally durable wood" from Section 2302.1 to Section 202 will expand its applicability to account for all instances of the term in the IBC. The definition is also revised editorially so that the text is nonmandatory.

In Section 2304.11.2.3, "approved" before "naturally durable" is deleted due to redundancy. Since the term is defined, meeting the definition is seen as sufficient since procedures for approval by the building official are specified in Chapter 1. The deletion will also make Section 2304.11.2.3 consistent with all other instances of "naturally durable" in the IBC of which none are preceded by "approved." In addition to the sections and tables noted above, refer to Sections 2304.11.1 through 2304.11.2.2, 2304.11.2.4 through 2304.11.4, 2304.11.4.2, 2304.11.5 and 2304.11.6.

References to "naturally durable" and "naturally durable wood" are also found in the 2009 IRC, including a definition for "naturally durable wood" in Section R202. According to Section R201.1, the definitions in Section R202 are applicable throughout the IRC in the same manner as the definitions in IBC Section 202 are applicable throughout the IBC. Thus, the changes in this proposal for the IBC are not needed in the IRC and will make the IBC consistent with the IRC with respect to naturally durable wood.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brazil-S38-2302.1

S196–09/10
2302.1

Proponent: Edward L. Keith, PE, APA - The Engineered Wood Association

1. Revise as follows:

STRUCTURAL COMPOSITE LUMBER. Structural members manufactured using wood elements bonded together with exterior adhesives. Examples of structural composite lumber are:

Laminated veneer lumber (LVL). A composite of wood veneer elements with wood fibers primarily oriented along the length of the member. Veneer thickness shall not exceed 0.25 inches (6.4 mm).

Parallel strand lumber (PSL). A composite of wood strand elements with wood fibers primarily oriented along the length of the member. The least dimension of the strands shall not exceed 0.25 inches (6.4 mm) and the average length shall be a minimum of 300 times the least dimension.

Laminated strand lumber (LSL). A composite of wood strand elements with wood fibers primarily oriented along the length of the member. The least dimension of the strands shall not exceed 0.10 inches (2.54 mm) and the average length shall be a minimum of 150 times the least dimension.

Oriented strand lLumber (OSL). A composite of wood strand elements with wood fibers primarily oriented along the length of the member. The least dimension of the strands shall not exceed 0.10 inches (2.54 mm) and the average length shall be a minimum of 75 times the least dimension.

Reason: ASTM Standard D5456 recognizes 4 types of structural composite lumber. This proposal adds the two types missing from the existing definition and makes them consistent with ASTM D5456

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KEITH-S2-2302.1 Definitions

S197–09/10
2302.1

Proponent: Harvey B. Manbeck, PE, Manbeck Engineering, Inc., representing the National Frame Building Association

Add new definition as follows:

2302.1 Definitions. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

POST-FRAME BUILDING SYSTEM. A post-frame building system is characterized by primary structural frames of posts as columns and trusses or rafters as roof framing. The roof framing is attached to the posts, either directly or indirectly through structural headers. Posts are typically graded lumber, graded timbers, laminated lumber or fabricated of composite or hybrid material. Posts are embedded in the soil and supported on isolated footings, or are attached to the top of piers, concrete or masonry walls, slabs-on-grade, or other suitable foundations. Secondary framing members, purlins in the roof and girts in the walls, are attached to the primary framing members to provide lateral support and to transfer sheathing loads, both in-plane and out-of-plane, to the posts and roof framing. Structures are sheathed with a wide variety of materials, including metal and wood structural panels or other suitable materials.

Reason: Post-frame foundations, metal-clad, wood-framed diaphragm panels and design procedures, and mechanically laminated posts are referenced Section 2306.1 and Chapter 35 of the current edition of the IBC. However, nowhere are post-frame building systems defined in the IBC. This causes post-frame building systems to be confused with other wood framed building systems. Addition of the proposed definition would eliminate such confusion.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MANBECK-S1-2302

S198–09/10
2303.1.1, 2303.1.1.1 (New), 2303.1.1.2 (New)

Proponent: Sam Francis, American Forest & Paper Association

Revise as follows:

2303.1.1 Sawn lumber. Sawn lumber used for load-supporting purposes, including end-jointed or edge-glued lumber, machine stress-rated or machine-evaluated lumber, shall be identified by the grade *mark* of a lumber grading or inspection agency that has been approved by an accreditation body that complies with DOC PS 20 or equivalent. Grading practices and identification shall comply with rules published by an agency approved in accordance with the procedures of DOC PS 20 or equivalent procedures.

2303.1.1.1 Certificate of Inspection. In lieu of a grade mark on the material, a certificate of inspection as to species and grade issued by a lumber grading or inspection agency meeting the requirements of this section is permitted to be accepted for precut, remanufactured or rough-sawn lumber and for sizes larger than 3 inches (76 mm) nominal thickness.

2303.1.1.2 End-jointed lumber. Approved end-jointed lumber is permitted to be used interchangeably with solid-sawn members of the same species and grade. End-jointed lumber used in an assembly required elsewhere in this code to have a fire resistance rating shall have the designation “Heat Resistant Adhesive” or “HRA” included in its grade mark.

Reason: The American Lumber Standards Committee (ALSC) recently added elevated-temperature performance requirements for end-jointed lumber adhesives intended for use in fire resistance-rated assemblies. End-jointed lumber manufactured with adhesives which meet the new requirements is being designated as "Heat Resistant Adhesive" or "HRA" on the grade stamp. Heat Resistant Adhesives are required to be qualified in accordance with one of two new ASTM standards, *D7374-08 Practice for Evaluating Elevated Temperature Performance of Adhesives Used in End-Jointed Lumber* and *D7470-08 Practice for Evaluating Elevated Temperature Performance of End-Jointed Lumber Studs*. End-jointed lumber manufactured with a Heat Resistant Adhesive under an auditing program of an ALSC-accredited grading agency is allowed to carry the HRA mark on the grade-stamp. End-jointed lumber manufactured with an adhesive not qualified as a Heat Resistant Adhesive will be designated as "Non-Heat Resistant Adhesive" or "non-HRA" on the grade stamp. Lumber carrying the HRA mark is permitted to be used interchangeably with solid-sawn members of the same species and grade in fire-rated applications.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: FRANCIS-S2-2303.1.1.1

S199–09/10
2303.1.4, 2304.6.2, Table 2306.3, Chapter 35; IRC R604.1, Table R703.4, Chapter 44

Proponent: Edward L. Keith, PE, representing APA – the Engineered Wood Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

1. Revise as follows:

2303.1.4 Wood structural panels. Wood structural panels, when used structurally (including those used for siding, roof and wall sheathing, subflooring, diaphragms and built-up members), shall conform to the requirements for their type in DOC PS 1, DOC ~~or~~ PS 2 or ANSI/APA PRP 210. Each panel or member shall be identified for grade and glue type by the trademarks of an approved testing and grading agency. Wood structural panel components shall be designed and fabricated in accordance with the applicable standards listed in Section 2306.1 and identified by the trademarks of an *approved* testing and inspection agency indicating conformance with the applicable standard. In addition, wood structural panels when permanently exposed in outdoor applications shall be of exterior type, except that wood structural panel roof sheathing exposed to the outdoors on the underside is permitted to be interior type bonded with exterior glue, Exposure 1.

2304.6.2 Interior paneling. Softwood wood structural panels used for interior paneling shall conform to the provisions of Chapter 8 and shall be installed in accordance with Table 2304.9.1. Panels shall comply with DOC PS 1, DOC ~~or~~ PS 2 or ANSI/APA PRP 210. Prefinished hardboard paneling shall meet the requirements of CPA/ANSI A135.5. Hardwood plywood shall conform to HPVA HP-1.

TABLE 2306.3
ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL SHEAR WALLS WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHER PINE[a] FOR WIND OR SEISMIC LOADING[b, h, i, j, l]

PANEL GRADE	MINIMUM NOMINAL PANEL THICKNESS (inch)	MINIMUM FASTENER PENETRATION IN FRAMING (inches)	PANELS APPLIED DIRECT TO FRAMING					PANELS APPLIED OVER ½" or 5/8" GYPSUM SHEATHING				
			Nail (common or galvanized box) or staple size [k h]	Fastener spacing at panel edges (inches)				Nail (common or galvanized box) or staple size [k h]	Fastener spacing at panel edges (inches)			
				6	4	3	2 [e d]		6	4	3	2 [e d]
Sheathing, plywood siding [g] except Group 5 species, ANSI/ APA PRP 210 siding	5/16[c] or 1/4[c]	1 ¼	6d (2"x0.113" common, 2"x0.099" galvanized box)	180	270	350	450	8d (2 ½" x 0.131" common, 2 ½" x 0.113" galvanized box)	180	270	350	450
		1	1 ½ 16 Gage	145	220	295	375	2 16 Gage	110	165	220	285
	3/8	1 ¼	6d (2"x0.113" common, 2"x0.099" galvanized box)	200	300	390	510	8d (2 ½" x 0.131" common, 2 ½" x 0.113" galvanized box)	200	300	390	510
		1 3/8	8d (2 ½" x 0.131" common, 2 ½" x 0.113" galvanized box)	220[d]	320[d]	410[d]	530[d]	10d (3" x 0.148" common, 3" x 0.128" galvanized box)	260	380	490[f]	640
		1	1 ½ 16 Gage	140	210	280	360	2 16 Gage	140	210	280	360
	7/16	1 3/8	8d (2 ½" x 0.131" common, 2 ½" x 0.113" galvanized box)	240[d]	350[d]	450[d]	585[d]	10d (3" x 0.148" common, 3" x 0.128" galvanized box)	260	380	490[f]	640
		1	1 ½ 16 Gage	155	230	310	395	2 16 Gage	140	210	280	360
	15/32	1 3/8	8d (2 ½" x 0.131" common, 2 ½" x 0.113" galvanized box)	260	380	490	640	10d (3" x 0.148" common, 3" x 0.128" galvanized box)	260	380	490[f]	640
		1 ½	10d (3" x 0.148" common, 3" x 0.128" galvanized box)	310	460	600[f]	770	-	-	-	-	-
		1	1 ½ 16 Gage	170	255	335	430	2 16 Gage	140	210	280	360
	19/32	1 ½	10d (3" x 0.148" common, 3" x 0.128" galvanized box)	340	510	665[f]	870	-	-	-	-	-
		1	1 3/4 16 Gage	185	280	375	475	-	-	-	-	-
			Nail Size (galvanized casing)					Nail Size (galvanized casing)				
	5/16[c]	1 ¼	6d (2" x 0.099")	140	210	275	360	8d (2 ½" x 0.113")	140	210	275	360
	3/8[c]	1 3/8	8d (2 ½" x 0.113")	160	240	310	410	10d (3" x 0.128")	160	240	310[f]	410

(Remainder of table and footnotes unchanged)

2. Add new standard to Chapter 35 as follows:

APA
ANSI/APA PRP 210-08 Standard for Performance-Rated Engineered Wood Siding

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

R604.1 Identification and grade. Wood structural panels shall conform to DOC PS 1, ~~or~~ DOC PS 2 or ANSI/APA PRP 210; or, when manufactured in Canada, CSA 0437 or CSA 0325. All panels shall be identified by a grade mark or certificate of inspection issued by an approved agency.

2. Revise as follows:

TABLE R703.4
WEATHER–RESISTANT SIDING ATTACHMENT AND MINIMUM THICKNESS

				TYPE OF SUPPORTS FOR THE SIDING MATERIAL AND FASTENERS [b,c,d]					
SIDING MATERIAL	NOMINAL THICKNESS[a] (INCHES)	JOINT TREATMENT	WATER-RESISTIVE BARRIER REQUIRED	Wood or wood structural panel sheathing	Fiberboard sheathing into stud	Gypsum sheathing into stud	Foam plastic sheathing into stud	Direct to Studs	Number or spacing of fasteners
Wood structural panel[i], ANSI/APA PRP 210, siding[i] (exterior grade)	3/8 – 1/2	Note p	YES	0.099 NAIL–2"	0.113 NAIL–21/2"	0.113 NAIL–21/2"	0.113 nail[v]	0.099 NAIL–2"	6" PANEL EDGES, 12" INTER. SUP.

(Remainder of table and footnotes unchanged)

3. Add new standard to Chapter 44 as follows:

APA
ANSI/APA PRP 210-08 Standard for Performance-Rated Engineered Wood Siding

Reason:
PART I- This proposal recognized a new national consensus standard for wood structural panel siding products. Such products were formerly covered under several national standards such as APA PRP-108 and others. The industry developed this standard via the ANSI consensus process. Siding products manufactured to this standard have been developed specifically for wall covering/weather proofing applications, carry an Exterior exposure durability classification, and panels have equivalent shear performance on a thickness by thickness basis when nailed in accordance with Table 2306.3. Copies of this new ANSI standard have been provide to the committee and can be downloaded free of charge at the apawood.org website (Form number J350).
PART II- This proposal recognized a new national consensus standard for wood structural panel siding products. Such products were formerly covered under several industry standards such as APA PRP-108 and others. The industry developed this standard via the ANSI consensus process. Siding products manufactured to this standard have been developed specifically for wall covering/weather proofing applications and carry an Exterior exposure durability classification. Copies of this new ANSI standard have been provided to the committee and can be downloaded free of charge at the apawood.org website (Form number J350).

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ANSI/APA PRP 210-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KEITH-S1-2303.1.4

S200–09/10
2303.1.4; IRC R503.2.1, R503.2.1.1, R602.3, R803.2.1

Proponent: Edward L. Keith, PE, APA - The Engineered Wood Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC-STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

2303.1.4 Wood structural panels. Wood structural panels, when used structurally (including those used for siding, roof and wall sheathing, subflooring, diaphragms and built-up members), shall conform to the requirements for their type in DOC PS 1 or PS 2. Each panel or member shall be identified for grade, ~~and glue type~~ bond classification, and Performance Class by the trademarks of an *approved* testing and grading agency. The Performance Class value shall be used as the "nominal panel thickness" or "panel thickness" whenever referenced in this code. Wood structural panel components shall be designed and fabricated in accordance with the applicable standards listed in Section 2306.1 and identified by the trademarks of an *approved* testing and inspection agency indicating conformance with the applicable standard. In addition, wood structural panels when permanently exposed in outdoor applications shall be of ~~exterior~~ Exterior type, except that wood structural panel roof sheathing exposed to the outdoors on the underside is permitted to be ~~interior type bonded with exterior glue,~~ Exposure 1 type.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R503.2.1 Identification and grade. Wood structural panel sheathing used for structural purposes shall conform to DOC PS 1, DOC PS 2 or, when manufactured in Canada, CSA O437 or CSA O325. All panels shall be identified for grade, bond classification, and Performance Class by a grade mark of certificate or inspection issued by an approved agency. The Performance Class value shall be used as the "nominal panel thickness" or "panel thickness" whenever referenced in this code.

R503.2.1.1 Subfloor and combined subfloor underlayment. Where used as subflooring or combination subfloor underlayment, wood structural panels shall be of one of the grades specified in Table R503.2.1.1(1). When sanded plywood is used as combination subfloor underlayment, the grade, bond classification, and Performance Class shall be as specified in Table R503.2.1.1(2).

R602.3 Design and construction. Exterior walls of wood-frame construction shall be designed and constructed in accordance with the provisions of this chapter and Figures R602.3(1) and R602.3.(2) or in accordance with AF&PA's NDS. Components of exterior walls shall be fastened in accordance with Tables R602.3(1) through R602.3(4). Structural wall sheathing shall be fastened directly to structural framing members. Exterior wall coverings shall be capable of resisting the wind pressures listed in Table R301.2(2) adjusted for height and exposure using Table R301.2(3). Wood structural panel sheathing used for exterior walls shall conform to DOC PS 1, DOC PS 2 or, when manufactured in Canada, CSA O437 or CSA O325. All panels shall be identified for grade, bond classification, and Performance Class by a grade mark or certificate of inspection issued by an approved agency and shall conform to the requirements of Table R602.3(3).

R803.2.1 Identification and grade. Wood structural panels shall conform to DOC PS 1, DOC PS 2 or, when manufactured in Canada, CSA O437 or CSA O325, and shall be identified for grade, bond classification, and Performance Class by a grade mark or certificate of inspection issued by an approved agency. Wood structural panels shall comply with the grades specified in Table R503.2.1.1(1).

Reason: (IBC & IRC) This is a nomenclature change that reflects the newest versions of National Standards PS 1 and PS 2. Wood structural panels are required to be in conformance to DOC PS 1 and PS 2 in the code. The PS 1 and PS 2 consensus standard committees have revised both standards to include the terminologies of "bond classification" to reference glue type and "Performance Classes" to reference the thicknesses tolerance consistent with the nominal panel thicknesses in the IBC. This change proposal updates the code to the nomenclature that appears on the trademark of wood structural panels in the field in accordance with DOC PS 1 and PS 2. This is not a technical change.

(IRC)In Section R602.3, the description of wood structural panel was added as it shows up in Chapters 5 and 8 where wood structural panels are also specified. This was done to make the code read consistently between similar sections.

Cost Impact: This will **not** impact the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Keith-S4-2303.1.4

S201-09/10

2303.2, 2303.2.1, 2303.2.2, 2303.2.3; IRC R802.1.3, R802.1.3.1, R802.1.3.2, R802.1.3.3

Proponent: Joe Holland and Dave Bueche, representing Hoover Treated Wood Products

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE STRUCTURAL COMMITTEE.

PART I- IBC STRUCTURAL

1. Revise as follows:

2303.2 Fire-retardant-treated wood. *Fire-retardant-treated wood* (FRTW) is a pressure treated ~~any~~ wood product ~~which, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when~~ tested in accordance with ASTME 84 or UL723~~,~~.FRTW shall have a *listed* flame spread index of 25 or less and show no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. ~~Additionally, t~~The flame front shall not progress more than 101/2 feet (3200 mm) beyond the centerline of the burners at any time during the test.

2. Delete without substitution:

~~**2303.2.1 Pressure process.** For wood products impregnated with chemicals by a pressure process, the process shall be performed in closed vessels under pressures not less than 50 pounds per square inch gauge (psig) (345 kPa).~~

~~**2303.2.2 Other means during manufacture.** For wood products produced by other means during manufacture, the treatment shall be an integral part of the manufacturing process of the wood product. The treatment shall provide permanent protection to all surfaces of the wood product.~~

~~**2303.2.3 Testing.** For wood products produced by other means during manufacture, other than a pressure process, all sides of the wood product shall be tested in accordance with and produce the results required in Section 2303.2. Wood structural panels shall be permitted to test only the front and back faces.~~

(Renumber remaining sections)

PART II- IRC BUILDING/ENERGY

1. Revise as follows:

R802.1.3 Fire-retardant-treated wood. *Fire-retardant-treated wood* (FRTW) is a pressure treated ~~any~~ wood product ~~which, when impregnated with chemicals by a pressure process or other means during manufacture, shall have, when~~ tested in accordance with ASTME 84~~,~~.FRTW shall have a *listed* flame spread index of 25 or less and show no evidence of significant progressive combustion when the test is continued for an additional 20-minute period. ~~Additionally, t~~The flame front shall not progress more than 10.5 feet (3200 mm) beyond the centerline of the burners at any time during the test

2. Delete without substitution:

~~**R802.1.3.1 Pressure process.** For wood products impregnated with chemicals by a pressure process, the process shall be performed in closed vessels under pressures not less than 50 pounds per square inch gauge (psig) (345 kPa).~~

~~**R802.1.3.2 Other means during manufacture.** For wood products produced by other means during manufacture, the treatment shall be an integral part of the manufacturing process of the wood product. The treatment shall provide permanent protection to all surfaces of the wood product.~~

~~**R802.1.3.3 Testing.** For wood products produced by other means during manufacture, other than a pressure process, all sides of the wood product shall be tested in accordance with and produce the results required in Section 2303.2. Wood structural panels shall be permitted to test only the front and back faces.~~

(Renumber remaining sections)

Reason: Revision is more concise. Present section is wordy. In the fifty years of recognition of FRTW in the code there is no wood product meeting the requirement of FRTW where adding the fire retardant to the wood is done during manufacture. This provision creates interpretation problems in the field. Revision will improve enforcement of section. "Pressure process" and "other means during manufacturer" are no longer used; delete Sections 2303.2.1 through 2303.2.3.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I- IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II-IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: Holland-Bueche-S1-2303.2-RB-2-R802.1.3

S202–09/10
2304.8.4.2, 2304.8.5.2

Proponent: Jeff Linville, PE, representing American Institute of Timber Construction

Revise as follows:

2304.8.4.2 Nailing. Each piece of decking shall be toenailed at each support with one 16d common nail through the tongue and face-nailed with one 16d common nail. Other nailing patterns are permitted where justified by an engineering analysis. Predrilled holes are permitted to be used to prevent splitting.

2304.8.5.2 Nailing. Each piece shall be toenailed at each support with one 40d common nail and face-nailed with one 60d common nail. Other nailing patterns are permitted where justified by an engineering analysis. Predrilled holes are permitted to be used to prevent splitting. Courses shall be spiked to each other with 8 inch (203 mm) spikes at maximum intervals of 30 inches (762 mm) through predrilled edge holes penetrating to a depth of approximately 4 inches (102 mm). One spike shall be installed at a distance not exceeding 10 inches (254 mm) from the end of each piece.

Reason: Sections 2304.8.4.2 and 2304.8.5.2 are proposed to be revised to allow other than the prescriptive nailing patterns if justified by engineering analysis. Additionally, these sections are further revised to allow predrilled holes to prevent splitting, such as when nails are placed near the ends of boards.

Cost Impact: The proposed code changes will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LINVILLE-S1-2304.8.4.2

S203–09/10

2304.9.5, 2304.9.5.1, 2304.9.5.2, 2304.9.5.3, 2304.9.5.4; IRC R317.3, R317.3.1, R 317.3.2, R317.3.3, R317.3.4

Proponent: Gary J. Ehrlich, PE, representing National Association of Home Builders

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

2304.9.5 Fasteners and connectors in contact with preservative-treated and fire-retardant-treated wood. Fasteners, including nuts and washers, and connectors in contact with *preservative-treated* and *fire-retardant-treated wood* shall be in accordance with Sections 2304.9.5.1 through 2304.9.5.4. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A 153.

2304.9.5.1 Fasteners and connectors for preservative-treated wood. Fasteners, including nuts and washers, in contact with *preservative-treated wood* shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum. Connectors that are used in exterior applications and in contact with *preservative-treated wood* shall have coating types and weights in accordance with the treated wood or connector manufacturer's recommendations. In the absence of manufacturer's recommendations, a minimum of ASTM A 653, type G185 zinc-coated galvanized steel, or equivalent, shall be used.

> **Exception:** Plain carbon steel fasteners, including nuts and washers, in SBX/DOT and zinc borate *preservative-treated wood* in an interior, dry environment shall be permitted.

2304.9.5.2 Fastenings for wood foundations. Fastenings, including nuts and washers, for wood foundations shall be as required in AF&PA PWF.

2304.9.5.3 Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations. Fasteners, including nuts and washers, for *fire-retardant-treated wood* used in exterior applications or wet or damp locations shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

2304.9.5.4 Fasteners for fire-retardant-treated wood used in interior applications. Fasteners, including nuts and washers, for *fire-retardant-treated wood* used in interior locations shall be in accordance with the manufacturer's recommendations. In the absence of the manufacturer's recommendations, Section 2304.9.5.3 shall apply.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R317.3 Fasteners and connectors in contact with preservative-treated and fire-retardant-treated wood. Fasteners, including nuts and washers, and connectors in contact with preservative-treated wood and fire-retardant-treated wood shall be in accordance with this section. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A 153.

R317.3.1 Fasteners for preservative-treated wood. Fasteners, including nuts and washers, for preservative-treated wood shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Coating types and weights for connectors in contact with preservative-treated wood shall be in accordance with the connector manufacturer's recommendations. In the absence of manufacturer's recommendations, a minimum of ASTM A 653 type G185 zinc-coated galvanized steel, or equivalent, shall be used.

Exceptions:

1. One-half-inch (12.7 mm) diameter or greater steel bolts.
2. Fasteners other than nails and timber rivets shall be permitted to be of mechanically deposited zinc coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.
3. Plain carbon steel fasteners in SBX/DOT and zinc borate preservative-treated wood in an interior, dry environment shall be permitted.

R317.3.2 Fastenings for wood foundations. Fastenings, including nuts and washers, for wood foundations shall be as required in AF&PA PWF.

R317.3.3 Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations. Fasteners, including nuts and washers, for fire-retardant-treated wood used in exterior applications or wet or damp locations shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Fasteners other than nails and timber rivets shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

R317.3.4 Fasteners for fire-retardant-treated wood used in interior applications. Fasteners, including nuts and washers, for fire-retardant-treated wood used in interior locations shall be in accordance with the manufacturer's recommendations. In the absence of the manufacturer's recommendations, Section R317.3.3 shall apply.

Reason: The purpose of this proposal is to clarify the requirements for fasteners in treated wood. The nuts and washers that accompany a bolt (or other fastener) in pressure-treated or fire-retardant treated wood could also be exposed to the corrosive action of the treatments. It therefore makes sense for the nut and washer to have the same coating, or other approved coating or protection, as the fastener with which they are associated. Additionally, the language allowing carbon steel fasteners when borates are used in interior dry applications is added to the IRC. Similar language was successfully added to the IBC last cycle.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Ehrlich-S3-2304.9.5

S204–09/10
2304.9.5.1, 2304.9.5.3

Proponent: Randall Shackelford, PE, representing Simpson Strong-Tie Co.

1. Revise as follows:

2304.9.5.1 Fasteners and connectors for preservative-treated wood. Fasteners in contact with *preservative-treated wood* shall be of hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Fasteners other than nails, and timber rivets~~, wood screws and lag screws~~ shall be permitted to be of mechanically deposited zinc coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum. Connectors that are used in exterior applications and in contact with *preservative-treated wood* shall have coating types and weights in accordance with the treated wood or connector manufacturer's recommendations. In the absence of manufacturer's recommendations, a minimum of ASTM A 653, type G185 zinc-coated galvanized steel, or equivalent, shall be used.

Exception: Plain carbon steel fasteners in SBX/DOT and zinc borate *preservative-treated wood* in an interior, dry environment shall be permitted.

2304.9.5.3 Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations. Fasteners for *fire-retardant-treated wood* used in exterior applications or wet or damp locations shall be of hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Fasteners other than nails, and timber rivets~~, wood screws and lag screws~~ shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

Reason: The purpose of this code change is to permit wood screws and lag screws that are galvanized in accordance with ASTM B 695, Class 55 to be used in contact with fire-retardant and preservative-treated wood. This will bring the IBC into agreement with the fasteners in treated wood requirements of the IRC.

Mechanical galvanizing is very common for screws, and in fact is possibly the only way to deposit a thick zinc coating on them. Wood screws and lag screws are frequently installed in pre-drilled holes, so abrasion of the finish is not the same problem as for nails.

Currently, all fasteners in treated wood are permitted to be hot dipped galvanized with a coating weight in accordance with ASTM A 153. This results in a zinc coating weight on the fastener of one to 1.25 ounces of zinc per square foot, and a minimum thickness of 43 to 53 microns, depending on the diameter of the fastener. See Class C and D in copy of the standard below:

TABLE 1 Thickness or Weight [Mass] of Zinc Coating for Various Classes of Material

NOTE 1— Length of the piece, stated in Classes B-1, B-2, and B-3, refers to the finished dimension of the piece after fabrication.

Class of Material	Weight [Mass] of Zinc Coating, oz/ft²[g/m²] of Surface, Minimum		Coating Thickness, mils [microns], Minimum	
	Average of Specimens Tested	Any Individual Specimen	Average of Specimens Tested	Any Individual Specimen
Class A—Castings—Malleable Iron, Steel	2.00 [610]	1.80 [550]	3.4 [86]	3.1 [79]
Class B—Rolled, pressed, and forged articles (except those which would be included under Classes C and D):				
B-1—3/16 in. [4.76 mm] and over in thickness and over 15 in. [381 mm] in length	2.00 [610]	1.80 [550]	3.4 [86]	3.1 [79]
B-2—under 3/16 in. [4.76 mm] in thickness and over 15 in. [381 mm] in length	1.50 [458]	1.25 [381]	2.6 [66]	2.1 [53]
B-3—any thickness and 15 in. [381 mm] and under in length	1.30 [397]	1.10 [336]	2.2 [56]	1.9 [48]
Class C—Fasteners over 3/8 in. [9.52 mm] in diameter and similar articles. Washers 3/16 in. and 1/4 in. [4.76 and 6.35 mm] in thickness	1.25 [381]	1.00 [305]	2.1 [53]	1.7 [43]
Class D—Fasteners 3/8 in. [9.52 mm] and under in diameter, rivets, nails and similar articles. Washers under 3/16 in. [4.76 mm] in thickness	1.00 [305]	0.85 [259]	1.7 [43]	1.4 [36]

ASTM B 695, Class 55 will also provide a minimum thickness of 53 µm of zinc on the fastener. (See table below from ASTM B 695).

3. Classification

3.1 *Classes*—Zinc coatings are classified on the basis of thickness, as follows:

Class	Minimum Thickness, µm
110	107
80	81
70	69
65	66
55	53
50	50
40	40
25	25
12	12
8	8
5	5

Since the corrosion resistance of a galvanized coating is directly proportional to the amount of zinc on the fastener, providing an equivalent amount of zinc by mechanical galvanizing will provide an equivalent corrosion resistance to hot dip galvanizing to ASTM A 153. Therefore the alternative galvanizing standard should be accepted.

Further, Section X1 of the Appendix of ASTM B 695 states the following:

> "X1.2 Zinc coatings are usually applied to provide corrosion resistance. The performance of a zinc coating depends largely on its thickness, the supplementary treatment if any, and the kind of environment to which it is exposed. The seven heaviest classes of coatings offer suitable alternatives to hot-dip galvanizing."

Class 55 is the fifth heaviest so it certainly falls within the seven heaviest.

Cost Impact: This proposal will not increase costs. It could decrease costs where more economical mechanically galvanized fasteners can be used instead of hot dipped galvanized fasteners.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: SHACKELFORD-S2-2304.9.5.1

S205–09/10
2304.11.6

Proponent: Homer Maiel, PE, CBO, City of San Jose**,** representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay)

Revise as follows:

Section 2304.11.6 Termite protection. In geographical areas where hazard of termite damage is known to be very heavy, wood floor framing exposed to the ground in crawl spaces or unexcavated areas located within the periphery of

the building foundation and exposed framing of exterior decks or balconies, shall be of durable species (termite resistant) or preservative treated in accordance with AWPA U1 for the species, product preservative and end use or provided with approved methods of termite protection.

Reason: This change intends to clarify that the wood floor framing that needs to be durable species or preservative treated wood are limited to those interior floors with exposure to soil instead of all floors in the building. In addition exposed exterior decks or balcony framing are specifically added. Other provisions address wood in contact with concrete or close to grade for all termite hazard regions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAIEL-S1-2304.11.6

S206–09/10
2304.13 (New)

Proponent: Jason Thompson, National Concrete Masonry Association, representing the Masonry Alliance for Codes and Standards

Add new text as follows:

2304.13 Buildings with prefabricated wood I-joists or trusses for floor and roof systems. All buildings using prefabricated wood I-joists or trusses for the floor or roof system shall be marked in accordance with all of the following:

1. A placard shall be attached to the building on the front of the structure in the vicinity of the front entrance and in a visible location. Additional placards shall be applied to each side of the structure in a visible location.
2. Building placards shall be 8 inches (203 mm) high by 24 inches (610 mm) long with a white background, black letters and a black border. The letters and border shall be easily visible and readable at 10 feet (3048 mm).
3. The placard shall state: *"This building uses prefabricated wood I-joists or trusses for the floor or roof system. Proceed with caution if entering during a fire emergency"*

Reason: Section 2304 of the International Building Code outlines the general construction requirements for buildings using wood materials. This includes provisions applicable to engineered wood products such as wood I-joists and trusses. Though suitable for structural loads, buildings constructed of wood I-joist or trusses pose an inherent risk to the fire service when responding to a fire emergency. There have been numerous instances where fire conditions have brought on structural failure of the floor or roof systems sooner than that experienced with structures constructed of conventional wood framed construction. This early failure under fire conditions has the potential to trap fire fighters within the building while performing interior fire attacks. This proposal will require buildings constructed with wood I-joists and trusses for the floor or roof system to have placards placed on the building to warn emergency responders of these construction features and allow them to proceed with caution if entering the building during a fire emergency.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Thompson-S3-2304.13 (new)

S207–09/10
2302.1, 2303.1, 2303.1.12 (New), 2304.13 (New), CHAPTER 35; IRC R317.4.1 (New)

Proponent: John Woestman, The Kellen Company representing the Composite Lumber Manufacturers Association (CLMA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

1. Add new definition as follows:

WOOD PLASTIC COMPOSITE. A composite material made primarily from wood or cellulose-based materials, and plastic.

2. Revise as follows:

2303.1 General. Structural sawn lumber; end-jointed lumber; prefabricated wood I-joists; structural glued laminated timber; wood structural panels, fiberboard sheathing (when used structurally); hardboard siding (when used structurally); particleboard; preservative-treated wood; structural log members; structural composite lumber; round timber poles and piles; fire-retardant-treated wood; hardwood plywood; wood trusses; wood plastic composite exterior deck components; joist hangers; nails; and staples shall conform to the applicable provisions of this section.

3. Add new text as follows:

2303.1.12 Wood plastic composite exterior deck, railing, and stairway components. Structural capacities for exterior wood plastic composite deck boards, stair treads, handrails and guardrail systems shall be determined in accordance with ASTM D 7032.

2304.13 Wood plastic composite exterior deck, railing, and stairway components. Exterior wood plastic composite deck boards, deck boards used as stair treads, handrails and guardrail systems shall meet the applicable requirements of ASTM D 7032, and bear a label indicating the required performance levels and demonstrating compliance with ASTM D 7032,

4. Add new standard to Chapter 35 as follows:

ASTM

D 7032-08	Standard Specification for Establishing Performance Ratings For Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails)

5. Add new text as follows:

2304.13.1 Labeling. Labels for deck boards and stair treads shall include the allowable maximum load and span. Labels for handrails and guardrail systems shall indicate the allowable maximum span.

6. Add new text as follows:

2304.13.2 Installation. Wood plastic composite deck components shall be installed in accordance with the manufacturer's instructions.

PART II – IRC BUILDING/ENERGY

1. Add new text as follows:

R317.4.1 Labeling. Labels for deck boards and stair treads shall include the allowable maximum load and span. Labels for handrails and guardrail systems shall indicate the allowable maximum span.

2. Revise as follows:

~~**R317.4.1**~~ **R317.4.2 Installation.** Wood/plastic composites shall be installed in accordance with the manufacturer's instructions.

Reason:
(Part I, items 1-4) The IBC is currently silent regarding requirements for wood plastic composite exterior deck components. The Composite Lumber Manufacturers Association (CLMA) seeks to make it easier for code officials to enforce the IBC and to make it easier for deck builders to comply with the code by incorporating requirements for wood plastic composite decking into the IBC.

This code change proposes to include requirements for wood plastic composite exterior deck components in Chapter 23 of the IBC, which is the most appropriate chapter of the IBC for these products. Section 2301.2 refers to elements or systems "constructed partially or wholly of wood or wood-based products". No other IBC chapter incorporates wood-based products of this type.

Wood plastic composite exterior deck components are constructed partially of wood-based material (as are particleboard and composite panels; included in Chapter 23), and partially of resin bonded by heat and pressure (as are several materials included in Chapter 23, such as particleboard). CLMA reviewed Chapter 26, Plastic, but concluded that wood plastic composite exterior deck components are much more closely aligned with the methods of distribution and application to the materials included in Chapter 23 than those in Chapter 26. Moreover, the ASTM standard governing wood plastic composite decking (ASTM D 7032) has been developed by and continues to be maintained by the ASTM D7 committee on wood. For these reasons, this proposal includes revisions to Chapter 23.

This CLMA proposal complements language in the 2009 IRC which defines "wood plastic composite" and requires wood plastic composite deck boards, stair treads, handrails and guardrail systems to bear a label indicating the required performance levels and demonstrating compliance to ASTM D 7032. This labeling requirement, by definition of "label" in the IBC, includes 3rd-party certification and ongoing quality assurance and will help to assure the code official that wood-plastic composite decking will meet the performance provisions in the IBC.

Complying with ASTM D 7032 verifies the wood plastic composite materials are appropriate for use as deck components and includes deck-related performance evaluations such as flexural tests, ultraviolet resistance tests, freeze-thaw resistance tests, bio-deterioration tests, fire performance tests, creep recovery tests, mechanical fastener holding tests, and slip resistance tests. The standard also includes consideration of the effects of temperature and moisture, concentrated loads, and fire propagation tests.

This code change for the IBC will make it faster and easier to verify that a deck constructed of wood plastic composite material complies with the code.

(Part I, items 5) This item adds a new subject matter in 2304.13.1. This new requirement specifies that the load and span information is required on the labels.

This item will make it faster and easier to verify that a deck constructed of wood plastic composite material complies with the code. The wood plastic composite deck boards and stair treads are to have a label indicating the span rating (i.e. 100 lbs/ft^2 at 16" O.C.). Handrails and guardrail systems will be similarly labeled. The load and span information will improve the ability to verify compliance to the code.

(Part I, items 6) This item adds a new subject matter in 2304.13.2 which requires that wood plastic composite deck components be installed per the manufacturer's instructions.

As with most engineered building components, wood plastic composite deck components should be required to be installed per the manufacturer's instructions. It's important that wood plastic composite deck components be installed as intended by the manufacturer.

(Part II, IRC) This CLMA proposal complements language proposed for IBC (see Part I, item 5).

This code change for the IRC will make it faster and easier to verify that a deck constructed of wood plastic composite material complies with the code. The wood plastic composite deck boards and stair treads are to have a label indicating the span rating (i.e. 100 lbs/ft^2 at 16" O.C.) in addition to confirming compliance to ASTM D7032. Handrails and guardrail systems will be similarly labeled with their span rating (distance between support posts).

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM D7032-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WOESTMAN-S7-2304.13.2

S208–09/10

2305, 2306, 2307, 2308.11.2, 2308.12.2, 1704.6.1

Proponent: Brad Douglas, American Forest & Paper Association

1. Revise as follows:

2305.1 General. Structures using wood-frame shear walls ~~and~~ or wood-frame diaphragms to resist wind, seismic ~~and~~ or other lateral loads shall be designed and constructed in accordance with AF&PA SDPWS and the applicable provisions of Sections 2305, 2306 and 2307.

2305.2 Diaphragm deflection. The deflection of wood-frame diaphragms shall be determined in accordance with AF&PA SDPWS. The deflection (Δ) of a blocked wood structural panel diaphragm uniformly fastened throughout with staples is permitted to be calculated by using ~~the following~~ Equation 23-1. If not uniformly fastened, the constant 0.188 (For SI: 1/1627) in the third term shall be modified ~~accordingly~~ by an approved method.

$$\Delta = \frac{5vL^3}{8EAb} + \frac{vL}{4Gt} + 0.188Le_n + \frac{\sum(\Delta_c X)}{2b}$$

$$For\ SI:\ \Delta = \frac{0.052vL^3}{EAb} + \frac{vL}{4Gt} + \frac{Le_n}{1627} + \frac{\Sigma(\Delta_c X)}{2b}$$

where:

A = Area of chord cross section, in square inches (mm^2).
B = Diaphragm width, in feet (mm).
E = Elastic modulus of chords, in pounds per square inch (N/mm^2).
e_n = Staple deformation, in inches (mm) [see Table 2305.2(1)].
Gt = Panel rigidity through the thickness, in pounds per inch (N/mm) of panel width or depth [see Table 2305.2(2)].
L = Diaphragm length, in feet (mm).
V = Maximum shear due to design loads in the direction under consideration, in pounds per linear foot (plf) *(N/mm).*
Δ = The calculated deflection, in inches (mm).
$\Sigma(\Delta_c X)$ = Sum of individual chord-splice slip values on both sides of the diaphragm, each multiplied by its distance to the nearest support.

2305.3 Shear wall deflection. The deflection of wood-frame shear walls shall be determined in accordance with AF&PA SDPWS. The deflection (Δ) of a blocked wood structural panel shear wall uniformly fastened throughout with staples is permitted to be calculated by the use of the following equation:

$$\Delta = \frac{8vh^3}{EAb} + \frac{vh}{Gt} + 0.75he_n + d_a\frac{h}{b}$$

$$For\ SI:\ \Delta = \frac{vh^3}{3EAb} + \frac{vh}{Gt} + \frac{he_n}{407.6} + d_a\frac{h}{b}$$

where:

A = Area of boundary element cross section in square inches (mm^2) (vertical member at shear wall boundary).
b = Wall width, in feet (mm).
d_a = Vertical elongation of overturning anchorage (including fastener slip, device elongation, anchor rod elongation, etc.) at the design shear load (v).
E = Elastic modulus of boundary element (vertical member at shear wall boundary), in pounds per square inch (N/mm^2).
e_n = Staple deformation, in inches (mm) [see Table 2305.2(1)].
Gt = Panel rigidity through the thickness, in pounds per inch (N/mm) of panel width or depth [see Table 2305.2(2)].
h = Wall height, in feet (mm).
v = Maximum shear due to design loads at the top of the wall, in pounds per linear foot (N/mm).
Δ = The calculated deflection, in inches (mm).

2306.1 Allowable stress design. The ~~structural analysis~~ design and construction of wood elements in structures using *allowable stress design* shall be in accordance with the following applicable standards:

(No change to list of allowable stress design standards)

2306.2 Wood-frame diaphragms. Wood-frame diaphragms shall be designed and constructed in accordance with AF&PA SDPWS. Where panels are fastened to framing members with staples, requirements and limitations of AF&PA SDPWS shall be met and the allowable shear values set forth in Table 2306.2(1) or 2306.2(2) shall be permitted. The allowable shear values in Tables 2306.2(1) and 2306.2(2) are permitted to be increased 40 percent for wind design.
2. Delete without substitution:

~~**2306.2.1 Wood structural panel diaphragms.** Wood structural panel diaphragms shall be designed and constructed in accordance with AF&PA SDPWS. Wood structural panel diaphragms are permitted to resist horizontal forces, using the allowable shear capacities set forth in Table 2306.2.1(1) or 2306.2.1(2). The allowable shear capacities in Tables 2306.2.1(1) and 2306.2.1(2) are permitted to be increased 40 percent for wind design.~~

~~**2306.2.2 Single diagonally sheathed lumber diaphragms.** Single diagonally sheathed lumber diaphragms shall be designed and constructed in accordance with AF&PA SDPWS.~~

~~2306.2.3 Double diagonally sheathed lumber diaphragms.~~ ~~Double diagonally sheathed lumber diaphragms shall be designed and constructed in accordance with AF&PA SDPWS.~~

3. Revise as follows:

~~2306.2.4~~ 2306.2.1 Gypsum board diaphragm ceilings. Gypsum board diaphragm ceilings shall be in accordance with Section 2508.5.

TABLE ~~2306.2.1(1)~~ 2306.2(1)
ALLOWABLE SHEAR VALUES (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL DIAPHRAGMS UTILIZING STAPLES WITH FRAMING OF DOUGLAS-FIR-LARCH, OR SOUTHERN PINE[a] FOR WIND OR SEISMIC LOADING [h f]

PANEL GRADE	~~COMMON NAIL SIZE OR~~ STAPLE [f d] LENGTH AND GAGE	MINIMUM FASTENER PENETRATION IN FRAMING (inches)	MINIMUM NOMINAL PANEL THICKNESS (inch)	MINIMUM NOMINAL WIDTH OF FRAMING MEMBER AT ADJOINING PANEL EDGES AND BOUN-DARIES [g e] (inches)	BLOCKED DIAPHRAGMS				UNBLOCKED DIAPHRAGMS	
					Fastener spacing (inches) at diaphragm boundaries (all cases) at continuous panel edges parallel to load (Cases 3,4), and at all panel edges (Cases 5, 6)[b]				Fasteners spaced 6" max. at supported edges[b]	
					6	4	2 1/2[c]	2[c]	Case 1 (No unblocked edges or continuous joints parallel to load)	All other configurations (Cases 2, 3, 4, 5 and 6)
					Fastener spacing (inches) at other panel edges (Cases 1, 2, 3 and 4)					
					6	6	4	3		
Structural I grades	~~8d (2½" x 0.131)~~	~~1 3/8~~	3/8	~~2~~	~~270~~	~~360~~	~~530~~	~~600~~	~~240~~	~~180~~
				~~3~~	~~300~~	~~400~~	~~600~~	~~675~~	~~265~~	~~200~~
	1½ 16 Gage	1		2	175	235	350	400	155	115
				3	200	265	395	450	175	130
	~~10d[d] (3" x 0.148")~~	~~1 ½~~	15/32	~~2~~	~~320~~	~~425~~	~~640~~	~~730~~	~~285~~	~~215~~
				~~3~~	~~360~~	~~480~~	~~720~~	~~820~~	~~320~~	~~240~~
	1½ 16 Gage	1		2	175	235	350	400	155	120
				3	200	265	395	450	175	130
Sheathing, single floor and other grades covered in DOC PS1 and PS2	~~6d[e] (2" x 0.113)~~	~~1 ¼~~	3/8	~~2~~	~~185~~	~~250~~	~~375~~	~~420~~	~~165~~	~~125~~
				~~3~~	~~210~~	~~280~~	~~420~~	~~475~~	~~185~~	~~140~~
	~~8d (2½" x 0.131)~~	~~1 3/8~~		~~2~~	~~240~~	~~320~~	~~480~~	~~545~~	~~215~~	~~160~~
				~~3~~	~~270~~	~~360~~	~~540~~	~~610~~	~~240~~	~~180~~
	1½ 16 Gage	1		2	160	210	315	360	140	105
				3	180	235	355	400	160	120
	~~8d (2½" x 0.131)~~	~~1 3/8~~	7/16	~~2~~	~~255~~	~~340~~	~~505~~	~~575~~	~~230~~	~~170~~
				~~3~~	~~285~~	~~380~~	~~570~~	~~645~~	~~255~~	~~190~~
	1½ 16 Gage	1		2	165	225	335	380	150	110
				3	190	250	375	425	165	125
	~~8d (2½" x 0.131)~~	~~1 3/8~~	15/32	~~2~~	~~270~~	~~360~~	~~530~~	~~600~~	~~240~~	~~180~~
				~~3~~	~~300~~	~~400~~	~~600~~	~~675~~	~~265~~	~~200~~
	~~10d[d] (3" x 0.148")~~	~~1 ½~~		~~2~~	~~290~~	~~385~~	~~575~~	~~655~~	~~255~~	~~190~~
				~~3~~	~~325~~	~~430~~	~~650~~	~~735~~	~~290~~	~~215~~
	1½ 16 Gage	1		2	160	210	315	360	140	105
				3	180	235	355	405	160	120
	~~10d[d] (3" x 0.148")~~	~~1 ½~~	19/32	~~2~~	~~320~~	~~425~~	~~640~~	~~730~~	~~285~~	~~215~~
				~~3~~	~~360~~	~~480~~	~~720~~	~~820~~	~~320~~	~~140~~
	1½ 16 Gage	1		2	175	235	350	400	155	115
				3	200	265	395	450	175	130

For SI: 1 inch =- 25.4 mm, 1 pound per foot = 14.59 N/m.

(No Change to Diaphragm Figure Case 1 through Case 6)

a. For framing of other species: (1) Find specific gravity for species of lumber in AF&PA NDS. (2) For staples find shear value from table above for Structural I panels (regardless of actual grade) and multiply value by 0.82 for species with specific gravity of 0.42 or greater, or 0.65 for all other species. ~~(3) For nails find shear value from table above for nail size for actual grade and multiply value by the following adjustment factor: Specific Gravity Adjustment Factor = [1 - (0.5 - SG)], where SG = Specific Gravity of the framing lumber. This adjustment factor shall not be greater than 1.~~

b. Space fasteners maximum 12 inches o.c. along intermediate framing members (6 inches o.c. where supports are spaced 48 inches o.c.).

c. Framing at adjoining panel edges shall be 3 inches nominal or wider~~, and nails at all panel edges shall be staggered where panel edge nailing is specified 2-1/2 inches o.c. or less~~.

~~d. Framing at adjoining panel edges shall be 3 inches nominal or wider, and nails at all panel edges shall be staggered where both of the following conditions are met: (1) 10d nails having penetration into framing of more than 1-1/2 inches and (2) panel edge nailing is specified 3 inches o.c. or less.~~

~~e. 8d is recommended minimum for roofs due to negative pressures of high winds.~~

~~f.~~d. Staples shall have a minimum crown width of 7/16 inch and shall be installed with their crowns parallel to the long-dimension of the framing members.

~~g~~e. The minimum nominal width of framing members not located at boundaries or adjoining panel edges shall be 2 inches.

~~h~~ f. For shear loads of normal or permanent load duration as defined by the AF&PA NDS, the values in the table above shall be multiplied by 0.63 or 0.56, respectively.

TABLE ~~2306.2.1(2)~~ 2306.2(2)
ALLOWABLE SHEAR VALUES (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL BLOCKED DIAPHRAGMS UTILIZING MULTIPLE ROWS OF ~~FASTENERS~~ STAPLES (HIGH LOAD DIAPHRAGMS) WITH FRAMING OF DOUGLAS FIR, LARCH, OR SOUTHERN PINE[a] FOR WIND OR SEISMIC LOADING[b, g, h]

PANEL GRADE[c]	~~COMMON NAIL SIZE OR~~ STAPLE[f] GAGE	MINIMUM FASTENER PENETRATION IN FRAMING (inches)	MINIMUM NOMINAL PANEL THICKNESS (inch)	MINIMUM NOMINAL WIDTH OF FRAMING MEMBER AT ADJOINING PANEL EDGES AND BOUNDARIES[e] (inches)	LINES OF FASTENERS	BLOCKED DIAPHRAGMS Cases 1 and 2[d] Fastener Spacing Per Line at Boundaries (inches)					
						4		2 1/2		2	
						Fastener Spacing Per Line at Other Panel Edges (inches)					
						6	4	4	3	3	2
Structural I grades	~~10d common nails~~	~~1 ½~~	~~15/32~~	~~3~~	~~2~~	~~605~~	~~815~~	~~875~~	~~1,150~~	-	-
				~~4~~	~~2~~	~~700~~	~~915~~	~~1,005~~	~~1,290~~	-	-
				~~4~~	~~3~~	~~875~~	~~1,220~~	~~1,285~~	~~1,395~~	-	-
			~~19/32~~	~~3~~	~~2~~	~~670~~	~~880~~	~~965~~	~~1,255~~	-	-
				~~4~~	~~2~~	~~780~~	~~990~~	~~1,110~~	~~1,440~~	-	-
				~~4~~	~~3~~	~~965~~	~~1,320~~	~~1,405~~	~~1,790~~	-	-
			~~23/32~~	~~3~~	~~2~~	~~730~~	~~955~~	~~1,050~~	~~1,365~~	-	-
				~~4~~	~~2~~	~~855~~	~~1,070~~	~~1,210~~	~~1,565~~	-	-
				~~4~~	~~3~~	~~1,050~~	~~1,430~~	~~1,525~~	~~1,800~~	-	-
	14 gage staples	2	15/32	3	2	600	600	860	960	1,060	1,200
				4	3	860	900	1,160	1,295	1,295	1,400
			19/32	3	2	600	600	875	960	1,075	1,200
				4	3	875	900	1,175	1,440	1,475	1,795
Sheathing, single floor and other grades covered in DOC PS1 and PS2	~~10d common nails~~	~~1 ½~~	~~15/32~~	~~3~~	~~2~~	~~525~~	~~725~~	~~765~~	~~1,010~~	-	-
				~~4~~	~~2~~	~~605~~	~~815~~	~~875~~	~~1,105~~	-	-
				~~4~~	~~3~~	~~765~~	~~1,085~~	~~1,130~~	~~1,195~~	-	-
			~~19/32~~	~~3~~	~~2~~	~~650~~	~~860~~	~~935~~	~~1,225~~	-	-
				~~4~~	~~2~~	~~755~~	~~965~~	~~1,080~~	~~1,370~~	-	-
				~~4~~	~~3~~	~~935~~	~~1,290~~	~~1,365~~	~~1,495~~	-	-
			~~23/32~~	~~3~~	~~2~~	~~710~~	~~935~~	~~1,020~~	~~1,335~~	-	-
				~~4~~	~~2~~	~~825~~	~~1,050~~	~~1,175~~	~~1,445~~	-	-
				~~4~~	~~3~~	~~1,020~~	~~1,400~~	~~1,480~~	~~1,565~~	-	-
	14 gage staples	2	15/32	3	2	540	540	735	865	915	1,080
				4	3	735	810	1,005	1,105	1,105	1,195
			19/32	3	2	600	600	865	960	1,065	1,200
				4	3	865	900	1,130	1,430	1,370	1,485
			23/32	4	3	865	900	1,130	1,490	1,430	1,545

For SI: 1 inch =- 25.4 mm.

a. For framing of other species: (1) Find specific gravity for species of framing lumber in AF&PA NDS. (2) For staples, find shear value from table above for Structural I panels (regardless of actual grade) and multiply value by 0.82 for species with specific gravity of 0.42 or greater, or 0.65 for all other species. ~~(3) For nails, find shear value from table above for nail size of actual grade and multiply value by the following adjustment factor: Specific Gravity Adjustment Factor = [1 - (0.5 - SG)], where SG = Specific gravity of the framing lumber. This adjustment factor shall not be greater than 1.~~

b. Fastening along intermediate framing members: Space fasteners a maximum of 12 inches on center, except 6 inches on center for spans greater than 32 inches.

c. Panels conforming to PS 1 or PS 2.

d. This table gives shear values for Cases 1 and 2 as shown in Table ~~2306.2.1(1)~~ 2306.2(1). The values shown are applicable to Cases 3, 4, 5 and 6 as shown in Table ~~2306.2.1(1)~~ 2306.2(1), provided fasteners at all continuous panel edges are spaced in accordance with the boundary fastener spacing.

e. The minimum nominal depth of framing members shall be 3 inches. The minimum nominal width of framing members not located at boundaries or adjoining panel edges shall be 2 inches.

f. Staples shall have a minimum crown width of 7/16 inch, and shall be installed with their crowns parallel to the long dimension of the framing members.

g. High load diaphragms shall be subject to special inspection in accordance with Section 1704.6.1.

h. For shear loads of normal or permanent load duration as defined by the AF&PA NDS, the values in the table above shall be multiplied by 0.63 or 0.56, respectively.

(No Change to Fastener Placement Figure)

4. Delete and substitute as follows:

~~2306.3 Wood structural panel shear walls.~~ ~~Wood structural panel shear walls shall be designed and constructed in accordance with AF&PA SDPWS. Wood structural panel shear walls are permitted to resist horizontal forces, using the allowable capacities set forth in Table 2306.3. Allowable capacities in Table 2306.3 are permitted to be increased 40 percent for wind design.~~

2306.3 Wood-frame shear walls. Wood-frame shear walls shall be designed and constructed in accordance with AF&PA SDPWS. Where panels are fastened to framing members with staples, requirements and limitations of AF&PA SDPWS shall be met and the allowable shear values set forth in Table 2306.3(1), 2306.3(2) or 2306.3(3) shall be

permitted. The allowable shear values in Tables 2306.3(1) and 2306.3(2) are permitted to be increased 40 percent for wind design.

5. Revise as follows:

TABLE ~~2306.3~~ 2306.3(1)
ALLOWABLE SHEAR VALUES (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL SHEAR WALLS UTILIZING STAPLES WITH FRAMING OF DOUGLAS FIR-LARCH OR SOUTHERN PINE[a] FOR WIND OR SEISMIC LOADING [b,~~h,i,j~~,f,g]

PANEL GRADE	MINIMUM NOMINAL PANEL THICKNESS (inch)	MINIMUM FASTENER PENETRATION IN FRAMING (inches)	PANELS APPLIED DIRECT TO FRAMING					PANELS APPLIED OVER ½" or 5/8" GYPSUM SHEATHING				
			~~Nail (common or galvanized box) or~~ staple size [k,h]	Fastener spacing at panel edges (inches)				~~Nail (common or galvanized box) or~~ staple size [k,h]	Fastener spacing at panel edges (inches)			
				6	4	3	2 [e,d]		6	4	3	2 [e,d]
Structural I Sheathing	3/8	~~1 3/8~~	~~8d (2 ½" x 0.131" common, 2 ½" x 0.113" galvanized box)~~	~~230~~[d]	~~360~~[d]	~~460~~[d]	~~610~~[d]	~~10d (3" x 0.148" common, 3" x 0.128" galvanized box)~~	~~280~~	~~430~~	~~550~~[f]	~~730~~
		1	1 ½ 16 Gage	155	235	315	400	2 16 Gage	155	235	310	400
	7/16	~~1 3/8~~	~~8d (2 ½" x 0.131" common, 2 ½" x 0.113" galvanized box)~~	~~255~~[d]	~~395~~[d]	~~505~~[d]	~~670~~[d]	~~10d (3" x 0.148" common, 3" x 0.128" galvanized box)~~	~~280~~	~~430~~	~~550~~[f]	~~730~~
		1	1 ½ 16 Gage	170	260	345	440	2 16 Gage	155	235	310	400
	15/32	~~1 3/8~~	~~8d (2 ½" x 0.131" common, 2 ½" x 0.113" galvanized box)~~	~~280~~	~~430~~	~~550~~	~~730~~	~~10d (3" x 0.148" common, 3" x 0.128" galvanized box)~~	~~280~~	~~430~~	~~550~~[f]	~~730~~
		1	1 ½ 16 Gage	185	280	375	475	2 16 Gage	155	235	300	400
		~~1 ½~~	~~10d (3" x 0.148" common, 3" x 0.128" galvanized box)~~	~~340~~	~~510~~	~~665~~[f]	~~870~~	~~10d (3" x 0.148" common, 3" x 0.128" galvanized box)~~	-	-	-	-
Sheathing, plywood siding [g,e] except Group 5 species	5/16[c] or 1/4[c]	~~1 ¼~~	~~6d (2"x0.113" common, 2"x0.099" galvanized box)~~	~~180~~	~~270~~	~~350~~	~~450~~	~~8d (2 ½" x 0.131" common, 2 ½" x 0.113" galvanized box)~~	~~180~~	~~270~~	~~350~~	~~450~~
		1	1 ½ 16 Gage	145	220	295	375	2 16 Gage	110	165	220	285
	3/8	~~1 ¼~~	~~6d (2"x0.113" common, 2"x0.099" galvanized box)~~	~~200~~	~~300~~	~~390~~	~~510~~	~~8d (2 ½" x 0.131" common, 2 ½" x 0.113" galvanized box)~~	~~200~~	~~300~~	~~390~~	~~510~~
		~~1 3/8~~	~~8d (2 ½" x 0.131" common, 2 ½" x 0.113" galvanized box)~~	~~220~~[d]	~~320~~[d]	~~410~~[d]	~~530~~[d]	~~10d (3" x 0.148" common, 3" x 0.128" galvanized box)~~	~~260~~	~~380~~	~~490~~[f]	~~640~~
		1	1 ½ 16 Gage	140	210	280	360	2 16 Gage	140	210	280	360
	7/16	~~1 3/8~~	~~8d (2 ½" x 0.131" common, 2 ½" x 0.113" galvanized box)~~	~~240~~[d]	~~350~~[d]	~~450~~[d]	~~585~~[d]	~~10d (3" x 0.148" common, 3" x 0.128" galvanized box)~~	~~260~~	~~380~~	~~490~~[f]	~~640~~
		1	1 ½ 16 Gage	155	230	310	395	2 16 Gage	140	210	280	360
	15/32	~~1 3/8~~	~~8d (2 ½" x 0.131" common, 2 ½" x 0.113" galvanized box)~~	~~260~~	~~380~~	~~490~~	~~640~~	~~10d (3" x 0.148" common, 3" x 0.128" galvanized box)~~	~~260~~	~~380~~	~~490~~[f]	~~640~~
		~~1 ½~~	~~10d (3" x 0.148" common, 3" x 0.128" galvanized box)~~	~~310~~	~~460~~	~~600~~[f]	~~770~~	-	-	-	-	-
		1	1 ½ 16 Gage	170	255	335	430	2 16 Gage	140	210	280	360
	19/32	~~1 ½~~	~~10d (3" x 0.148" common, 3" x 0.128" galvanized box)~~	~~340~~	~~510~~	~~665~~[f]	~~870~~	-	-	-	-	-
		1	1 3/4 16 Gage	185	280	375	475	-	-	-	-	-
			~~Nail Size (galvanized casing)~~					~~Nail Size (galvanized casing)~~				
	~~5/16[c]~~	~~1 ¼~~	~~6d (2" x 0.099")~~	~~140~~	~~210~~	~~275~~	~~360~~	~~8d (2 ½" x 0.113")~~	~~140~~	~~210~~	~~275~~	~~360~~
	~~3/8[c]~~	~~1 3/8~~	~~8d (2 ½" x 0.113")~~	~~160~~	~~240~~	~~310~~	~~410~~	~~10d (3" x 0.128")~~	~~160~~	~~240~~	~~310~~[f]	~~410~~

For SI: 1 inch =- 25.4 mm, 1 pound per foot = 14.59 N/m.

a. For framing of other species: (1) Find specific gravity for species of lumber in NDS. (2) For staples find shear value from table above for Structural I panels (regardless of actual grade) and multiply value by 0.82 for species with specific gravity of 0.42 or greater, or 0.65 for all other species. ~~(3) For nails find shear value from table above for nail size for actual grade and multiply value by the following adjustment factor: Specific Gravity Adjustment Factor = [1 - (0.5 - SG)], Where SG = Specific Gravity of the framing lumber. This adjustment factor shall not be greater than 1.~~

b. Panel edges backed with 2-inch nominal or wider framing. Install panels either horizontally or vertically. Space fasteners maximum 6 inches on center along intermediate framing members for 3/8-inch and 7/16-inch panels installed on studs spaced 24 inches on center. For other conditions and panel thickness, space fasteners maximum 12 inches on center on intermediate supports.

c. 3/8-inch panel thickness or siding with a span rating of 16 inches on center is minimum recommended where applied direct to framing as exterior siding. For grooved panel siding, the nominal panel thickness is the thickness of the panel measured at the point of ~~nailing~~ fastening.

~~d. Allowable shear values are permitted to be increased to values shown for 15/32-inch sheathing with same nailing fastening provided (a) studs are spaced a maximum of 16 inches on center, or (b) if panels are applied with long dimension across studs.~~

~~e~~ d. Framing at adjoining panel edges shall be 3 inches nominal or wider~~, and nails at all panel edges shall be staggered where panel edge nailing is specified 2 inches on center or less~~.

~~f. Framing at adjoining panel edges shall be 3 inches nominal or wider, and nails at all panel edges shall be staggered where both of the following conditions are met: (1) 10d (3" x 0.148") nails having penetration into framing of more than 1-1/2 inches and (2) panel edge nailing is specified 3 inches on center or less.~~

~~g~~ e. Values apply to all-veneer plywood. Thickness at point of fastening on panel edges governs shear values.

~~h~~ f. Where panels are applied on both faces of a wall and ~~nail~~ fastener spacing is less than 6 inches o.c. on either side, panel joints shall be offset to fall on different framing members. Or framing shall be 3-inch nominal or thicker at adjoining panel edges~~ and nails at all panel edges shall be staggered~~.

~~i~~ g. In Seismic Design Category D, E or F, where shear design values exceed 350 pounds per lineal foot, all framing members receiving edge ~~nailing~~ fastening from abutting panels shall not be less than a single 3-inch nominal member, or two 2-inch nominal members fastened together in accordance with Section 2306.1 to transfer the design shear value between framing members. ~~Wood structural panel joint and sill plate nailing shall be staggered at all panel edges.~~ See ~~Sections 4.3.6.1 and 4.3.6.4.2 of~~ AF&PA SDPWS for sill plate size and anchorage requirements.

~~j. Galvanized nails shall be hot-dipped or tumbled.~~

~~k~~ h. Staples shall have a minimum crown width of 7/16 inch and shall be installed with their crowns parallel to the long dimension of the framing members.

~~l~~ i. For shear loads of normal or permanent load duration as defined by the AF&PA NDS, the values in the table above shall be multiplied by 0.63 or 0.56, respectively.

6. Delete without substitution:

~~TABLE 2306.5~~
~~ALLOWABLE SHEAR FOR PARTICLEBOARD SHEAR WALL SHEATHING[b]~~

~~PANEL GRADE~~	~~MINIMUM NOMINAL PANEL THICKNESS (inch)~~	~~MINIMUM NAIL PENETRATION IN FRAMING (inches)~~	~~PANELS APPLIED DIRECT TO FRAMING~~				
			~~Nail size (common or galvanized box)~~	~~Allowable shear (pounds per foot) nail spacing at panel edges (inches)a~~			
				~~6~~	~~4~~	~~3~~	~~2~~
~~M-S "Exterior Glue" and M-2 "Exterior Glue"~~	~~3/8~~	~~11/2~~	~~6d~~	~~120~~	~~180~~	~~230~~	~~300~~
	~~3/8~~	~~11/2~~	~~8d~~	~~130~~	~~190~~	~~240~~	~~315~~
	~~1/2~~			~~140~~	~~210~~	~~270~~	~~350~~
	~~1/2~~	~~15/8~~	~~10d~~	~~185~~	~~275~~	~~360~~	~~460~~
	~~5/8~~			~~200~~	~~305~~	~~395~~	~~520~~

7. Revise as follows:

TABLE ~~2306.6~~ 2306.3(2)
ALLOWABLE SHEAR VALUES (plf) FOR WIND OR SEISMIC LOADING ON SHEAR WALLS OF FIBERBOARD SHEATHING BOARD CONSTRUCTION UTILIZING STAPLES FOR TYPE V CONSTRUCTION ONLY [a,b,c,d,e]

THICKNESS AND GRADE	FASTENER SIZE	ALLOWABLE SHEAR VALUE (pounds per linear foot) ~~NAIL~~ STAPLE SPACING AT PANEL EDGES (inches)[a]		
		4	3	2
1/2"' or 25/32" Structural	~~No. 11 gage galvanized roofing nail 1 1/2" long for 1/2", 1¾ for 25/32" with 3/8" head~~	~~170~~	~~230~~	~~260~~
	No. 11 gage galvanized staple, 7/16" crown[f]	150	200	225
	No. 11 gage galvanized staple, 1" crown[f]	220	290	325

(No change to footnote a)

b. Panel edges shall be backed with 2 inch or wider framing of Douglas fir-larch or Southern pine. For framing of other species: (1) Find specific gravity for species of framing lumber inAF&PANDS. (2) For staples, multiply the shear value from the table above by 0.82 for species with specific gravity of 0.42 or greater, or 0.65 for all other species. ~~(3) For nails, multiply the shear value from the table above by the following adjustment factor: specific gravity adjustment factor = [1-(0.5-SG)], where SG = Specific gravity of the framing lumber.~~

(No change to footnotes c through f)

TABLE ~~2306.7~~ 2306.3(3)
ALLOWABLE SHEAR VALUES FOR WIND OR SEISMIC FORCES FOR SHEAR WALLS OF LATH AND PLASTER OR GYPSUM BOARD WOOD FRAMED WALL ASSEMBLIES UTILIZING STAPLES

TYPE OF MATERIAL	THICKNESS OF MATERIAL	WALL CONSTRUCTION	~~FASTENER~~ STAPLE SPACING[b] MAXIMUM (inches)	SHEAR VALUE [a, e c] (plf)	MINIMUM ~~FASTENER~~ STAPLE SIZE [c,d,j,k f, g]
1. Expanded metal or woven wire lath and Portland cement plaster	7/8"	Unblocked	6	180	~~No. 11 gage 1 ½" long, 7/16" head~~ No. 16 gage galv. staple, 7/8" legs
~~2. Gypsum lath, plain or perforated with vertical joints staggered~~	~~3/8" lath and ½" plaster~~	~~Unblocked~~	~~5~~	~~180~~	~~No. 13 gage galv. 1 1/8" long, 19/64" head, plasterboard nail~~
3. Gypsum lath, plain or perforated	3/8" lath and 1/2" plaster	Unblocked	5	100	No. 16 gage galv. staple, 1 1/8" long, ~~0.120" nail, min. 3/8" head, 1 ¼" long~~
4. Gypsum board, gypsum veneer base or water-resistant gypsum backing board	½"	Unblocked [f d]	7	75	~~5d cooler (1 5/8" x 0.086") or wallboard 0.120" nail, min. 3/8" head, 1 ½" long~~ No. 16 gage galv. staple, 1 ½" long
		Unblocked [f d]	4	110	
		Unblocked	7	100	
		Unblocked	4	125	
		Blocked [g e]	7	125	
		Blocked [g e]	4	150	
		~~Unblocked~~	~~8/12[h]~~	~~60~~	~~No. 6 1 ½" screws[i]~~
		~~Blocked[g]~~	~~4/16[h]~~	~~160~~	
		~~Blocked[f,g]~~	~~4/12[h]~~	~~155~~	
		~~Blocked[g]~~	~~8/12[h]~~	~~70~~	
		~~Blocked[g]~~	~~6/12[h]~~	~~90~~	
	5/8"	Unblocked [f d]	7	115	~~6d cooler (1 7/8" x 0.092") or wallboard 0.120" nail, min 3/8" head, 1 ¾" long~~ No. 16 gage galv. staple, 1 ½" legs, 1 5/8" long
			4	145	
		Blocked [g e]	7	145	
			4	175	
		Blocked [g e] Two-ply	Base ply: 9 Face ply: 7	250	~~Base ply 6d cooler (1 7/8" x 0.092") or wallboard 1 ¾" x 0.120" nail, min. 3/8" head 1 5/8"~~ No. 16" gage galv. staple,1 5/8" long ~~Face ply 8d cooler (2 3/8" x 0.113") or wallboard 0.120" nail, min. 3/8" head, 2 3/8" long~~ No. 15 gage galv. staple, 2 ¼" long
		~~Unblocked~~	~~8/12[h]~~	~~70~~	~~No. 6 1 ¼" screws[i]~~
		~~Blocked~~	~~8/12[h]~~	~~90~~	

For SI: 1 inch =- 25.4 mm, 1 foot = 304.8 mm, 1 pound per foot = 14.59N/m.

a. These shear walls shall not be used to resist loads imposed by masonry or concrete walls (see ~~Section 4.1.5 of~~ AF&PA SDPWS). Values shown are for short-term loading due to wind or seismic load. Walls resisting seismic loads shall be subject to the limitations in Section 12.2.1 of ASCE 7. Values shown shall be reduced 25 percent for normal loading.

b. Applies to fastening at studs, top and bottom plates and blocking.

~~c. Alternate fasteners are permitted to be used if their dimensions are not less than the specified dimensions Drywall screws are permitted to substitute for the 5d (1-5/8" x 0.086") and 6d (1-7/8" x 0.092") (cooler) nails listed above, and No. 6-1 1/4 inch Type S or W screws for 6d (1-7/8" x 0.092") (cooler) nails.~~

~~d. For properties of cooler nails, see ASTM C 514.~~

~~e~~ c. Except as noted, shear values are based on a maximum framing spacing of 16 inches on center.

~~f~~ d. Maximum framing spacing of 24 inches on center.

~~g~~ e. All edges are blocked, and edge fastening is provided at all supports and all panel edges.

~~h. First number denotes fastener spacing at the edges; second number denotes fastener spacing at intermediate framing members.~~

~~i. Screws are Type W or S.~~

~~j~~ f. Staples shall have a minimum crown width of 7/16 inch, measured outside the legs, and shall be installed with their crowns parallel to the long dimension of the framing members.

~~k~~ g. Staples for the attachment of gypsum lath and woven-wire lath shall have a minimum crown width of 3/4 inch, measured outside the legs.

8. Delete without substitution:

~~**2306.4 Lumber sheathed shear walls.** Single and double diagonally sheathed lumber shear walls shall be designed and constructed in accordance with AF&PA SDPWS. Single and double diagonally sheathed lumber walls shall not be used to resist seismic forces in structures assigned to *Seismic Design Category* E or F.~~

~~**2306.5 Particleboard shear walls.** Particleboard shear walls shall be designed and constructed in accordance with AF&PA SDPWS. Particleboard shear walls shall be permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.5. Allowable capacities in Table 2306.5 are permitted to be increased 40 percent for~~

~~wind design. Particleboard shall not be used to resist seismic forces in structures assigned to *Seismic Design Category* D, E or F.~~

~~**2306.6 Fiberboard shear walls.** Fiberboard shear walls shall be designed and constructed in accordance with AF&PASDPWS. Fiberboard shear walls are permitted to resist horizontal forces, using the allowable shear capacities set forth in Table 2306.6. Allowable capacities in Table 2306.6 are permitted to be increased 40 percent for wind design. Fiberboard shall not be used to resist seismic forces in structures assigned to *Seismic Design Category* D, E or F.~~

~~**2306.7 Shear walls sheathed with other materials.** Shear walls sheathed with portland cement plaster, gypsum lath, gypsum sheathing or gypsum board shall be designed and constructed in accordance with AF&PA SDPWS. Shear walls sheathed with these materials p~~ are permitted to resist horizontal forces using the allowable shear capacities set forth in Table 2306.7. ~~Shear walls sheathed with portland cement plaster, gypsum lath, gypsum sheathing or gypsum board shall not be used to resist seismic forces in structures assigned to *Seismic Design Category* E or F.~~

9. Revise as follows:

2307.1 Load and resistance factor design. The ~~structural analysis~~ design and construction of wood elements and structures using *load and resistance factor design* shall be in accordance with AF&PA NDS and AF&PA SDPWS.

10. Delete without substitution:

~~**2307.1.1 Wood structural panel shear walls.** In *Seismic Design Category* D, E or F, where shear design values exceed 490 pounds per foot (7154 N/m), all framing members receiving edge nailing fastening from abutting panels shall not be less than a single 3-inch (76 mm) nominal member or two 2-inch (51 mm) nominal members fastened together in accordance with AF&PA NDS to transfer the design shear value between framing members. Wood structural panel joint and sill plate nailing shall be staggered at all panel edges. See Sections 4.3.6.1 and 4.3.6.4.3 of AF&PA SDPWS for sill plate size and anchorage requirements.~~

11. Revise as follows:

2308.11.2 Concrete or masonry. Concrete or masonry walls and stone or masonry veneer shall not extend above the basement.

Exceptions:

1. Stone and masonry veneer is permitted to be used in the first two stories above grade plane or the first three stories above grade plane where the lowest story has concrete or masonry walls in Seismic Design Category B, provided that structural use panel wall bracing is used, and the length of bracing provided is 1.5 times the required length as determined in Table 2308.9.3(1).
2. Stone and masonry veneer is permitted to be used in the first story above grade plane or the first two stories above grade plane where the lowest story has concrete or masonry walls in Seismic Design Category B or C.
3. Stone and masonry veneer is permitted to be used in both stories of buildings with two stories above grade plane in Seismic Design Categories B and C provided the following criteria are met:
   3.1. Type of brace per Section 2308.9.3 shall be Method 3 and the allowable shear capacity in accordance with ~~Table 2306.3~~ Section 2306.3 shall be a minimum of 350 plf (5108 N/m).
   3.2. Braced wall panels in the second story shall be located in accordance with Section 2308.9.3 and not more than 25 feet (7620 mm) on center, and the total length of braced wall panels shall be not less than 25 percent of the braced wall line length. Braced wall panels in the first story shall be located in accordance with Section 2308.9.3 and not more than 25 feet (7620 mm) on center, and the total length of braced wall panels shall be not less than 45 percent of the braced wall line length.
   3.3. Hold-down connectors shall be provided at the ends of each braced wall panel for the second story to first story connection with an allowable design of 2,000 pounds (907.0 kg). Hold-down connectors shall be provided at the ends of each braced wall panel for the first story to foundation connection with an allowable capacity of 3,900 pounds (1768 kg). In all cases, the hold down connector force shall be transferred to the foundation.
   3.4. Cripple walls shall not be permitted.

2308.12.2 Concrete or masonry. Concrete or masonry walls and stone or masonry veneer shall not extend above a basement.

Exception: Stone and masonry veneer is permitted to be used in the first story above grade plane in Seismic Design Category D provided the following criteria are met:

1. Type of brace in accordance with Section 2308.9.3 shall be Method 3 and the allowable shear capacity in accordance with ~~Table 2306.3~~ Section 2306.3 shall be a minimum of 350 plf (5108 N/m).
2. The bracing of the first story shall be located at each end and at least every 25 feet (7620 mm) o.c. but not less than 45 percent of the braced wall line.
3. Hold-down connectors shall be provided at the ends of braced walls for the first floor to foundation with an allowable capacity of 2,100 pounds (1768 kg).
4. Cripple walls shall not be permitted.

1704.6.1 High-load diaphragms. High-load diaphragms designed in accordance with ~~Table 2306.2.1(2)~~ Section 2306.2 shall be installed with special inspections as indicated in Section 1704.1. The special inspector shall inspect the wood structural panel sheathing to ascertain whether it is of the grade and thickness shown on the approved construction documents. Additionally, the special inspector must verify the nominal size of framing members at adjoining panel edges, the nail or staple diameter and length, the number of fastener lines and that spacing between fasteners in each line and at edge margins agrees with the approved construction documents.

Reason: This proposal coordinates provisions of the IBC with those in the AF&PA consensus standard, *Special Design Provisions for Wind and Seismic* (*SDPWS*).

Item 1 implements consistent use of the term "wood-frame" to describe shear walls and diaphragms in 2305 and adds a reference to *SDPWS* for determining deflection of wood-frame diaphragms and shear walls. Item 2 removes design information for nailed diaphragms and shear walls that is duplicated in *SDPWS*. Revised Sections 2306.2 and 2306.3 clarify that design and construction as well as limitations provided in *SDPWS* are applicable to use of allowable design values for stapled diaphragm and shear wall construction. Table numbers and footnotes are editorially revised to account for removal of allowable design values for nailed diaphragms and shear walls. Item 3, replaces references to a table with a reference to Section 2306.3 to address both stapled and nailed construction. Item 4, the reference to the allowable design value table is replaced by a reference to Section 2306.2 to address both stapled and nailed construction.

Cost Impact: No known impact.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FRANCIS-S4-2305.1

S209–09/10
2305.1.2 (New)

Proponent: James E. Russell, City of Palo Alto, representing self

Add new text as follows:

2305.1.2 Sill plate anchor bolts. For sill plates of 2x or 3x nominal thickness, the allowable lateral design strength for shear parallel to grain of sill plate anchor bolts is permitted to be determined using the lateral design value for a bolt attaching a wood sill plate to concrete, as specified in AF&PA NDS Table 11E, provided the anchor bolts comply with all of the following:

1. The maximum anchor bolt diameter is 5/8 inches (16 mm).
2. The anchor bolt is cast-in-place and embedded at least 7 inches (178 mm) into concrete.
3. The anchor bolt is located a minimum of 2-1/2 anchor diameters from any concrete edge that is parallel to the sill plate; and
4. The anchor bolt is located a minimum of 15 anchor diameters from any concrete edge that is perpendicular to the sill plate.

Reason: To clarify that the Section 1908.1.9 modifications to ACI 318 Section D.3.3 establishing shear capacity applicable to small diameter sill plate anchor bolts installed in concrete with certain minimum embedment, edge and end distances, permit the use of the lateral design value of the bolt attaching a wood sill plate to concrete, specified in AF&PA NDS Table 11E. The proposal that adds this information in Section 1908.1.9 specifically refers back to Section 2305, but currently Section 2305 does not contain any information about design of sill plate anchor bolts. Therefore this change is intended to make Section 2305 compatible with 1908.1.9 and to aid the code user by specifically explaining what the change in 1908.1.9 will allow.

Current design provisions require calculation of the capacity of sill plate anchor bolts using the provisions of ACI 318 Appendix D, however, those methods result in shear capacities far smaller than historical values using provisions of earlier codes and standards. Recent experiments specifically focused on this connection have revealed that the actual capacities exceed those historically used and support a return to determining

the sill bolt shear capacity based upon its capacity in the wood sill plate member. The experimental data supporting this proposal and a similar proposal to change 2009 IBC Section 1908.1.9, indicate that concrete failure modes do not control the capacity of these connections when certain embedment, edge and end distances are maintained. Therefore, it is proposed that Section 2305 clearly state that the minimum design capacity be based upon the lateral design value of the bolt attaching a wood sill plate to concrete, as determined using AF&PA NDS.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

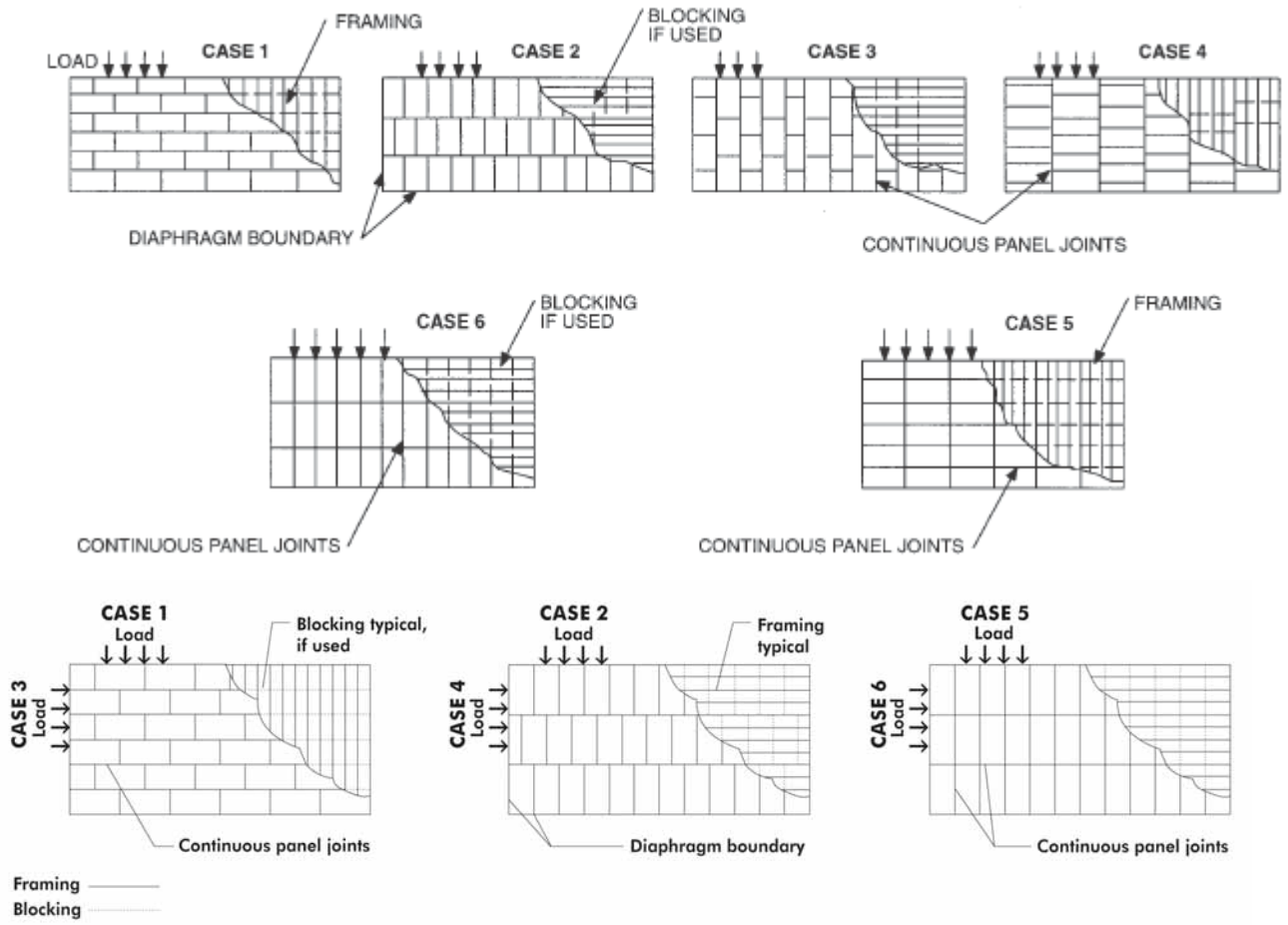
ICCFILENAME: RUSSELL-S1-2503.1.2

S210–09/10
Table 2306.2.1(1)

Proponent: Edward L. Keith, PE, APA - The Engineered Wood Association

TABLE 2306.2.1(1)
ALLOWABLE SHEAR (POUNDS PER FOOT) FOR WOOD STRUCTURAL PANEL DIAPHRAGMS WITH FRAMING OF DOUGLAS FIR-LARCH, OR SOUTHERN PINE[a] FOR WIND OR SEISMIC LOADING[h]

Delete and substitute as follows:



Reason: The existing drawings in the 2006 Code are difficult to understand; partially because of the quality of the drawing and because of the improper placement of the annotation lines. The proposed drawing was drawn at a higher resolution to better differentiate between blocking and framing members. A legend was added to assist the user and the annotation lies were more carefully placed. This proposal makes no technical changes to the code.

As the designer is going to be concerned with a specific diaphragm geometry with two loading cases for that diaphragm (one load for each orthogonal direction), we have shown the 3 diaphragm configurations represented by the old 6 figures and added the two appropriate cases for each configuration. We were also able to increase the size of the figure to make them easier to understand. No changes have been made to the case

numbers or table content. This provision just better matches the cases with the corresponding diaphragm configurations to simplify the use of the table.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KEITH-S3-TABLE 2306.2.1(1)

S211–09/10
2308.3.2, 2308.3.2.1 (New), 2308.3.2.2 (New), 2308.12.6

Proponent: Robert Rice, Grants Pass, representing Josephine County Building Safety and Southern Oregon Chapter International Code Council.

Revise as follows:

2308.3.2 Braced wall line connections. Wind and seismic lateral forces shall be transferred from the roof ~~roofs~~ and floor ~~floors~~ diaphragms to braced wall lines and from the braced wall lines in upper stories to the braced wall lines in the story below in accordance with ~~this section~~ Sections 2308.3.2.1 and 2308.3.2.2.

2308.3.2.1 Bottom plate connection. Braced wall line bottom plates shall be connected to joists or full-depth blocking below in accordance with Table 2304.9.1, Item 6, or to foundations in accordance with Section 2308.3.3.

2308.3.2.2 Top plate connection. Where joists or rafters are used, braced wall line top plates shall be fastened to joists, rafters or full-depth blocking above in accordance with Table 2304.9.1, Items 11, 12, 15 or 19 as applicable based on the orientation of the joists or rafters to the braced wall line. ~~Braced wall line bottom plates shall be connected to joists or blocking below in accordance with Table 2304.9.1, Item 6, or to foundations in accordance with Section 2308.3.3.~~ Blocking shall be a minimum of 2 inches (51 mm) nominal in thickness and equal to the depth of the joist or rafter at the wall line and shall be fastened to the braced wall line top plate as specified in Table 2304.9.1, Item 11.

Exception: Blocking at rafters need not be full depth when there are no braced wall lines above but shall extend to within 2 inches (51 mm) from the sheathing above.

At exterior gable end walls braced wall panel sheathing in the top *story* shall be extended and fastened to roof framing where the spacing between parallel exterior braced wall lines is greater than 50 feet (15240 mm).

~~Exception:~~ Where roof trusses are used and are installed perpendicular to an exterior braced wall line, lateral forces shall be transferred from the roof diaphragm to the braced wall by blocking of the ends of the trusses or by other *approved* methods providing equivalent lateral force transfer. Blocking shall be minimum 2 inch (51 mm) nominal thickness and equal to the depth of the truss at the wall line and shall be fastened to the braced wall line top plate as specified in Table 2304.9.1, Item 11

2308.12.6 Irregular structures. *Conventional light-frame construction* shall not be used in irregular portions of structures in *Seismic Design Category* D or E. Such irregular portions of structures shall be designed to resist the forces specified in Chapter 16 to the extent such irregular features affect the performance of the conventional framing system. A portion of a structure shall be considered to be irregular where one or more of the conditions described in Items 1 through 6 below are present.

1. Where exterior braced wall panels are not in one plane vertically from the foundation to the uppermost *story* in which they are required, the structure shall be considered to be irregular [see Figure 2308.12.6(1)].

   Exception: Floors with cantilevers or setbacks not exceeding four times the nominal depth of the floor joists [see Figure 2308.12.6(2)] are permitted to support braced wall panels provided:

   1. Floor joists are 2 inches by 10 inches (51mm by 254 mm) or larger and spaced not more than 16 inches (406 mm) o.c.
   2. The ratio of the back span to the cantilever is at least 2:1.
   3. Floor joists at ends of braced wall panels are doubled.

4. A continuous rim joist is connected to the ends of cantilevered joists. The rim joist is less than 0.058 inch (1.47 mm) (16 galvanized gage) and 11/2 inches (38 mm) wide fastened with six 16d common nails on each side. The metal tie shall have a minimum yield of 33,000 psi (227 MPa).
5. Joists at setbacks or the end of cantilevered joists shall not carry gravity loads from more than a single *story* having uniform wall and roof loads, nor carry the reactions from headers having a span of 8 feet (2438 mm) or more.

2. Where a section of floor or roof is not laterally supported by braced wall lines on all edges and connected in accordance with Section 2308.3.2, the structure shall be considered to be irregular [see Figure 2308.12.6(3)].

   Exception: Portions of roofs or floors that do not support braced wall panels above are permitted to extend up to 6 feet (1829 mm) beyond a braced wall line [see Figure 2308.12.6(4)] provided that the framing members are connected to the braced wall line below in accordance with Section 2308.3.2.

3. Where the end of a required braced wall panel extends more than 1 foot (305 mm)over an opening in the wall below, the structure shall be considered to be irregular. This requirement is applicable to braced wall panels offset in plane and to braced wall panels offset out of plane as permitted by the exception to Item 1 above in this section [see Figure 2308.12.6(5)].

   Exception: Braced wall panels are permitted to extend over an opening not more than 8 feet (2438 mm) in width where the header is a 4-inch by 12-inch (102 mm by 305 mm) or larger member.

4. Where portions of a floor level are vertically offset such that the framing members on either side of the offset cannot be lapped or tied together in an *approved* manner, the structure shall be considered to be irregular [see Figure 2308.12.6(6)].

   Exception: Framing supported directly by foundations need not be lapped or tied directly together.

5. Where braced wall lines are not perpendicular to each other, the structure shall be considered to be irregular [see Figure 2308.12.6(7)].

6. Where openings in floor and roof diaphragms having a maximum dimension greater than 50 percent of the distance between lines of bracing or an area greater than 25 percent of the area between orthogonal pairs of braced wall lines are present, the structure shall be considered to be irregular [see Figure 2308.12.6(8)].

Reason: This code section addresses the connection of braced wall lines to framing above and below to transfer lateral (wind and seismic) forces into the roof and floor diaphragms. This proposal does not add any new requirements. First, in Section 2308.3.2, this proposal separates the top plate connection requirements from the bottom plate connections for clarity. Secondly, in section 2308.12.6, a reference is added to point to the connection requirements in 2308.3.2.

Purpose: As currently written, the text of the code combines top plate and bottom plate connections in the same paragraph. Top plate connection requirements at roofs and ceilings are typically different than connections to floors above. At roofs, rafters or trusses are used and pose different challenges as opposed to flat floor joists. This proposal is intended to make the section read more clearly as well as arrange it to work with another proposal revising this section that will provide prescriptive solutions for connections at the top plate to the roof diaphragm when full-depth, solid blocking will not work or is impractical.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-S1-2308.3.2

S212–09/10
2308.3.2, Figure 2308.3.2(1) (New), Figure 2308.3.2(2) (New)

Proponent: Robert Rice, Grants Pass, OR, representing Josephine County Building Safety and Southern Oregon Chapter International Code Council.

Revise as follows:

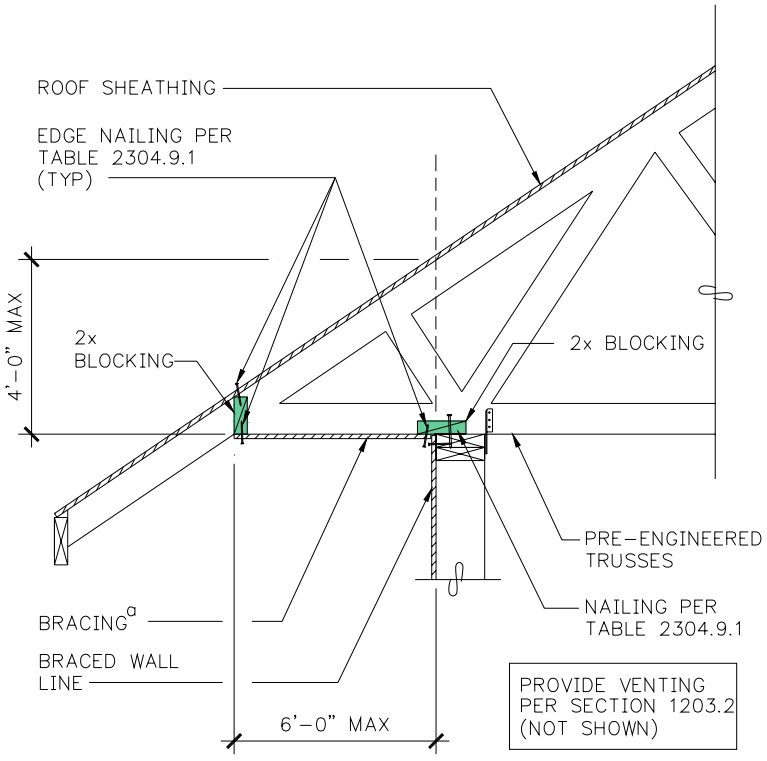
2308.3.2 Braced wall line connections. Wind and seismic lateral forces shall be transferred from the roofs and floors to braced wall lines and from the braced wall lines in upper stories to the braced wall lines in the story below in accordance with is section.

Braced wall line top plates shall be fastened to joists, rafters or full-depth blocking above in accordance with Table 2304.9.1, Items 11, 12, 15 or 19 as applicable based on the orientation of the joists or rafters to the braced wall line. Braced wall line bottom plates shall be connected to joists or blocking below in accordance with Table 2304.9.1, Item 6, or to foundations in accordance with Section 2308.3.3. At exterior gable end walls, braced wall panel sheathing in the top story shall be extended and fastened to roof framing where the spacing between parallel exterior braced wall lines is greater than 50 feet (15 240 mm).

~~**Exception:**~~ Where roof trusses are used and are installed perpendicular to an exterior braced wall line, lateral forces shall be transferred from the roof diaphragm to the braced wall by blocking of the ends of the trusses or by other approved methods providing equivalent lateral force transfer. Blocking shall be a minimum of 2 inches (51 mm) nominal in thickness and equal to the depth of the truss at the wall line and shall be fastened to the braced wall line top plate as specified in Table 2304.9.1, Item 11.

Exceptions:

1. For buildings that are classified as Seismic Design Category A, B or C and the basic wind speed is less than 100 mph (45 m/s) where the framing members are perpendicular to the wall line below and the distance from the top plate to the sheathing above is less than 9 1/4 inches (235 mm) solid blocking need not be provided when the perpendicular framing members or a parallel member such as a continuous rim joist or header is attached to the wall line in accordance with Table 2304.9.1.
2. Where the roof sheathing is greater than 9-1/4 inches (235 mm) above the top plate solid blocking is not required when the framing members are connected in accordance with one of the following methods:
   - 2.1 In accordance with Figure 2308.3.2 (1)
   - 2.2 In accordance with Figure 2308.3.2 (2)
   - 2.3 With full height engineered blocking panels designed for values listed in AF&PA WFCM.
   - 2.4 Designed in accordance with accepted engineering methods.

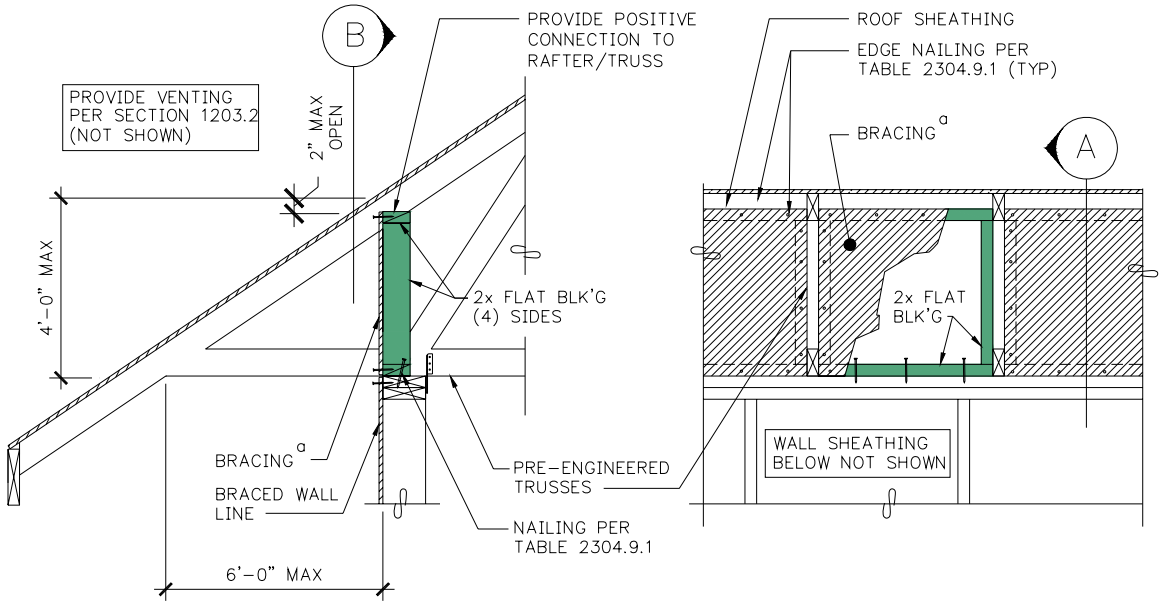


a. Methods of bracing shall be as described in Section 2308.9.3 method 2, 3, 4, 6, 7 or 8

A SECTION

For SI: 1 inch = 25.4 mm

FIGURE 2308.3.2 (1)
BRACED WALL PANEL TOP PLATE CONNECTION



For SI: 1 inch = 25.4 mm

FIGURE 2308.3.2 (2)
BRACED WALL PANEL TOP PLATE CONNECTION

Reason: The 2006 IBC had fairly clear wording that the diaphragms need to be connected to the braced wall lines. With the approval of proposal 2008/2009 S224 the 2009 language was modified to make the purpose even more clear in that the connection is required to resist wind and seismic (lateral) forces. This proposal merely provides prescriptive methods to accomplish the connection whether with solid blocking or when solid blocking doesn't work.

In addition, another proposal that I have submitted rearranges the existing section to separate top plate connections from bottom plate connections since roof connections at the top plate differ from conditions where there is floor framing above. The two proposals are intended to work together and are shown at the end of the purpose statement combined as one.

Purpose: The current text of the IBC states the intention of connecting the braced wall line to the roof or floor diaphragm above in section 2308.3.2. A similar version of this proposal was adopted as an Oregon amendment for the adoption of the 2006 IBC (and the recent adoption of the 2009 IBC) and has worked well. Since then, countless hours have gone into developing proposals for both the IRC and the IBC in the 2009 code development process. The proposal for the IRC (which was the main focus) was successful and was approved for the 2009 IRC. The details for that proposal are the same ones submitted for this proposal. During the process of resolving opposition and developing a consensus two main changes were made to the proposals. First, based on engineering reports and historical data, an exception was made for low heel connections (9 ¼") in lower wind and seismic zones to not require the blocking. Second, the details for the high-heel blocking was modified to allow a 2" gap at the top to allow for venting (again, backed up by engineering data). Following the approval for the 2009 IRC an article was published in the Spring 2009 issue of *Wood Design Focus* addressing the issue. The article, "*When is Roof Eave Blocking Required?", states, Because the 2006 IRC lacks clarity on when roof eave blocking is required for lateral force transfer, IRC users and code officials are forced to interpret its intent on a case by case basis, often with varied results." "Fortunately, Section R602.10.6.2 of the 2009 IRC provides a reasonable solution that addresses the above concerns, places reasonable limits on past successful practices, and avoids the pitfalls of the 2006 IRC…..".*

This proposal does not add additional requirements to the code. This proposal clarifies that the connection needs to occur and provides prescriptive solutions when solid blocking in not possible or is impractical.

Per accepted engineering practice for lateral design loads, the floor and roof diaphragms transmit wind and seismic loads into the braced walls (engineered shearwalls or prescriptive braced panels). The fact that the diaphragm needs to be connected to the braced wall line is often not fully understood by plans examiners, inspectors and contractors. The typical requirement that is intended by the code is that solid blocking occur at this connection with the blocking connected to the top plate of the wall to transfer the diaphragm (plf) force to the wall top plates. This is evidenced in the IBC by the exception to irregular structures stating, *"..lateral forces shall be transferred from the roof diaphragm to the braced wall by blocking of the ends of the trusses.."*. In order for the forces to be transferred there has to be a connection capable of transferring the diaphragm shear evenly to the top plates.

The condition that occurs at an increasing rate that brings this issue up is with cantilevered or high stub-heel trusses. In that construction method solid blocking (either with 2x or engineered wood products) is often not possible due to the height of the diaphragm above the top plate of the wall.

Without this clarification of the text it is a connection that may or may not occur based on what I have seen in the field and have discussed with code officials. The blocking that is called for in the code serves three functions. It provides closure to prevent animals, birds, etc. from entering the

attic space, it prevents the trusses or rafters from "rolling over" and it transfers the diaphragm forces to the wall. Most code officials, inspectors and contractors understand the first two objectives. However, the latter is a concept that is often not fully understood. This needs to be perceived, understood and implemented in a uniform way.

In addition, rather than identify a problem without providing a solution, my proposal includes two details to accomplish this connection simply. The solutions are, in principle, fundamentally extending the braced wall sheathing to the roof diaphragm either vertically in the truss bays or horizontally through the soffit. No engineering or testing is required since it is just completing the load path with the already defined sheathing and nailing.

Without prescriptive provisions in the current code this condition would require engineering or, as stated in 2308.3.2, Exception to item 1 "..by other approved methods." would be left up to the Authority Having Jurisdiction to determine what is acceptable without any guidance or uniformity between jurisdictions.

Typically, the engineering solution would provide details similar to those included in this proposal. Therefore, the solution and construction costs would not change. Costs would be reduced by eliminating additional costs for engineering where these prescriptive solutions work.

If approved, the two proposals I have submitted for section 2308.3.2 would read as shown below when combined:

2308.3.2 Braced wall line connections. Wind and seismic lateral forces shall be transferred from the roof and floor diaphragms to braced wall lines and from the braced wall lines in upper stories to the braced wall lines in the story below in accordance with this sections 2308.3.2.1 and 2308.3.2.2.
2308.3.2.1 Bottom plate connection. Braced wall line bottom plates shall be connected to joists or full depth blocking below in accordance with Table 2304.9.1, Item 6, or to foundations in accordance with Section 2308.3.3.
2308.3.2.2 Top plate connection. Where joists or rafters are used, braced wall line top plates shall be fastened to joists, rafters or full-depth blocking above in accordance with Table 2304.9.1, Items 11, 12, 15 or 19 as applicable based on the orientation of the joists or rafters to the braced wall line. Blocking shall be a minimum of 2 inches (51 mm) nominal in thickness and equal to the depth of the truss at the wall line and shall be fastened to the braced wall line top plate as specified in Table 2304.9.1, Item 11.

Exception: Blocking at rafters need not be full depth when there are no braced wall lines above but shall extend to within 2 inches (51mm) from the sheathing above.

At exterior gable end walls, braced wall panel sheathing in the top story shall be extended and fastened to roof framing where the spacing between parallel exterior braced wall lines is greater than 50 feet (15 240 mm).

Where roof trusses are used and are installed perpendicular to an exterior braced wall line, lateral forces shall be transferred from the roof diaphragm to the braced wall by blocking of the ends of the trusses or by other approved methods providing equivalent lateral force transfer. Blocking shall be a minimum of 2 inches (51 mm) nominal in thickness and equal to the depth of the truss at the wall line and shall be fastened to the braced wall line top plate as specified in Table 2304.9.1, Item 11.

Exceptions:

1. For Seismic Design Categories C and less and wind speed zones less than 100 mph where the rafters, joists or trusses are perpendicular to the wall line below and the distance from the top plate is less than 9 ¼ inches (235 mm) solid blocking need not be provided when the perpendicular framing members or a parallel member such as a continuous rim joist or header is attached to the wall line per Table 2304.9.1
2. Where the roof sheathing is greater than 9-1/4 inches (235 mm) above the top plate solid blocking is not required when the rafters, joists or trusses are connected in accordance with one of the following methods:
    1. In accordance with Figure 2308.3.2 (1)
    2. In accordance with Figure 2308.3.2 (2)
    3. With full height engineered blocking panels designed for values listed in American Forest and Paper Association (AF&PA) Wood Frame Construction Manual for One- and Two-Family Dwellings (WFCM).
    4. Designed in accordance with accepted engineering methods.

Bibliography: "When is Roof Eave Blocking Required*", by Jay H. Crandell, P.E., Robert Rice, Brian Foley, P.E., and Frank Woeste, PhD, P.E Volume 19, Number 1, Spring 2009 Wood Design Focus, a quarterly publication of Forest Products Society, Madison WI..*

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-S2-2308.3.2

S213–09/10
2308.9.2.3

Proponent: Edwin Huston, National Council of Structural Engineers Associations- Code Advisory Committee - General Requirements Subcommittee

Revise as follows:

2308.9.2.3 Nonbearing walls and partitions. In nonbearing walls and partitions, studs shall be spaced not more than ~~28~~ 24 inches (~~711~~ 609 mm) o.c. and in interior nonbearing walls and partitions, are permitted to be set with the long dimension parallel to the wall. Interior nonbearing partitions shall be capped with no less than a single top plate installed to provide overlapping at corners and at intersections with other walls and partitions. The plate shall be continuously tied at joints by solid blocking at least 16 inches (406 mm) in length and equal in size to the plate or by 1/2-inch by 11/2-inch (12.7 mm by 38 mm) metal ties with spliced sections fastened with two 16d nails on each side of the joint.

Reason: The ICC Structural Committee liked the idea of Code Change Proposal S228-07/08 but thought it was unclear. NCSEA was not the author of S228-07/08, but is now proposing a change to this section to address what we see as a potential safety concern for wind loading. Section 2308.9.2.3 allows 2x studs to be placed flat wise in a wall and be spaced at up to 28" oc. Table 2308.9.1 limits the height of edge wise studs in such a wall to 14 feet for 2x4 nonbearing walls, for example. Our Code Change Proposal is aimed at limiting this construction to interior walls. Tall flat wise stud construction is not appropriate for exterior walls which are subject to wind loads.

We are also recommending that the 28" spacing in Section 2308.9.2.3 should be changed to 24" oc. Table 2308.9.1 limits the maximum spacing of edge wise studs in all non-bearing walls to 24". Turning the stud and using it flat wise in the wall, should not let the stud spacing increase. We also note that in modern construction almost all wall framing is based on modules which fit within dimensions of 48" or 96". A spacing of 24" oc is a module of 48" and 96" but a spacing of 28" oc is not.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HUSTON-S1-2308.9.2.3

S214–09/10
2308.9.4; IRC R602.9

Proponent: Robert Rice, Grants Pass, representing Josephine County Building Safety and Southern Oregon Chapter International Code Council.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC-STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

2308.9.4 Cripple walls. Foundation cripple walls shall ~~be framed of studs~~ not be less in size than the required width of the studding above with a minimum length of 14 inches (356 mm), or the wall shall be framed of solid blocking or other approved method to prevent the studs from splitting. Where exceeding 4 feet (1219 mm) in height, such walls shall be framed of studs having the size required for an additional story.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R602.9 Cripple Walls. Foundation cripple walls shall be framed of studs not smaller than required size of the studding above. When exceeding 4 feet (1219 mm) in height, such walls shall be framed of studs having the size required for an additional story.

Cripple walls with a stud height less than 14 inches (356 mm) shall be sheathed on at least one side with a wood structural panel that is fastened to both the top and bottom plates in accordance with Table R602.3(1) or other approved method to prevent studs from splitting or the cripple walls shall be constructed of solid blocking. Cripple walls shall be braced as required for lateral loads per section R602.10.2 and R602.10.11.4 and supported on continuous foundations~~.~~

Reason: There are situations where the wall above is of studs larger than what would be required for structural reasons. In some cases it is to accommodate increased insulation or for tall walls. Typically, a 2x4 cripple wall is structurally sufficient even though the wall above may be 2x 6 for insulation reasons or 2x 8 for tall studs. The words "..required width…" would clear this up.

Regarding the 14" studs, this code section has been modified in the past by Oregon amendment and perhaps been misunderstood by others. The purpose for "Cripple walls with a stud height less than 14 inches…", to be sheathed does not relate to lateral bracing as the Oregon amendment implies,

For example, the Oregon amendment reads as follows:

> *Cripple walls with a stud height less than 14 inches (356 mm)* ***supporting exterior walls or an interior braced wall line which is supported by a continuous foundation as required by Section 602.10.9*** *shall be sheathed on at least one side with a wood structural panel that is fastened to both the top and bottom plates in accordance with Table R602.3(1), or the cripple walls shall be constructed of solid blocking.*

The intention of this code requirement is to ensure structural stability of walls with studs that are short enough to be susceptible to splitting. The 14" limit is due to the fact that, historically, up to 14" dimensional lumber was available to be used as solid blocking in lieu of the short studs. In addition, the proposal states, "or other approved method" since mechanical anchors are currently available that would allow the studs to be attached to the top and bottom plate without damaging the studs.

With the provision contained in R602.9, studs shorter than 14" can be used as long as sheathing is placed on one side of the wall to maintain the integrity of the studs and plates. The text continues, "...or the cripple walls shall be constructed of solid blocking." which would allow a number of

products, now available, to be used such as glue-laminated beams (GLB), laminated veneer lumber beams (LVL) or dimensional lumber such as 4x's and 6x's.

The IRC commentary states, "The minimum length of 14 inches for cripple wall studs provides sufficient clear space for required nailing of the framing". The IBC commentary states, "The minimum stud length of 14 inches is based on the length necessary to properly fasten the studs to the foundation wall plate and the double plate above."

In addition, "Section R602.9 Cripple Walls" appears in the wall "framing" portion of the code. Wall "bracing" begins to be addressed in section R602.10. In Section R602.10.2 "Cripple wall bracing" is addressed specifically.

In summary, section "R602.9 Cripple Walls" has nothing to do with lateral bracing.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-S-2308.9.4

S215–09/10
2308.12.4, Table 2308.12.4

Proponent: Ali M. Fattah, City of San Diego, Development Services Department, representing SD Area Chapter ICC Code Committee

Revise as follows:

2308.12.4 Braced wall line sheathing. Braced wall lines shall be braced by one of the types of sheathing prescribed by Table 2308.12.4 as shown in Figure 2308.9.3. The sum of lengths of braced wall panels at each braced wall line shall conform to the required percentage of wall length required to be braced per braced wall line in Table 2308.12.4. Braced wall panels shall be distributed along the length of the braced wall line and start at not more than 8 feet (2438 mm) from each end of the braced wall line. Panel sheathing joints shall occur over studs or blocking. Sheathing shall be fastened to studs, top and bottom plates and at panel edges occurring over blocking. Wall framing to which sheathing used for bracing is applied shall be nominal 2 inch wide [actual 11/2 inch (38 mm)] or larger members.

Cripple walls having a stud height exceeding 14 inches (356 mm) shall be considered a story for the purpose of this section and shall be braced as required for braced wall lines in accordance with the required percentage of wall length required to be braced per braced wall line in Table 2308.12.4. Where interior braced wall lines occur without a continuous foundation below, the length of parallel exterior cripple wall bracing shall be one and one-half times the lengths required by Table 2308.12.4. Where the cripple wall sheathing type used is Type S-W and this additional length of bracing cannot be provided, the capacity of Type S-W sheathing shall be increased by reducing the spacing of fasteners along the perimeter of each piece of sheathing to 4 inches (102 mm) o.c.

TABLE 2308.12.4
WALL BRACING IN SEISMIC DESIGN CATEGORIES D AND E
(Minimum Percentage ~~Length~~ of Wall Bracing per each ~~25 Linear Feet of~~ Braced Wall Line[a])

Condition	SHEATHING TYPE[b]	$S_{DS} < 0.50$	$0.50 \le S_{DS} < 0.75$	$0.50 \le S_{DS} \le 1.00$	$S_{DS} > 1.00$
One Story	G-P[c]	~~10 feet 8 inches~~ 43 %	~~14 feet 8 inches~~ 59 %	~~18 feet 8 inches~~ 75 %	~~25 feet 0 inches~~ 100 %
	S-W	~~5 feet 4 inches~~ 21 %	~~8 feet 0 inches~~ 32 %	~~9 feet 4 inches~~ 37 %	~~12 feet 0 inches~~ 48 %

(No change to footnotes)

Reason: This proposed change is to add clarity to the IBC. This is necessary to account for real world cases like a 20 ft by 20 ft building or a 40 ft by 40 ft building. This will also assist both the code official and designer to better visualize what the expected wall bracing pattern will appear to be as a percentage by showing the percentage of the wall that is required to be solid.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FATTAH-S1-2308.12.4

S216–09/10
Table 2308.12.4, 2308.12.4.1 (New)

Proponent: Gregory Mahoney, City of Davis Community Development Department, representing Sacramento Valley Association of Building Officials

1. Add new text as follows:

2308.12.4.1 Alternative bracing. An alternate braced wall panel constructed in accordance with Section 2308.9.3.1 or 2308.9.3.2 is permitted to be substituted for a braced wall panel in Section 2308.9.3 Items 2 through 8. For methods 2, 3, 4, 6, 7 and 8 each 48 inch (1219 mm) section or portion thereof required by Table 2308.12.4 is permitted to be replaced by one alternate braced wall panel constructed in accordance with Section 2308.9.3.1 or 2308.9.3.2. For method 5 each 96 inch (2438 mm) section (applied to one face) or 48 inch (1219 mm) section (applied to both faces) or portion thereof required by Table 2308.12.4 is permitted to be replaced by one alternate braced wall panel constructed in accordance with Section 2308.9.3.1 or 2308.9.3.2.

2. Revise as follows:

TABLE 2308.12.4
WALL BRACING IN SESIMIC DESIGN CATEGORIES D AND E
(Minimum Length of Wall Bracing per each 25 Linear Feet of Braced Wall Line[a])
(No change to table entries

a. Minimum length of panel bracing of one face of the wall for S-W sheathing or both faces of the wall for G-P sheathing; h/w ratio shall not exceed 2:1. For S-W panel bracing of the same material on two faces of the wall, the minimum length is permitted to be one-half the tabulated value but the h/w ratio shall not exceed 2:1 and design for uplift is required. The 2:1 h/w ratio limitation does not apply to alternate braced wall panels constructed in accordance with Section 2308.9.3.1 or 2308.9.3.2.

(No change to footnotes b and c)

Reason: Sections 2308.9.3.1 and 2308.9.3.2 provide for the substitution of braced wall panels listed in 2308.9.3 with Alternative bracing (2308.9.3.1) or Alternate bracing wall panels (2308.9.3.2). Section 2308.12 specifies additional requirements governing the use of braced wall panels constructed in accordance with 2308.9.3 in Seismic Design Categories D and E. The code is not clear regarding the use of alternate braced wall panels constructed in accordance with 2308.9.3.1 or 2308.9.3.2 in Seismic Design Categories D and E.

The purpose of this addition is to clarify that alternate braced wall panels may be substituted for braced wall panels in Seismic Design Categories D and E. In addition the proposed code addition further clarifies that an alternate brace wall panel is equal to one section of brace wall panel or portion thereof when used in Seismic Design Categories D and E.

So if Table 2308.12.4 requires 5'4" of S-W braced wall panel then that section of wall could be replaced by 2 alternate braced wall panels. If Table 2308.12.4 required 8' of S-W braced wall panels then the section of wall could also be replaced by 2 alternate braced wall panels.

The second part of the proposed change is a clarification of Footnote a to Table 2308.12.4. Footnote a to Table 2308.12.4 indicates that the h/w ratio shall not exceed 2:1. Table 2308.12.4 is based on Table 12.4-2 of the 2003 NEHRP Provisions. The NEHRP commentary suggests that the primary concern in limiting the height-to-width is to limit the overturning demand on braced wall panels due to the lack of overturning restraint. However, the NEHRP provisions do not include or address alternative braced wall panels. Since alternate braced wall panels incorporate overturning restraint devices, they should not be subject to the 2:1 limit.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: MAHONEY-S1-T2308.12.4

S217–09/10
2406.1

Proponent: Don Davies representing Utah Chapter of ICC

Revise as follows:

2406.1 Human impact loads. Individual glazed areas, including glass mirrors, in hazardous locations as defined in Section 2406.4 shall comply with Sections 2406.1.1 through 2406.1.4. Wired glass is not permitted in any of the locations where safety glazing is required in Section 2406.4.

Reason: The process of removing wired glazing from hazardous locations has taken several years and has involved changes to both sections 715.5 and 2406.1. Some confusion in Section 715 has been cleared up in the 2009 I.B.C. in sections 715.4.7.4 and 715.5.3 which both reference to chapter 24 for safety glazing. The bottom line is that wired glass is not allowed in those locations. When one turns to chapter 24 it is still unclear to the first time user of the code that wired glass is no longer allowed when a fire-protection rating is required. In the 2006 commentary to I.B.C.

Section 715.4.6.4 second paragraph on page 7-94 it states “Code users should be very aware of the change that first occurred in Chapter 24 of the 2006 code. Earlier editions of the code permitted wired glass to meet a lower level of impact resistance”. Changes to Chapter 24 relating to this issue even go back to the 2003 edition of the I.B.C. where only Group E occupancies were identified as locations where wired glass could not be used in Section 2406.1.2. In the 2006 code the reference to wired glass in 2406.1 has been removed leading one to surmise that it is no longer addressed in the code at that location. The current code user shouldn’t have to refer to two previous editions of the code to determine how the current code addresses an issue. The current code should stand on its own and be a straight forward document stating what is allowed and what is not. The convoluted path listing test and standards mean nothing to the typical code user. This item is too important to miss due to an oversight.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Davies-S1-2406.1

S218–09/10

2406.1, 2106.4, 2406.4.1, 2406.4.2 (New), 2406.4.3 (New), 2406.4.4 (New), 2406.4.5 (New), 2406.4.6 (New), 2406.4.7 (New); IRC R308.4, R308.4.1 (New), R308.4.2 (New), R308.4.3 (New), R308.4.4 (New), R308.4.5 (New), R308.4.6 (New), R308.4.7 (New)

Proponent: Roger R. Evans, Park City Municipal Corporation, representing Utah Chapter of Building Officials

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

2406.1 Human impact loads. Individual glazed areas, including glass mirrors, in hazardous locations as defined in Section 2406.4 shall comply with Sections 2406.1.1 through 2406.1.4.

Exception: Mirrors and other glass panels mounted or hung on a surface that provides a continuous backing support.

2406.4 Hazardous locations. The ~~following~~ locations specified in Sections 2306.4.1 through 2406.4.7 shall be considered specific hazardous locations requiring safety glazing materials.~~:~~

1. ~~Glazing in swinging doors except jalousies (see Section 2406.4.1).~~
2. ~~Glazing in fixed and sliding panels of sliding door assemblies and panels in sliding and bifold closet door assemblies.~~
3. ~~Glazing in storm doors.~~
4. ~~Glazing in unframed swinging doors.~~
5. ~~Glazing in doors and enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers. Glazing in any portion of a building wall enclosing these compartments where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) above a standing surface.~~

2406.4.1 Glazing in doors. Glazing in all fixed and operable panels of swinging, sliding, and bifold doors shall be considered a hazardous location.

Exceptions:

1. Glazed openings of a size through which a 3-inch diameter (76 mm) sphere is unable to pass.
2. Decorative glazing.
3. Glazing materials used as curved glazed panels in revolving doors.
4. Commercial refrigerated cabinet glazed doors.

~~6.~~ **2406.4.2 Glazing adjacent doors**. Glazing in an individual fixed or operable panel adjacent to a door where the nearest ~~exposed~~ vertical edge of the glazing is within a 24-inch (610 mm) arc of either vertical edge of the door in a closed position and where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) above the walking surface shall be considered a hazardous location.

Exceptions:

1. Decorative glazing.
2. ~~Panels where~~ When there is an intervening wall or other permanent barrier between the door and glazing.
3. Where access through the door is to a closet or storage area 3 feet (914 mm) or less in depth. Glazing in this application shall comply with Section ~~2406.4, Item 7~~ 2406.4.3.
4. Glazing in walls ~~perpendicular to the plane of the door in a closed position, other than the wall towards which the door swings when opened,~~ on the latch side of and perpendicular to the plane of the door in a closed position in one- and two-family *dwellings* or within *dwelling units* in Group R-2.
5. Glazing that is adjacent to the fixed panel of patio doors.

~~7.~~ **2406.4.3 Glazing in windows.** Glazing in an individual fixed or operable panel~~, other than in those locations described in preceding Items 5 and 6, which~~ that, meets all of the following conditions shall be considered a hazardous location:

~~7.~~1. ~~Exposed~~ The exposed area of an individual pane is greater than 9 square feet (0.84 m^2);
~~7.~~2. ~~Exposed~~ The bottom edge of the glazing is less than 18 inches (457 mm) above the floor;
~~7.~~3. ~~Exposed~~ The top edge of the glazing is greater than 36 inches (914 mm) above the floor; and
~~7.~~4. One or more walking surface(s) are within 36 inches (914 mm), measured horizontally ~~of the plane~~ and in a straight line, of the glazing.

Exceptions: ~~Safety glazing for Item 7 is not required for the following installations:~~

~~1. A protective bar 11/2 inches (38 mm) or more in height, capable of withstanding a horizontal load of 50 pounds plf (730 N/m) without contacting the glass, is installed on the accessible sides of the glazing 34 inches to 38 inches (864 mm to 965 mm) above the floor.~~

1. Decorative glazing.
2. When a horizontal rail is installed on the accessible side(s) of the glazing 34 to 38 inches above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot (730 N/m) without contacting the glass and be a minimum of 1½ inches (38 mm) in cross sectional height.
~~2~~3. ~~The outboard~~ Outboard panes in insulating glass units or multiple glazing where the bottom exposed edge of the glass is 25 feet (7620 mm) or more above any grade, roof, walking surface or other horizontal or sloped (within 45 degrees of horizontal) (0.78 rad) surface adjacent to the glass exterior.

~~8.~~ **2406.4.4 Glazing in guards and railings.** Glazing in guards and railings, including structural baluster panels and nonstructural in-fill panels, regardless of area or height above a walking surface shall be considered a hazardous location.

~~9. Glazing in walls and fences enclosing indoor and outdoor swimming pools, hot tubs and spas where all of the following conditions are present:~~

~~9.1. The bottom edge of the glazing on the pool or spa side is less than 60 inches (1524 mm) above a walking surface on the pool or spa side of the glazing; and~~

~~9.2. The glazing is within 60 inches (1524 mm) horizontally of the water's edge of a swimming pool or spa.~~

2406.4.5 Glazing and wet surfaces. Glazing in walls, enclosures or fences containing or facing hot tubs, spas, whirlpools, saunas, steam rooms, bathtubs, showers and indoor or outdoor swimming pools where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) measured vertically above any standing or walking surface shall be considered a hazardous location. This shall apply to single glazing and all panes in multiple glazing.

Exception: Glazing that is more than 60 inches (1524 mm), measured horizontally and in a straight line, from the water's edge of a bathtub, hot tub, spa, whirlpool, or swimming pool.

~~10.~~ **2406.4.6 Glazing adjacent stairs and ramps.** Glazing ~~adjacent to~~ where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) above the plane of the adjacent walking surface of stairways, landings between flights of stairs, and ramps shall be considered a hazardous location ~~within 36 inches (914 mm) horizontally of a walking surface; when the exposed surface of the glass is less than 60 inches (1524 mm) above the plane of the adjacent walking surface~~.

Exceptions:

1. The side of a stairway, landing or ramp which has a guard complying with the provisions of Sections 1013 and 1607.7, and the plane of the glass is greater than 18 inches (457 mm) from the railing.
2. Glazing 36 inches (914 mm) or more measured horizontally from the walking surface.

~~11.~~ **2406.4.7 Glazing adjacent the bottom stair landing.** ~~Glazing adjacent to *stairways* within 60 inches (1524 mm) horizontally of the bottom tread of a *stairway* in any direction when the exposed surface of the glass is less than 60 inches (1524 mm) above the nose of the tread.~~ Glazing adjacent the landing at the bottom of a stairway where the glazing is less than 36 inches (914 mm) above the landing and within 60 inches (1524 mm) horizontally of the bottom tread shall be considered a hazardous location.

Exception: ~~Safety glazing for Item 10 or 11 is not required for the following installations where:~~

1. The ~~side of a stairway, landing or ramp which has~~ glazing is protected by a guard ~~or handrail, including balusters or in-fill panels,~~ complying with ~~the provisions of~~ Sections 1013 and 1607.7~~;~~ and ~~2. The~~ the plane of the glass is greater than 18 inches (457 mm) from the ~~railing~~ guard.

~~**2406.4.1 Exceptions.** The following products, materials and uses shall not be considered specific hazardous locations:~~

1. ~~Openings in doors through which a 3-inch (76 mm) sphere is unable to pass.~~
2. ~~Decorative glass in Section 2406.4, Item 1, 6 or 7.~~
3. ~~Glazing materials used as curved glazed panels in revolving doors.~~
4. ~~Commercial refrigerated cabinet glazed doors.~~
5. ~~Glass-block panels complying with Section 2101.2.5.~~
6. ~~Louvered windows and jalousies complying with the requirements of Section 2403.5.~~
7. ~~Mirrors and other glass panels mounted or hung on a surface that provides a continuous backing support.~~

PART II – IRC BUILDING/ENERGY

Revise as follows:

R308.4 Hazardous locations. The ~~following~~ locations specified in Sections R308.4.1 through R308.4.7 shall be considered specific hazardous locations for the purposes of glazing:

~~1.~~ **R308.4.1 Glazing in doors.** Glazing in all fixed and operable panels of swinging, sliding and bifold doors shall be considered a hazardous location.

Exceptions:

1. Glazed openings of a size through which a 3-inch diameter (76 mm) sphere is unable to pass.
2. Decorative glazing.

~~2.~~ **R308.4.2 Glazing adjacent doors.** Glazing in an individual fixed or operable panel adjacent to a door where the nearest vertical edge of the glazing is within a 24-inch (610 mm) arc of either vertical edge of the door in a closed position and ~~whose~~ where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) above the floor or walking surface shall be considered a hazardous location.

Exceptions:

1. Decorative glazing.
2. When there is an intervening wall or other permanent barrier between the door and the glazing.
3. Glazing in walls on the latch side of and perpendicular to the plane of the door in a closed position.
4. ~~Glazing adjacent to a door where~~ Where access through the door is to a closet or storage area 3 feet (914 mm) or less in depth. Glazing in this application shall comply with section R308.4.3.
5. Glazing that is adjacent to the fixed panel of patio doors.

~~3.~~ **R308.4.3 Glazing in windows.** Glazing in an individual fixed or operable panel that meets all of the following conditions shall be considered a hazardous location:

~~3.1.~~1. The exposed area of an individual pane is larger than 9 square feet (0.836 m2); and
~~3.2.~~2. The bottom edge of the glazing is less than 18 inches (457 mm) above the floor; and
~~3.3.~~3. The top edge of the glazing is more than 36 inches (914 mm) above the floor; and
~~3.4.~~4. One or more walking surfaces are within 36 inches (914 mm), measured horizontally and in a straight line, of the glazing.

Exceptions:

1. Decorative glazing.
2. When a horizontal rail is installed on the accessible side(s) of the glazing 34 to 38 inches (864 to 965) above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot (730 N/m) without contacting the glass and be a minimum of 11/2 inches (38 mm) in cross sectional height.
3. Outboard panes in insulating glass units and other multiple glazed panels when the bottom edge of the glass is 25 feet (7620 mm) or more above grade, a roof, walking surfaces or other horizontal [within 45 degrees (0.79 rad) of horizontal] surface adjacent to the glass exterior.

~~4.~~ **R308.4.4 Glazing in guards and railings.** ~~All glazing in railings regardless of area or height above a walking surface. Included are structural baluster panels and nonstructural infill panels.~~ Glazing in guards and railings, including structural baluster panels and nonstructural in-fill panels, regardless of area or height above a walking surface shall be considered a hazardous location.

~~5. Glazing in enclosures for or walls facing hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) measured vertically above any standing or walking surface.~~

~~**Exception:** Glazing that is more than 60 inches (1524 mm) measured horizontally and in a straight line, from the waters edge of a hot tub, whirlpool or bathtub.~~

~~6. Glazing in walls and fences adjacent to indoor and outdoor swimming pools, hot tubs and spas where the bottom edge of the glazing is less than 60 inches (1524 mm) above a walking surface and within 60 inches (1524 mm), measured horizontally and in a straight line, of the water's edge. This shall apply to single glazing and all panes in multiple glazing.~~

R308.4.5 Glazing and wet surfaces. Glazing in walls, enclosures or fences containing or facing hot tubs, spas, whirlpools, saunas, steam rooms, bathtubs, showers and indoor or outdoor swimming pools where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) measured vertically above any standing or walking surface shall be considered a hazardous location. This shall apply to single glazing and all panes in multiple glazing.

Exception: Glazing that is more than 60 inches (1524 mm), measured horizontally and in a straight line, from the water's edge of a bathtub, hot tub, spa, whirlpool, or swimming pool.

~~7.~~ **R308.4.6 Glazing adjacent stairs and ramps.** Glazing ~~adjacent to~~ where the bottom exposed edge of the glazing is less than 36 inches (914 mm) above the plane of the adjacent walking surface of stairways, landings between flights of stairs, and ramps shall be considered a hazardous location ~~within 36 inches (914 mm) horizontally of a walking surface when the exposed surface of the glazing is less than 60 inches (1524 mm) above the plane of the adjacent walking surface~~.

Exceptions:

1. When a rail is installed on the accessible side(s) of the glazing 34 to 38 inches (864 to 965 mm) above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot (730 N/m) without contacting the glass and be a minimum of 11/2 inches (38 mm) in cross sectional height.
2. Glazing 36 inches (914 mm) or more measured horizontally from the walking surface.
~~2. The side of the stairway has a guardrail or handrail, including balusters or in-fill panels, complying with Sections R311.7.6 and R312 and the plane of the glazing is more than 18 inches (457 mm) from the railing; or~~
~~3. When a solid wall or panel extends from the plane of the adjacent walking surface to 34 inches (863 mm) to 36 inches (914 mm) above the walking surface and the construction at the top of that wall or panel is capable of withstanding the same horizontal load as a guard.~~

~~8.~~ **R308.4.7 Glazing adjacent the bottom stair landing.** ~~Glazing adjacent to stairways within 60 inches (1524 mm) horizontally of the bottom tread of a stairway in any direction when the exposed surface of the glazing is less than 60 inches (1524 mm) above the nose of the tread.~~ Glazing adjacent the landing at the bottom of a stairway where the glazing is less than 36 inches (914 mm) above the landing and within 60 inches (1524 mm) horizontally of the bottom tread shall be considered a hazardous location.

Exceptions~~:~~:

1. ~~1.~~ The ~~side of the stairway has~~ glazing is protected by a guard~~rail or handrail, including balusters or in-fill panels~~, complying with Section~~s R311.7.6 and~~ R312 and the plane of the glass is more than 18 inches (457 mm) from the ~~railing; or~~ guard.
2. ~~2. When a solid wall or panel extends from the plane of the adjacent walking surface to 34 inches (864 mm) to 36 inches (914 mm) above the walking surface and the construction at the top of that wall or panel is capable of withstanding the same horizontal load as a guard.~~

Reason:
PART I- This code change was submitted for the IRC in Palm Springs. While the Committee said they supported the change, they said that the proposal should include the IBC for consistency. There is a companion code change submitted for the IRC. The main purpose of this code change is to eliminate conflicts, create consistency, and ease the use of the safety glazing requirements. Following is a point by point explanation of the changes.

The Exception to Section 2406.1 is relocated from 2406.4.1

Items 1-4 are combined into Section 2406.4.1 and item 5 is relocated to Section 2406.4.5.

Exception 1 to Section 2406.4.2 is from 2406.4.1 and exceptions 4 & 5 provide consistency with the IRC.

Editorial revision in Section 2406.4.3 removes unnecessary language.

Exception 1 to Section 2406.4.3 is from 2406.4.1. Exception 2 is for consistency w/IRC. "Protective bar" implies evaluation by the BO that the "bar" meets certain safety standards. The language already provides a minimum size and rigidity which is sufficient.

Section 2406.4.5 combines all of the language related to hazardous glazing adjacent water, eliminates conflicting or confusing language, and eases interpretation. It also addresses the issue of glazing adjacent a freestanding bathtub by treating it the same as a hot tub, spa or whirlpool. Consistency with the IRC/IBC.

Section 2406.4.6 is largely editorial however there is a difference between the IRC and IBC in that the IRC exempts safety glazing if the glass is in a wall and 34 to 38 inches above the walking surface. No such exception occurs in the IBC so 60 inches is the rule. Exception one is repeated from current item #11. Reference to a handrail with balusters (a guard) is deleted.

(2406.4.7) While the current text says "stairways", clearly what is being regulated is the bottom landing because of the use of the term "horizontally of the bottom tread.. Exception 2 provides the basis for the least restrictive scenario, that being a wall with glazing 34-38 inches above the walking surface.

PART II- This code change was submitted for the IRC in Palm Springs. While the Committee said they supported the change, they said that the proposal should include the IBC for consistency. There is a companion code change submitted for the IBC. The main purpose of this code change is to eliminate conflicts, create consistency, and ease the use of the safety glazing requirements. Following is a point by point explanation of the changes.

Safety glazing requirements have been placed in separate sections, R308.4.1 through R308.4.7, with descriptive titles to aid in use of the code.

R308.4.2 and R308.4.4 are revised for consistency w/IBC

R308.4.5 combines all of the language related to hazardous glazing adjacent water, eliminates conflicting or confusing language, and eases interpretation. It also addresses the issue of glazing adjacent a freestanding bathtub by treating it the same as a hot tub, spa or whirlpool and provides consistency with the IBC.

R308.4.6 is largely editorial but permits unprotected glazing within 36 inches horizontally of the plane of the walking surface. Exception 3 reduces the height when safety glazing is required from 60 inches to 34-38 inches if the glazing is in a wall or panel. Since glazing usually means windows and since windows are typically in a wall, the exception is most always the rule. It is puzzling that such a wall would have an upper limit. Does the glazing become hazardous again if the wall is 40 inches high? An average of 36 inches was chosen as the minimum height for the wall consistent with the height of a guard. Exception 1 exempts safety glazing if a rail is installed 34 to 38 inches high regardless of whether or not there are balusters or in-fill panels and without regard to the proximity of the glass. Since this is the least restrictive exception, it makes no sense to require glazing to be 18 inches from a guard or to require a guard have balusters or in-fill panels in Exception 2. Exception 3 language is incorporated into the main section since the standard installation is for the window to be installed in a wall. This exception says if a wall places the window 34 to 38 inches above the walking surface safety glazing is not required. There is no legitimate reason to have an upper limit.

(R308.4.7) While the current text says "stairways", clearly what is being regulated is the bottom landing because of the use of the term "horizontally of the bottom tread. Exception 2 provides the basis for the least restrictive scenario, that being a wall with glazing 34-38 inches above the walking surface and is incorporated into the main section since the standard installation is for the window to be installed in a wall. The exception says if a wall places the window 34 to 38 inches above the walking surface safety glazing is not required. There is no legitimate reason to have an upper limit.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EVANS-S1-2406.

S219–09/10
2406.2; IRC R308.3.1

Proponent: William E. Koffel, Koffel Associates, Inc., representing Glazing Industry Code Committee

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC STRUCTURAL

Revise as follows:

2406.2 Impact Test. Where required by other sections of this code, glazing shall be tested in accordance with CPSC 16 CFR 1201. Glazing shall comply with the test criteria for Category ~~I or~~ II ~~as,~~ unless otherwise indicated in Table 2406.2(1)

> **Exception:** Glazing not in doors or enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers shall be permitted to be tested in accordance with ANSI Z97.1. Glazing shall comply with the test criteria for Class A ~~or B as~~ , unless otherwise indicated in Table 2406.2(2).

PART II – IRC BUILDING/ENERGY

Revise as follows:

R308.3.1 Impact Test. Where required by other sections of this code, glazing shall be tested in accordance with CPSC 16 CFR 1201. Glazing shall comply with the test criteria for Category ~~I or~~ II ~~as,~~ unless otherwise indicated in Table R308.3.1(1).

> **Exception:** Glazing not in doors or enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers shall be permitted to be tested in accordance with ANSI Z97.1. Glazing shall comply with the test criteria for Class A ~~or B as~~ , unless otherwise indicated in Table R308.3.1(2).

Reason: Not all of the hazardous locations are indicated in the Table and as such the performance or test criteria for the safety glazing are not specified in the Code. The proposal uses the higher test criteria as the default value and the Table relaxes the requirement for specific applications.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KOFFELL-S2-2406.2

S220–09/10
2406.4

Proponent: John D. McGee, Binswanger Glass Training Center, representing self

Revise as follows:

2406.4 Hazardous locations. The following shall be considered specific hazardous locations requiring safety glazing materials:

(No change to items 1 through 11)

12. Ceiling mounted glass mirrors panels shall be no larger than 18 square feet (1.672 m^2), shall have CPSC 16 CFR 1201 Category II safety backing applied to back of mirror, and shall apply for annealed, heat strengthened, or tempered glass mirrors. Both adhesive fastening and mechanical retention systems shall be used for all ceiling-mounted glass mirrors. Substrate and mechanical fasteners shall be of suitable strength to support a 4:1 ratio of the weight of the mirror. Design by a registered design professional shall be provided where required by the Building Official. The adhesive shall be applied in accordance with the manufacturer's instructions and the mechanical fastener or retainer shall capture a minimum glass bite of ½-inch (12.7 mm) on all mirror edges. Where rosette-type fasteners are used, holes shall be no closer to the mirror edge than the mirror thickness plus ¼-inch (6.4 mm). All holes drilled into the mirror (i.e., screws, light fixtures, etc.) shall have adequate radius to prevent stress cracks. Screw- and bolt-type fasteners shall be of stainless steel.

Reason: With over 100 nationwide locations, Binswanger Glass regularly receives numerous requests to mount mirrors on ceilings, which is an extremely dangerous practice. The ICC indicates no code exists to address this application, even though poorly mounted ceiling mirrors can kill if they fall off. The revision indicated above is only a starting point for council consideration; detailed assessment by other glazing specialists is urged.

Cost Impact: Variable based on glass thickness.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCGEE-S1-2406.4.DOC

S221–09/10
2407.1.1

Proponent: Thomas B. Zuzik Jr., Artistic Railing Inc., representing self

Revise as follows:

2407.1.1 Loads. The glass ~~panels and their support system~~ shall be designed to withstand the loads specified in Sections 1607.7.1 and 1607.7.1.2. ~~1607.7.~~ A safety factor of four shall be used.

Reason: I am requesting that 2407.1.1 be revised to more clearly define which loads the glass is required to meet when glass is used in guards or handrails. Currently 2407.1.1 states that the glass be DESIGNED to withstand the loads of 1607.7, however 1607.7.1.2 is not directly a design load, but arguably a test load, as the text states "shall be able to resist" without the notation requirement of design.

"**1607.7.1.1 Concentrated load.** Handrails and *guards* **SHALL BE ABLE** to **RESIST A SINGLE CONCENTRAITED LOAD OF 200 POUNDS…"**

Further more the 2006 IBC commentary for section 2407.1.1 states in the last sentence " It is not intended that an in-place glass guard or handrail system be tested for or capable of withstanding four times the design load"

This confusion with the current language in 2407.1.1 brings forth the question is the code directing us to use only the loads in 1607.7 that are design loads?

The intent is a four times design load as 1607.7.1 directs the reader to section 2407 when glass is part of a guard or handrail system. The four times safety factor would require the guard or handrail to be designed to resist a 200 plf (0.73 kN/m) rather than the set 50 plf. However, 1607.7.1.2 which notes a 200 pound concentrated would be elevated to a 800 pound load which is not an intended requirement.

The removal of the language "panels and their support system" from the text is redundant and not needed as the glass is required to meet the loads and when installed section 1607.7.1 requires the loads to be transfer through the support structure.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ZUZIK-S1-2407.1.1

S222–09/10
Figure 721.5.1(2), Figure 721.5.1(3), Table 2506.2, Table 2507.2; IRC R702.2.1, R702.2.2, R702.3.1

Proponent: Michael Gardner, representing Gypsum Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I- IBC STRUCTURAL

1. Revise as follows:

FIGURE 721.5.1(2)
GYPSUM WALLBOARD PROTECTED
STRUCTURAL STEEL COLUMNS WITH SHEET STEEL
(No change to figure)

2. Type X gypsum wallboard in accordance with ASTM ~~C 36~~ C 1396. For single-layer applications, the wallboard shall be applied vertically with no horizontal joints. For multiple-layer applications, horizontal joints are permitted at a minimum spacing of 8 feet, provided that the joints in successive layers are staggered at least 12 inches. The total required thickness of wallboard shall be determined on the basis of the specified fire-resistance rating and the weight-to-heated-perimeter ratio (*W/D*) of the column. For fire-resistance ratings of 2 hours or less, one of the required layers of gypsum wallboard may be applied to the exterior of the sheet steel column covers with 1-inch-long Type S screws spaced 1 inch from the wallboard edge and 8 inches on center. For such installations, 0.0149-inch minimum thickness galvanized steel corner beads with 1½-inch legs shall be attached to the wallboard with Type S screws spaced 12 inches on center.

(No change to footnotes not shown)

FIGURE 721.5.1(3)
GYPSUM WALLBOARD PROTECTED STRUCTURAL STEEL COLUMNS WITH STEEL STUD/SCREW ATTACHMENT SYSTEM
(No change to figure)

3. Type X gypsum wallboard in accordance with ASTM ~~C 36~~ C 1396. For single-layer applications, the wallboard shall be applied vertically with no horizontal joints. For multiple-layer applications, horizontal joints are permitted at a minimum spacing of 8 feet, provided that the joints in successive layers are staggered at least 12 inches. The total required thickness of wallboard shall be determined on the basis of the specified fire-resistance rating and the weight-to-heated-perimeter ratio (*W/D*) of the column.

(No change to footnotes not shown)

TABLE 2506.2
GYPSUM BOARD MATERIALS AND ACCESSORIES

MATERIAL	STANDARD
~~Exterior Soffit Board~~	~~ASTM C 931~~
~~Gypsum backing board and gypsum shaftliner board~~	~~ASTM C 442~~
~~Gypsum ceiling board~~	~~ASTM C 1395~~
~~Gypsum sheathing~~	~~ASTM C 79~~
~~Gypsum wallboard~~	~~ASTM C 36~~
~~Predecorated gypsum board~~	~~ASTM C 960~~
~~Water-resistant gypsum backing board~~	~~ASTM C 630~~

(Portions of Table not shown remain unchanged)

TABLE 2507.2
LATH, PLASTERING MATERIALS AND ACCESSORIES

MATERIAL	STANDARD
~~Gypsum lath~~	~~ASTM C 37~~
~~Gypsum base for veneer plasters~~	~~ASTM C 588~~

(Portions of Table not shown remain unchanged)

PART II- IRC

1. Revise as follows:

R702.3.1. Materials. All gypsum board materials and accessories shall conform to ASTM ~~C 36, C 79~~, C 475, C 514, ~~C 630~~, ~~C 931, C 960,~~ C 1002, C 1047, C 1177, C 1178, C 1278, ~~C 1395~~, C 1396, or C 1658 and shall be installed in accordance with the provisions of this section. Adhesives for the installation of gypsum board shall conform to ASTM C 557.

R702.2.1 Gypsum plaster. Gypsum plaster materials shall conform to ASTM C 5, C 28, C 35, ~~C 37~~, C 59, C 61, C 587, ~~C 588~~, C 631, C 847, C 933, C 1032 and C 1047 and shall be installed or applied in conformance with ASTM C 843 and C 844. Gypsum lath or gypsum base for veneer plaster shall conform to ASTM C 1396. Plaster shall not be less than three coats when applied over metal lath and not less than two coats when applied over other bases permitted by this section, except that veneer plaster may be applied in one coat not to exceed 3/16 inch (4.76 mm) thickness, provided the total thickness is in accordance with Table R702.1(1).

R702.2.2 Cement plaster. Cement plaster materials shall conform to ASTM ~~C 37~~, C 91 (Type M, S or N), C 150 (Type I, II, and III), ~~C 588~~, C 595 [Type IP, I (PM), IS and I (SM), C 847, C 897, C 926, C 933, C 1032, C 1047 and C 1328, and shall be installed or applied in conformance with ASTM C 1063. Gypsum lath shall conform to ASTM C 1396. Plaster shall not be less than three coats when applied over metal lath and not less than two coats when applied over other bases permitted by this section, except that veneer plaster may be applied in one coat not to exceed 3/16 inch (4.76 mm) thickness, provided the total thickness is in accordance with Table R702.1(1).

Reason:
PART I- In December 2004, a single composite ASTM International reference Specification C 1396/ C1396M, *Specification for Gypsum Board*, replaced nine individual standards previously used to designate specific gypsum board products employed in residential and non-residential construction. The nine withdrawn standards are no longer being maintained by ASTM.

ASTM C 1396 is presently contained in Tables 2506.2 and 2507.2 of IBC Chapter 25 as a reference standard.

Proposal is submitted to reflect the use of the composite standard. It eliminates references to standards that are no longer available.

PART II- In December 2004, a single composite ASTM International reference Specification C 1396/ C1396M, *Specification for Gypsum Board*, replaced nine individual standards previously used to designate specific gypsum board products employed in residential and non-residential construction. The nine withdrawn standards are no longer being maintained by ASTM.

ASTM C 1396 is presently contained in the IRC as a reference standard.

Proposal is submitted to reflect the use of the composite standard. It eliminates references to standards that are no longer available.

Proposal is submitted to remove the reference to the withdrawn standards.

Section R702.2.1 has been modified to reflect the elimination of the individual standards for gypsum lath and gypsum veneer base.

Section R702.2.2 has been modified to reflect the elimination of the individual standard for gypsum lath. The reference to the veneer base standard (C 588) has been eliminated, as it is not appropriate to install cement plaster directly to gypsum veneer base.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I- IBC:

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II- IRC:

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GARDNER-S1-Figure 721.5.2(2).doc-RB2-702.2-RB4-702.3

S223–09/10
2509.2

Proponent: Jose M. Estrada, representing USG Corporation

1. Revise as follows:

2509.2 Base for Tile. Glass mat water-resistant gypsum backing panel, discrete nonasbestos fiber-cement interior substrate sheets, water-resistant fiber-reinforced gypsum backers or nonasbestos fiber-mat reinforced cement substrate sheets in compliance with ASTM C 1178, C 1288, C 1278 or C 1325 and installed in accordance with manufacturer recommendations shall be used as a base for the wall tile in tub and shower areas and wall and ceiling panels in shower areas. Water-resistant gypsum backing board shall be used as a base for tile in water closet compartment walls when installed in accordance with GA -216 or ASTM C 840 and manufacturers recommendations. Regular gypsum wallboard is permitted under tile or wall panels in other wall and ceiling areas when installed in accordance with GA-216 or ASTM C 840.

Reason: The purpose of this proposal is to include an ASTM material standard for current provisions of the IBC. ASTM C 1278 products are engineered and manufactured specifically for interior water-resistant backing. The proposed ASTM material standard has been recognized by the International Residential Code (IRC) since the 2007 Supplement. The water-resistant products complying with this ASTM standard have a demonstrated track record, which has been documented substantially and historically, in consensus industry publications such as the TCA Handbook for Ceramic Tile Installation, published by the Tile Council of North America, where the ASTM C1278 products have been recognized for use in wet areas, including their use as a base for the wall tile in tub and shower surrounds since 2007. The wall and floor designs for the ASTM

C1278 products listed in the TCA Handbook for wet area application are equivalent to those of ASTM C 1178, C 1288 and C 1325 products. The products covered under ASTM C 1278 for use as a base for tile have a proven track record in the field, where hundreds of millions of feet have been installed since its release to the market. The inclusion of this standard will allow for more competitive product bidding in turn reducing overall construction costs.

Bibliography:
The Tile Council of North America. 2009 TCA Handbook for Ceramic Tile Installation. Anderson, SC: TCNA, 2009.

Cost Impact: This code proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ESTRADA-S1-2509.2

S224–09/10
2509.2; IRC R702.4.2

Proponent: Keith Poerschke representing National Gypsum Company

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IBC STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IBC

Revise as follows:

2509.2 Base for tile. Glass mat water-resistant gypsum backing panels, discrete nonasbestos fiber-cement interior substrate sheets or nonasbestos fiber-mat reinforced cementitious backer units ~~cement substrate sheets~~ in compliance with ASTM C 1178, C 1288 or C 1325 and installed in accordance with manufacturer recommendations shall be used as a base for wall tile in tub and shower areas and wall and ceiling panels in shower areas. Water-resistant gypsum backing board shall be used as a base for tile in water closet compartment walls when installed in accordance with GA-216 or ASTM C 840 and manufacturer recommendations. Regular gypsum wallboard is permitted under tile or wall panels in other wall and ceiling areas when installed in accordance with GA-216 or ASTM C 840.

PART II – IRC

Revise as follows:

R702.4.2 Fiber-cement, fiber-mat reinforced cement, glass mat gypsum backers and fiber-reinforced gypsum backers. Fiber-cement, fiber-mat reinforced cementitious backer units ~~cement~~, glass mat gypsum backers or fiber-reinforced gypsum backers in compliance with ASTM C 1288, C 1325, C 1178 or C 1278, respectively, and installed in accordance with manufacturers' recommendations shall be used as backers for wall tile in tub and shower areas and wall panels in shower areas.

Reason: The ASTM C17 subcommittee, which is responsible for the C1325 standard, voted and approved a title change and other modifications in 2008. The title of ASTM C 1325 was changed to cementitious backer units, which is more representative of how these products have been referred to for decades. This change should be reflected in the language of IBC Section 2509.2 and IRC R702.4.2. Additional changes were made to the standard to more accurately describe what constitutes failure in the test methods and to bring the requirements of the standard more in line with the ANSI standard for the product.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: POERSCHKE-S1-2509.2

S225–09/10
2510.6; IRC R703.6.3

Proponent: Kimdolyn Boone, representing DuPont Building Innovations

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE STRUCTURAL COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I- IBC STRUCTURAL

Revise as follows:

2510.6 Water-resistive barriers. Water-resistive barriers shall be installed as required in Section 1404.2 and, where applied over wood-based sheathing, shall include a water-resistive vapor-permeable barrier with a performance at least equivalent to two layers of Grade D paper. The individual layers shall be installed such that each layer is installed ship lapped fashion and any flashing (installed in accordance with Section 1405.4) intended to drain to the water-resistive barrier is directed between the layers.

Exception: Where the water-resistive barrier that is applied over wood-based sheathing has a water resistance equal to or greater than that of 60-minute Grade D paper and is separated from the stucco by an intervening, substantially nonwater-absorbing layer or drainage space.

PART II- IRC BUILDING/ENERGY

Revise as follows:

R703.6.3 Water-resistive barriers. Water-resistive barriers shall be installed as required in Section R703.2 and, where applied over wood-based sheathing, shall include a water-resistive vapor-permeable barrier with a performance at least equivalent to two layers of Grade D paper. The individual layers shall be installed such that each layer is installed ship lapped fashion and any flashing (installed in accordance with Section R703.8) intended to drain to the water-resistive barrier is directed between the layers.

Exception: Where the water-resistive barrier that is applied over wood-based sheathing has a water resistance equal to or greater than that of 60 minute Grade D paper and is separated from the stucco by an intervening, substantially nonwater-absorbing layer or designed drainage space.

Reason: Clarification of current requirement of the code

Currently the code requires 2 layers be installed but does not address how these layers are installed. There are 2 methods of installation and these methods provide different performance Attributes.

1. 2 layer system – Each layer of WRB is individually installed in a ship lapped fashion. The interior layer is configured to form a continuous drainage plane and is integrated with the flashing.
2. ply system - Both layers are installed and lapped together. The outboard layer is integrated the flashing.

The benefits of using two layers of water resistive barrier (WRB) can only be realized if the method and manner of the installation establish a continuous drainage plane, separated from the stucco.

In a 2-layer system each layer provides a separate & distinct function. The primary function of the inboard layer is to resist water penetration into the cavity. This layer should be integrated with window and door flashings, the weep screed at the bottom of the wall and any through-wall flashings or expansion joints. This layer becomes the drainage plane for incidental water. The primary function of the outboard layer (layer that comes in contact with the stucco) is to separate the stucco from the water resistive barrier. This layer has historically been called a sacrificial layer, intervening layer or bond break layer.

When structures are detailed as 2 layer systems, it is possible to install each layer to meet its intended function. A continuous drainage plane can be established on the inboard layer. However, this is not the case with a 2-ply system. A 2-ply system functions as a single layer and the only benefit provided is additional water resistance. If additional water holdout is the only benefit you are seeking then a superior 1 layer WRB should be sufficient.

This dual function concept has also been noted in building science research studies. A few of the conclusions in the Final Report For Energy Efficient, Mold-Resistant Materials and Construction Practices for New California Homes (California Energy Commission August 2008) are as follows:

A Capillary break between stucco and WRB is required for optimal gravity drainage.
Double layer provides space, outer layer provides bond break.
Sill pan drains to the interior layer (the functional WRB)

Cost Impact: For installations that currently install 2 ply systems this may have a slight increase in the labor costs.

PART I-IBC STRUCTURAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II-IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOONE-S1-2510.6-RB-2-R703.6.3

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL ENERGY CONSERVATION CODE

ENERGY CONSERVATION CODE COMMITTEE

Dale Greiner - ***Chair***
Building Official
Lake County
Tavares, FL

Robert Austin - *Vice Chair*
Code Specialist
New Jersey Department of Community Affairs,
Division of Codes & Standards
Trenton, NJ

Joseph Andre
Western Field Representative
National Electrical Manufacturers Association
Bothell, WA

Misti Bruceri, CEM
Rep: Pacific Gas and Electric Company
Principal
Misti Bruceri & Associates, LLC
Napa, CA

Lynn Chamberlin
Architect II
Nebraska Energy Office
Lincoln, NE

Medard Kopczynski
Assistant City Manager
City of Keene
Keene, NH

Marjorie Meares
President
Meares Environmental Consulting
Asheville, NC

Ron Nickson
Vice President of Building Codes
National Multi Housing Council
Washington, DC

Keith Peetz, PE
Engineer Supervisor
City & County of Denver – Community
Planning & Dev
Denver, CO

Gary Pringey, CBO
Plan Analyst
Colorado Code Consulting LLC
Denver, CO

Robert Ross
Rep: National Association of Home Builders
G&R Construction Services LLC
Austin, TX

Deborah Taylor, AIA, LEED, AP
Chief Sustainability Officer
New York City Department of Buildings
New York, NY

David Weitz
Director, Applied Building Science Division
Conservation Services Group
Westborough, MA

Donald White
Rep: Southern Nevada Inter-jurisdictional
Energy Code Committee
Architectural Plans Examiner
City of Las Vegas Department of Bldg. and
Safety
Las Vegas, NV

Howard Wiig, MA
Institutional Energy Analyst
State of Hawaii Strategic Industries Division
Honululu, HI

Staff Secretariat:
David Bowman, PE
Manager of Codes
International Code Council

TENTATIVE ORDER OF DISCUSSION

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL ENERGY CONSERVATION CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does **not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair.

ADM24-09/10
ADM25-09/10
ADM26-09/10
ADM27-09/10
ADM28-09/10
ADM29-09/10
EC65-09/10
ADM30-09/10
ADM31-09/10
EC1-09/10, Part I
EC2-09/10, Part I
EC3-09/10
EC4-09/10, Part I
EC5-09/10
EC6-09/10
EC7-09/10
EC8-09/10
EC9-09/10
EC10-09/10
EC13-09/10, Part I
EC14-09/10
EC15-09/10
EC19-09/10, Part I
EC25-09/10, Part I
EC16-09/10, Part I
EC11-09/10, Part I
EC232-09/10
EC12-09/10
EC17-09/10, Part I
EC18-09/10, Part I
EC20-09/10
EC21-09/10, Part I
EC22-09/10, Part I
EC23-09/10, Part I
EC24-09/10
EC26-09/10, Part I
EC27-09/10, Part I
EC28-09/10, Part I
EC29-09/10, Part I
EC30-09/10, Part I
EC31-09/10, Part I
EC32-09/10, Part I
EC33-09/10
EC34-09/10, Part I
EC35-09/10, Part I
EC36-09/10, Part I
EC37-09/10
EC38-09/10, Part I
EC39-09/10, Part I
EC40-09/10, Part I
EC41-09/10, Part I
EC42-09/10, Part I
EC43-09/10, Part I
EC44-09/10
EC45-09/10, Part I
EC46-09/10, Part I
EC47-09/10, Part I
EC48-09/10, Part I
EC49-09/10
EC50-09/10, Part I
EC51-09/10
EC52-09/10
EC53-09/10, Part I
EC54-09/10, Part I
EC55-09/10, Part I
EC56-09/10, Part I
EC57-09/10, Part I
EC58-09/10I, Part I
EC59-09/10, Part I
EC60-09/10, Part I
EC61-09/10
EC62-09/10
EC63-09/10, Part I
EC64-09/10, Part I
EC65-09/10
EC66-09/10, Part I
EC67-09/10
EC68-09/10, Part I
EC69-09/10, Part I
EC70-09/10
EC71-09/10, Part I
EC72-09/10, Part I
EC73-09/10, Part I
EC74-09/10, Part I
EC75-09/10
EC76-09/10, Part I
EC77-09/10, Part I
EC78-09/10, Part I
EC79-09/10, Part I
EC80-09/10, Part I
EC81-09/10, Part I
EC82-09/10, Part I
EC83-09/10, Part I
EC84-09/10, Part I
EC85-09/10
EC86-09/10, Part I
EC87-09/10, Part I
EC88-09/10
EC89-09/10, Part I
EC90-09/10, Part I
EC91-09/10, Part I
EC92-09/10, Part I
EC93-09/10
EC94-09/10
EC96-09/10, Part I
EC97-09/10
EC98-09/10, Part I
EC99-09/10, Part I
EC100-09/10, Part I
EC101-09/10, Part I
EC102-09/10, Part I
EC103-09/10, Part I
EC104-09/10, Part I
EC105-09/10
EC106-09/10, Part I
EC107-09/10, Part I
EC108-09/10
EC109-09/10, Part I
EC110-09/10
EC111-09/10
EC112-09/10, Part I
EC113-09/10
EC114-09/10, Part I
EC115-09/10, Part I
EC116-09/10, Part I
EC117-09/10, Part I
EC118-09/10, Part I
EC119-09/10, Part I
EC120-09/10, Part I
EC121-09/10, Part I
EC122-09/10, Part I
EC123-09/10, Part I
EC124-09/10, Part I
EC125-09/10, Part I
EC126-09/10, Part I
EC127-09/10, Part I
EC128-09/10
EC129-09/10, Part I
EC130-09/10, Part I
EC131-09/10, Part I
EC132-09/10
EC133-09/10
EC134-09/10
EC135-09/10
EC136-09/10
EC137-09/10
EC138-09/10
EC139-09/10
EC140-09/10
EC141-09/10
EC142-09/10
EC143-09/10
EC144-09/10
EC145-09/10
EC146-09/10
EC147-09/10
EC148-09/10
EC149-09/10
EC150-09/10
EC151-09/10
EC152-09/10
EC153-09/10
EC154-09/10
EC155-09/10

EC156-09/10
EC157-09/10
EC158-09/10
EC159-09/10
EC160-09/10
EC161-09/10
EC162-09/10
EC163-09/10
EC164-09/10
EC165-09/10
EC166-09/10
EC167-09/10
EC168-09/10
EC169-09/10
EC170-09/10
EC171-09/10
EC172-09/10
EC173-09/10
EC174-09/10
EC175-09/10
EC176-09/10
EC177-09/10
EC178-09/10
EC179-09/10
EC180-09/10
EC181-09/10
EC182-09/10
EC183-09/10
EC184-09/10
EC185-09/10
EC186-09/10
EC187-09/10
EC188-09/10
EC189-09/10
EC190-09/10
EC191-09/10
EC192-09/10
EC193-09/10
EC194-09/10
EC195-09/10
EC196-09/10
EC197-09/10
EC198-09/10
EC199-09/10
EC200-09/10
EC201-09/10
EC202-09/10
EC203-09/10
EC204-09/10
EC205-09/10
EC206-09/10
EC207-09/10
EC208-09/10
EC209-09/10
EC210-09/10
EC211-09/10
EC212-09/10
EC213-09/10
EC214-09/10
EC215-09/10
EC216-09/10
EC217-09/10
EC218-09/10
EC219-09/10
EC220-09/10
EC221-09/10
EC222-09/10
EC223-09/10
EC224-09/10
EC225-09/10
EC226-09/10
EC227-09/10
EC228-09/10
EC229-09/10
EC230-09/10
EC231-09/10

EC1–09/10
Table 301.1, Figure 301.1; IRC Table N1101.2, Figure N1101.2

Proponent: Thomas F. Johnson, Code Official for the Town of Durham, NH, representing the NH Seacoast Code Officials Association and NH Building Officials Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise as follows:

TABLE 301.1
CLIMATE ZONES, MOISTURE REGIMES, AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

NEW HAMPSHIRE

~~6A Belknap~~
~~6A Carroll~~
~~5A Cheshire~~
~~6A Coos~~
~~6A Grafton~~
~~5A Hillsborough~~
~~6A Merrimack~~
~~5A Rockingham~~
~~5A Strafford~~
~~6A Sullivan~~

6A All

(Portions of table not shown remain unchanged)

2. Figure 301.1 shading of the 4 NH southern counties should also be changed to reflect Zone 6 shading statewide.

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

TABLE N1101.2
CLIMATE ZONES, MOISTURE REGIMES AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY

NEW HAMPSHIRE
~~6A Belknap~~
~~6A Carroll~~
~~5A Cheshire~~
~~6A Coos~~
~~6A Grafton~~
~~5A Hillsborough~~
~~6A Merrimack~~
~~5A Rockingham~~
~~5A Strafford~~
~~6A Sullivan~~
6A All

(Portions of table not shown remain unchanged)

2. Figure N1101.2 shading of the 4 NH southern counties should also be changed to reflect Zone 6 shading statewide.

Reason
(Part I): The State of New Hampshire thru the N.H. Public Utilities Commission and N.H. Building Code Review Board had previously amended the adopted 2000 IECC, and then the adopted 2006 IECC Table 301.1 and Figure 301.1 to delete all of the Zone 5 counties and effectively placed all of New Hampshire in Zone 6. It is expected that the current 2009 IECC soon to be adopted will similarly be amended. By not carrying this statewide amendment into the 2012 IECC document provides improper guidance to all those users of the I-Codes that may not be aware of the statewide amendments during design drawings or installations using the printed code document text and tables based on our enforcement experiences with the 2000 and 2006 IECC.

(Part II): The State of New Hampshire thru the N.H. Public Utilities Commission and N.H. Building Code Review Board had previously amended the adopted 2000 IRC, and then the adopted 2006 IRC to delete all of the Zone 5 counties and effectively placed all of New Hampshire in Zone 6. It is expected that the current 2009 IRC soon to be adopted will similarly be amended. By not carrying this statewide amendment into the 2012 IRC document provides improper guidance to all those users of the I-Codes that may not be aware of the statewide amendments during design drawings or installations using the printed code document text and tables based on our enforcement experiences with the 2000 and 2006 IRC.

Cost Impact: The change in the IECC and the IRC will not impact the cost of construction; the State of New Hampshire has already mandated the proposed change therefore no increase to NH construction. In fact, the change will reduce the cost of construction by eliminating errors using the current code text during the design phase of construction which gets rejected during code plan review; or improper installations rejected upon code compliance inspections.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: JOHNSON(THOMAS)-EC-1-T. 301.1-RE-1-T. N1101.2

EC2–09/10
303.1.1.2 (New); IRC N1101.4.2.1 (New)

Proponent: Craig Conner, Building Quality, representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Part I – IECC

Add new text as follows:

303.1.1.2 Insulated sheathing R-value mark. Where R-values for multiple sheathing thicknesses are printed on insulated sheathing, the actual R-value shall be printed on the insulated sheathing board in lettering at least two times the height of any other R-value or thickness. Alternatively, the installed insulated sheathing R-value shall be listed on the insulation certification required in Section 303.1.1

Part II – IRC

Add new text as follows:

N1101.4.2.1 Insulated sheathing R-value mark. Where R-values for multiple sheathing thicknesses are printed on insulated sheathing, the actual R-value shall be printed on the insulated sheathing board in lettering at least two times the height of any other R-value or thickness. Alternately, the installed insulated sheathing R-value shall be listed on the insulation certification required in section N1101.4.2.

Reason: Sheets of insulated sheathing routinely carry tables of multiple R-values printed on the sheet, where the R-value for a variety of thicknesses is displayed on every sheet. Verifying compliance would be easier if the actual R-value for the specific product installed was clear at a glance. This can be accomplished through an enlarged font for the actual R-Value, or through the installer certificate

Cost Impact: The code change proposal will increase the cost of construction, but ease inspection for compliance.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CONNER-EC-6-303.1.1.2.DOC

EC3–09/10
202 (New), 303.1.3, Table 303.1.3(3)

Proponent: Garrett Stone, Brickfield, Burchette, Ritts & Stone, representing Cardinal Glass Industries

1. Add new definition as follows:

VISIBLE TRANSMITTANCE (VT). The ratio of visible light entering the space through the fenestration product assembly to the incident visible light. VT includes the effects of glazing material and frame and is expressed as a number between 0 and 1.

2. Revise as follows:

303.1.3 Fenestration product rating. *U*-factors of fenestration products (windows, doors and skylights) shall be determined in accordance with NFRC 100 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled *U*-factor shall be assigned a default *U*-factor from Table 303.1.3(1) or 303.1.3(2). The solar heat gain coefficient (SHGC) and *visible transmittance* (VT) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled SHGC shall be assigned a default SHGC from Table 303.1.3(3).

TABLE 303.1.3(3)
DEFAULT GLAZED FENESTRATION SHGC AND VT

	SINGLE GLAZED		DOUBLE GLAZED		
	Clear	**Tinted**	**Clear**	**Tinted**	**GLAZED BLOCK**
SHGC	0.8	0.7	0.7	0.6	0.6
VT	0.6	0.3	0.6	0.3	0.6

Reason: The visible transmittance (VT) of fenestration products represents the amount of light that enters the building through the fenestration product. It is the key performance parameter in encouraging proper daylighting, which can reduce lighting and internal heat loads. The effective use of daylighting in commercial construction has long been recognized as bringing energy savings and benefits to a building's occupants.
In order to better utilize VT in the code, the code needs to include a definition of VT and specify a method for determining this performance feature. This proposal satisfies both of these needs.

Visible transmittance is currently determined for the fenestration industry according to NFRC 200 – *Procedure for Determining Fenestration Product Solar Heat Gain Coefficients and Visible Transmittance at Normal Incidents*, which is already a referenced standard in the *IECC* and is referenced in *IECC* Section 303.1.3 for determining SHGC. This proposal offers the appropriate modification to the language of 303.1.3 to include VT.

This proposal also establishes default values where rated values are not available. The values proposed for the default table are taken from the *ASHRAE Handbook of Fundamentals*, Table 13, pages 31.26 - 31.28 as the worst-case (lowest) visible light values for any frame with clear and tinted glass and rounded off using the same approach as currently incorporated into the code for SHGC. This produces reasonable, conservative values for VT for default products. Because values for glass block were not available in the *Handbook*, we set the value equal to the double pane clear product.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: STONE-EC-3-202-303.1.3

EC4–09/10
303.1.4; IRC N1101.6

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing The Extruded Polystyrene Foam Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

303.1.4 Insulation product rating. The thermal resistance (*R*-value) of insulation shall be determined in accordance with the U.S. Federal Trade Commission *R*-value rule (CFR Title 16, Part 460, May 31, 2005) in units of h x ft^2 x °F/Btu at a mean temperature of 75°F (24°C). Foam plastic products that contain a captive blowing agent shall report the thermal resistance (*R*-value) after aging for180 days at ambient conditions (75°F (24°C) and 50% relative humidity or aging for 90 days at 140°F (60°C) prior to thermal conductivity testing and reporting.

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1101.6 Insulation product rating. The thermal resistance (*R*-value) of insulation shall be determined in accordance with the CFR Title 16, Part 460 in units of h · ft^2 · °F/Btu at a mean temperature of 75°F (24°C). Foam plastic products that contain a captive blowing agent shall report the thermal resistance (R-value) after aging for 180 days at ambient conditions (75°F (24°C) and 50% relative humidity or aging for 90 days at 140°F (60°C) prior to thermal conductivity testing and reporting.

Reason: The new language improves the clarity and the enforceability of the Code requirement by specifying the specific aging requirements prior to testing. Currently, there are several different procedures for aging, making the comparison of *R*-values confusing. This language will level the playing field and ensure that thermal performance reported is that which will exist over time.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BIETEL-EC-1-303.1.4.DOC

EC5–09/10
302, 302.1, 303, 401.2, 401.3, 402.2.12, 403.6, 403.10, 501.3, 501.4, 502.2, 502.2.1, 502.3, 503.2.1, 503.4

Proponent: Ronald Majette, representing US Department of Energy

1. Delete without substitution:

~~**SECTION 302**~~
~~**DESIGN CONDITIONS**~~

~~**302.1 Interior design conditions.** The interior design temperatures used for heating and cooling load calculations shall be a maximum of 72ºF (22ºC) for heating and minimum of 75ºF (24ºC) for cooling.~~

2. Revise as follows:

403.6 Equipment sizing (Mandatory). Heating and cooling equipment shall be sized in accordance with Section M1401.3 of the *International Residential Code*. The interior design temperatures used for heating and cooling load calculations shall be a maximum of 72ºF (22ºC) for heating and minimum of 75ºF (24ºC) for cooling.

503.2.1 Calculation of heating and cooling loads. Design loads shall be determined in accordance with the procedures described in the ASHRAE/ACCA Standard 183. Heating and cooling loads shall be adjusted to account for load reductions that are achieved when energy recovery systems are utilized in the HVAC system in accordance with the ASHRAE *HVAC Systems and Equipment Handbook*. Alternatively, design loads shall be determined by an *approved* equivalent computation procedure, using ~~the design parameters specified in Chapter 3.The~~ an interior design temperature~~s used for heating and cooling load calculations shall be a maximum of~~ no more than 72ºF (22ºC) for heating and ~~minimum of~~ no less than 75ºF (24ºC) for cooling.

3. Delete without substitution:

~~**SECTION 303**~~
~~**MATERIALS, SYSTEMS AND EQUIPMENT**~~

~~**303.1 Identification.** Materials, systems and equipment shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this code.~~

~~**303.1.1 Building thermal envelope insulation.** An *R*-value identification mark shall be applied by the manufacturer to each piece of *building thermal envelope* insulation 12 inches (305 mm) or greater in width. Alternately, the insulation installers shall provide a certification listing the type, manufacturer and *R*-value of insulation installed in each element of the *building thermal envelope*. For blown or sprayed insulation (fiberglass and cellulose), the initial installed thickness, settled thickness, settled *R*-value, installed density, coverage area and number of bags installed shall be *listed* on the certification. For sprayed polyurethane foam (SPF) insulation, the installed thickness of the areas covered and *R*-value of installed thickness shall be *listed* on the certification. The insulation installer shall sign, date and post the certification in a conspicuous location on the job site.~~

~~**303.1.1.1 Blown or sprayed roof/ceiling insulation.** The thickness of blown-in or sprayed roof/ceiling insulation (fiberglass or cellulose) shall be written in inches (mm) on markers that are installed at least one for every 300 square feet (28 m^2) throughout the attic space. The markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness with numbers a minimum of 1 inch (25 mm) in height. Each marker shall face the attic access opening. Spray polyurethane foam thickness and installed *R*-value shall be *listed* on certification provided by the insulation installer.~~

~~**303.1.2 Insulation mark installation.** Insulating materials shall be installed such that the manufacturer's *R*-value mark is readily observable upon inspection.~~

~~**303.1.3 Fenestration product rating.** *U*-factors of fenestration products (windows, doors and skylights) shall be determined in accordance with NFRC 100 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled *U*-factor shall be assigned a default *U*-factor from Table 303.1.3(1) or 303.1.3(2). The solar heat gain coefficient (SHGC) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled SHGC shall be assigned a default SHGC from Table 303.1.3(3).~~

~~**TABLE 303.1.3(1)**~~
~~**DEFAULT GLAZED FENESTRATION U-FACTOR**~~

~~**FRAME TYPE**~~	~~**SINGLE PANE**~~	~~**DOUBLE PANE**~~	~~**SKYLIGHT**~~	
			~~**Single**~~	~~**Double**~~
~~Metal~~	~~1.20~~	~~0.80~~	~~2.00~~	~~1.30~~
~~Metal with Thermal Break~~	~~1.10~~	~~0.65~~	~~1.90~~	~~1.10~~
~~Nonmetal or Metal Clad~~	~~0.95~~	~~0.55~~	~~1.75~~	~~1.05~~
~~Glazed Block~~	~~0.60~~			

~~**TABLE 303.1.3(2)**~~
~~**DEFAULT DOOR U-FACTORS**~~

~~**DOOR TYPE**~~	~~**U-FACTOR**~~
~~Uninsulated Metal~~	~~1.20~~
~~Insulated Metal~~	~~0.60~~
~~Wood~~	~~0.50~~
~~Insulated, nonmetal edge, max 45% glazing, any glazing double pane~~	~~0.35~~

~~**TABLE 303.1.3(3)**~~
~~**DEFAULT GLAZED FENESTRATION SHGC**~~

~~**SINGLE GLAZED**~~		~~**DOUBLE GLAZED**~~		~~**GLAZED BLOCK**~~
~~**Clear**~~	~~**Tinted**~~	~~**Clear**~~	~~**Tinted**~~	
~~0.8~~	~~0.7~~	~~0.7~~	~~0.6~~	~~0.6~~

~~**303.1.4 Insulation product rating.** The thermal resistance (*R*-value) of insulation shall be determined in accordance with the U.S. Federal Trade Commission *R*-value rule (CFR Title 16, Part 460, May 31, 2005) in units of h x ft^2 x°F/Btu at a mean temperature of 75°F (24°C).~~

4. Add new text and tables as follows:

401.3 Materials, systems, and equipment.

401.3.1 Identification. Materials, systems and equipment shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this code.

401.3.1.1 Building thermal envelope insulation. An *R*-value identification mark shall be applied by the manufacturer to each piece of *building thermal envelope* insulation 12 inches (305 mm) or greater in width. Alternately, the insulation installers shall provide a certification listing the type, manufacturer and *R*-value of insulation installed in each element of the *building thermal envelope*. For blown or sprayed insulation (fiberglass and cellulose), the initial installed thickness, settled thickness, settled *R*-value, installed density, coverage area and number of bags installed shall be *listed* on the certification. For sprayed polyurethane foam (SPF) insulation, the installed thickness of the areas covered and *R*-value of installed thickness shall be *listed* on the certification. The insulation installer shall sign, date and post the certification in a conspicuous location on the job site.

401.3.1.1.1 Blown or sprayed roof/ceiling insulation. The thickness of blown-in or sprayed roof/ceiling insulation (fiberglass or cellulose) shall be written in inches (mm) on markers that are installed at least one for every 300 square feet (28 m^2) throughout the attic space. The markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness with numbers a minimum of 1 inch (25 mm) in height. Each marker shall face the attic access opening. Spray polyurethane foam thickness and installed *R*-value shall be *listed* on certification provided by the insulation installer.

401.3.1.2 Insulation mark installation. Insulating materials shall be installed such that the manufacturer's *R*-value mark is readily observable upon inspection.

401.3.1.3 Fenestration product rating. *U*-factors of fenestration products (windows, doors and skylights) shall be determined in accordance with NFRC 100 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled *U*-factor shall be assigned a default *U*-factor from Table 401.3.1.3(1) or 401.3.1.3(2). The solar heat gain coefficient (SHGC) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled SHGC shall be assigned a default SHGC from Table 401.3.1.3(3).

TABLE 401.3.1.3(1)
DEFAULT GLAZED FENESTRATION U-FACTOR

FRAME TYPE	SINGLE PANE	DOUBLE PANE	SKYLIGHT	
			Single	Double
Metal	1.20	0.80	2.00	1.30
Metal with Thermal Break	1.10	0.65	1.90	1.10
Nonmetal or Metal Clad	0.95	0.55	1.75	1.05
Glazed Block	0.60			

TABLE 401.3.1.3(2)
DEFAULT DOOR U-FACTORS

DOOR TYPE	U-FACTOR
Uninsulated Metal	1.20
Insulated Metal	0.60
Wood	0.50
Insulated, nonmetal edge, max 45% glazing, any glazing double pane	0.35

TABLE 401.3.1.3(3)
DEFAULT GLAZED FENESTRATION SHGC

SINGLE GLAZED		DOUBLE GLAZED		GLAZED BLOCK
Clear	Tinted	Clear	Tinted	
0.8	0.7	0.7	0.6	0.6

401.3.1.4 Insulation product rating. The thermal resistance (*R*-value) of insulation shall be determined in accordance with the U.S. Federal Trade Commission *R*-value rule (CFR Title 16, Part 460, May 31, 2005) in units of h x ft^2 x°F/Btu at a mean temperature of 75°F (24°C).

502.2 Specific insulation requirements (Prescriptive). Opaque assemblies shall comply with Table 502.2(1). Materials shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this code. The thermal resistance (*R*-value) of insulation shall be determined in accordance with the U.S. Federal Trade Commission *R*-value rule (CFR Title 16, Part 460, May 31, 2005) in units of h _ ft2 _ °F/Btu at a mean temperature of 75°F (24°C).

An *R*-value identification mark shall be applied by the manufacturer to each piece of *building thermal envelope* insulation 12 inches (305 mm) or greater in width. Alternately, the insulation installers shall provide a certification listing the type, manufacturer and *R*-value of insulation installed in each element of the *building thermal envelope*. For blown or sprayed insulation (fiberglass and cellulose), the initial installed thickness, settled thickness, settled *R*-value, installed density, coverage area and number of bags installed shall be *listed* on the certification. For sprayed polyurethane foam (SPF) insulation, the installed thickness of the areas covered and *R*-value of installed thickness shall be *listed* on the certification. The insulation installer shall sign, date and post the certification in a conspicuous location on the job site. Insulating materials shall be installed such that the manufacturer's *R*-value mark is readily observable upon inspection.

Insulation applied to the exterior of basement walls, crawlspace walls and the perimeter of slab-on-grade floors shall have a rigid, opaque and weather-resistant protective covering to prevent the degradation of the insulation's thermal performance. The protective covering shall cover the exposed exterior insulation and extend a minimum of 6 inches (153 mm) below grade.

5. Revise as follows:

502.2.1 Roof assembly. The minimum thermal resistance (*R*-value) of the insulating material installed either between the roof framing or continuously on the roof assembly shall be as specified in Table 502.2(1), based on construction materials used in the roof assembly.

Exception: Continuously insulated roof assemblies where the thickness of insulation varies 1 inch (25 mm) or less and where the area-weighted *U*-factor is equivalent to the same assembly with the *R*-value specified in Table 502.2(1).

Insulation installed on a suspended ceiling with removable ceiling tiles shall not be considered part of the minimum thermal resistance of the roof insulation.

The thickness of blown-in or sprayed roof/ceiling insulation (fiberglass or cellulose) shall be written in inches (mm) on markers that are installed at least one for every 300 square feet (28 m2) throughout the attic space. The markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness with numbers a minimum of 1 inch (25 mm) in height. Each marker shall face the attic access opening. Spray polyurethane foam thickness and installed *R*-value shall be *listed* on certification provided by the insulation installer.

502.3 Fenestration (Prescriptive). Fenestration shall comply with Table 502.3(1). *U*-factors of fenestration products (windows, doors and skylights) shall be determined in accordance with NFRC 100 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled *U*-factor shall be assigned a default *U*-factor from Table ~~303.1.3(1) or 303.1.3(2)~~ Table 502.3. The solar heat gain coefficient (SHGC) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled SHGC shall be assigned a default SHGC from Table ~~303.1.3(3)~~.

TABLE 502.3(1)
BUILDING ENVELOPE REQUIREMENTS: FENESTRATION
(No change to the table)

TABLE ~~303.1.3(1)~~ 502.3(2)
DEFAULT GLAZED FENESTRATION U-FACTOR

FRAME TYPE	SINGLE PANE	DOUBLE PANE	SKYLIGHT	
			Single	Double
Metal	1.20	0.80	2.00	1.30
Metal with Thermal Break	1.10	0.65	1.90	1.10
Nonmetal or Metal Clad	0.95	0.55	1.75	1.05
Glazed Block	0.60			

TABLE ~~303.1.3(2)~~ 502.3(3)
DEFAULT DOOR U-FACTORS

DOOR TYPE	U-FACTOR
Uninsulated Metal	1.20
Insulated Metal	0.60
Wood	0.50
Insulated, nonmetal edge, max 45% glazing, any glazing double pane	0.35

TABLE ~~303.1.3(3)~~ 502.3(4)
DEFAULT GLAZED FENESTRATION SHGC

SINGLE GLAZED		DOUBLE GLAZED		GLAZED BLOCK
Clear	Tinted	Clear	Tinted	
0.8	0.7	0.7	0.6	0.6

6. Delete without substitution:

~~**303.2 Installation.** All materials, systems and equipment shall be installed in accordance with the manufacturer's installation instructions and the *International Building Code*.~~

7. Revise as follows:

401.2 Compliance. All materials, systems and equipment shall be installed in accordance with the manufacturer's installation instructions and the *International Building Code.* Projects shall comply with Sections 401, 402.4, 402.5, and 403.1, 403.2.2, 403.2.3, and 403.3 through 403.9 (referred to as the mandatory provisions) and either:

1. Sections 402.1 through 402.3, 403.2.1 and 404.1 (prescriptive); or
2. Section 405 (performance).

8. Add new text as follows:

501.3 Installation. All materials, systems and equipment shall be installed in accordance with the manufacturer's installation instructions and the *International Building Code*.

9. Relocate and renumber as follows:

~~**303.2.1 Protection of exposed foundation insulation.** Insulation applied to the exterior of basement walls, crawlspace walls and the perimeter of slab-on-grade floors shall have a rigid, opaque and weather-resistant protective covering to prevent the degradation of the insulation's thermal performance. The protective covering shall cover the exposed exterior insulation and extend a minimum of 6 inches (153 mm) below grade.~~

402.2.12 Protection of exposed foundation insulation. Insulation applied to the exterior of basement walls, crawlspace walls and the perimeter of slab-on-grade floors shall have a rigid, opaque and weather-resistant protective covering to prevent the degradation of the insulation's thermal performance. The protective covering shall cover the exposed exterior insulation and extend a minimum of 6 inches (153 mm) below grade.

~~**303.3 Maintenance information.** Maintenance instructions shall be furnished for equipment and systems that require preventive maintenance. Required regular maintenance actions shall be clearly stated and incorporated on a readily accessible label. The label shall include the title or publication number for the operation and maintenance manual for that particular model and type of product.~~

403.10 Maintenance information. Maintenance instructions shall be furnished for equipment and systems that require preventive maintenance. Required regular maintenance actions shall be clearly stated and incorporated on a readily accessible label. The label shall include the title or publication number for the operation and maintenance manual for that particular model and type of product.

10. Add new text as follows:

501.4 Maintenance information. Maintenance instructions shall be furnished for equipment and systems that require preventive maintenance. Required regular maintenance actions shall be clearly stated and incorporated on a readily accessible label. The label shall include the title or publication number for the operation and maintenance manual for that particular model and type of product.

Reason: The proposal merely moves and rearranges text so that specific provisions are found in correct and logical locations. Section 302 relates only to interior design conditions, which is unrelated to the topic of Chapter 3 (Climate Zones). The content of Section 302 is more relevant to Section 403.6 and 503.2.1 and is proposed to be located therein alongside the related topics of load calculations and equipment sizing. The content in Section 303 not related to climate zones and is more appropriate in Chapters 4 and 5 at locations where it is relevant.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Majette-EC-64-Ch 3-4-5-

EC6–09/10
202

Proponent: Michael P. Burnetter, PE, New York State Department of State, representing Division of Code Enforcement and Administration

Revise definition as follows:

CONDITIONED SPACE. An area or room ~~within a building being heated or cooled, containing uninsulated ducts, or with a fixed opening directly into an adjacent *conditioned space*.~~ which is within the thermal envelope of a building heated or cooled using fossil or electric fuel as the energy source.

Reason: The definition change is to eliminate confusion and gaming of the code as the 2009 IECC allows for an un-insulated duct passing through a space, or having a small outlet in any duct, to define that space of any size as conditioned. In NYS, the New York Research and Development Authority (NYSERDA) has identified this as a problem causing much confusion in their Energy Star Homes program. The thermal envelope is what should define conditioned space since a well installed thermal envelope will equate the temperature within a building to all be "conditioned" even if unintentional which is simply acknowledged here. This will then build consistency in the code as this approach is used in Section 403.2 (see the Exception). This change will help to make the code more consistent with other sections as well.

Cost Impact: Providing clarity of purpose should lower the design costs of a building involving this type of space.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BURNETTER-EC-2-CH 2

EC7–09/10
202

Proponent: Ronald Majette, representing US Department of Energy

1. Revise definition as follows:

CONDITIONED FLOOR AREA. The ~~horizontal projection of the floors associated with~~ gross floor area of the *conditioned space*.

2. Add new definition as follows:

GROSS FLOOR AREA. The sum of the floor areas of the spaces within the building, including basements, mezzanine and intermediate-floored tiers, and penthouses with a headroom height of 7.5 ft or greater. It is measured from the exterior faces of exterior walls or from the centerline of walls separating buildings, but excluding covered walkways, open roofed-over areas, porches and similar spaces, pipe trenches, exterior terraces or steps, chimneys, roof overhangs, and similar features.

Reason: For consistency with ASHRAE Standard 90.1. The term as presented is not precise in that it does not fully represent the area associated with ramps.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: This will create a different definition for the same term that is currently in the IBC.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-34-202-REDONE

EC8–09/10
202 (New)

Proponent: Ronald Majette, representing US Department of Energy

Add new definition as follows:

FLOOR. That portion of the building, other than slab on grade, that has conditioned space above and is horizontal or tilted at an angle of less than 60 degrees from horizontal.

Reason: For consistency with ASHRAE Standard 90.1-07. Since floors are currently undefined, it is difficult to determine when sloped surfaces must meet either the floor or wall requirements in the code. This proposal eliminates any confusion or need for interpretation on this issue.

Cost Impact: The code change will decrease the cost of construction associated with those assemblies that previously would have been considered walls under the ICC and would now be considered floors.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-35-202

EC9–09/10
202

Proponent: Ronald Majette, representing US Department of Energy

Revise as follows:

RESIDENTIAL BUILDING. For this code, includes detached one- and two-family dwellings and multiple single-family dwellings (townhouses) ~~R-3 buildings~~, as well as Group R-2, R-3 and R-4 buildings three stories or less in height above grade.

Reason: To clarify that the residential portion of the IECC applies to the buildings under the scope of the IRC (one/two family dwellings and townhouses) as well as low-rise R-2 and R-3 and R-4 buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-79-202

EC10–09/10
202

Proponent: Ron Nickson, representing the National Multi Housing Council

Revise definition as follows:

RESIDENTIAL BUILDING. For this code, includes R-2, R-3, and R-4 buildings~~, as well as R-2 and R-4 buildings three stories or less in height above grade~~.

Reason: To allow the energy provisions of Chapter 4 for residential occupancies to apply to all residential occupancies without any restriction on building height. Building height is controlled in either the IRC or IBC based on the type of construction and building area. The energy performance of a residential building is not a function of the building height, but rather a function of the building components that make up the building envelope and the performance of the systems within the structure for heating, cooling, light and water heating. The primary occupancy impacted by this change would be an R-2. Currently R-2 buildings three-stories or less in height fall under the provisions of Chapter 4. R-2 buildings four-or-more stories in height are covered by Chapter 5 for commercial buildings. Typically buildings four-or-less stories in height are wood frame, whereas taller buildings will have either a concrete or steel frame. Energy wise, they function the same and the provisions of Chapter 4 of the IECC would be applicable to all of the buildings except for those which have central HVAC systems. Section 403.7 of the IECC addresses the issue by directing the code user to Sections 503 (Building Mechanical Systems) and 504 (Service Water Heating) in the commercial portion of the IECC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NICKSON-EC-3-202

EC11–09/10
Chapter 4; IRC Chapter 11

Proponents: David Cohan, representing Northwest Energy Codes Group; Eric Makela, Britt/Makela Group, representing Northwest Energy Codes Group; Chuck Murray, Washington State CTED Energy Policy Division, representing Northwest Energy Codes Group

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise as follows:

401.2 Compliance. Projects shall comply with Sections 401, 402.4, 402.5, and 403.1, 403.2.2, 403.2.3, and 403.3

through 403.9 (referred to as the mandatory provisions) and either:

1. Sections 402.1 through 402.3, including Section 402.1.3, (prescriptive) and Section 406 or
2. Section 405 (performance) with the annual energy cost of the proposed design 10 percent less than the annual energy cost of the standard reference design.

401.3 Additions. Additions to an existing dwelling unit shall comply with Sections 401.2 and 406.1.

~~401.3~~ 401.4 Certificate. A permanent certificate shall be posted on or in the electrical distribution panel. The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certificate shall be completed by the builder or registered design professional. The certificate shall list the predominant *R*-values of insulation installed in or on ceiling/roof, walls, foundation (slab, *basement wall*, crawlspace wall and/or floor) and ducts outside conditioned spaces; *U*-factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the tested ACH50 for envelope air leakage and also the tested CFM for duct leakage if applicable. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be *listed* for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT

CLIMATE ZONE	FENESTRATION *U*-FACTOR	Skylight *U*-FACTOR	GLAZED FENESTRATION SHGC	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[h]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
1	~~1.20~~NR	0.75	0.30	30	13	3 / 4	13	0	0	0
2	0.65[j]	~~0.75~~ 0.65	0.30	30	13	4 / 6	13	0	0	0
3	0.50[j]	~~0.65~~ 0.55	0.30	30	13	5 / 8	19	5/13[i]	0	5 / 13
4 except Marine	0.35	~~0.60~~ 0.55	NR	38	20 or 13+5[h] ~~13~~	13 / 17 [5 / 10]	19	10 / 13	10, 2 ft	10/13
5 and Marine 4	~~0.35~~ 0.32	~~0.60~~ 0.55	NR	38	20 or 13+5[h]	13 / 17	30[f]	10/13	10,2ft	10/13
6	~~0.35~~ 0.32	~~0.60~~ 0.55	NR	49	20 or 13+5[h]	15 / 19	30[f]	15/19	10,4ft	10/13
7 and 8	~~0.35~~ 0.32	~~0.60~~ 0.55	NR	49	21	19 / 21	38[f]	15/19	10,4ft	10/13

TABLE 402.1.3
EQUIVALENT *U*-FACTORS[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR	Skylight *U*-FACTOR	CEILING *U*-Factor	FRAME WALL *U*-Factor	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
1	~~1.20~~ NR	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	~~0.75~~ 0.65	0.035	0.082	0.165	0.064	0.360	0.477
3	0.5	~~0.65~~ 0.55	0.035	0.082	0.141	0.047	0.091[c]	0.136
4 except Marine	0.35	~~0.60~~ 0.55	0.030	~~0.082~~ 0.060	0.141	0.047	0.059	0.065

5 and Marine 4	~~0.35~~ 0.32	~~0.60~~ 0.55	0.030	0.060	0.082	0.033	0.059	0.065
6	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	0.060	0.060	0.033	0.059	0.065
7 and 8	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	0.057	0.057	0.033	0.059	0.065

402.1.3 *U*-factor alternative. An assembly with a *U*-factor equal to or less than that specified in Table 402.1.3 shall be permitted as an alternative to the *R*-value in Table 402.1.1.

402.4 Air leakage (Mandatory).

402.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Sections 402.4.1.1 and 402.4.1.2. ~~be durably sealed to limit infiltration.~~ The sealing methods between dissimilar materials shall allow for differential expansion and contraction. ~~The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:~~

~~1. All joints, seams and penetrations.~~
~~2. Site-built windows, doors and skylights.~~
~~3. Openings between window and door assemblies and their respective jambs and framing.~~
~~4. Utility penetrations.~~
~~5. Dropped ceilings or chases adjacent to the thermal envelope.~~
~~6. Knee walls.~~
~~7. Walls and ceilings separating a garage from conditioned spaces.~~
~~8. Behind tubs and showers on exterior walls.~~
~~9. Common walls between dwelling units.~~
~~10. Attic access openings.~~
~~11. Rim joist junction.~~
~~12. Other sources of infiltration.~~

402.4.1.1 Installation. The components of the *building thermal envelope* as listed in Table 402.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table 402.4.1.1, as applicable to the method of construction. Where required by the *code official*, an *approved* party independent from the installer of the insulation shall inspect the air barrier and insulation.

TABLE ~~402.4.2~~ 402.4.1.1
AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

COMPONENT	CRITERIA
Air barrier and thermal barrier	Exterior thermal envelope insulation for framed walls ~~is~~ shall be installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier ~~are~~ shall be filled or ~~repaired~~ sealed. Air permeable insulation ~~is~~ shall not be used as a sealing material. Air permeable insulation ~~is~~ shall be inside of an air barrier.
Ceiling / attic	The air barrier in any dropped ceiling / soffit ~~is substantially~~ shall be aligned with the insulation and any gaps ~~are~~ in the air barrier sealed. ~~Attic access (except unvented attic), knee wall door, or drop down stair is sealed.~~ Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.
Walls	Corners and headers are insulated and the~~.~~ junction of the foundation and sill plate ~~is~~ shall be sealed.
Windows, skylights, and doors	The space between window/door jambs and framing and skylights and framing ~~is~~ shall be sealed.
Rim joists	Rim joists ~~are~~ shall be insulated and include an air barrier.
Floors (including above garage and cantilevered floors)	Insulation ~~is~~ shall be installed to maintain permanent contact with underside of subfloor decking. An air barrier ~~is~~ shall be installed at any exposed edge of insulation.
Crawlspace walls	Where provided in lieu of floor insulation, insulation ~~is~~ shall be permanently attached to the crawlspace walls. Exposed earth in unvented crawlspaces ~~is~~ shall be covered with a class I vapor retarder with overlapping joints taped.

Shafts, penetrations	Duct shafts, utility penetrations, knee walls, and flue shafts opening to exterior or unconditioned space ~~are~~ shall be sealed.
Narrow cavities	~~Batts in narrow cavities are cut to fit, or narrow cavities are filled by spayed/blown insulation.~~ Insulation to be installed in non-standard framing cavity spaces shall be cut to fit the cavity or the cavity shall be insulated with insulation that will readily conform to the cavity.
Garage separation	Air sealing ~~is~~ shall be provided ~~between~~ for the ~~assemblies the~~ separating the garage ~~and~~ from conditioned spaces.
Recessed lighting	Recessed light fixtures that penetrate the building envelope ~~are~~ shall be airtight, IC rated, and sealed to the drywall. ~~Exception: fixtures in conditioned space.~~
Plumbing and Wiring	~~Insulation is placed between outside and pipes.~~ Batt insulation ~~is~~ shall be cut to fit around wiring and plumbing without compression in exterior walls, or sprayed/blown insulation shall extend~~s~~ behind piping and wiring.
Shower / tub on exterior wall	Exterior walls adjacent to showers and tubs ~~on exterior walls~~ shall be ~~have~~ insulati~~on~~ed and an air barrier installed separating them from the ~~exterior wall~~ showers and tubs.
Electrical / phone box on exterior walls	The required air barrier ~~extends~~ shall be installed behind electrical or communication boxes or ~~an~~ air sealed ~~type~~ boxes ~~are~~ shall be installed.
Common wall	An air barrier ~~is~~ shall be installed in the common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building thermal envelope ~~are~~ shall be sealed to the subfloor or drywall.
Fireplace	An air barrier shall be installed on fireplace walls. ~~include an air barrier.~~

~~**402.4.2 Air sealing and insulation.** Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2.~~

~~**Exception:** Residential occupancies other than one- and two-family dwellings shall follow Section 402.4.2.2~~

~~**402.4.2.1 Testing option.** Building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is no greater less than seven four air changes per hour (ACH) in zones 1 to 3 and three ACH in zones 4 to 8 when tested with a blower door at a pressure of 33.5 psf 50 Pascals(50 Pa) using ASHRAE 119. Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances. Where required by the *code official*, an *approved* independent party shall perform the building envelope air leakage testing.~~

402.4.1.2 Testing. The dwelling shall be tested and found to have an air leakage rate not exceeding seven air changes per hour (ACH50) in climate zones 1 and 2 and five ACH50 in climate zones 3 through 8. Testing shall be conducted with a blower door at a pressure of 50 Pascals (50 Pa) in accordance with ASHRAE 119 by a party *approved* by the *code official.* Where required by the *code official*, testing shall be conducted by an *approved* party independent from the builder and the installer of insulation, air barrier and other sealing materials. A written report of the results of the test shall be signed by the party conducting the testing attesting to the accuracy of the values and provided to the *code official*. Testing shall be performed any time after rough in and creation of all penetrations of the *building thermal envelope*

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed~~;~~ beyond the weatherstripping or other infiltration control measures that will be installed;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed, ~~including exhaust, intake, makeup air, backdraft and flue dampers~~ beyond infiltration control measures that will be installed;
3. Interior doors, if installed at the time of test, shall be open;
4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling system(s), if installed at the time of the test, shall be turned off; and
6. ~~HVAC ducts shall not be sealed; and~~

~~7.~~ 6. Supply and return registers, if installed at the time of the test, shall ~~not~~ be ~~sealed~~ fully open.

Exceptions:

1. Dwelling units of multi-family residential buildings with more than four individual units shall be exempted from the testing requirement if they satisfy the requirements 402.1.1.
2. Additions less than 1,000 square feet.
3. Projects that are unsuccessful in complying with the maximum air leakage performance standards shall, at the approval of the code official and, in the presence of either the code official or designated third party:
   3.1. Determine that all identifiable air leakage openings have been sealed, and
   3.2. Conduct a blower door test

The certificate required in section 401.4 shall note the tested air leakage rate of the home and that the home did not comply with the air leakage performance standard.

402.4.1.3 Sampling. For groups of five or more homes of the same model, with no variations in foundation and construction which will be tested for air leakage during the same sixty-day period, the code official may elect to test less than 100 percent, but not less than 20 percent of the homes. If any tested home fails to meet the maximum air leakage requirement stated in Section 402.4.1.2 then the code official shall have all homes tested until a minimum of three consecutive homes pass the test.

Exception: The first three homes built of the same model, with no variations in foundation and construction.

~~**402.4.2.2 Visual inspection for buildings other than one- and two family dwellings option.** Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table 402.4.2, applicable to the method of construction, are field verified. Where required by the *code official*, an *approved* party independent from the installer of the insulation shall inspect the air barrier and insulation.~~

402.4.2 Fireplaces. New wood-burning fireplaces shall have gasketed doors and outdoor combustion air.

403.2.2 Sealing (Mandatory). All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the *International Residential Code*.

Duct tightness shall be verified by ~~either of~~ the following:

~~1. Postconstruction test: Leakage to outdoors shall be less than or equal to 8 cfm (226.5 L/min) per 100 ft2 (9.29 m2) of *conditioned floor area* or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft2 (9.29 m2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.~~

2. ~~Rough-in test:~~ Total leakage shall be less than or equal to ~~6~~ 4 cfm (169.9 L/min) per 100 ft2 (9.29 m2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) ~~across the roughed-in system,~~ including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to ~~4~~ 3 cfm (113.3 L/min) per 100 ft2 (9.29 m2) of *conditioned floor area*.

Exceptions: Duct tightness test is not required if the air handler and all ducts are located within *conditioned space*.

SECTION 405
SIMULATED PERFORMANCE ALTERNATIVE
(Performance)

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Air exchange rate	~~Specific leakage area (SLA)[d] = 0.00036 assuming no energy recovery~~ Air Changes Per Hour (ACH50)	For residences that are not tested, the same as the standard reference design. For residences without mechanical ventilation that are tested in accordance with ASHRAE 119, Section 5.1, the measured air exchange rate[e] but not less than 0.35 ACH For residences with mechanical ventilation that are tested in accordance with ASHRAE 119, Section 5.1, the measured air exchange rate[e]

	assuming no energy recovery Climate Zone 1 -2: ACH50 = 7 Climate Zone 3 -8: ACH50 = 5	combined with the mechanical ventilation rate, *f* which shall not be less than 0.01 x *CFA* + 7.5 x (N_{br}+1) where: *CFA* = conditioned floor area N_{br} = number of bedrooms

2. Add new section as follows:

SECTION 406
ADDITIONAL PRESCRIPTIVE EFFICIENCY MEASURES

406.1 Additional efficiency measures. Each dwelling unit shall include two of the measures described in Table 406.1. Single-family dwelling units greater than or equal to 4,000 square feet in floor area shall include three measures described in Table 406.1.

Exceptions:

1. Projects installing a ground or water source heat pump with minimum COP meeting the requirements of Table 503.2.3(2). Single-family dwelling units greater than or equal to 4,000 square feet in floor area shall include one additional measure.
2. Additions less than 1000 square feet shall include one measure from Table 406.1.

TABLE 406.1
ADDITIONAL EFFICIENCY MEASURES
(SELECT TWO MEASURES BASED ON CLIMATE ZONE).

CLIMATE ZONES 1, 2 and 3	
MEASURE	
1	HIGH EFFICIENCY HVAC SYSTEM: SEER 15 Air Conditioner
2	HIGH EFFICIENCY WATER HEATING: Tankless Gas Water Heater for all water heater end uses, EF-0.82, Capacity 1 Gallon
3	SOLAR HOT WATER Solar water heating supplementing a minimum standard water heater. Solar water heating will provide a rated minimum savings of 85 therms or 2000 kWh based on the Solar Rating and Certification Corporation (SRCC) Annual Performance of OG-300 Certified Solar Water Heating Systems
4	CEILING AND WINDOWS OPTION 1: R-38 Ceiling and the following window characteristics: Zone 1: U-factor 0.45, SHGC .25 Zone 2: U-factor 0.45, SHGC .25 Zone 3: U-factor 0.35, SHGC ,25
5	CEILING AND WINDOWS OPTION 2: R-30 Ceiling with radiant barrier and the following window characteristics: Zone 1: U-factor 0.45, SHGC .25 Zone 2: U-factor 0.45, SHGC .25 Zone 3: U-factor 0.35, SHGC ,25
6	HIGH EFFICIENCY HVAC DISTRIBUTION SYSTEM: All heating and cooling system components installed inside the conditioned space. All combustion equipment shall be direct vent or sealed combustion. Not qualifying: Systems utilizing electric resistant heat, including baseboard and furnace, as the primary heat source.
7	SMALL HOUSING UNIT:

	Housing units less than 1300 square feet in floor area with less than 220 square feet of fenestration.

CLIMATE ZONES 4, MARINE 4, 5 and 6	
MEASURE	
1	HIGH EFFICIENCY HVAC SYSTEM: Gas, propane or oil-fired furnace or boiler with minimum AFUE of 90% and SEER 14 Air Conditioner, or Air-source heat pump with minimum HSPF of 8.5
2	HIGH EFFICIENCY BUILDING ENVELOPE: Zone 4: Attic R-49, Vaults R-38 or Glazing U-0.30 Zone 4 Marine and 5: Walls: R-20+R5, Attic R-49, Vaults R-38 or Attic R-49, Vaults R-38 and Glazing U-0.30 or Glazing U-0.25. Zone 6: Walls: R-20+R5, Attic R-49, Vaults R-38 or Attic R-60 Vaults R-49 and Glazing U-0.30 or Glazing U-0.25.
3	ENVELOPE UA: The proposed building envelope shall have a total UA at least 15% less than the code target UA as calculated using Table 402.1.4 and Section 402.1.4 Total UA alternative**.**
4	REDUCED AIR LEAKAGE ENVELOPE: Envelope leakage of an ACH50 of 2.5 or less when tested with a blower door at a pressure difference of 50 pascals. Testing shall follow the requirements in Section 402.4.1.2.
5	HIGH EFFICIENCY HVAC DISTRIBUTION SYSTEM: All heating and cooling system components installed inside the conditioned space. All combustion equipment shall be direct vent or sealed combustion. Not qualifying: Systems utilizing electric resistant heat, including baseboard and furnace, as the primary heat source.
6	HIGH EFFICIENCY WATER HEATING. Water heating system includes one of the following: Gas, propane or oil water heater with a minimum EF of 0.80 or Electric Heat Pump Water Heater with a minimum COP of 2.
7	SOLAR HOT WATER Solar water heating supplementing a minimum standard water heater. Solar heater will provide a rated minimum savings of 85 therms or 2000 kWh based on the Solar Rating and Certification Corporation (SRCC) Annual Performance of OG-300 Certified Solar Water Heating Systems
8	SMALL HOUSING UNIT: Housing units less than 1300 square feet in floor area with less than 220 square feet of fenestration.

CLIMATE ZONES 7 and 8	
MEASURE	
1	HIGH EFFICIENCY HVAC SYSTEM: Gas propane or oil-fired furnace or boiler with minimum AFUE of 90 percent and SEER 14 air conditioner, or Air-source heat pump with minimum HSPF of 8.5
2	HIGH EFFICIENCY BUILDING ENVELOPE: Walls: R-20+R5, Attic R-60, Vaults R-38 or Walls: R-20, Attic R-60 Vaults R-38 and Glazing U-0.30, or

	Glazing U-0.25.
3	ENVELOPE UA: The proposed building envelope shall have a total UA at least 15 percent less than the code target UA as calculated using Table 402.1.4 and Section 402.1.4 Total UA alternative**.**
4	REDUCED AIR LEAKAGE ENVELOPE: Envelope leakage of an ACH50 of 2.5 or less when tested with a blower door at a pressure difference of 50 pascals. Testing shall follow the requirements in Section 402.4.1.2.
5	HIGH EFFICIENCY HVAC DISTRIBUTION SYSTEM: All heating and cooling system components installed inside the conditioned space. All combustion equipment shall be direct vent or sealed combustion. Not qualifying: Systems utilizing electric resistant heat, including baseboard and furnace, as the primary heat source.
6	HIGH EFFICIENCY WATER HEATING: Water heating system includes one of the following: Gas, propane or oil water heater with a minimum EF of 0.80 or Electric Heat Pump Water Heater with a minimum COP of 2.
7	SOLAR HOT WATER Solar water heating supplementing a minimum standard water heater. Solar water heating will provide a rated minimum savings of 85 therms or 2000 kWh based on the Solar Rating and Certification Corporation (SRCC) Annual Performance of OG-300 Certified Solar Water Heating Systems
8	SMALL HOUSING UNIT: Housing units less than 1300 square feet in floor area with less than 220 square feet of fenestration.

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

N1101.2 Compliance. Compliance shall be demonstrated by either meeting the requirements of the *International Energy Conservation Code* or meeting the requirements of ~~this chapter~~ Sections N1101 through N1104 and Section N1105. Climate zones from Figure N1101.2 or Table N1101.2 shall be used in determining the applicable requirements from this chapter.

2. Add new text as follows:

N1101.2.1 Additions. Additions to an existing dwelling unit shall comply with Section N1101.2.

3. Revise as follows:

N1101.9 Certificate. A permanent certificate shall be posted on or in the electrical distribution panel. The certificate shall not cover or obstruct the visibility of the circuit directory *label*, service disconnect *label* or other required *labels*. The certificate shall be completed by the builder or registered *design professional*. The certificate shall list the predominant *R*-values of insulation installed in or on ceiling/roof, walls, foundation (slab, *basement wall*, crawlspace wall and/or floor) and ducts outside *conditioned spaces*; *U*-factors for fenestration; and the solar heat gain coefficient (SHGC) of fenestration. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the tested ACH50 for envelope air leakage and also the tested CFM for duct leakage if applicable. The certificate shall list the types and efficiencies of heating, cooling and service water heating *equipment*. Where a gas-fired unvented room heater, electric furnace and/or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be listed for gas-fired unvented room heaters, electric furnaces or electric base board heaters.

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT

CLIMATE ZONE	FENESTRATION *U*-FACTOR	Skylight[b] *U*-FACTOR	GLAZED FENESTRATION SHGC	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[h]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
1	~~1.20~~NR	~~0.75~~ 0.65	~~0.35j~~ 0.30	30	13	3 / 4	13	0	0	0
2	0.65[j]	~~0.75~~ 0.55	~~0.35j~~ 0.30	30	13	4 / 6	13	0	0	0
3	0.50[j]	~~0.65~~ 0.55	~~0.35j~~ 0.30	30	13	5 / 8	19	5/13[i]	0	5 / 13
4 except Marine	0.35	~~0.60~~ 0.55	NR	38	20 or 13+5[h] ~~13~~	13 / 17 [5 / 10]	19	10 / 13	10, 2 ft	10/13
5 and Marine 4	~~0.35~~ 0.32	~~0.60~~ 0.55	NR	38	20 or 13+5[h]	13 / 17	30[f]	10/13	10,2ft	10/13
6	~~0.35~~ 0.32	~~0.60~~ 0.55	NR	49	20 or 13+5[h]	15 / 19	30[f]	~~10/13~~ 15/19	10,4ft	10/13
7 and 8	~~0.35~~ 0.32	~~0.60~~ 0.55	NR	49	21	19 / 21	~~30~~[g] 38[f]	~~10/13~~ 15/19	10,4ft	10/13

(Footnotes remain unchanged)

TABLE N1102.1.2
EQUIVALENT *U*-FACTORS[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR	Skylight *U*-FACTOR	CEILING *U*-Factor	FRAME WALL *U*-Factor	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
1	~~1.20~~ NR	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	~~0.75~~ 0.65	0.035	0.082	0.165	0.064	0.360	0.477
3	0.5	~~0.65~~ 0.55	0.035	0.082	0.141	0.047	0.091[c]	0.136
4 except Marine	0.35	~~0.60~~ 0.55	0.030	~~0.082~~ 0.060	0.141	0.047	0.059	0.065
5 and Marine 4	~~0.35~~ 0.32	~~0.60~~ 0.55	0.030	0.060	0.082	0.033	0.059	0.065
6	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	0.060	0.060	0.033	0.059	0.065
7 and 8	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	0.057	0.057	0.033	0.059	0.065

(Footnotes remain unchanged)

N1102.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Sections N1102.4.1.1 and N1102.4.1.2 ~~be durably sealed to limit infiltration~~. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. ~~The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material.~~

1. ~~All joints, seams and penetrations.~~
2. ~~Site-built windows, doors and skylights.~~
3. ~~Openings between window and door assemblies and their respective jambs and framing.~~
4. ~~Utility penetrations.~~
5. ~~Dropped ceilings or chases adjacent to the thermal envelope.~~
6. ~~Knee walls.~~
7. ~~Walls and ceilings separating the garage from *conditioned spaces*.~~
8. ~~Behind tubs and showers on *exterior walls*.~~
9. ~~Common walls between *dwelling units*.~~

~~10. Attic access openings.~~
~~11. Rim joists junction.~~
~~12. Other sources of infiltration.~~

4. Add new text as follows:

N1102.4.1.1 Installation. The components of the *building thermal envelope* as listed in Table N1102.1 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table N1102.4.2, as applicable to the method of construction. Where required by the *building official*, an *approved third* party from the installer of the insulation shall inspect the air barrier and insulation.

5. Revise as follows:

TABLE N1102.4.2
AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

COMPONENT	CRITERIA
Air barrier and thermal barrier	Exterior thermal envelope insulation for framed walls ~~is~~ shall be installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier ~~are~~ shall be filled or ~~repaired~~ sealed. Air permeable insulation ~~is~~ shall not be used as a sealing material. Air permeable insulation ~~is~~ shall be inside of an air barrier.
Ceiling / attic	The air barrier in any dropped ceiling / soffit ~~is substantially~~ shall be aligned with the insulation and any gaps ~~are~~ in the air barrier sealed. ~~Attic access (except unvented attic), knee wall door, or drop down stair is sealed.~~ Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.
Walls	Corners and headers are insulated and the~~.~~ junction of the foundation and sill plate ~~is~~ shall be sealed.
Windows, skylights, and doors	The space between window/door jambs and framing and skylights and framing ~~is~~ shall be sealed.
Rim joists	Rim joists ~~are~~ shall be insulated and include an air barrier.
Floors (including above garage and cantilevered floors)	Insulation ~~is~~ shall be installed to maintain permanent contact with underside of subfloor decking. An air barrier ~~is~~ shall be installed at any exposed edge of insulation.
Crawlspace walls	Where provided in lieu of floor insulation, insulation ~~is~~ shall be permanently attached to the crawlspace walls. Exposed earth in unvented crawlspaces ~~is~~ shall be covered with a class I vapor retarder with overlapping joints taped.
Shafts, penetrations	Duct shafts, utility penetrations, knee walls, and flue shafts opening to exterior or unconditioned space ~~are~~ shall be sealed.
Narrow cavities	~~Batts in narrow cavities are cut to fit, or narrow cavities are filled by spayed/blown insulation.~~ Insulation to be installed in non-standard framing cavity spaces shall be cut to fit the cavity or the cavity shall be insulated with insulation that will readily conform to the cavity.
Garage separation	Air sealing ~~is~~ shall be provided ~~between~~ for the ~~assemblies the~~ separating the garage ~~and~~ from conditioned spaces.
Recessed lighting	Recessed light fixtures that penetrate the building envelope ~~are~~ shall be airtight, IC rated, and sealed to the drywall. ~~Exception: fixtures in conditioned space.~~
Plumbing and Wiring	~~Insulation is placed between outside and pipes.~~ Batt insulation ~~is~~ shall be cut to fit around wiring and plumbing without compression in exterior walls, or sprayed/blown insulation shall extend~~s~~ behind piping and wiring.
Shower / tub on exterior wall	Exterior walls adjacent to showers and tubs ~~on exterior walls~~ shall be ~~have~~ insulati~~on~~ed and an air barrier installed separating them from the ~~exterior wall~~ showers and tubs.
Electrical / phone box on exterior walls	The required air barrier ~~extends~~ shall be installed behind electrical or communication boxes or ~~an~~ air sealed ~~type~~ boxes ~~are~~ shall be installed.
Common wall	An air barrier ~~is~~ shall be installed in the common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building thermal envelope ~~are~~ shall be sealed to the subfloor or drywall.
Fireplace	An air barrier shall be installed on fireplace walls. ~~include an air barrier.~~

6. Delete without substitution:

~~**N1102.4.2 Air sealing and insulation.** Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section N1102.4.2.1 or N1102.4.2.2.~~

~~**N1102.4.2.1 Testing option.** Tested air leakage is less than 7 ACH when tested with a blower door at a pressure of 50 pascals (0.007 psi). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.~~

~~During testing:~~

1. ~~Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;~~
2. ~~Dampers shall be closed, but not sealed; including exhaust, intake, makeup air, back draft, and flue dampers;~~
3. ~~Interior doors shall be open;~~
4. ~~Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;~~
5. ~~Heating and cooling system(s) shall be turned off;~~
6. ~~HVAC ducts shall not be sealed; and~~
7. ~~Supply and return registers shall not be sealed.~~

7. Add new text as follows:

N1102.4.1.2 Testing. The dwelling shall be tested and found to have an air leakage rate not exceeding seven air changes per hour (ACH50) in climate zones 1 and 2 and five ACH50 in climate zones 3 through 8. Testing shall be conducted with a blower door at a pressure of 50 pascals (50 Pa) in accordance with ASHRAE 119 by a party *approved* by the *building official.* Where required by the *building official*, testing shall be conducted by an *approved* party independent from the builder and the installer of insulation, air barrier and other sealing materials. A written report of the results of the test shall be signed by the party conducting the testing attesting to the accuracy of the values and provided to the *building official*. Testing shall be performed any time after rough in and creation of all penetrations of the *building thermal envelope*

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed beyond the weatherstripping or other infiltration control measures that will be installed;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed that will be installed;
3. Interior doors, if installed at the time of test, shall be open;
4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling system(s), if installed at the time of the test, shall be turned off;
7. Supply and return registers, if installed at the time of the test, shall be fully opened.

Exceptions:

1. Dwelling units of multi-family residential buildings with more than four individual units shall be exempted from the testing requirement if they satisfy the requirements of Section N1102.4.1.1.
2. Additions less than 1,000 square feet.
3. Projects that are unsuccessful in complying with the maximum air leakage performance standards shall, at the approval of the code official and, in the presence of either the code official or designated third party:
   - 3.1. Determine that all identifiable air leakage openings have been sealed, and
   - 3.2. Conduct a blower door test.

The certificate required in Section N1101.9 shall note the tested air leakage rate of the dwelling unit and that the dwelling unit did not comply with the air leakage performance standard.

N1102.4.3 Sampling. For groups of five or more dwelling units of the same model, with no variations in foundation and construction which will be tested for air leakage during the same sixty-day period, the building official may elect to test less than 100 percent, but not less than 20 percent, of the homes. If any tested home fails to meet the maximum air leakage requirement stated in Section N1102.4.1.2 then the building official shall have all homes tested until a minimum of three consecutive homes pass the test.

Exception: The first three homes built of the same model, with no variations in foundation and construction.

8. Revise as follows:

N1103.2.2 Sealing. Ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.4. Duct tightness shall be verified by either of the following:

~~1. Post-construction test: Leakage to outdoors shall be less than or equal to 8 cfm (3.78 L/s) per 100 ft2 (9.29 m2) of conditioned floor area or a total leakage less than or equal to 12 cfm (5.66 L/s) per 100 ft2 (9.29m2) of conditioned floor area when tested at a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler end closure. All register boots shall be taped or otherwise sealed during the test.~~

~~2~~ 1. ~~Rough-in test:~~ Total leakage shall be less than or equal to ~~6~~ 4 cfm (~~2.83~~ 1.89 L/s) per 100 square feet (9.29 m2) of conditioned floor area when tested at a pressure differential of 0.1 inch w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to ~~4~~ 3 cfm (~~1.89~~ 1.42 L/s) per 100 ft2 (9.29 m2) of conditioned floor area.

Exception: Duct tightness test is not required if the air handler and all ducts are located within *conditioned space*.

SECTION N1103
SYSTEMS

N1103.2 Ducts

N1103.2.2 Sealing. Ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.4. Duct tightness shall be verified by either of the following:

~~1. Post-construction test: Leakage to outdoors shall be less than or equal to 8 cfm (3.78 L/s) per 100 ft2 (9.29 m2) of conditioned floor area or a total leakage less than or equal to 12 cfm (5.66 L/s) per 100 ft2 (9.29m2) of conditioned floor area when tested at a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler end closure. All register boots shall be taped or otherwise sealed during the test.~~

~~2.~~1. ~~Rough-in test:~~ Total leakage shall be less than or equal to ~~6~~ 4 cfm (~~2.83~~ 1.89 L/s) per 100 ft^2 (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inch w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to ~~4~~ 3 cfm (~~1.89~~ 1.42 L/s) per 100 ft^2 (9.29 m^2) of conditioned floor area.

Exception: Duct tightness test is not required if the air handler and all ducts are located within *conditioned space*.

9. Add new section as follows:

SECTION N1105
ADDITIONAL PRESCRIPTIVE EFFICIENT MEASURES

N1105.1 Additional Efficiency Measures. Each project shall include two of the measures described in Table 1105.1. Single-family dwelling units greater than or equal to 4,000 square feet in floor area shall include three measures described in Table N1105.1.

Exceptions:

1. Projects installing a ground or water source heat pump with minimum COP meeting the requirements of Table 503.2.3(2) of the *International Energy Conservation Code*. Single-family dwelling units greater than or equal to 4,000 square feet in floor area shall include one additional measure.
2. Additions less than 1000 square feet shall include one measure from Table N1105.1.

TABLE N1105.1
ADDITIONAL EFFICIENCY MEASURES
(SELECT TWO MEASURES BASED ON CLIMATE ZONE).

CLIMATE ZONES 1, 2, AND 3	
Measure	
1	HIGH EFFICIENCY HVAC SYSTEM: SEER 15 Air Conditioner
2	HIGH EFFICIENCY WATER HEATING: Tankless Gas Water Heater, EF-0.82, Capacity 1 Gallon
3	SOLAR HOT WATER Solar water heating supplementing a minimum standard water heater. Solar water heating will provide a rated minimum savings of 85 therms or 2000 kWh based on the Solar Rating and Certification Corporation (SRCC) Annual Performance of OG-300 Certified Solar Water Heating Systems
4	CEILING AND WINDOWS OPTION 1: R-38 Ceiling and the following window characteristics: Zone 1: U-factor 0.45, SHGC .25 Zone 2: U-factor 0.45, SHGC .25 Zone 3: U-factor 0.35, SHGC ,25
5	CEILING AND WINDOWS OPTION 2: R-30 Ceiling with radiant barrier and the following window characteristics: Zone 1: U-factor 0.45, SHGC .25 Zone 2: U-factor 0.45, SHGC .25 Zone 3: U-factor 0.35, SHGC ,25
6	HIGH EFFICIENCY HVAC DISTRIBUITON SYSTEM: All heating and cooling system components installed inside the conditioned space. All combustion equipment shall be direct vent or sealed combustion. Not qualifying: Systems utilizing electric baseboard heat as the primary heat source.
7	SMALL HOUSING UNIT: Housing units less than 1300 square feet in floor area with less than 220 square feet of fenestration.

CLIMATE ZONE 4, MARINE 4, 5 and 6	
MEASURE	
1	HIGH EFFICIENCY HVAC SYSTEM: Gas, propane or oil-fired furnace or boiler with minimum AFUE of 90% and SEER 14 Air Conditioner, or Air-source heat pump with minimum HSPF of 8.5
2	HIGH EFFICIENCY BUILDING ENVELOPE: Zone 4: Attic R-49, Vaults R-38 or Glazing U-0.30 Zone 4 Marine and 5: Walls: R-20+R5, Attic R-49, Vaults R-38 or Attic R-49, Vaults, R-38 and Glazing U-0.30 or Glazing U-0.25. Zone 6: Walls: R-20+R5, Attic R-49, Vaults R-38 or Attic R-60, Vaults, R-49 and Glazing U-0.30 or Glazing U-0.25.

3	ENVELOPE UA: The proposed building envelope shall have a total UA at least 15% less than the code target UA as calculated using Table N1102.1.2 and Section N1102.1.2 Total UA alternative**.**
4	REDUCED AIR LEAKAGE ENVELOPE: Envelope leakage of an ACH50 of 2.5 or less when tested with a blower door at a pressure difference of 50 pascals. Testing shall follow the requirements in Section N1102.4.1.2.
5	HIGH EFFICIENCY HVAC DISTRIBUITON SYSTEM: All heating and cooling system components installed inside the conditioned space. All combustion equipment shall be direct vent or sealed combustion. Not qualifying: Systems with components located in conditioned crawl spaces and systems utilizing electric resistant heat, including baseboard and furnace, as the primary heat source.
6	HIGH EFFICIENCY WATER HEATING. Water heating system includes one of the following: Gas, propane or oil water heater with a minimum EF of 0.80 or Electric Heat Pump Water Heater with a minimum COP of 2.
7	SOLAR HOT WATER Solar water heating supplementing a minimum standard water heater. Solar heater will provide a rated minimum savings of 85 therms or 2000 kWh based on the Solar Rating and Certification Corporation (SRCC) Annual Performance of OG-300 Certified Solar Water Heating Systems
8	SMALL HOUSING UNIT: Housing units less than 1300 square feet in floor area with less than 220 square feet of fenestration.

CLIMATE ZONES 7 & 8	
MEASURE	
1	HIGH EFFICIENCY HVAC SYSTEM: Gas propane or oil-fired furnace or boiler with minimum AFUE of 90% and SEER 14 air conditioner, or Air-source heat pump with minimum HSPF of 8.5
2	HIGH EFFICIENCY BUILDING ENVELOPE: Walls: R-20+R5, Attic R-60, Vaults R-38 or Attic R-60 Vaults R-38 and Glazing U-0.30, or Glazing U-0.25.
3	ENVELOPE UA: The proposed building envelope shall have a total UA at least 15% less than the code target UA as calculated using Table N1102.1.2 and Section N1102.1.2 Total UA alternative**.**
4	REDUCED AIR LEAKAGE ENVELOPE: Envelope leakage of an ACH50 of 2.5 or less when tested with a blower door at a pressure difference of 50 pascals. Testing shall follow the requirements in Section N1102.4.1.2.
5	HIGH EFFICIENCY HVAC DISTRIBUITON SYSTEM: All heating and cooling system components installed inside the conditioned space. All combustion equipment shall be direct vent or sealed combustion. Not qualifying: Systems with components located in conditioned crawl spaces and systems utilizing electric resistant heat, including baseboard and furnace, as the primary heat source.
6	HIGH EFFICIENCY WATER HEATING: Water heating system includes one of the following: Gas, propane or oil water heater with a minimum EF of 0.80 or Electric Heat Pump Water Heater with a minimum COP of 2.

7	SOLAR HOT WATER Solar water heating supplementing a minimum standard water heater. Solar water heating will provide a rated minimum savings of 85 therms or 2000 kWh based on the Solar Rating and Certification Corporation (SRCC) Annual Performance of OG-300 Certified Solar Water Heating Systems
8	SMALL HOUSING UNIT: Housing units less than 1300 square feet in floor area with less than 220 square feet of fenestration.

Reason: PART I- The proposal submitted by the Northwest Energy Codes Group (NWECG) increases the efficiency of new residential construction 30% above that of a base-case residence meeting the 2006 IECC. The innovative feature of this proposal is the inclusion of menus from which users must pick a fixed number of items. This approach was successfully incorporated into the Oregon residential code that went into effect in July of 2008. There have been no problems to date implementing that code.
The proposal offers several important benefits:

Provides flexibility for designers and builders;

Contains a limited number of discrete option items that are understandable and enforceable which will result in high compliance rates.

The proposed modifications have broad industry support, are proven energy savers, and appear in several other IECC code change proposals. The NWECG also is proposing to require air leakage testing for the building envelope for residential construction. Reducing air leakage provides significant energy savings especially in Climate Zones 3 and above and requiring air leakage testing has broad industry support. This proposal maintains the Total UA Alternative and also the Simulated Performance Alternative to provide flexibility to the code.

The modifications made to the base case prescriptive requirements in Table 402.1 provide a portion of the energy savings. The Additional Prescriptive Efficiency Measures in Section 406 provide the remainder. The tables in Section 406 were developed by reviewing a wide variety of measures to identify the most promising possibilities for achieving the desired 30% incremental change in efficiency. Next, the basic construct of Table 406.1 was developed and the measures to be included were selected, guided by several important criteria including ease of identification and implementation and applicability to a large percentage of homes. Products that were not broadly familiar were purposefully excluded. Once the measures were selected, they were analyzed in detail to generate a savings estimate for the code change proposal. All of the energy evaluations were conducted using REM/Rate Version 12.43. This is an evaluation tool commonly used to provide IECC simulated performance alternative code compliance documentation. Measures can be added or removed from the table as the IECC evolves or through local amendment which increases the usefulness of the format.

The NWECG proposal includes differentiated treatment of homes by size, a new idea for the IECC. Additional energy efficiency measures are required for larger homes, while small housing is included as an efficiency measure. The housing unit sizes selected were not determined using energy analysis. They represent approximately the smallest and the largest deciles of housing unit sizes in the United States, as reported in the 2003 American Housing Survey. The energy savings for small homes, or increased energy use in large homes, far exceed any measure analyzed in this study.

The NWECG solicited broad industry review and comment to ensure that the proposed changes could be implemented and enforced and achieve the target energy savings. The Energy Systems Laboratory at Texas A&M and Florida Solar Energy Center were consulted to ensure that the measures selected for hot climates were both practical and saved energy. Research studies and individuals with research and field experience were also used to help select measures for colder climates. We urge your support on this proposal.

Reason: PART II- The proposal submitted by the Northwest Energy Codes Group (NWECG) increases the efficiency of new residential construction 30% above that of a base-case residence meeting the 2006 IRC and IECC. The innovative feature of this proposal is the inclusion of menus from which users must pick a fixed number of items. This approach was successfully incorporated into the Oregon residential code that went into effect in July of 2008. There have been no problems to date implementing that code.
The proposal offers several important benefits:

Provides flexibility for designers and builders;

Contains a limited number of discrete option items that are understandable and enforceable which will result in high compliance rates.

This proposal focuses on maintaining the existing format of the 2009 IRC and adding a set of prescriptive measures that allow the code user to select from to achieve the additional energy savings. Modifications were made Table N1102.1 to increase the efficiency of the base building requirements. The proposed modifications have broad industry support, are proven energy savers, and appear in several other IECC code change proposals. Changes are also proposed to align the Solar Heat Gain Coefficient requirements in the IRC with those in the IECC. The NWECG also is proposing to require air leakage testing for the building envelope for residential construction. Reducing air leakage provides significant energy savings especially in Climate Zones 3 and above and requiring air leakage testing has broad industry support. This proposal maintains the Total UA Alternative to provide flexibility to the code.

The modifications made to the base case prescriptive requirements in Table N1102.1 provide a portion of the energy savings. The Additional Prescriptive Efficiency Measures in Section N1105 provide the remainder. The tables in Section N1105 were developed by reviewing a wide variety of measures to identify the most promising possibilities for achieving the desired 30% incremental change in efficiency. Next, the basic construct of Table N1105 was developed and the measures to be included were selected, guided by several important criteria including ease of identification and implementation and applicability to a large percentage of homes. Products that were not broadly familiar were purposefully excluded. Once the measures were selected, they were analyzed in detail to generate a savings estimate for the code change proposal. All of the energy evaluations were conducted using REM/Rate Version 12.43. This is an evaluation tool commonly used to provide IECC simulated performance alternative code compliance documentation. Measures can be added or removed from the table as the IRC evolves or through local amendment which increases the usefulness of the format.

The NWECG proposal includes differentiated treatment of homes by size, a new idea for the IECC. Additional energy efficiency measures are required for larger homes, while small housing is included as an efficiency measure. The housing unit sizes selected were not determined using energy analysis. They represent approximately the smallest and the largest deciles of housing unit sizes in the United States, as reported in the 2003 American Housing Survey. The energy savings for small homes, or increased energy use in large homes, far exceed any measure analyzed in this study.

The NWECG solicited broad industry review and comment to ensure that the proposed changes could be implemented and enforced and achieve the target energy savings. The Energy Systems Laboratory at Texas A&M and Florida Solar Energy Center were consulted to ensure that the measures selected for hot climates were both practical and saved energy. Research studies and individuals with research and field experience were also used to help select measures for colder climates. We urge your support on this proposal.

Cost Impact: The code change proposal will increase the cost of construction. The initial cost of this improvement may be higher, but long-term energy savings outweigh these costs.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

EC12–09/10
103.1.1, 401, 402, 403, 405

Proponent: Craig Conner, Building Quality, representing self

Revise as follows:

103.1.1 Above code programs. The code official or other authority having jurisdiction shall be permitted to deem a national, state or local energy efficiency program to exceed the energy efficiency required by this code. Buildings approved in writing by such an energy efficiency program shall be considered in compliance with this code. ~~The requirements identified as "mandatory" in Chapters 4 and 5 of this code, as applicable, shall be met.~~

401.1 Scope. This chapter applies to residential buildings.

401.2 Compliance. ~~Projects shall comply with Sections 401, 402.4, 402.5, 403.1, 403.2.2, 403.2.3 and 403.4 through 403.9 (referred to as the mandatory provisions) and either:~~

1. ~~Sections 402.1 through 402.3, 403.2.1 and 404.1 (prescriptive); or~~
2. ~~Section 405 (performance).~~

Compliance shall be demonstrated by meeting the applicable provisions of this chapter.

402.1 General. ~~(Prescriptive).~~
402.2 Specific insulation requirements. ~~(Prescriptive)~~
402.3 Fenestration. ~~(Prescriptive)~~
402.4 Air leakage. ~~(Mandatory)~~
~~402.5 Maximum fenestration *U*-factor and SHGC. (Mandatory).~~

SECTION 403
SYSTEMS ~~(Mandatory~~)

403.1 Controls. ~~(Mandatory)~~
403.1.2 Heat pump supplementary heat. ~~(Mandatory)~~
403.2 Ducts.
403.2.1 Insulation. ~~(Prescriptive)~~
403.2.2 Sealing. ~~(Mandatory)~~
403.2.3 Building cavities. ~~(Mandatory)~~
403.3 Mechanical system piping insulation. ~~(Mandatory)~~
403.4 Circulating hot water systems. ~~(Mandatory)~~
403.5 Mechanical ventilation. ~~(Mandatory)~~
403.6 Equipment sizing. ~~(Mandatory)~~
403.7 Systems serving multiple dwelling units. ~~(Mandatory)~~
403.8 Snow melt system controls. ~~(Mandatory)~~
403.9 Pools. ~~(Mandatory)~~
404.1 Lighting equipment ~~(Prescriptive).~~

SECTION 405
SIMULATED PERFORMANCE ALTERNATIVE –
~~(Performance)~~

405.2 Mandatory requirements. Compliance with this Section requires that ~~the mandatory provisions identified in Section 401.2 be met~~ projects comply with Sections 401, 402.4, 402.5, 403.1, 403.2.2, 403.2.3 and 403.4 through 403.9. All supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6.

Reason: This creates consistency between the IECC and IRC, corrects erroneous use of the term "*mandatory*", and corrects errors in the IECC concerning what can be traded in the performance section. This change creates a simple listing of the sections that cannot be traded off within the performance approach, as was in energy codes prior to 2006.

The three labels "*mandatory*", "*prescriptive*" and "*performance*" are used to label many sections in IECC, but not used at all in the IRC. Code consistency could be achieved by removing the terms from section headings in the IECC or by adding the terms to the IRC.

The word "*shall*" and the concept of "*mandatory*" is woven throughout the I-codes. It is important that the energy code be correct in its use of the word "*mandatory*" and be consistent with the other I-codes, including the IRC. The IRC definition is ***SHALL**. The term, when used in this code, is construed to mean "mandatory".* Therefore any section with "*shall*" in it implies "*mandatory*". Implying sections with the word "*prescriptive*" are somehow not "*mandatory*" is at the very least confusing, if not outright wrong.

Why are the three labels even in the IECC? The three labels were intended to separate what could or could not be traded off in the performance path. A simpler and clearer way to separate what can and cannot be traded off is to list the sections in one place as was done prior to 2006. Section 405 (Performance) already has a subsection ("Mandatory Requirements") defining what is subject to the performance tradeoff and what is not. The sections that cannot be traded off in the performance calculation should simply be listed under the existing heading "Mandatory Requirements" (Section 405.2) and the multiple unneeded headings can be removed as is shown below.

The existing code incorrectly lists some requirements as "prescriptive", meaning they can be traded off under the performance approach. Requirements incorrectly listed as "tradable" include installing insulation to be permanently attached in the floor and crawlspace (Sections 402.2.6 and 402.2.9), and the crawl space vapor retarder (Section 402.2.9). Permanent attachment of the insulation and important vapor retarders should not be traded away in a performance calculation.

Even if one argued that the three labels were not required in the IRC due to performance being only in IECC only, there are still inconsistencies within the IECC. Most importantly the IECC uses the word "mandatory" incorrectly in respect to the rest of the I-codes. Furthermore, the use of the terms is even inconsistent within the IECC. For example some (but not all) of sections labeled "*prescriptive*" and some (but not all) of the sections labeled "*mandatory*" in the IECC are also included as possible variables in the Performance Section (Section 405). Duct insulation is both "*mandatory*" (Section 405.2) and "*prescriptive*" (Section 403.2).

This change moves the list of requirements that cannot be traded into a single location in the performance section. It removes the mention of mandatory from the above-codes program (which after all are "above code"), removes 19 instances of the use of "*mandatory*", "*prescriptive*" and "*performance*" from section and subsection heading, and corrects errors in labeling requirements that can be traded; all without any change to section or subsection content. No change is made to the IRC, as the two codes are now consistent.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CONNER-EC-2-103.1.1-CH 4.DOC

EC13–09/10

202 (New), 401.2, Table 402.1.1, 401.3, Table 402.1.3, Table 402.2.5, Section 402.4, 402.4.1.1 (New), 402.4.1.2.1 (New),403.2, 403.2.4 (New), 403.4, Table 403.4.2 (new), 403.5, 404 (New), Table 405.5.2(1); IRC R202 (New), N1101.9, Table N1102.1, Table N1102.1.2, Table N1102.2.5, Section N1102.4, N1102.4.1.1 (New), N1102.4.1.2.1 (New), N1103.2, N1103.2.4.1 (New), N1103.4, Table N1103.4.2 (New), N1103.5, N1104 (New), Chapter 4

Proponent: Ronald Majette, representing US Department of Energy

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Add new definition as follows:

DEMAND RECIRCULATION WATER SYSTEM. A water distribution system where pump(s) prime the service hot water piping with heated water upon demand for hot water.

2. Revise as follows:

401.2 Compliance. Projects shall comply with Sections identified as "mandatory" and with either sections identified as "prescriptive" or the performance approach in Section 406. ~~Sections 401, 402.4, 402.5, and 403.1, 403.2.2, 403.2.3, and 403.3 through 403.9 (referred to as the mandatory provisions) and either:~~

~~1. Sections 402.1 through 402.3, 403.2.1 and 404.1 (prescriptive); or~~
~~2. Section 405 (performance).~~

401.3 Certificate (Mandatory). A permanent certificate shall be completed and posted on or in the electrical distribution panel by the builder or registered design professional. The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. ~~The certificate shall be completed by the builder or registered design professional.~~ The certificate shall list the predominant *R*-values of insulation installed in or on ceiling/roof, walls, foundation (slab, *basement wall*, crawlspace wall and/or floor) and ducts outside conditioned spaces; *U*-factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration, and the results from any duct system and building envelope air leakage testing done on the building. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be *listed* for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY Component

CLIMATE ZONE	FENESTRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	GLAZED FENESTRATION SHGC	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[i]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
1	~~1.20~~ NR	0.75	0.30	30	13	3 / 4	13	0	0	0
2	~~0.65~~ 0.50[j]	0.65 ~~0.75~~	0.30	30	13	4 / 6	13	0	0	0
3	~~0.50~~ 0.40[j]	0.55 ~~0.65~~	0.30[e]	~~30~~38	13	5 / 8	19	5/13[f]	0	5 / 13
4 except Marine	0.35	0.55 ~~0.60~~	NR	38	~~13~~ 20 or 13+5[h]	~~5 / 10~~ 8 / 13	19	10 / 13	10, 2 ft	10/13
5 and Marine 4	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	~~38~~49	20 or 13+5[h]	13 / 17	30[g]	10/13	10,2ft	10/13
6	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	49	20+5 or 13+~~5~~ 10[h]	15 / ~~19~~ 20	30[g]	15/19	10,4ft	10/13
7 and 8	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	49	~~21~~ 20+5 or 13+10[h]	19 / 21	38[g]	15/19	10,4ft	10/13

For SI: 1 foot = 304.8 mm.

a. *R*-values are minimums. *U*-factors and SHGC are maximums. R-19 batts compressed into a nominal 2x6 framing cavity such that the R-value is reduced by R-1 or more shall be marked with the compressed batt R-value in addition to the full thickness R-value.
b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
c. 15/19" means R-15 continuous ~~insulated sheathing~~ insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous ~~insulated sheathing~~ insulation on the interior or exterior of the home. "10/13" means R-10 continuous ~~insulated sheathing~~ insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.
d. R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 ft, whichever is less, in zones 1 through 3 for heated slabs.
e. There are no SHGC requirements in the Marine zone.
f. Basement wall insulation is not required in warm-humid locations as defined by Figure 301.1 and Table 301.1.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. First value is cavity insulation, second is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required in the locations where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.
i. The second R-value applies when more than half the insulation is on the interior of the mass wall.
j. For impact rated fenestration in wind-borne debris regions ~~complying with Section R301.2.1.2 of the IRC or Section 1608.1.2 of the IBC~~, the maximum U-factor shall be 0.75 in Zone 2 and 0.65 in Zone 3.

TABLE 402.1.3

EQUIVALENT *U*-FACTORS[a]

CLIMATE ZONE	FENES-TRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	CEILING *U*-FACTOR	FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
1	~~1.20~~ 0.65	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	~~0.65~~ 0.50	~~0.75~~ 0.65	0.035	0.082	0.165	0.064	0.360	0.477
3	~~0.50~~ 0.40	~~0.65~~ 0.55	~~0.035~~0.030	0.082	0.141	0.047	0.091[c]	0.136
4 except Marine	0.35	~~0.60~~ 0.55	0.030	~~0.082~~ 0.057	~~0.141~~ 0.098	0.047	0.059	0.065
5 and Marine 4	~~0.35~~ 0.32	~~0.60~~ 0.55	~~0.030~~0.026	0.057	0.082	0.033	0.059	0.065
6	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	~~0.057~~ 0.048	0.060	0.033	0.050	0.065
7 and 8	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	~~0.057~~ 0.048	0.057	0.028	0.050	0.065

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.

b. When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in zone 1, 0.14 in zone 2, 0.12 in zone 3, 0.10 in zone 4 except Marine, 0.087 in zone 5 and Marine 4, and the same as the frame wall U-factor in Marine zone 4 and zones 5 through 8.

c. Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure 301.1 and Table 301.2.

TABLE 402.2.5

STEEL-FRAME CEILING, WALL AND FLOOR INSULATION

(*R*-VALUE)

WOOD FRAME *R*-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT *R*-VALUE[a]
	Steel Truss Ceilings[b]
R-30	R -38 or R-30+3 or R-26+5
R-38	R -49 or R-38+3
R-49	R-38+5
	Steel Joist Ceilings[b]
R-30	R-38 in 2×4 or 2×6 or 2×8 R - 49 in any framing
R-38	R -49 in 2×4 or 2×6 or 2×8 or 2×10
	Steel Framed Wall
R-13	R -13+5 o rR-15+4 or R-21+3 or R-0+10
R-19	R -13+9 or R-19+8 or R-25+7
R-20 or R-21	R-13+10 or R-19+9 or R-25+8
R-20+5	R-13+15 or R-19+14 or R-25+13
	Steel Joist Floor
R-13	R-19 in 2×6; R-19+6 in 2×8 or 2×10
R-19	R-19+6 in 2×6; R-19+12 in 2×8 or 2×10

a. Cavity insulation *R*-value is listed first, followed by continuous insulation *R*-value.

b. Insulation exceeding the height of the framing shall cover the framing.

402.4 Air leakage (Mandatory).

402.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Sections 402.4.1.1 and 402.4.1.2. ~~be durably sealed to limit infiltration.~~ The sealing methods between dissimilar materials shall allow for differential expansion and contraction. ~~The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:~~

~~1. All joints, seams and penetrations.~~
~~2. Site-built windows, doors and skylights.~~
~~3. Openings between window and door assemblies and their respective jambs and framing.~~
~~4. Utility penetrations.~~
~~5. Dropped ceilings or chases adjacent to the thermal envelope.~~
~~6. Knee walls.~~
~~7. Walls and ceilings separating a garage from conditioned spaces.~~
~~8. Behind tubs and showers on exterior walls.~~
~~9. Common walls between dwelling units.~~
~~10. Attic access openings.~~
~~11. Rim joist junction.~~
~~12. Other sources of infiltration.~~

3. Add new text as follows:

402.4.1.1 Installation. The components of the *building thermal envelope* as listed in Table 402.4.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table 402.4.1.1, as applicable to the method of construction. Where required by the *code official*, an *approved* party shall inspect all components and verify compliance.

4. Revise as follows:

Table ~~402.4.2~~ 402.4.1.1
AIR BARRIER AND INSULATION ~~INSPECTION COMPONENT CRITERIA~~ INSTALLATION

COMPONENT	CRITERIA
Air barrier and thermal barrier	A continuous air barrier shall be installed in the building envelope. ~~Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier.~~ Breaks or joints in the air barrier ~~are filled or repaired~~ shall be sealed. Air permeable insulation ~~is~~ shall not be used as a sealing material. Any ~~A~~air permeable insulation shall be installed ~~is~~ inside of an air barrier.
Ceiling / attic	The air barrier in any dropped ceiling / soffit ~~is substantially~~ shall be aligned with the insulation and any gaps ~~are~~ in the air barrier sealed. ~~Attic access (except unvented attic), knee wall door, or drop down stair is sealed.~~ Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.
Walls	Corners and headers shall be ~~are~~ insulated and the~~.~~ junction of the foundation and sill plate ~~is~~ shall be sealed. The junction of the top plate and top of exterior walls shall be sealed. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier. Knee walls shall be sealed.
Windows, skylights and doors	The space between window/door jambs and framing and skylights and framing ~~is~~ shall be sealed.
Rim joists	Rim joists ~~are~~ shall be insulated and include ~~an~~ the air barrier.
Floors (including above garage and cantilevered floors)	Insulation ~~is~~ shall be installed to maintain permanent contact with underside of subfloor decking. The air barrier ~~is~~ shall be installed at any exposed edge of insulation.
Crawlspace walls	Where provided in lieu of floor insulation, insulation ~~is~~ shall be permanently attached to the crawlspace walls. Exposed earth in unvented crawlspaces ~~is~~ shall be covered with a class I vapor retarder with overlapping joints taped.
Shafts, penetrations	Duct shafts, utility penetrations, ~~knee walls,~~ and flue shafts opening to exterior or unconditioned space ~~are~~ shall be sealed.
Narrow cavities	Batts in narrow cavities ~~are~~ shall be cut to fit, or narrow cavities ~~are~~ shall be filled by ~~spayed/blown~~ insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing ~~is~~ shall be provided between the garage and conditioned spaces.
Recessed lighting	Recessed light fixtures installed in the building thermal envelope ~~are~~ shall be airtight, IC rated, and sealed to the drywall. ~~Exception: fixtures in conditioned space.~~
Plumbing and Wiring	~~Insulation is placed between outside and pipes.~~ Batt insulation ~~is~~ shall be cut neatly to fit around wiring and plumbing in exterior walls, or ~~sprayed/blown~~ insulation that on installation readily conforms to available space shall extend~~s~~ behind piping and wiring.
Shower / tub on exterior wall	Exterior walls adjacent to showers and tubs ~~on exterior walls~~ shall be ~~have~~ insulati~~on~~ed and ~~an~~ the air barrier installed separating them from the ~~exterior wall~~ showers and tubs.
Electrical / phone box on exterior walls	The air barrier ~~extends~~ shall be installed behind electrical or communication boxes or ~~an~~ air sealed ~~type~~ boxes ~~are~~ shall be installed.
Common wall	An air barrier ~~is~~ shall be installed in the common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building thermal envelope ~~are~~ shall be sealed to the subfloor or drywall.
Fireplace	An air barrier shall be installed on fireplace walls. ~~include an air barrier.~~ Fireplaces shall have gasketed doors.

5. Delete and substitute as follows:

~~**402.4.2 Air sealing and insulation.** Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2.~~

~~**402.4.2.1 Testing option.** Building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 33.5 psf (50 Pa). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.~~

402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding 5 air changes per hour (ACH50) in zones 1 and 2, and 3 air changes per hour in zones 3 through 8. Testing

shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the *code official*, testing shall be conducted by an *approved* party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after rough in and creation of all penetrations of the *building thermal envelope*

Exception: Where heating and cooling equipment meets the requirements of Section 404, maximum leakage rate shall be seven air changes per hour (ACH50) in zones 1 and 2 and five air changes per hour in zones 3 through 8. Additions less than 1000 square feet are exempt from testing.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed~~;~~ beyond the intended weatherstripping or other infiltration control measures;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed, ~~including exhaust, intake, makeup air, backdraft and flue dampers~~ beyond intended infiltration control measures;
3. Interior doors, if installed at the time of test, shall be open;
4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling system(s), if installed at the time of the test, shall be turned off; and
6. ~~HVAC ducts shall not be sealed; and~~
7. ~~7~~ 6. Supply and return registers, if installed at the time of the test, shall ~~not~~ be ~~sealed~~ fully open.

6. Add new text as follows:

402.4.1.2.1 Sampling. Where groups of seven or more buildings of similar design and construction are completed and are issued occupancy permits during a 120-day period, or where a multifamily structure contains more than four dwelling units, testing of less than 100 percent, but not less than 1 in 7 or 15 percent, of the buildings from a specific builder and/or contractor or of dwelling units in a multifamily structure shall be permitted when *approved* by the *code official*. The specific buildings or dwelling units to be tested shall be selected by the *code official*. If any tested building or dwelling unit fails to comply with the maximum air leakage requirement in Section 402.4.1.2 then all buildings or dwelling units shall be tested until a minimum of three consecutive buildings or dwelling units comply from that specific builder and/or contractor or multifamily structure before the *code official* may permit sampling to resume.

7. Delete without substitution:

~~**402.4.2.2 Visual inspection option.** Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table 402.4.2, applicable to the method of construction, are field verified. Where required by the *code official*, an *approved* party independent from the installer of the insulation shall inspect the air barrier and insulation.~~

8. Revise as follows:

402.4.3 Fireplaces. New wood-burning fireplaces shall have ~~gasketed doors and~~ outdoor combustion air.

403.2.2 Sealing (Mandatory). All ducts, air handlers, and filter boxes ~~and building cavities used as ducts~~ shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the *International Residential Code*.

Duct tightness shall be verified by either of the following:

1. Postconstruction test: Total leakage ~~to outdoors~~ shall be less than or equal to ~~8~~ 4 cfm (~~226.5~~ 113.3 L/min) per 100 square feet (9.29 m^2) of *conditioned floor area* ~~or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*~~ when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.
2. Rough-in test: Total leakage shall be less than or equal to ~~6~~ 4 cfm (~~169.9~~ 113.3 L/min) per 100 square feet (9.29 m^2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the ~~roughed in~~ system, including the manufacturer's air handler enclosure. All register ~~boot~~s shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to ~~4~~ 3 cfm (~~113.3~~ 85.0 L/min) per 100 square feet (9.29 m^2) of *conditioned floor area*.

~~**Exceptions:** Duct tightness test is not required if the air handler and all ducts are located within *conditioned space*~~.

Exception: Where heating and cooling equipment meets the requirements of Section 404:

1. Maximum total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 square feet (9.29m^2) of conditioned floor area for ducts located outside conditioned space, and
2. The maximum leakage test is not required for ducts and air handlers located entirely within conditioned space.

9. Add new text as follows:

403.2.4 Location (Prescriptive). All ducts and air handlers shall be located within the conditioned space.

Exception: Where heating and cooling equipment meets the requirements of Section 404.

10. Revise as follows:

403.4 Service hot water systems.

~~**403.4**~~ **403.4.1 Circulating hot water systems (Mandatory).** ~~All circulating service hot water piping shall be insulated to at least R-2.~~ Circulating hot water systems shall ~~include~~be provided with an automatic or readily accessible manual switch that can turn off the hot water circulating pump when not in use.

11. Add new text and table as follows:

403.4.2 Hot water pipe insulation (Prescriptive). Insulation with a minimum thermal resistance (R-value) of at least R-3 shall be applied to the following:

1. Piping larger than 3/4 inch nominal diameter;
2. Piping serving more than one dwelling unit;
3. Piping from the water heater to kitchen outlets;
4. Piping located outside the conditioned space;
5. Piping from the water heater to a distribution manifold;
6. Piping located under a floor slab;
7. Buried piping; and
8. Supply and return piping in recirculation systems other than demand recirculation systems.

All remaining piping shall be insulated to at least R-3 or meet the run length requirements of Table 403.4.2.

TABLE 403.4.2
MAXIMUM RUN LENGTH (feet)[a]

Nominal Pipe Diameter of Largest Diameter Pipe in the Run (in.)	3/8	1/2	3/4	> 3/4
Maximum Run Length	30	20	10	5

a. Total length of all piping from the distribution manifold or the recirculation loop to a point of use.

12. Revise as follows:

403.5 Mechanical ventilation (Mandatory). The building shall be provided with ventilation that meets the requirements of Section M1507 of the *International Residential Code* or with other approved means of ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

13. Add new text as follows:

404 Improved equipment efficiency alternative. (Prescriptive) For new residences, Sections 404.1 and 402.2 shall be permitted as an alternative to certain requirements as specified by Exceptions in Sections 402.4.1.2, 403.2.2, and 403.2.4.

404.1 Heating equipment. In zones 3 and 4 gas furnace AFUE shall be at least 90. In zones 5 through 8, gas furnace AFUE shall be at least 92. In zones 3 through 8, gas boiler, oil boiler, or oil furnace AFUE shall be at least 85. In zones 3 through 8, heat pump HSPF shall be at least 8.5. Ground source heat pumps shall have a minimum efficiency as specified in Table 503.2.3(2). All-electric heated buildings shall utilize either an air-source or ground source heat pump.

404.2 Cooling equipment. In zones 1 and 2, vapor compression air conditioning SEER shall be at least 16.0 and EER at least 12.5. In zone 3, vapor compression air conditioning SEER shall be at least 15.0 and EER at least 12.5. In zones 1 through 3, room air conditioner EER shall be at least 11.0 for air conditioners with capacity less than 20,000 Btu/hr, or 10.0 for capacities equal to or greater than 20,000 Btu/hr. Ground source heat pumps shall have a minimum efficiency as specified in Table 503.2.3(2).

404.2.3 Future updates to federal manufacturing standards. If applicable Federal manufacturing standards as specified in 10 CFR 430 are updated to establish new efficiency requirements, equipment efficiency requirements in this section shall be improved by a percentage equivalent to the percentage improvement from the efficiency required by 10 CFR 430 as of January 1, 2011 to the efficiency required by 10 Code of Federal Regulations 430 at the date of plan check approval.

Exception: AFUEs for furnaces and boilers shall not be required to exceed the higher of 95 or the requirement in 10 CFR 430 at the date of plan check approval.

14. Revise as follows:

SECTION ~~404~~ 405
ELECTRICAL POWER AND LIGHTING SYSTEMS

~~404.1~~ 405.1 Lighting equipment (Prescriptive). A minimum of ~~50~~ seventy-five percent of the lamps in permanently installed lighting fixtures shall be high efficacy lamps or a minimum of seventy-five percent of the permanently installed lighting fixtures shall contain only high efficacy lamps.

Exception: Low-voltage lighting.

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Air Exchange Rate	~~Specific leakage area (SLA)[d] = 0.00036~~ Air leakage rate of 5 air changes per hour in zones 1 and 2, and 3 air changes per hour in zones 3 through 8 at a pressure of 0.2 inches w.g. (50 Pa). ~~assuming no energy recovery~~. The mechanical ventilation rate shall be in addition to the air leakage rate and the same as in the proposed design, but no greater than 0.01 x *CFA* + 7.5 x (*Nbr*+1) where: *CFA* = conditioned floor area *Nbr* = number of bedrooms Energy recovery shall not be assumed for mechanical ventilation.	For residences that are not tested, the same air leakage rate as the standard reference design. ~~For residences without mechanical ventilation that are tested in accordance with ASHRAE 119, Section 5.1, the measured air exchange rate[e] but not less than 0.35 ACH~~ For tested residences ~~with mechanical ventilation that are tested in accordance with ASHRAE 119, Section 5.1~~, the measured air exchange rate[e] ~~combined with the~~ proposed mechanical ventilation rate, ~~*f* which shall not be less than 0.01 x *CFA* + 7.5 x (*Nbr*+1)~~ ~~where:~~ ~~*CFA* = conditioned floor area~~ ~~*Nbr* = number of bedrooms~~ The mechanical ventilation rate shall be in addition to the air leakage rate and shall be as proposed.

Thermal distribution systems	~~A thermal distribution system efficiency (DSE) of 0.88 shall be applied to both the heating and cooling system efficiencies for all systems other than tested duct systems. Duct insulation: From Section 403.2.1. For tested duct systems, the leakage rate shall be the applicable maximum rate from Section 403.2.2. 4 cfm (113.3 L/min) per 100 ft2 (9.29 m2) of conditioned floor area at a pressure differential of 0.1 inches w.g. (25 Pa).~~	Thermal distribution system efficiency shall be as tested or as specified by Table 405.5.2(2) if not tested. Duct insulation shall be as proposed.

e. Where required by the *code official*, testing shall be conducted by an *approved* party. ~~Tested envelope leakage shall be determined and documented by an independent party approved by the *code official*.~~ Hourly calculations as specified in the ~~2001~~ASHRAE *Handbook of Fundamentals*~~, Chapter 26, page 26.21, Equation 40 (Sherman-Grimsrud model)~~ or the equivalent shall be used to determine the energy loads resulting from infiltration.

(Portions of table and footnotes not shown remain unchanged)

PART II – IRC BUILDING/ENERGY

1. Add new definition as follows:

DEMAND RECIRCULATION WATER SYSTEM. A water distribution system where pump(s) prime the service hot water piping with heated water upon demand for hot water.

2. Revise as follows:

N1101.9 Certificate. A permanent certificate shall be completed and posted on or in the electrical distribution panel by the builder or registered design professional. The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. ~~The certificate shall be completed by the builder or registered design professional.~~ The certificate shall list the predominant *R*-values of insulation installed in or on ceiling/roof, walls, foundation (slab, *basement wall*, crawlspace wall and/or floor) and ducts outside conditioned spaces; *U*-factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration, and the results from any duct system and building envelope air leakage testing done on the building. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be *listed* for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY Component

CLIMATE ZONE	FENESTRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	GLAZED FENESTRATION SHGC	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[k]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
1	~~1.20~~ NR	0.75	0.30 0.35[j]	30	13	3 / 4	13	0	0	0
2	~~0.65~~ 0.50[i]	0.65 ~~0.75~~	0.30 0.35[j]	30	13	4 / 6	13	0	0	0
3	~~0.50~~ 0.40[i]	0.55 ~~0.65~~	0.30 0.35[e, j]	~~30~~38	13	5 / 8	19	5/13[f]	0	5 / 13
4 except Marine	0.35	0.55 ~~0.60~~	NR	38	~~13~~ 20 or 13+5[h]	~~5 / 10~~ 8 / 13	19	10 / 13	10, 2 ft	10/13
5 and Marine 4	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	~~38~~49	20 or 13+5[h]	13 / 17	30[f g]	10/13	10,2ft	10/13
6	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	49	20+5 or 13+~~5~~ 10[h]	15 / ~~19~~ 20	30[g]	15/19	10,4ft	10/13
7 and 8	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	49	~~21~~ 20+5 or 13+10[h]	19 / 21	38[g]	15/19	10,4ft	10/13

For SI: 1 foot = 304.8 mm.

a. *R*-values are minimums. *U*-factors and SHGC are maximums. R-19 batts compressed into a nominal 2x6 framing cavity such that the R-value is reduced by R-1 or more shall be marked with the compressed batt R-value in addition to the full thickness R-value.

b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.

c. The first value applies to continuous insulation, the second to framing cavity insulation; either insulation meets the requirement.
d. R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 ft, whichever is less, in zones 1 through 3 for heated slabs.
e. There are no SHGC requirements in the Marine zone.
f. Basement wall insulation is not required in warm-humid locations as defined by Figure N1101.2 and Table N1101.2.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. First value is cavity insulation, second is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required in the locations where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.
i. For impact rated fenestration in wind-borne debris regions ~~complying with Section R301.2.1.2~~, the maximum U-factor shall be 0.75 in Zone 2 and 0.65 in Zone 3.
~~j. For impact rated fenestration complying with Section R301.2.1.2 of the *International Residential Code*, the maximum SHGC shall be 0.40.~~
k. The second R-value applies when more than half the insulation is on the interior of the mass wall.

TABLE N1102.1.2
EQUIVALENT *U*-FACTORS[a]

CLIMATE ZONE	FENES-TRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	CEILING *U*-FACTOR	FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
1	~~1.20~~ 0.65	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	~~0.65~~ 0.50	~~0.75~~ 0.65	0.035	0.082	0.165	0.064	0.360	0.477
3	~~0.50~~ 0.40	~~0.65~~ 0.55	~~0.035~~0.030	0.082	0.141	0.047	0.091[c]	0.136
4 except Marine	0.35	~~0.60~~ 0.55	0.030	~~0.082~~ 0.057	~~0.141~~ 0.098	0.047	0.059	0.065
5 and Marine 4	~~0.35~~ 0.32	~~0.60~~ 0.55	~~0.030~~0.026	0.057	0.082	0.033	0.059	0.065
6	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	~~0.057~~ 0.048	0.060	0.033	0.050	0.065
7 and 8	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	~~0.057~~ 0.048	0.057	0.028	0.050	0.065

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.
b. When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in zone 1, 0.14 in zone 2, 0.12 in zone 3, 0.10 in zone 4 except Marine, 0.087 in zone 5 and Marine 4, and the same as the frame wall U-factor in Marine zone 4 and zones 5 through 8.
c. Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure N1101.2 and Table N1101.2.

TABLE N1102.2.5
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION
(*R*-VALUE)

WOOD FRAME *R*-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT *R*-VALUE[a]
	Steel Truss Ceilingsb
R-30	R -38 or R-30+3 or R-26+5
R-38	R -49 or R-38+3
R-49	R-38+5
	Steel Joist Ceilings[b]
R-30	R-38 in 2×4 or 2×6 or 2×8 R - 49 in any framing
R-38	R -49 in 2×4 or 2×6 or 2×8 or 2×10
	Steel Framed Wall
R-13	R -13+5 o rR-15+4 or R-21+3 or R-0+10
R-19	R -13+9 or R-19+8 or R-25+7
R-20 or R-21	R-13+10 or R-19+9 or R-25+8
R-20+5	R-13+15 or R-19+14 or R-25+13
	Steel Joist Floor
R-13	R-19 in 2×6; R-19+6 in 2×8 or 2×10
R-19	R-19+6 in 2×6; R-19+12 in 2×8 or 2×10

a. Cavity insulation *R*-value is listed first, followed by continuous insulation *R*-value.
b. Insulation exceeding the height of the framing shall cover the framing.

N1102.4 Air leakage (Mandatory).

N1102.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Sections N1102.4.1.1 and N1102.4.1.2. ~~be durably sealed to limit infiltration.~~ The sealing methods between dissimilar materials shall allow for differential expansion and contraction. ~~The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:~~

1. ~~All joints, seams and penetrations.~~
2. ~~Site-built windows, doors and skylights.~~
3. ~~Openings between window and door assemblies and their respective jambs and framing.~~
4. ~~Utility penetrations.~~
5. ~~Dropped ceilings or chases adjacent to the thermal envelope.~~
6. ~~Knee walls.~~
7. ~~Walls and ceilings separating a garage from conditioned spaces.~~
8. ~~Behind tubs and showers on exterior walls.~~
9. ~~Common walls between dwelling units.~~
10. ~~Attic access openings.~~
11. ~~Rim joist junction.~~
12. ~~Other sources of infiltration.~~

3. Add new text as follows:

N1102.4.1.1 Installation. The components of the *building thermal envelope* as listed in Table N1102.4.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table N1102.4.1.1, as applicable to the method of construction. Where required by the *building official*, an *approved* party shall inspect all components and verify compliance.

4. Revise as follows:

TABLE N1102.4.1.1 ~~N1102.4.2~~
AIR BARRIER AND INSULATION ~~INSPECTION COMPONENT CRITERIA~~ INSTALLATION

COMPONENT	CRITERIA
Air barrier and thermal barrier	A continuous air barrier shall be installed in the building envelope. ~~Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier.~~ Breaks or joints in the air barrier ~~are~~ ~~filled or repaired~~ shall be sealed. Air permeable insulation ~~is~~ shall not be used as a sealing material. Any ~~A~~air permeable insulation shall be installed ~~is~~ inside of an air barrier.
Ceiling / attic	The air barrier in any dropped ceiling / soffit ~~is substantially~~ shall be aligned with the insulation and any gaps ~~are~~ in the air barrier sealed. ~~Attic access (except unvented attic), knee wall door, or drop down stair is sealed.~~ Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.
Walls	Corners and headers shall be ~~are~~ insulated and the~~.~~ junction of the foundation and sill plate ~~is~~ shall be sealed. The junction of the top plate and top of exterior walls shall be sealed. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier. Knee walls shall be sealed.
Windows, skylights and doors	The space between window/door jambs and framing and skylights and framing ~~is~~ shall be sealed.
Rim joists	Rim joists ~~are~~ shall be insulated and include ~~an~~ the air barrier.
Floors (including above garage and cantilevered floors)	Insulation ~~is~~ shall be installed to maintain permanent contact with underside of subfloor decking. The air barrier ~~is~~ shall be installed at any exposed edge of insulation.
Crawlspace walls	Where provided in lieu of floor insulation, insulation ~~is~~ shall be permanently attached to the crawlspace walls. Exposed earth in unvented crawlspaces ~~is~~ shall be covered with a class I vapor retarder with overlapping joints taped.
Shafts, penetrations	Duct shafts, utility penetrations, ~~knee walls,~~ and flue shafts opening to exterior or unconditioned space ~~are~~ shall be sealed.
Narrow cavities	Batts in narrow cavities ~~are~~ shall be cut to fit, or narrow cavities ~~are~~ shall be filled by ~~spayed/blown~~ insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing ~~is~~ shall be provided between the garage and conditioned spaces.
Recessed lighting	Recessed light fixtures installed in the building thermal envelope ~~are~~ shall be airtight, IC rated, and sealed to the drywall. ~~Exception- fixtures in conditioned space.~~
Plumbing and Wiring	~~Insulation is placed between outside and pipes.~~ Batt insulation ~~is~~ shall be cut neatly to fit around wiring and plumbing in exterior walls, or ~~sprayed/blown~~ insulation that on installation readily conforms to available space shall extend~~s~~ behind piping and wiring.
Shower / tub on exterior wall	Exterior walls adjacent to showers and tubs ~~on exterior walls~~ shall be ~~have~~ insulati~~on~~ed and ~~an~~ the air barrier installed separating them from the ~~exterior wall~~ showers and tubs.
Electrical / phone box on exterior walls	The air barrier ~~extends~~ shall be installed behind electrical or communication boxes or ~~an~~ air sealed ~~type~~ boxes ~~are~~ shall be installed.
Common wall	An air barrier ~~is~~ shall be installed in the common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building thermal envelope ~~are~~ shall be sealed to the subfloor or drywall.
Fireplace	An air barrier shall be installed on fireplace walls. ~~include an air barrier.~~ Fireplaces shall have gasketed doors.

5. Delete and substitute as follows:

~~**N1102.4.2 Air sealing and insulation.** Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section N1102.4.2.1 or N1102.4.2.2.~~

~~**N1102.4.2.1 Testing option.** Building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 33.5 psf (50 Pa). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.~~

N1102.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding 5 air changes per hour (ACH50) in zones 1 and 2, and 3 air changes per hour in zones 3 through 8. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the *building official*, testing shall be conducted by an *approved* party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *building official*. Testing shall be performed at any time after rough in and creation of all penetrations of the *building thermal envelope*

> **Exception:** Where heating and cooling equipment meets the requirements of Section N1104, maximum leakage rate shall be seven air changes per hour (ACH50) in zones 1 and 2 and five air changes per hour in zones 3 through 8. Additions less than 1000 square feet are exempt from testing.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed~~;~~ beyond the intended weatherstripping or other infiltration control measures;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed, ~~including exhaust, intake, makeup air, backdraft and flue dampers~~ beyond intended infiltration control measures;
3. Interior doors, if installed at the time of test, shall be open;
4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling system(s), if installed at the time of the test, shall be turned off; and
6. ~~HVAC ducts shall not be sealed; and~~

~~7~~ 6. Supply and return registers, if installed at the time of the test, shall ~~not~~ be ~~sealed~~ fully open.

6. Add new text as follows:

N1102.4.1.2.1 Sampling. Where groups of seven or more buildings of similar design and construction are completed and are issued occupancy permits during a 120-day period, or where a multifamily structure contains more than four dwelling units, testing of less than 100 percent, but not less than 15 percent, of the buildings from a specific builder and/or contractor or of dwelling units in a multifamily structure shall be permitted when *approved* by the *building official*. The specific buildings or dwelling units to be tested shall be selected by the *building official*. If any tested building or dwelling unit fails to comply with the maximum air leakage requirement in Section N1102.4.1.2 then all buildings or dwelling units shall be tested until a minimum of three consecutive buildings or dwelling units comply from that specific builder and/or contractor or multifamily structure before the *building official* may permit sampling to resume.

7. Delete without substitution:

~~**N1102.4.2.2 Visual inspection option.** Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table N1102.4.2, applicable to the method of construction, are field verified. Where required by the *code official*, an *approved* party independent from the installer of the insulation shall inspect the air barrier and insulation.~~

8. Revise as follows:

N1102.4.3 Fireplaces. New wood-burning fireplaces shall have ~~gasketed doors and~~ outdoor combustion air.

N1103.2.2 Sealing (Mandatory). All ducts, air handlers, and filter boxes ~~and building cavities used as ducts~~ shall be sealed. Joints and seams shall comply with Section M1601.4. Duct tightness shall be verified by either of the following:

1. Postconstruction test: Total leakage ~~to outdoors~~ shall be less than or equal to ~~8~~ 4 cfm (~~226.5~~ 113.3 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* ~~or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*~~ when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.
2. Rough-in test: Total leakage shall be less than or equal to ~~6~~ 4 cfm (~~169.9~~ 113.3 L/min) per 100 square feet (9.29 m^2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the ~~roughed in~~ system, including the manufacturer's air handler enclosure. All register ~~boot~~s shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to ~~4~~ 3 cfm (~~113.3~~ 85.0 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*.

~~**Exceptions:** Duct tightness test is not required if the air handler and all ducts are located within *conditioned space*~~.

Exception: Where heating and cooling equipment meets the requirements of section N1104:

1. Maximum total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 ft^2 (9.29m^2) of conditioned floor area for ducts located outside conditioned space, and
2. The maximum leakage test is not required for ducts and air handlers located entirely within conditioned space.

9. Add new text as follows:

N1103.2.4 Location (Prescriptive). All ducts and air handlers shall be located within the conditioned space.

Exception: Where heating and cooling equipment meets the requirements of Section N1104.

10. Revise as follows:

N1103.4 Service hot water systems.

~~**N1103.4**~~ **N1103.4.1 Circulating hot water systems (Mandatory).** ~~All circulating service hot water piping shall be insulated to at least R-2.~~ Circulating hot water systems shall ~~include~~be provided with an automatic or readily accessible manual switch that can turn off the hot water circulating pump when not in use.

11. Add new text and table as follows:

N1103.4.2 Hot water pipe insulation (Prescriptive). Insulation with a minimum thermal resistance (R-value) of at least R-3 shall be applied to the following:

1. Piping larger than 3/4 inch nominal diameter;
2. Piping serving more than one dwelling unit;
3. Piping from the water heater to kitchen outlets;
4. Piping located outside the conditioned space;
5. Piping from the water heater to a distribution manifold;
6. Piping located under a floor slab;
7. Buried piping; and
8. Supply and return piping in recirculation systems other than demand recirculation systems.

All remaining piping shall be insulated to at least R-3 or meet the run length requirements of Table N1103.4.2.

TABLE N1103.4.2
MAXIMUM RUN LENGTH (feet)[a]

Nominal Pipe Diameter of Largest Diameter Pipe in the Run (in.)	3/8	1/2	3/4	> 3/4
Maximum Run Length	30	20	10	5

a. Total length of all piping from the distribution manifold or the recirculation loop to a point of use.

12. Revise as follows:

N1103.5 Mechanical ventilation (Mandatory). The building shall be provided with ventilation that meets the requirements of Section M1507 of the *International Residential Code* or with other approved means of ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

13. Add new text as follows:

N1104 Improved equipment efficiency alternative. (Prescriptive) For new residences, Sections N1104.1 and N1102.2 shall be permitted as an alternative to certain requirements as specified by exceptions in Sections N1102.4.1.2, N1103.2.2, and N1103.2.4.

N1104.1 Heating equipment. In zones 3 and 4 gas furnace AFUE shall be at least 90. In zones 5 through 8, gas furnace AFUE shall be at least 92. In zones 3 through 8, gas boiler, oil boiler, or oil furnace AFUE shall be at least 85. In zones 3 through 8, heat pump HSPF shall be at least 8.5. Ground source heat pumps shall have a minimum efficiency as specified in Table 503.2.3(2). All-electric heated buildings shall utilize either an air-source or ground source heat pump.

N1104.2 Cooling equipment. In zones 1 and 2, vapor compression air conditioning SEER shall be at least 16.0 and EER at least 12.5. In zone 3, vapor compression air conditioning SEER shall be at least 15.0 and EER at least 12.5. In zones 1 through 3, room air conditioner EER shall be at least 11.0 for air conditioners with capacity less than 20,000 Btu/hr, or 10.0 for capacities equal to or greater than 20,000 Btu/hr. Ground source heat pumps shall have a minimum efficiency as specified in Table 503.2.3(2).

N1104.2.3 Future updates to federal manufacturing standards. If applicable Federal manufacturing standards as specified in 10 CFR 430 are updated to establish new efficiency requirements, equipment efficiency requirements in this section shall be improved by a percentage equivalent to the percentage improvement from the efficiency required by 10 CFR 430 as of January 1, 2011 to the efficiency required by 10 Code of Federal Regulations 430 at the date of plan check approval.

> **Exception:** AFUEs for furnaces and boilers shall not be required to exceed the higher of 95 or the requirement in 10 CFR 430 at the date of plan check approval.

14. Revise as follows:

SECTION ~~N1104~~ N1105
LIGHTING SYSTEMS

~~N1104.1~~ N1105.1 Lighting equipment. A minimum of ~~50~~ seventy-five percent of the lamps in permanently installed lighting fixtures shall be high efficacy lamps or a minimum of seventy-five percent of the permanently installed lighting fixtures shall contain only high efficacy lamps.

> **Exception:** Low-voltage lighting.

15. Add new standard to Chapter 44 as follows:

DOE
10 CFR, Part 430 Energy Conservation Standards

Reason: The purpose of this proposal is to substantially improve the energy performance of residential buildings that comply with the IECC. This proposal is one part of an effort by DOE and other stakeholders to improve the energy efficiency of the IECC by 30% compared to the 2006 edition of the code. DOE recognizes that recent federal legislation, potential new legislation, movements in numerous state and local building code jurisdictions, and general environmental concerns dictate an unquestionable call for substantial reductions in the energy consumption of residential buildings. This proposal addresses that need via improvements to several key areas of the IECC, while minimizing the extent of structural/format change in the code, an important consideration for maximizing returns on past investments in training and infrastructure by code jurisdictions. There are four key areas of improvement in this proposal:

Reduced leakage in duct systems and building envelopes, verified by testing. The proposal requires that all ductwork be inside conditioned space, sets new leakage limits on the ductwork, and adds a new requirement for testing the air tightness of the building envelope. As an alternative, homes with high-efficiency HVAC equipment are exempted from the requirement for ducts inside the conditioned space and are subject to less stringent duct and whole-house testing requirements.

Several studies of recently built residences in states with the IECC code or other codes that require building envelope sealing show a distribution of air leakage rates, varying from low to high leakage. Based on these studies, DOE believes the proposed maximum leakage rates are already being achieved in well-sealed homes. The main effect of the proposed leakage rate limits will be to improve the considerable share of homes that have higher leakage rates.

The proposal would allow the code official to permit sampling (of not less than 1 in 7 buildings) for air tightness testing from a specific builder. The idea is that once the code official has gained confidence that the builder has a good track record of sealing properly to code, the sampling could be permitted to lower costs associated with the air leakage testing. The code official would still be required to do a visual inspection of air sealing in every new building.

Improved envelope insulation. Fenestration U-factors (including skylights) are reduced in most zones. The proposed U-factors for fenestration other than skylights in zones 2 and 3 match those that were approved by the IECC committee in the 07/08 cycle though these improvements were ultimately overturned at the final action hearings. Wood-frame wall insulation is increased from R-13 to R-20 in zone 4 and ceiling insulation levels are increased on zones 3 and 5.

New provisions to limit energy loss from domestic hot water pipes. The IECC and IRC currently have minimal requirements for energy efficiency related to water heating. This proposed pipe insulation requirement represent a modest initial investment that will save energy for the life of the home, even through water heating equipment changeouts. The proposed requirements are structured to encourage "short and skinny" pipe runs that will minimize energy losses due to stranded water in pipes. Hot water pipes that are longer and/or larger in diameter will require insulation. Either way, these requirements help save water and limit the energy wasted when a faucet or appliance is turned off and the pipes are left full of hot water.

Larger fraction of high efficacy lighting. The proposal increases the fraction of lamps that must be high-efficacy from 50% to 75%, a reasonable improvement given the advances in efficient lighting and the approaching Federal standards that will require efficient lighting by 2014.
This proposal has a number of other more minor changes to improve and clarify code language and save energy.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, DOE 10 CFR 430, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-65-202-CH 4-IRC R202-CH 11-

EC14–09/10

202 (New), 401.2, Table 402.1.1, 401.3, Table 402.1.3, Table 402.2.5, Section 402.4, 402.4.1.1 (New), 402.4.1.2.1 (New),403.2, 403.2.3 (New), 403.2.4 (New), 403.4, Table 403.4.2 (new), 403.5, 404 (New), Table 405.5.2(1), Chapter 6

Proponent: Ron Nickson, representing National Multi Housing Council

1. Add new definition as follows:

DEMAND RECIRCULATION WATER SYSTEM. A water distribution system where pumps prime the service hot water piping with heated water upon demand for hot water.

2. Revise as follows:

401.2 Compliance. Projects shall comply with Sections identified as "mandatory" and with either sections identified as "prescriptive" or the performance approach in Section 406. ~~Sections 401, 402.4, 402.5, and 403.1, 403.2.2, 403.2.3, and 403.3 through 403.9 (referred to as the mandatory provisions) and either:~~

1. ~~Sections 402.1 through 402.3, 403.2.1 and 404.1 (prescriptive); or~~
2. ~~Section 405 (performance).~~

401.3 Certificate (Mandatory). A permanent certificate shall be completed and posted on or in the electrical distribution panel by the builder or registered design professional. The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. ~~The certificate shall be completed by the builder or registered design professional.~~ The certificate shall list the predominant *R*-values of insulation installed in or on ceiling/roof, walls, foundation (slab, *basement wall*, crawlspace wall and/or floor) and ducts outside conditioned spaces; *U*-factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration, and the results from any duct system and building envelope air leakage testing done on the building. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room

heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be *listed* for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY Component

CLIMATE ZONE	FENESTRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	GLAZED FENESTRATION SHGC	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[i]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
1	~~1.20~~ NR	0.75	0.30	30	13	3 / 4	13	0	0	0
2	~~0.65~~ 0.50[j]	0.65 ~~0.75~~	0.30	30	13	4 / 6	13	0	0	0
3	~~0.50~~ 0.40[j]	0.55 ~~0.65~~	0.30[e]	~~30~~38	13	5 / 8	19	5/13[f]	0	5 / 13
4 except Marine	0.35	0.55 ~~0.60~~	NR	38	~~13~~ 20 or 13+5[g, h]	~~5 / 10~~ 8 / 13	19	10 / 13	10, 2 ft	10/13
5 and Marine 4	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	~~38~~49	20 or 13+5[h]	13 / 17	30[g]	10/13	10,2ft	10/13
6	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	49	20+5 or ~~13+5~~ 10[h]	15 / ~~19~~ 20	30[g]	15/19	10,4ft	10/13
7 and 8	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	49	~~21~~ 20+5 or 13+10[h]	19 / 21	38[g]	15/19	10,4ft	10/13

For SI: 1 foot = 304.8 mm.

a. *R*-values are minimums. *U*-factors and SHGC are maximums. R-19 batts compressed into a nominal 2x6 framing cavity such that the R-value is reduced by R-1 or more shall be marked with the compressed batt R-value in addition to the full thickness R-value.
b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
c. 15/19" means R-15 continuous ~~insulated sheathing~~ insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous ~~insulated sheathing~~ insulation on the interior or exterior of the home. "10/13" means R-10 continuous ~~insulated sheathing~~ insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.
d. R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 ft, whichever is less, in zones 1 through 3 for heated slabs.
e. There are no SHGC requirements in the Marine zone.
f. Basement wall insulation is not required in warm-humid locations as defined by Figure 301.1 and Table 301.1.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. First value is cavity insulation, second is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required in the locations where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.
i. The second R-value applies when more than half the insulation is on the interior of the mass wall.
j. For impact rated fenestration in wind-borne debris regions ~~complying with Section R301.2.1.2 of the IRC or Section 1608.1.2 of the IBC~~, the maximum U-factor shall be 0.75 in Zone 2 and 0.65 in Zone 3.

TABLE 402.1.3
EQUIVALENT *U*-FACTORS[a]

CLIMATE ZONE	FENES-TRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	CEILING *U*-FACTOR	FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
1	~~1.20~~ 0.65	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	~~0.65~~ 0.50	~~0.75~~ 0.65	0.035	0.082	0.165	0.064	0.360	0.477
3	~~0.50~~ 0.40	~~0.65~~ 0.55	~~0.035~~0.030	0.082	0.141	0.047	0.091[c]	0.136
4 except Marine	0.35	~~0.60~~ 0.55	0.030	~~0.082~~ 0.057	~~0.141~~ 0.098	0.047	0.059	0.065
5 and Marine 4	~~0.35~~ 0.32	~~0.60~~ 0.55	~~0.030~~0.026	0.057	0.082	0.033	0.059	0.065
6	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	~~0.057~~ 0.048	0.060	0.033	0.050	0.065
7 and 8	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	~~0.057~~ 0.048	0.057	0.028	0.050	0.065

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.
b. When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in zone 1, 0.14 in zone 2, 0.12 in zone 3, 0.10 in zone 4 except Marine, 0.087 in zone 5 and Marine 4, and the same as the frame wall U-factor in Marine zone 4 and zones 5 through 8.
c. Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure 301.1 and Table 301.2.

TABLE 402.2.5
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION
(*R*-VALUE)

WOOD FRAME *R*-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT *R*-VALUE[a]
	Steel Truss Ceilings[b]
R-30	R -38 or R-30+3 or R-26+5
R-38	R -49 or R-38+3
R-49	R-38+5
	Steel Joist Ceilings[b]
R-30	R-38 in 2×4 or 2×6 or 2×8 R - 49 in any framing
R-38	R -49 in 2×4 or 2×6 or 2×8 or 2×10
	Steel Framed Wall
R-13	R -13+5 o rR-15+4 or R-21+3 or R-0+10
R-19	R -13+9 or R-19+8 or R-25+7
R-20 or R-21	R-13+10 or R-19+9 or R-25+8
R-20+5	R-13+15 or R-19+14 or R-25+13
	Steel Joist Floor
R-13	R-19 in 2×6; R-19+6 in 2×8 or 2×10
R-19	R-19+6 in 2×6; R-19+12 in 2×8 or 2×10

a. Cavity insulation *R*-value is listed first, followed by continuous insulation *R*-value.
b. Insulation exceeding the height of the framing shall cover the framing.

402.4 Air leakage (Mandatory).

402.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Sections 402.4.1.1 and 402.4.1.2. ~~be durably sealed to limit infiltration.~~ The sealing methods between dissimilar materials shall allow for differential expansion and contraction. ~~The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:~~

~~1. All joints, seams and penetrations.~~
~~2. Site-built windows, doors and skylights.~~
~~3. Openings between window and door assemblies and their respective jambs and framing.~~
~~4. Utility penetrations.~~
~~5. Dropped ceilings or chases adjacent to the thermal envelope.~~
~~6. Knee walls.~~
~~7. Walls and ceilings separating a garage from conditioned spaces.~~
~~8. Behind tubs and showers on exterior walls.~~
~~9. Common walls between dwelling units.~~
~~10. Attic access openings.~~
~~11. Rim joist junction.~~
~~12. Other sources of infiltration.~~

3. Add new text as follows:

402.4.1.1 Installation. The components of the *building thermal envelope* as listed in Table 402.4.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table 402.4.1.1, as applicable to the method of construction. Where required by the *code official*, an *approved* party shall inspect all components and verify compliance.

4. Revise as follows:

TABLE ~~402.4.2~~ 402.4.1.1
AIR BARRIER AND INSULATION ~~INSPECTION COMPONENT CRITERIA~~ INSTALLATION

COMPONENT	CRITERIA
Air barrier and thermal barrier	A continuous air barrier shall be installed in the building envelope. ~~Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier.~~ Breaks or joints in the air barrier ~~are filled or repaired~~ shall be sealed. Air permeable insulation ~~is~~ shall not be used as a sealing material. Any air permeable insulation shall be installed ~~is~~ inside of an air barrier.
Ceiling / attic	The air barrier in any dropped ceiling / soffit ~~is substantially~~ shall be aligned with the insulation and any gaps ~~are~~ in the air barrier sealed. ~~Attic access (except unvented attic), knee wall door, or drop down stair is sealed.~~ Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.
Walls	Corners and headers shall be ~~are~~ insulated and the~~.~~ junction of the foundation and sill plate ~~is~~ shall be sealed. The junction of the top plate and top of exterior walls shall be sealed. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier. Knee walls shall be sealed.
Windows, skylights and doors	The space between window/door jambs and framing and skylights and framing ~~is~~ shall be sealed.
Rim joists	Rim joists ~~are~~ shall be insulated and include ~~an~~ the air barrier.
Floors (including above garage and cantilevered floors)	Insulation ~~is~~ shall be installed to maintain permanent contact with underside of subfloor decking. The air barrier ~~is~~ shall be installed at any exposed edge of insulation.
Crawlspace walls	Where provided in lieu of floor insulation, insulation ~~is~~ shall be permanently attached to the crawlspace walls. Exposed earth in unvented crawlspaces ~~is~~ shall be covered with a class I vapor retarder with overlapping joints taped.
Shafts, penetrations	Duct shafts, utility penetrations, ~~knee walls,~~ and flue shafts opening to exterior or unconditioned space ~~are~~ shall be sealed.
Narrow cavities	Batts in narrow cavities ~~are~~ shall be cut to fit, or narrow cavities ~~are~~ shall be filled by ~~spayed/blown~~ insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing ~~is~~ shall be provided between the garage and conditioned spaces.
Recessed lighting	Recessed light fixtures installed in the building thermal envelope ~~are~~ shall be airtight, IC rated, and sealed to the drywall. ~~Exception--fixtures in conditioned space.~~
Plumbing and Wiring	~~Insulation is placed between outside and pipes.~~ Batt insulation ~~is~~ shall be cut neatly to fit around wiring and plumbing in exterior walls, or ~~sprayed/blown~~ insulation that on installation readily conforms to available space shall extend~~s~~ behind piping and wiring.
Shower / tub on exterior wall	Exterior walls adjacent to showers and tubs ~~on exterior walls~~ shall be ~~have~~ insulat~~ion~~ed and ~~an~~ the air barrier installed separating them from the ~~exterior wall~~ showers and tubs.
Electrical / phone box on exterior walls	The air barrier ~~extends~~ shall be installed behind electrical or communication boxes or ~~an~~ air sealed ~~type~~ boxes ~~are~~ shall be installed.
Common wall	An air barrier ~~is~~ shall be installed in the common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building thermal envelope ~~are~~ shall be sealed to the subfloor or drywall.
Fireplace	An air barrier shall be installed on fireplace walls. ~~include an air barrier.~~ Fireplaces shall have gasketed doors.

5. Delete and substitute as follows:

~~**402.4.2 Air sealing and insulation.** Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2.~~

~~**402.4.2.1 Testing option.** Building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 33.5 psf (50 Pa). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.~~

402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding 5 air changes per hour (ACH50) in Climate Zones 1 and 2, and 3 air changes per hour in Climate Zones 3 through 8. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the *code official*, testing shall be conducted by an *approved* party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after rough in and creation of all penetrations of the *building thermal envelope*

Exception: Where heating and cooling equipment meets the requirements of Section 404, maximum leakage rate shall be seven air changes per hour (ACH50) in zones 1 and 2 and five air changes per hour in zones 3 through 8. Additions less than 1000 ft^2 are exempt from testing.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed~~,~~ beyond the intended weatherstripping or other infiltration control measures;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed, ~~including exhaust, intake, makeup air, backdraft and flue dampers~~ beyond intended infiltration control measures;
3. Interior doors, if installed at the time of test, shall be open;
4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling system(s), if installed at the time of the test, shall be turned off; and
6. ~~HVAC ducts shall not be sealed; and~~

~~7~~ 6. Supply and return registers, if installed at the time of the test, shall ~~not~~ be ~~sealed~~ fully ~~open~~.

6. Add new text as follows:

402.4.1.2.1 Sampling. Where groups of seven or more buildings of similar design and construction are completed and are issued occupancy permits during a 120-day period, or where a multifamily structure contains more than four dwelling units, testing of less than 100%, but not less than 15%, of the buildings from a specific builder and/or contractor or of dwelling units in a multifamily structure shall be permitted when *approved* by the *code official*. The specific buildings or dwelling units to be tested shall be selected by the *code official*. If any tested building or dwelling unit fails to comply with the maximum air leakage requirement in Section 402.4.1.2 then all buildings or dwelling units shall be tested until a minimum of three consecutive buildings or dwelling units comply from that specific builder and/or contractor or multifamily structure before the *code official* may permit sampling to resume.

7. Delete without substitution:

~~**402.4.2.2 Visual inspection option.** Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table 402.4.2, applicable to the method of construction, are field verified. Where required by the *code official*, an *approved* party independent from the installer of the insulation shall inspect the air barrier and insulation.~~

~~**402.4.3 Fireplaces.** New wood-burning fireplaces shall have gasketed doors and outdoor combustion air.~~

8. Revise as follows:

403.2.2 Sealing (Mandatory). All ducts, air handlers, and filter boxes ~~and building cavities used as ducts~~ shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the *International Residential Code*.

Exception: Duct tightness test is not required if the air handler and all ducts are located within *conditioned space*.

Duct tightness shall be verified by either of the following:

1. Postconstruction test: Total leakage ~~to outdoors~~ shall be less than or equal to ~~8~~ 4 cfm (~~226.5~~ 113.3 L/min)

per 100 ft^2 (9.29 m^2) of *conditioned floor area* ~~or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*~~ when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.

2. Rough-in test: Total leakage shall be less than or equal to ~~6~~ 4 cfm (~~169.9~~ 113.3 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the ~~roughed in~~ system, including the manufacturer's air handler enclosure. All register ~~boot~~s shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to ~~4~~ 3 cfm (~~113.3~~ 85.0 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*.

   ~~**Exceptions:** Duct tightness test is not required if the air handler and all ducts are located within *conditioned space*~~.

   Exception: Where heating and cooling equipment meets the requirements of Section 404:

   1. Maximum total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 ft^2 (9.29m^2) of conditioned floor area for ducts located outside conditioned space, and
   2. The maximum leakage test is not required for ducts and air handlers located entirely within conditioned space.

9. Add new text as follows:

403.2.3 Building cavities (Mandatory). Building framing cavities shall not be used as supply ducts.

403.2.4 Location (Prescriptive). All ducts and air handlers shall be located within the conditioned space.

Exception: Where heating and cooling equipment meets the requirements of Section 404.

10. Revise as follows:

403.4 Service hot water systems.

~~**403.4**~~ **403.4.1 Circulating hot water systems (Mandatory).** ~~All circulating service hot water piping shall be insulated to at least R-2.~~ Circulating hot water systems shall ~~include~~ be provided with an automatic or readily accessible manual switch that can turn off the hot water circulating pump when not in use.

11. Add new text and table as follows:

403.4.2 Hot water pipe insulation (Prescriptive). Insulation with a minimum thermal resistance (R-value) of at least R-3 shall be applied to the following:

1. Piping larger than 3/4 in. nominal diameter
2. Piping serving more than one dwelling unit
3. Piping from the water heater to kitchen outlets
4. Piping located outside the conditioned space
5. Piping from the water heater to a distribution manifold
6. Piping located under a floor slab
7. Buried piping
8. Supply and return piping in recirculation systems other than demand recirculation systems

All remaining piping shall be insulated to at least R-3 or meet the run length requirements of Table 403.4.2.

TABLE 403.4.2
MAXIMUM RUN LENGTH (feet)[a]

Nominal Pipe Diameter of Largest Diameter Pipe in the Run (in.)	3/8	1/2	3/4	> 3/4
Maximum Run Length	30	20	10	5

a. Total length of all piping from the distribution manifold or the recirculation loop to a point of use.

12. Revise as follows:

403.5 Mechanical ventilation (Mandatory). Bathrooms and kitchens shall be provided with ventilation that meets the requirements of Section M1507.3 of the *International Residential Code* or with other approved means of ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

Exception: If the building is designed to comply with the 3 ACH50 requirement specified in Section 402.4.1.2, the building shall comply with ASHRAE Standard 62.2.

13. Add new text as follows:

SECTION 404
IMPROVED EQUIPMENT EFFICIENCY ALTERNATIVE
(Prescriptive)

404.1 General. For new residences, Sections 404.1 and 402.2 shall be permitted as an alternative to certain requirements as specified by exceptions in Sections 402.4.1.2, 403.2.2, and 403.2.4.

404.2 Heating equipment. In Climate Zones 3 and 4 gas furnace AFUE shall be at least 90. In Climate Zones 5 through 8, gas furnace AFUE shall be at least 92. In Climate Zones 3 through 8, gas boiler, oil boiler, or oil furnace AFUE shall be at least 85. In Climate Zones 3 through 8, heat pump HSPF shall be at least 8.5. Ground source heat pumps shall have a minimum efficiency as specified in Table 503.2.3(2). All-electric heated buildings shall utilize either an air-source or ground source heat pump.

404.3 Cooling equipment. In Climate Zones 1 and 2, vapor compression air conditioning SEER shall be at least 16.0 and EER at least 12.5. In Climate Zone 3, vapor compression air conditioning SEER shall be at least 15.0 and EER at least 12.5. In Climate Zones 1 through 3, room air conditioner EER shall be at least 11.0 for air conditioners with capacity less than 20,000 Btu/hr, or 10.0 for capacities equal to or greater than 20,000 Btu/hr. Ground source heat pumps shall have a minimum efficiency as specified in Table 503.2.3(2).

14. Revise as follows:

SECTION ~~404~~ 405
ELECTRICAL POWER AND LIGHTING SYSTEMS

~~404.1~~ 405.1 Lighting equipment (Prescriptive). A minimum of ~~50~~ seventy-five percent of the lamps in permanently installed lighting fixtures shall be high efficacy lamps or a minimum of seventy-five percent of the permanently installed lighting fixtures shall contain only high efficacy lamps.

Exception: Low-voltage lighting.

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Air Exchange Rate	~~Specific leakage area (SLA)[d] = 0.00036~~ The applicable natural leakage ACH rate at a pressure of 33.5 psf (50 Pa) as specified in Section 402.4.1.2 including the exception. ~~assuming no energy recovery~~. The mechanical ventilation rate shall be in addition to the natural leakage rate and the same as in the proposed design, but no greater than 0.01 x *CFA* + 7.5 x (*Nbr*+1) where: *CFA* = conditioned floor area *Nbr* = number of bedrooms Energy recovery shall not be assumed for mechanical ventilation.	For residences that are not tested, the same natural leakage rate as the standard reference design. ~~For residences without mechanical ventilation that are tested in accordance with ASHRAE 119, Section 5.1, the measured air exchange rate[e] but not less than 0.35 ACH~~ For tested residences ~~with mechanical ventilation that are tested in accordance with ASHRAE 119, Section 5.1~~, the measured air exchange rate[e] ~~combined with the~~

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
		~~proposed~~ ~~mechanical ventilation rate, *f* which shall not be less than 0.01 x *CFA* + 7.5 x (*Nbr*+1)~~ ~~where:~~ ~~*CFA* = conditioned floor area~~ ~~*Nbr* = number of bedrooms~~ The mechanical ventilation rate is in addition to the natural leakage rate and shall be as proposed.
Thermal distribution systems	~~A thermal distribution system efficiency (DSE) of 0.88 shall be applied to both the heating and cooling system efficiencies for all systems other than tested duct systems. Duct insulation: From Section 403.2.1. For tested duct systems, the leakage rate shall be the applicable maximum rate from Section 403.2.2. 4 cfm (113.3 L/min) per 100 ft2 (9.29 m2) of conditioned floor area at a pressure differential of 0.1 inches w.g. (25 Pa).~~	Thermal distribution system efficiency shall be as tested or as specified by Table 405.5.2(2) if not tested. Duct insulation shall be as proposed.

e. Where required by the *code official*, testing shall be conducted by an *approved* party independent from the builder and the installer of insulation, air barrier and other sealing materials. ~~Tested envelope leakage shall be determined and documented by an independent party approved by the *code official*.~~ Hourly calculations as specified in the ~~2001~~ASHRAE *Handbook of Fundamentals*~~, Chapter 26, page 26.21, Equation 40 (Sherman-Grimsrud model)~~ or the equivalent shall be used to determine the energy loads resulting from infiltration.

(Portions of table and footnotes not shown remain unchanged)

15. Add new standard to Chapter 6 as follows:

ASHRAE

ANSI/ASHRAE
Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings

Reason: To add and Exception to Section 403.2.2 that exempts ducts in condition spaces from the requirement for duct sealing. This proposal repositions the current exception, which was deleted by DOE, concerning the exception that ducts do not need to be tested if the ducts and air handler are located within the condition space. Duct leakage is important only if the leakage is to the outside. Air leakage to the inside, if the ducts and air handler are located within the conditioned space, does not create any additional energy usage.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The only difference between this code change proposal and EC5-09/10 is the added exception in Section 403.2.2.

Analysis: A review of the standard(s) proposed for inclusion in the code, ANSI/ASHRAE Standard 62.2-2007, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: NICKSON-EC-4-202-CH 4

EC15–09/10

202 (New), 401.2, Table 402.1.1, 401.3, Table 402.1.3, Table 402.2.5, Section 402.4, 402.4.1.1 (New), 402.4.1.2.1 (New),403.2, 403.2.3 (New), 403.2.4 (New), 403.4, Table 403.4.2 (new), 403.5, 404 (New), Table 405.5.2(1), Chapter 6

Proponent: Ron Nickson, representing National Multi Housing Council

1. Add new definition as follows:

DEMAND RECIRCULATION WATER SYSTEM. A water distribution system where pump(s) prime the service hot water piping with heated water upon demand for hot water.

2. Revise as follows:

401.2 Compliance. Projects shall comply with Sections identified as "mandatory" and with either sections identified as "prescriptive" or the performance approach in Section 406. ~~Sections 401, 402.4, 402.5, and 403.1, 403.2.2, 403.2.3, and 403.3 through 403.9 (referred to as the mandatory provisions) and either:~~

~~1. Sections 402.1 through 402.3, 403.2.1 and 404.1 (prescriptive); or~~
~~2. Section 405 (performance).~~

401.3 Certificate (Mandatory). A permanent certificate shall be completed and posted on or in the electrical distribution panel by the builder or registered design professional. The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. ~~The certificate shall be completed by the builder or registered design professional.~~ The certificate shall list the predominant *R*-values of insulation installed in or on ceiling/roof, walls, foundation (slab, *basement wall*, crawlspace wall and/or floor) and ducts outside conditioned spaces; *U*-factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration, and the results from any duct system and building envelope air leakage testing done on the building. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be *listed* for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY Component

CLIMATE ZONE	FENESTRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	GLAZED FENESTRATION SHGC	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[i]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
1	~~1.20~~ NR	0.75	0.30	30	13	3 / 4	13	0	0	0
2	~~0.65~~ 0.50 j	0.65 ~~0.75~~	0.30	30	13	4 / 6	13	0	0	0
3	~~0.50~~ 0.40[j]	0.55 ~~0.65~~	0.30[e]	~~30~~38	13	5 / 8	19	5/13[f]	0	5 / 13
4 except Marine	0.35	0.55 ~~0.60~~	NR	38	~~13~~ 20 or 13+5[g, h]	~~5 / 10~~ 8 / 13	19	10 / 13	10, 2 ft	10/13
5 and Marine 4	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	~~38~~49	20 or 13+5[h]	13 / 17	30[g]	10/13	10,2ft	10/13
6	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	49	20+5 or 13+~~5~~ 10[h]	15 / ~~19~~ 20	30[g]	15/19	10,4ft	10/13
7 and 8	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	49	~~21~~ 20+5 or 13+10[h]	19 / 21	38[g]	15/19	10,4ft	10/13

For SI: 1 foot = 304.8 mm.

a. *R*-values are minimums. *U*-factors and SHGC are maximums. R-19 batts compressed into a nominal 2x6 framing cavity such that the R-value is reduced by R-1 or more shall be marked with the compressed batt R-value in addition to the full thickness R-value.
b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
c. 15/19" means R-15 continuous ~~insulated sheathing~~ insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous ~~insulated sheathing~~ insulation on the interior or exterior of the home. "10/13" means R-10 continuous ~~insulated sheathing~~ insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.
d. R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 ft, whichever is less, in zones 1 through 3 for heated slabs.
e. There are no SHGC requirements in the Marine zone.
f. Basement wall insulation is not required in warm-humid locations as defined by Figure 301.1 and Table 301.1.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. First value is cavity insulation, second is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required in the locations where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.
i. The second R-value applies when more than half the insulation is on the interior of the mass wall.
j. For impact rated fenestration in wind-borne debris regions ~~complying with Section R301.2.1.2 of the IRC or Section 1608.1.2 of the IBC~~, the maximum U-factor shall be 0.75 in Zone 2 and 0.65 in Zone 3.

TABLE 402.1.3
EQUIVALENT *U*-FACTORS[a]

CLIMATE ZONE	FENES-TRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	CEILING *U*-FACTOR	FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
1	~~1.20~~ 0.65	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	~~0.65~~ 0.50	~~0.75~~ 0.65	0.035	0.082	0.165	0.064	0.360	0.477
3	~~0.50~~ 0.40	~~0.65~~ 0.55	~~0.035~~0.030	0.082	0.141	0.047	0.091[c]	0.136
4 except Marine	0.35	~~0.60~~ 0.55	0.030	~~0.082~~ 0.057	~~0.141~~ 0.098	0.047	0.059	0.065
5 and Marine 4	~~0.35~~ 0.32	~~0.60~~ 0.55	~~0.030~~0.026	0.057	0.082	0.033	0.059	0.065
6	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	~~0.057~~ 0.048	0.060	0.033	0.050	0.065
7 and 8	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	~~0.057~~ 0.048	0.057	0.028	0.050	0.065

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.
b. When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in zone 1, 0.14 in zone 2, 0.12 in zone 3, 0.10 in zone 4 except Marine, 0.087 in zone 5 and Marine 4, and the same as the frame wall U-factor in Marine zone 4 and zones 5 through 8.
c. Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure 301.1 and Table 301.2.

TABLE 402.2.5
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION
(*R*-VALUE)

WOOD FRAME *R*-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT *R*-VALUE[a]
	Steel Truss Ceilings[b]
R-30	R -38 or R-30+3 or R-26+5
R-38	R -49 or R-38+3
R-49	R-38+5
	Steel Joist Ceilings[b]
R-30	R-38 in 2×4 or 2×6 or 2×8 R - 49 in any framing
R-38	R -49 in 2×4 or 2×6 or 2×8 or 2×10
	Steel Framed Wall
R-13	R -13+5 o rR-15+4 or R-21+3 or R-0+10
R-19	R -13+9 or R-19+8 or R-25+7
R-20 or R-21	R-13+10 or R-19+9 or R-25+8
R-20+5	R-13+15 or R-19+14 or R-25+13
	Steel Joist Floor
R-13	R-19 in 2×6; R-19+6 in 2×8 or 2×10
R-19	R-19+6 in 2×6; R-19+12 in 2×8 or 2×10

a. Cavity insulation *R*-value is listed first, followed by continuous insulation *R*-value.
b. Insulation exceeding the height of the framing shall cover the framing.

402.4 Air leakage (Mandatory).

402.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Sections 402.4.1.1 and 402.4.1.2. ~~be durably sealed to limit infiltration.~~ The sealing methods between dissimilar materials shall allow for differential expansion and contraction. ~~The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:~~

~~1. All joints, seams and penetrations.~~
~~2. Site-built windows, doors and skylights.~~
~~3. Openings between window and door assemblies and their respective jambs and framing.~~
~~4. Utility penetrations.~~
~~5. Dropped ceilings or chases adjacent to the thermal envelope.~~
~~6. Knee walls.~~

7. ~~Walls and ceilings separating a garage from conditioned spaces.~~
8. ~~Behind tubs and showers on exterior walls.~~
9. ~~Common walls between dwelling units.~~
10. ~~Attic access openings.~~
11. ~~Rim joist junction.~~
12. ~~Other sources of infiltration.~~

3. Add new text as follows:

402.4.1.1 Installation. The components of the *building thermal envelope* as listed in Table 402.4.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table 402.4.1.1, as applicable to the method of construction. Where required by the *code official*, an *approved* party shall inspect all components and verify compliance.

4. Revise as follows:

Table 402.4.2~~.~~1.1
AIR BARRIER AND INSULATION ~~INSPECTION COMPONENT CRITERIA~~ INSTALLATION

COMPONENT	CRITERIA
Air barrier and thermal barrier	A continuous air barrier shall be installed in the building envelope. ~~Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier.~~ Breaks or joints in the air barrier ~~are filled or repaired~~ shall be sealed. Air permeable insulation ~~is~~ shall not be used as a sealing material. Any air permeable insulation shall be installed ~~is~~ inside of an air barrier.
Ceiling / attic	The air barrier in any dropped ceiling / soffit ~~is substantially~~ shall be aligned with the insulation and any gaps ~~are~~ in the air barrier sealed. ~~Attic access (except unvented attic), knee wall door, or drop down stair is sealed.~~ Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.
Walls	Corners and headers shall be ~~are~~ insulated and the~~.~~ junction of the foundation and sill plate ~~is~~ shall be sealed. The junction of the top plate and top of exterior walls shall be sealed. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier. Knee walls shall be sealed.
Windows, skylights and doors	The space between window/door jambs and framing and skylights and framing ~~is~~ shall be sealed.
Rim joists	Rim joists ~~are~~ shall be insulated and include ~~an~~ the air barrier.
Floors (including above garage and cantilevered floors)	Insulation ~~is~~ shall be installed to maintain permanent contact with underside of subfloor decking. The air barrier ~~is~~ shall be installed at any exposed edge of insulation.
Crawlspace walls	Where provided in lieu of floor insulation, insulation ~~is~~ shall be permanently attached to the crawlspace walls. Exposed earth in unvented crawlspaces ~~is~~ shall be covered with a class I vapor retarder with overlapping joints taped.
Shafts, penetrations	Duct shafts, utility penetrations, ~~knee walls,~~ and flue shafts opening to exterior or unconditioned space ~~are~~ shall be sealed.
Narrow cavities	Batts in narrow cavities ~~are~~ shall be cut to fit, or narrow cavities ~~are~~ shall be filled by ~~spayed/blown~~ insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing ~~is~~ shall be provided between the garage and conditioned spaces.
Recessed lighting	Recessed light fixtures installed in the building thermal envelope ~~are~~ shall be airtight, IC rated, and sealed to the drywall. ~~Exception - fixtures in conditioned space.~~
Plumbing and Wiring	~~Insulation is placed between outside and pipes.~~ Batt insulation ~~is~~ shall be cut neatly to fit around wiring and plumbing in exterior walls, or ~~sprayed/blown~~ insulation that on installation readily conforms to available space shall extend~~s~~ behind piping and wiring.
Shower / tub on exterior wall	Exterior walls adjacent to showers and tubs ~~on exterior walls~~ shall be ~~have~~ insulation~~ed~~ and ~~an~~ the air barrier installed separating them from the ~~exterior wall~~ showers and tubs.
Electrical / phone box on exterior walls	The air barrier ~~extends~~ shall be installed behind electrical or communication boxes or ~~an~~ air sealed ~~type~~ boxes ~~are~~ shall be installed.
Common wall	An air barrier ~~is~~ shall be installed in the common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building thermal envelope ~~are~~ shall be sealed to the subfloor or drywall.
Fireplace	An air barrier shall be installed on fireplace walls. ~~include an air barrier.~~ Fireplaces shall have gasketed doors.

5. Delete and substitute as follows:

~~**402.4.2 Air sealing and insulation.** Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2.~~

~~**402.4.2.1 Testing option.** Building envelope tightness and insulation installation shall be considered acceptable when~~

~~tested air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 33.5 psf (50 Pa). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.~~

402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding 5 air changes per hour (ACH50) in Climate zones 1 and 2, and 3 air changes per hour in Climate Zones 3 through 8. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the *code official*, testing shall be conducted by an *approved* party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after rough in and creation of all penetrations of the *building thermal envelope*

Exceptions:

1. Where heating and cooling equipment meets the requirements of Section 404, maximum leakage rate shall be seven air changes per hour (ACH50) in zones 1 and 2 and five air changes per hour in zones 3 through 8. Additions less than 1000 ft^2 are exempt from testing.
2. Dwelling units of multi-family residential buildings with more than four individual units shall be excepted from the testing requirements if they satisfy the requirements of Section 402.1.1.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed~~;~~ beyond the intended weatherstripping or other infiltration control measures;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed, ~~including exhaust, intake, makeup air, backdraft and flue dampers~~ beyond intended infiltration control measures;
3. Interior doors, if installed at the time of test, shall be open;
4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling system(s), if installed at the time of the test, shall be turned off; and
6. ~~HVAC ducts shall not be sealed; and~~

~~7~~ 6. Supply and return registers, if installed at the time of the test, shall ~~not~~ be ~~sealed~~ fully ~~open~~.

6. Add new text as follows:

402.4.1.2.1 Sampling. Where groups of seven or more buildings of similar design and construction are completed and are issued occupancy permits during a 120-day period, or where a multifamily structure contains more than four dwelling units, testing of less than 100%, but not less than 1 in 7 or 15%, of the buildings from a specific builder and/or contractor or of dwelling units in a multifamily structure shall be permitted when *approved* by the *code official*. The specific buildings or dwelling units to be tested shall be selected by the *code official*. If any tested building or dwelling unit fails to comply with the maximum air leakage requirement in Section 402.4.1.2 then all buildings or dwelling units shall be tested until a minimum of three consecutive buildings or dwelling units comply from that specific builder and/or contractor or multifamily structure before the *code official* may permit sampling to resume.

7. Delete without substitution:

~~**402.4.2.2 Visual inspection option.** Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table 402.4.2, applicable to the method of construction, are field verified. Where required by the *code official*, an *approved* party independent from the installer of the insulation shall inspect the air barrier and insulation.~~

~~**402.4.3 Fireplaces.** New wood-burning fireplaces shall have gasketed doors and outdoor combustion air.~~

8. Revise as follows:

403.2.2 Sealing (Mandatory). All ducts, air handlers, and filter boxes ~~and building cavities used as ducts~~ shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the *International Residential Code*.

Duct tightness shall be verified by either of the following:

1. Postconstruction test: Total leakage ~~to outdoors~~ shall be less than or equal to ~~8~~ 4 cfm (~~226.5~~ 113.3 L/min) per

100 ft^2 (9.29 m^2) of *conditioned floor area* ~~or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*~~ when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.

2. Rough-in test: Total leakage shall be less than or equal to ~~6~~ 4 cfm (~~169.9~~ 113.3 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the ~~roughed in~~ system, including the manufacturer's air handler enclosure. All register ~~boot~~s shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to ~~4~~ 3 cfm (~~113.3~~ 85.0 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*.

~~**Exceptions:** Duct tightness test is not required if the air handler and all ducts are located within *conditioned space*~~.

Exception: Where heating and cooling equipment meets the requirements of Section 404:

1. Maximum total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 ft^2 (9.29m^2) of conditioned floor area for ducts located outside conditioned space, and
2. The maximum leakage test is not required for ducts and air handlers located entirely within conditioned space.

9. Add new text as follows:

403.2.3 Building cavities (Mandatory). Building framing cavities shall not be used as supply ducts.

403.2.4 Location (Prescriptive). All ducts and air handlers shall be located within the conditioned space.

Exception: Where heating and cooling equipment meets the requirements of Section 404.

10. Revise as follows:

403.4 Service hot water systems.

~~403.4~~ 403.4.1 Circulating hot water systems (Mandatory). ~~All circulating service hot water piping shall be insulated to at least R-2.~~ Circulating hot water systems shall ~~include~~ be provided with an automatic or readily accessible manual switch that can turn off the hot water circulating pump when not in use.

11. Add new text and table as follows:

403.4.2 Hot water pipe insulation (Prescriptive). Insulation with a minimum thermal resistance (R-value) of at least R-3 shall be applied to the following:

1. Piping larger than 3/4 in. nominal diameter
2. Piping serving more than one dwelling unit
3. Piping from the water heater to kitchen outlets
4. Piping located outside the conditioned space
5. Piping from the water heater to a distribution manifold
6. Piping located under a floor slab
7. Buried piping
8. Supply and return piping in recirculation systems other than demand recirculation systems

All remaining piping shall be insulated to at least R-3 or meet the run length requirements of Table 403.4.2.

TABLE 403.4.2
MAXIMUM RUN LENGTH (feet)[a]

Nominal Pipe Diameter of Largest Diameter Pipe in the Run (in.)	3/8	1/2	3/4	> 3/4
Maximum Run Length	30	20	10	5

a. Total length of all piping from the distribution manifold or the recirculation loop to a point of use.

12. Revise as follows:

403.5 Mechanical ventilation (Mandatory). Bathrooms and kitchens shall be provided with ventilation that meets the requirements of Section M1507.3 of the *International Residential Code* or with other approved means of ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

Exception: If the building is designed to comply with the 3 ACH50 requirement specified in Section 402.4.1.2, the building shall comply with ASHRAE Standard 62.2.

13. Add new text as follows:

404 Improved equipment efficiency alternative. (Prescriptive) For new residences, Sections 404.1 and 402.2 shall be permitted as an alternative to certain requirements as specified by exceptions in Sections 402.4.1.2, 403.2.2, and 403.2.4.

404.1 Heating equipment. In Climate Zones 3 and 4 gas furnace AFUE shall be at least 90. In Climate Zones 5 through 8, gas furnace AFUE shall be at least 92. In Climate Zones 3 through 8, gas boiler, oil boiler, or oil furnace AFUE shall be at least 85. In Climate Zones 3 through 8, heat pump HSPF shall be at least 8.5. Ground source heat pumps shall have a minimum efficiency as specified in Table 503.2.3(2). All-electric heated buildings shall utilize either an air-source or ground source heat pump.

404.2 Cooling Equipment. In Climate Zones 1 and 2, vapor compression air conditioning SEER shall be at least 16.0 and EER at least 12.5. In Climate Zone 3, vapor compression air conditioning SEER shall be at least 15.0 and EER at least 12.5. In Climate Zones 1 through 3, room air conditioner EER shall be at least 11.0 for air conditioners with capacity less than 20,000 Btu/hr, or 10.0 for capacities equal to or greater than 20,000 Btu/hr. Ground source heat pumps shall have a minimum efficiency as specified in Table 503.2.3(2).

14. Revise as follows:

SECTION ~~404~~ 405
ELECTRICAL POWER AND LIGHTING SYSTEMS

~~404.1~~ 405.1 Lighting equipment (Prescriptive). A minimum of ~~50~~ seventy-five percent of the lamps in permanently installed lighting fixtures shall be high efficacy lamps or a minimum of seventy-five percent of the permanently installed lighting fixtures shall contain only high efficacy lamps.

Exception: Low-voltage lighting.

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Air Exchange Rate	~~Specific leakage area (SLA)[d] = 0.00036~~ The applicable natural leakage ACH rate at a pressure of 33.5 psf (50 Pa) as specified in Section 402.4.1.2 including the exception. ~~assuming no energy recovery~~. The mechanical ventilation rate shall be in addition to the natural leakage rate and the same as in the proposed design, but no greater than 0.01 x *CFA* + 7.5 x (*Nbr*+1) where: *CFA* = conditioned floor area *Nbr* = number of bedrooms Energy recovery shall not be assumed for mechanical ventilation.	For residences that are not tested, the same natural leakage rate as the standard reference design. ~~For residences without mechanical ventilation that are tested in accordance with ASHRAE 119, Section 5.1, the measured air exchange rate[e] but not less than 0.35 ACH~~ For tested residences ~~with mechanical ventilation that are tested in accordance with ASHRAE 119, Section 5.1~~, the measured air exchange rate[e] ~~combined with the~~ proposed mechanical ventilation rate, ~~*f* which shall not be less than 0.01 x *CFA* + 7.5 x (*Nbr*+1)~~

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
		~~where:~~ ~~*CFA* = conditioned floor area~~ ~~*Nbr* = number of bedrooms~~ The mechanical ventilation rate is in addition to the natural leakage rate and shall be as proposed.
Thermal distribution systems	~~A thermal distribution system efficiency (DSE) of 0.88 shall be applied to both the heating and cooling system efficiencies for all systems other than tested duct systems. Duct insulation: From Section 403.2.1. For tested duct systems, the leakage rate shall be the applicable maximum rate from Section 403.2.2. 4 cfm (113.3 L/min) per 100 ft2 (9.29 m2) of conditioned floor area at a pressure differential of 0.1 inches w.g. (25 Pa).~~	Thermal distribution system efficiency shall be as tested or as specified by Table 405.5.2(2) if not tested. Duct insulation shall be as proposed.

e. Where required by the *code official*, testing shall be conducted by an *approved* party independent from the builder and the installer of insulation, air barrier and other sealing materials. ~~Tested envelope leakage shall be determined and documented by an independent party approved by the *code official*.~~ Hourly calculations as specified in the ~~2001~~ASHRAE *Handbook of Fundamentals*~~, Chapter 26, page 26.21, Equation 40 (Sherman-Grimsrud model)~~ or the equivalent shall be used to determine the energy loads resulting from infiltration.

(Portions of table and footnotes not shown remain unchanged)

15. Add new standard to Chapter 6 as follows:

ASHRAE

ANSI/ASHRAE
Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings

Reason: To address issues in the DOE proposal which are of concern to multifamily and would cause a major problem and expense to multi-famliy construction. Specifically:

Section 402.4.1.2 Testing. The NMHC proposed modification adds a second exception exempting multi-family residential properties from the blower door testing requirement. Changes were also made to Section 402.4.1.2.1 Sampling which are necessary if the proposed modification to not require testing of multi-family properties is accepted. It is very difficult if not impossible to obtain accurate and meaningful testing of multifamily properties because of the size of the building, the division of the building into many sub units (apartments), and the construction sequence.

a. Size of the building. The test is impractical because of the size of the building. Blower door testing of the entire building would require more than just the normal blower placed in the door opening of the building. The test would require either one very large blower or many individual blowers at multiple openings to pressurize the building as needed for the test. Even if done, because of the size of the building it would be virtually impossible to determine where the leaks are, or if the leakage problem is a combination of many small leaks or one large leak.
b. Sub units (apartments). Testing of individual apartments, as suggested in the DOE proposal, does not provide any accurate information on the leakage to the outside of the building which is the concerning in sealing up the building. Any leakage of air could just as well be leaking to the apartment next door, to the apartment above or below or to the hallway. Leakage to these areas is of little concern as they are all conditioned spaces and the leakage does not impose a additional load of the heating and cooling system.
c. Construction sequence. In most cases apartment type buildings are completed on a floor by floor bases, with apartments units on the lower floors being completed and in some cases occupied while work is being completed in apartments on the upper floors. This sequencing makes it difficult if not impossible to test the entire building because the different levels of the building completion and occupancy would have an impact of the true building performance during the blower door testing.

NMHC does not oppose the specific inspection requirements currently in the code and specifically detailed in Table 402.4.2 (DOE Table 402.4.1.1) as they, if done properly, will insure that the air barrier is installed.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The only difference between this code change proposal and EC4-09/10 is the added exception in Section 402.4.1.2 and a slight difference in wording in Section 402.4.1.2.1.

Analysis: A review of the standard(s) proposed for inclusion in the code, ANSI/ASHRAE Standard 62.2-2007, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: NICKSON-EC-5-202-CH 4

EC16–09/10
103, 202, Chapter 4; IRC R202, N1102, N1103, N1104, N1105 (New)

Proponent: Ken Sagan, representing National Association of Home Builders

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise as follows:

103.2 Information on construction documents. Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted when *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, as applicable, cardinal directions; insulation materials and their R-values; fenestration U-factors and SHGCs; area-weighted U-factor and SHGC calculations; projection factor calculations; mechanical system design criteria; mechanical and service water heating system and equipment types, sizes and efficiencies; economizer description; equipment and systems controls; fan motor horsepower (hp) and controls; duct sealing, duct and pipe insulation and location; lighting fixture schedule with wattage and control narrative; and air sealing details.

2. Add new definitions as follows:

DEMAND RECIRCULATION WATER SYSTEM. A water distribution system where pumps prime the service water heating with heated water when triggered by a manual button or switch, or by sensing the presence of a person where the heated water is used.

PROJECTION FACTOR. The ratio of the horizontal depth of an overhang, eave, or permanently attached shading device, divided by the distance measured vertically from the bottom of the fenestration glazing to the underside of the overhang, eave, or permanently attached shading device.

3. Revise as follows:

401.1 Scope. This chapter applies to residential buildings.

401.2 Compliance. Projects shall comply with Sections 401, ~~402.4~~ 403.4, ~~402.5,~~ ~~403.1~~ 404.1, ~~403.2.2~~ 404.2.2, ~~403.2.3~~ 404.2.3 and ~~403.3~~ 404.3 through ~~403.9~~ 404.9 (referred to as the mandatory provisions) and either:

1. Sections 402, ~~402.1~~ 403.1 through ~~402.3~~ 403.3, ~~403.2.1~~ 404.2.1, 404.2.3, and ~~404.1~~ 405.1 (prescriptive); or
2. Section ~~405~~ 406 (performance).

401.3 Certificate. A permanent certificate shall be posted on or in the electrical distribution panel. The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certificate shall be completed by the builder or registered design professional. The certificate shall list the predominant *R*-values of insulation installed in or on ceiling/roof, walls, foundation (slab, basement wall, crawlspace wall and/or floor) and ducts outside conditioned spaces; *U*-factors for fenestration, ~~; and~~ the solar heat gain coefficient (SHGC) of fenestration and tested or sampled ACH_{50}. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiency of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace, and/or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater", "electric furnace", or "baseboard electric heater" as appropriate. An efficiency shall not be listed for gas-fired unvented room heaters, electric furnaces, or electric baseboard heaters.

4. Add new text and table as follows:

401.4 Compliance testing. Where testing is required to determine air leakage of buildings or duct systems, the code official shall be permitted to require random sample testing of no fewer than one in seven residences.

SECTION 402
PRESCRIPTIVE REQUIREMENT TABLES

402.1 General (Prescriptive). The building thermal envelope and mechanical systems shall meet the requirements of one path in Table 402.1 based on the climate zone specified in Chapter 3. The prescriptive and mandatory provisions of Section 402, 403 and 404 shall be used in applying the requirements of Table 402.1.

TABLE 402.1
PRESCRIPTIVE REQUIREMENTS BY COMPONENT[a]

Climate Zone	Path Number	Fenestration U-Factor[b,c]	Skylight U-Factor[b]	Glazed Fenestration SHGC[b,d,e]	Ceiling R-Value	Wood-frame wall R-Value[f]	Mass Wall R-Value[g]	Floor R-Value[h]	Basement/ Crawl space Wall R-Value[i]	Slab R-Value & Depth[j]	Building Air Tightness (ACH50)[k]	Duct Tightness[l]	Furnace (AFUE) /Heat Pump (HSPF)[m]	Air Conditioning (SEER)[n]	Hot Water Heater[o]
1	1	0.60	0.75	0.25	38	13+3	5/10	13	0	0	7	Cond or Tested	Standard	Standard	Standard
1	2	NR	0.75	0.3	30	13	3/4	13	0	0	7	Cond or Tested	Standard	SEER 15	62G/94E
1	3	0.60	0.75	0.3	30	13	3/4	13	0	0	7	Reduced Leakage	Standard	Standard	Standard
1	4	NR	0.75	0.3	30	13	3/4	13	0	0	7	Cond or Tested	Standard	SEER 17	Standard

Climate Zone	Path Number	Fenestration U-Factor[b,c]	Skylight U-Factor[b]	Glazed Fenestration SHGC[b,d,e]	Ceiling R-Value	Wood-frame wall R-Value[f]	Mass Wall R-Value[g]	Floor R-Value[h]	Basement/ Crawl space Wall R-Value[i]	Slab R-Value & Depth[j]	Building Air Tightness (ACH50)[k]	Duct Tightness[l]	Furnace (AFUE) /Heat Pump (HSPF)[m]	Air Conditioning (SEER)[n]	Hot Water Heater[o]
2	1	0.35	0.65	0.25	38	13+3	6/13	13	0	0	7	Cond or Tested	Standard	Standard	Standard
2	2	0.60	0.65	0.3	30	13	4/6	13	0	0	7	Cond or Tested	Standard	SEER 15	62G/94E
2	3	0.35	0.65	0.3	30	13	4/6	13	0	0	7	Reduced Leakage	Standard	Standard	Standard
2	4	0.60	0.65	0.3	30	13	4/6	13	0	0	7	Cond or Tested	Standard	SEER 17	Standard

Climate Zone	Path Number	Fenestration U-Factor[b,c]	Skylight U-Factor[b]	Glazed Fenestration SHGC[b,d,e]	Ceiling R-Value	Wood-frame wall R-Value[f]	Mass Wall R-Value[g]	Floor R-Value[h]	Basement/ Crawl space Wall R-Value[i]	Slab R-Value & Depth[j]	Building Air Tightness (ACH50)[k]	Duct Tightness[l]	Furnace (AFUE) /Heat Pump (HSPF)[m]	Air Conditioning (SEER)[n]	Hot Water Heater[o]
3	1	0.32	0.6	0.3	38	20 or 13+5	8/13	19	5/13[p]	0	7	Cond or Tested	Standard	Standard	Standard
3	2	0.35	0.6	0.3	30	13	5/8	19	5/13[p]	0	7	Cond or Tested	90/8.9	SEER 17	62G/94E
3	3	0.50	0.6	0.3	38	13	5/8	19	5/13[p]	0	4	Reduced Leakage	Standard	Standard	Standard
3	4	0.50	0.6	0.3	30	13	5/8	19	5/13[p]	0	4	Cond or Tested	90/8.9	SEER 15	Standard

Climate Zone	Path Number	Fenestration U-Factor[b,c]	Skylight U-Factor[b]	Glazed Fenestration SHGC[b,d,e]	Ceiling R-Value	Wood-frame wall R-Value[f]	Mass Wall R-Value[g]	Floor R-Value[h]	Basement/ Crawl space Wall R-Value[i]	Slab R-Value & Depth[j]	Building Air Tightness (ACH50)[k]	Duct Tightness[l]	Furnace (AFUE) /Heat Pump (HSPF)[m]	Air Conditioning (SEER)[n]	Hot Water Heater[o]
4 except Marine 4	1	0.32	0.6	NR	38	20 or 13+5	8/13	19	10/13	10; 2 ft	7	Cond or Tested	Standard	Standard	Standard
4 except Marine 4	2	0.35	0.6	NR	38	13	5/10	19	10/13	10; 2 ft	7	Cond or Tested	90/8.9	SEER 15	62G/94E

Climate Zone	Path Number	Fenestration U-Factor[b,c]	Skylight U-Factor[b]	Glazed Fenestration SHGC[b,d,e]	Ceiling R-Value	Wood-frame wall R-Value[f]	Mass Wall R-Value[g]	Floor R-Value[h]	Basement/ Crawl space Wall R-Value[i]	Slab R-Value & Depth[j]	Building Air Tightness (ACH50)[k]	Duct Tightness[l]	Furnace (AFUE) /Heat Pump (HSPF)[m]	Air Conditioning (SEER)[n]	Hot Water Heater[o]
4 except Marine 4	3	0.32	0.6	NR	38	13	5/10	19	10/13	10; 2 ft	4	Reduced Leakage	Standard	Standard	Standard
4 except Marine 4	4	0.35	0.6	NR	38	13	5/10	19	10/13	10; 2 ft	4	Cond or Tested	90/8.9	SEER 15	Standard

Climate Zone	Path Number	Fenestration U-Factor[b,c]	Skylight U-Factor[b]	Glazed Fenestration SHGC[b,d,e]	Ceiling R-Value	Wood-frame wall R-Value[f]	Mass Wall R-Value[g]	Floor R-Value[h]	Basement/ Crawl space Wall R-Value[i]	Slab R-Value & Depth[j]	Building Air Tightness (ACH50)[k]	Duct Tightness[l]	Furnace (AFUE) /Heat Pump (HSPF)[m]	Air Conditioning (SEER)[n]	Hot Water Heater[o]
5 and Marine 4	1	0.32	0.6	NR	49	20+5 or 13+10	15/20	30	15/19	10; 2 ft	4	Cond or Tested	Standard	Standard	Standard
5 and Marine 4	2	0.32	0.6	NR	38	20 or 13+5	13/17	30	10/13	10; 2 ft	7	Reduced Leakage	92/9.1	15 SEER	62G/94E
5 and Marine 4	3	0.32	0.6	NR	49	20 or 13+5	13/17	30	15/19	10; 2 ft	4	Reduced Leakage	Standard	Standard	Standard
5 and Marine 4	4	0.35	0.6	NR	38	20 or 13+5	13/17	30	15/19	10; 2 ft	4	Cond or Tested	92/9.1	Standard	Standard

Climate Zone	Path Number	Fenestration U-Factor[b,c]	Skylight U-Factor[b]	Glazed Fenestration SHGC[b,d,e]	Ceiling R-Value	Wood-frame wall R-Value[f]	Mass Wall R-Value[g]	Floor R-Value[h]	Basement/ Crawl space Wall R-Value[i]	Slab R-Value & Depth[j]	Building Air Tightness (ACH50)[k]	Duct Tightness[l]	Furnace (AFUE) /Heat Pump (HSPF)[m]	Air Conditioning (SEER)[n]	Hot Water Heater[o]
6	1	0.30	0.6	NR	49	20+5 or 13+10	19/21	30	15/19	10; 4 ft	4	Cond or Tested	Standard	Standard	Standard
6	2	0.35	0.6	NR	49	20 or 13+5	15/19	30	15/19	10; 4 ft	7	Reduced Leakage	92/9.1	Standard	62G/94E
6	3	0.32	0.6	NR	60	20 or 13+5	15/19	30	15/19	10; 4 ft	3	Reduced Leakage	Standard	Standard	Standard
6	4	0.35	0.6	NR	49	20 or 13+5	15/19	38	15/19	10; 4 ft	4	Cond or Tested	92/9.1	Standard	Standard

Climate Zone	Path Number	Fenestration U-Factor[b,c]	Skylight U-Factor[b]	Glazed Fenestration SHGC[b,d,e]	Ceiling R-Value	Wood-frame wall R-Value[f]	Mass Wall R-Value[g]	Floor R-Value[h]	Basement/ Crawl space Wall R-Value[i]	Slab R-Value & Depth[j]	Building Air Tightness (ACH50)[k]	Duct Tightness[l]	Furnace (AFUE) /Heat Pump (HSPF)[m]	Air Conditioning (SEER)[n]	Hot Water Heater[o]
7 and 8	1	0.27	0.6	NR	60	20+5 or 13+10	19/21	38	15/19	10; 4 ft	3	Cond or Tested	Standard	Standard	Standard
7 and 8	2	0.30	0.6	NR	49	20 or 13+5	15/19	38	15/19	10; 4 ft	4	Cond or Tested	92/9.1	Standard	62G/94E
7 and 8	3	0.32	0.6	NR	49	20+5 or 13+10	19/21	38	15/19	10; 4 ft	3	Reduced Leakage	Standard	Standard	Standard
7 and 8	4	0.35	0.6	NR	49	20 or 13+5	15/19	38	15/19	10; 4 ft	4	Reduced Leakage	92/9.1	Standard	Standard

For SI: 1 foot = 304.8 mm.

(relettered and reordered in order of table)

a. *R*-values are minimums. *U*-factors and SHGC are maximums. R-19 batts compressed into a nominal 2x6 framing cavity such that the R-value is reduced by R-1 or more shall be marked with the compressed batt R-value in addition to the full thickness R-value.

b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration. "NR" means no requirement.

cj. For impact rated fenestration complying with Section R301.2.1.2 of the International Residential Code or Section 1609.1.2 of the International Building Code, the maximum U-factor in Climate Zones 1-3 shall be permitted to be 0.15 higher than that specified in Table 402.1~~0.75 in Zone 2 and 0.65 in Zone 3~~.

de. There are no SHGC requirements in the Marine Zone.

e. SHGC calculations and exceptions are covered under Section 403.3.

fh. "xx+yy" means R-xx cavity insulation plus R-yy insulated sheathing. ~~"13+5" means R-13 cavity insulation plus R-5 insulated sheathing.~~ If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.

gi. The second R-value applies when more than half the insulation is on the interior of the mass wall and applies interior cavity insulation.

hg. Or insulation sufficient to fill the framing cavity, R-19 minimum.

ie. "15/19" means R-15 continuous insulated sheathing on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulated sheathing on the interior or exterior of the home. "10/13" means R-10 continuous insulated sheathing on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.

jd. R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 ft, whichever is less, in Zones 1 through 3 for heated slabs.

k. Air tightness testing requirements are listed in Section 403.4.1.1.

l. "Cond or Tested" means that the duct system shall either be located within conditioned space or tested in accordance with Section 404.2.2. "Reduced Leakage" means that the duct system shall comply with the requirements of section 404.2.3.

m. Heating system performance tested in accordance with ASHRAE Standard 103 or ARI Standard 210/240 or equivalent. Coefficient of Performance (COP) is converted into HSPF by multiplying by 3.413. "Standard" represents the prevailing minimum efficiency acceptable under federal law.

n. Cooling system performance tested in accordance with ARI Standard 210/240 or equivalent. Energy Efficiency Ratio (EER) is converted to SEER by multiplying EER*1.143. "Standard" represents the prevailing minimum efficiency acceptable under federal law.

o. Water heater Energy Factor requirements for Gas (G) and Electric (E) water heaters. "Standard" represents the prevailing minimum efficiency acceptable under federal law.

p. Basement wall insulation is not required in warm-humid locations as defined by Figure 301.1 and Table 301.1.

5. Revise as follows:

SECTION 403
BUILDING THERMAL ENVELOPE

~~402.1~~ 403.1 General (Prescriptive).

~~402.1.1 Insulation and fenestration criteria.~~ ~~The building thermal envelope shall meet the requirements of Table 402.1.1 based on the climate zone specified in Chapter 3.~~

403.1.1 Insulation Installation. All insulation installed as part of the building thermal envelope to achieve compliance with Table 402.1 shall be installed in accordance with the manufacturer's installation instructions and in a manner such that as installed it meets the specified performance levels provided in Table 402.1. An area-weighted average of each component shall be permitted to satisfy the requirements in Table 402.1.

~~402.1.2~~ 403.1.2 *R*-value computation. Insulation material used in layers, such as framing cavity insulation and insulating sheathing, shall be summed to compute the component *R*-value. The manufacturer's settled *R*-value shall be used for blown insulation. Computed *R*-values shall not include an *R*-value for other building materials or air films.

6. Delete table without substitution:

~~**TABLE 402.1.1**~~
~~**INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT**~~

7. Revise and renumber as follows:

TABLE ~~402.1.3~~ 403.1.3
EQUIVALENT *U*-FACTORS[a]

CLIMATE ZONE	FENES-TRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	Glazed Fenestration SHGC	CEILING *U*-FACTOR	FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR[d]	CRAWL SPACE WALL *U*-FACTOR[c]	ENVELOPE LEAKAGE RATES (ACH50)
1	~~1.20~~0.50	0.75	.25	0.03~~05~~	0.06~~82~~	0.13~~897~~/0.120	0.064	0.360	0.477	7
2	~~0.65~~0.35	~~0.75~~0.65	.25	0.03~~05~~	0.06~~82~~	0.1~~65~~38/0.098	0.064	0.360	0.477	7
3	~~0.50~~0.32	0.65	.3	0.03~~05~~	0.05~~82~~	~~0.141~~0.098/0.087	0.047	0.091[c]	0.136	7
4 except Marine	~~0.35~~0.32	0.60	NR	0.030	0.05~~82~~	~~0.141~~0.098/0.087	0.047	0.059	0.065	4
5 and Marine 4	~~0.35~~0.32	0.60	NR	0.02~~630~~	0.048~~057~~	~~0.082~~0.058/0.057	0.033	0.050~~9~~	0.05~~365~~	4
6	~~0.35~~0.30	~~0.60~~0.55	NR	0.026	0.048~~057~~	~~0.06~~0.047/0.054	0.033	0.050	0.05~~365~~	4
7 and 8	~~0.35~~0.27	~~0.60~~0.55	NR	0.02~~46~~	0.048~~057~~	~~0.057~~0.043/0.047	0.028	0.050	0.05~~365~~	3

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.
b. When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in Zone 1, 0.14 in Zone 2, 0.12 in Zone 3, 0.10 in Zone 4 except Marine, and the same as the frame wall U-factor in Marine Zone 4 and Zones 5 through 8.
c. Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure 301.1 and Table 301.2.
d. Foundation U-factor requirements shown in Table ~~402.1.3~~ 403.1.3 include wall construction and interior air films but exclude soil conductivity and exterior air films. U-factors for determining code compliance in accordance with Section ~~402.1.4~~ 403.1.4 (total UA alternative) of Section 405 (Simulated Performance Alternative) shall be modified to include soil conductivity and exterior air film.

~~402.1.3~~ 403.1.3 *U*-factor alternative. An assembly with a *U*-factor equal to or less than the equivalent R-value specified in Table 402.1 determined by using a method consistent with the ASHRAE *Handbook of Fundamentals* including the thermal bridging effects of framing materials shall be permitted as an alternative to the required *R*-value in Table 402.1.1 for the selected path. Nonfenestration *U*-factors or R-values shall be obtained from measurement, calculation or an approved source.~~that specified in Table 402.1.3 shall be permitted as an alternative to the *R*-value in Table 402.1.1.~~

~~402.1.4~~ 403.1.4 Total UA alternative. If the total building thermal envelope UA (sum of *U*-factor times assembly area) is less than or equal to the total UA resulting from using the *U*-factors in Table ~~402.1.3~~ 403.1.3 (multiplied by the same assembly area as in the proposed building), the building shall be considered in compliance with the R-value and U-factor requirements of Table ~~402.1.1~~ 402.1. The UA calculation shall be done using a method consistent with the ASHRAE *Handbook of Fundamentals* and shall include the thermal bridging effects of framing materials. The SHGC and Envelope Leakage rate requirements in Table 403.1.3 shall be met in addition to UA compliance.

~~402.2~~ 403.2 Specific insulation requirements (Prescriptive).

8. Add new text and table as follows:

403.2.1 Ceilings with attic space. Wherever full height of uncompressed insulation extends over the wall top plate at the eaves, the reduced values in Table 403.2.1 shall be deemed to satisfy the ceiling insulation requirements. This reduction shall not apply to the U-factor alternative approach in Section 403.1.3 and the Total UA alternative in Section 403.1.4.

TABLE 403.2.1
ALLOWABLE CEILING R-VALUE WITH FULL HEIGHT PERIMETER INSULATION

TABLE 402.1 LISTED CEILING R-VALUE	ALLOWABLE R-VALUE WITH FULL HEIGHT PERIMETER INSULATION
38	30
49	38
60	49

9. Delete without substitution:

~~402.2.1 Ceilings with attic spaces.~~ ~~When Section 402.1.1 would require R-38 in the ceiling, R-30 shall be deemed to satisfy the requirement for R-38 wherever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Similarly R-38 shall be deemed to satisfy the requirement for R-49 wherever the full height of uncompressed R-38 insulation extends over the wall top plate at the eaves. This reduction shall not apply to the U-factor alternative approach in Section 402.1.3 and the Total UA alternative in Section 402.1.4.~~

10. Revise and renumber as follows:

~~402.2.2~~ 403.2.2 Ceilings without attic spaces. Where Section ~~402.1.1~~ 402.1 would require insulation levels above R-30 and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section 402.1.1 shall be limited to 500 square feet (46 m^2) or 20% of the total insulated ceiling area, whichever is less. This reduction shall not apply to the U-factor alternative approach in Section ~~402.1.3~~ 403.1.3 and the Total UA alternative in Section ~~402.1.4~~ 403.1.4.

~~402.2.3~~ 403.2.3 Access hatches and doors. Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weatherstripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment which prevents damaging or compressing the insulation. A wood framed or equivalent baffle or retainer is required to be provided when loose fill insulation is installed, the purpose of which is to prevent the loose fill insulation from spilling into the living space when the attic access is opened, and to provide a permanent means of maintaining the installed R-value of the loose fill insulation.

~~402.2.4~~ **403.2.4 Mass walls.** Mass walls for the purposes of this Chapter shall be considered above grade walls of concrete block, concrete, insulated concrete form (ICF), masonry cavity, brick (other than brick veneer), earth (adobe, compressed earth block, rammed earth) and solid timber/logs.

~~402.2.5~~ **403.2.5 Steel-frame ceilings, walls and floors.** Steel-frame ceilings, walls and floors shall meet the insulation requirements of Table ~~402.2.5~~ 403.2.5 or shall meet the *U*-factor requirements in Table ~~402.1.3~~ 403.1.3. The calculation of the *U*-factor for a steel-frame envelope assembly shall use a series-parallel path calculation method.

~~**Exception:** In Climate Zones 1 and 2, the continuous insulation requirements in Table 403~~2.2.4~~5~~ ~~shall be permitted to be reduced to R-3 for steel frame wall assemblies with studs spaced at 24 inches (610 mm) on center.~~

TABLE ~~402.2.5~~ 403.2.5
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION
(*R*-VALUE)

WOOD FRAME *R*-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT *R*-VALUE[a]
	Steel Truss Ceilings[b]
R-30	R -38 or R-30+3 or R-26+5
R-38	R -49 or R-38+3
R-49	R-38+5
	Steel Joist Ceilings[b]
R-30	R-38 in 2×4 or 2×6 or 2×8 R - 49 in any framing
R-38	R -49 in 2×4 or 2×6 or 2×8 or 2×10
	Steel Framed Wall
R-13[c]	R -13+5 or R-15+4 or R-21+3 or R-0+10
R-19	R -13+9 or R-19+8 or R-25+7
R-21	R-13+10 or R-19+9 or R-25+8
	Steel Joist Floor
R-13	R-19 in 2×6; R-19+6 in 2×8 or 2×10
R-19	R-19+6 in 2×6; R-19+12 in 2×8 or 2×10

a. Cavity insulation *R*-value is listed first, followed by continuous insulation *R*-value.
b. Insulation exceeding the height of the framing shall cover the framing.
c. Under prescriptive paths 2, 3, and 4, insulation for steel framed wall assemblies with studs spaced 24 inches (610mm) on center shall be permitted to be R-13+0 when ceiling insulation is increased to a wood framed equivalent of R-38 in climate zones 1 and 2 and permitted to be R-13+3 when ceiling insulation is increased to a wood framed equivalent of R-49 in climate zones 3 and 4.

~~402.2.6~~ **403.2.6 Floors.** Floor insulation shall be installed to maintain permanent contact with the underside of the subfloor decking.

~~402.2.7~~ **403.2.7 Basement walls.** Walls associated with conditioned basements shall be insulated from the top of the basement wall down to 10 feet (3048 mm) below grade or to the basement floor, whichever is less. Walls associated with unconditioned basements shall meet this requirement unless the floor overhead is insulated in accordance with Sections ~~402.1.1~~ 402.1 and ~~402.2.6~~ 403.2.6.

~~402.2.8~~ **403.2.8 Slab-on-grade floors.** Slab-on-grade floors with a floor surface less than 12 inches (305 mm) below grade shall be insulated in accordance with Table ~~402.1.1~~ 402.1. The insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below grade shall be extended the distance provided in Table ~~402.1.1~~ 402.1 by any combination of vertical insulation, insulation extending under the slab or insulation extending out from the building. Insulation extending away from the building shall be protected by pavement or by a minimum of 10 inches (254 mm) of soil. The top edge of the insulation installed between the exterior wall and the edge of the interior slab shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the exterior wall. Slab-edge insulation is not required in jurisdictions designated by the code official as having a very heavy termite infestation.

~~402.2.9~~ **403.2.9 Crawl space walls.** As an alternative to insulating floors over crawl spaces, crawl space walls shall be permitted to be insulated when the crawl space is not vented to the outside. Crawl space wall insulation shall be permanently fastened to the wall and extend downward from the floor to the finished grade level and then vertically and/or horizontally for at least an additional 24 inches (610 mm). Exposed earth in unvented crawl space foundations

shall be covered with a continuous Class I vapor retarder. All joints of the vapor retarder shall overlap by 6 inches (153 mm) and be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (153 mm) up the stem wall and shall be attached to the stem wall.

~~402.2.10~~ 403.2.10 **Masonry veneer.** Insulation shall not be required on the horizontal portion of the foundation that supports a masonry veneer.

~~402.2.11~~ 403.2.11 **Thermally isolated sunroom insulation.** The minimum ceiling insulation *R*-values shall be R-19 in zones 1 through 4 and R-24 in zones 5 though 8. The minimum wall *R*-value shall be R-13 in all zones. New wall(s) separating a sunroom from conditioned space shall meet the building thermal envelope requirements.

~~402.3~~ 403.3 **Fenestration (Prescriptive).**

~~402.3.1~~ 403.3.1 ***U*-factor.** An area-weighted average of fenestration products shall be permitted to satisfy the *U*-factor requirements.

~~402.3.2~~ 403.3.2 **Glazed fenestration SHGC.** An area-weighted average of fenestration products more than 50 percent glazed shall be permitted to satisfy the SHGC requirements.

11. Add new text and table as follows:

403.3.3 Glazed Fenestration SHGC exception. In climate zones 1-3, vertical fenestration shaded by an overhang, eave, or permanently attached shading device shall be permitted to satisfy the SHGC requirements provided the projection factor is greater than or equal to the value listed in table N1103.3.3 for the appropriate orientation. The overhang, eave, or permanently attached shading device shall have a minimum projection that shall extend beyond each side of the glazing a minimum of 12 inches. Where different windows and glazed doors have different projection factors, they shall each be evaluated separately, or an area-weighted projection factor value shall be calculated and used. Each orientation shall be rounded to the nearest cardinal orientation (+/-45 degrees or 0.79 rad) for purposes of calculations and demonstrating compliance.

TABLE 403.3.3
MINIMUM PROJECTION FACTOR REQUIRED BY ORIENTATION FOR SHGC EXCEPTION

ORIENTATION	PROJECTION FACTOR
North	>=0.30
South	>=0.20
East	>=0.50
West	>=0.50

12. Revise and renumber as follows:

~~402.3.3~~ 403.3.4 **Glazed fenestration exemption.** Up to 15 square feet (1.4 m^2) of glazed fenestration per dwelling unit shall be permitted to be exempt from *U*-factor and SHGC requirements in Section ~~402.1.1~~ 402.1. This exemption shall not apply to the U-factor alternative approach in Section ~~402.1.3~~ 403.1.3 and the Total UA alternative in Section ~~402.1.4~~ 403.1.4.

~~402.3.4~~ 403.3.5 **Opaque door exemption.** One side-hinged opaque door assembly up to 24 square feet (22 m^2) in area is exempted from the *U*-factor requirement in Section 402.1.1. This exemption shall not apply to the U-factor alternative approach in Section ~~402.1.3~~ 403.1.3 and the Total UA alternative in Section 403~~2~~.1.4.

~~402.3.5~~ 403.3.6 **Thermally isolated sunroom *U*-factor.** For Zones 4 through 8, the maximum fenestration *U*-factor shall be 0.50 and the maximum skylight *U*-factor shall be 0.75. New windows and doors separating the sunroom from conditioned space shall meet the building thermal envelope requirements.

~~402.3.6~~ 403.3.7 **Replacement fenestration.** Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the ~~applicable~~ following requirements for *U*-factor and SHGC ~~in Table 402.1.1~~. : SHGC in climate zones 1-3 of 0.30, U-Factor of 0.5 in climate zones 2, 3, 0.35 in climate zones 4,5, 0.32 in climate zones 6, 7 and 8 subject to the all the provisions in Section 403.3.

~~402.4~~ 403.4 **Air leakage (Mandatory).**

~~402.4.1~~ 403.4.1 **Building thermal envelope.** The building thermal envelope shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. ~~The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:~~

~~1. All joints, seams and penetrations.~~
~~2. Site-built windows, doors and skylights.~~
~~3. Openings between window and door assemblies and their respective jambs and framing.~~
~~4. Utility penetrations.~~
~~5. Dropped ceilings or chases adjacent to the thermal envelope.~~
~~6. Knee walls.~~
~~7. Walls and ceilings separating a garage from conditioned spaces.~~
~~8. Behind tubs and showers on exterior walls.~~
~~9. Common walls between dwelling units.~~
~~10. Attic access openings~~
~~11. Rim joist junction~~
~~12. Other sources of infiltration.~~

~~**402.4.2 Air sealing and insulation.**~~ Building envelope air tightness shall be demonstrated to comply with a pre-close visual inspection and air tightness testing in accordance with Sections 403.4.1.1 and 403.4.1.2. ~~and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2:~~

~~**402.4.2.1**~~ 403.4.1.1 **Testing ~~option~~.** Building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is less than or equal to the building ~~seven~~ air changes per hour (ACH) listed in the selected path of Table 402.1 when tested with a blower door apparatus at a pressure of 0.2 in w.c.~~33.5 psi~~ (50 Pa). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation, and combustion appliances.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;
2. Dampers shall be closed, but not sealed; including exhaust, intake, makeup air, back draft, and flue dampers;
3. Interior doors shall be open;
4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling system(s) shall be turned off;
6. HVAC ducts shall not be sealed; and
7. Supply and return registers shall not be sealed.

13. Add new text as follows:

403.4.1.1.1 Multi-family and single family attached. For residential occupancies other than single family detached dwellings, testing shall be permitted to be the entire building tested simultaneously or a sampling of no fewer than 1 in 7 individual units within the structure. Individual unit tightness shall be permitted to be determined by either total unit leakage or leakage to unconditioned space (including outside). Where multiple tests are performed for a building, the average tightness of tested units shall be permitted to satisfy the required building envelope airtightness level.

403.4.1.1.2 Failed testing. If the dwelling does not achieve the air-leakage requirement on the initial test, after an attempt to correct, a subsequent test must be performed that demonstrates compliance or at least a 10% reduction in leakage and within 1 ACH of the required tightness.

Exception: Testing is not required in climate zones 1-4 for residences claiming an air tightness level of 7 ACH50.

14. Revise and renumber as follows:

~~**402.4.2.2**~~ 403.4.1.2 **Visual inspection ~~option~~:** Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table ~~402.4.2~~ 403.4.1.2, applicable to the method of construction, are field verified~~. Where required by the code official,~~ or an approved party ~~independent from the installer of the insulation, shall inspect the air barrier and insulation~~.

~~402.4.3~~ **403.4.2 Fireplaces.** New wood-burning fireplaces shall have gasketed doors and outdoor combustion air.

~~402.4.4~~ **403.4.3 Fenestration air leakage.** Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m^2), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m^2), when tested according to NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled by the manufacturer.

Exceptions: Site-built windows, skylights and doors.

TABLE ~~402.4.2~~ 403.4.1.2
AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

COMPONENT	CRITERIA
Air barrier and thermal barrier	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air permeable insulation is not used as a sealing material. Air permeable insulation is inside of an air barrier.
Ceiling / attic	Air barrier in any dropped ceiling / soffit is substantially aligned with insulation and any gaps are sealed. Attic access (except unvented attic), knee wall door, or drop down stair is sealed.
Walls	Corners and headers are insulated. Junction of foundation and sill plate is sealed.
Windows and doors	Space between window/door jambs and framing is sealed.
Rim joists	Rim joists are insulated and include an air barrier.
Floors (including above garage and cantilevered floors)	Insulation is installed to maintain permanent contact with underside of subfloor decking. Air barrier is installed at any exposed edge of insulation.
Crawl space walls	Insulation is permanently attached to walls. Exposed earth in unvented crawlspaces is covered with class I vapor retarder with overlapping joints taped.
Shafts, penetrations	Duct shafts, utility penetrations, knee walls, and flue shafts opening to exterior or unconditioned space are sealed.
Narrow cavities	Batts in narrow cavities are cut to fit, or narrow cavities are filled by spayed/blown insulation.
Garage separation	Air sealing is provided between the garage and conditioned spaces.
Recessed lighting	Recessed light fixtures are airtight, IC rated, and sealed to drywall. Exception—fixtures in conditioned space.
Plumbing and Wiring	Insulation is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing, or sprayed/blown insulation extends behind piping and wiring.
Shower / tub on exterior wall	Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.
Electrical / phone box on exterior walls	Air barrier extends behind boxes or an air sealed type boxes are installed.
Common wall	Air barrier is installed in common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.
Fireplace	Fireplace walls include an air barrier.

~~402.4.5~~ **403.4.4 Recessed lighting.** Recessed luminaires installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and labeled as meeting ASTM E 283 when tested at 1.57 psi (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.

15. Delete without substitution:

~~**402.5 Maximum fenestration *U*-factor and SHGC (Mandatory).** The area weighted average maximum fenestration *U*-factor permitted using trade offs from Section 402.1.4 or Section 404 shall be 0.48 in zones 4 and 5 and 0.40 in zones 6 through 8 for vertical fenestration, and 0.75 in zones 4 through 8 for skylights. The area weighted average maximum fenestration SHGC permitted using trade-offs from Section 405 in Zones 1 through 3 shall be 0.50.~~

16. Revise as follows:

SECTION ~~403~~ 404
SYSTEMS

~~403.1~~ 404.1 Controls (Mandatory). At least one thermostat shall be provided for each separate heating and cooling system.

~~403.1.1~~ 404.1.1 Programmable thermostat. Where the primary heating system is a forced air furnace, at least one thermostat per dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain zone temperatures down to 55ºF (13ºC) or up to 85ºF (29ºC). The thermostat shall initially be programmed with a heating temperature set point no higher than 70ºF (21ºC) and a cooling temperature set point no lower than 78ºF (26ºC).

~~403.1.2~~ 404.1.2 Heat pump supplementary heat (Mandatory). Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load.

~~403.2~~ 404.2 Ducts.

~~403.2.1~~ 404.2.1 Insulation (Prescriptive). Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.

Exception: Ducts or portions thereof located completely inside the building thermal envelope.

~~403.2.2~~ 404.2.2 Sealing (Mandatory). All ducts, air handlers, filter boxes shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the *International Residential Code*. Duct tightness shall be verified by either of the following:

1. Post-construction test: Leakage to outdoors shall be less than or equal to 8 cfm (226.5 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.
2. Rough-in test: Total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm (113.3 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area.

   Exception: Duct tightness test is not required if the air handler and all ducts are located within conditioned space.

17. Add new text as follows:

404.2.3 Reduced Leakage ducts. (Prescriptive). When specified as part of a selected Path Number in Table 402.1, Reduced Leakage ducts must be located entirely within conditioned space and tested for total leakage and leakage to outside conditioned space. Leakage to outdoors shall be less than or equal to 3 cfm (84.9 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area, and the total leakage shall be less than or equal to 8 cfm (226.5 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. Total leakage of not greater than 3 cfm per 100 ft^2 of conditioned floor area at a pressure difference of 0.01 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure, shall be deemed to satisfy this requirement without measurement of leakage to outdoors.

18. Revise as follows:

~~403.2.3~~ 404.2.4 Building cavities (Mandatory). Building framing cavities shall not be used as supply ducts.

~~403.3~~ **404.3 Mechanical system piping insulation (Mandatory).** Mechanical system piping capable of carrying fluids above 105°F (41°C) or below 55°F (13°C) shall be insulated to a minimum of R-3.

~~403.4~~ **404.4 Service hot water systems.**

19. Add new text as follows:

404.4.1 Hot water pipe insulation. At least R-3 insulation shall be applied to the following:

1. Piping larger than 3/4 in. outside diameter
2. Piping outside conditioned space
3. Piping in a floor slab or in the ground
4. Piping in a recirculating system exception: demand recirculation systems
5. Entire pipe run from water heater to kitchen sink

20. Revise as follows:

~~403.4~~ **404.4.2 Recirculating ~~Circulating~~ hot water systems.** ~~All circulating service hot water piping shall be insulated to at least R-2.~~ Recirculating ~~Circulating~~ hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when not in use.

~~403.5~~ **404.5 Mechanical ventilation (Mandatory).** Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

~~403.6~~ **404.6 Equipment sizing (Mandatory).** Heating and cooling equipment shall be sized in accordance with Section M1401.3 of the *International Residential Code.*

~~403.7~~ **404.7 Systems serving multiple dwelling units (Mandatory).** Systems serving multiple dwelling units shall comply with Sections 503 and 504 in lieu of Section ~~403~~ 404.

~~403.8~~ **404.8 Snow melt system controls (Mandatory).** Snow- and ice-melting systems, supplied through energy service to the building, shall include automatic controls capable of shutting off the system when the pavement temperature is above 50ºF, and no precipitation is falling and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40ºF.

~~403.9~~ **404.9 Pools (Mandatory).** Pools shall be provided with energy conserving measures in accordance with Sections ~~403.9.1~~ 404.9.1 through ~~403.9.3~~ 404.9.3.

~~403.9.1~~ **404.9.1 Pool heaters.** All pool heaters shall be equipped with a readily accessible on-off switch to allow shutting off the heater without adjusting the thermostat setting. Pool heaters fired by natural gas or LPG shall not have continuously burning pilot lights.

~~403.9.2~~ **404.9.2 Time switches.** Time switches that can automatically turn off and on heaters and pumps according to a preset schedule shall be installed on swimming pool heaters and pumps.

Exceptions:

1. Where public health standards require 24-hour pump operation.
2. Where pumps are required to operate solar-and-waste-heat-recovery pool heating systems.

~~403.9.3~~ **404.9.3 Pool covers.** Heated pools shall be equipped with a vapor-retardant pool cover on or at the water surface. Pools heated to more than 90°F (32°C) shall have a pool cover with a minimum insulation value of R-12.

Exception: Pools deriving over 60 percent of the energy from heating from site-recovered or solar energy source.

SECTION ~~404~~ 405
ELECTRICAL POWER AND LIGHTING SYSTEMS

~~404.1~~ **405.4.1 Lighting equipment (Prescriptive).** A minimum of ~~fifty~~ seventy-five percent of the lamps in permanently installed lighting fixtures shall be high efficacy lamps.

SECTION ~~405~~ 406
SIMULATED PERFORMANCE ALTERNATIVE
(Performance)

405.1 ~~406.1~~ Scope. This section establishes criteria for compliance using simulated energy performance analysis. Such analysis shall include heating, cooling, and service water heating energy only.

~~405.2~~ 406.2 Mandatory requirements. Compliance with this Section requires that the mandatory provisions identified in Section 401.2 be met. All supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6.

~~405.3~~ 406.3 Performance-based compliance. Compliance based on simulated energy performance requires that a proposed residence (proposed design) be shown to have an annual energy cost that is less than or equal to the annual energy cost of the standard reference design. Energy prices shall be taken from a source approved by the code official, such as the Department of Energy, Energy Information Administration's *State Energy Price and Expenditure Report*. Code officials shall be permitted to require time-of-use pricing in energy cost calculations.

Exception: The energy use based on source energy expressed in Btu or Btu per square foot of conditioned floor area shall be permitted to be substituted for the energy cost. The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1.

~~405.4~~ 406.4 Documentation.

~~405.4.1~~ 406.4.1 Compliance software tools. Documentation verifying that the methods and accuracy of the compliance software tools conform to the provisions of this section shall be provided to the code official.

~~405.4.2~~ 406.4.2 Compliance report. Compliance software tools shall generate a report that documents that the proposed design complies with Section ~~405.3~~ 406.3. The compliance documentation shall include the following information:

1. Address or other identification of the residence;
2. An inspection checklist documenting the building component characteristics of the proposed design as listed in Table ~~405.5.2(1)~~ 406.5.2(1). The inspection checklist shall show the estimated annual energy cost results for both the standard reference design and the proposed design, and shall document all inputs entered by the user necessary to reproduce the results;
3. Name of individual completing the compliance report; and
4. Name and version of the compliance software tool.

Exception: Multiple orientations. When an otherwise identical building model is offered in multiple orientations, compliance for any orientation shall be permitted by documenting that the building meets the performance requirements in each of the four cardinal (north, east, south and west) orientations.

~~405.4.3~~ 406.4.3 Additional documentation. The code official shall be permitted to require the following documents:

1. Documentation of the building component characteristics of the standard reference design.
2. A certification signed by the builder providing the building component characteristics of the proposed design as given in Table ~~405.5.2(1)~~ 406.5.2(1).
3. Documentation of the actual values used in the software calculations for the proposed design.

~~405.5~~ 406.5 Calculation procedure.

~~405.5.1~~ 406.5.1 General. Except as specified by this section, the standard reference design and proposed design shall be configured and analyzed using identical methods and techniques.

~~405.5.2~~ 406.5.2 Residence specifications. The standard reference design and proposed design shall be configured and analyzed as specified by Table ~~405.5.2(1)~~ 406.5.2(1). Table ~~405.5.2(1)~~ 406.5.2(1) shall include by reference all notes contained in Table 402.1.1.

~~405.6~~ 406.6 Calculation software tools.

~~405.6.1~~ 406.6.1 Minimum capabilities. Calculation procedures used to comply with this section shall be software

tools capable of calculating the annual energy consumption of all building elements that differ between the standard reference design and the proposed design and shall include the following capabilities:

1. Computer generation of the standard reference design using only the input for the proposed design. The calculation procedure shall not allow the user to directly modify the building component characteristics of the standard reference design.
2. Calculation of whole-building (as a single zone) sizing for the heating and cooling equipment in the standard reference design residence in accordance with Section M1401.3 of the *International Residential Code*.
3. Calculations that account for the effects of indoor and outdoor temperatures and part-load ratios on the performance of heating, ventilating and air conditioning equipment based on climate and equipment sizing.
4. Printed code official inspection checklist listing each of the proposed design component characteristics from Table 406~~5~~.5.2(1) determined by the analysis to provide compliance, along with their respective performance ratings (e.g. *R*-Value, *U*-Factor, SHGC, HSPF, AFUE, SEER, EF, etc.).

~~405.6.2~~ 406.6.2 Specific approval. Performance analysis tools meeting the applicable sections of ~~405~~ 406 shall be permitted to be approved. Tools are permitted to be approved based on meeting a specified threshold for a jurisdiction. The code official shall be permitted to approve tools for a specified application or limited scope.

~~405.6.3~~ 406.6.3 Input values. When calculations require input values not specified by Sections 402, 403, 404, 405 and ~~405~~ 406, those input values shall be taken from an approved source.

TABLE ~~405.5.2(1)~~ 406.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Above-grade walls	Type: mass wall if proposed wall is mass; otherwise wood frame. Gross area: same as proposed *U*-factor: from Table ~~402.1.3~~ 403.1.3 Solar absorptance = 0.75 Remittance = 0.90	As proposed As proposed As proposed As proposed As proposed
Basement and crawl space walls	Type: same as proposed Gross area: same as proposed *U*-factor: from Table ~~402.1.3~~ 403.1.3, with insulation layer on interior side of walls.	As proposed As proposed As proposed
Above-grade floors	Type: wood frame Gross area: same as proposed *U*-factor: from Table 403~~2~~.1.3	As proposed As proposed As proposed
Ceilings	Type: wood frame Gross area: same as proposed *U*-factor: from Table ~~402.1.3~~ 403.1.3	As proposed As proposed As proposed
Roofs	Type: composition shingle on wood sheathing Gross area: same as proposed Solar absorptance = 0.75 Emittance = 0.90	As proposed As proposed As proposed As proposed
Attics	Type: vented with aperture = 1 ft^2 per 300 ft^2 ceiling area	As proposed
Foundations	Type: same as proposed foundation wall area above and below grade and soil characteristics: same as proposed.	As proposed As proposed
Doors	Area: 40 ft^2 Orientation: North *U*-factor: same as fenestration from Table ~~402.1.3~~ 403.1.3.	As proposed As proposed As proposed
Glazing[a]	Total area[b] = ~~a) The proposed glazing area; where proposed glazing area is less than~~ 15% of the conditioned floor area.	As proposed

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
	~~b) 15% of the conditioned floor area; where the proposed glazing area is 15% or more of the conditioned floor area.~~ Orientation: equally distributed to four cardinal compass orientations (N, E, S & W). *U*-factor: from Table ~~402.1.3~~ 403.1.3 SHGC: From Table ~~403.1.2.1.1~~ 403.1.3 except that for climates with no requirement (NR) SHGC = 0.40 shall be used. Interior shade fraction: Summer (all hours when cooling is required) = 0.70 Winter (all hours when heating is required) = 0.85[c] External shading: none	As proposed As proposed As proposed Same as standard reference design As proposed
Skylights	None	As proposed
Thermally isolated sunrooms	None	As proposed
Air exchange rate	ACH_{50} from Table 403.1.3 ~~Specific leakage area (SLA)[d] = 0.00036 assuming no energy Recovery~~	For residences that are not tested, ACH_{50} shall be 7. For residences without mechanical ventilation that are tested in accordance with Section 403.4.1.1, the measured air exchange rate[e] but not less than 0.35 ACH natural ventilation. For residences with mechanical ventilation that are tested in accordance with Section 403.4.1.1, ~~For residences that are not tested, the same as the standard reference design. For residences without mechanical ventilation that are tested in accordance with ASHRAE 119, Section 5.1, the measured air exchange ratee but not less than 0.35 ACH For residences with mechanical ventilation that are tested in accordance with ASHRAE 119, Section 5.1,~~ the measured air exchange rate[e] combined with the mechanical ventilation rate, [f] which shall not be less than $0.01 \times CFA + 7.5 \times (N_{br}+1)$ where: *CFA* = conditioned floor area N_{br} = number of bedrooms
Mechanical ventilation	None, except where mechanical ventilation is specified by the proposed design, in which case: Annual vent fan energy use: kWh/yr = $0.03942 \times CFA + 29.565 \times (N_{br} +1)$ where: *CFA* = conditioned floor area N_{br} = number of bedrooms	As proposed
Internal gains	IGain = $17{,}900 + 23.8 \times CFA + 4104 \times N_{br}$ (Btu/day per dwelling unit)	Same as standard reference design

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Internal mass	An internal mass for furniture and contents of 8 pounds per square foot of floor area.	Same as standard reference design, plus any additional mass specifically designed as a thermal storage element[g, f] but not integral to the building envelope or structure
Structural mass	For masonry floor slabs, 80% of floor area covered by R-2 carpet and pad, and 20% of floor directly exposed to room air. For masonry basement walls, as proposed, but with insulation required by Table 402.1.3 403.1.3 located on the interior side of the walls For other walls, for ceilings, floors, and interior walls, wood frame construction	As proposed As proposed As proposed
Heating systems[g, h, i]	Fuel type: same as proposed design Efficiencies: Electric: air-source heat pump with prevailing federal minimum efficiency Nonelectric furnaces: natural gas furnace with prevailing federal minimum efficiency Nonelectric boilers: natural gas boiler with prevailing federal minimum efficiency ~~As proposed~~ Capacity: sized in accordance with Section M1401.3 of the *International Residential Code*	As proposed As proposed As proposed As proposed As proposed
Cooling systems[g, i, h, i]	Fuel type: Electric Efficiency: in accordance with prevailing federal minimum standards ~~As proposed~~ Capacity: sized in accordance with Section M1401.3 of the *International Residential Code*	As proposed As proposed As proposed
Service water heating[g, i, j, k]	Fuel type: same as proposed design for non-solar water heating. Where proposed design includes solar water heating, the standard reference shall include the equivalent capacity with fuel type same as the non-solar water heating. Efficiency: in accordance with prevailing Federal minimum standards Use: gal/day = 30 + 10 × *Nbr* Tank temperature: 120°F ~~As proposed~~ ~~Use: same as proposed design~~	As proposed As proposed Same as standard reference Same as standard reference ~~gal/day = 30 + (10 × N_{br})~~
Thermal distribution systems	A thermal distribution system efficiency (DSE) of 0.88 shall be applied to both the heating and cooling system efficiencies for all systems other than tested duct systems. Duct insulation: From Section ~~403.2.1~~ 404.2.1. For tested duct systems, the leakage rate shall be the applicable maximum rate from Section ~~403.2.2~~ 404.2.2.	As ~~-~~tested or as specified in Table 406~~5~~.5.2(2) ~~if not tested~~
Thermostat	Type: Manual, cooling temperature setpoint = 75°F; Heating temperature setpoint = 72°F	Same as standard reference

For SI: 1 square foot = 0.93 m^2; 1 British thermal unit = 1055 J; 1 pound per square foot = 4.88 kg/m^2; 1 gallon (U.S.) = 3.785 L; °C = (°F-3)/1.8, 1 degree = ~~0.79~~ 0.017 rad.

a. Glazing shall be defined as sunlight-transmitting fenestration, including the area of sash, curbing or other framing elements, that enclose conditioned space. Glazing includes the area of sunlight-transmitting fenestration assemblies in walls bounding conditioned basements. For doors where the sunlight-transmitting opening is less than 50 percent of the door area, the glazing area is the sunlight transmitting opening area. For all other doors, the glazing area is the rough frame opening area for the door including the door and the frame.
b. For residences with conditioned basements, R-2 and R-4 residences and townhouses, the following formula shall be used to determine glazing

area:

$AF = As \times FA \times F$

where:

AF = Total glazing area.
As = Standard reference design total glazing area.
FA = (Above-grade thermal boundary gross wall area)/(above-grade boundary wall area + 0.5 × below-grade boundary wall area).
F = (Above-grade thermal boundary wall area)/(above-grade thermal boundary wall area + common wall area) or 0.56, whichever is greater.

and where:

Thermal boundary wall is any wall that separates conditioned space from unconditioned space or ambient conditions.

Above-grade thermal boundary wall is any thermal boundary wall component not in contact with soil.
Below-grade boundary wall is any thermal boundary wall in soil contact.

Common wall area is the area of walls shared with an adjoining dwelling unit.

c. For fenestrations facing within 15 degrees (0.26 rad) of true south that are directly coupled to thermal storage mass, the winter interior shade fraction shall be permitted to be increased to 0.95 in the proposed design.
~~d. Where leakage area (*L*) is defined in accordance with Section 5.1 of ASHRAE 119 and where: *SLA = L/CFA* where *L* and *CFA* are in the same units.~~
e. Tested envelope leakage shall be determined and documented by an independent party approved by the *code official*. Hourly calculations as specified in the ~~2001~~ 2005 ASHRAE *Handbook of Fundamentals*, Chapter ~~26~~ 27, page ~~26.21~~ 27.21, Equation 40 (Sherman-Grimsrud model) or the equivalent shall be used to determine the energy loads resulting from infiltration.
f. The combined air exchange rate for infiltration and mechanical ventilation shall be determined in accordance with Equation 43 of ~~2004~~ 2005 ASHRAE *Handbook of Fundamentals,* page ~~26.24~~ 27.24 and the "Whole-house Ventilation" provisions of 2001 ASHRAE *Handbook of Fundamentals*, page ~~26.19~~ 27.19 for intermittent mechanical ventilation.
g. Thermal storage element shall mean a component not part of the floors, walls or ceilings that is part of a passive solar system, and that provides thermal storage such as enclosed water columns, rock beds, or phase-change containers. A thermal storage element must be in the same room as fenestration that faces within 15 degrees (0.26 rad) of true south, or must be connected to such a room with pipes or ducts that allow the element to be actively charged.
h. For a proposed design with multiple heating~~,~~ or cooling ~~or water heating~~ systems using different fuel types, the applicable standard reference design system capacities and fuel types shall be weighted in accordance with their respective loads as calculated by accepted engineering practice for each equipment and fuel type present.
i. For a proposed design without a proposed heating system, a heating system with the prevailing federal minimum efficiency shall be assumed for both the standard reference design and proposed design. For electric heating systems, the prevailing federal minimum efficiency air-source heat pump shall be used for the standard reference design.
j. For a proposed design home without a proposed cooling system, an electric air conditioner with the prevailing federal minimum efficiency shall be assumed for both the standard reference design and the proposed design.
k. For a proposed design with a non-storage-type water heater, a 40-gallon storage-type water heater with the prevailing federal minimum energy factor for the same fuel as the predominant heating fuel type shall be assumed. For the case of a proposed design without a proposed water heater, a 40-gallon storage-type water heater with the prevailing federal minimum efficiency for the same fuel as the predominant heating fuel type shall be assumed for both the proposed design and standard reference design.

TABLE ~~405.5.2(2)~~ 406.5.2(2)
DEFAULT DISTRIBUTION SYSTEM EFFICIENCIES FOR PROPOSED DESIGNS[a]

DISTRIBUTION SYSTEM CONFIGURATION AND CONDITION:	FORCED AIR SYSTEMS	HYDRONIC SYSTEMS[b]
Distribution system components located in unconditioned space	—	0.95
Untested distribution systems entirely located in conditioned space[c]	0.88	1
Tested distribution system components located in unconditioned space[f]	0.88	—
"Ductless" systems[d]	1	—

For SI: 1 cubic foot per minute = 0.47 L/s; 1 square foot = 0.093m^2; 1 pound per square inch = 6895 Pa; 1 inch water gauge = 1250 Pa.

a. Default values given by this table are for untested distribution systems, which must still meet minimum requirements for duct system insulation.
b. Hydronic systems shall mean those systems that distribute heating and cooling energy directly to individual spaces using liquids pumped through closed loop piping and that do not depend on ducted, forced airflow to maintain space temperatures.
c. Entire system in conditioned space shall mean that no component of the distribution system, including the air handler unit, is located outside of the conditioned space.
d. Ductless systems shall be allowed to have forced air flow across a coil but shall not have any ducted air flow external to the manufacturer's air handler enclosure.

PART II – IRC BUILDING/ENERGY

1. Add new definitions as follows:

DEMAND RECIRCULATION WATER SYSTEM. A water distribution system where pump(s) prime the service water heating with heated water when triggered by a manual button or switch, or by sensing the presence of a person where the heated water is used.

PROJECTION FACTOR. The ratio of the horizontal depth of an overhang, eave, or permanently attached shading device, divided by the distance measured vertically from the bottom of the fenestration glazing to the underside of the overhang, eave, or permanently attached shading device.

2. Revise as follows:

N1101.9 Certificate. A permanent certificate shall be posted on or in the electrical distribution panel. The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certificate shall be completed by the builder or registered design professional. The certificate shall list the predominant *R*-values of insulation installed in or on ceiling/roof, walls, foundation (slab, basement wall, crawlspace wall and/or floor) and ducts outside conditioned spaces; *U*-factors for fenestration~~, and~~ the solar heat gain coefficient (SHGC) of fenestration and tested or sampled ACH_{50}. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiency of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace, and/or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater", "electric furnace", or "baseboard electric heater" as appropriate. An efficiency shall not be listed for gas-fired unvented room heaters, electric furnaces, or electric baseboard heaters.

3. Add new text as follows:

N1101.10 Compliance testing. Where testing is required to determine air leakage of buildings or duct systems, the code official shall be permitted to require random sample testing of no fewer than one in seven residences.

4. Delete Sections N1102, N1103 and N1104 and replace as follows:

SECTION N1102
PRESCRIPTIVE REQUIREMENT TABLES

N1102.1 General . The building thermal envelope and mechanical systems shall meet the requirements of one path in Table N1102.1 based on the climate zone specified in Table N1101.2.

TABLE N1102.1
PRESCRIPTIVE REQUIREMENTS BY COMPONENT[a]

Climate Zone	Path Number	Fenestration U-Factor [b,c]	Skylight U-Factor [b]	Glazed Fenestration SHGC [b,d,e]	Ceiling R-Value	Wood-frame wall R-Value[f]	Mass Wall R-Value[g]	Floor R-Value[h]	Basement/ Crawl space Wall R-Value[i]	Slab R-Value & Depth[j]	Building Air Tightness (ACH50)[k]	Duct Tightness[l]	Furnace (AFUE) /Heat Pump (HSPF)[m]	Air Conditioning (SEER)[n]	Hot Water Heater[o]
1	1	0.60	0.75	0.25	38	13+3	5/10	13	0	0	7	Cond or Tested	Standard	Standard	Standard
1	2	NR	0.75	0.3	30	13	3/4	13	0	0	7	Cond or Tested	Standard	SEER 15	62G/94E
1	3	0.60	0.75	0.3	30	13	3/4	13	0	0	7	Reduced Leakage	Standard	Standard	Standard
1	4	NR	0.75	0.3	30	13	3/4	13	0	0	7	Cond or Tested	Standard	SEER 17	Standard

Climate Zone	Path Number	Fenestration U-Factor [b,c]	Skylight U-Factor [b]	Glazed Fenestration SHGC [b,d,e]	Ceiling R-Value	Wood-frame wall R-Value[f]	Mass Wall R-Value[g]	Floor R-Value[h]	Basement/ Crawl space Wall R-Value[i]	Slab R-Value & Depth[j]	Building Air Tightness (ACH50)[k]	Duct Tightness[l]	Furnace (AFUE) /Heat Pump (HSPF)[m]	Air Conditioning (SEER)[n]	Hot Water Heater[o]
2	1	0.35	0.65	0.25	38	13+3	6/13	13	0	0	7	Cond or Tested	Standard	Standard	Standard
2	2	0.60	0.65	0.3	30	13	4/6	13	0	0	7	Cond or Tested	Standard	SEER 15	62G/94E
2	3	0.35	0.65	0.3	30	13	4/6	13	0	0	7	Reduced Leakage	Standard	Standard	Standard
2	4	0.60	0.65	0.3	30	13	4/6	13	0	0	7	Cond or Tested	Standard	SEER 17	Standard

Climate Zone	Path Number	Fenestration U-Factor [b,c]	Skylight U-Factor [b]	Glazed Fenestration SHGC [b,d,e]	Ceiling R-Value	Wood-frame wall R-Value[f]	Mass Wall R-Value[g]	Floor R-Value[h]	Basement/ Crawl space Wall R-Value[i]	Slab R-Value & Depth[j]	Building Air Tightness (ACH50)[k]	Duct Tightness[l]	Furnace (AFUE) /Heat Pump (HSPF)[m]	Air Conditioning (SEER)[n]	Hot Water Heater[o]
3	1	0.32	0.6	0.3	38	20 or 13+5	8/13	19	5/13[p]	0	7	Cond or Tested	Standard	Standard	Standard
3	2	0.35	0.6	0.3	30	13	5/8	19	5/13[p]	0	7	Cond or Tested	90/8.9	SEER 17	62G/94E
3	3	0.50	0.6	0.3	38	13	5/8	19	5/13[p]	0	4	Reduced Leakage	Standard	Standard	Standard
3	4	0.50	0.6	0.3	30	13	5/8	19	5/13[p]	0	4	Cond or Tested	90/8.9	SEER 15	Standard

Climate Zone	Path Number	Fenestration U-Factor [b,c]	Skylight U-Factor [b]	Glazed Fenestration SHGC [b,d,e]	Ceiling R-Value	Wood-frame wall R-Value[f]	Mass Wall R-Value[g]	Floor R-Value[h]	Basement/ Crawl space Wall R-Value[i]	Slab R-Value & Depth[j]	Building Air Tightness (ACH50)[k]	Duct Tightness[l]	Furnace (AFUE) /Heat Pump (HSPF)[m]	Air Conditioning (SEER)[n]	Hot Water Heater[o]
4 except Marine 4	1	0.32	0.6	NR	38	20 or 13+5	8/13	19	10/13	10; 2 ft	7	Cond or Tested	Standard	Standard	Standard
4 except Marine 4	2	0.35	0.6	NR	38	13	5/10	19	10/13	10; 2 ft	7	Cond or Tested	90/8.9	SEER 15	62G/94E
4 except Marine 4	3	0.32	0.6	NR	38	13	5/10	19	10/13	10; 2 ft	4	Reduced Leakage	Standard	Standard	Standard
4 except Marine 4	4	0.35	0.6	NR	38	13	5/10	19	10/13	10; 2 ft	4	Cond or Tested	90/8.9	SEER 15	Standard

Climate Zone	Path Number	Fenestration U-Factor [b,c]	Skylight U-Factor [b]	Glazed Fenestration SHGC [b,d,e]	Ceiling R-Value	Wood-frame wall R-Value[f]	Mass Wall R-Value[g]	Floor R-Value[h]	Basement/ Crawl space Wall R-Value[i]	Slab R-Value & Depth[j]	Building Air Tightness (ACH50)[k]	Duct Tightness[l]	Furnace (AFUE) /Heat Pump (HSPF)[m]	Air Conditioning (SEER)[n]	Hot Water Heater[o]
5 and Marine 4	1	0.32	0.6	NR	49	20+5 or 13+10	15/20	30	15/19	10; 2 ft	4	Cond or Tested	Standard	Standard	Standard
5 and Marine 4	2	0.32	0.6	NR	38	20 or 13+5	13/17	30	10/13	10; 2 ft	7	Reduced Leakage	92/9.1	15 SEER	62G/94E
5 and Marine 4	3	0.32	0.6	NR	49	20 or 13+5	13/17	30	15/19	10; 2 ft	4	Reduced Leakage	Standard	Standard	Standard
5 and Marine 4	4	0.35	0.6	NR	38	20 or 13+5	13/17	30	15/19	10; 2 ft	4	Cond or Tested	92/9.1	Standard	Standard

Climate Zone	Path Number	Fenestration U-Factor [b,c]	Skylight U-Factor [b]	Glazed Fenestration SHGC [b,d,e]	Ceiling R-Value	Wood-frame wall R-Value[f]	Mass Wall R-Value[g]	Floor R-Value[h]	Basement/ Crawl space Wall R-Value[i]	Slab R-Value & Depth[j]	Building Air Tightness (ACH50)[k]	Duct Tightness[l]	Furnace (AFUE) /Heat Pump (HSPF)[m]	Air Conditioning (SEER)[n]	Hot Water Heater[o]
6	1	0.30	0.55	NR	49	20+5 or 13+10	19/21	30	15/19	10; 4 ft	4	Cond or Tested	Standard	Standard	Standard
6	2	0.35	0.55	NR	49	20 or 13+5	15/19	30	15/19	10; 4 ft	7	Reduced Leakage	92/9.1	Standard	62G/94E
6	3	0.32	0.55	NR	60	20 or 13+5	15/19	30	15/19	10; 4 ft	3	Reduced Leakage	Standard	Standard	Standard
6	4	0.35	0.55	NR	49	20 or 13+5	15/19	38	15/19	10; 4 ft	4	Cond or Tested	92/9.1	Standard	Standard

Climate Zone	Path Number	Fenestration U-Factor [b,c]	Skylight U-Factor [b]	Glazed Fenestration SHGC [b,d,e]	Ceiling R-Value	Wood-frame wall R-Value[f]	Mass Wall R-Value[g]	Floor R-Value[h]	Basement/ Crawl space Wall R-Value[i]	Slab R-Value & Depth[j]	Building Air Tightness (ACH50)[k]	Duct Tightness[l]	Furnace (AFUE) /Heat Pump (HSPF)[m]	Air Conditioning (SEER)[n]	Hot Water Heater[o]
7 and 8	1	0.27	0.55	NR	60	20+5 or 13+10	19/21	38	15/19	10; 4 ft	3	Cond or Tested	Standard	Standard	Standard
7 and 8	2	0.30	0.55	NR	49	20 or 13+5	15/19	38	15/19	10; 4 ft	4	Cond or Tested	92/9.1	Standard	62G/94E
7 and 8	3	0.32	0.55	NR	49	20+5 or 13+10	19/21	38	15/19	10; 4 ft	3	Reduced Leakage	Standard	Standard	Standard
7 and 8	4	0.35	0.55	NR	49	20 or 13+5	15/19	38	15/19	10; 4 ft	4	Reduced Leakage	92/9.1	Standard	Standard

For SI: 1 foot = 304.8 mm.

(relettered and reordered in order of table)

a. *R*-values are minimums. *U*-factors and SHGC are maximums. R-19 batts compressed into a nominal 2x6 framing cavity such that the R-value is reduced by R-1 or more shall be marked with the compressed batt R-value in addition to the full thickness R-value.

b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration. "NR" means no requirement.

c~~j~~. For impact rated fenestration complying with Section R301.2.1.2 of the International Residential Code, the maximum U-factor in Climate Zones 1-3 shall be permitted to be 0.15 higher than that specified in Table N1102.1.

d~~e~~. There are no SHGC requirements in the Marine Zone.

e. SHGC calculations and exceptions are covered under Section N1103.3.

f~~h~~. "xx+yy" means R-xx cavity insulation plus R-yy insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.

g~~i~~. The second R-value applies when more than half the insulation is on the interior of the mass wall and applies interior cavity insulation.

h~~g~~. Or insulation sufficient to fill the framing cavity, R-19 minimum.

i~~c~~. "15/19" means R-15 continuous insulated sheathing on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulated sheathing on the interior or exterior of the home. "10/13" means R-10 continuous insulated sheathing on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.

j~~d~~. R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 ft, whichever is less, in Zones 1 through 3 for heated slabs.

k. Air tightness testing requirements are listed in Section N1103.4.1.1.
l. "Cond or Tested" means that the duct system shall either be located within conditioned space or tested in accordance with Section N1104.2.2."Reduced Leakage" means that the duct system shall comply with the requirements of section N1104.2.3.
m. Heating system performance tested in accordance with ASHRAE Standard 103 or ARI Standard 210/2N110 or equivalent. Coefficient of Performance (COP) is converted into HSPF by multiplying by 3.413. "Standard" represents the prevailing minimum efficiency acceptable under federal law.
n. Cooling system performance tested in accordance with ARI Standard 210/2N110 or equivalent. Energy Efficiency Ratio (EER) is converted to SEER by multiplying EER*1.143. "Standard" represents the prevailing minimum efficiency acceptable under federal law.
o. Water heater Energy Factor requirements for Gas (G) and Electric (E) water heaters. "Standard" represents the prevailing minimum efficiency acceptable under federal law.
p. Basement wall insulation is not required in warm-humid locations as defined by Figure 301.1 and Table 301.1.

SECTION N1103
BUILDING THERMAL ENVELOPE

N1103.1 General.

N1103.1.1 Insulation installation. All insulation installed as part of the building thermal envelope to achieve compliance with Table N1102.1 shall be installed in accordance with the manufacturer's installation instructions and in a manner such that as installed it meets the specified performance levels provided in Table N1102.1. An area-weighted average of each component shall be permitted to satisfy the requirements in Table N1102.1.

N1103.1.2 *R*-value computation. Insulation material used in layers, such as framing cavity insulation and insulating sheathing, shall be summed to compute the component *R*-value. The manufacturer's settled *R*-value shall be used for blown insulation. Computed *R*-values shall not include an *R*-value for other building materials or air films.

TABLE N1103.1.3
EQUIVALENT *U*-FACTORS[a]

CLIMATE ZONE	FENES-TRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	Glazed Fenestration SHGC	CEILING *U*-FACTOR	FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR[d]	CRAWL SPACE WALL *U*-FACTOR[c]	ENVELOPE LEAKAGE RATES (ACH50)
1	0.50	0.75	.25	0.030	0.066	0.138/0.120	0.064	0.360	0.477	7
2	0.35	0.65	.25	0.030	0.066	0.116/0.098	0.064	0.360	0.477	7
3	0.32	0.65	.3	0.030	0.058	0.098/0.087	0.047	0.091[c]	0.136	7
4 except Marine	0.32	0.60	NR	0.030	0.058	0.098/0.087	0.047	0.059	0.065	4
5 and Marine 4	0.32	0.60	NR	0.026	0. 048	0.060/0.057	0.033	0.050	0.053	4
6	0.30	0.55	NR	0.026	0.048	0.057/0.057	0.033	0.050	0.053	4
7 and 8	0.27	0.55	NR	0.024	0.048	0.057/0.057	0.028	0.050	0.053	3

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.
b. When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in Zone 1, 0.14 in Zone 2, 0.12 in Zone 3, 0.10 in Zone 4 except Marine, and the same as the frame wall U-factor in Marine Zone 4 and Zones 5 through 8.
c. Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure 301.1 and Table 301.2.
d. Foundation U-factor requirements shown in Table N1102~~3~~.1.3 include wall construction and interior air films but exclude soil conductivity and exterior air films. U-factors for determining code compliance in accordance with Section N1102~~3~~.1.4 (total UA alternative) of Section N1105 (Simulated Performance Alternative) shall be modified to include soil conductivity and exterior air film.

N1103.1.3 *U*-factor alternative. An assembly with a *U*-factor equal to or less than the equivalent R-value specified in Table N1102.1 determined by using a method consistent with the ASHRAE *Handbook of Fundamentals* including the thermal bridging effects of framing materials shall be permitted as an alternative to the required *R*-value in Table N1102.1.1 for the selected path. Nonfenestration *U*-factors or R-values shall be obtained from measurement, calculation or an approved source.

N1103.1.4 Total UA alternative. If the total building thermal envelope UA (sum of *U*-factor times assembly area) is less than or equal to the total UA resulting from using the *U*-factors in Table N1103~~2~~.1.3 (multiplied by the same assembly area as in the proposed building), the building shall be considered in compliance with the R-value and U-factor requirements of Table N1102.1. The UA calculation shall be done using a method consistent with the ASHRAE *Handbook of Fundamentals* and shall include the thermal bridging effects of framing materials. The SHGC and Envelope Leakage rate requirements in Table N1103.1.3 shall be met in addition to UA compliance.

N1103.2 Specific insulation requirements.

N1103.2.1 Ceilings with attic space. Wherever full height of uncompressed insulation extends over the wall top plate at the eaves, the reduced values in Table N1103.2.1 shall be deemed to satisfy the ceiling insulation requirements. This reduction shall not apply to the U-factor alternative approach in Section N1103.1.3 and the Total UA alternative in Section N1103.1.4.

TABLE N1103.2.1
ALLOWABLE CEILING R-VALUE WITH FULL HEIGHT PERIMETER INSULATION

TABLE N1102.1 LISTED CEILING R-VALUE	ALLOWABLE R-VALUE WITH FULL HEIGHT PERIMETER INSULATION
38	30
49	38
60	49

N1103.2.2 Ceilings without attic spaces. Where Section N1102.1 would require insulation levels above R-30 and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section N1102.1.1 shall be limited to 500 square feet (46 m^2) or 20% of the total insulated ceiling area, whichever is less. This reduction shall not apply to the U-factor alternative approach in Section N1103.1.3 and the Total UA alternative in Section N1103.1.4.

N1103.2.3 Access hatches and doors. Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weatherstripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment which prevents damaging or compressing the insulation. A wood framed or equivalent baffle or retainer is required to be provided when loose fill insulation is installed, the purpose of which is to prevent the loose fill insulation from spilling into the living space when the attic access is opened, and to provide a permanent means of maintaining the installed R-value of the loose fill insulation.

N1103.2.4 Mass walls. Mass walls for the purposes of this chapter shall be considered above grade walls of concrete block, concrete, insulated concrete form (ICF), masonry cavity, brick (other than brick veneer), earth (adobe, compressed earth block, rammed earth) and solid timber/logs.

N1103.2.5 Steel-frame ceilings, walls and floors. Steel-frame ceilings, walls and floors shall meet the insulation requirements of Table N1103.2.5 or shall meet the *U*-factor requirements in Table N1103.1.3. The calculation of the *U*-factor for a steel-frame envelope assembly shall use a series-parallel path calculation method.

TABLE N1103.2.5
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION
(*R*-VALUE)

WOOD FRAME *R*-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT *R*-VALUE[a]
	Steel Truss Ceilings[b]
R-30	R -38 or R-30+3 or R-26+5
R-38	R -49 or R-38+3
R-49	R-38+5
	Steel Joist Ceilings[b]
R-30	R-38 in 2×4 or 2×6 or 2×8 R - 49 in any framing
R-38	R -49 in 2×4 or 2×6 or 2×8 or 2×10
	Steel Framed Wall
R-13[c]	R -13+5 or R-15+4 or R-21+3 or R-0+10
R-19	R -13+9 or R-19+8 or R-25+7
R-21	R-13+10 or R-19+9 or R-25+8
	Steel Joist Floor
R-13	R-19 in 2×6; R-19+6 in 2×8 or 2×10
R-19	R-19+6 in 2×6; R-19+12 in 2×8 or 2×10

a. Cavity insulation *R*-value is listed first, followed by continuous insulation *R*-value.
b. Insulation exceeding the height of the framing shall cover the framing.
c. Under prescriptive paths 2, 3, and 4, insulation for steel framed wall assemblies with studs spaced 24 inches (610mm) on center shall be permitted to be R-13+0 when ceiling insulation is increased to a wood framed equivalent of R-38 in climate zones 1 and 2 and permitted to be R-13+3 when ceiling insulation is increased to a wood framed equivalent of R-49 in climate zones 3 and 4.

N1103.2.6 Floors. Floor insulation shall be installed to maintain permanent contact with the underside of the subfloor decking.

N1103.2.7 Basement walls. Walls associated with conditioned basements shall be insulated from the top of the basement wall down to 10 feet (3048 mm) below grade or to the basement floor, whichever is less. Walls associated with unconditioned basements shall meet this requirement unless the floor overhead is insulated in accordance with Sections N1102.1 and N1103.2.6.

N1103.2.8 Slab-on-grade floors. Slab-on-grade floors with a floor surface less than 12 inches (305 mm) below grade shall be insulated in accordance with Table N1102.1. The insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below grade shall be extended the distance provided in Table N1102.1 by any combination of vertical insulation, insulation extending under the slab or insulation extending out from the building. Insulation extending away from the building shall be protected by pavement or by a minimum of 10 inches (254 mm) of soil. The top edge of the insulation installed between the exterior wall and the edge of the interior slab shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the exterior wall. Slab-edge insulation is not required in jurisdictions designated by the code official as having a very heavy termite infestation.

N1103.2.9 Crawl space walls. As an alternative to insulating floors over crawl spaces, crawl space walls shall be permitted to be insulated when the crawl space is not vented to the outside. Crawl space wall insulation shall be permanently fastened to the wall and extend downward from the floor to the finished grade level and then vertically and/or horizontally for at least an additional 24 inches (610 mm). Exposed earth in unvented crawl space foundations shall be covered with a continuous Class I vapor retarder. All joints of the vapor retarder shall overlap by 6 inches (153 mm) and be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (153 mm) up the stem wall and shall be attached to the stem wall.

N1103.2.10 Masonry veneer. Insulation shall not be required on the horizontal portion of the foundation that supports a masonry veneer.

N1103.2.11 Thermally isolated sunroom insulation. The minimum ceiling insulation *R*-values shall be R-19 in zones 1 through 4 and R-24 in zones 5 though 8. The minimum wall *R*-value shall be R-13 in all zones. New wall(s) separating a sunroom from conditioned space shall meet the building thermal envelope requirements.

N1103.3 Fenestration.

N1103.3.1 *U*-factor. An area-weighted average of fenestration products shall be permitted to satisfy the *U*-factor requirements.

N1103.3.2 Glazed fenestration SHGC. An area-weighted average of fenestration products more than 50 percent glazed shall be permitted to satisfy the SHGC requirements.

N1103.3.3 Glazed Fenestration SHGC exception. In climate zones 1-3, vertical fenestration shaded by an overhang, eave, or permanently attached shading device shall be permitted to satisfy the SHGC requirements provided the projection factor is greater than or equal to the value listed in table N1103.3.3 for the appropriate orientation. The overhang, eave, or permanently attached shading device shall have a minimum projection that shall extend beyond each side of the glazing a minimum of 12 inches. Where different windows and glazed doors have different projection factors, they shall each be evaluated separately, or an area-weighted projection factor value shall be calculated and used. Each orientation shall be rounded to the nearest cardinal orientation (+/-45 degrees or 0.79 rad) for purposes of calculations and demonstrating compliance.

TABLE N1103.3.3
MINIMUM PROJECTION FACTOR REQUIRED BY ORIENTATION FOR SHGC EXCEPTION

ORIENTATION	PROJECTION FACTOR
North	>=0.30
South	>=0.20
East	>=0.50
West	>=0.50

N1103.3.4 Glazed fenestration exemption. Up to 15 square feet (1.4 m^2) of glazed fenestration per dwelling unit shall be permitted to be exempt from *U*-factor and SHGC requirements in Section N1102.1. This exemption shall not apply to the U-factor alternative approach in Section N1103.1.3 and the Total UA alternative in Section N1103.1.4.

N1103.3.5 Opaque door exemption. One side-hinged opaque door assembly up to 24 square feet (22 m^2) in area is exempted from the *U*-factor requirement in Section N1102.1.1. This exemption shall not apply to the U-factor alternative approach in Section N1103.1.3 and the Total UA alternative in Section N1103.1.4.

N1103.3.6 Thermally isolated sunroom *U*-factor. For Zones 4 through 8, the maximum fenestration *U*-factor shall be 0.50 and the maximum skylight *U*-factor shall be 0.75. New windows and doors separating the sunroom from conditioned space shall meet the building thermal envelope requirements.

N1103.3.7 Replacement fenestration. Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the following requirements for *U*-factor and SHGC. : SHGC in climate zones 1-3 of 0.30, U-Factor of 0.55 in climate zone 2, 0.45 in climate zone 3, 0.35 in climate zones 4,5, 0.32 in climate zones 6, 7 and 8 subject to the all the provisions in Section N1103.3.

N1103.4 Air leakage.

N1103.4.1 Building thermal envelope. The building thermal envelope shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction.

N1103.4.1.1 Testing. Building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is less than or equal to the building air changes per hour (ACH) listed in the selected path of Table N1102.1 when tested with a blower door apparatus at a pressure of 0.2 in w.c. (50 Pa). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation, and combustion appliances.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;
2. Dampers shall be closed, but not sealed; including exhaust, intake, makeup air, back draft, and flue dampers;
3. Interior doors shall be open;
4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling system(s) shall be turned off;
6. HVAC ducts shall not be sealed; and
7. Supply and return registers shall not be sealed.

N1103.4.1.1.1 Single Family Attached. For residential occupancies other than single family detached dwellings, testing shall be permitted to be the entire building tested simultaneously or a sampling of no fewer than 1 in 7 individual units within the structure. Individual unit tightness shall be permitted to be determined by either total unit leakage or leakage to unconditioned space (including outside). Where multiple tests are performed for a building, the average tightness of tested units shall be permitted to satisfy the required building envelope airtightness level.

N1103.4.1.1.2 Failed Testing. If the dwelling does not achieve air-leakage requirement on the initial test, after an attempt to correct, a subsequent test must be performed that demonstrates compliance or at least a 10% reduction in leakage from the initial test and within 1 ACH of the required tightness.

Exception: Testing is not required in climate zones 1-4 for residences claiming an air tightness level of 7 ACH50.

N1103.4.1.2 Visual inspection: Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table N1103.4.1.2, applicable to the method of construction, are field verified or an approved party.

N1103.4.2 Fireplaces. New wood-burning fireplaces shall have gasketed doors and outdoor combustion air.

N1103.4.3 Fenestration air leakage. Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m^2), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m^2), when tested according to NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled by the manufacturer.

Exceptions: Site-built windows, skylights and doors.

TABLE N1103.4.1.2
AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

COMPONENT	CRITERIA
Air barrier and thermal barrier	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air permeable insulation is not used as a sealing material. Air permeable insulation is inside of an air barrier.
Ceiling / attic	Air barrier in any dropped ceiling / soffit is substantially aligned with insulation and any gaps are sealed. Attic access (except unvented attic), knee wall door, or drop down stair is sealed.
Walls	Corners and headers are insulated. Junction of foundation and sill plate is sealed.
Windows and doors	Space between window/door jambs and framing is sealed.
Rim joists	Rim joists are insulated and include an air barrier.
Floors (including above garage and cantilevered floors)	Insulation is installed to maintain permanent contact with underside of subfloor decking. Air barrier is installed at any exposed edge of insulation.
Crawl space walls	Insulation is permanently attached to walls. Exposed earth in unvented crawlspaces is covered with class I vapor retarder with overlapping joints taped.
Shafts, penetrations	Duct shafts, utility penetrations, knee walls, and flue shafts opening to exterior or unconditioned space are sealed.
Narrow cavities	Batts in narrow cavities are cut to fit, or narrow cavities are filled by spayed/blown insulation.
Garage separation	Air sealing is provided between the garage and conditioned spaces.
Recessed lighting	Recessed light fixtures are airtight, IC rated, and sealed to drywall. Exception—fixtures in conditioned space.
Plumbing and Wiring	Insulation is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing, or sprayed/blown insulation extends behind piping and wiring.
Shower / tub on exterior wall	Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.
Electrical / phone box on exterior walls	Air barrier extends behind boxes or an air sealed type boxes are installed.
Common wall	Air barrier is installed in common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.
Fireplace	Fireplace walls include an air barrier.

N1103.4.4 Recessed lighting. Recessed luminaires installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and labeled as meeting ASTM E 283 when tested at 1.57 psi (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.

SECTION N1104
SYSTEMS

N1104.1 Controls. At least one thermostat shall be provided for each separate heating and cooling system.

N1104.1.1 Programmable thermostat. Where the primary heating system is a forced air furnace, at least one thermostat per dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain zone temperatures down to 55ºF (13ºC) or up to 85ºF (29ºC). The thermostat shall initially be programmed with a heating temperature set point no higher than 70ºF (21ºC) and a cooling temperature set point no lower than 78ºF (26ºC).

N1104.1.2 Heat pump supplementary heat. Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load.

N1104.2 Ducts.

N1104.2.1 Insulation. Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.

Exception: Ducts or portions thereof located completely inside the building thermal envelope.

N1104.2.2 Sealing. All ducts, air handlers, filter boxes shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the *International Residential Code*. Duct tightness shall be verified by either of the following:

1. Post-construction test: Leakage to outdoors shall be less than or equal to 8 cfm (226.5 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.
2. Rough-in test: Total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm (113.3 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area.

   Exception: Duct tightness test is not required if the air handler and all ducts are located within conditioned space.

N1104.2.3 Reduced Leakage ducts. When specified as part of a selected Path Number in Table N1102.1, Reduced Leakage ducts must be located entirely within conditioned space and tested for total leakage and leakage to outside conditioned space. Leakage to outdoors shall be less than or equal to 3 cfm (84.9 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area, and the total leakage shall be less than or equal to 8 cfm (226.5 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. Total leakage of not greater than 3 cfm per 100 ft^2 of conditioned floor area at a pressure difference of 0.01 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure, shall be deemed to satisfy this requirement without measurement of leakage to outdoors.

N1104.2.4 Building cavities. Building framing cavities shall not be used as supply ducts.

N1104.3 Mechanical system piping insulation. Mechanical system piping capable of carrying fluids above 105°F (41°C) or below 55°F (13°C) shall be insulated to a minimum of R-3.

N1104.4 Service hot water systems.

N1104.4.1 Hot water pipe insulation. At least R-3 insulation shall be applied to the following:

1. Piping larger than 3/4 in. outside diameter
2. Piping outside conditioned space
3. Piping in a floor slab or in the ground
4. Piping in a re-circulating system

   Exception: demand recirculation systems

5. Entire pipe run from water heater to kitchen sink

N1104.4.2 Re-circulating hot water systems. Re-circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when not in use.

N1104.5 Mechanical ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

N1104.6 Equipment sizing. Heating and cooling equipment shall be sized in accordance with Section M1401.3 of the *International Residential Code.*

N1104.7 Snow melt system controls. Snow- and ice-melting systems, supplied through energy service to the building, shall include automatic controls capable of shutting off the system when the pavement temperature is above 50ºF, and no precipitation is falling and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40ºF.

N1104.8 Pools. Pools shall be provided with energy conserving measures in accordance with Sections N1104.9.1 through N1104.9.3

N1104.8.1 Pool heaters. All pool heaters shall be equipped with a readily accessible on-off switch to allow shutting off the heater without adjusting the thermostat setting. Pool heaters fired by natural gas or LPG shall not have continuously burning pilot lights.

N1104.8.2 Time switches. Time switches that can automatically turn off and on heaters and pumps according to a preset schedule shall be installed on swimming pool heaters and pumps.

Exceptions:

1. Where public health standards require 24-hour pump operation.
2. Where pumps are required to operate solar-and-waste-heat-recovery pool heating systems.

N1104.8.3 Pool covers. Heated pools shall be equipped with a vapor-retardant pool cover on or at the water surface. Pools heated to more than 90^{o}F (32^{o}C) shall have a pool cover with a minimum insulation value of R-12.

Exception: Pools deriving over 60 percent of the energy from heating from site-recovered or solar energy source.

SECTION N1105
ELECTRICAL POWER AND LIGHTING SYSTEMS

N1105.1 Lighting equipment. A minimum of seventy-five percent of the lamps in permanently installed lighting fixtures shall be high efficacy lamps.

Reason: The main purpose of this Proposal is two-fold. One is to achieve energy efficiency that is 30% above the 2006 IECC. The second is to achieve consistency between the IECC and the IRC for low-rise residential buildings. This proposal is also designed to bring together sound building science practices, energy efficiency options, code compliance verification, and practicality with respect to the construction of residential dwellings, without creating a market advantage for any one product or practice.

Significant energy savings is achieved several ways in this proposal by limiting whole house air leakage limiting fenestration area, increasing the building envelope requirements and equipment performance, resulting in a 30% improvement over the 2006 IECC.

This proposal has multiple prescriptive paths that builders and code officials can easily follow and without complicated calculations. Some paths use equipment to achieve the savings, others use air tightness and/or additional insulation.

As written in the 2009 IECC, many low SHGC windows are very dark resulting in higher lighting usage and an increased desire for more windows, thus do not save energy. Projection factor trade-offs for window SHGC requirements have successfully been used in the commercial and high rise residential energy codes for many years and have proven to be simple to calculate. The projection factor in this proposal allows builders to incorporate shading devices to satisfy the SHGC requirement.

Moreover, fenestration is a significant contributor to space conditioning costs in every climate. Solar heat gains in the Southern climates and conduction losses in the Northern climates are significantly reduced when a typical R-2 to R-3 window is replaced by an R-13 to R-21 wall. Providing an incentive for lower fenestration area by limiting window percentage in the prescriptive path will provide for increased opaque wall area, again, resulting in energy savings.

Another area that this proposal addresses is the percentage of windows (one of the least energy efficient components in a house) relative to the overall window-to-wall ratio. Recognizing the impact of the windows on the performance of the house, it is necessary to provide options to off-set the energy requirements of the windows. The window-to-floor area (UA) factor is adjusted according to the energy saving items listed in that particular climate zone and path option.

A tight building envelope and duct system are integral parts of an energy efficient home. Blower door and duct testing are recognized as tools used to evaluate these items and are addressed in this proposal. Once properly trained, contractors who perform air sealing and duct installation repeatedly install the systems in a consistent manner, testing would not necessarily be required in every home. Sample testing provides valuable periodic feedback to keep the performance levels consistent and acceptable. This has been demonstrated by the Energy Star program that has allowed sample testing for many years. Testing does not save energy, sealing ducts and the building envelope do.

Although the equipment trade-off Tables were eliminated from the 2009 IECC, increasing equipment efficiency is often a practical and cost effective means of saving energy. With the 4 option paths in this proposal, the builder can comply with the code by increased equipment efficiency or

other options that would meet the required energy savings. As new technologies are developed that increases equipment efficiencies, it would only makes sense to incorporate the improved HVAC equipment to save energy.

Builders understand the need to increase energy efficiency in homes, but they must be given a variety of options and paths with which to reach their targets without being overburdened with complicated calculations that could easily lead to errors. This proposal provides that level of stringency and allows code officials an easy path to certify compliance of the code without requiring expensive testing.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SAGAN-EC-7-103.2-202-CH 4-RE-1-R202-N1101-N1104

EC17–09/10
202; IRC R202

Proponent: Matthew Dobson, representing Vinyl Siding Institute

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Add new definition as follows:

SECTION 202
GENERAL DEFINITIONS

INSULATED SIDING. A cladding system with integral insulating material, having a minimum thermal resistance of R-2.

PART II – IRC ENERGY

Add new definition as follows:

SECTION R202
DEFINITIONS

INSULATED SIDING. A cladding system with integral insulating material, having a minimum thermal resistance of R-2.

Reason: Forms of insulated siding have been commercially available for at least twelve years. Current versions of insulated vinyl siding as well as other types of insulated claddings are now being tested to show actual field R-values. Many of these tests are being conducted using the appropriate testing methodology using the "hot box" test or ASTM C1363. This building component presents a viable option. A minimal performance value of R-value is consistent with the minimal R-value requirements to establish the product as a home insulation or insulation.

In addition to the thermal resistance characteristics, insulated siding's components and other non-related energy performance characteristics are covered by the code and specific product standards. For example the foam plastic used with insulated siding is addressed in the foam plastic sections of the IBC and IRC as well as through AC12. In addition ASTM C578 is the standard for foam plastics. Over the past few years both an acceptance criteria and product standard have been developed to address the non-thermal characteristics of what is termed as "backed siding". These material standards (ASTM D7445-09 and AC 37 (both vinyl and backed vinyl siding)) provide performance criteria for the siding including areas required by the building codes for example warp, shrinkage, impact strength, expansion, appearance, and wind load resistance.

Testing relative to moisture and water management issues indicated that use of insulated siding has no negative effect on the performance of the wall panels in relationship to moisture absorption. In field studies where the product had been installed for nearly ten years there were no indications of any problems of moisture entrapment related issues. Further the industry knows of no claims or complaints relating to moisture issues and the performance insulated vinyl siding.

Included with this proposal is an example of testing that has been completed using the ASTM C1363 test method as well as recent research co-funded by VSI through the New York State Energy Research and Development Authority's High Performance Residential Development Challenge program. Both testing and research support insulated siding as a viable option to help increase the energy efficiency of buildings.

As a part of this proposal please visit the link provided of an example of testing that has been completed using the ASTM C1363 test method as well as a link to recent research co-funded by VSI through the New York State Energy Research and Development Authority's High Performance Residential Development Challenge program. Both testing and research support insulated siding as a viable option to help increase the energy efficiency of buildings.

Here is the link to the example ASTM C1363 testing results
http://www.vinylsiding.org/aboutsiding/insulatedvinylsiding/ASTM%5FC1363%5Ftest%5Fresults%2Epdf.

Here is a link to the New York State Energy Research and Development Authority report

http://www.vinylsiding.org/aboutsiding/newsroom/insulatedvs/090702_Building_Green_with_Insualted_Vinyl_Siding_Case_Study.pdf**.**

Cost Impact: The code change proposal will not increase the cost of construction as it will give specifiers another affordable option for achieving energy code compliance.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DOBSON-EC-1-202-RB-1-R202

EC18–09/10
404.1.1 (New); IRC N1104.1.1 (New)

Proponents: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Add new text as follows:

404.1.1 Lighting equipment (Mandatory). Fuel gas lighting systems shall not have continuously burning pilot lights.

PART II – IRC BUILDING/ENERGY

Add new text as follows:

N1104.1.1 Lighting equipment. Fuel gas lighting systems shall not have continuously burning pilot lights.

Reason: This language is consistent with the ban on continuously burning pilot lights for pool heaters currently found in the *IECC*. Under a new federal rulemaking, gas cooking equipment will also not be allowed to have continuously burning pilot lights.

There are significant energy savings. Typical gas lights use 18 therms per month, most of that due to the pilot light (about 2,500 Btu/hr for many systems). At a national average cost of $1.20 per therm, the cost to a typical consumer is $21.60 per month, or $259.20 per year. With advanced controls (electronic spark ignition, for example), the standby energy losses are eliminated, and the consumer saves at least $200 per year (assuming lights are turned off 80% of the time. If the lights operate for 50% of the time, the savings are $129.60 per year).

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-28-401.1-N1104.1

EC19 –09/10

202, 401.2, Table 402.1.1, 401.3, Table 402.1.3, Table 402.2.5, Section 402.4, 403.2, 403.4, 403.5, 404, Table 405.5.2(1); IRC Section R202, N1101.9, Table N1102.1, Table N1102.1.2, Table N1102.2.5, N1102.4, N1103.2, N1103.4, N1103.5, N1104

Proponent: Craig Conner, Building Quality, representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Add new definition as follows:

CHAPTER 2
DEFINITIONS

DEMAND RECIRCULATION WATER SYSTEM. A water distribution system where pump(s) prime the service hot water piping with heated water upon demand for hot water.

2. Revise as follows:

CHAPTER 4
RESIDENTIAL ENERGY EFFICIENCY

401.2 Compliance. Projects shall comply with Sections identified as "mandatory" and with either sections identified as "prescriptive" or the performance approach in Section 406. ~~Sections 401, 402.4, 402.5, and 403.1, 403.2.2, 403.2.3, and 403.3 through 403.9 (referred to as the mandatory provisions) and either:~~

1. ~~Sections 402.1 through 402.3, 403.2.1 and 404.1 (prescriptive); or~~
2. ~~Section 405 (performance).~~

401.3 Certificate (Mandatory). A permanent certificate shall be completed and posted on or in the electrical distribution panel by the builder or registered design professional. The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. ~~The certificate shall be completed by the builder or registered design professional.~~ The certificate shall list the predominant *R*-values of insulation installed in or on ceiling/roof, walls, foundation (slab, *basement wall*, crawlspace wall and/or floor) and ducts outside conditioned spaces; *U*-factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration, and the results from any duct system and building envelope air leakage testing done on the building. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be *listed* for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY Component

CLIMATE ZONE	FENESTRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	GLAZED FENESTRATION SHGC	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[i]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
1	~~1.20~~ NR	0.75	0.30	30	13	3 / 4	13	0	0	0
2	~~0.65~~ 0.50 j	0.65 ~~0.75~~	0.30	30	13	4 / 6	13	0	0	0
3	~~0.50~~ 0.40[j]	0.55 ~~0.65~~	0.30[e]	~~30~~38	13	5 / 8	19	5/13[f]	0	5 / 13
4 except Marine	0.35	0.55 ~~0.60~~	NR	38	~~13~~ 20 or 13+5[h]	~~5 / 10~~ 8 / 13	19	10 / 13	10, 2 ft	10/13
5 and Marine 4	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	~~38~~49	20 or 13+5[h]	13 / 17	30[g]	10/13	10,2ft	10/13
6	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	49	20~~+5~~ or 13+~~5~~ 10[h]	15 / ~~19~~ 20	30[g]	15/19	10,4ft	10/13
7 and 8	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	49	~~21~~ 20+5 or 13+10[h]	19 / 21	38[g]	15/19	10,4ft	10/13

For SI: 1 foot = 304.8 mm.

a. *R*-values are minimums. *U*-factors and SHGC are maximums. R-19 batts compressed into a nominal 2x6 framing cavity such that the R-value is reduced by R-1 or more shall be marked with the compressed batt R-value in addition to the full thickness R-value.

b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.

c. 15/19" means R-15 continuous ~~insulated sheathing~~ insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous ~~insulated sheathing~~ insulation on the interior or exterior of the home. "10/13" means R-10 continuous ~~insulated sheathing~~ insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.

d. R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 ft, whichever is less, in zones 1 through 3 for heated slabs.

e. There are no SHGC requirements in the Marine zone.

f. Basement wall insulation is not required in warm-humid locations as defined by Figure 301.1 and Table 301.1.

g. Or insulation sufficient to fill the framing cavity, R-19 minimum.

h. First value is cavity insulation, second is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required in the locations where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.

i. The second R-value applies when more than half the insulation is on the interior of the mass wall.

j. For impact rated fenestration in wind-borne debris regions ~~complying with Section R301.2.1.2 of the IRC or Section 1608.1.2 of the IBC~~, the maximum U-factor shall be 0.75 in Zone 2 and 0.65 in Zone 3.

TABLE 402.1.3
EQUIVALENT *U*-FACTORS[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	CEILING *U*-FACTOR	FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
1	~~1.20~~ 0.65	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	~~0.65~~ 0.50	~~0.75~~ 0.65	0.035	0.082	0.165	0.064	0.360	0.477
3	~~0.50~~ 0.40	~~0.65~~ 0.55	~~0.035~~0.030	0.082	0.141	0.047	0.091[c]	0.136
4 except Marine	0.35	~~0.60~~ 0.55	0.030	~~0.082~~ 0.057	~~0.141~~ 0.098	0.047	0.059	0.065
5 and Marine 4	~~0.35~~ 0.32	~~0.60~~ 0.55	~~0.030~~0.026	0.057	0.082	0.033	0.059	0.065
6	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	~~0.057~~ 0.048	0.060	0.033	0.050	0.065
7 and 8	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	~~0.057~~ 0.048	0.057	0.028	0.050	0.065

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.

b. When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in Climate Zone 1, 0.14 in Climate Zone 2, 0.12 in Climate Zone 3, 0.10 in Climate Zone 4 except Marine, 0.087 in Climate Zone 5 and Marine 4, and the same as the frame wall U-factor in Marine Zone 4 and Climate Zones 5 through 8.

c. Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure 301.1 and Table 301.2.

TABLE 402.2.5
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION
(*R*-VALUE)

WOOD FRAME *R*-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT *R*-VALUE[a]
	Steel Truss Ceilings[b]
R-30	R -38 or R-30+3 or R-26+5
R-38	R -49 or R-38+3
R-49	R-38+5
	Steel Joist Ceilings[b]
R-30	R-38 in 2×4 or 2×6 or 2×8 R - 49 in any framing
R-38	R -49 in 2×4 or 2×6 or 2×8 or 2×10
	Steel Framed Wall
R-13	R -13+5 o rR-15+4 or R-21+3 or R-0+10
R-19	R -13+9 or R-19+8 or R-25+7
R-20 or R-21	R-13+10 or R-19+9 or R-25+8

WOOD FRAME *R*-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT *R*-VALUE[a]
R-20+5	R-13+15 or R-19+14 or R-25+13
	Steel Joist Floor
R-13	R-19 in 2×6; R-19+6 in 2×8 or 2×10
R-19	R-19+6 in 2×6; R-19+12 in 2×8 or 2×10

a. Cavity insulation *R*-value is listed first, followed by continuous insulation *R*-value.
b. Insulation exceeding the height of the framing shall cover the framing.

402.4 Air leakage (Mandatory).

402.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Sections 402.4.1.1 and 402.4.1.2. ~~be durably sealed to limit infiltration.~~ The sealing methods between dissimilar materials shall allow for differential expansion and contraction. ~~The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:~~

~~1. All joints, seams and penetrations.~~
~~2. Site-built windows, doors and skylights.~~
~~3. Openings between window and door assemblies and their respective jambs and framing.~~
~~4. Utility penetrations.~~
~~5. Dropped ceilings or chases adjacent to the thermal envelope.~~
~~6. Knee walls.~~
~~7. Walls and ceilings separating a garage from conditioned spaces.~~
~~8. Behind tubs and showers on exterior walls.~~
~~9. Common walls between dwelling units.~~
~~10. Attic access openings.~~
~~11. Rim joist junction.~~
~~12. Other sources of infiltration.~~

402.4.1.1 Installation. The components of the *building thermal envelope* as listed in Table 402.4.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table 402.4.1.1, as applicable to the method of construction. Where required by the *code official*, an *approved* party shall inspect all components and verify compliance.

TABLE ~~402.4.2.1.1~~ 402.4.1.1
AIR BARRIER AND INSULATION ~~INSPECTION COMPONENT CRITERIA~~ INSTALLATION

COMPONENT	CRITERIA
Air barrier and thermal barrier	A continuous air barrier shall be installed in the building envelope. ~~Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier.~~ Breaks or joints in the air barrier ~~are filled or repaired~~ shall be sealed. Air permeable insulation ~~is~~ shall not be used as a sealing material. Any ~~A~~air permeable insulation shall be installed ~~is~~ inside of an air barrier.
Ceiling / attic	The air barrier in any dropped ceiling / soffit ~~is substantially~~ shall be aligned with the insulation and any gaps ~~are~~ in the air barrier sealed. ~~Attic access (except unvented attic), knee wall door, or drop down stair is sealed.~~ Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.
Walls	Corners and headers shall be ~~are~~ insulated and the~~.~~ junction of the foundation and sill plate ~~is~~ shall be sealed. The junction of the top plate and top of exterior walls shall be sealed. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier. Knee walls shall be sealed.
Windows, skylights and doors	The space between window/door jambs and framing and skylights and framing ~~is~~ shall be sealed.
Rim joists	Rim joists ~~are~~ shall be insulated and include ~~an~~ the air barrier.
Floors (including above garage and cantilevered floors)	Insulation ~~is~~ shall be installed to maintain permanent contact with underside of subfloor decking. The air barrier ~~is~~ shall be installed at any exposed edge of insulation.
Crawlspace walls	Where provided in lieu of floor insulation, insulation ~~is~~ shall be permanently attached to the crawlspace walls. Exposed earth in unvented crawlspaces ~~is~~ shall be covered with a class I vapor retarder with

COMPONENT	CRITERIA
	overlapping joints taped.
Shafts, penetrations	Duct shafts, utility penetrations, ~~knee walls,~~ and flue shafts opening to exterior or unconditioned space ~~are~~ shall be sealed.
Narrow cavities	Batts in narrow cavities ~~are~~ shall be cut to fit, or narrow cavities ~~are~~ shall be filled by ~~spayed/blown~~ insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing ~~is~~ shall be provided between the garage and conditioned spaces.
Recessed lighting	Recessed light fixtures installed in the building thermal envelope ~~are~~ shall be airtight, IC rated, and sealed to the drywall. ~~Exception: fixtures in conditioned space.~~
Plumbing and Wiring	~~Insulation is placed between outside and pipes.~~ Batt insulation ~~is~~ shall be cut neatly to fit around wiring and plumbing in exterior walls, or ~~sprayed/blown~~ insulation that on installation readily conforms to available space shall extend~~s~~ behind piping and wiring.
Shower / tub on exterior wall	Exterior walls adjacent to showers and tubs ~~on exterior walls~~ shall be ~~have~~ insulat~~ion~~ed and ~~an~~ the air barrier installed separating them from the ~~exterior wall~~ showers and tubs.
Electrical / phone box on exterior walls	The air barrier ~~extends~~ shall be installed behind electrical or communication boxes or ~~an~~ air sealed ~~type~~ boxes ~~are~~ shall be installed.
Common wall	An air barrier ~~is~~ shall be installed in the common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building thermal envelope ~~are~~ shall be sealed to the subfloor or drywall.
Fireplace	An air barrier shall be installed on fireplace walls. ~~include an air barrier.~~ Fireplaces shall have gasketed doors.

~~**402.4.2 Air sealing and insulation.** Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2.~~

~~**402.4.2.1 Testing option.** Building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 33.5 psf (50 Pa). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.~~

402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding 5 air changes per hour (ACH50) in Climate Zones 1 and 2, and 3 air changes per hour in Climate Zones 3 through 8. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the *code official*, testing shall be conducted by an *approved* party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after rough in and creation of all penetrations of the *building thermal envelope*

Exception: Where heating and cooling equipment meets the requirements of Section 404, maximum leakage rate shall be seven air changes per hour (ACH50) in Climate Zones 1 and 2 and five air changes per hour in Climate Zones 3 through 8. Additions less than 1000 ft^2 are exempt from testing. Buildings with more than four dwelling units are exempt from testing.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed~~;~~ beyond the intended weatherstripping or other infiltration control measures;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed, ~~including exhaust, intake, makeup air, backdraft and flue dampers~~ beyond intended infiltration control measures;
3. Interior doors, if installed at the time of test, shall be open;
4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling system(s), if installed at the time of the test, shall be turned off; and
~~6. HVAC ducts shall not be sealed; and~~
~~7.~~ 6. Supply and return registers, if installed at the time of the test, shall ~~not~~ be ~~sealed~~ fully open.

402.4.1.2.1 Sampling. The *code official* shall be permitted to require testing of an approved sample of residences constructed by a specific builder, but not less than 1 in 7 residences The specific buildings or dwelling units to be tested shall be selected by the *code official*. If any tested building or dwelling unit fails to comply with the maximum air

leakage requirement in Section 402.4.1.2 then all buildings or dwelling units shall be tested until a minimum of three consecutive buildings or dwelling units comply from that specific builder and/or contractor or multifamily structure before the *code official* may permit sampling to resume.

~~**402.4.2.2 Visual inspection option.** Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table 402.4.2, applicable to the method of construction, are field verified. Where required by the *code official*, an *approved* party independent from the installer of the insulation shall inspect the air barrier and insulation.~~

402.4.3 Fireplaces. New wood-burning fireplaces shall have ~~gasketed doors and~~ outdoor combustion air.

403.2.2 Sealing (Mandatory). All ducts, air handlers, and filter boxes ~~and building cavities used as ducts~~ shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the *International Residential Code*.

Duct tightness shall be verified by either of the following:

1. Postconstruction test: Total leakage ~~to outdoors~~ shall be less than or equal to ~~8~~ 4 cfm (~~226.5~~ 113.3 L/min) per 100 square feet (9.29 m^2) of *conditioned floor area* ~~or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*~~ when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.
2. Rough-in test: Total leakage shall be less than or equal to ~~6~~ 4 cfm (~~169.9~~ 113.3 L/min) per 100 square feet (9.29 m^2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the ~~roughed in~~ system, including the manufacturer's air handler enclosure. All register ~~boot~~s shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to ~~4~~ 3 cfm (~~113.3~~ 85.0 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*.

   ~~**Exceptions:** Duct tightness test is not required if the air handler and all ducts are located within *conditioned space*.~~

   Exception: Where heating and cooling equipment meets the requirements of Section 404:

   1. Maximum total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 square feet (9.29 m^2) of conditioned floor area for ducts located outside conditioned space, and
   2. The maximum leakage test is not required for ducts and air handlers located entirely within conditioned space.

403.2.4 Location (Prescriptive). All ducts and air handlers shall be located within the conditioned space.

Exception: Where heating and cooling equipment meets the requirements of Section 404.

403.4 Service hot water systems. Energy conservation measures for hot water service systems shall be in accordance with Sections 403.4.1 and 403.4.2.

~~**403.4**~~ **404.4.1 Circulating hot water systems (Mandatory).** ~~All circulating service hot water piping shall be insulated to at least R-2.~~ Circulating hot water systems shall ~~include~~ be provided with an automatic or readily accessible manual switch that can turn off the hot water circulating pump when not in use.

403.4.2 Hot water pipe insulation (Prescriptive). Insulation for hot water pipe with a minimum thermal resistance (R-value) of at least R-3 shall be applied to the following:

1. Piping larger than 3/4 inch nominal diameter
2. Piping serving more than one dwelling unit
3. Piping from the water heater to kitchen outlets
4. Piping located outside the conditioned space
5. Piping from the water heater to a distribution manifold
6. Piping located under a floor slab
7. Buried piping
8. Supply and return piping in recirculation systems other than demand recirculation systems

9. Piping with run lengths greater than the maximum run lengths for the nominal pipe diameter given in Table 403.4.2.

TABLE 403.4.2
MAXIMUM RUN LENGTH (FEET)[1]

Nominal Diameter of Largest Diameter Pipe in the Run (in.)	3/8	1/2	3/4	> 3/4
Maximum Run Length (ft.)	30	20	10	5

1. Total length of all piping from the distribution manifold or the recirculation loop to a point of use.

403.5 Mechanical ventilation (Mandatory). The building shall be provided with ventilation that meets the requirements of Section M1507 of the *International Residential Code* or with other approved means of ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

All combustion equipment in new residences in Climate Zones 3 through 8 shall be sealed combustion, induced draft, or power vented.

Exception: Stoves and ovens in kitchens with vents and fireplaces that meet the applicable requirements of Section 402.

SECTION 404
IMPROVED EQUIPMENT EFFICIENCY ALTERNATIVE

404.1 General (Prescriptive). For new residences, Sections 404.2 and 402.3 shall be permitted as an alternative to certain requirements as specified by exceptions in Sections 402.4.1.2, 403.2.2, and 403.2.4.

404.2 Heating equipment. In Climate Zones 3 and 4 gas furnace AFUE shall be at least 90. In Climate Zones 5 through 8, gas furnace AFUE shall be at least 92. In Climate Zones 3 through 8, gas boiler, oil boiler, or oil furnace AFUE shall be at least 85. In Climate Zones 3 through 8, heat pump HSPF shall be at least 8.5. Ground source heat pumps shall have a minimum efficiency as specified in Table 503.2.3(2). All-electric heated buildings shall utilize either an air-source or ground source heat pump.

404.3 Cooling equipment. In Climate Zones 1 and 2, vapor compression air conditioning SEER shall be at least 16.0 and EER at least 13. In Climate Zone 3, vapor compression air conditioning SEER shall be at least 15.0 and EER at least 12.5. In Climate Zones 1 through 3, room air conditioner EER shall be at least 11.0 for air conditioners with capacity less than 20,000 Btu/hr, or 10.0 for capacities equal to or greater than 20,000 Btu/hr. Ground source heat pumps shall have a minimum efficiency as specified in Table 503.2.3(2).

404.3.1 Future updates to federal manufacturing standards. If applicable Federal manufacturing standards as specified in 10 CFR 430 are updated to establish new efficiency requirements, equipment efficiency requirements in this section shall be improved by a percentage equivalent to the percentage improvement from the efficiency required by 10 CFR 430 as of January 1, 2011 to the efficiency required by 10 Code of Federal Regulations 430 at the date of plan check approval.

Exception: AFUEs for furnaces and boilers shall not be required to exceed the higher of 95 or the requirement in 10 CFR 430 at the date of plan check approval.

SECTION ~~404~~ 405
ELECTRICAL POWER AND LIGHTING SYSTEMS

~~404.1~~ 405.1 Lighting equipment (Prescriptive). A minimum of ~~50~~ seventy-five percent of the lamps in permanently installed lighting fixtures shall be high efficacy lamps or a minimum of seventy-five percent of the permanently installed lighting fixtures shall contain only high efficacy lamps.

Exception: Low-voltage lighting.

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Air Exchange Rate	~~Specific leakage area (SLA)[e] = 0.00036~~ Air leakage rate of 5 air changes per hour in zones 1 and 2, and 3 air changes per hour in zones 3 through 8 at a pressure of 0.2 inches w.g. (50 Pa). ~~assuming no energy recovery~~. The mechanical ventilation rate shall be in addition to the air leakage rate and the same as in the proposed design, but no greater than 0.01 x *CFA* + 7.5 x (N_{br}+1) where: *CFA* = conditioned floor area N_{br} = number of bedrooms Energy recovery shall not be assumed for mechanical ventilation.	For residences that are not tested, the same air leakage rate as the standard reference design. ~~For residences without mechanical ventilation that are tested in accordance with ASHRAE 119, Section 5.1, the measured air exchange rate[e] but not less than 0.35 ACH~~ For tested residences ~~with mechanical ventilation that are tested in accordance with ASHRAE 119, Section 5.1~~, the measured air exchange rate[e] ~~combined with the proposed mechanical ventilation rate, *f* which shall not be less than 0.01 x *CFA* + 7.5 x (N_{br}+1) where: *CFA* = conditioned floor area N_{br} = number of bedrooms~~ The mechanical ventilation rate shall be in addition to the air leakage rate and shall be as proposed.
Thermal distribution systems	A thermal distribution system efficiency (DSE) of 0.88 shall be applied to both the heating and cooling system efficiencies for all systems other than tested duct systems. Duct insulation: From Section 403.2.1. For tested duct systems, the leakage rate shall be ~~the applicable maximum rate from Section 403.2.2.~~ 4 cfm (113.3 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* at a pressure differential of 0.1 inches w.g. (25 Pa).	Thermal distribution system efficiency shall be as ~~As~~ tested or as specified by Table 405.5.2(2) if not tested. Duct insulation shall be as proposed.

e. Where required by the *code official*, testing shall be conducted by an *approved* party. ~~Tested envelope leakage shall be determined and documented by an independent party approved by the *code official*.~~ Hourly calculations as specified in the ~~2001~~ASHRAE *Handbook of Fundamentals*~~, Chapter 26, page 26.21, Equation 40 (Sherman-Grimsrud model)~~ or the equivalent shall be used to determine the energy loads resulting from infiltration.

(Portions of table and footnotes not shown remain unchanged)

PART II – IRC ENERGY

1. Add new definition as follows:

SECTION 202
DEFINITIONS

DEMAND RECIRCULATION WATER SYSTEM. A water distribution system where pump(s) prime the service hot water piping with heated water upon demand for hot water.

2. Revise as follows:

CHAPTER 11
ENERGY EFFICIENCY

N1101.9 Certificate. A permanent certificate shall be completed and posted on or in the electrical distribution panel by the builder or registered design professional. The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. ~~The certificate shall be completed by the builder or registered design professional.~~ The certificate shall list the predominant *R*-values of insulation installed in or on ceiling/roof, walls, foundation (slab, *basement wall*, crawlspace wall and/or floor) and ducts outside conditioned spaces; *U*-factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration, and the results from any duct system and building envelope air leakage testing done on the building. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be *listed* for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT

CLIMATE ZONE	FENESTRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	GLAZED FENESTRATION SHGC	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[k]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
1	~~1.20~~ NR	0.75	0.30 ~~0.35~~[j]	30	13	3 / 4	13	0	0	0
2	~~0.65~~ 0.50[i]	0.65 ~~0.75~~	0.30 ~~0.35~~[j]	30	13	4 / 6	13	0	0	0
3	~~0.50~~ 0.40[i]	0.55 ~~0.65~~	0.30 ~~0.35~~[e, j]	~~30~~38	13	5 / 8	19	5/13[f]	0	5 / 13
4 except Marine	0.35	0.55 ~~0.60~~	NR	38	~~13~~ 20 or 13+5[g][h]	~~5 / 10~~ 8 / 13	19	10 / 13	10, 2 ft	10/13
5 and Marine 4	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	~~38~~49	20 or 13+5[h]	13 / 17	30[f g]	10/13	10,2ft	10/13
6	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	49	20+5 or 13+~~5~~ 10[h]	15 / ~~19~~ 20	30[g]	15/19	10,4ft	10/13
7 and 8	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	49	~~21~~ 20+5 or 13+10[h]	19 / 21	38[g]	15/19	10,4ft	10/13

For SI: 1 foot = 304.8 mm.

a. *R*-values are minimums. *U*-factors and SHGC are maximums. R-19 batts compressed into a nominal 2x6 framing cavity such that the R-value is reduced by R-1 or more shall be marked with the compressed batt R-value in addition to the full thickness R-value.

b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.

c. The first value applies to continuous insulation, the second to framing cavity insulation; either insulation meets the requirement.

d. R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 ft, whichever is less, in zones 1 through 3 for heated slabs.

e. There are no SHGC requirements in the Marine zone.

f. Basement wall insulation is not required in warm-humid locations as defined by Figure N1101.2 and Table N1101.2.

g. Or insulation sufficient to fill the framing cavity, R-19 minimum.

h. First value is cavity insulation, second is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required in the locations where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.

i. For impact rated fenestration in wind-borne debris regions ~~complying with Section R301.2.1.2~~, the maximum U-factor shall be 0.75 in Zone 2 and 0.65 in Zone 3.

~~j. For impact rated fenestration complying with Section R301.2.1.2 of the *International Residential Code*, the maximum SHGC shall be 0.40.~~

~~k.~~ j. The second R-value applies when more than half the insulation is on the interior of the mass wall.

TABLE N1102.1.2
EQUIVALENT *U*-FACTORS[a]

CLIMATE ZONE	FENES-TRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	CEILING *U*-FACTOR	FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
1	~~1.20~~ 0.65	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	~~0.65~~ 0.50	~~0.75~~ 0.65	0.035	0.082	0.165	0.064	0.360	0.477
3	~~0.50~~ 0.40	~~0.65~~ 0.55	~~0.035~~0.030	0.082	0.141	0.047	0.091[c]	0.136
4 except Marine	0.35	~~0.60~~ 0.55	0.030	~~0.082~~ 0.057	~~0.141~~ 0.098	0.047	0.059	0.065
5 and Marine 4	~~0.35~~ 0.32	~~0.60~~ 0.55	~~0.030~~0.026	0.057	0.082	0.033	0.059	0.065
6	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	~~0.057~~ 0.048	0.060	0.033	0.050	0.065
7 and 8	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	~~0.057~~ 0.048	0.057	0.028	0.050	0.065

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.

b. When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in zone 1, 0.14 in zone 2, 0.12 in zone 3, 0.10 in zone 4 except Marine, 0.087 in zone 5 and Marine 4, and the same as the frame wall U-factor in Marine zone 4 and zones 5 through 8.

c. Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure N1101.2 and Table N1101.2.

TABLE N1102.2.5
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION
(*R*-VALUE)

WOOD FRAME *R*-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT *R*-VALUE[a]
	Steel Truss Ceilingsb
R-30	R -38 or R-30+3 or R-26+5
R-38	R -49 or R-38+3
R-49	R-38+5
	Steel Joist Ceilings[b]
R-30	R-38 in 2×4 or 2×6 or 2×8 R - 49 in any framing
R-38	R -49 in 2×4 or 2×6 or 2×8 or 2×10
	Steel Framed Wall
R-13	R -13+5 o rR-15+4 or R-21+3 or R-0+10
R-19	R -13+9 or R-19+8 or R-25+7
R-20 or R-21	R-13+10 or R-19+9 or R-25+8
R-20+5	R-13+15 or R-19+14 or R-25+13
	Steel Joist Floor
R-13	R-19 in 2×6; R-19+6 in 2×8 or 2×10
R-19	R-19+6 in 2×6; R-19+12 in 2×8 or 2×10

a. Cavity insulation *R*-value is listed first, followed by continuous insulation *R*-value.
b. Insulation exceeding the height of the framing shall cover the framing.

N1102.4 Air leakage (Mandatory).

N1102.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Sections N1102.4.1.1 and N1102.4.1.2. ~~be durably sealed to limit infiltration.~~ The sealing methods between dissimilar materials shall allow for differential expansion and contraction. ~~The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:~~

~~1. All joints, seams and penetrations.~~
~~2. Site-built windows, doors and skylights.~~
~~3. Openings between window and door assemblies and their respective jambs and framing.~~
~~4. Utility penetrations.~~
~~5. Dropped ceilings or chases adjacent to the thermal envelope.~~
~~6. Knee walls.~~
~~7. Walls and ceilings separating a garage from conditioned spaces.~~
~~8. Behind tubs and showers on exterior walls.~~
~~9. Common walls between dwelling units.~~
~~10. Attic access openings.~~
~~11. Rim joist junction.~~
~~12. Other sources of infiltration.~~

N1102.4.1.1 Installation. The components of the *building thermal envelope* as listed in Table N1102.4.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table N1102.4.1.1, as applicable to the method of construction. Where required by the *code official*, an *approved* party shall inspect all components and verify compliance.

TABLE ~~N1102.4.2.1.1~~ N1102.4.1.1
AIR BARRIER AND INSULATION ~~INSPECTION COMPONENT CRITERIA~~ INSTALLATION

COMPONENT	CRITERIA
Air barrier and thermal barrier	A continuous air barrier shall be installed in the building envelope. ~~Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier.~~ Breaks or joints in the air barrier ~~are filled or repaired~~ shall be sealed. Air permeable insulation ~~is~~ shall not be used as a sealing material. Any ~~A~~air permeable insulation shall be installed ~~is~~ inside of an air barrier.
Ceiling / attic	The air barrier in any dropped ceiling / soffit ~~is substantially~~ shall be aligned with the insulation and any gaps ~~are~~ in the air barrier sealed. ~~Attic access (except unvented attic), knee wall door, or drop down stair is sealed.~~ Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.
Walls	Corners and headers shall be ~~are~~ insulated and the~~.~~ junction of the foundation and sill plate ~~is~~ shall be sealed. The junction of the top plate and top of exterior walls shall be sealed. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier. Knee walls shall be sealed.
Windows, skylights and doors	The space between window/door jambs and framing and skylights and framing ~~is~~ shall be sealed.
Rim joists	Rim joists ~~are~~ shall be insulated and include ~~an~~ the air barrier.
Floors (including above garage and cantilevered floors)	Insulation ~~is~~ shall be installed to maintain permanent contact with underside of subfloor decking. The air barrier ~~is~~ shall be installed at any exposed edge of insulation.
Crawlspace walls	Where provided in lieu of floor insulation, insulation ~~is~~ shall be permanently attached to the crawlspace walls. Exposed earth in unvented crawlspaces ~~is~~ shall be covered with a class I vapor retarder with overlapping joints taped.
Shafts, penetrations	Duct shafts, utility penetrations, ~~knee walls,~~ and flue shafts opening to exterior or unconditioned space ~~are~~ shall be sealed.
Narrow cavities	Batts in narrow cavities ~~are~~ shall be cut to fit, or narrow cavities ~~are~~ shall be filled by ~~spayed/blown~~ insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing ~~is~~ shall be provided between the garage and conditioned spaces.
Recessed lighting	Recessed light fixtures installed in the building thermal envelope ~~are~~ shall be airtight, IC rated, and sealed to the drywall. ~~Exception--fixtures in conditioned space.~~
Plumbing and Wiring	~~Insulation is placed between outside and pipes.~~ Batt insulation ~~is~~ shall be cut neatly to fit around wiring and plumbing in exterior walls, or ~~sprayed/blown~~ insulation that on installation readily conforms to available space shall extend~~s~~ behind piping and wiring.
Shower / tub on exterior wall	Exterior walls adjacent to showers and tubs ~~on exterior walls~~ shall be ~~have~~ insulat~~ion~~ed and ~~an~~ the air barrier installed separating them from the ~~exterior wall~~ showers and tubs.
Electrical / phone box on exterior walls	The air barrier ~~extends~~ shall be installed behind electrical or communication boxes or ~~an~~ air sealed ~~type~~ boxes ~~are~~ shall be installed.
Common wall	An air barrier ~~is~~ shall be installed in the common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building thermal envelope ~~are~~ shall be sealed to the subfloor or drywall.
Fireplace	An air barrier shall be installed on fireplace walls. ~~include an air barrier.~~ Fireplaces shall have gasketed doors.

~~N1102.4.2 Air sealing and insulation.~~ ~~Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section N1102.4.2.1 or N1102.4.2.2.~~

~~N1102.4.2.1 Testing option.~~ ~~Building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 33.5 psf (50 Pa). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.~~

N1102.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding 5 air changes per hour (ACH50) in Climate Zones 1 and 2, and 3 air changes per hour in Climate Zones 3 through 8. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the *code official*, testing shall be conducted by an *approved* party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after rough in and creation of all penetrations of the *building thermal envelope*

Exception: Where heating and cooling equipment meets the requirements of Section N1104, maximum leakage rate shall be seven air changes per hour (ACH50) in Climate Zones 1 and 2 and five air changes per hour in Climate Zones 3 through 8. Additions less than 1000 square feet are exempt from testing. Buildings with more than four dwelling units are exempt from testing.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed~~;~~ beyond the intended weatherstripping or other infiltration control measures;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed, ~~including exhaust, intake, makeup air, backdraft and flue dampers~~ beyond intended infiltration control measures;
3. Interior doors, if installed at the time of test, shall be open;
4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling system(s), if installed at the time of the test, shall be turned off; and
6. ~~HVAC ducts shall not be sealed; and~~
7. ~~6.~~ Supply and return registers, if installed at the time of the test, shall ~~not~~ be ~~sealed~~ fully open.

N1102.4.1.2.1 Sampling. The *code official* shall be permitted to require testing of an approved sample of residences constructed by a specific builder, but not less than 1 in 7 residences. The specific buildings or dwelling units to be tested shall be selected by the *code official*. If any tested building or dwelling unit fails to comply with the maximum air leakage requirement in Section N1102.4.1.2 then all buildings or dwelling units shall be tested until a minimum of three consecutive buildings or dwelling units comply from that specific builder and/or contractor before the *code official* may permit sampling to resume.

~~**N1102.4.2.2 Visual inspection option.** Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table N1102.4.2, applicable to the method of construction, are field verified. Where required by the *code official*, an *approved* party independent from the installer of the insulation shall inspect the air barrier and insulation.~~

N1102.4.3 Fireplaces. New wood-burning fireplaces shall have ~~gasketed doors and~~ outdoor combustion air.

N1103.2.2 Sealing (Mandatory). All ducts, air handlers, and filter boxes ~~and building cavities used as ducts~~ shall be sealed. Joints and seams shall comply with Section M1601.4. Duct tightness shall be verified by either of the following:

1. Postconstruction test: Total leakage ~~to outdoors~~ shall be less than or equal to ~~8~~ 4 cfm (~~226.5~~ 113.3 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* ~~or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*~~ when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.
2. Rough-in test: Total leakage shall be less than or equal to ~~6~~ 4 cfm (~~169.9~~ 113.3 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the ~~roughed in~~ system, including the manufacturer's air handler enclosure. All register ~~boot~~s shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to ~~4~~ 3 cfm (~~113.3~~ 85.0 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*.

   ~~**Exceptions:** Duct tightness test is not required if the air handler and all ducts are located within *conditioned space*.~~

   Exception: Where heating and cooling equipment meets the requirements of Section N1104:

   1. Maximum total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 ft^2 (9.29 m^2) of conditioned floor area for ducts located outside conditioned space, and
   2. The maximum leakage test is not required for ducts and air handlers located entirely within conditioned space.

N1103.2.4 Location (Prescriptive). All ducts and air handlers shall be located within the conditioned space.

Exception: Where heating and cooling equipment meets the requirements of Section N1104.

N1103.4 Service hot water systems. Energy conservation measures for hot water service systems shall be in accordance with Sections 1103.4.1 and 1103.4.2.

N1103.4.1 Circulating hot water systems (Mandatory). ~~All circulating service hot water piping shall be insulated to at least R-2.~~ Circulating hot water systems shall ~~include~~be provided with an automatic or readily accessible manual switch that can turn off the hot water circulating pump when not in use.

N1103.4.2 Hot water pipe insulation (Prescriptive). Insulation for hot water pipe with a minimum thermal resistance (R-value) of at least R-3 shall be applied to the following:

1. Piping larger than 3/4 inch nominal diameter
2. Piping serving more than one dwelling unit
3. Piping from the water heater to kitchen outlets
4. Piping located outside the conditioned space
5. Piping from the water heater to a distribution manifold
6. Piping located under a floor slab
7. Buried piping
8. Supply and return piping in recirculation systems other than demand recirculation systems
9. piping with run lengths greater than the maximum run lengths for the nominal pipe diameter given in Table N1103.4.2.

All remaining piping shall be insulated to at least R-3 or meet the run length requirements of Table N1103.4.2.

TABLE N1103.4.2
MAXIMUM RUN LENGTH (FEET)[1]

Nominal Diameter of Largest Pipe in the Run (in.)	3/8	1/2	3/4	> 3/4
Maximum Run Length (feet)	30	20	10	5

1. Total length of all piping from the distribution manifold or the recirculation loop to a point of use.

N1103.5 Mechanical ventilation (Mandatory). The building shall be provided with ventilation that meets the requirements of Section M1507 of the *International Residential Code* or with other approved means of ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

All combustion equipment in new residences in zones 3 to 8 shall be sealed combustion, induced draft, or power vented.

Exception: Stoves and ovens in kitchens with vents and fireplaces that meet the applicable requirements of Section N11402.

N1104 Improved equipment efficiency alternative. (Prescriptive) For new residences, Sections N1104.1 and N1102.2 shall be permitted as an alternative to certain requirements as specified by exceptions in Sections N1102.4.1.2, N1103.2.2, and N1103.2.4.

N1104.1 Heating equipment. In Climate Zones 3 and 4 gas furnace AFUE shall be at least 90 and EER at least 13. In Climate Zones 5 through 8, gas furnace AFUE shall be at least 92. In Climate Zones 3 through 8, gas boiler, oil boiler, or oil furnace AFUE shall be at least 85. In Climate Zones 3 through 8, heat pump HSPF shall be at least 8.5. Ground source heat pumps shall have a minimum efficiency as specified in Table 503.2.3(2). All-electric heated buildings shall utilize either an air-source or ground source heat pump.

N1104.2 Cooling equipment. In Climate Zones 1 and 2, vapor compression air conditioning SEER shall be at least 16.0 and EER at least 12.5. In Climate Zone 3, vapor compression air conditioning SEER shall be at least 15.0 and EER at least 12.5. In Climate Zones 1 through 3, room air conditioner EER shall be at least 11.0 for air conditioners with capacity less than 20,000 Btu/hr, or 10.0 for capacities equal to or greater than 20,000 Btu/hr. Ground source heat pumps shall have a minimum efficiency as specified in Table 503.2.3(2).

N1104.2.3 Future updates to federal manufacturing standards. If applicable Federal manufacturing standards as specified in 10 CFR 430 are updated to establish new efficiency requirements, equipment efficiency requirements in this section shall be improved by a percentage equivalent to the percentage improvement from the efficiency required

by 10 CFR 430 as of January 1, 2011 to the efficiency required by 10 Code of Federal Regulations 430 at the date of plan check approval.

Exception: AFUEs for furnaces and boilers shall not be required to exceed the higher of 95 or the requirement in 10 CFR 430 at the date of plan check approval.

SECTION ~~N1104~~ N1105
LIGHTING SYSTEMS

~~N1104.~~1 N1105.1 Lighting equipment. A minimum of ~~50~~ seventy-five percent of the lamps in permanently installed lighting fixtures shall be high efficacy lamps or a minimum of seventy-five percent of the permanently installed lighting fixtures shall contain only high efficacy lamps.

Exception: Low-voltage lighting.

Reason: This proposal is a key part of increasing the I-code energy efficiency to at least 30% over the 2006 IECC. This proposal includes a number of efficiency upgrades, as well as editorial improvements. These changes have been discussed among a variety of stakeholders and have been improved by that discussion.

Improved heating and cooling equipment efficiency is largest single savings in this proposal. To be consistent with Federal law this proposal allows increased building enclosure air tightness with increased duct tightness as an alternative to higher equipment efficiency.

To its credit the Department of Energy (DOE) actively participated in, encouraged and at times lead the discussion that preceded most parts of this proposal. This proposal is very similar to the DOE proposal. To make it easier to compare the proposals, the only four differences between this proposal and the DOE proposal are noted at the end of this reason statement.

The main changes are as follows, ordered by section-

Where available, tested air tightness results are added to the residence's energy certificate. (Sections 401.3, N1101.9- Certificate.**)**

This proposal includes several upgrades to the building enclose to reduce heat loss and heat gain. (See Tables 402.1.1, 402.1.3, N1102.1, and N1102.1.2.) The U-factor measures conductive heat flow, so a lower U-factors mean less heat flow. Looking at the U-factors already in the code shows that the windows are easily the highest U-factor and therefore the highest heat loss. This proposal reduces window and skylight U-factors in most climate zones. Thermally the weakest part of the opaque building enclose is the walls, as is shown by comparing the wall U-factors to the ceiling and floor U-factors. In this proposal frame wall U-factors are reduced (R-values are increased) in the northern and middle climate zones where heating is most important. These lower wall U-factors could represent a number of construction alternatives; insulated sheathing that covers the framing, ICFs, SIPs, or double wall construction. In a few places the IRC and IECC differ based on changes approved in the last code cycle; therefore the IECC and IRC are made consistent in this proposal by adopting IECC R-values and SHGC into the IRC tables. (Tables 402.1.1, 402.1.3, N1102.1, N1102.1.2.)

R-value equivalences for steel framing in walls are added. (Table 402.2.5, N1102.2.5.)

The redundant listing of items to be air sealed is deleted and the inspection "checklist" table for the air barrier and insulation installation is clarified with a large number of mostly editorial changes. (Sections 402.4.1, N1102.4.1- Building thermal envelope; Tables 402.4.1.1, N1102.4.1.1.)

The allowed air leakage through the building enclosure (infiltration) is reduced significantly. Alternately the allowed air leakage is only moderately reduced if high efficiency heating and cooling equipment is used. Instead of allowing a visual inspection as an alternative to air tightness testing, the proposed code requires both a visual inspection and air tightness testing. Requirements for the testing are clarified. Testing of a sample of the homes, rather than all homes, is allowed if the code official chooses. (Sections 402.4.1.2 N1102.4.1.2 Testing.)

The allowed duct leakage is reduced significantly. Alternately the allowed duct leakage is only moderately reduced or ducts are indoors, provided the residence uses high efficiency heating and cooling equipment. (Sections 403.2.2, N1103.2.2- Sealing.)

New requirements are added for efficient distribution of service hot water. Insulation is required on the hot water pipes that are the most actively used (larger trunk lines, kitchen, …) or in locations with high heat loss (outside conditioned space, in slab, …). Less used pipes must either be insulated or the piping to the water using fixtures must be "short and skinny". Short and skinny pipes mean less heat is lost by "stranded hot water" which usually cools in the piping between periods of use. Because piping is shorter and skinnier, the piping will probably be less expensive. Because less water is moved to provide hot water at the points of water use, the wait time for hot water is also reduced; thereby, providing better service to the home's occupant. (Demand recirculation definition, Sections 403.4, N1103.4- Service hot water systems.)

Ventilation is improved to maintain indoor air quality. Ventilation specified in Section M1507 of the *International Residential Code* is required. Due to the tighter building enclosures combustion equipment is limited to sealed-combustion, induced draft, or power-vented. Some combustion equipment relies on a natural draft, the tendency for warm air to rise up a chimney to vent the combustion products. More efficient equipment sends much less heat up the chimney, weakening the natural draft. The combination of a weaker natural draft and the tighter building enclosure proposed here can lead to back drafting, therefore combustion equipment is required to be sealed combustion, induced draft, or power vented. (Sections 403.5 and N1103.5- Mechanical ventilation.)

High efficiency heating and cooling equipment is specified for new residences. Greater heating equipment efficiency is specified in the climates with larger heating loads. Condensing gas furnaces are required in the north and middle zones. Due to the problem with condensing oil equipment, there is a lesser requirement for oil furnaces. Higher efficiency heat pumps are required. Higher efficiency cooling equipment is specified in the south. Higher efficiency cooling equipment is required for both central and room air conditioners. An adjustment is added for possible increases in Federally required equipment efficiency. (Sections 404, N1104- Improved equipment efficiency alternative; Sections 402.4.1.2 and N1102.4.1.2- Testing; Table 405.5.2(1).)

The minimum fraction of lighting required to be energy efficient (compact fluorescent or equivalent) is increased to 75%. An option for compliance based on either fixtures or bulbs is added to accommodate multi-bulb chandler-type fixtures. (Sections 405.1 and N1105.1- Lighting equipment.)

The base case building enclosure air leakage and duct leakage rates in the performance calculation are adjusted to be consistent with the new minimum leakage rates in this code change. (Table 405.5.2(1).)

The are only four differences between this proposal and DOE's similar proposal:

1) Residences with more than four dwelling units are exempted from the building enclosure air tightness testing. Testing large residential structures for overall air tightness is not practical. These large residential buildings must still comply with the inspection list on air barriers and insulation installation (Sections 402.4.1.2 and N402.4.1.2; Tables 402.4.1.1, N1102.4.1.1)

2) The language allowing the code official to approve testing a sample of a builder's residences rather than every residence was simplified. This still requires air leakage testing, but removes the impractical record keeping related to groups of homes, the similarities between the houses and the confusing 120-day period in DOE's change. (Sections 402.4.1.2.1 and N1102.4.1.2- Sampling.)
3) The required air conditioning efficiency in the most southern zones (zones 1 and 2) is 16 SEER with a 13 EER, as opposed to a 12.5 EER in DOE's proposal. The higher EER matches the EER specified in the current tax credit for energy efficient equipment and Consortium for Energy Efficiency's (CEE) Tier III. A higher EER means better equipment performance during electric utility peak loads on the hottest days. (Sections 404.2, N1104.2)
4) Fossil fueled combustion must be sealed combustion, induced draft, or power vented. Combustion equipment that relies on a natural draft utilizes the wasted heat to get warm air to rise up a chimney. More efficient equipment sends much less heat up the chimney, weakening the natural draft. The combination of a weaker natural draft and the tighter building enclosure proposed here can lead to back drafting, therefore combustion equipment is required to be sealed combustion, induced draft, or power vented to avoid indoor air quality problems. (Sections 403.5 and N1103.5- Mechanical ventilation.)

Approval of this code change will greatly increase the energy efficiency of the I-codes and move significantly towards the goal of an energy code that is at least 30% more energy efficient.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CONNER-EC-10-202-401.2 - R202-N1101.9.DOC

EC20–09/10
401.2

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

Revise as follows:

401.2 Compliance. Projects shall comply with Sections 401, 402.4, 402.5, and 403.1, 403.2.2, 403.2.3, ~~and~~ 403.3 through 403.9 (referred to as the mandatory provisions), <u>and 404.1</u> and either:

1. Sections 402.1 through 402.3, <u>and</u> 403.2.1 ~~and 404.1 (prescriptive)~~; or
2. Section 405 (performance).

Reason: This proposal is intended to add in the mandatory requirements that can be approved for the IECC in this cycle. This proposal is a placeholder to allow the committee to add all sections, and includes the lighting section 404.1 as a mandatory section.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-4-401.2

EC21–09/10
401.2.2 (New); IRC N1101.2.2 (New)

Proponent: Ken Sagan, representing National Association of Home Builders (NAHB)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Add new text as follows:

401.2.2 Compliance testing. Where testing is required to determine air leakage of duct systems, the code official shall be permitted to require random sample testing of no fewer than one in seven homes.

PART II – IRC BUILDING/ENERGY

Add new text as follows:

N1101.2.2 Compliance testing. Where testing is required to determine air leakage of duct systems, the code official shall be permitted to require random sample testing of no fewer than one in seven homes.

Reason: The EPA Energy Star program, an above code program, only requires duct testing on 1 out of every 7 homes because EPA recognizes that once a trained installer understands how to seal a duct they continue to do it correctly on subsequent homes.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SAGAN-EC-8-401.2.2-RE-2-N1101.2.2

EC22–09/10
401.3; IRC N1101.9

Proponent: Ronald Majette, representing US Department of Energy

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

401.3 Certificate. A permanent certificate shall be completed and posted on or in the electrical distribution panel by the builder or registered design professional. The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. ~~The certificate shall be completed by the builder or registered design professional.~~ The certificate shall list the predominant *R*-values of insulation installed in or on ceiling/roof, walls, foundation (slab, *basement wall*, crawlspace wall and/or floor) and ducts outside conditioned spaces; *U*-factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration, and the results from any duct system and building envelope air leakage testing . Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be *listed* for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1101.9 Certificate. A permanent certificate shall be completed and posted on or in the electrical distribution panel by the builder or registered design professional. The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. ~~The certificate shall be completed by the builder or registered design professional.~~ The certificate shall list the predominant *R*-values of insulation installed in or on

ceiling/roof, walls, foundation (slab, *basement wall*, crawlspace wall and/or floor) and ducts outside conditioned spaces; *U*-factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration, and the results from any duct system and building envelope air leakage testing . Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be *listed* for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.

Reason: For clarification and to include the results for any duct or infiltration testing, both of which are important to documenting the specifications as built and documenting compliance with the code.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-63-401.3-N1101.9-

EC23–09/10
401.3; IRC N1101.9

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

401.3 Certificate. A permanent certificate shall be posted on or in the electrical distribution panel. The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certificate shall be completed and signed by the builder or registered design professional and shall constitute such individual's certification of the information contained on the certificate. The certificate shall list:

1. The ~~predominant~~ location and R-values of insulation installed in or on the ceiling/roof, walls, foundation (slab, *basement wall*, crawlspace wall and/or floor), pipes and ducts inside and outside of conditioned space~~s~~*;*
2. The U-factors ~~for fenestration~~ and the solar heat gain coefficient (SHGC) of fenestration. Where there is more than one value for each component, the certificate shall either list the individual values with associated square footage or the weighted-average value; ~~covering the largest area.~~
3. The tested air leakage and the tested duct leakage where required for compliance;
4. The types and listed wattage for all lamps in permanently installed locations where required for compliance; and
5. ~~The certificate shall list~~ the types, capacities and efficiencies of heating, cooling and service water heating and any related equipment, including fan motor horsepower, controls, mechanical ventilation, economizer or energy recovery ventilation equipment, dehumidification, or pumping equipment. ~~Where a gas-fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace," or "baseboard electric heater" as appropriate. An efficiency shall not be *listed* for gas-fired unvented room heaters, electric furnaces, or electric baseboard heaters.~~

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1101.9 Certificate. A permanent certificate shall be posted on or in the electrical distribution panel. The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certificate shall be completed and signed by the builder or registered *design professional* and shall constitute such individual's certification of the information contained on the certificate. The certificate shall list:

1. The ~~predominant~~ location and R-values of insulation installed in or on the ceiling/roof, walls, foundation (slab, *basement wall*, crawlspace wall and/or floor), pipes and ducts inside and outside of *conditioned spaces~~;~~*
2. *T*he U-factors ~~for fenestration~~ and the solar heat gain coefficient (SHGC) of fenestration. Where there is more than one value for each component, the certificate shall either list the individual values with associated square footage or the weighted-average value~~; covering the largest area.~~
3. The tested air leakage and the tested duct leakage where required for compliance;
4. The types and listed wattage for all lamps in permanently installed locations where required for compliance; and
5. ~~The certificate shall list~~ the types, capacities and efficiencies of heating, cooling and service water heating and any related *equipment*, including fan motor horsepower, controls, mechanical ventilation, economizer or energy recovery ventilation equipment, dehumidification, or pumping equipment. ~~Where a gas-fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace," or "baseboard electric heater" as appropriate. An efficiency shall not be *listed* for gas-fired unvented room heaters, electric furnaces, or electric baseboard heaters.~~

Reason: The purpose of this proposal is to update the certificate requirements to include recent requirements added to the code and potential new requirements and also to improve the clarity of required information on the certificate. The proposal is also intended to require the certificate to be signed by the responsible party as a certification of the accuracy of the information on the certificate.

Two new sections have been added, including:

1. Testing for air leakage and ducts
2. Lighting

In addition, the section on heating, cooling and service water heating is proposed to be expanded to include various other equipment that are already required as information on construction documents in this section to increase consistency in the information that code officials and builders are using.

Finally, the last two lines were deleted to ensure that any equipment is reported consistently in the heating, cooling and service water heating section of this section.

These proposed modifications to this section are reasonable and will improve the usability and accuracy of the currently required certificate.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-5-401.3-N1101.9

EC24–09/10
401.3

Proponent: Guy Tomberlin, Fairfax County, VA, representing the VA Plumbing and Mechanical Inspectors/VA Building and Code Officials

Delete without substitution:

~~**401.3 Certificate.** A permanent certificate shall be posted on or in the electrical distribution panel. The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certificate shall be completed by the builder or registered design professional. The certificate shall list the predominant~~

~~*R*-values of insulation installed in or on ceiling/roof, walls, foundation (slab, *basement wall*, crawlspace wall and/or floor) and ducts outside conditioned spaces; *U* factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be *listed* for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.~~

Reason: This section requires a certificate be placed on the electrical panel stating certain energy related building components such as R-values, U-factors etc… Unfortunately this is nothing more than a good idea with no energy conserving benefit what so ever. This information is no more useful than if the builder were required to place a label on the panel stating the joist size, framing wall sizes, etc or the type of plumbing and electrical fixtures. Yes it's nice to know but does it lend itself in anyway to increased energy conservation or enhanced building safety, no. In fact it will be create problems throughout the life of the building. For example what if the owner changes some components with out the benefit of permits and inspections, then sells the building and the next owner comes in years later to make adjustments and finds that the building is not what the certificate says it was? It may be better, what then? What does the code official do when the label contains the wrong information? Do they reject occupancy from someone moving into their new home? Lets face it when a building component needs to be replaced it is almost always financial economics and market availability that drives the decision on replacement items, not a certificate that was posted years prior. The certificate is completely useless for any and all practical purpose. In fact, it could easily cause a chaotic exercise that builders would have to deal with in the 11th hour. Finial inspections and occupancy are being withheld because this label may have not been posted. Lets not endorse rules and practice just because they are good ideas lets stay with the long standing fundamentals that the code is a minimum standard set in place to assure safety and uphold the concepts of energy conservation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-EC-1-401.3

EC25–09/10

101.3, 202, 402.4.1, 402.4.2, 402.4.2.1, 402.4.2.2, 402.4.2.3 (New), 403.2.1, 403.2.2, 403.2.3, 403.4, 403.4.1 (New), 403.4.2 (New), 403.4.3 (New), 403.11 (New), Tables 402.1.1, 402.1.3, 402.2.5, 402.4.2, 405.5.2(1); IRC R202, N1102.4.1, N1102.4.2, N1102.4.2.1, N1102.4.2.2, N1102.4.2.3, N1103.2.1, N1103.2.2, N1103.2.3, N1103.4, N1103.4.1(New), N1103.4.2 (New), N1103.4.3 (New), N1103.10 (New), Table N1102.1, N1102.1.2, N1102.2.5, N1102.4.2

Proponent: Bill Fay, representing Energy Efficient Coalition

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise as follows:

101.3 Intent. This code shall regulate the design and construction of buildings for the effective use and conservation of energy over the useful life of each building. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this objective. ~~the effective use of energy.~~ This code is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.

SECTION 202
GENERAL DEFINITIONS

ENERGY RECOVERY VENTILATION SYSTEM. Systems that employ air-to-air heat exchangers to recover energy from exhaust air for the purpose of preheating, precooling, humidifying or dehumidifying outdoor ventilation air prior to supplying the air to a space, either directly or as part of an HVAC system. Such systems include equipment referred to as an "energy recovery ventilator" (ERV) or as a "heat recovery ventilator" (HRV).

2. Add new text as follows:

SECTION 202
GENERAL DEFINITIONS

SPECIFIC LEAKAGE AREA (SLA). The air leakage area (L) per conditioned floor area (CFA) of a home (L/CFA), where leakage area (L) is defined in accordance with section 5.1 of ASHRAE 119 and where L and CFA are in the same units.

3. Revise as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

Climate Zone	Fenestration U-Factor	Glazed Fenestration SHGC[b,e]	Ceiling R-Value	Wood Frame Wall R-Value[h]	Mass Wall R-Value[i]	Basement[c] Wall R-Value	Crawl Space[c] Wall R-Value
1	NR ~~1.20~~	~~0.30~~ 0.25	30	13	3/4	0	0
2	0.40 ~~0.65~~ [j]	~~0.30~~ 0.25	~~30~~ 38	13	4/6	0	0
3	0.35 ~~0.50~~ [j]	~~0.30~~ 0.25	~~30~~ 38	~~13~~ 20 or 13+5	~~5/8~~ 8/13	5/13[f]	5/13
4 except Marine	0.35	NR	~~38~~ 49	~~13~~ 20 or 13+5	~~5/10~~ 8/13	10/13	10/13
5 and Marine 4	0.32 ~~0.35~~	NR	~~38~~ 49	20 or 13+5[h]	13/17	15/19 ~~10/13~~	15/19 ~~10/13~~
6	0.32 ~~0.35~~	NR	49	20+5 or 13+10~~5~~[h]	15/~~19~~20	15/19	15/19 ~~10/13~~
7 and 8	0.32 ~~0.35~~	NR	49	20+5 or 13+10~~-21~~	19/21	15/19	15/19 ~~10/13~~

~~j. For impact rated fenestration complying with Section 301.2.1.2 of the *International Residential Code* or Section 1608.1.2 of the *International Building Code*, the maximum U-factor shall be 0.75 in Zone 2 and 0.65 in Zone 3.~~

(Portions of table and notes not shown remain unchanged)

TABLE 402.1.3
EQUIVALENT U-FACTORS[a]

Climate Zone	Fenestration U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Basement Wall U-Factor[d]	Crawl Space Wall U-Factor[c]
1	0.50 ~~1.20~~	0.035	0.082	0.197	0.360	0.477
2	0.40 ~~0.65~~	~~0.035~~ 0.030	0.082	0.165	0.360	0.477
3	0.35 ~~0.50~~	~~0.035~~ 0.030	~~0.082~~ 0.057	~~0.141~~ 0.098	0.091[c]	0.136
4 except Marine	0.35	~~0.030~~ 0.026	~~0.082~~ 0.057	~~0.141~~ 0.098	0.059	0.065
5 and Marine 4	0.32 ~~0.35~~	~~0.030~~ 0.026	0.057	0.082	0.050 ~~0.059~~	0.055 ~~0.065~~
6	0.32 ~~0.35~~	0.026	0.048~~57~~	0.060	0.050	0.055 ~~0.065~~
7 and 8	0.32 ~~0.35~~	0.026	0.048~~57~~	0.057	0.050	0.055 ~~0.065~~

(Portions of table and notes not shown remain unchanged)

TABLE 402.2.5
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION
(R-VALUE)

Wood Frame R-Value Requirement	Cold-Formed Steel Equivalent R-Value[a]
Steel-Framed Wall	
R-13	R-13+5 or R-15+4 or R-21+3 or R-0+10
R-19	R-13+9 or R-19+8 or R-25+7
R-20	R-13+10 or R-19+8 or R-25+7
R-21	R-13+10 or R-19+9 or R-25+8
R-20+5	R-13+15 or R-19+14 or R-25+13

(Portions of table and notes not shown remain unchanged)

402.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Section 402.4.2 and be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:

1. All joints, seams and penetrations.
2. Site-built windows, doors and skylights.
3. Openings between window and door assemblies and their respective jambs and framing.
4. Utility penetrations.
5. Dropped ceilings or chases adjacent to the thermal envelope.
6. Knee walls.
7. Walls and ceilings separating a garage from conditioned spaces.
8. Behind tubs and showers on exterior walls.
9. Common walls between dwelling units.
10. Attic access openings.
11. Rim joist junction.
12. Other sources of infiltration.

402.4.2 Air sealing and insulation. The components of the *building thermal envelope* as listed in Table 402.4.2 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table 402.4.2, as applicable to the method of construction. Building envelope air tightness and insulation installation shall be demonstrated to comply with ~~one of~~ the ~~following options given~~ requirements established by Section 402.4.2.1 ~~or~~ and 402.4.2.2:

402.4.2.1 Performance testing requirement ~~option~~. The building shall meet the air leakage standard set forth below as demonstrated by an air leakage test conducted as specified below:

1. Building envelope tightness ~~and insulation installation~~ shall be ~~considered acceptable when~~ tested by a party *approved* by the code official. Where required by the code official, the *approved* party shall be independent from both the builder and any other entity responsible for installing the insulation and air barrier and otherwise sealing the building. A written report specifying the results of the test and attesting to the accuracy of the results shall be signed by the party conducting the testing and provided to the builder and *code official*.
2. The building shall be required to have an air leakage ~~is~~ less than 0.00030 *specific leakage area (SLA)* ~~seven air changes per hour (ACH)~~ when tested with a blower door at a pressure of 33.5 psf (50 Pa). Testing shall occur any time after rough in and after (i) installation of all penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation, and combustion appliances, and (ii) completion of sealing of the *building thermal envelope* as required in section 402.4.1.
3. During testing:

    1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed beyond the weather-stripping, caulking and other intended permanent air infiltration control measures;
    2. Dampers shall be closed, but not sealed, including exhaust, intake, makeup air, backdraft, fireplace and flue dampers beyond intended permanent air infiltration control measures;
    3. Interior doors connecting conditioned spaces shall be open, doors connecting to unconditioned spaces closed but not sealed;
    4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;

5. Heating and cooling system(s) shall be turned off;
6. ~~HVAC ducts systems shall not be sealed; and~~
7. ~~7.~~ Supply and return registers shall be fully open at the time of the test ~~not be sealed~~.

Exception: Multi-family residential buildings, with more than four dwelling units per building, may be individually exempted from the testing requirement only when meeting all of the following requirements:

1. The exemption is approved by the *code official* after inspection of the sealing of thermal envelope in accordance with Section 402.4.1 and Table 402.4.2;
2. At least 15% of the units are tested to have an air leakage less than 0.00036 *specific leakage area (SLA)* when tested with a blower door at a pressure of 33.5 psf (50 Pa), with the units to be tested specified by the code official; and
3. The tests demonstrate compliance for such units.

When any tested dwelling unit subject to this exception fails to meet the maximum air leakage requirement stated in Section 402.4.2.1, then the builder must resolve any leakage problems so that such unit passes the test and then must continue to test each additional dwelling unit in such building until a minimum of three consecutive dwelling units pass the test before the builder can return to testing as specified in Item 2 of this exception.

402.4.2.2 Visual insulation inspection ~~option~~ (Mandatory). Building envelope ~~tightness and~~ insulation installation shall be ~~considered acceptable when the items listed in Table 402.4.2, applicable to the method of construction, are~~ field verified to meet the Insulation Installation Criteria in Table 402.4.2. Where required by the *code official*, an *approved* party independent from the builder and the installer of the insulation, shall inspect the ~~air barrier and~~ insulation; in such case, a written inspection report, including a checklist demonstrating compliance shall be provided to the *code official* and builder before interior finish materials are applied.

402.4.2.3 Visual air barrier inspection. For any building or dwelling unit not required to be tested under section 402.4.2.1, building envelope tightness shall be field verified to meet the Air Barrier Criteria in Table 402.4.2. Where required by the *code official*, an *approved* party independent from the builder and the installer of any air barrier materials, shall inspect the air barrier; in such case, a written inspection report, including a checklist demonstrating compliance shall be provided to the *code official* and builder before interior finish materials are applied. In cases where the building or dwelling unit satisfies the testing requirement of section 402.4.2.1, the *code official* may also require field verification to show that the building meets the Air Barrier Criteria if deemed necessary.

4. Delete Table 402.4.2 and replace with the following table:

~~TABLE 402.4.2~~
~~AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA~~
TABLE 402.4.2
VISUAL AIR BARRIER AND INSULATION INSPECTION

COMPONENT	INSULATION INSTALLATION CRITERIA	AIR BARRIER CRITERIA
General Requirements	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier.	A continuous air barrier is installed in the thermal envelope. Breaks or joints in the air barrier are sealed. Air permeable insulation is not used as a sealing material.
Ceiling / attic	In any dropped ceiling/soffit, the insulation is substantially aligned with the air barrier.	Air barrier in any dropped ceiling / soffit is substantially aligned with insulation and any gaps are sealed. Attic access, knee wall door or drop down stair to unconditioned attic is sealed.
Walls	All corners and headers are insulated. Insulation is in substantial contact and continuous alignment with air barrier.	Junction of foundation and sill plate is sealed. Junction of exterior wall and top plate is sealed. Junction of the exterior wall and floor sheathing is sealed. Knee wall is sealed.
Fenestration		Space between fenestration jambs and framing is sealed.
Rim joists	Rim joists are insulated.	Air barrier is installed at the rim joist.
Floors (including above garage	Insulation is installed to maintain permanent contact	Air barrier is installed at any exposed edge of

COMPONENT	INSULATION INSTALLATION CRITERIA	AIR BARRIER CRITERIA
and cantilevered floors)	with underside of subfloor decking.	insulation.
Crawl space walls	Insulation is permanently attached to walls.	Exposed earth in unvented crawlspaces is covered with Class I vapor retarder with overlapping joints taped.
Shafts, penetrations		Duct shafts, utility penetrations, knee walls, and flue shafts opening to exterior or unconditioned space are sealed.
Narrow cavities	Batts in narrow cavities are cut to fit; narrow cavities are filled by sprayed/blown insulation.	
Garage separation		Air sealing is provided between the garage and conditioned spaces.
Recessed lighting		Recessed light fixtures installed in the building thermal envelope are airtight, IC rated, and sealed to drywall.
Plumbing and Wiring	Insulation is placed between the exterior of the wall assembly and pipes. Batt insulation is cut and fitted around wiring and plumbing, or sprayed/blown insulation extends between piping and wiring and to the exterior of the wall assembly.	All plumbing and wiring penetrations shall be sealed to the air barrier.
Shower / tub on exterior wall	Exterior walls adjacent to showers and tubs have insulation filling any gaps or voids between tub or shower walls and unconditioned space.	Exterior walls adjacent to showers and tubs have an air barrier separating the exterior wall from the shower and tubs.
Electrical / phone box on exterior walls	Insulation completely fills voids between the box and exterior sheathing	Air barrier extends behind boxes or air sealed type boxes are installed.
Common wall		Air barrier is installed in common wall between dwelling units.
HVAC register boots		HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.
Fireplace		Air barrier is installed on fireplace walls. Fireplace shall have gasketed doors.

5. Revise as follows:

403.2.1 Insulation (Prescriptive). Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.

Exception: Where all ducts ~~or portions thereof~~ are located completely within *conditioned space* ~~inside the *building thermal envelope*~~, supply ducts shall be insulated to a minimum of R-4.

403.2.2 Sealing (Mandatory). All ducts, air handlers, and filter boxes~~, and building cavities used as ducts~~ shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the *International Residential Code* or Section 603.9 of the *International Mechanical Code,* as applicable.

Duct tightness shall be verified by a test performed by a party *approved* by the *code official* after construction is completed. Where required by the code official, testing shall be conducted by an approved party independent from the builder and the installer of the ducts. ~~either of the following:~~ A written report specifying the results of the test and attesting to the accuracy of the results shall be signed by the party conducting the testing and provided to the builder and the *code official*.

1. ~~Post-construction test: L~~ As tested, total duct l~~L~~eakage ~~to outdoors~~ shall be less than ~~or equal to 8 cfm (226.5 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* or a total leakage less than~~ or equal to 6 ~~12~~ cfm (226.5~~12~~ L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.
2. ~~Rough-in test: Total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm (113.3 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*.~~

Exceptions~~:~~ ~~Duct tightness test is not required if~~ Where the air handler and all ducts are located within conditioned space, total duct leakage shall not exceed 12 cfm per 100 ft^2 of conditioned floor area when tested as specified above.

403.2.3 Building cavities (Mandatory). Building framing cavities shall not be used as ~~supply~~ ducts.

403.4 Service water heating (Mandatory). Service hot water piping shall be installed in accordance with Sections 403.4.1 through 403.4.3.

403.4.1 Pipe length and Insulation. Service hot water piping shall be no more than a total of 60 linear feet of pipe length to all fixtures being served by one service water heating unit. All service hot water piping shall be insulated to at least R-3 for pipes sized 1" in diameter or less and R-4 for pipes larger than 1" in diameter for the distance between the service water heating equipment to within 5 feet of each fixture connected to the hot water pipe and the first 5 feet of hot and cold water pipes from the storage tank for non-recirculating service water heating systems.

Exception: Hot water distribution systems that are not located below ground or in a mass floor or mass wall in contact with the ground and that supply hot water from one of the following sources:

1. Condensing gas service water heating equipment,
2. Solar thermal water heating equipment that is designed to provide more than 50% of annual hot water requirements from solar heated water,
3. Heat pump electric service water heating equipment,
4. Tankless demand service gas water heating equipment, or
5. Tankless demand service electric heating equipment, where either: (a) heated water is provided through piping that is insulated to R-3 or (b) there is no more than a total of 15 linear feet of pipe length to all fixtures being served by each unit.

403.4.2 Circulating hot water systems ~~(Mandatory)~~. All circulating service hot water piping shall be insulated to at least R-3~~2~~ for pipes sized 1" in diameter or less and R-4 for pipes larger than 1" in diameter. Circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not in use.

403.4.3 Heat Traps. Water heating equipment not supplied with integral heat traps and serving non-circulating systems shall be provided with heat traps on the supply and discharge piping associated with the equipment.

6. Add new text as follows:

403.11 *Energy Recovery Ventilation System* and Air leakage supplemental requirements. The building shall meet the following the requirements:

1. An *energy recovery ventilation system* shall be installed. For warm humid counties as identified in table 301.1, a dehumidifier with a built in humidistat shall be installed in addition to the *energy recovery ventilation system*.
2. Building air leakage shall be tested in accordance with the procedure prescribed in Section 402.4.2.1, except that the air leakage shall not exceed 0.00015 *specific leakage area (SLA)* for all buildings except multifamily, which shall not exceed 0.00018 *specific leakage area (SLA),* when tested with a blower door at a pressure of 33.5 psf (50 Pa) by an approved party independent of the builder and any contractors involved in any aspect of sealing the building.

Exceptions:

1. Buildings located in climate zones 1 or 2 with installed cooling equipment with an efficiency that exceeds prevailing federal minimum standards by at least 20% and meets or exceeds 12.5 EER.
2. Buildings located in climate zones 3, 4 or 5 with installed heating and cooling equipment with an efficiency that exceeds prevailing federal minimum standards by at least 15% and cooling equipment that meets or exceeds 12.5 EER.
3. Buildings located in climate zones 6, 7 or 8 with installed heating equipment with an efficiency that exceeds prevailing federal minimum standards by at least 20%.
4. In the event the heating or cooling equipment specified in the exception applicable to a particular climate zone above is not available in the market, the equipment with the highest rated efficiency commercially available can be substituted, when *approved* by the *code official*,

5. As an alternative to the heating equipment specified in Exceptions 2 and 3 above, a ground source heat pump with an efficiency of greater than or equal to 2.8 COP and 13 EER may be installed.

6. Revise as follows:

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Air Exchange Rate	*Specific leakage area (SLA)* = 0.0001536 ~~assuming no energy recovery.~~ with a 70% efficient *energy recovery ventilation system*. Exceptions: 1. For multifamily buildings, the specific leakage area shall be 0.00018 with a 70% efficient *energy recovery ventilation system*. 2. For buildings subject to the exceptions in section 403.11, SLA = 0.00030, assuming no energy recovery.	~~For residences that are not tested, the same as the standard reference design.~~ *Specific Leakage Area (SLA)* = the tested value for the proposed home and the tested value shall be in determined accordance with the methodology set out in section 402.4.2.1 and the ASHRAE 119, Section 5.1 and the SLA shall be: 1. For residences without mechanical ventilation ~~that are tested in accordance with ASHRAE 119, Section 5.1,~~ the measured air exchange rate[e] but not less than 0.35 ACH. 2. For residences with mechanical ventilation that is not an *energy recovery ventilation system* ~~that are tested in accordance with ASHRAE 119, Section 5.1,~~ the measured air exchange rate[e] combined with the mechanical ventilation rate, *f* which shall not be less than 0.01 x *CFA* + 7.5 x (N_{br} + 1) where: *CFA* = conditioned floor area N_{br} = number of bedrooms 3. For residences with *energy recovery ventilation systems*, the efficiency of the energy or heat recovery ventilation system shall be as proposed.

(Portions of table and notes not shown remain unchanged)

~~d. Where leakage area (L) is defined in accordance with Section 5.1 of ASHRAE 119 and where:~~
~~SLA = L/CFA~~

~~where L and CFA are in the same units.~~

PART II – IRC BUILDING/ENERGY

1. Add new text as follows:

SECTION R202
GENERAL DEFINITIONS

ENERGY RECOVERY VENTILATION SYSTEM. Systems that employ air-to-air heat exchangers to recover energy from exhaust air for the purpose of preheating, precooling, humidifying or dehumidifying outdoor ventilation air prior to supplying the air to a space, either directly or as part of an HVAC system. Such systems include equipment referred to as an "energy recovery ventilator" (ERV) or as a "heat recovery ventilator" (HRV).

SPECIFIC LEAKAGE AREA (SLA). The air leakage area (L) per conditioned floor area (CFA) of a home (L/CFA), where leakage area (L) is defined in accordance with Section 5.1 of ASHRAE 119 and where L and CFA are in the same units.

2. Revise as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

Climate Zone	Fenestration U-Factor	Glazed Fenestration SHGC[b,e]	Ceiling R-Value	Wood Frame Wall R-Value[h]	Mass Wall R-Value[i]	Basement [c] Wall R-Value	Crawl Space [c] Wall R-Value
1	NR ~~1.20~~	~~0.30~~ 0.25[j]	30	13	3/4	0	0
2	0.40 ~~0.65~~ [j]	~~0.30~~ 0.25[j]	~~30~~ 38	13	4/6	0	0
3	0.35 ~~0.50~~ [j]	~~0.30~~ 0.25 [e,j]	~~30~~ 38	~~13~~ 20 or 13+5	~~5/8~~ 8/13	5/13[f]	5/13
4 except Marine	0.35	NR	~~38~~ 49	~~13~~ 20 or 13+5	~~5/10~~ 8/13	10/13	10/13
5 and Marine 4	0.32 ~~0.35~~	NR	~~38~~ 49	20 or 13+5[h]	13/17	15/19 ~~10/13~~	15/19 ~~10/13~~
6	0.32 ~~0.35~~	NR	49	20+5 or 13+10~~5~~[h]	15/~~19~~20	15/19 ~~10/13~~	15/19 ~~10/13~~
7 and 8	0.32 ~~0.35~~	NR	49	20+5 or 13+10 ~~21~~	19/21	15/19 ~~10/13~~	15/19 ~~10/13~~

~~i. For impact-rated fenestration complying with Section R301.2.1.2, the maximum U-factor shall be 0.75 in Zone 2 and 0.65 in Zone 3.~~
~~j. For impact-resistant fenestration complying with Section R301.2.1.2 of the *International Residential Code*, the maximum SHGC shall be 0.40.~~

(Portions of table and notes not shown remain unchanged)

TABLE N1102.1.2
EQUIVALENT U-FACTORS[a]

Climate Zone	Fenestration U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Basement Wall U-Factor [d]	Crawl Space Wall U-Factor [c]
1	0.50 ~~1.20~~	0.035	0.082	0.197	0.360	0.477
2	0.40 ~~0.65~~ [i]	~~0.035~~ 0.030	0.082	0.165	0.360	0.477
3	0.35 ~~0.50~~ [i]	~~0.035~~ 0.030	0.082	~~0.141~~ 0.098	0.091[c]	0.136
4 except Marine	0.35	~~0.030~~ 0.026	0.082	~~0.141~~ 0.098	0.059	0.065
5 and Marine 4	0.32 ~~0.35~~	~~0.030~~ 0.026	0.060	0.082	0.050 ~~0.059~~	0.055 ~~0.065~~
6	0.32 ~~0.35~~	0.026	0.04860	0.060	0.050 ~~0.059~~	0.055 ~~0.065~~
7 and 8	0.32 ~~0.35~~	0.026	0.04857	0.057	0.050 ~~0.059~~	0.055 ~~0.065~~

(Portions of table and notes not shown remain unchanged)

TABLE N1102.2.5
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION (R-VALUE)

Wood Frame R-Value Requirement	Cold-Formed Steel Equivalent R-Value[a]
Steel-Framed Wall	
R-13	R-13+5 or R-15+4 or R-21+3 or R-0+10
R-19	R-13+9 or R-19+8 or R-25+7
R-20	R-13+10 or R-19+8 or R-25+7
R-21	R-13+10 or R-19+9 or R-25+8
R-20+5	R-13+15 or R-19+14 or R-25+13

(Portions of table and notes not shown remain unchanged)

N1102.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Section N1102.4.2 and be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material.

1. All joints, seams and penetrations.
2. Site-built windows, doors and skylights.
3. Openings between window and door assemblies and their respective jambs and framing.
4. Utility penetrations.
5. Dropped ceilings or chases adjacent to the thermal envelope.
6. Knee walls.
7. Walls and ceilings separating the garage from conditioned spaces.
8. Behind tubs and showers on exterior walls.
9. Common walls between dwelling units.
10. Attic access openings.
11. Rim joist junction.
12. Other sources of infiltration.

N1102.4.2 Air sealing and insulation. The components of the *building thermal envelope* as listed in Table N1102.4.2 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table N1102.4.2, as applicable to the method of construction. Building envelope air tightness and insulation installation shall be demonstrated to comply with ~~one of~~ the ~~following options given~~ requirements established by Section N1102.4.2.1 ~~or~~ and N1102.4.2.2.

N1102.4.2.1 Performance testing requirement ~~option~~. The building shall meet the air leakage standard set forth below as demonstrated by an air leakage test conducted as specified below:

1. Building envelope tightness shall be tested by a party *approved* by the code official. Where required by the code official, the *approved* party shall be independent from both the builder and any other entity responsible for installing the insulation and air barrier and otherwise sealing the building. A written report specifying the results of the test and attesting to the accuracy of the results shall be signed by the party conducting the testing and provided to the builder and *code official*.
2. ~~Tested~~ The building shall be required to have an air leakage ~~is~~ less than 0.00030 *specific leakage area (SLA)* ~~7 ACH~~ when tested with a blower door at a pressure of 33.5 psf (50 Pa) ~~pascals (0.007 psi)~~. Testing shall occur any time after rough in and after (i) installation of all penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation, and combustion appliances, and (ii) completion of sealing of the *building thermal envelope* as required in section N1102.4.1.
3. During testing:
    1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed beyond the weather-stripping, caulking and other intended permanent air infiltration control measures;
    2. Dampers shall be closed, but not sealed, including exhaust, intake, makeup air, backdraft, fireplace and flue dampers beyond intended permanent air infiltration control measures;
    3. Interior doors connecting conditioned spaces shall be open, doors connecting to unconditioned spaces closed but not sealed;
    4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
    5. Heating and cooling system(s) shall be turned off;
    6. ~~HVAC ducts systems shall not be sealed; and~~
    7. ~~7.~~ Supply and return registers shall be fully open at the time of the test ~~not be sealed~~.

Exception: Multi-family residential buildings, with more than four dwelling units per building, may be individually exempted from the testing requirement only when meeting all of the following requirements:

1. The exemption is approved by the *code official* after inspection of the sealing of thermal envelope in accordance with section N1102.4.1 and Table N1102.4.2;
2. At least 15% of the units are tested to have an air leakage less than 0.00036 *specific leakage area (SLA)* when tested with a blower door at a pressure of 33.5 psf (50 Pa), with the units to be tested specified by the code official; and
3. The tests demonstrate compliance for such units.

When any tested dwelling unit subject to this exception fails to meet the maximum air leakage requirement stated in Section N1102.4.2.1, then the builder must resolve any leakage problems so that such unit passes the test and then must continue to test each additional dwelling unit in such building until a minimum of three consecutive dwelling units pass the test before the builder can return to testing as specified in Item 2 of this Exception.

N1102.4.2.2 Visual insulation inspection ~~option~~. ~~The items listed in Table N1102.4.2, applicable to the method of~~

~~construction, are~~ Building envelope insulation installation shall be field verified to meet the Insulation Installation Criteria in Table N1102.4.2. Where required by the code official, an *approved* party independent from the builder and the installer of the insulation, shall inspect the ~~air barrier and~~ insulation; in such case, a written inspection report, including a checklist demonstrating compliance shall be provided to the *code official* and builder before interior finish materials are applied.

N1102.4.2.3 Visual air barrier inspection. For any building or dwelling unit not required to be tested under section N1102.4.2.1, building envelope tightness shall be field verified to meet the Air Barrier Criteria in Table N1102.4.2. Where required by the *code official*, an *approved* party independent from the builder and the installer of any air barrier materials, shall inspect the air barrier; in such case, a written inspection report, including a checklist demonstrating compliance shall be provided to the *code official* and builder before interior finish materials are applied. In cases where the building or dwelling unit satisfies the testing requirement of section N1102.4.2.1, the *code official* may also require field verification to show that the building meets the Air Barrier Criteria if deemed necessary.

3. Delete Table N1102.4.2 and replace with the following table:

~~**TABLE N1102.4.2**~~
~~**AIR BARRIER AND INSULATION INSPECTION**~~

TABLE N1102.4.2
VISUAL AIR BARRIER AND INSULATION INSPECTION

COMPONENT	INSULATION INSTALLATION CRITERIA	AIR BARRIER CRITERIA
General Requirements	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier.	A continuous air barrier is installed in the thermal envelope. Breaks or joints in the air barrier are sealed. Air permeable insulation is not used as a sealing material.
Ceiling / attic	In any dropped ceiling/soffit, the insulation is substantially aligned with the air barrier.	Air barrier in any dropped ceiling / soffit is substantially aligned with insulation and any gaps are sealed. Attic access, knee wall door or drop down stair to unconditioned attic is sealed.
Walls	All corners and headers are insulated. Insulation is in substantial contact and continuous alignment with air barrier.	Junction of foundation and sill plate is sealed. Junction of exterior wall and top plate is sealed. Junction of the exterior wall and floor sheathing is sealed. Knee wall is sealed.
Fenestration		Space between fenestration jambs and framing is sealed.
Rim joists	Rim joists are insulated.	Air barrier is installed at the rim joist.
Floors (including above garage and cantilevered floors)	Insulation is installed to maintain permanent contact with underside of subfloor decking.	Air barrier is installed at any exposed edge of insulation.
Crawl space walls	Insulation is permanently attached to walls.	Exposed earth in unvented crawlspaces is covered with Class I vapor retarder with overlapping joints taped.
Shafts, penetrations		Duct shafts, utility penetrations, knee walls, and flue shafts opening to exterior or unconditioned space are sealed.
Narrow cavities	Batts in narrow cavities are cut to fit; narrow cavities are filled by sprayed/blown insulation.	

COMPONENT	INSULATION INSTALLATION CRITERIA	AIR BARRIER CRITERIA
Garage separation		Air sealing is provided between the garage and conditioned spaces.
Recessed lighting		Recessed light fixtures installed in the building thermal envelope are airtight, IC rated, and sealed to drywall.
Plumbing and Wiring	Insulation is placed between the exterior of the wall assembly and pipes. Batt insulation is cut and fitted around wiring and plumbing, or sprayed/blown insulation extends between piping and wiring and to the exterior of the wall assembly.	All plumbing and wiring penetrations shall be sealed to the air barrier.
Shower / tub on exterior wall	Exterior walls adjacent to showers and tubs have insulation filling any gaps or voids between tub or shower walls and unconditioned space.	Exterior walls adjacent to showers and tubs have an air barrier separating the exterior wall from the shower and tubs.
Electrical / phone box on exterior walls	Insulation completely fills voids between the box and exterior sheathing	Air barrier extends behind boxes or air sealed type boxes are installed.
Common wall		Air barrier is installed in common wall between dwelling units.
HVAC register boots		HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.
Fireplace		Air barrier is installed on fireplace walls. Fireplace shall have gasketed doors.

4. Revise as follows:

N1103.2.1 Insulation. Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.

Exception: Where all ~~D~~ducts ~~or portions thereof~~ are located completely within *conditioned space* ~~inside the building thermal envelope~~, supply ducts shall be insulated to a minimum of R-4.

N1103.2.2 Sealing. All ducts, air handlers, and filter boxes~~, and building cavities used as ducts~~ shall be sealed. Joints and seams shall comply with Section M1601.4 of the *International Residential Code.*

Duct tightness shall be verified by a test performed by a party *approved* by the *code official* after construction is completed. Where required by the code official, testing shall be conducted by an approved party independent from the builder and the installer of the ducts. ~~either of the following:~~ A written report specifying the results of the test and attesting to the accuracy of the results shall be signed by the party conducting the testing and provided to the builder and the *code official*.

1. ~~Post-construction test: L~~ As tested, total duct l~~L~~eakage ~~to outdoors~~ shall be less than ~~or equal to 8 cfm (3.78 L/S) per 100 ft^2 (9.29 m^2) of conditioned floor area or a total leakage less than~~ or equal to 6 ~~12~~ cfm (226.5 L/min ~~5.66 L/S~~) per 100 ft^2 (9.29 m^2) of *conditioned floor area* when tested at a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler ~~end closure~~ enclosure. All register boots shall be taped or otherwise sealed during the test.
2. ~~Rough-in test: Total leakage shall be less than or equal to 6 cfm (2.83 L/S) per 100 ft^2 (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm (1.89 L/S) per 100 ft^2 (9.29 m^2) of conditioned floor area.~~

Exceptions: ~~Duct tightness test is not required if~~ Where the air handler and all ducts are located within conditioned space, total duct leakage shall not exceed 12 cfm per 100 ft^2 of conditioned floor area when tested as specified above.

N1103.2.3 Building cavities. Building framing cavities shall not be used as ~~supply~~ ducts.

N1103.4 Service water heating. Service hot water piping shall be installed in accordance with Sections 403.4.1 through 403.4.3.

N1103.4.1 Pipe length and Insulation. Service hot water piping shall be no more than a total of 60 linear feet of pipe length to all fixtures being served by one service water heating unit. All service hot water piping shall be insulated to at least R-3 for pipes sized 1" in diameter or less and R-4 for pipes larger than 1" in diameter for the distance between the service water heating equipment to within 5 feet of each fixture connected to the hot water pipe. In addition, the first 5 feet of hot and cold water pipes from the storage tank for non-recirculating service water heating systems shall be insulated to at least R-3 for pipes sized 1" in diameter or less and R-4 for pipes larger than 1" in diameter.

Exception: Hot water distribution systems that supply hot water from one of the following sources (this exception does not apply to portions of hot water distribution systems located below ground or in a mass floor or mass wall in contact with the ground):

1. Condensing gas service water heating equipment,
2. Solar thermal water heating equipment that is designed to provide more than 50% of annual hot water requirements from solar heated water,
3. Heat pump electric service water heating equipment,
4. Tankless demand service gas water heating equipment, or
5. Tankless demand service electric heating equipment, where either: (a) heated water is provided through piping that is insulated to R-3 or (b) there is no more than a total of 15 linear feet of pipe length to all fixtures being served by each unit.

N1103.4.2 Circulating hot water systems. All circulating service hot water piping shall be insulated to at least R-3~~2~~ for pipes sized 1" in diameter or less and R-4 for pipes larger than 1" in diameter. Circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not in use.

N1103.4.3 Heat Traps. Water heating equipment not supplied with integral heat traps and serving non-circulating systems shall be provided with heat traps on the supply and discharge piping associated with the equipment.

5. Add new text as follows:

N1103.10 *Energy Recovery Ventilation System* and air leakage supplemental requirements. The building shall meet the following the requirements:

1. An *energy recovery ventilation system* shall be installed. For warm humid counties as identified in table N1101.2, a dehumidifier with a built in humidistat shall be installed in addition to the *energy recovery ventilation system*.
2. Building air leakage shall be tested in accordance with the procedure prescribed in Section N1102.4.2.1, except that the air leakage shall not exceed 0.00015 *specific leakage area (SLA)* for all buildings except multifamily, which shall not exceed 0.00018 *specific leakage area (SLA),* when tested with a blower door at a pressure of 33.5 psf (50 Pa) by an *approved* party independent of the builder and any contractors involved in any aspect of sealing the building.

   Exceptions:

   1. Buildings located in climate zones 1 or 2 with installed cooling equipment with an efficiency that exceeds prevailing federal minimum standards by at least 20% and meets or exceeds 12.5 EER.
   2. Buildings located in climate zones 3, 4 or 5 with installed heating and cooling equipment with an efficiency that exceeds prevailing federal minimum standards by at least 15% and cooling equipment that meets or exceeds 12.5 EER.
   3. Buildings located in climate zones 6, 7 or 8 with installed heating equipment with an efficiency that exceeds prevailing federal minimum standards by at least 20%.
   4. In the event the heating or cooling equipment specified in the exception applicable to a particular climate zone above is not commercially available, the equipment with the highest rated efficiency commercially available can be substituted, when *approved* by the *code official*,
   5. As an alternative to the heating equipment specified in Exceptions 2 and 3 above, a ground source heat pump with an efficiency of greater than or equal to 2.8 COP and 13 EER may be installed.

Reason: At the 2009 Final Action Hearings, a majority of voting code officials supported proposals to substantially boost energy efficiency of the 2009 IECC's energy efficiency over its 2006 counterpart (including over 60% who voted for the Energy Efficient Codes Coalition's EC14, also known as "The 30% Solution"). Even though some of those votes fell short of the 2/3 majority needed for adoption, the final version of IECC 2009 will boost efficiency by more than 10% *(http://www.thirtypercentsolution.org/solution/EECC-Savings_Analysis-Jan-2009.pdf).*

This comprehensive proposal builds on the momentum ICC's members set in Minneapolis last year, while simultaneously responding to profound events that are shining a national spotlight on energy codes, the role buildings play in national energy use and the impact both can have on national energy policy.

Specifically, this **Core Package Proposal** was developed by the Energy Efficient Codes Coalition (EECC) to support the ICC (and its I-Code process) in reaching the energy savings targets proposed by many (including DOE) and being considered by Congress in several pending bills. Our proposal incorporates currently available technologies that are being included in new home construction every day and is designed to make the code as simple and clear as possible (to avoid undue burdens on code officials) and to be consistent with current federal law regarding efficient equipment covered by federal standards. Some of the major energy-saving improvements captured in this comprehensive package include:

(1) Improved envelope measures including better fenestration and insulation in most climate zones;
(2) Comprehensive air sealing, testing, and insulation inspection;
(3) Improved sealing and testing requirements for ducts;
(4) Requirements for efficient hot water service distribution system or equipment; and
(5) Requirements for reduced envelope infiltration along with energy recovery ventilation, or else more efficient HVAC equipment.

The elements of this and other individual EECC proposals have been reviewed by energy efficiency experts, building scientists and many others, and improved based on their comments. Individual EECC supporters are also submitting each element of this package, along with a number of other proposals, in the form of individual proposals to strengthen energy efficiency in both the *IECC* and *IRC.* The detailed reasons supporting the individual elements of this proposal can be found in these individual proposals, which are incorporated by reference into this reason statement.

We estimate that this Core Package Proposal will result in a 2012 IECC that is at least 20% more energy efficient than the 2009 IECC (and more than 30% more efficient than the 2006 IECC). Taken together with the efficiency gains in the 2009 IECC, adoption of this proposal by the full ICC will produce a 2012 IECC that comfortably exceeds Congress' initial 30% savings target (compared with IECC 2006) and puts the ICC on the path to the next target of 50% savings.

EECC is submitting this proposal to both the *IRC* and the *IECC*, in order to assure consistency between the two codes. However, EECC believes that America needs a single model energy code, the IECC (the only I-Code recognized in federal statutes)**. For this reason,** EECC is also submitting a separate proposal that would incorporate the IECC by reference in the IRC Chapter 11 (as is currently done with the International Building Code IBC).

Since September of 2008, three events have occurred that could transform the ICC's residential model energy code:

The US Conference of Mayors and other elected officials charged with establishing and implementing national, state and local energy policies have begun to recognize the profound impact that the model energy codes can have on achieving local, regional, and national goals for sustainable economic growth, and have endorsed the concept of a 30% improvement in model energy codes. Several city and state governments have adopted their own policies to achieve at least 30% efficiency improvements in new buildings.

Congress has also jumped into the energy code arena with legislative carrots and sticks designed to speed the rate of energy efficiency improvements in the I-Code and their adoption by state and local jurisdictions. First, Congress linked billions of dollars in stimulus funds to each state's adoption of the 2009 IECC (or equivalent), followed by the introduction of legislation that sets targets of 30%, then 50% and beyond, for ICC to meet or exceed. The proposed legislation also authorizes hundreds of millions of federal dollars for code development bodies and state and local governments for adoption, implementation and compliance with codes that meet these goals. Finally, the ICC's new schedule for I-Code development reduces the number of opportunities to meet these targets being considered in Congress to once in each three-year code cycle.

As the growing national interest in the ICC and its model energy code attests, our nation's energy policy is in a period of transition. As states scramble to meet increasing peak energy demands and to curb pollution and greenhouse gases, there has been an increased focus on energy efficiency at all levels of government and the private sector. Federal and state governments recognize that energy efficiency is the most cost-effective means of meeting increasing energy demand. The time has come to complete the transition to at least a 30% more efficient residential energy code before 2012, and this proposal will help to bring that about.

The Energy Efficient Codes Coalition (website: www.thirtypercentsolution.org) was established to boost the energy efficiency of the IECC, and its supporters include all forms of electric utilities, low-income homeowner groups, a wide-range of regional and national energy efficiency and environmental organizations, many levels of government, business and labor coalitions, and as well as many of the typical participants in the ICC process.

Cost Impact: This proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FAY-EC-1-101

EC26–09/10

202, 202 (New), 402, 405.2, 502, Table 502.1.2, Table 502.2(1)-(2), Table 502.3, Chapter 6; IRC R202, R202 (New), N1101, N1102, N1103.2.1, Table N1102.4.2

Proponent: Joseph Lstiburek, Building Science Corporation

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise as follows:

AIR BARRIER. Material(s) assembled and joined together to provide a barrier to air leakage through the building ~~envelope~~ enclosure. An air barrier may be a single material or a combination of materials.

BUILDING THERMAL ~~ENVELOPE~~ BARRIER. The basement walls, slab, exterior walls, floor, roof, and any other building element that enclose conditioned space. This boundary also includes the boundary between conditioned space and any exempt or unconditioned space.

2. Add new definitions as follows:

AIR-IMPERMEABLE. A material or assembly having an air permeance equal to or less than 0.02 L/s-m^2 at 75 Pa pressure differential tested according to ASTM E 2178 or ASTM E 283.

AIR-PERMEABLE. A material or assembly having an air permeance greater than 0.02 L/s-m^2 at 75 Pa pressure differential tested according to ASTM E 2178 or ASTM E 283.

BUILDING ENCLOSURE. A system or assembly of components that provides environmental separation between the conditioned space and the exterior environment.

3. Revise as follows:

SECTION 402
BUILDING THERMAL ~~ENVELOPE~~ BARRIER

402.1.1 Insulation and fenestration criteria. The building thermal ~~envelope~~ barrier shall meet the requirements of Table 402.1.1 based on the climate zone specified in Chapter 3.

402.1.4. Total UA alternative. If the total building thermal ~~envelope~~ barrier UA (sum of U-factor times assembly area) is less than or equal to the total UA resulting from the U-factors in Table 402.1.3 (multiplied by the same assembly area as in the proposed building), the building shall be considered in compliance with Table 402.1.1. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The SHGC requirements shall be met in addition to UA compliance.

402.2.6 Floors. Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of the subfloor decking or in contact with the topside of sheathing or insulating sheathing installed on the underside of floor framing.

402.2.11 Thermally isolated sunroom insulation. The minimum ceiling insulation R-values shall be R-19 in Zones 1 through 4 and R-24 in Zones 5 through 8. The minimum wall R-values shall be R-13 in all zones. New wall(s) separating a sunroom from conditioned space shall meet the building thermal ~~envelope~~ barrier requirements.

402.2.3.5 Thermally isolated sunroom U-factor. For Zones 4 through 8, the maximum fenestration U-factor shall be 0.50 and the maximum skylight U-factor shall be 0.75. New windows and doors separating the sunroom from conditioned space shall meet the building thermal ~~envelope~~ boundary requirements.

402.4.1 Building ~~thermal envelope~~ enclosure. The building ~~thermal envelope~~ enclosure shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction.

The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:

402.4.2 Air sealing and insulation. Building ~~envelope~~ enclosure air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2.

402.4.2.1 Testing option. Building ~~envelope~~ enclosure tightness and insulation installation shall be considered acceptable when tested air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 33.5 psf (50 Pa). Testing shall occur after rough in and after installation of penetrations of the building ~~envelope~~ enclosure, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.

402.4.2.2 Visual inspection option. Building ~~envelope~~ enclosure tightness and insulation installation shall be considered acceptable when the items listed in Table 402.4.2, applicable to the method of construction, are field verified. Where required by the code official, an approved party independent from the installer of the insulation shall inspect the air barrier and insulation.

402.4.5 Recessed lighting. Recessed luminaries installed in the building thermal ~~envelope~~ barrier shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaries shall be IC-rated and labeled as meeting ASTM E 283 when tested a 1.57 psf (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity. All recessed luminaries shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.

403.2.1 Insulation (Prescriptive). Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.

Exception: Ducts or portions thereof located completely inside the building thermal ~~envelope~~ barrier.

TABLE 402.4.2
AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

COMPONENT	CRITERIA
Air barrier and thermal barrier	~~Exterior thermal envelope~~ Cavity insulation for framed walls is installed in substantial contact and continuous alignment with ~~building envelope air barrier~~ exterior sheathing or with the interior sheathing or gypsum board. Breaks or joints in the air barrier are filled or repaired. Air-permeable insulation is not used as a sealing material. Air-permeable insulation is inside of an air barrier.
Floors (including above-garage and cantilevered floors)	~~Insulation~~ Floor framing cavity insulation is installed to maintain permanent contact with underside of subfloor decking or in contact with the topside of sheathing or insulating sheathing installed on the underside of floor framing. Air barrier is installed at any exposed edge of insulation.

(Portions of table not shown remain unchanged)

405.2 Mandatory requirements. Compliance with this section requires that the mandatory provisions identified in Section 401.2 be met. All supply and return ducts not completely inside the building thermal ~~envelope~~ barrier shall be insulated to a minimum of R-6.

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS
(Portions of table and footnotes not shown remain unchanged)

b. For residences with conditioned basements, R-2 and R-4 residences and townhouses, the following formula shall be used to determine glazing area:

$AF = As \times FA \times F$

where:

AF = Total glazing area.
As = Standard reference design total glazing area.
FA = (Above-grade thermal ~~boundary~~ barrier gross wall area)/(above-grade ~~boundary~~ barrier wall area + 0.5 × below-grade ~~boundary~~ barrier wall area).
F = (Above-grade thermal ~~boundary~~ barrier wall area)/(above-grade thermal ~~boundary~~ barrier wall area + common wall area) or 0.56, whichever is greater.

and where:

Thermal ~~boundary~~ barrier wall is any wall that separates conditioned space from unconditioned space or ambient conditions.
Above-grade thermal ~~boundary~~ barrier wall is any thermal boundary wall component not in contact with soil.
Below-grade ~~boundary~~ barrier wall is any thermal boundary wall in soil contact.
Common wall area is the area of walls shared with an adjoining dwelling unit.

e. Tested ~~envelope~~ enclosure leakage shall be determined and documented by an independent party approved by the code official. Hourly calculations as specified in the 2001 ASHRAE Handbook of Fundamentals, Chapter 26, page 26.21, Equation 40 (Sherman-Grimsrud model) or the equivalent shall be used to determine the energy loads from infiltration.

SECTION 502
BUILDING ~~ENVELOPE~~ ENCLOSURE REQUIREMENTS

502.1.1 Insulation and fenestration criteria. The building thermal ~~envelope~~ barrier shall meet the requirements of Tables 502.2(1) and 502.3 based on the climate zone specified in Chapter 3. Commercial buildings or portions of commercial buildings enclosing Group R occupancies shall use the R-values from the "Group R" column of Table 502.2 (1). Commercial buildings or portions of commercial buildings enclosing occupancies other than Group R shall use the R-values from the "All other" column of Table 502.2(1). Buildings with a vertical fenestration area or skylight area that exceeds that allowed in Table 502.3 shall comply with the building ~~envelope~~ enclosure provisions of ASHRAE/IESNA 90.1.

Section 502.4.3 Sealing of the building ~~envelope~~ enclosure. Openings and penetrations in the building ~~envelope~~ enclosure shall be sealed with caulking materials or closed with gasketing systems compatible with the construction materials and location. Joints and seams shall be sealed in the same manner or covered with an air-impermeable ~~moisture vapor-permeable~~ wrapping material. Sealing materials spanning joints between construction materials shall allow for expansion and contraction of the construction materials.

Section 502.4.8 Recessed lighting. Recessed luminaires installed in the building thermal ~~envelope~~ boundary shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and labeled as meeting ASTM E 283 when tested at 1.57 psf (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity. All recessed luminaires shall be sealed with a gasket or caulk between the housing and interior wall or ceiling covering.

TABLE 502.1.2
BUILDING ~~ENVELOPE~~ ENCLOSURE REQUIREMENTS OPAQUE ELEMENT, MAXIMUM U-FACTORS
(No change to table contents)

TABLE 502.2(1)
BUILDING ~~ENVELOPE~~ ENCLOSURE REQUIREMENTS - OPAQUE ASSEMBLIES
(No change to table contents)

TABLE 502.2(2)
BUILDING ~~ENVELOPE~~ ENCLOSURE REQUIREMENTS - OPAQUE ASSEMBLIES
(No change to table contents)

TABLE 502.3
BUILDING ~~ENVELOPE~~ ENCLOSURE REQUIREMENTS: FENESTRATION
(No change to table contents)

4. Add new standard to Chapter 6 as follows:

ASTM
E 2178 – 03 Standard Test Method for Air Permeance of Building Materials

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

AIR BARRIER. Material(s) assembled and joined together to provide a barrier to air leakage through the building ~~envelope~~ enclosure. An air barrier may be a single material or a combination of materials.

BUILDING THERMAL ~~ENVELOPE~~ BARRIER. The basement walls, slab, exterior walls, floor, roof, and any other building element that enclose conditioned space. This boundary also includes the boundary between conditioned space and any exempt or unconditioned space.

2. Add new definitions as follows:

AIR-PERMEABLE. A material or assembly having an air permeance greater than 0.02 L/s-m^2 at 75 Pa pressure differential tested according to ASTM E 2178 or ASTM E 283.

BUILDING ENCLOSURE. A system or assembly of components that provides environmental separation between the conditioned space and the exterior environment.

3. Revise as follows:

N1101.1 Scope. This chapter regulates the energy efficiency for the design and construction of buildings regulated by this code.

Exception: Portions of the building ~~envelope~~ that do not enclose conditioned space.

N1101.4 Building thermal ~~Envelope~~ barrier. An R-value identification mark shall be applied by the manufacturer to each piece of building thermal ~~envelope~~ barrier insulation 12 inches 9305 mm) or more wide. Alternatively, the insulation installers shall provide a certification listing the type, manufacturer and R-value of insulation installed in each element of the building thermal ~~envelope~~ barrier. For blown or sprayed insulation (fiberglass and cellulose), the initial installed thickness, settled thickness, settled R-value, installed density, coverage area and number of bags installed shall be listed on the certification. For sprayed polyurethane foam (SPF) insulation, the installed thickness of area covered and R-value of installed thickness shall be listed on the certificate. The insulation installer shall sign, date and post the certificate in a conspicuous location on the job site.

N1101.7.1 Protection of exposed foundation insulation. Insulation applied to the exterior of basement walls, crawl space walls, and the perimeter of slab-on-grade floors shall have a rigid, opaque and ~~weather~~ water resistant protective covering to prevent the degradation of the insulation's thermal performance. The protective covering shall cover the exposed exterior insulation and extend a minimum of 6 inches (152 mm) below grade.

SECTION N1102
BUILDING THERMAL ~~ENVELOPE~~ BARRIER

N1102.1 Insulation and fenestration criteria. The building thermal ~~envelope~~ barrier shall meet the requirements of Table N1102.1 based on the climate zone specified in Table N1101.2.

N1102.1.3 Total UA alternative. If the total building thermal ~~envelope~~ barrier UA (sum of U-factor times assembly area) is less than or equal to the total UA resulting from the U-factors in Table N1102.1.2, (multiplied by the same assembly area as in the proposed building), the building shall be considered in compliance with Table N1102.1. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The SHGC requirements shall be met in addition to UA compliance.

N1102.2.6 Floors. Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of the subfloor decking or in contact with the topside of sheathing or insulating sheathing installed on the underside of floor framing.

N1102.2.11 Thermally isolated sunroom insulation. The minimum ceiling insulation R-values shall be R-19 in Zones 1 through 4 and R-24 in Zones 5 through 8. The minimum wall R-values shall be R-13 in all zones. New wall(s) separating a sunroom from conditioned space shall meet the building thermal ~~envelope~~ barrier requirements.

N1102.3.5 Thermally isolated sunroom U-factor. For Zones 4 through 8, the maximum fenestration U-factor shall be 0.50 and the maximum skylight U-factor shall be 0.75. New windows and doors separating the sunroom from conditioned space shall meet the building thermal ~~envelope~~ boundary requirements.

N1102.4.1 Building ~~thermal envelope~~ enclosure. The building ~~thermal envelope~~ enclosure shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:

N1102.4.2 Air sealing and insulation. Building ~~envelope~~ enclosure air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section N1102.4.2.1 or N1102.4.2.2.

N1102.4.2.1 Testing option. Building ~~envelope~~ enclosure tightness and insulation installation shall be considered acceptable when tested air leakage is less than 7 air changes per hour (ACH) when tested with a blower door at a pressure of 50 Pa (0.007 psi). Testing shall occur after rough in and after installation of penetrations of the building ~~envelope~~ enclosure, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.

N1102.4.5 Recessed lighting. Recessed luminaries installed in the building thermal ~~envelope~~ barrier shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaries shall be IC-rated and labeled as meeting ASTM E 283 when tested a 1.57 psf (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity. All recessed luminaries shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.

N1103.2.1 Insulation. Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.

Exception: Ducts or portions thereof located completely inside the building thermal ~~envelope~~ barrier.

TABLE N1102.4.2
AIR BARRIER AND INSULATION INSPECTION

COMPONENT	CRITERIA
Air barrier and thermal barrier	~~Exterior thermal envelope~~ Cavity insulation for framed walls is installed in substantial contact and continuous alignment with ~~building envelope air barrier~~ exterior sheathing or with the interior sheathing or gypsum board. Breaks or joints in the air barrier are filled or repaired. Air-permeable insulation is not used as a sealing material.
Floors (including above-garage and cantilevered floors)	~~Insulation~~ Floor framing cavity insulation is installed to maintain permanent contact with underside of subfloor decking or in contact with the topside of sheathing or insulating sheathing installed on the underside of floor framing. Air barrier is installed at any exposed edge of insulation.

(Portions of table not shown remain unchanged)

Reason: The current language of the building code is inconsistent with terms in the engineering, scientific, technical, educational, building science and "common use" communities. In fact terms and language within the code itself are inconsistently used. "Codespeak" makes it difficult to communicate appropriate requirements and concepts. The I-Codes are likely the most effective educational documents used in the construction industry. It behooves us to use the language in them correctly. If you don't call "things" by their proper names how can you expect users of the documents to execute the actions correctly? The changes proposed in this code change do not change the intent of the sections – they only fix bad physics and bad terms and language. For example one of the worst terms every coined in "codespeak" is "building thermal envelope". No one outside of the coderoom uses that phrase. The correct term is "thermal barrier". Thermal barrier is in fact used correctly in Table 402.4.2 and Table N1102.4.2 but is not used consistently throughout the code. This code change fixes that. Another example, Federal Express uses "envelopes", architects and engineers and builders should use the word "enclosure". And another example, the phrase "air-permeable" is used but not defined. Air-impermeable is defined in the IRC but not in the IECC. Finally, some of the physics is just plane wrong - such as requiring insulation in floors to be in direct contact with the underfloor sheathing. Yes, this is one option, but a better one in cold climates is to have an airspace between the floor sheathing and the top of the cavity insulation as this leads to a warmer floor - yet does not change the heat loss as long as the cavity insulation is in direct contact with a sheathing below it. Isn't physics neat? Also, how do you deal with rigid insulation boards on the underside of insulated floors? This language fixes that.

The current language in Section 502.4.3 is a big error in the governing physics – the air sealing materials do not necessarily have to be vapor permeable. Many air barrier materials are vapor impermeable and are used regularly such as fully adhered membranes or liquid and trowelled

applied membranes applied/installed over paperless gypsum sheathing that are covered with exterior insulating sheathing boards. This language fixes that.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: ASTM E 283-04 and ASTM E 2178-03 are currently referenced in the IRC.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: LSTIBUREK-EC-1-202-402-IRC-R202-N1101.1

EC27–09/10

Tables 402.1.1, 402.1.3 and 402.2.5; IRC Tables N1102.1, N1102.1.2 and N1102.2.5

Proponent: Ronald Majette, representing US Department of Energy

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	GLAZED FENESTRATION SHGC	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[i]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
1	~~1.20~~ NR	0.75	0.30	30	13	3 / 4	13	0	0	0
2	~~0.65~~ 0.50 j	0.65 ~~0.75~~	0.30	30	13	4 / 6	13	0	0	0
3	~~0.50~~ 0.40[j]	0.55 ~~0.65~~	0.30[e]	~~30~~38	13	5 / 8	19	5/13[f]	0	5 / 13
4 except Marine	0.35	0.55 ~~0.60~~	NR	38	~~13~~ 20 or 13+5g[h]	~~5 / 10~~ 8 / 13	19	10 / 13	10, 2 ft	10/13
5 and Marine 4	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	~~38~~49	20 or 13+5[h]	13 / 17	30[g]	10/13	10,2ft	10/13
6	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	49	20~~+5~~ or 13~~+5~~ 10[h]	15 / ~~19~~ 20	30[g]	15/19	10,4ft	10/13
7 and 8	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	49	~~21~~ 20+5 or 13+10[h]	19 / 21	38[g]	15/19	10,4ft	10/13

For SI: 1 foot = 304.8 mm.

a. *R*-values are minimums. *U*-factors and SHGC are maximums. R-19 batts compressed into a nominal 2x6 framing cavity such that the R-value is reduced by R-1 or more shall be marked with the compressed batt R-value in addition to the full thickness R-value.
b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
c. 15/19" means R-15 continuous ~~insulated sheathing~~ insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous ~~insulated sheathing~~ insulation on the interior or exterior of the home. "10/13" means R-10 continuous ~~insulated sheathing~~ insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.
d. R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 ft, whichever is less, in zones 1 through 3 for heated slabs.
e. There are no SHGC requirements in the Marine zone.
f. Basement wall insulation is not required in warm-humid locations as defined by Figure 301.1 and Table 301.1.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. First value is cavity insulation, second is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required in the locations where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.
i. The second R-value applies when more than half the insulation is on the interior of the mass wall.
j. For impact rated fenestration in wind-borne debris regions ~~complying with Section R301.2.1.2 of the IRC or Section 1608.1.2 of the IBC~~, the maximum U-factor shall be 0.75 in Zone 2 and 0.65 in Zone 3.

TABLE 402.1.3
EQUIVALENT *U*-FACTORS[a]

CLIMATE ZONE	FENES-TRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	CEILING *U*-FACTOR	FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
1	~~1.20~~ 0.65	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	~~0.65~~ 0.50	~~0.75~~ 0.65	0.035	0.082	0.165	0.064	0.360	0.477
3	~~0.50~~ 0.40	~~0.65~~ 0.55	~~0.035~~0.030	0.082	0.141	0.047	0.091[c]	0.136
4 except Marine	0.35	~~0.60~~ 0.55	0.030	~~0.082~~ 0.057	~~0.141~~ 0.098	0.047	0.059	0.065
5 and Marine 4	~~0.35~~ 0.32	~~0.60~~ 0.55	~~0.030~~0.026	0.057	0.082	0.033	0.059	0.065
6	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	~~0.057~~ 0.048	0.060	0.033	0.050	0.065
7 and 8	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	~~0.057~~ 0.048	0.057	0.028	0.050	0.065

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.
b. When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in Climate Zone 1, 0.14 in Climate Zone 2, 0.12 in Climate Zone 3, 0.10 in Climate Zone 4 except Marine, 0.087 in zone 5 and Marine 4, and the same as the frame wall U-factor in Marine zone 4 and zones 5 through 8.
c. Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure 301.1 and Table 301.2.

TABLE 402.2.5
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION
(*R*-VALUE)

WOOD FRAME *R*-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT *R*-VALUE[a]
	Steel Truss Ceilings[b]
R-30	R -38 or R-30+3 or R-26+5
R-38	R -49 or R-38+3
R-49	R-38+5
	Steel Joist Ceilings[b]
R-30	R-38 in 2×4 or 2×6 or 2×8 R - 49 in any framing
R-38	R -49 in 2×4 or 2×6 or 2×8 or 2×10
	Steel Framed Wall
R-13	R -13+5 o rR-15+4 or R-21+3 or R-0+10
R-19	R -13+9 or R-19+8 or R-25+7
R-20 or R-21	R-13+10 or R-19+9 or R-25+8
R-20+5	R-13+15 or R-19+14 or R-25+13
	Steel Joist Floor
R-13	R-19 in 2×6; R-19+6 in 2×8 or 2×10
R-19	R-19+6 in 2×6; R-19+12 in 2×8 or 2×10

a. Cavity insulation *R*-value is listed first, followed by continuous insulation *R*-value.
b. Insulation exceeding the height of the framing shall cover the framing.

PART II – IRC BUILDING/ENERGY

Revise as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	GLAZED FENESTRATION SHGC	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[k]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
1	~~1.20~~ NR	0.75	0.30 0.35[j]	30	13	3 / 4	13	0	0	0
2	~~0.65~~ 0.50[i]	0.65 ~~0.75~~	0.30 0.35[j]	30	13	4 / 6	13	0	0	0
3	~~0.50~~ 0.40[i]	0.55 ~~0.65~~	0.30 0.35[e, j]	~~30~~38	13	5 / 8	19	5/13[f]	0	5 / 13
4 except Marine	0.35	0.55 ~~0.60~~	NR	38	~~13~~ 20 or 13+5[g h]	~~5 / 10~~ 8 / 13	19	10 / 13	10, 2 ft	10/13
5 and Marine 4	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	~~38~~49	20 or 13+5[h]	13 / 17	30[f g]	10/13	10,2ft	10/13
6	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	49	20+5 or 13+~~5~~ 10[h]	15 / ~~19~~ 20	30[g]	15/19	10,4ft	10/13
7 and 8	~~0.35~~ 0.32	0.55 ~~0.60~~	NR	49	~~21~~ 20+5 or 13+10[h]	19 / 21	38[g]	15/19	10,4ft	10/13

For SI: 1 foot = 304.8 mm.

a. *R*-values are minimums. *U*-factors and SHGC are maximums. R-19 batts compressed into a nominal 2x6 framing cavity such that the R-value is reduced by R-1 or more shall be marked with the compressed batt R-value in addition to the full thickness R-value.
b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
c. The first value applies to continuous insulation, the second to framing cavity insulation; either insulation meets the requirement.
d. R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 ft, whichever is less, in zones 1 through 3 for heated slabs.
e. There are no SHGC requirements in the Marine zone.
f. Basement wall insulation is not required in warm-humid locations as defined by Figure N1101.2 and Table N1101.2.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. First value is cavity insulation, second is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required in the locations where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.
i. For impact rated fenestration in wind-borne debris regions ~~complying with Section R301.2.1.2~~, the maximum U-factor shall be 0.75 in Climate Zone 2 and 0.65 in Climate Zone 3.
~~j. For impact rated fenestration complying with Section R301.2.1.2 of the *International Residential Code*, the maximum SHGC shall be 0.40.~~
k. The second R-value applies when more than half the insulation is on the interior of the mass wall.

TABLE N1102.1.2
EQUIVALENT *U*-FACTORS[a]

CLIMATE ZONE	FENES-TRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	CEILING *U*-FACTOR	FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
1	~~1.20~~ 0.65	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	~~0.65~~ 0.50	~~0.75~~ 0.65	0.035	0.082	0.165	0.064	0.360	0.477
3	~~0.50~~ 0.40	~~0.65~~ 0.55	~~0.035~~0.030	0.082	0.141	0.047	0.091[c]	0.136
4 except Marine	0.35	~~0.60~~ 0.55	0.030	~~0.082~~ 0.057	~~0.141~~ 0.098	0.047	0.059	0.065
5 and Marine 4	~~0.35~~ 0.32	~~0.60~~ 0.55	~~0.030~~0.026	0.057	0.082	0.033	0.059	0.065
6	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	~~0.057~~ 0.048	0.060	0.033	0.050	0.065
7 and 8	~~0.35~~ 0.32	~~0.60~~ 0.55	0.026	~~0.057~~ 0.048	0.057	0.028	0.050	0.065

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.
b. When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in zone 1, 0.14 in Climate Zone 2, 0.12 in Climate Zone 3, 0.10 in Climate Zone 4 except Marine, 0.087 in zone 5 and Marine 4, and the same as the frame wall U-factor in Marine zone 4 and zones 5 through 8.
c. Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure N1101.2 and Table N1101.2.

TABLE N1102.2.5
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION
(*R*-VALUE)

WOOD FRAME *R*-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT *R*-VALUE[a]
	Steel Truss Ceilingsb
R-30	R -38 or R-30+3 or R-26+5
R-38	R -49 or R-38+3
R-49	R-38+5
	Steel Joist Ceilings[b]
R-30	R-38 in 2×4 or 2×6 or 2×8 R - 49 in any framing
R-38	R -49 in 2×4 or 2×6 or 2×8 or 2×10
	Steel Framed Wall
R-13	R -13+5 o rR-15+4 or R-21+3 or R-0+10
R-19	R -13+9 or R-19+8 or R-25+7
R-20 or R-21	R-13+10 or R-19+9 or R-25+8
R-20+5	R-13+15 or R-19+14 or R-25+13
	Steel Joist Floor
R-13	R-19 in 2×6; R-19+6 in 2×8 or 2×10
R-19	R-19+6 in 2×6; R-19+12 in 2×8 or 2×10

a. Cavity insulation *R*-value is listed first, followed by continuous insulation *R*-value.
b. Insulation exceeding the height of the framing shall cover the framing.

Reason: The proposed changes improve the thermal integrity of the building envelope by decreasing the allowed U-factors for several building components that are currently below their reasonable potential in some climate zones. Improvements in available technologies and the demonstrated viability of the proposed levels in programs such as Energy Star, Building America, and other beyond-code efforts make these changes viable improvements in the context of the current and increasing need for lower energy consumption by buildings in the U.S.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-70-T. 402-IRC T. N1102-

EC28–09/10
402.1.1; IRC N1101.7

Proponent: James Bowman, representing American Forest and Paper Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

402.1.1 Insulation and fenestration criteria. The *building thermal envelope* shall meet the requirements of Table 402.1.1 based on the climate *zone* specified in Chapter 3. Where required, insulation board shall be installed in compliance with its listing and not alter the application of wood structural panels or the lateral force resisting system of the assembly.

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1101.7 Installation. All materials, systems and equipment shall be installed in accordance with manufacturer's installation instructions and the provisions of this code. Insulation board shall be installed to not alter or preclude the approved application of structural panels, or the lateral force resisting system of the assembly.

Reason: With the increased specification of insulation-board only options, it may make the use of WSP more problematic in high-wind and seismic zones, where compliant structural components and connections are crucial. Each of these components must be attached per their listings, engineered designs and comply with structural code provisions of the IBC. This proposal simply reinforces and provides a reference to the need to adhere to pertinent attachment requirements and not use one set of fasteners for multiple panels or otherwise use inadequate attachments. Existing manufacturer's installation instructions don't anticipate and could be construed to allow through nailing if the specified gage and spacing were used. Structural panels must have nailing flush to the panel, not the insulation face if nailed through both layers.

Cost Impact: The code change proposal will not increase the cost of construction

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOWMAN-EC3-402.1.1-RE-1-N1101.7

EC29–09/10
Table 402.1.1; IRC Table N1102.1

Proponent: Craig Conner, Building Quality, representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGYCOMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise table as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLAB[d] R-VALUE & DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.30 c	30	13	3/4	13	0	0	0
2	0.65j	0.75	0.30 c	30	13	4/6	13	0	0	0
3	0.50j	0.65	0.30 c	30	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5h	13/17	30g	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13+5h	15/19	30g	15/19	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	38g	15/19	10, 4 ft	10/13

a. through b. (No change)
c. For skylights and thermally isolated sunrooms the maximum SHGC is 0.40.
c. through j. (Reletter)

PART II – IRC ENERGY

Revise table as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHTb U-FACTOR	GLAZED FENESTRATION SHGC	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUEk	FLOOR R-VALUE	BASEMENTc WALL R-VALUE	SLABd R-VALUE AND DEPTH	CRAWL SPACEc WALL R-VALUE
1	1.2	0.75	~~0.35~~ 0.30[c, j]	30	13	3/4	13	0	0	0
2	0.65i	0.75	~~0.35~~ 0.30[c, j]	30	13	4/6	13	0	0	0
3	0.50i	0.65	~~0.35~~ 0.30[c, e, j]	30	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13 + 5h	13/17	30f	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13 + 5h	15/19	30g	10/13	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	30g	10/13	10, 4 ft	10/13

a. through b. (No change)
c. For skylights and thermally isolated sunrooms the maximum SHGC is 0.40.
c. through k. (Reletter)

Reason: Higher SHGCs are generally associated with high transmission of visible light. Skylights need a higher SHGC to allow for the transmission of more visible light.

Likewise sunrooms are meant to admit sun. Thermally isolated sunrooms are sometimes used only 3 seasons of the year. Sunrooms used to house plants need to admit reasonable levels of sunlight

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

PART II – IRC ENERGY

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CONNER-EC-15-T. 402.1.1 - T. N1102.1.DOC

EC30–09/10
Table 402.1.1; IRC Table N1102.1

Proponent: Charles C. Cottrell, North American Insulation Manufacturers (NAIMA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGYCOMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise table footnote as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT
(No change to table contents)

a. R-values are minimums. U-factors and SHGC are maximums. ~~R-19 batts compressed into a nominal 2x6 framing cavity such that the R-value is reduced by R-1 or more shall be marked with the compressed batt R-value in addition to the full thickness R-value.~~ When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the actual R-value of the insulation shall not be less than the R-value specified in the table.

b. through j. (No change)

PART II – IRC ENERGY

Revise table footnote as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT
(No change to table contents)

a. R-values are minimums. U-factors and SHGC are maximums. ~~R-19 batts compressed into a nominal 2x6 framing cavity such that the R-value is reduced by R-1 or more shall be marked with the compressed batt R-value in addition to the full thickness R-value.~~ When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the actual R-value of the insulation shall not be less than the R-value specified in the table.

b. through k. (No change)

Reason: The proposed change in wording is an improvement in the current code language for 2 reasons.

First, this new language does not change the intent of the existing language. Additionally it prohibits all types of insulation from being compressed to less than its design/ label thickness and meeting the code. The current language only addresses compression of R-19 batts being compressed to less than their design/label thickness (typically 6 ¼"), while the new language would prevent all insulation materials from being compressed to less than their design/label thickness and being presumed to meet the code requirements.

Second, as written, the code language is a violation of the Federal Trade Commission's ("FTC") "Labeling and Advertising of Home Insulation" Rule, 16 C.F.R. Part 460, also known as the R-value Rule because the code language requires insulation to be "marked" or labeled. The FTC has established jurisdiction over the advertising and labeling of insulation products sold or marketed to consumers in the United States. Specifically, the FTC has preempted conflicting laws:

16 C.F.R. 460.23(b).

State and local laws and regulations that are inconsistent with, or frustrate the purposes of, the provisions of this regulation are preempted. However, a State or local government may petition the Commission, for good cause, to permit the enforcement of any part of a State or local law or regulation that would be preempted by this section.

Federal preemption essentially means that a federal law supersedes and supplants any inconsistent state or local law or regulation. Currently this ICC code provision is in violation of the FTC R-value rule and is preempted by Federal law.

Making this proposed change will cover all instances of compressed insulation that may not meet the code requirements and eliminates the additional marking or labeling requirements, which are in conflict with the FTC Rule.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COTTRELL-EC-1-T. 402.1.1-T. N1102.1.DOC

EC31–09/10
402.1.1, Table 402.1.1; IRC N1102.1, Table N1102.1

Proponent: Donald J. Vigneau, AIA, Northeast Energy Efficiency Partnerships, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

402.1.1 Insulation and fenestration criteria. The *building thermal envelope* shall meet the minimum requirements of Table 402.1.1 based on the climate *zone* specified in Chapter 3. Use of the Table 402.1.1 prescriptive component option shall be limited to a maximum fenestration area of 20 percent of the gross conditioned floor area. U-factor and SHGC exemptions allowed under Sections 402.3.2 and 402.3.3 shall be included in the maximum allowable percentage area.

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]
COMBINED WINDOW, SKYLIGHT AND DOOR AREAS NOT GREATER THAN 20 PERCENT OF GROSS CONDITIONED FLOOR AREA

(Table contents and footnotes remain unchanged)

PART II – IRC BUILDING/ENERGY

Revise as follows:

1102.1 Insulation and fenestration criteria. The *building thermal envelope* shall meet the requirements of Table N1102.1.1 based on the climate *zone* specified in Table N1101.2. Use of the Table N1102.1 prescriptive component alternative shall be limited to a maximum fenestration area of 20 percent of the gross conditioned floor area. U-factor and SHGC exemptions allowed under Sections N1102.3.3 and N1102.3.4 shall be included in the maximum allowable percentage area.

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]
COMBINED WINDOW, SKYLIGHT AND DOOR AREAS NOT GREATER THAN 20 PERCENT OF GROSS CONDITIONED FLOOR AREA

(Table contents and footnotes remain unchanged)

Reason
(Part I): Table 402.1.3 provides direct evidence that the use of glazing without limitation, as adopted in the IECC 2004 Supplement, allows for enormous energy waste and directly impacts both first cost and energy use, by allowing unlimited use of a thermal envelope component with inferior performance and a greater total installed cost. Affordability is NOT an issue in glazing allowed by a limited prescriptive option, only light, ventilation and emergency egress.

The proposed 20 percent of gross conditioned floor area limitation is greater than twice the minimum areas required to satisfy the above code requirements; including opaque door assemblies. The greater area proposed allows for flexibility in window selections and placement to accommodate design and construction issues. It applies uniformly to single and multi-family dwelling construction.

Currently, each square foot of code-compliant glazing still uses greater than 4 to over 10 TIMES as much energy as the adjacent complying envelope wall (see Table 402.1.3 for specific zone), and about twice the performance of the best windows available. Thus, each square foot of glazing beyond a reasonable minimum allows for undue waste of energy.

Since glazing area percentage has been changed to a percentage of the gross conditioned floor area (IECC 2004 Supplement), the prior IECC 2003 Chapter 6 limitation of 15 percent of thermal wall envelope area is proposed as 20 percent of conditioned floor area to realize about twice the glazing required by the above minimum standards possible within the prescriptive option.

The proposed change does not limit glazing; it only restricts the use of the prescriptive option to demonstrate compliance. The applicant is still able to use more than 20 percent fenestration by demonstrating compliance through the Section 402.1.3 U-factor alternative, the Section 402.1.4 Total UA alternative, or the Section 404.5 Simulated Performance Alternative.

PART II- Table N1102.1.2 provides direct evidence that the use of glazing without limitation, as adopted in the IRC 2006 Edition, allows for enormous energy waste and directly impacts both first cost and energy use, by allowing unlimited use of thermal envelope components with inferior performance and a greater total installed cost. Affordability is NOT an issue in glazing allowed by a limited prescriptive option; only light, ventilation and emergency egress.

The proposed 20 percent of gross conditioned floor area limitation is greater than twice the minimum areas required to satisfy the above code requirements; including opaque door assemblies. The greater area proposed allows for flexibility in window selections and placement to accommodate design and construction issues. It applies uniformly to single and townhouse dwelling construction.

Currently, each square foot of code-compliant glazing still uses greater than 4 to over 10 TIMES as much energy as the adjacent complying envelope wall (see Table N1102.1.2 for specific zone), and about twice the energy of the best windows available. Thus, each square foot of code-compliant glazing beyond a reasonable minimum allows for undue waste of energy.

Since glazing area percentage has been changed to a percentage of the gross conditioned floor area (IRC 2006), the prior IECC 2003 Chapter 6 limitation of 15 percent of thermal wall envelope area for detached One and Two Family homes is proposed as 20 percent of conditioned floor area to realize about twice the glazing required by the above minimum standards possible within the prescriptive option.

The proposed change does not limit glazing; it only restricts the use of the prescriptive option to demonstrate compliance. The applicant is still able to use more than 20 percent fenestration by demonstrating compliance through the Section N1102.1.2 U-factor alternative or the Section N1102.1.3 Total UA alternative, the method available in the RES*Check* energy software.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: VIGNEAU-EC-1-402.1.1-RE-1-N1102.1

EC32–09/10

Table 402.1.1, Table 402.1.3, 402.3.3 (New); IRC Table N1102.1, Table N1102.1.2, N1102.3.3 (New)

Proponent: Thomas D. Culp, Ph.D., Birch Point Consulting LLC, representing Quanta Technologies, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise tables as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b]	
1	1.2	**(Remainder of table unchanged)**
2	0.65[j]	
3	0.50[j]	
4 except Marine	0.35	
5 and Marine 4	~~0.35~~ 0.26	
6	~~0.35~~ 0.26	
7 and 8	~~0.35~~ 0.26	

(Footnotes remain unchanged)

TABLE 402.1.3
EQUIVALENT *U*-FACTORS[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR	
1	1.2	**(Remainder of table unchanged)**
2	0.65	
3	0.50	
4 except Marine	0.35	
5 and Marine 4	~~0.35~~ 0.26	
6	~~0.35~~ 0.26	
7 and 8	~~0.35~~ 0.26	

(Footnotes remain unchanged)

2. Add new text as follows:

402.3.3 U-factor and SHGC alternative. Vertical windows with a U-factor of 0.27 and SHGC greater than or equal to 0.35, or a U-factor of 0.28 and SHGC greater than or equal to 0.40, shall be permitted to satisfy the fenestration *U*-factor requirements of Table 402.1.1 in Climate Zones 5, 6, 7 and 8. For compliance with this section, default SHGC values from Table 303.1.3(3) shall not be permitted.

PART II – IRC ENERGY

1. Revise tables as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b]	
1	1.2	**(Rest of table unchanged)**
2	0.65[j]	
3	0.50[j]	
4 except Marine	0.35	
5 and Marine 4	~~0.35~~ 0.26	
6	~~0.35~~ 0.26	
7 and 8	~~0.35~~ 0.26	

(Footnotes remain unchanged)

TABLE N1102.1.2
EQUIVALENT *U*-FACTORS[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR	
1	1.2	**(Rest of table unchanged)**
2	0.65	
3	0.50	
4 except Marine	0.35	
5 and Marine 4	~~0.35~~ 0.26	
6	~~0.35~~ 0.26	
7 and 8	~~0.35~~ 0.26	

(Footnotes remain unchanged)

2. Add new text as follows:

N1102.3.3 U-factor and SHGC alternative. Vertical windows with a U-factor of 0.27 and SHGC greater than or equal to 0.35, or a U-factor of 0.28 and SHGC greater than or equal to 0.40, shall be permitted to satisfy the fenestration *U*-factor requirements of Table N1102.1 in Climate Zones 5, 6, 7 and 8. For compliance with this section, default SHGC values from Table 303.1.3(3) shall not be permitted.

Reason: This proposal would significantly increase energy efficiency of windows in the northern climate by lowering the U-factor such that triple glazing will be required. Moving from double to triple glazing does have potentially significant cost implications, with the increase in window cost estimated to be least 15%.[1] However, this change becomes an important component if the code is heading towards a major increase in energy efficiency of first 30%, then 50%.

Therefore, an equally important component is to maximize cost effectiveness by ensuring the widest product flexibility. This is achieved by including both the lower basic U-factor in the table as well as the alternative criteria described in the new section. These alternative criteria are based upon a similar equivalent energy path in the recently announced 2010 Energy Star requirements.[2] This alternate path, based upon an analysis performed by Lawrence Berkeley National Laboratory, allows a U-factor 0.01 higher for SHGC 0.35 and 0.02 higher for SHGC 0.40. This same alternative is included here, and will ensure that a larger range of triple glazed products with various frame and glass types can satisfy the requirement, thus helping to maximize cost effectiveness through economy of scale.

1. "U.S. Department of Energy ENERGY STAR Program, Windows, Doors, and Skylights Draft Criteria and Analysis", D&R International Ltd, August 6, 2008. http://www.energystar.gov/ia/partners/prod_development/archives/downloads/windows_doors/WindowsDoorsSkylights_DraftCriteriaAnalysis_CORRECTED.pdf
2. "ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0", U.S. Department of Energy, April 7, 2009. http://www.energystar.gov/ia/partners/prod_development/archives/downloads/windows_doors/WindowsDoorsSkylightsProgRequirements7Apr09.pdf

Cost Impact: The code change proposal will increase the cost of windows by requiring triple glazing in the north. An August 2008 report by D&R International for the U.S. Department of Energy's Energy Star program for Windows, Doors, and Skylights estimated a minimum cost increase of 15%.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CULP-EC-6-T. 402.1.1-T. 402.1.3-402.3.3-T. N1102.1-T. N1102.1.2-N1102.3.3.DOC

EC33–09/10
Table 402.1.1

Proponent: Jeff Lowinski, Window and Door Manufacturers Association (WDMA)

Revise table as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHTb U-FACTOR	GLAZED FENESTRATION SHGCb, [e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R-VALUE	BASEMENTc WALL R-VALUE	SLABd R-VALUE & DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	~~1.2~~ 0.65	0.75	0.30	30	13	3/4	13	0	0	0
2	0.65j	0.75	0.30	30	13	4/6	13	0	0	0
3	0.50j	0.65	0.30	30	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5h	13/17	30g	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13+5h	15/19	30g	15/19	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	38g	15/19	10, 4 ft	10/13

(Footnotes remain unchanged)

Reason: This proposal recommends the same U-factor for fenestration in climate zone 1 as in climate zone 2 to reduce the cooling load energy demand. Granted, a low SHGC is much more effective at reducing cooling energy demand, but improving the U-factor is also important for reducing energy demand. There are windows and doors available that meet the thermal performance requirements proposed and meet other performance requirements of climate zone 1.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Lowinski-EC-1-T. 402.1.1

EC34–09/10

Table 402.1.1, Table 402.1.3; IRC Table N1102.1, Table N1102.1.2

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise tables as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGCb, [e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLABd R-VALUE & DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	~~1.2~~ NR	0.75	0.30	30	13	3/4	13	0	0	0
2	~~0.65~~[j] 0.40	0.75	0.30	30	13	4/6	13	0	0	0
3	~~0.50~~[j] 0.35	0.65	0.30	30	13	5/8	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5[h]	13/17	30[g]	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13+5[h]	15/19	30[g]	15/19	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	38[g]	15/19	10, 4 ft	10/13

(Footnotes remain unchanged)

TABLE 402.1.3
EQUIVALENT U-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR[d]	CRAWL SPACE WALL U-FACTOR[c]
1	~~1.20~~ 0.50	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	~~0.65~~ 0.40	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	~~0.50~~ 0.35	0.65	0.035	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.057	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.057	0.060	0.033	0.050	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.028	0.050	0.065

(Footnotes remain unchanged)

PART II – IRC BUILDING/ENERGY

Revise tables as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[k]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	~~1.2~~ NR	0.75	0.35[j]	30	13	3/4	13	0	0	0
2	~~0.65i~~ 0.40	0.75	0.35[j]	30	13	4/6	13	0	0	0
3	~~0.50i~~ 0.35	0.65	0.35[e, j]	30	13	5/8	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13 + 5[h]	13/17	30[f]	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13 + 5[h]	15/19	30[g]	10/13	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	30[g]	10/13	10, 4 ft	10/13

(Footnotes remain unchanged)

TABLE N1102.1.2
EQUIVALENT U-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
1	~~1.20~~ 0.50	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	~~0.65~~ 0.40	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	~~0.50~~ 0.35	0.65	0.035	0.082	0.141	0.047	0.091[c]	0.136
4 except Marine	0.35	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.060	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.060	0.060	0.033	0.059	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.033	0.059	0.065

(Footnotes remain unchanged)

Reason: This proposal substantially increases energy efficiency in climate zones 1-3 by specifying lower, more realistic fenestration U-factors that more closely resemble actual windows used to meet current requirements in these zones and, as a result, will close a significant gap in trade-off compliance paths and performance path calculations as well as make the code more efficient.

The current window U-factor requirements in the three southernmost climate zones are unreasonably high, given the current *IECC* SHGC requirement of 0.30 and *IRC* SHGC requirement of 0.35. To meet the SHGC requirement in these three zones, builders typically use low solar gain, low-e glass. As a result, the only issue is a reasonable choice of frame to meet increasing energy efficiency demands. With such a frame, the resulting product has a much lower U-factor than the current requirements for these climate zones. The practical effect of this lower U-factor for actual windows is that users who follow the Total UA alternative or the Simulated Performance Alternative automatically receive unnecessary free trade-off credit (the difference between the artificially high U-factor requirement and the window's actual U-factor), which is then used to reduce efficiency elsewhere in the home.

The proposed change sets U-factors at reasonable levels designed to match reasonably efficient windows available in all markets. According to the *2005 ASHRAE Handbook of Fundamentals* (page 31.8, Table 4), a low solar gain, low-e window (0.05 emissivity) with a ½ inch air space typically achieves the following U-factors:

	Operable w/o Argon	Fixed w/o Argon	Operable w/Argon	Fixed w/Argon
Aluminum Thermal Break	0.47	0.41	0.44	0.37
Wood/Vinyl	0.39	0.35	0.36	0.31

This proposal would continue to allow, under the prescriptive compliance path, any frame in climate zone 1, but would require a builder to use a more reasonable 0.50 U-factor (reflecting the range of U-factors portrayed above) where they elect to use a UA trade-off or the performance path. In climate zone 2, this proposal would use a vinyl framed window without argon as the baseline prescriptive path window (wood and clad-wood framed windows would also meet this requirement as well as some aluminum thermal break framed windows). In zone 3, to achieve a 0.35 U-factor, this proposal would typically require the addition of argon (beyond the level for climate zone 2) for the prescriptive path window. While this proposal may require some to switch from aluminum to vinyl windows if they choose to use the prescriptive path, there does not appear to be an additional cost to achieve the 0.40 or better U-factor, given that the cost of vinyl and aluminum window frames are reportedly very competitive. While there is a slight additional cost to add argon, such cost is relatively minimal and more than offset by the benefits of a better U-factor in climate zone 3. There is

also precedent for much lower U-factors in these climate zones. For example, under the 2009 American Recovery and Reinvestment Act (Stimulus Bill), the federal tax credit for replacement windows specifies a 0.30 U-factor nationwide.

This proposal substantially increases energy efficiency in climate zones 1-3. The table below illustrates the estimated energy cost savings from the prescriptive changes in climate zones 2 and 3 over the current 2009 *IECC* and *IRC* values. . These savings are significant and when coupled with other proposed code modifications can lead to significant overall energy savings for homes.

	Climate Zone 1	Climate Zone 2	Climate Zone 3
Heating, Cooling, Hot Water Purchased Energy Cost Percent Savings	-	7.5%	6.2%
Total Purchased Energy Cost Percent Savings (also including major appliances and lighting)	-	5.3%	4.5%

The proposed change is designed to match windows available in all markets. While most wood or vinyl-framed double-pane windows already meet the 0.35 U-factor requirement, any frame type could also be used under either the Total UA alternative or the Simulated Performance Alternative. In our experience, these values are already achieved by many, if not most, of the windows sold in these climate zones.

This proposal represents a reasonable and cost effective improvement that will provide states and local jurisdictions with an option to easily increase the efficiency of their code.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

PART II – IRC BUILDING/ENERGY

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: PRINDLE-EC-14-T. 402.1.1-T. N1102.1

EC35–09/10
Table 402.1.1; IRC Table N1102.1

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

Proponent: Jeff Lowinski, representing Window and Door Manufacturers Association (WDMA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise table as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLABd R-VALUE & DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.30	30	13	3/4	13	0	0	0
2	0.65[j]	0.75	0.30	30	13	4/6	13	0	0	0
3	0.50[j]	0.65	0.30	30	13	5/8	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5[h]	13/17	30[g]	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13+5[h]	15/19	30[g]	15/19	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	38[g]	15/19	10, 4 ft	10/13

~~j. For impact rated fenestration complying with Section R301.2.1.2 of the *International Residential Code* or Section 1608.1.2 of the *International Building Code*, the maximum U-factor shall be 0.75 in Zone 2 and 0.65 in Zone 3.~~

(Portions of footnotes not shown remain unchanged)

PART II – IRC BUILDING/ENERGY

Revise table as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[k]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.35[~~j~~]	30	13	3/4	13	0	0	0
2	0.65[~~i~~]	0.75	0.35[~~j~~]	30	13	4/6	13	0	0	0
3	0.50[~~i~~]	0.65	0.35[e,~~j~~]	30	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13 + 5h	13/17	30f	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13 + 5h	15/19	30g	10/13	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	30g	10/13	10, 4 ft	10/13

~~i. For impact-rated fenestration complying with Section R301.2.1.2, the maximum U-factor shall be 0.75 in Zone 2 and 0.65 in Zone 3.~~
~~j. For impact-resistant fenestration complying with Section R301.2.1.2 of the *International Residential Code*, the maximum SHGC shall be 0.40.~~

(Portions of footnotes not shown remain unchanged)

Reason:
(Prindle) This proposal will increase energy efficiency by eliminating unnecessary exceptions to the fenestration requirements for impact rated fenestration. The IECC exception for U-factor and the IRC exceptions for U-factor and SHGC should all be removed. The exceptions are written too broadly and create an unnecessary loophole in fenestration requirements.

Exceptions are Too Broad. Although impact rated fenestration may not be required (or even advisable) in every home in climate zones 1 through 3, these exception could apply to any home in this part of the country. These footnotes are not limited to those situations in which the *IBC* or I*RC* would *require* impact rated fenestration. The *IRC* only requires impact-rated glazing in Wind-Borne Debris Regions, and it defines Wind-Borne Debris Region as follows:

Areas within hurricane-prone regions within one mile of the coastal mean high water line where the basic wind speed is 110 miles per hour (49 m/s) or greater; or where the basic wind speed is equal to or greater than 120 miles per hour (54 m/s); or Hawaii.

IRC page 22. Regions that fit within that definition are much narrower than climate zones 2 and 3. See Figure R301.2(4), Basic Wind Speeds for 50-Year Mean Recurrence Interval. While Wind-Borne Debris Regions typically only cover coastal counties, the U-factor exception reaches all counties in these climate zones, even as far inland as Las Vegas, Nevada. The result is a significant wasted opportunity to make new homes more energy efficient, in exchange for windows that are unnecessary in these regions.

Products are Widely Available. Both exceptions were rejected by the *IECC* Committee in the 07/08 code cycle because they are unnecessary: The committee agreed with opponents that there were a sufficient amount of impact resistant products readily available that will meet fenestration U-factors for hurricane prone regions; therefore the exception for impact resistant windows is unnecessary.

There are many products already available on the market that meets both the prescriptive requirements and the wind-borne debris requirement. The exception simply wastes an opportunity to bring more energy efficiency to climate zones 1 through 3.

Weighted Average and Flexibility. Even if a builder installs windows that do not meet the prescriptive requirements, users may simply engage the Total UA Alternative or the Simulated Performance Alternative in Section 405 of the *IECC*, or the Department of Energy's free *RES*check software, and trade efficiency among all the envelope components. Because of the flexibility afforded by multiple compliance options, exceptions like these unnecessarily weaken the energy efficiency of the code.

(Lowinski) Fenestration thermal performance requirements should be independent of other performance criteria, such as providing protection from wind-borne debris or structural design pressure. This proposal seeks to undo a weakening of the energy code included in the 2009 IECC. There's plenty of windows and doors available in the market that can meet the thermal performance requirements as proposed, and meet the impact-resistant requirements of Section 1608.1.2.

Cost Impact: (Lowinski) The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

PART II – IRC BUILDING/ENERGY

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: PRINDLE-EC-16-Lowinski-EC-2-T. 402.1.1-T. N1102.1

EC36–09/10
Table 402.1.1; IRC Table N1102.1

Proponent: Julie Ruth, PE, JRuth Code Consulting, representing the American Architectural Manufacturers Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise table as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	GLAZED FENESTRATION SHGC	SKYLIGHT[b] U-FACTOR	~~GLAZED FENESTRATION~~ SKYLIGHT[B] SHGC	Remainder of Table unchanged
1	1.20	0.30	0.75	~~0.30~~ 0.40[j]	
2	0.65[i]	0.30	0.75	~~0.30~~ 0.40[j]	
3	0.50[i]	0.30	0.65	~~0.30~~ 0.40[j]	
4 except Marine	0.35	N.R.	0.60	N.R.	
5 and Marine 4	0.35	N.R.	0.60	N.R.	
6	0.35	N.R.	0.60	N.R.	
7 and 8	0.35	N.R.	0.60	N.R.	

For SI: 1 foot = 304.8 mm.

b. The fenestration *U*-factor and glazed fenestration SGHC columns exclude~~s~~ skylights. ~~The SHGC column applies to all glazed fenestration.~~

j. The maximum SHGC for tubular daylighting devices (TDDs) that do not exceed 1.30 sq ft (0.12 m^2) in cross sectional area shall be 0.45.

(Portions of table and footnotes not shown remain unchanged)

PART II – IRC BUILDING/ENERGY

Revise table as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[A]

CLIMATE ZONE	FENESTRATION U-FACTOR	GLAZED FENESTRATION SHGC	SKYLIGHT U-FACTOR	~~GLAZED FENESTRATION~~ SKYLIGHT SHGC	Remainder of Table unchanged
1	1.20	0.35[l]	0.75	~~0.35~~[l] 0.40[l]	
2	0.65[i]	0.35[l]	0.75	~~0.35~~[l] 0.40[l]	
3	0.50[i]	0.35[l]	0.65	~~0.35~~[l] 0.40[l]	
4 except Marine	0.35	N.R.	0.60	N.R.	
5 and Marine 4	0.35	N.R.	0.60	N.R.	
6	0.35	N.R.	0.60	N.R.	
7 and 8	0.35	N.R.	0.60	N.R.	

b. The fenestration *U*-factor and glazed fenestration SHGC columns exclude~~s~~ skylights. ~~The SHGC column applies to all glazed fenestration.~~

l. The maximum SHGC for tubular daylighting devices (TDDs) that do not exceed 1.30 sq. ft. (0.12 m^2) in cross sectional area shall be 0.45.

(Portions of table and footnotes not shown remain unchanged)

Reason: Significant energy savings can be achieved in all types of buildings through the use of daylighting, which is free and therefore does not contribute to the energy cost of a building at all. Toplighting by skylights can be an important component of good daylighting design, but only if an adequate amount of light is transmitted through the skylight. The Visible Transmittance (VT) of light through a skylight is directly proportional to its SHGC. A review of the NFRC database on March 30, 2009 found that domed skylights with SHGC less than 0.35 had VT less than 0.50 and flat glass skylights with SHGC less than 0.35 had VT less than 0.56.

Increasing the SHGC for residential skylights brings domed skylights with VT between 0.60 and 0.70, and flat glass skylights with VT between 0.63 and 0.69 into the range of availability. This proposal provides that increase for skylights only, and also includes a footnote that establishes a maximum SHGC of 0.45 for tubular daylighting devices (TDDs). TDDs permit a lot of light to enter a space through a relatively small opening in the roof structure, but their SHGC will commonly be between 0.40 and 0.45.

Use of these skylights (flat glass, domed and TDDs) to provide daylighting into residences are a cost effective way to save energy, and should be not only permitted, but encouraged within both the IRC and IECC.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

PART II – IRC BUILDING/ENERGY

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: RUTH-EC-4-T. 402.1.1-T. N1102.1

EC37–09/10
Table 402.1.1

Proponent: Jeff Lowinski, representing Window and Door Manufacturers Association (WDMA)

Revise table as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC[b], [e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R-VALUE	BASEMENTc WALL R-VALUE	SLABd R-VALUE & DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	~~0.30~~ 0.35	30	13	3/4	13	0	0	0
2	0.65[j]	0.75	~~0.30~~ 0.35	30	13	4/6	13	0	0	0
3	0.50[j]	0.65	~~0.30~~ 0.35	30	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5[h]	13/17	30[g]	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13+5[h]	15/19	30[g]	15/19	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	38[g]	15/19	10, 4 ft	10/13

(Footnotes remain unchanged)

Reason: Skylights provide daylighting as a primary function. Low SHGC values might reduce the amount of daylighting available. WDMA proposes a revision to the maximum SHGC allowed for skylights in residential applications to allow an increase in visible light (daylighting).

Roof-mounted fenestration, such as skylights, provide lighting to the interior of spaces as a primary benefit and compliment lighting from windows and doors. Allowing for a slightly higher maximum SHGC value will preserve a level of natural visible light that is sufficient to maximize the opportunities for occupants to switch off artificial lights.

When the 2006 energy code modifications were being debated, the severe reductions in fenestration SHGC were accepted with the unintended consequence of reducing the availability of qualifying skylights that carry NFRC ratings. Discussion of the amended proposal centered exclusively on windows in walls and reducing cooling energy consumption, without regard to the significant offsetting lighting energy savings unique to natural toplighting with visible transmittance high enough to permit switching off lights even under an overcast sky.

It should also be noted that skylight area as a percentage of roof area is typically 0 to 3%, so the negative heat gain contribution on the average building from skylights is very minor in relation to that of the windows in the average house.

Cost Impact: This code change will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Lowinski-EC-5-T. 402.1.1

EC38–09/10
Table 402.1.1, Table 402.1.3, 402.3.3 (New); IRC Table N1102.1, Table N1102.1.2, N1102.3.3

Proponent: Thomas S.Zaremba, Roetzel & Andress, representing Pilkington North America

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise tables as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b]	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[i]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
1	1.2	0.75	0.30	30	13	3/4	13	0	0	0
2	0.65[j]	0.75	0.30	30	13	4/6	13	0	0	0
3	0.50[j]	0.65	0.30	30	13	5/8	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.30~~0.35~~	0.60	NR	38	20 or 13+5[h]	13/17	30[g]	10/13	10, 2 ft	10/13
6	0.30~~0.35~~	0.60	NR	49	20 or 13+5[h]	15/19	30[g]	15/19	10, 4 ft	10/13
7 and 8	0.30~~0.35~~	0.60	NR	49	21	19/21	38[g]	15/19	10, 4 ft	10/13

(Footnotes remain unchanged)

TABLE 402.1.3
EQUIVALENT *U*-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR[d]	CRAWL SPACE WALL U-FACTOR[c]
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	0.035	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	~~0.35~~ 0.30	0.60	0.030	0.057	0.082	0.033	0.059	0.065
6	~~0.35~~ 0.30	0.60	0.026	0.057	0.060	0.033	0.050	0.065
7 and 8	~~0.35~~ 0.30	0.60	0.026	0.057	0.057	0.028	0.050	0.065

(Footnotes remain unchanged)

2. Add new text as follows:

402.3.3 U-factor and SHGC alternative. Window assemblies having a U-factor of 0.31 and SHGC greater than or equal to 0.35 or a U-factor of 0.32 and SHGC greater than or equal to 0.40 shall be permitted to satisfy the requirements of Table 402.1.1 in Climate Zones 5, 6, 7 and 8. For compliance with this section, default SHGC values from Table 303.1.3(3) shall not be permitted.

PART II – IRC BUILDING/ENERGY

1. Revise tables as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[k]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.35j	30	13	3/4	13	0	0	0
2	0.65i	0.75	0.35j	30	13	4/6	13	0	0	0
3	0.50i	0.65	0.35e, j	30	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	~~0.35~~ 0.30	0.60	NR	38	20 or 13 + 5h	13/17	30f	10/13	10, 2 ft	10/13
6	~~0.35~~ 0.30	0.60	NR	49	20 or 13 + 5h	15/19	30g	10/13	10, 4 ft	10/13
7 and 8	~~0.35~~ 0.30	0.60	NR	49	21	19/21	30g	10/13	10, 4 ft	10/13

(Footnotes remain unchanged

TABLE N1102.1.2
EQUIVALENT U-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	0.035	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	~~0.35~~ 0.30	0.60	0.030	0.060	0.082	0.033	0.059	0.065
6	~~0.35~~ 0.30	0.60	0.026	0.060	0.060	0.033	0.059	0.065
7 and 8	~~0.35~~ 0.30	0.60	0.026	0.057	0.057	0.033	0.059	0.065

(Footnotes remain unchanged)

2. Add new text as follows:

N1102.3.3 U-factor and SHGC alternative. Window assemblies having a U-factor of 0.31 and SHGC greater than or equal to 0.35 or a U-factor of 0.32 and SHGC greater than or equal to 0.40 shall be permitted to satisfy the fenestration U-factor requirements of Table N1102.1 in Climate Zones 5, 6, 7 and 8. For compliance with this section, default SHGC values from Table N1101.5(3) shall not be permitted.

Reason: After Lawrence Berkeley National Laboratories (LBNL) did an extensive study of energy equivalency of matching U-factors with various SHGCs in northern climate zones, the Department of Energy issued a new Energy Star Windows criteria (Energy Star) which will take effect on January 4, 2010. The DOE established the following alternate, equivalent energy performance criteria for Energy Star labeled windows for IECC climate zones 5-8:

U-factor	SHGC
0.30	Any or NR
= 0.31	0.35
= 0.32	≥ 0.40

In support of these alternate paths, DOE's Energy Star report issued on April 7, 2009 explains:

> The energy savings analysis … revealed that in the North, a 0.01 increase in U-factor produces equivalent energy performance to a 0.05 increase in SHGC. DOE used this relationship to establish the proposed revised tradeoff levels: setting the … 0.30 U-factor and 0.30 SHGC as the base case, the minimum required SHGC in the revised tradeoffs rise 0.05 to balance a 0.01 rise in U-factor. The two alternative criteria specify U-factors of 0.31 and 0.32, while allowing the minimum SHGC to rise to 0.35

and 0.40 respectively. Windows with those specific U-factors and the corresponding SHGCs or higher will qualify.

If adopted, this proposal would harmonize the 2012 IECC to the criteria specified for Energy Star windows in the north. It would be timely for the IECC to do this since, even before the new Energy Star criteria takes effect in January 2010, the DOE plans to begin researching a new, Phase 2 proposal for Energy Star Windows.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ZAREMBA-EC-2-T. 402.1.1- RE-1-T. N1102.1

EC39–09/10

Table 402.1.1, Table 402.1.3; IRC Table N1102.1, Table N1102.1.2

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise tables as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGCb, [e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLAB[d] R-VALUE & DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.30	30	13	3/4	13	0	0	0
2	0.65[j]	0.75	0.30	30	13	4/6	13	0	0	0
3	0.50[j]	0.65	0.30	30	13	5/8	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	~~0.35~~ 0.32	0.60	NR	38	20 or 13+5[h]	13/17	30[g]	10/13	10, 2 ft	10/13
6	~~0.35~~ 0.32	0.60	NR	49	20 or 13+5[h]	15/19	30[g]	15/19	10, 4 ft	10/13
7 and 8	~~0.35~~ 0.32	0.60	NR	49	21	19/21	38[g]	15/19	10, 4 ft	10/13

(Footnotes remain unchanged)

TABLE 402.1.3
EQUIVALENT U-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR[d]	CRAWL SPACE WALL U-FACTOR[c]
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	0.035	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	~~0.35~~ 0.32	0.60	0.030	0.057	0.082	0.033	0.059	0.065
6	~~0.35~~ 0.32	0.60	0.026	0.057	0.060	0.033	0.050	0.065
7 and 8	~~0.35~~ 0.32	0.60	0.026	0.057	0.057	0.028	0.050	0.065

(Footnotes remain unchanged)

PART II – IRC BUILDING/ENERGY

Revise tables as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[k]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.35j	30	13	3/4	13	0	0	0
2	0.65i	0.75	0.35j	30	13	4/6	13	0	0	0
3	0.50i	0.65	0.35e, j	30	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	~~0.35~~ 0.32	0.60	NR	38	20 or 13 + 5h	13/17	30f	10/13	10, 2 ft	10/13
6	~~0.35~~ 0.32	0.60	NR	49	20 or 13 + 5h	15/19	30g	10/13	10, 4 ft	10/13
7 and 8	~~0.35~~ 0.32	0.60	NR	49	21	19/21	30g	10/13	10, 4 ft	10/13

(Footnotes remain unchanged)

TABLE N1102.1.2
EQUIVALENT U-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	0.035	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	~~0.35~~ 0.32	0.60	0.030	0.060	0.082	0.033	0.059	0.065
6	~~0.35~~ 0.32	0.60	0.026	0.060	0.060	0.033	0.059	0.065
7 and 8	~~0.35~~ 0.32	0.60	0.026	0.057	0.057	0.033	0.059	0.065

(Footnotes remain unchanged)

Reason: This proposal specifies an improved fenestration U-factor requirement for colder climates. Lowering the U-factor to 0.32 in zones Marine 4, and 5-8 would result in a guaranteed increase of almost 10% in window insulating value (almost a 10% reduction in heat loss through these

windows) in these cold climates and would guarantee energy savings year-round in every home. A lower glazing U-factor is a proven energy saver for heating and cooling energy, so there will be savings on natural gas, heating oil and electric bills.

While the window U-factor and SHGC requirements in other climate zones have improved substantially in recent code cycles, U-factors in these northern climate zones have not been improved.

Many windows sold in the northern U.S. that meet the 0.35 U-factor also meet the 0.32 U-factor. Typically, the difference between a 0.35 and 0.32 window is the level of argon-fill, a low or no-cost option. While lowering the U-factor from 0.35 to 0.32 may be aggressive for some frame types, the area weighted average approach incorporated into the code will allow some windows to exceed this value, so long as the windows selected for the home on average meet the 0.32 value.

This proposal increases energy efficiency in climate zones Marine 4 and 5-8. The table below illustrates the estimated energy cost savings from this measure in each climate zone. These savings are significant and when coupled with other proposed code modifications can lead to significant overall energy savings for homes.

	Climate Zone 4 Marine	Climate Zone 5	Climate Zone 6	Climate Zone 7	Climate Zone 8
Heating, Cooling, Hot Water Purchased Energy Cost Percent Savings	2.3%	2.0%	2.0%	1.5%	1.7%
Total Purchased Energy Cost Percent Savings (also including major appliances and lighting)	1.8%	1.5%	1.6%	1.2%	1.4%

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

PART II – IRC BUILDING/ENERGY

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: PRINDLE-EC-15-T. 402.1.1-T. N1102.1

EC40–09/10

Table 402.1.1, Table 402.1.3, 402.3.6; IRC Table N1102.1, Table N1102.1.2, N1102.3.6

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	~~SKYLIGHT[b] U-FACTOR~~	GLAZED FENESTRATION SHGCb, [e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R-VALUE	BASEMENTc WALL R-VALUE	SLABd R-VALUE & DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	~~0.75~~	0.30	30	13	3/4	13	0	0	0
2	0.65[j]	~~0.75~~	0.30	30	13	4/6	13	0	0	0
3	0.50[j]	~~0.65~~	0.30	30	13	5/8	19	5/13[f]	0	5/13
4 except Marine	0.35	~~0.60~~	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	~~0.60~~	NR	38	20 or 13+5h	13/17	30[g]	10/13	10, 2 ft	10/13
6	0.35	~~0.60~~	NR	49	20 or 13+5h	15/19	30[g]	15/19	10, 4 ft	10/13
7 and 8	0.35	~~0.60~~	NR	49	21	19/21	38[g]	15/19	10, 4 ft	10/13

b. ~~The fenestration U-factor column excludes skylights.~~ The SHGC column applies to all glazed fenestration.

(Footnotes remain unchanged)

TABLE 402.1.3
EQUIVALENT U-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	~~SKYLIGHT U-FACTOR~~	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR[d]	CRAWL SPACE WALL U-FACTOR[c]
1	1.20	~~0.75~~	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	~~0.75~~	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	~~0.65~~	0.035	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	~~0.60~~	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	~~0.60~~	0.030	0.057	0.082	0.033	0.059	0.065
6	0.35	~~0.60~~	0.026	0.057	0.060	0.033	0.050	0.065
7 and 8	0.35	~~0.60~~	0.026	0.057	0.057	0.028	0.050	0.065

(Footnotes remain unchanged)

402.3.6 Replacement fenestration. Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration ~~unit~~ product shall meet the applicable requirements for U-factor and SHGC in Table 402.1.1. Where more than one unit is being replaced, an area-weighted average of the replacement fenestration products shall be permitted to satisfy the U-factor and SHGC requirements.

Exception: Replacement skylights shall be permitted to have a weighted average U-factor not to exceed 0.60 and an SHGC not to exceed the value prescribed in Table 402.1.1.

PART II – IRC BUILDING/ENERGY

Revise as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	~~SKYLIGHT[b] U-FACTOR~~	GLAZED FENESTRATION SHGC	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[k]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	~~0.75~~	0.35[j]	30	13	3/4	13	0	0	0
2	0.65[i]	~~0.75~~	0.35[j]	30	13	4/6	13	0	0	0
3	0.50[i]	~~0.65~~	0.35e, [j]	30	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	~~0.60~~	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	~~0.60~~	NR	38	20 or 13 + 5h	13/17	30f	10/13	10, 2 ft	10/13
6	0.35	~~0.60~~	NR	49	20 or 13 + 5h	15/19	30g	10/13	10, 4 ft	10/13
7 and 8	0.35	~~0.60~~	NR	49	21	19/21	30g	10/13	10, 4 ft	10/13

b. ~~The fenestration U-factor column excludes skylights.~~ The SHGC column applies to all glazed fenestration.

(Footnotes remain unchanged)

TABLE N1102.1.2
EQUIVALENT U-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	~~SKYLIGHT U-FACTOR~~	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
1	1.20	~~0.75~~	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	~~0.75~~	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	~~0.65~~	0.035	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	~~0.60~~	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	~~0.60~~	0.030	0.060	0.082	0.033	0.059	0.065
6	0.35	~~0.60~~	0.026	0.060	0.060	0.033	0.059	0.065
7 and 8	0.35	~~0.60~~	0.026	0.057	0.057	0.033	0.059	0.065

(Footnotes remain unchanged)

N1102.3.6 Replacement Fenestration. Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration ~~unit~~ product shall meet the applicable requirements for U-factor and solar heat gain coefficient (SHGC)in Table N1102.1. Where more than one unit is being replaced, an area-weighted average of the replacement fenestration products shall be permitted to satisfy the U-factor and SHGC requirements.

Exception: Replacement skylights shall be permitted to have a weighted average U-factor not to exceed 0.60 and an SHGC not to exceed the value prescribed in Table N1102.1.

Reason: This proposal increases energy efficiency by eliminating separate specific skylight requirements in new construction and requiring that skylights meet overall fenestration U-factors on a weighted average basis. Since vertical fenestration maximum U-factors are lower than skylights maximum U-factors in all climate zones (except zone 1), this proposal will serve to produce energy savings in all homes built with skylights. Given that skylights (with R-values often less than R-2) occupy space that would otherwise be filled by a R-30 or R-49 roof, it is important that as much efficiency be captured as possible.

While skylights generally may not meet more stringent vertical fenestration U-factors on an individual unit basis, this is not a problem because the fenestration U-factor requirements can be satisfied on a weighted average basis. As a result, less stringent skylights will be offset by more stringent vertical fenestration. Since there are no limits on fenestration (including skylights) in the prescriptive path, this improvement will serve to ensure that the actual overall fenestration U-factor, including skylights, is lower under the prescriptive path. To illustrate, to meet a 0.35 U-factor fenestration requirement, the builder could install 40 square feet of skylights at a 0.60 U-factor and 360 square feet of vertical fenestration at a 0.32 U-factor. The resulting weighted average U-factor would be 0.348, thereby satisfying a 0.35 U-factor.

The proposed revisions to the replacement fenestration section are also necessary so that replacement fenestration can qualify on a weighted average basis and to permit skylight replacement (since vertical fenestration may not be replaced when skylights are replaced, it is necessary to offer a separate standard in the exception for replacement skylights).

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-9-T. 402.1.1-T. N1102.1

EC41–09/10
Table 402.1.1; IRC Table N1102.1

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise table as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGCb,[b e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLABd R-VALUE & DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	~~0.30~~ 0.25	30	13	3/4	13	0	0	0
2	0.65[j]	0.75	~~0.30~~ 0.25	30	13	4/6	13	0	0	0
3	0.50[j]	0.65	~~0.30~~ 0.25[e]	30	13	5/8	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5[h]	13/17	30[g]	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13+5[h]	15/19	30[g]	15/19	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	38[g]	15/19	10, 4 ft	10/13

(Footnotes remain unchanged)

PART II – IRC BUILDING/ENERGY

Revise table as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC [b]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[k]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	~~0.35~~[j] 0.25	30	13	3/4	13	0	0	0
2	0.65[i]	0.75	~~0.35~~[j] 0.25	30	13	4/6	13	0	0	0
3	0.50[i]	0.65	~~0.35~~[e,j] 0.25[e,j]	30	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13 + 5[h]	13/17	30[f]	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13 + 5[h]	15/19	30[g]	10/13	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	30[g]	10/13	10, 4 ft	10/13

(Footnotes remain unchanged)

Reason: This proposal increases energy efficiency, reduces peak demand and sizing of cooling systems, and improves comfort in climate zones 1-3 by lowering the prescriptive SHGC values to 0.25. The need for and viability of lower SHGCs for these cooling climates is already recognized in the 2006 and 2009 *IECC* for commercial buildings, where the prescriptive value without an overhang is 0.25, establishing a precedent for a 0.25 SHGC. This proposal would establish the same value for residential buildings as well.

This proposal would reduce fenestration solar gain in hot climates (zones 1-3) in the *IECC* by almost 17% and in the *IRC* by almost 29%. Without even factoring in the increased cost of on-peak energy that this proposal would avoid, this proposal would provide an average of approximately 1% in additional heating and cooling purchased energy savings, in additional to reduced peak electrical demand, over the values set in the 2009 *IECC*. There should be no negative construction cost impact from this increase in energy code stringency since the existing SHGC requirements already effectively dictate a low solar gain low-e window and the new requirements will also require low solar gain low-e glass, but only with a lower SHGC. Such lower SHGC glass is readily available in the market. Moreover, the potential for smaller HVAC systems could generate construction cost savings. Finally, by maintaining the same SHGC requirements for all three zones, this proposal will promote lower costs of construction as a result of economies of scale, reduced inventory requirements and increased competition among suppliers of these fenestration products.

This proposal represents a reasonable and cost effective improvement that will provide states and local jurisdictions with an option to easily increase the efficiency of their code.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-12-T. 402.1.1-T. N1102.1

EC42–09/10

Table 402.1.1; IRC Table N1102.1

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise table as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLABd R-VALUE & DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.30	30	13	3/4	13	0	0	0
2	0.65[j]	0.75	0.30	30	13	4/6	13	0	0	0
3	0.50[j]	0.65	0.30	30	13	5/8	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	~~NR~~ 0.40	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5[h]	13/17	30[g]	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13+5[h]	15/19	30[g]	15/19	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	38[g]	15/19	10, 4 ft	10/13

(Footnotes remain unchanged)

PART II – IRC BUILDING/ENERGY

Revise table as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC [b]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[k]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.35[j]	30	13	3/4	13	0	0	0
2	0.65[i]	0.75	0.35[j]	30	13	4/6	13	0	0	0
3	0.50[i]	0.65	0.35[e, j]	30	13	5/8	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	~~NR~~ 0.40[e]	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13 + 5[h]	13/17	30[f]	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13 + 5[h]	15/19	30[g]	10/13	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	30[g]	10/13	10, 4 ft	10/13

(Footnotes remain unchanged)

Reason: This proposal promotes "the effective use of energy" (see *IECC* section 101.3) by reducing the need for peak electricity by adopting a modest and conservative Solar Heat Gain Coefficient (SHGC) requirement in climate zone 4 except Marine.

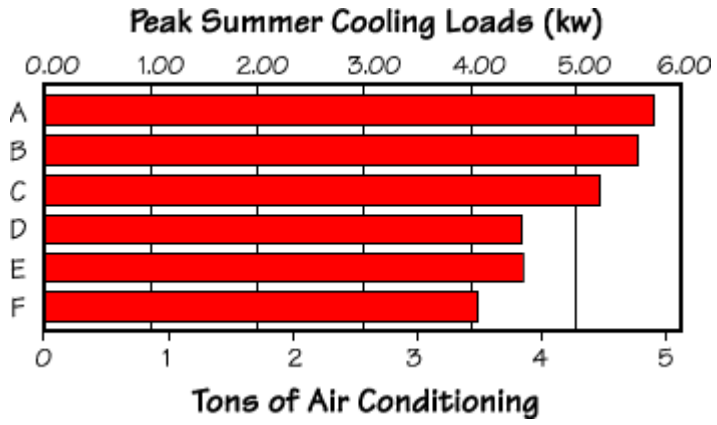
Precedent for a Maximum SHGC Requirement in Climate Zone 4.

DOE/EPA's ENERGY STAR for Windows program has included an SHGC maximum requirement in the North-Central zone (roughly *IECC* climate zone 4) for a number of years. The most recent Energy Star qualification criteria, released in April 2009, requires a maximum 0.40 SHGC in the North-Central zone. The 2009 American Recovery and Reinvestment Act (Stimulus Bill) goes even further, requiring a maximum 0.30 SHGC nationwide for the enhanced window tax credit. Chapter 5 of the *IECC* (Commercial Energy Efficiency) already requires a maximum SHGC of 0.40 in climate zones 4-6. ASHRAE 90.1-2007 also contains the same requirement in climate zones 4-6 for both high rise residential and commercial construction. See Table 5.5-4. It is time for the residential chapters of the *IECC* and *IRC* to move in the same direction.

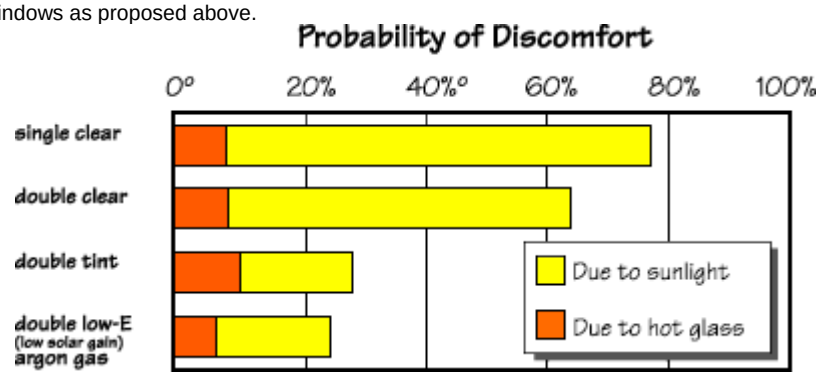
The proposed change would still allow a great deal of flexibility. The SHGC requirements in both ENERGY STAR and the Stimulus Bill apply to *each window*, as opposed to the area-weighted average flexibility allowed by the *IECC*. This proposal sets the *weighted average* at 0.40 SHGC, a level already achieved by most products on the market in climate zone 4.

Reduction of Peak Electricity Demand and Potential Energy Cost Savings.
Every state in climate zone 4 is "summer-peaking," meaning that demand for electricity is highest on the hottest summer days. Electricity during peaking times is scarce and exponentially more expensive on the open market. States have been forced to build and site new peaking power plants (or to revive retired, dirty plants) for the sake of keeping up with peak demand, due in large part to the increased use of air conditioners in new construction.

Windows with low SHGC are an obvious answer to this growing problem. The following chart, developed by the U.S. Department of Energy's Lawrence Berkley National Laboratory (LBNL), which is found on the Efficient Window Collaborative (EWC) website (www.efficientwindows.org), shows the potential for saving peak demand (and tons of HVAC) for different window types. Window E is a higher solar gain low-e double-pane window that meets the current U-factor requirement in climate zone 4. Window F is the low SHGC, low U-factor window that would meet the current U-factor requirement plus the SHGC maximum of this proposal. The reduction in peak cooling load is nearly half of a kW, reducing by almost a half ton the size of the air conditioning unit. As is readily apparent, improved windows will lead to smaller HVAC sizes (with lower costs to the homeowner) and lower peak cooling loads (saving the state from building additional peak capacity).



Similarly, the following chart shows the probability of discomfort during summer from sunlight and hot glass. The summertime probability of discomfort ranges from over 60% with double clear (which is currently allowed in climate zone 4 under the UA trade-off and performance paths) to almost 20% with low SHGC windows as proposed above.



Windows with low SHGC will reduce the volatility of temperatures in the home, which will reduce occupant discomfort and make it less likely that occupants will need to adjust the thermostat and use more energy.

Construction Costs/Benefits of a Low SHGC Requirement in Climate Zone 4.

There should be no increased construction cost for moving to a low SHGC requirement in climate zone 4. Climate zone 4 already requires a 0.35 U-factor window. Such a window, by definition, already incorporates low-e glass. Meeting a 0.40 SHGC merely requires that the low-e coating be designed to limit low solar gain, a feature that adds no additional cost.

On the other hand, use of lower SHGC windows will result in construction cost savings from properly downsizing the HVAC equipment.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-13-T. 402.1.1-T. N1102.1.DOC

EC43–09/10
Table 402.1.1, Table N1102.1

Proponent: Thomas S. Zaremba, representing Pilkington North America, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC. PART II WILL BE HEARD BY THE IRC B/E COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I- IBC ENERGY CONSERVATION

Revise as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b]	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[i]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
1	1.2	0.75	0.30 max	30	13	3/4	13	0	0	0
2	0.65[j]	0.75	0.30 max	30	13	4/6	13	0	0	0
3	0.50[j]	0.65	0.30 max	30	13	5/8	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	0.30 min[k] ~~NR~~	38	20 or 13+5[h]	13/17	30[g]	10/13	10, 2 ft	10/13
6	0.35	0.60	0.30 min[k] ~~NR~~	49	20 or	15/19	30[g]	15/19	10, 4 ft	10/13

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b]	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[i]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
					13+5[h]					
7 and 8	0.35	0.60	0.30 min[k] ~~NR~~	49	21	19/21	38[g]	15/19	10, 4 ft	10/13

For S1: 1 foot = 304.8 mm.

a. *R*-values are minimums. *U*-factors are maximums. ~~and~~ SHGC are maximums("max") or minimums ("min") as noted. R-19 batts compressed into a nominal 2x6 framing cavity such that the *R*-value is reduced by R-1 or more shall be marked with the compressed batt *R*-value in addition to the full thickness *R*-value.
b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
c. "15/19" means R-15 continuous insulated sheathing on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulated sheathing on the interior or exterior of the home. "10/13" means R-10 continuous insulated sheathing on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.
d. R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less in Zones 1 through 3 for heated slabs.
e. There are no SHGC requirements in the Marine Zone.
f. Basement wall insulation is not required in warm-humid locations as defined by Figure 301.1 and Table 301.1.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, insulating sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.
i. The second *R*-value applies when more than half the insulation is on the interior of the mass wall.
j. For impact rated fenestration complying with Section R301.2.1.2 of the *International Residential Code* or Section 1608.1.2 of the *International Building Code*, the maximum *U*-factor shall be 0.75 in Zone 2 and 0.65 in Zone 3.
k. To determine compliance of unlabeled fenestration with min SHGC, the default SHGC shall be 0.27, and use of default SHGC values from Table 303.1.3(3) shall not be permitted.

PART II- IRC BUILDING/ENERGY

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[k] [i]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
1	1.2	0.75	0.30 max0.35[j]	30	13	3/4	13	0	0	0
2	0.65[i]	0.75	0.30max 0.35[j]	30	13	4/6	13	0	0	0
3	0.50[i]	0.65	0.30 max 0.35[e, j]	30	13	5/8	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	0.30 min [k] NR	38	20 or 13+5[h]	13/17	30[f]	10/13	10, 2 ft	10/13
6	0.35	0.60	0.30 min [k] NR	49	20 or 13+5[h]	15/19	30[g]	10/13	10, 4 ft	10/13
7 and 8	0.35	0.60	0.30 min[k] NR	49	21	19/21	30[g]	10/13	10, 4 ft	10/13

a. *R*-values are minimums. *U*-factors are maximums. and SHGC are maximums ("max") or minimums ("min") as noted. R-19 batts compressed into a nominal 2x6 framing cavity such that the *R*-value is reduced by R-1 or more shall be marked with the compressed batt *R*-value in addition to the full thickness *R*-value.
b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
c. The first *R*-value applies to continuous insulation, the second to framing cavity insulation; either insulation meets the requirement.
d. R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less, in zones 1 through 3 for heated slabs.
e. There are no SHGC requirements in the Marine Zone.
f. Basement wall insulation is not required in warm-humid locations as defined by Figure N1101.2 and Table N1101.2.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. "13+5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25% or less of the exterior, R-5 sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25% of exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.
i. For impact-rated fenestration complying with Section R301.2.1.2, the maximum *U*-factor shall be 0.75 in zone 2 and 0.65 in zone 3.
i j. For impact-resistant fenestration complying with Section R301.2.1.2 of the *International Residential Code*, or Section 1608.1.2 of the *International Building Code*, the maximum U-factor shall be 0.75 in Zone 2 and 0.65 in Zone 3SHGC shall be 0.40.
j ~~k~~. The second *R*-value applies when more than half the insulation is on the interior.
k. To determine compliance of unlabeled fenestration with min SHGC, the default SHGC shall be 0.27, and use of default SHGC values from Table N1101.5(3)shall not be permitted.

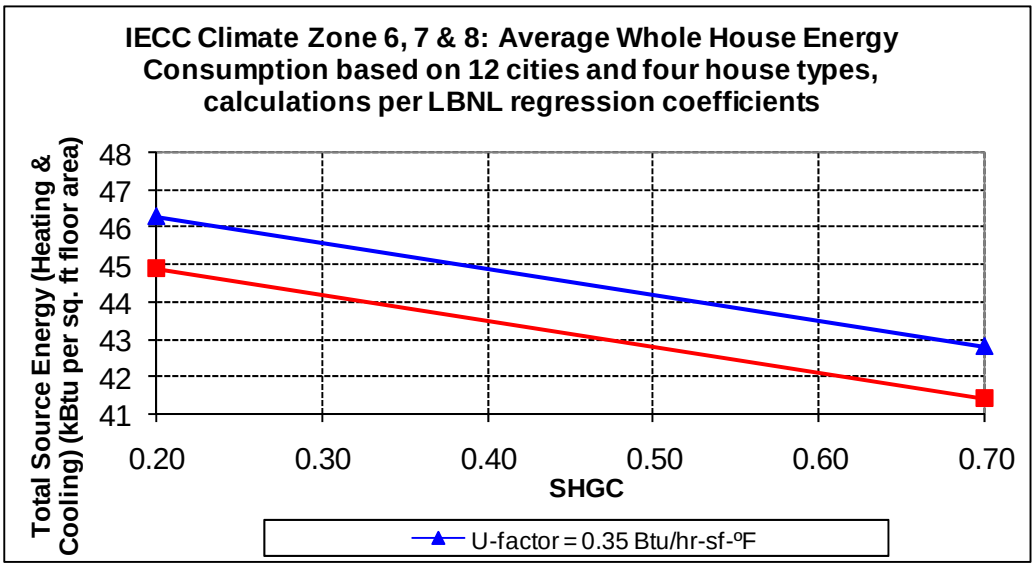
Reason:
Part I- The trend in prescriptive SHGCs in the south is clearly downward. The 2006 IECC prescribed a 0.40 SHGC in zones 1-3; the 2007 Supplement lowered that to 0.37; and it was lowered again in 2009 to 0.30 or lower.

For its full useful life, a 0.40 SHGC window means that it will permanently blocks 60% of the sun's energy while allowing 40% of its energy to pass into a home. Reducing solar gain from 40% to 30% by lowering SHGC to 0.30 makes sense in the south because southern climates are cooling dominated and reducing solar gain in the south reduces cooling loads which saves energy.
The Department of Energy is pressing for even lower SHGC windows in the south. Beginning on January 4, 2010, only windows with a 0.27 or lower SHGC will qualify for DOE's Energy Star Windows Program in zones 1 and 2. These windows will reduce solar gain to only 27%. Since consumers respond to the Energy Star label on windows, DOE's decision to qualify only 0.27 SHGC windows in the south will drive manufacturers in the direction of marketing ultra-low SHGC windows.

This proposal is intended to close a loop hole being created by lowering prescriptive SHGCs in the south, while leaving a "NR" or "No Rating" for SHGC in the north. Unless this loophole is closed, it will result in the code allowing ultra-low SHGC southern windows to be used in the north. This will reduce, rather than increase, energy efficiency. In that regard, window manufacturers distribute products through national networks. That means the current "NR" rating for SHGC in the north will permit national networks not only to market ultra-low SHGC windows in the south, where they make sense, but also in the north where no SHGC requirement currently exists. If ultra-low SHGC windows intended for the south are used in the north, it will increase annual energy consumption, rather than conserve it.

When windows with 0.30 or lower SHGCs are installed in homes in northern climates, they permanently block 70% or more of the sun's free energy from heating those homes all winter long. This means northern homes with low SHGC windows will necessarily burn more fossil fuels in the winter to compensate for the solar gain lost through the use of low SHGC windows. This, in turn, results in increased energy consumption, not increased energy efficiency.

The increase in energy consumption attributable to the use of low SHGC windows in the north is illustrated in the following chart which depicts total energy consumption of four different house types found in 12 northern cities in climate zones 6-8. (See bibliography for details). In simulating the whole house energy use depicted in these graphs, the U-factors were held constant at either 0.35 (blue line) or 0.30 (red line) while SHGC was increased from 0.20 to 0.70. (A 0.20 SHGC window only allows 20% of the sun's energy to enter a home while a 0.70 SHGC window allows 70%). These simulations show that when higher SHGC windows are used in northern homes, the sun's energy significantly reduces a home's total energy use. Conversely, when lower SHGC windows are used, it increases a home's total energy use:



The sun's energy is free and renewable. Using low SHGC windows in the south saves energy. However, using those same windows in the north will increase energy consumption. The minimum SHGC proposed here is intended only to eliminate the northern use of ultra-low SHGC windows mandated in the south. If adopted, this proposal will save energy in the north by using the free and renewable energy of the sun.
Part II- This proposal would make two types of changes: 1- it will harmonize the fenestration provisions of Table N1102.1 of the IRC with the fenestration provisions of Table 402.1.1 of the IECC, and 2- it will add a minimum SHGC in climate zones 5-8. The reasons for harmonizing the fenestration provisions of the IRC with the IECC are obvious and require no further explanation. The reasons supporting the addition of a minimum SHGC in the northern climate zones follow.

The trend in prescriptive SHGCs in the south is clearly downward. In 2006, the IECC prescribed a 0.40 SHGC in zones 1-3; the 2007 Supplement lowered that to 0.37; and it was lowered, again, in 2009 to 0.30 or lower. To harmonize the IRC's southern SHGCs with the 2009 IECC, this proposal lowers SHGC in climate zones 1 through 3 from 0.35 to 0.30.

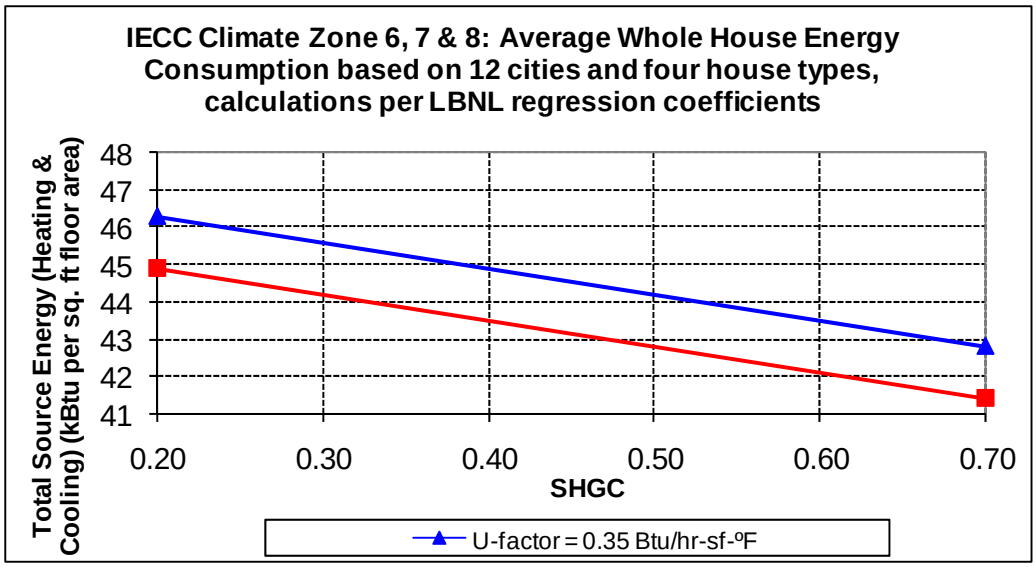
For its entire useful life, a 0.40 SHGC window will permanently block 60% of the sun's energy while allowing 40% of its energy to pass into a home. Reducing solar gain from 40% to 30% by lowering SHGC from 0.40 to 0.30 makes sense in the south because southern climates are cooling dominated and reducing solar gain in the south reduces cooling loads which saves energy.

The Department of Energy is pressing for even lower SHGC windows in the south. Beginning on January 4, 2010, only windows with a 0.27 or lower SHGC will qualify for DOE's Energy Star Windows Program in zones 1 and 2. These windows will reduce solar gain to only 27%. Since consumers respond to the Energy Star label on windows, DOE's decision to qualify only 0.27 SHGC windows in the south will drive manufacturers in the direction of marketing ultra-low SHGC windows.

This proposal is intended to close a loop hole created by lowering prescriptive SHGCs in the south, while leaving a "NR" or "No Rating" for SHGC in the north. Unless this loophole is closed, it will result in the code allowing ultra-low SHGC southern windows to be used in the north. This will reduce, rather than increase, energy efficiency. In that regard, window manufacturers distribute products through national networks. That means the current "NR" rating for SHGC in the north will permit these national networks not only to market ultra-low SHGC windows in the south, where they make sense, but also in the north where no SHGC requirement currently exists. If ultra-low SHGC windows intended for the south are used in the north, it will increase annual energy consumption, rather than conserve it.

When windows with 0.30 or lower SHGCs are installed in homes in northern climates, they permanently block 70% or more of the sun's free energy from heating those homes all winter long. This means northern homes with low SHGC windows will necessarily burn more fossil fuels in the winter to compensate for the solar gain lost through the use of low SHGC windows. This, in turn, results in increased energy consumption, not increased energy efficiency.

The increase in energy consumption attributable to the use of low SHGC windows in the north is illustrated in the following chart which depicts total energy consumption of four different house types found in 12 northern cities in climate zones 6-8. (See bibliography for details). In simulating the whole house energy use depicted in these graphs, the U-factors were held constant at either 0.35 (blue line) or 0.30 (red line) while SHGC was increased from 0.20 to 0.70. (A 0.20 SHGC window only allows 20% of the sun's energy to enter a home while a 0.70 SHGC window allows 70%). These simulations show that when higher SHGC windows are used in northern homes, the sun's energy significantly reduces a home's total energy use. Conversely, when lower SHGC windows are used, it increases a home's total energy use:



The sun's energy is free and renewable. Using low SHGC windows in the south saves energy. However, using those same windows in the north will increase energy consumption. The minimum SHGC proposed here is intended only to eliminate the northern use of ultra-low SHGC windows mandated in the south. If adopted, this proposal will save energy in the north by using the free and renewable energy of the sun.

Bibliography: The graphs were developed using regression equations developed by Lawrence Berkley National Laboratories (LBNL) for DOE in connection with the development of criteria for Energy Star Windows. These reports can be found at: http://windows.lbl.gov/EStar2008/. The graphs display averages of four housing types, (1) existing Furnace – one story, (2) existing Furnace – two story, (3) new Furnace – one story, and (4) new furnace – two story in these twelve (12) northern cities: (1) ME, Portland, (2) MI, Houghton, (3) MN, Duluth, (4) MN, International Falls, (5) MN, Minneapolis, (6) ND, Bismarck, (7) NH, Concord, (8) RI, Providence, (9) SD, Pierre, (10) VT, Burlington, (11) WI, Madison, and (12) WY, Cheyenne. While the annual energy savings resulting from higher SHGC windows is less in climate zone 5 than it is in climate zones 6-8, it still exists.

PART I - IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II - IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Zaremba-EC-3-T. 402.1.1; RE-2-T. N1102.1

EC44-09/10
Table 402.1.1

Proponent: Ken Sagan, representing National Association of Home Builders (NAHB)

Revise table as follows:

TABLE 402.1.1

INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b]	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[i]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL[c] SPACE WALL *R*-VALUE
1	1.20	0.75	~~0.30~~ 0.40	30	13	3 / 4	13	0	0	0
2	0.65j	0.75	~~0.30~~ 0.40	30	13	4 / 6	13	0	0	0
3	0.50j	0.60	~~0.30~~ 0.40	30	13	5 / 8	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5 / 10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5[h]	13 / 17	30[g]	10/13	10, 2ft	10/13
6	0.35	0.60	NR≥	49	20 or 13+5[h]	15 / 19	30[g]	15/19	10, 4ft	10/13
7 and 8	0.35	0.60	NR	49	21	19 / 21	38[g]	15/19	10, 4ft	10/13

(No change to footnotes)

Reason: The purpose of this proposal is to retain the Solar Heat Gain Coefficient (SHGC) of the 2006 IECC and provide a more realistic target that can be compliant with which the products that are readily available in climate zones 1, 2 & 3 can comply. The current market produces very few windows with a solar heat gain coefficient (SHGC) less than 0.35. This makes it difficult for builders to comply with this requirement in the referenced zones. Moreover, there are even fewer doors manufactured with glazing that meets the 0.30 SHGC requirement.

Another concern is when the SHGC is lowered, less daylight passes through the window. This will cause the consumer to demand a greater number of windows or more interior lighting, thus negating the energy savings perceived to be found in the 2009 IECC. The 2009 IECC causes more energy to be consumed, instead of conserving energy, as is the intent of the code.

The lower SHGC's referenced by the IECC introduced a proprietary requirement that severely limits the number of manufacturers that can supply the glass required.

Retaining the original SHGC requirements of the 2006 IECC permits all types of window glass to remain competitive and benefit the builder with lower costs, and provide homeowners with available products that are not limited to a few manufacturers.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: SAGAN-EC-3-T. 402.1.1

EC45–09/10
Tables 402.1.1 and 402.1.3; IRC Tables N1102.1 and N1102.1.2

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise tables as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHTb U-FACTOR	GLAZED FENESTRATION SHGCb, [e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R-VALUE	BASEMENTc WALL R-VALUE	SLABd R-VALUE & DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.30	30	13	3/4	13	0	0	0
2	0.65j	0.75	0.30	~~30~~ 38	13	4/6	13	0	0	0
3	0.50j	0.65	0.30	~~30~~ 38	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	0.60	NR	~~38~~ 49	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	~~38~~ 49	20 or 13+5h	13/17	30g	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13+5h	15/19	30g	15/19	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	38g	15/19	10, 4 ft	10/13

(Footnotes remain unchanged)

TABLE 402.1.3
EQUIVALENT U-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR[d]	CRAWL SPACE WALL U-FACTOR[c]
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	~~0.035~~ 0.030	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	~~0.035~~ 0.030	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	0.60	~~0.030~~ 0.026	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	~~0.030~~ 0.026	0.057	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.057	0.060	0.033	0.050	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.028	0.050	0.065

(Footnotes remain unchanged)

PART II – IRC BUILDING/ENERGY

Revise tables as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[k]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.35j	30	13	3/4	13	0	0	0
2	0.65i	0.75	0.35j	~~30~~ 38	13	4/6	13	0	0	0
3	0.50i	0.65	0.35e, j	~~30~~ 38	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	0.60	NR	~~38~~ 49	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	~~38~~ 49	20 or 13 + 5h	13/17	30f	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13 + 5h	15/19	30g	10/13	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	30g	10/13	10, 4 ft	10/13

(Footnotes remain unchanged)

TABLE N1102.1.2
EQUIVALENT U-FACTORS[a]

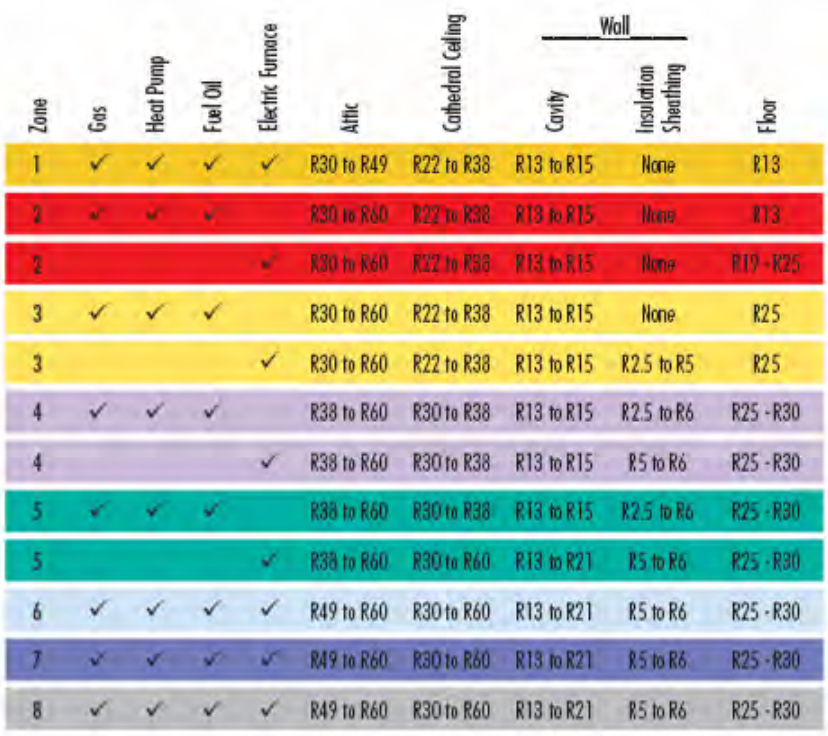
CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	~~0.035~~ 0.030	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	~~0.035~~ 0.030	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	0.60	~~0.030~~ 0.026	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	~~0.030~~ 0.026	0.060	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.060	0.060	0.033	0.059	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.033	0.059	0.065

(Footnotes remain unchanged)

Reason: This code proposal is intended to improve thermal envelope efficiency through improved insulation in ceilings in climate zones 2-5. These proposed improvements are reasonable, producing savings in total heating, cooling and hot water energy ranging from 0.8% to 1.4% in these climate zones. These savings are significant and when coupled with other proposed code modifications can lead to significant overall energy savings for homes. Moreover, unlike many building components, ceiling insulation can last for the life of the building, delivering consistent energy savings far longer than most energy savings measures. The following table portrays estimated savings from these measures:

	Climate Zone 2	Climate Zone 3	Climate Zone 4	Climate Zone 4M	Climate Zone 5
Heating, Cooling, Hot Water Purchased Energy Cost Percent Savings	0.8%	1.0%	1.2%	1.4%	1.4%
Total Purchased Energy Cost Percent Savings (also including major appliances and lighting)	0.6%	0.8%	0.9%	1.1%	1.0%

The U.S. Department of Energy issued new recommendations for cost-effective insulation levels in new homes in early 2008. The R-values in this proposal are consistent with the recommendations for new construction as shown in the table below from the DOE.



Zone	Gas	Heat Pump	Fuel Oil	Electric Furnace	Attic	Cathedral Ceiling	Wall: Cavity	Wall: Insulation Sheathing	Floor
1	✓	✓	✓	✓	R30 to R49	R22 to R38	R13 to R15	None	R13
2	✓	✓	✓		R30 to R60	R22 to R38	R13 to R15	None	R13
2				✓	R30 to R60	R22 to R38	R13 to R15	None	R19 - R25
3	✓	✓	✓		R30 to R60	R22 to R38	R13 to R15	None	R25
3				✓	R30 to R60	R22 to R38	R13 to R15	R2.5 to R5	R25
4	✓	✓	✓		R38 to R60	R30 to R38	R13 to R15	R2.5 to R6	R25 - R30
4				✓	R38 to R60	R30 to R38	R13 to R15	R5 to R6	R25 - R30
5	✓	✓	✓		R38 to R60	R30 to R38	R13 to R15	R2.5 to R6	R25 - R30
5				✓	R38 to R60	R30 to R60	R13 to R21	R5 to R6	R25 - R30
6	✓	✓	✓	✓	R49 to R60	R30 to R60	R13 to R21	R5 to R6	R25 - R30
7	✓	✓	✓	✓	R49 to R60	R30 to R60	R13 to R21	R5 to R6	R25 - R30
8	✓	✓	✓	✓	R49 to R60	R30 to R60	R13 to R21	R5 to R6	R25 - R30

Source: http://www1.eere.energy.gov/consumer/tips/insulation.html

These modest, cost-effective savings are part of a larger package of proposals that together will get the IECC to the 30% improvement that national policymakers are seeking. Achieving this goal requires several modest improvements, in multiple components of the building. Recent energy price increases, despite softening effects of the current economic downturn, signal a new era of sharply higher energy costs. In addition, climate change policy is likely to be enacted before the 2012 IECC is published, and its effects will likely include further energy price increases This

proposal represents one of a set of reasonable and cost effective improvements that give states new options to increase the efficiency of their energy codes.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-6-T. 402.1.1-T. N1102.1

EC46–09/10

Table 402.1.1, Table 402.1.3, 402.2.1; IRC Table N1102.1, Table N1102.1.2, N1102.2.1

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHTb U-FACTOR	GLAZED FENESTRATION SHGCb, [e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R-VALUE	BASEMENTc WALL R-VALUE	SLABd R-VALUE & DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.30	30	13	3/4	13	0	0	0
2	0.65j	0.75	0.30	30	13	4/6	13	0	0	0
3	0.50j	0.65	0.30	30	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5h	13/17	30g	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13+5h	15/19	30g	15/19	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	~~49~~ 60	21	19/21	38g	15/19	10, 4 ft	10/13

(Footnotes remain unchanged)

TABLE 402.1.3
EQUIVALENT U-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR[d]	CRAWL SPACE WALL U-FACTOR[c]
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	0.035	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.057	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.057	0.060	0.033	0.050	0.065
7 and 8	0.35	0.60	~~0.026~~ 0.024	0.057	0.057	0.028	0.050	0.065

(Footnotes remain unchanged)

402.2.1 Ceilings with attic spaces. When Section 402.1.1 would require R-38 in the ceiling, R-30 shall be deemed to satisfy the requirement for R-38 wherever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Similarly R-38 shall be deemed to satisfy the requirements for R-49 or higher wherever the full height of uncompressed R-38 insulation extends over the wall top plate at the eaves. This reduction shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4.

PART II – IRC BUILDING/ENERGY

Revise as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[k]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.35j	30	13	3/4	13	0	0	0
2	0.65i	0.75	0.35j	30	13	4/6	13	0	0	0
3	0.50i	0.65	0.35e, j	30	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13 + 5h	13/17	30f	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13 + 5h	15/19	30g	10/13	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	~~49~~ 60	21	19/21	30g	10/13	10, 4 ft	10/13

(Footnotes remain unchanged)

TABLE N1102.1.2
EQUIVALENT U-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	0.035	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.060	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.060	0.060	0.033	0.059	0.065
7 and 8	0.35	0.60	~~0.026~~ 0.024	0.057	0.057	0.033	0.059	0.065

(Footnotes remain unchanged)

N1102.2.1 Ceilings with attic spaces. When Section N1102.1.1 would require R-38 in the ceiling, R-30 shall be deemed to satisfy the requirement for R-38 wherever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Similarly R-38 shall be deemed to satisfy the requirements for R-49 or higher wherever the full height of uncompressed R-38 insulation extends over the wall top plate at the eaves. This reduction shall not apply to the U-factor alternative approach in Section N1102.1.2 and the total UA alternative in Section N1102.1.3.

Reason: This code proposal is intended to improve thermal envelope efficiency through improved insulation in ceilings in climate zones 7 and 8. By increasing the ceiling insulation from R-49 to R-60 in climate zones 7 & 8 residential buildings can achieve approximately 0.6 to 0.7% purchased energy cost savings. These savings, especially coupled with other proposed code modifications can lead to significant overall energy savings for homes. Moreover, unlike many building components, ceiling insulation can last for the life of the building, delivering consistent energy savings far longer than many energy savings measures. Given that these climates are extremely cold, insulation measures are especially cost-effective.

	Climate Zone 7	Climate Zone 8
Heating, Cooling, Hot Water Purchased Energy Cost Percent Savings	1.0%	0.9%
Total Purchased Energy Cost Percent Savings (also including major appliances and lighting)	0.7%	0.6%

The U.S. Department of Energy issued new recommendations for cost-effective insulation levels in new homes in early 2008. The R-values proposed in here are consistent with those recommendations as shown in the table below from the DOE.

Zone	Gas	Heat Pump	Fuel Oil	Electric Furnace	Attic	Cathedral Ceiling	Wall		Floor
							Cavity	Insulation Sheathing	
1	✓	✓	✓	✓	R30 to R49	R22 to R38	R13 to R15	None	R13
2	✓	✓	✓		R30 to R60	R22 to R38	R13 to R15	None	R13
2				✓	R30 to R60	R22 to R38	R13 to R15	None	R19 - R25
3	✓	✓	✓		R30 to R60	R22 to R38	R13 to R15	None	R25
3				✓	R30 to R60	R22 to R38	R13 to R15	R2.5 to R5	R25
4	✓	✓	✓		R38 to R60	R30 to R38	R13 to R15	R2.5 to R6	R25 - R30
4				✓	R38 to R60	R30 to R38	R13 to R15	R5 to R6	R25 - R30
5	✓	✓	✓		R38 to R60	R30 to R38	R13 to R15	R2.5 to R6	R25 - R30
5				✓	R38 to R60	R30 to R60	R13 to R21	R5 to R6	R25 - R30
6	✓	✓	✓	✓	R49 to R60	R30 to R60	R13 to R21	R5 to R6	R25 - R30
7	✓	✓	✓	✓	R49 to R60	R30 to R60	R13 to R21	R5 to R6	R25 - R30
8	✓	✓	✓	✓	R49 to R60	R30 to R60	R13 to R21	R5 to R6	R25 - R30

Source: http://www1.eere.energy.gov/consumer/tips/insulation.html

These modest, cost-effective savings are part of a larger package of proposals that together will get the IECC to the 30% improvement that national policymakers are seeking. Achieving this goal requires several modest improvements, in multiple components of the building. Recent energy price increases, despite softening effects of the current economic downturn, signal a new era of sharply higher energy costs. In addition, climate change policy is likely to be enacted before the 2012 IECC is published, and its effects will likely include further energy price increases This proposal represents one of a set of reasonable and cost effective improvements that give states new options to increase the efficiency of their energy codes.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-7-T. 402.1.1-T. N1102.1

EC47–09/10

Table 402.1.1, Table 402.1.3, Table 402.2.5; IRC Table N1102.1, Table N1102.1.2, Table N1102.2.5

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise tables as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGCb, [e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE[h]	MASS WALL R-VALUE[i]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLABd R-VALUE & DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.30	30	13	3/4	13	0	0	0
2	0.65[j]	0.75	0.30	30	13	4/6	13	0	0	0
3	0.50[j]	0.65	0.30	30	~~13~~ 20 or 13 + 5	~~5/8~~ 8/13	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	NR	38	~~13~~ 20 or 13+5	~~5/10~~ 8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5[h]	13/17	30[g]	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13+5[h]	15/19	30[g]	15/19	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	38[g]	15/19	10, 4 ft	10/13

(Footnotes remain unchanged)

TABLE 402.1.3
EQUIVALENT U-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	WOOD FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR[d]	CRAWL SPACE WALL U-FACTOR[c]
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	0.035	~~0.082~~ 0.057	~~0.141~~ 0.098	0.047	0.091c	0.136
4 except Marine	0.35	0.60	0.030	~~0.082~~ 0.057	~~0.141~~ 0.098	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.057	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.057	0.060	0.033	0.050	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.028	0.050	0.065

(Footnotes remain unchanged)

TABLE 402.2.5
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION (R-VALUE)

WOOD FRAME R-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT R-VALUE[a]
Steel Truss Ceilings[b]	
R-30	R-38 or R-30 + 3 or R-26 + 5
R-38	R-49 or R-38 + 3
R-49	R-38 + 5
Steel Joist Ceilings[b]	
R-30	R-38 in 2 x 4 or 2 x 6 or 2 x 8 R-49 in any framing
R-38	R-49 in 2 x 4 or 2 x 6 or 2 x 8 or 2 x 10
Steel-Framed Wall	
R-13	R-13 + 5 or R-15 + 4 or R-21 + 3 or R-0 + 10
R-19	R-13 + 9 or R-19 + 8 or R-25 + 7
R-20	R-13+10 or R-19+8 or R-25+7
R-21	R-13 + 10 or R-19 + 9 or R-25 + 8
Steel Joist Floor	
R-13	R-19 in 2 x 6 R-19 + 6 in 2 x 8 or 2 x 10
R-19	R-19 + 6 in 2 x 6 R-19 + 12 in 2 x 8 or 2 x 10

(Footnotes remain unchanged)

PART II – IRC BUILDING/ENERGY

Revise tables as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC	CEILING R-VALUE	WOOD FRAME WALL R-VALUE [h]	MASS WALL R-VALUE[k]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.35[j]	30	13	3/4	13	0	0	0
2	0.65[i]	0.75	0.35[j]	30	13	4/6	13	0	0	0
3	0.50[i]	0.65	0.35[e, j]	30	~~13~~ 20 or 13+5	~~5/8~~ 8/13	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	NR	38	~~13~~ 20 or 13+5	~~5/10~~ 8/13	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13 + 5[h]	13/17	30[f]	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13 + 5[h]	15/19	30[g]	10/13	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	30[g]	10/13	10, 4 ft	10/13

(Footnotes remain unchanged)

TABLE N1102.1.2
EQUIVALENT U-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	WOOD FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	0.035	~~0.082~~ 0.057	~~0.141~~ 0.098	0.047	0.091c	0.136
4 except Marine	0.35	0.60	0.030	~~0.082~~ 0.057	~~0.141~~ 0.098	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.060	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.060	0.060	0.033	0.059	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.033	0.059	0.065

(Footnotes remain unchanged)

TABLE N1102.2.5
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION (R-VALUE)

WOOD FRAME R-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT R-VALUE[a]
Steel Truss Ceilings[b]	
R-30	R-38 or R-30 + 3 or R-26 + 5
R-38	R-49 or R-38 + 3
R-49	R-38 + 5
Steel Joist Ceilings[b]	
R-30	R-38 in 2 x 4 or 2 x 6 or 2 x 8 R-49 in any framing
R-38	R-49 in 2 x 4 or 2 x 6 or 2 x 8 or 2 x 10
Steel-Framed Wall	
R-13	R-13 + 5 or R-15 + 4 or R-21 + 3 or R-0 + 10
R-19	R-13 + 9 or R-19 + 8 or R-25 + 7
R-20	R-13+10 or R-19+8 or R-25+7
R-21	R-13 + 10 or R-19 + 9 or R-25 + 8

WOOD FRAME R-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT R-VALUE[a]
Steel Joist Floor	
R-13	R-19 in 2 x 6 R-19 + 6 in 2 x 8 or 2 x 10
R-19	R-19 + 6 in 2 x 6 R-19 + 12 in 2 x 8 or 2 x 10

(Footnotes remain unchanged)

Reason: This code proposal is intended to improve the thermal envelope efficiency through improved insulation in walls in climate zones 3 and 4. The table below illustrates the estimated energy cost savings from this measure in each climate zone. These savings in these zones are substantial and when coupled with other proposed code modifications can lead to significant overall energy savings for homes. Moreover, unlike many building components, wall insulation can last for the life of the building, delivering consistent energy savings far longer than many energy savings measures. In addition, it is difficult to add additional wall insulation after the home is constructed. As a result, the failure to adequately insulate the walls would impose needlessly higher energy costs on homeowners for decades to come.

	Climate Zone 3	Climate Zone 4
Heating, Cooling, Hot Water Purchased Energy Cost Percent Savings	5.5%	6.9%
Total Purchased Energy Cost Percent Savings (including appliances and lighting)	4.0%	5.2%

For wood frame walls, the specific values proposed for climate zones 3 and 4 match exactly current requirements for the Marine 4 climate zone and climate zones 5 and 6. As we work to increase the energy efficiency of the code, it is reasonable to extend these prescriptive requirements that are already being met in these colder climate zones to climate zones 3 and 4.

It is important to remember that the builder need not install the specific wall insulation that is designated by the prescriptive path. Compliance with thermal envelope criteria can be achieved through several paths:

1. Any combination of cavity and sheathing—Builders can easily combine various types of batt and blown cavity insulation with continuous sheathing to achieve any of these nominal R-values. .
2. UA tradeoffs—Builders can calculate an average U-factor for the envelope, and adjust any component—walls, windows, ceilings, or floors—to adjust wall R-values to desired levels. Small changes in window specifications, for example, can easily allow builders to use a wide range of insulation solutions
3. Performance path—Builders can trade off wall insulation against a wide range of other measures.

Because of this built-in flexibility in the compliance options, as well as the fact that these requirements currently exist in three climate zones, there is no basis to claim that the insulation levels in this code change proposal are impractical or prevent competition. They are simply modest improvements in wall performance that are needed to achieve a larger overall performance improvement in American homes.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-10-T. 402.1.1-T. N1102.1

EC48–09/10

Table 402.1.1, Table 402.1.3, Table 402.2.5; IRC Table N1102.1, Table N1102.1.2, Table N1102.2.5

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise tables as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGCb, [e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE[h]	MASS WALL R-VALUE[i]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLABd R-VALUE & DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.30	30	13	3/4	13	0	0	0
2	0.65[j]	0.75	0.30	30	13	4/6	13	0	0	0
3	0.50[j]	0.65	0.30	30	13	5/8	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5[h]	13/17	30[g]	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20+5 or 13+10~~5~~[h]	15/~~19~~ 20	30[g]	15/19	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	20+5 or 13+10~~-21~~	19/21	38[g]	15/19	10, 4 ft	10/13

(Footnotes remain unchanged)

TABLE 402.1.3
EQUIVALENT U-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR[d]	CRAWL SPACE WALL U-FACTOR[c]
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	0.035	0.082	0.141	0.047	0.091[c]	0.136
4 except Marine	0.35	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.057	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.048 ~~57~~	0.060	0.033	0.050	0.065
7 and 8	0.35	0.60	0.026	0.0~~48~~ 57	0.057	0.028	0.050	0.065

(Footnotes remain unchanged)

TABLE 402.2.5
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION (R-VALUE)

WOOD FRAME R-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT R-VALUE[a]
Steel Truss Ceilings[b]	
R-30	R-38 or R-30 + 3 or R-26 + 5
R-38	R-49 or R-38 + 3
R-49	R-38 + 5
Steel Joist Ceilings[b]	
R-30	R-38 in 2 x 4 or 2 x 6 or 2 x 8 R-49 in any framing
R-38	R-49 in 2 x 4 or 2 x 6 or 2 x 8 or 2 x 10
Steel-Framed Wall	
R-13	R-13 + 5 or R-15 + 4 or R-21 + 3 or R-0 + 10
R-19	R-13 + 9 or R-19 + 8 or R-25 + 7
R-20	R-13+10 or R-19+8 or R-25+7
R-21	R-13 + 10 or R-19 + 9 or R-25 + 8
R-20+5	R-13+15 or R-19+14 or R-25+13

WOOD FRAME R-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT R-VALUE[a]
Steel Joist Floor	
R-13	R-19 in 2 x 6 R-19 + 6 in 2 x 8 or 2 x 10
R-19	R-19 + 6 in 2 x 6 R-19 + 12 in 2 x 8 or 2 x 10

(Footnotes remain unchanged)

PART II – IRC BUILDING/ENERGY

Revise tables as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC	CEILING R-VALUE	WOOD FRAME WALL R-VALUE[h]	MASS WALL R-VALUE[k]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.35[j]	30	13	3/4	13	0	0	0
2	0.65[i]	0.75	0.35[j]	30	13	4/6	13	0	0	0
3	0.50[i]	0.65	0.35[e, j]	30	13	5/8	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13 + 5h	13/17	30[f]	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20+5 or 13+10~~5~~[h]	15/~~19~~ 20	30[g]	10/13	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	20+5 or 13+10-~~21~~	19/21	30[g]	10/13	10, 4 ft	10/13

(Footnotes remain unchanged)

TABLE N1102.1.2
EQUIVALENT U-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	0.035	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.060	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.048 ~~60~~	0.060	0.033	0.059	0.065
7 and 8	0.35	0.60	0.026	0.048 ~~57~~	0.057	0.033	0.059	0.065

(Footnotes remain unchanged)

TABLE N1102.2.5
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION (R-VALUE)

WOOD FRAME R-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT R-VALUE[a]
Steel Truss Ceilings[b]	
R-30	R-38 or R-30 + 3 or R-26 + 5
R-38	R-49 or R-38 + 3
R-49	R-38 + 5
Steel Joist Ceilings[b]	

WOOD FRAME R-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT R-VALUE[a]
R-30	R-38 in 2 x 4 or 2 x 6 or 2 x 8 R-49 in any framing
R-38	R-49 in 2 x 4 or 2 x 6 or 2 x 8 or 2 x 10
Steel-Framed Wall	
R-13	R-13 + 5 or R-15 + 4 or R-21 + 3 or R-0 + 10
R-19	R-13 + 9 or R-19 + 8 or R-25 + 7
R-20	R-13+10 or R-19+8 or R-25+7
R-21	R-13 + 10 or R-19 + 9 or R-25 + 8
R-20+5	R-13+15 or R-19+14 or R-25+13
Steel Joist Floor	
R-13	R-19 in 2 x 6 R-19 + 6 in 2 x 8 or 2 x 10
R-19	R-19 + 6 in 2 x 6 R-19 + 12 in 2 x 8 or 2 x 10

(Footnotes remain unchanged)

Reason: This code proposal is intended to improve the thermal envelope efficiency through improved insulation in walls in climate zones 6, 7 and 8. The table below illustrates the estimated energy cost savings from this measure in each climate zone. These savings are significant and when coupled with other proposed code modifications can lead to significant overall energy savings for homes. Moreover, unlike many building components, wall insulation can last for the life of the building, delivering consistent energy savings far longer than many energy savings measures. In addition, it is difficult to add additional wall insulation after the home is constructed. As a result, the failure to adequately insulate the walls would impose needlessly higher energy costs on homeowners for decades to come.

	Climate Zone 6	Climate Zone 7	Climate Zone 8
Heating, Cooling, Hot Water Purchased Energy Cost Percent Savings	3.5%	3.6%	3.8%
Total Purchased Energy Cost Percent Savings (including appliances and lighting)	2.7%	2.7%	3.0%

As we work to increase the energy efficiency of the code, it is reasonable to raise the bar and increase current prescriptive requirements for these coldest climate zones.

It is important to remember that the builder need not install the specific wall insulation that is designated by the prescriptive path. Compliance with thermal criteria can be achieved through several paths:

1. Any combination of cavity and sheathing—Builders can easily combine various types of batt and blown cavity insulation with continuous sheathing to achieve any of these nominal R-values. .
2. UA tradeoffs—Builders can calculate an average U-factor for the envelope, and adjust any component—walls, windows, ceilings, or floors—to adjust wall R-values to desired levels. Small changes in window specifications, for example, can easily allow builders to use a wide range of insulation solutions
3. Performance path—Builders can trade off wall insulation against a wide range of other measures.

Because of this built-in flexibility in compliance options, there is no basis to claim that the insulation levels in this public comment are impractical, not cost-effective, or prevent competition. They are simply modest improvements in wall performance that are needed to achieve a larger overall performance improvement in American homes.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

PART II – IRC BUILDING/ENERGY

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: PRINDLE-EC-11-T. 402.1.1-T. N1102.1

EC49–09/10
Table 402.1.1, Table 402.1.3

Proponent: Ken Sagan, representing National Association of Home Builders (NAHB)

Revise tables as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b]	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[i]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] \ *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
1	1.20	0.75	0.30	30	13	3 / 4	13	0	0	0
2	0.65[j]	0.75	0.30	30	13	4 / 6	13	0	0	0
3	0.50[j]	0.60	0.30	30	13	5 / 8	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5 / 10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	~~20~~ 19or 13+5[h]	13 / 17	30[g]	10/13	10, 2ft	10/13
6	0.35	0.60	NR≥	49	~~20~~ 19or 13+5[h]	15 / 19	30[g]	15/19	10, 4ft	10/13
7 and 8	0.35	0.60	NR	49	21	19 / 21	38[g]	15/19	10, 4ft	10/13

(Footnotes remain unchanged)

TABLE 402.1.3
EQUIVALENT U-FACTORS[a]

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.75	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.65	0.65	0.035	0.082	0.141	0.047	0.360	0.136
4 except Marine	0.40	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	~~0.057~~ 0.060	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	~~0.057~~ 0.060	0.060	0.033	0.050	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.033	0.050	0.065

(Footnotes remain unchanged)

Reason: This proposal will retain the original requirements of the 2006 IECC, and will allow multiple products to be used to insulate a home. Permitting all types of insulation to remain competitive will benefit the builder and home owner with lower construction costs.

The increased stringency of the 2009 IECC limits the number of insulation products that were previously available, and thus fails to adequately address all primary building materials in a fair and equitable manner. The blown cellulose and the spray foam used in residences can achieve R-19 in a 2x6 wall cavity but do not typically achieve R-20. Although cellulose and spray foam do not achieve the R-20, they have been proven to be effective in reducing air infiltration and should be considered viable options.

Air infiltration can account for 30% of a building's heating and cooling costs and contributes to problems with moisture and air quality. Reducing the infiltration can significantly cut annual heating and cooling costs, improve building durability and create a healthier indoor environment.

The change to the 2009 IECC excludes products that are widely used in the construction industry and would adversely affect the cost of construction. This change eliminates materials that have a proven track record of providing energy conservation, thus making it economically unreasonable and creating a negative financial impact.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: SAGAN-EC-4-T. 402.1.1-T. 402.1.3

EC50–09/10

Table 402.1.1, Table 402.1.3; IRC Table N1102.1, Table N1102.1.2

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHTb U-FACTOR	GLAZED FENESTRATION SHGCb, [e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R-VALUE	BASEMENTc WALL R-VALUE	SLABd R-VALUE & DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.30	30	13	3/4	13	0	0	0
2	0.65j	0.75	0.30	30	13	4/6	13	0	0	0
3	0.50j	0.65	0.30	30	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5h	13/17	30g	~~10/13~~ 15/19	10, 2 ft	~~10/13~~ 15/19
6	0.35	0.60	NR	49	20 or 13+5h	15/19	30g	15/19	10, 4 ft	~~10/13~~ 15/19
7 and 8	0.35	0.60	NR	49	21	19/21	38g	15/19	10, 4 ft	~~10/13~~ 15/19

(Footnotes remain unchanged)

TABLE 402.1.3
EQUIVALENT U-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR[d]	CRAWL SPACE WALL U-FACTOR[c]
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	0.035	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.057	0.082	0.033	~~0.059~~ 0.050	~~0.065~~ 0.055
6	0.35	0.60	0.026	0.057	0.060	0.033	0.050	~~0.065~~ 0.055
7 and 8	0.35	0.60	0.026	0.057	0.057	0.028	0.050	~~0.065~~ 0.055

(Footnotes remain unchanged)

PART II – IRC BUILDING/ENERGY

Revise as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT[b] U-FACTOR	GLAZED FENESTRATION SHGC	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[k]	FLOOR R-VALUE	BASEMENT[c] WALL R-VALUE	SLAB[d] R-VALUE AND DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.35j	30	13	3/4	13	0	0	0
2	0.65i	0.75	0.35j	30	13	4/6	13	0	0	0
3	0.50i	0.65	0.35e, j	30	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13 + 5h	13/17	30f	~~10/13~~ 15/19	10, 2 ft	~~10/13~~ 15/19
6	0.35	0.60	NR	49	20 or 13 + 5h	15/19	30g	~~10/13~~ 15/19	10, 4 ft	~~10/13~~ 15/19
7 and 8	0.35	0.60	NR	49	21	19/21	30g	~~10/13~~ 15/19	10, 4 ft	~~10/13~~ 15/19

(Footnotes remain unchanged)

TABLE N1102.1.2
EQUIVALENT U-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	0.035	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.060	0.082	0.033	~~0.059~~ 0.050	~~0.065~~ 0.055
6	0.35	0.60	0.026	0.060	0.060	0.033	~~0.059~~ 0.050	~~0.065~~ 0.055
7 and 8	0.35	0.60	0.026	0.057	0.057	0.033	~~0.059~~ 0.050	~~0.065~~ 0.055

(Footnotes remain unchanged)

Reason: This code proposal is intended to improve thermal envelope efficiency through improved insulation in foundations, including both basements and crawlspaces, in the colder climates. The savings from this proposal, especially when coupled with other proposed code modifications can lead to significant overall energy savings for homes. Moreover, unlike many building components, foundation insulation can last for the life of the building, and is harder to install after new construction is complete than other building components. This helps in delivering consistent energy savings far longer than most energy savings measures. The following table portrays estimated savings from these measures:

	Basement Climate Zone 5	Basement Climate Zone 6	Basement Climate Zone 7	Basement Climate Zone8	Crawlspace Climate Zone 5	Crawlspace Climate Zone 6	Crawlspace Climate Zone 7	Crawlspace Climate Zone 8
Heating, Cooling, Hot Water Purchased Energy Cost Percent Savings	0.9%	0.9%	1.1%	0.9%	0.3%	0.3%	0.3%	0.3%
Total Purchased Energy Cost Percent Savings (also including major appliances and lighting)	0.7%	0.7%	0.8%	0.7%	0.2%	0.2%	0.3%	0.2%

These modest, cost-effective savings are part of a larger package of proposals that together will get the IECC to the 30% improvement that national policymakers are seeking. Achieving this goal requires several modest improvements, in multiple components of the building. Recent

energy price increases, despite softening effects of the current economic downturn, signal a new era of sharply higher energy costs. In addition, climate change policy is likely to be enacted before the 2012 IECC is published, and its effects will likely include further energy price increases This proposal represents one of a set of reasonable and cost effective improvements that give states new options to increase the efficiency of their energy codes.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

PART II – IRC BUILDING/ENERGY

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: PRINDLE-EC-8-T. 402.1.1-T. N1102.1.DOC

EC51–09/10
Table 402.1.1, Table 402.1.3

Proponent: Ken Sagan, representing National Association of Home Builders (NAHB)

Revise tables as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTOR[b]	SKYLIGHTb U-FACTOR	GLAZED FENESTRATION SHGCb, [e]	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE[i]	FLOOR R-VALUE	BASEMENTc WALL R-VALUE	SLABd R-VALUE & DEPTH	CRAWL SPACE[c] WALL R-VALUE
1	1.2	0.75	0.30	30	13	3/4	13	0	0	0
2	0.65j	0.75	0.30	30	13	4/6	13	0	0	0
3	0.50j	0.65	0.30	30	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5h	13/17	30g	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13+5h	15/19	30g	~~15/19~~ 10/13	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	38g	~~15/19~~ 10/13	10, 4 ft	10/13

(No change to footnotes)

TABLE 402.1.3
EQUIVALENT U-FACTORS[a]

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR[b]	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR[d]	CRAWL SPACE WALL U-FACTOR[c]
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	0.035	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.057	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.057	0.060	0.033	~~0.050~~ 0.059	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.028	~~0.050~~ 0.059	0.065

(Footnotes remain unchanged)

Reason: The purpose of this proposal is to retain the basement wall R-values of the 2006 IECC, and provide a more realistic value and cost benefit. The 4-6% saving claimed by the proponent during the 2007/2008 Code Hearings are incorrect and cannot be substantiated. The documented increase in construction costs in the last code cycle, showed costs for installing the higher R-value insulation cannot be justified by the negligible amount of energy savings attained.

The basement wall requirement of the 2009 IECC in Climate Zones 6, 7 and 8 results in increased construction costs. In addition, the provisions in the 2009 IECC may cause basement moisture and health problems for the homeowner.

History has shown that basement moisture problems significantly increased in Minnesota when basement insulation requirements were increased. This additional interior insulation will cause the basement foundation wall to be colder, thus increasing the amount of moisture that condenses on the wall. Ultimately this moisture buildup behind a finished basement wall will result in mold, rot, and insect problems.

Specifically designed and costly moisture resistant designs that are not covered by the IECC will be needed in order to avoid these potential problems. This proposal will retain the basement insulation requirements of the 2006 IECC that are proven to be a method of reducing moisture build-up while providing building envelope insulation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: SAGAN-EC-1-T. 402.1.1-T. 402.1.3

EC52–09/10

Table 402.1.1, Table 402.1.3

Proponent: Jeff Lowinski, Window and Door Manufacturers Association (WDMA)

Reformat table columns as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

~~CLIMATE ZONE~~	~~FENESTRATION U-FACTOR[b]~~	~~SKYLIGHT[b] U-FACTOR~~	~~GLAZED FENESTRATION SHGCb,[e]~~	~~CEILING R-VALUE~~	~~WOOD FRAME WALL R-VALUE~~	~~MASS WALL R-VALUE[i]~~	~~FLOOR R-VALUE~~	~~BASEMENTc WALL R-VALUE~~	~~SLABd R-VALUE & DEPTH~~	~~CRAWL SPACE[c] WALL R-VALUE~~
1	1.2	0.75	0.30	30	13	3/4	13	0	0	0
2	0.65j	0.75	0.30	30	13	4/6	13	0	0	0
3	0.50j	0.65	0.30	30	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5h	13/17	30g	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13+5h	15/19	30g	15/19	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	38g	15/19	10, 4 ft	10/13

CLIMATE ZONE	FENESTRATION				CEILING	WALL				FLOOR	SLAB
	WINDOW AND DOOR		SKYLIGHT			WOOD FRAME	MASS	BASEMENT	CRAWL SPACE		
	U-FACTOR[b]	SHGC[b,c]	U-FACTOR[b]	SHGC[b,d]	R-VALUE	R-VALUE	R-VALUE	R-VALUE	R-VALUE	R-VALUE	R-VALUE &DEPTH
1	1.2	0.3	0.75	0.3	NO CHANGE TO VALUES						
2	0.65	0.3	0.75	0.3							
3	0.5	0.3	0.65	0.3							
4 except Marine	0.35	NR	0.6	NR							
5 and Marine 4	0.35	`NR	0.6	NR							
6	0.35	NR	0.6	NR							
7 and 8	0.35	NR	0.6	NR							

~~b. The fenestration *U* factor column excludes skylights. The SHGC column applies to all glazed fenestration.~~
~~e. There are no SHGC requirements in the Marine Zone.~~

(Portions of table and footnotes not shown remain unchanged)

TABLE 402.1.3
EQUIVALENT U-FACTORS[a]

~~CLIMATE ZONE~~	~~FENESTRATION U-FACTOR~~	~~SKYLIGHT U-FACTOR~~	~~CEILING U-FACTOR~~	~~FRAME WALL U-FACTOR~~	~~MASS WALL U-FACTOR[b]~~	~~FLOOR U-FACTOR~~	~~BASEMENT WALL U-FACTOR[d]~~	~~CRAWL SPACE WALL U-FACTOR[c]~~
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	0.035	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.057	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.057	0.060	0.033	0.050	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.028	0.050	0.065

CLIMATE ZONE	FENESTRATION		CEILING	WALL				
	WINDOW AND DOOR	SKYLIGHT		WOOD FRAME	MASS	FLOOR	BASEMENT	CRAWL SPACE
	U-FACTOR	U-FACTOR	U-FACTOR	U-FACTOR	U-FACTOR	U-FACTOR	U-FACTOR	U-FACTOR
1	1.20	0.75	NO CHANGE TO VALUES					
2	0.65	0.75						
3	0.5	0.65						
4 except Marine	0.35	0.6						
5 and Marine 4	0.35	0.6						
6	0.35	0.6						
7 and 8	0.35	0.6						

(Portions of table and footnotes not shown remain unchanged)

Reason: WDMA suggests reformatting Table 402.1.1 for easier understanding, and by default, reformat complimentary Table 402.1.3. This proposal is intended to be only editorial and to not change any performance requirements. The reformatted table is quicker to use and easier to understand. After revising the format for the fenestration columns, the other columns in the table could be easily revised to follow the format of the fenestration columns.

With the reformatted table, footnotes b and e are proposed to be deleted. Footnote b is no longer needed with the format revisions to the fenestration columns. Footnote e is not needed because there are no SHGC requirements for fenestration in the line items containing the Marine Zone.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Lowinski-EC-3-T. 402.1.1-T. 402.1.3

EC53–09/10
202; IBC 202; IRC R202

Proponent: Daniel J. Walker, PE, Thomas Associates, Inc., representing National Sunroom Association

THIS IS A 3 PART CODE CHANGE. PARTS I AND II WILL BE HEARD BY THE IECC COMMITTEE. PART III WILL BE HEARD BY THE IRC BUILDING/ENERGY. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise definition as follows:

SUNROOM. A one-story structure attached to a dwelling with a glazing area in excess of 40 percent of the gross area of the structure's exterior walls ~~and roof~~.

PART II – IBC GENERAL

Revise definition as follows:

SUNROOM. A one-story structure attached to a dwelling with a glazing area in excess of 40 percent of the gross area of the structure's exterior walls ~~and roof~~.

PART III – IRC BUILDING/ENERGY

Revise definition as follows:

SUNROOM. A one-story structure attached to a dwelling with a glazing area in excess of 40 percent of the gross area of the structure's exterior walls ~~and roof~~.

Reason: The definition as it is currently written is in conflict with the code text. It has also caused confusion with regard to enforcement for officials. The dividing line for what would be considered a home addition or a sunroom is the limit on vertical glazing to 40% of the wall area in IECC Table 502.3. To allow a sunroom to be defined by both the wall and roof glazing could potentially include structures with less than 40% vertical glazing to be in compliance with the sunroom definition because skylights can be counted toward the total. IRC Section R303.1, exception No. 3 reflects the original intention that the wall fenestration is the only item that is to be counted toward the 40%.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WALKER-EC-1-202-RB-5-R202-IBC 202

EC54–09/10

Table 402.1.1, 402.1.2; IRC Table N1102.1, N1102.1.1

Proponent: Matthew Dobson, representing Vinyl Siding Institute

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

h. "13+5" means R-13 cavity insulation plus R-5 insulated sheathing or insulated siding. If structural sheathing covers less 25 percent or less of the exterior, insulated sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing or insulated siding of at least R-2.

(Portions of table and footnotes not shown remain unchanged)

402.1.2 *R*-value computation. Insulation material used in layers, such as framing cavity insulation ~~and~~ insulating sheathing and insulated siding, shall be summed to compute the component *R*-value. The manufacturer's settled *R*-value shall be used for blown insulation. Computed *R*-values shall not include an *R*-value for other building materials or air films.

PART II – IRC BUILDING/ENERGY

Revise as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

h. "13+5" means R-13 cavity insulation plus R-5 insulated sheathing or insulated siding. If structural sheathing covers less 25 percent or less of the exterior, insulated sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with insulated sheathing or insulated siding of at least R-2.

(Portions of table and footnotes not shown remain unchanged)

N1102.1.1 *R*-value computation. Insulation material used in layers, such as framing cavity insulation and insulating sheathing and insulated siding, shall be summed to compute the component *R*-value. The manufacturer's settled *R*-value shall be used for blown insulation. Computed *R*-values shall not include an *R*-value for other building materials or air films.

Reason: Forms of insulated siding have been commercially available for at least twelve years. Current versions of insulated vinyl siding as well as other types of insulated claddings are now being tested to show actual field R-values. Many of these tests are being conducted using the appropriate testing methodology using the "hot box" test or ASTM C1363. This building component presents a viable option. A minimal performance value of R-value is consistent with the minimal R-value requirements to establish the product as a home insulation or insulation.

In addition to the thermal resistance characteristics, insulated siding's components and other non-related energy performance characteristics are covered by the code and specific product standards. For example the foam plastic used with insulated siding is addressed in the foam plastic sections of the IBC and IRC as well as through AC12. In addition ASTM C578 is the standard for foam plastics. Over the past few years both an acceptance criteria and product standard have been developed to address the non-thermal characteristics of what is termed as "backed siding". These material standards (ASTM D7445-09 and AC 37 (both vinyl and backed vinyl siding)) provide performance criteria for the siding including areas required by the building codes for example warp, shrinkage, impact strength, expansion, appearance, and wind load resistance.

Testing relative to moisture and water management issues indicated that use of insulated siding has no negative effect on the performance of the wall panels in relationship to moisture absorption. In field studies where the product had been installed for nearly ten years there were no indications of any problems of moisture entrapment related issues. Further the industry knows of no claims or complaints relating to moisture issues and the performance insulated vinyl siding.

Included with the insulated siding definition proposal is an example of testing that has been completed using the ASTM C1363 test method as well as recent research co-funded by VSI through the New York State Energy Research and Development Authority's High Performance Residential Development Challenge program. Both testing and research support insulated siding as a viable option to help increase the energy efficiency of buildings.

As a part of this proposal please visit the link provided of an example of testing that has been completed using the ASTM C1363 test method as well as a link to recent research co-funded by VSI through the New York State Energy Research and Development Authority's High Performance Residential Development Challenge program. Both testing and research support insulated siding as a viable option to help increase the energy efficiency of buildings.

Here is the link to the example ASTM C1363 testing results
http://www.vinylsiding.org/aboutsiding/insulatedvinylsiding/ASTM%5FC1363%5Ftest%5Fresults%2Epdf.

Here is a link to the New York State Energy Research and Development Authority report
http://www.vinylsiding.org/aboutsiding/newsroom/insulatedvs/090702_Building_Green_with_Insualted_Vinyl_Siding_Case_Study.pdf**.**

Cost Impact: The code change proposal will not increase the cost of construction as it will give specifiers another affordable option for achieving energy code compliance.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DOBSON-EC-2 AND 3 MERGED-402.1.2-RE-1-N1102.1.1.DOC

EC55–09/10
Table 402.1.3; IRC Table N1102.1.2

Proponent: Martha VanGeem, CTL Group, representing Masonry Alliance for Codes and Standards

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC CODE COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

TABLE 402.1.3
EQUIVALENT U-FACTORS
(Portions of table and footnotes not shown remain unchanged)

b. When more than half the insulation is on the interior, the mass wall *U*-factors shall be a maximum of 0.17 in Zone 1, 0.14 in Zone 2, 0.12 in Zone 3, 0.10 in Zone 4 except Marine, 0.065 in Zone 5 and Marine 4, and 0.060 in Zone 6, and 0.057 in Zones 7 and 8. ~~and the same as the frame wall *U*-factor in Marine Zone 4 and Zones 5 through 8~~.

PART II – IRC BUILDING/ENERGY

Revise as follows:

TABLE N1102.1.2
EQUIVALENT U-FACTORS
(Portions of table and footnotes not shown remain unchanged)

b. When more than half the insulation is on the interior, the mass wall *U*-factors shall be a maximum of 0.17 in Zone 1, 0.14 in Zone 2, 0.12 in Zone 3, 0.10 in Zone 4 except Marine, 0.065 in Zone 5 and Marine 4, 0.060 in Zone 6, and 0.057 in Zones 7 and 8. ~~and the same as the frame wall *U*-factor in Marine Zone 4 and Zones 5 through 8~~.

Reason: This proposal corrects and clarifies U-factors for mass walls with interior insulation to correspond with the R-values in Table N1102.1.

For Zone 5 and Marine 4: The U-factor that corresponds to R-17 insulation on the interior of a mass wall in Table N1102.1 is 0.065. This is for a cast-in-place concrete wall with R-17 insulation between 2x6 wood framing and gypsum wallboard insulation.

For Zone 6: The U-factor that corresponds with R-19 insulation on the interior of a mass wall is approximately 0.060. This proposal does not change the value, and leaves it at 0.060. However, as the frame wall U-factors are revised, it is more clear to print the actual U-factor that corresponds with the R-value for mass walls. This is 0.060 as in the 2009 IRC.

For Zones 7 and 8: The U-factor that corresponds with R-21 insulation on the interior of a mass wall is approximately 0.057. This proposal does not change the value. However, as the frame wall U-factors are revised, it is more clear to print the actual U-factor that corresponds with the R-value for mass walls. This is 0.057 as in the 2009 IRC.

Note that DOE2 simulations show mass effects for a 2400 sq foot homes in all climates. The U-factor for mass walls in Table N1102.1.2 should correspond to the R-value for mass walls in Table N1102.1 and not refer to the U-factor for frame walls.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: VANGEEM-EC-1-T. 402.1.3-T. N1102.1.2

EC56–09/10

402.1.5 (New), Table 402.1.5 (New); IRC N1102.1.4 (New), Table N1102.1.4 (New)

Proponent: Thomas S. Zaremba, Roetzel & Andress; Thomas D. Culp, Ph.D, Birch Point Consulting LLC; Craig Conner, Building Quality

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Add new text and table as follows:

402.1.5 Alternative prescriptive requirements. If the building thermal envelope and mechanical systems meet the requirements of one path in Table 402.1.5, the building shall be considered in compliance with Section 402.1.1. The prescriptive and mandatory provisions of Section 402, 403 and 404 shall be used in applying the requirements of Table 402.1.5.

TABLE 402.1.5
ALTERNATIVE PRESCRIPTIVE REQUIREMENTS BY COMPONENT[a]

Climate Zone	Path Number	Fenestration U-Factor[b,c]	Skylight U-Factor[b]	Glazed Fenestration SHGC[b,d]	Ceiling R-Value	Wood-frame wall R-Value[e]	Mass Wall R-Value[f]	Floor R-Value[g]	Basement/ Crawl space Wall R-Value[h]	Slab R-Value & Depth[i]	Building Air Tightness (ACH50)	Duct Tightness[k]	Furnace (AFUE) /Heat Pump (HSPF)[l]	Air Conditioning (SEER)[m]	Hot Water Heater[n]
1	1	0.60	0.75	0.25	38	13+3	5/10	13	0	0	7	Cond or Tested	Standard	Standard	Standard
1	2	NR	0.75	0.3	30	13	3/4	13	0	0	7	Cond or Tested	Standard	SEER 15	62G/94E
1	3	0.60	0.75	0.3	30	13	3/4	13	0	0	7	Reduced Leakage	Standard	Standard	Standard
1	4	NR	0.75	0.3	30	13	3/4	13	0	0	7	Cond or Tested	Standard	SEER 17	Standard
Climate Zone	Path Number	Fenestration U-Factor[b,c]	Skylight U-Factor[b]	Glazed Fenestration SHGC[b,d]	Ceiling R-Value	Wood-frame wall R-Value[e]	Mass Wall R-Value[f]	Floor R-Value[g]	Basement/ Crawl space Wall R-Value[h]	Slab R-Value & Depth[i]	Building Air Tightness (ACH50)	Duct Tightness[k]	Furnace (AFUE) /Heat Pump (HSPF)[l]	Air Conditioning (SEER)[m]	Hot Water Heater[n]
2	1	0.35	0.65	0.25	38	13+3	6/13	13	0	0	7	Cond or Tested	Standard	Standard	Standard
2	2	0.60	0.65	0.3	30	13	4/6	13	0	0	7	Cond or Tested	Standard	SEER 15	62G/94E
2	3	0.35	0.65	0.3	30	13	4/6	13	0	0	7	Reduced Leakage	Standard	Standard	Standard
2	4	0.60	0.65	0.3	30	13	4/6	13	0	0	7	Cond or Tested	Standard	SEER 17	Standard
Climate Zone	Path Number	Fenestration U-Factor[b,c]	Skylight U-Factor[b]	Glazed Fenestration SHGC[b,d]	Ceiling R-Value	Wood-frame wall R-Value[e]	Mass Wall R-Value[f]	Floor R-Value[g]	Basement/ Crawl space Wall R-Value[h]	Slab R-Value & Depth[i]	Building Air Tightness (ACH50)	Duct Tightness[k]	Furnace (AFUE) /Heat Pump (HSPF)[l]	Air Conditioning (SEER)[m]	Hot Water Heater[n]
3	1	0.32	0.6	0.3	38	20 or 13+5	8/13	19	5/13[p]	0	7	Cond or Tested	Standard	Standard	Standard
3	2	0.35	0.6	0.3	30	13	5/8	19	5/13[p]	0	7	Cond or Tested	90/8.9	SEER 17	62G/94E
3	3	0.50	0.6	0.3	38	13	5/8	19	5/13[p]	0	4	Reduced Leakage	Standard	Standard	Standard
3	4	0.50	0.6	0.3	30	13	5/8	19	5/13[p]	0	4	Cond or Tested	90/8.9	SEER 15	Standard

Climate Zone	Path Number	Fenestration U-Factor[b,c]	Skylight U-Factor[b]	Glazed Fenestration SHGC[b,d]	Ceiling R-Value	Wood-frame wall R-Value[e]	Mass Wall R-Value[f]	Floor R-Value[g]	Basement/ Crawl space Wall R-Value[h]	Slab R-Value & Depth[i]	Building Air Tightness (ACH50)	Duct Tightness[k]	Furnace (AFUE) /Heat Pump (HSPF)[l]	Air Conditioning (SEER)[m]	Hot Water Heater[n]
4 except Marine	1	0.32	0.6	NR	38	20 or 13+5	8/13	19	10/13	10; 2 ft	7	Cond or Tested	Standard	Standard	Standard
4 except Marine	2	0.35	0.6	NR	38	13	5/10	19	10/13	10; 2 ft	7	Cond or Tested	90/8.9	SEER 15	62G/94E
4 except Marine	3	0.32	0.6	NR	38	13	5/10	19	10/13	10; 2 ft	4	Reduced Leakage	Standard	Standard	Standard
4 except Marine	4	0.35	0.6	NR	38	13	5/10	19	10/13	10; 2 ft	4	Cond or Tested	90/8.9	SEER 15	Standard

Climate Zone	Path Number	Fenestration U-Factor[b,c]	Skylight U-Factor[b]	Glazed Fenestration SHGC[b,d]	Ceiling R-Value	Wood-frame wall R-Value[e]	Mass Wall R-Value[f]	Floor R-Value[g]	Basement/ Crawl space Wall R-Value[h]	Slab R-Value & Depth[i]	Building Air Tightness (ACH50)	Duct Tightness[k]	Furnace (AFUE) /Heat Pump (HSPF)[l]	Air Conditioning (SEER)[m]	Hot Water Heater[n]
5 and Marine 4	1	0.32	0.6	NR	49	20+5 or 13+10	15/20	30	15/19	10; 2 ft	4	Cond or Tested	Standard	Standard	Standard
5 and Marine 4	2	0.32	0.6	NR	38	20 or 13+5	13/17	30	10/13	10; 2 ft	7	Reduced Leakage	92/9.1	15 SEER	62G/94E
5 and Marine 4	3	0.32	0.6	NR	49	20 or 13+5	13/17	30	15/19	10; 2 ft	4	Reduced Leakage	Standard	Standard	Standard
5 and Marine 4	4	0.35	0.6	NR	38	20 or 13+5	13/17	30	15/19	10; 2 ft	4	Cond or Tested	92/9.1	Standard	Standard

Climate Zone	Path Number	Fenestration U-Factor[b,c]	Skylight U-Factor[b]	Glazed Fenestration SHGC[b,d]	Ceiling R-Value	Wood-frame wall R-Value[e]	Mass Wall R-Value[f]	Floor R-Value[g]	Basement/ Crawl space Wall R-Value[h]	Slab R-Value & Depth[i]	Building Air Tightness (ACH50)	Duct Tightness[k]	Furnace (AFUE) /Heat Pump (HSPF)[l]	Air Conditioning (SEER)[m]	Hot Water Heater[n]
6	1	0.30	0.6	NR	49	20+5 or 13+10	19/21	30	15/19	10; 4 ft	4	Cond or Tested	Standard	Standard	Standard
6	2	0.35	0.6	NR	49	20 or 13+5	15/19	30	15/19	10; 4 ft	7	Reduced Leakage	92/9.1	Standard	62G/94E
6	3	0.32	0.6	NR	60	20 or 13+5	15/19	30	15/19	10; 4 ft	3	Reduced Leakage	Standard	Standard	Standard
6	4	0.35	0.6	NR	49	20 or 13+5	15/19	38	15/19	10; 4 ft	4	Cond or Tested	92/9.1	Standard	Standard

Climate Zone	Path Number	Fenestration U-Factor[b,c]	Skylight U-Factor[b]	Glazed Fenestration SHGC[b,d]	Ceiling R-Value	Wood-frame wall R-Value[e]	Mass Wall R-Value[f]	Floor R-Value[g]	Basement/ Crawl space Wall R-Value[h]	Slab R-Value & Depth[i]	Building Air Tightness (ACH50)	Duct Tightness[k]	Furnace (AFUE) /Heat Pump (HSPF)[l]	Air Conditioning (SEER)[m]	Hot Water Heater[n]
7 and 8	1	0.27	0.6	NR	60	20+5 or 13+10	19/21	38	15/19	10; 4 ft	3	Cond or Tested	Standard	Standard	Standard
7 and 8	2	0.30	0.6	NR	49	20 or 13+5	15/19	38	15/19	10; 4 ft	4	Cond or Tested	92/9.1	Standard	62G/94E
7 and 8	3	0.32	0.6	NR	49	20+5 or 13+10	19/21	38	15/19	10; 4 ft	3	Reduced Leakage	Standard	Standard	Standard
7 and 8	4	0.35	0.6	NR	49	20 or 13+5	15/19	38	15/19	10; 4 ft	4	Reduced Leakage	92/9.1	Standard	Standard

For SI: 1 foot = 304.8 mm.

a. *R*-values are minimums. *U*-factors and SHGC are maximums. R-19 batts compressed into a nominal 2x6 framing cavity such that the R-value is reduced by R-1 or more shall be marked with the compressed batt R-value in addition to the full thickness R-value.

b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration. "NR" means no requirement.

c. For impact rated fenestration in wind-borne debris regions, the maximum U-factor in Climate Zones 1-3 shall be permitted to be 0.15 higher than that specified in Table 402.5.1.

d. There are no SHGC requirements in the Marine Zone.

e. First value is cavity insulation, second is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 continuous insulation. If structural sheathing covers 25 percent or less of the exterior, continuous insulation is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with continuous insulation of at least R-2.

f. The second R-value applies when more than half the insulation is on the interior of the mass wall.

g. Or insulation sufficient to fill the framing cavity, R-19 minimum.

h. "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.

i. R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 ft, whichever is less, in Zones 1 through 3 for heated slabs.

j. Air tightness shall be demonstrated in accordance with Section 402.4.2.1.

k. "Cond or Tested" means that the duct system shall either be located within conditioned space or tested in accordance with Section 403.2.2. "Reduced Leakage" means that the duct system shall be located entirely within conditioned space and tested for total leakage and leakage to outside conditioned space. Leakage to outdoors shall be less than or equal to 3 cfm (84.9 L/min) per 100 ft2 (9.29 m2) of conditioned floor area, and the total leakage shall be less than or equal to 8 cfm (226.5 L/min) per 100 ft2 (9.29 m2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. Total leakage of not greater than 3 cfm per 100 ft2 of conditioned floor area at a pressure difference of 0.01 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure, shall be deemed to satisfy this requirement without measurement of leakage to outdoors.

l. Heating system performance tested in accordance with ASHRAE Standard 103 or ARI Standard 210/240 or equivalent. Coefficient of Performance (COP) is converted into HSPF by multiplying by 3.413. "Standard" represents the prevailing minimum efficiency acceptable under federal law.

m. Cooling system performance tested in accordance with ARI Standard 210/240 or equivalent. Energy Efficiency Ratio (EER) is converted to SEER by multiplying EER*1.143. "Standard" represents the prevailing minimum efficiency acceptable under federal law.

n. Water heater Energy Factor requirements for Gas (G) and Electric (E) water heaters. "Standard" represents the prevailing minimum efficiency acceptable under federal law.

o. Basement wall insulation is not required in warm-humid locations as defined by Figure 301.1 and Table 301.1.

PART II – IRC BUILDING/ENERGY

Add new text and table as follows:

N1102.1.4 Alternative prescriptive requirements. If the building thermal envelope and mechanical systems meet the requirements of one path in Table N1102.1.4, the building shall be considered in compliance with Section N1102.1. The other provisions of Section N1102, N1103 and N1104 shall be used in applying the requirements of Table N1102.1.4.

TABLE N1102.1.4
ALTERNATIVE PRESCRIPTIVE REQUIREMENTS BY COMPONENT[a]

Climate Zone	Path Number	Fenestration U-Factor [b,c]	Skylight U-Factor [b]	Glazed Fenestration SHGC[b,d]	Ceiling R-Value	Wood-frame wall R-Value[e]	Mass Wall R-Value[f]	Floor R-Value[g]	Basement/ Crawl space Wall R-Value[h]	Slab R-Value & Depth[i]	Building Air Tightness (ACH50)[j]	Duct Tightness[k]	Furnace (AFUE) /Heat Pump (HSPF)[l]	Air Conditioning (SEER)[m]	Hot Water Heater[n]
1	1	0.60	0.75	0.25	38	13+3	5/10	13	0	0	7	Cond or Tested	Standard	Standard	Standard
1	2	NR	0.75	0.3	30	13	3/4	13	0	0	7	Cond or Tested	Standard	SEER 15	62G/94E
1	3	0.60	0.75	0.3	30	13	3/4	13	0	0	7	Reduced Leakage	Standard	Standard	Standard
1	4	NR	0.75	0.3	30	13	3/4	13	0	0	7	Cond or Tested	Standard	SEER 17	Standard

Climate Zone	Path Number	Fenestration U-Factor [b,c]	Skylight U-Factor [b]	Glazed Fenestration SHGC[b,d]	Ceiling R-Value	Wood-frame wall R-Value[e]	Mass Wall R-Value[f]	Floor R-Value[g]	Basement/ Crawl space Wall R-Value[h]	Slab R-Value & Depth[i]	Building Air Tightness (ACH50)[j]	Duct Tightness[k]	Furnace (AFUE) /Heat Pump (HSPF)[l]	Air Conditioning (SEER)[m]	Hot Water Heater[n]
2	1	0.35	0.65	0.25	38	13+3	6/13	13	0	0	7	Cond or Tested	Standard	Standard	Standard

Climate Zone	Path Number	Fenestration U-Factor [b,c]	Skylight U-Factor [b]	Glazed Fenestration SHGC [b,d]	Ceiling R-Value	Wood-frame wall R-Value[e]	Mass Wall R-Value[f]	Floor R-Value[g]	Basement/ Crawl space Wall R-Value[h]	Slab R-Value & Depth[i]	Building Air Tightness (ACH50)[j]	Duct Tightness[k]	Furnace (AFUE) /Heat Pump (HSPF)	Air Conditioning (SEER)[m]	Hot Water Heater[n]
2	2	0.60	0.65	0.3	30	13	4/6	13	0	0	7	Cond or Tested	Standard	SEER 15	62G/94E
2	3	0.35	0.65	0.3	30	13	4/6	13	0	0	7	Reduced Leakage	Standard	Standard	Standard
2	4	0.60	0.65	0.3	30	13	4/6	13	0	0	7	Cond or Tested	Standard	SEER 17	Standard

Climate Zone	Path Number	Fenestration U-Factor [b,c]	Skylight U-Factor [b]	Glazed Fenestration SHGC [b,d]	Ceiling R-Value	Wood-frame wall R-Value[e]	Mass Wall R-Value[f]	Floor R-Value[g]	Basement/ Crawl space Wall R-Value[h]	Slab R-Value & Depth[i]	Building Air Tightness (ACH50)[j]	Duct Tightness[k]	Furnace (AFUE) /Heat Pump (HSPF)[l]	Air Conditioning (SEER)[m]	Hot Water Heater[n]
3	1	0.32	0.6	0.3	38	20 or 13+5	8/13	19	5/13[p]	0	7	Cond or Tested	Standard	Standard	Standard
3	2	0.35	0.6	0.3	30	13	5/8	19	5/13[p]	0	7	Cond or Tested	90/8.9	SEER 17	62G/94E
3	3	0.50	0.6	0.3	38	13	5/8	19	5/13[p]	0	4	Reduced Leakage	Standard	Standard	Standard
3	4	0.50	0.6	0.3	30	13	5/8	19	5/13[p]	0	4	Cond or Tested	90/8.9	SEER 15	Standard

Climate Zone	Path Number	Fenestration U-Factor [b,c]	Skylight U-Factor [b]	Glazed Fenestration SHGC [b,d]	Ceiling R-Value	Wood-frame wall R-Value[e]	Mass Wall R-Value[f]	Floor R-Value[g]	Basement/ Crawl space Wall R-Value[h]	Slab R-Value & Depth[i]	Building Air Tightness (ACH50)[j]	Duct Tightness[k]	Furnace (AFUE) /Heat Pump (HSPF)[l]	Air Conditioning (SEER)[m]	Hot Water Heater[n]
4 except Marine	1	0.32	0.6	NR	38	20 or 13+5	8/13	19	10/13	10; 2 ft	7	Cond or Tested	Standard	Standard	Standard
4 except Marine	2	0.35	0.6	NR	38	13	5/10	19	10/13	10; 2 ft	7	Cond or Tested	90/8.9	SEER 15	62G/94E
4 except Marine	3	0.32	0.6	NR	38	13	5/10	19	10/13	10; 2 ft	4	Reduced Leakage	Standard	Standard	Standard
4 except Marine	4	0.35	0.6	NR	38	13	5/10	19	10/13	10; 2 ft	4	Cond or Tested	90/8.9	SEER 15	Standard

Climate Zone	Path Number	Fenestration U-Factor [b,c]	Skylight U-Factor [b]	Glazed Fenestration SHGC [b,d]	Ceiling R-Value	Wood-frame wall R-Value[e]	Mass Wall R-Value[f]	Floor R-Value[g]	Basement/ Crawl space Wall R-Value[h]	Slab R-Value & Depth[i]	Building Air Tightness (ACH50)[j]	Duct Tightness[k]	Furnace (AFUE) /Heat Pump (HSPF)	Air Conditioning (SEER)[m]	Hot Water Heater[n]
5 and Marine 4	1	0.32	0.6	NR	49	20+5 or 13+10	15/20	30	15/19	10; 2 ft	4	Cond or Tested	Standard	Standard	Standard
5 and Marine 4	2	0.32	0.6	NR	38	20 or 13+5	13/17	30	10/13	10; 2 ft	7	Reduced Leakage	92/9.1	15 SEER	62G/94E
5 and Marine 4	3	0.32	0.6	NR	49	20 or 13+5	13/17	30	15/19	10; 2 ft	4	Reduced Leakage	Standard	Standard	Standard
5 and Marine 4	4	0.35	0.6	NR	38	20 or 13+5	13/17	30	15/19	10; 2 ft	4	Cond or Tested	92/9.1	Standard	Standard

Climate Zone	Path Number	Fenestration U-Factor [b,c]	Skylight U-Factor [b]	Glazed Fenestration SHGC [b,d]	Ceiling R-Value	Wood-frame wall R-Value[e]	Mass Wall R-Value[f]	Floor R-Value[g]	Basement/ Crawl space Wall R-Value[h]	Slab R-Value & Depth[i]	Building Air Tightness (ACH50)[j]	Duct Tightness[k]	Furnace (AFUE) /Heat Pump (HSPF)[l]	Air Conditioning (SEER)[m]	Hot Water Heater[n]
6	1	0.30	0.6	NR	49	20+5 or 13+10	19/21	30	15/19	10; 4 ft	4	Cond or Tested	Standard	Standard	Standard

Climate Zone	Path Number	Fenestration U-Factor [b,c]	Skylight U-Factor [b]	Glazed Fenestration SHGC [b,d]	Ceiling R-Value	Wood-frame wall R-Value[e]	Mass Wall R-Value[f]	Floor R-Value[g]	Basement/ Crawl space Wall R-Value[h]	Slab R-Value & Depth[i]	Building Air Tightness (ACH50)[j]	Duct Tightness[k]	Furnace (AFUE) /Heat Pump (HSPF)[l]	Air Conditioning (SEER)[m]	Hot Water Heater[n]
6	2	0.35	0.6	NR	49	20 or 13+5	15/19	30	15/19	10; 4 ft	7	Reduced Leakage	92/9.1	Standard	62G/94E
6	3	0.32	0.6	NR	60	20 or 13+5	15/19	30	15/19	10; 4 ft	3	Reduced Leakage	Standard	Standard	Standard
6	4	0.35	0.6	NR	49	20 or 13+5	15/19	38	15/19	10; 4 ft	4	Cond or Tested	92/9.1	Standard	Standard

Climate Zone	Path Number	Fenestration U-Factor [b,c]	Skylight U-Factor [b]	Glazed Fenestration SHGC [b,d]	Ceiling R-Value	Wood-frame wall R-Value[e]	Mass Wall R-Value[f]	Floor R-Value[g]	Basement/ Crawl space Wall R-Value[h]	Slab R-Value & Depth[i]	Building Air Tightness (ACH50)[j]	Duct Tightness[k]	Furnace (AFUE) /Heat Pump (HSPF)[l]	Air Conditioning (SEER)[m]	Hot Water Heater[n]
7 and 8	1	0.27	0.6	NR	60	20+5 or 13+10	19/21	38	15/19	10; 4 ft	3	Cond or Tested	Standard	Standard	Standard
7 and 8	2	0.30	0.6	NR	49	20 or 13+5	15/19	38	15/19	10; 4 ft	4	Cond or Tested	92/9.1	Standard	62G/94E
7 and 8	3	0.32	0.6	NR	49	20+5 or 13+10	19/21	38	15/19	10; 4 ft	3	Reduced Leakage	Standard	Standard	Standard
7 and 8	4	0.35	0.6	NR	49	20 or 13+5	15/19	38	15/19	10; 4 ft	4	Reduced Leakage	92/9.1	Standard	Standard

For SI: 1 foot = 304.8 mm.

a. *R*-values are minimums. *U*-factors and SHGC are maximums. R-19 batts compressed into a nominal 2x6 framing cavity such that the R-value is reduced by R-1 or more shall be marked with the compressed batt R-value in addition to the full thickness R-value.

b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration. "NR" means no requirement.

c. For impact rated fenestration in wind-borne debris regions, the maximum U-factor in Climate Zones 1-3 shall be permitted to be 0.15 higher than that specified in Table 402.5.1.

d. There are no SHGC requirements in the Marine Zone.

e. First value is cavity insulation, second is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 continuous insulation. If structural sheathing covers 25 percent or less of the exterior, continuous insulation is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of exterior, structural sheathing shall be supplemented with continuous insulation of at least R-2.

f. The second R-value applies when more than half the insulation is on the interior of the mass wall.

g. Or insulation sufficient to fill the framing cavity, R-19 minimum.

h. "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.

i. R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 ft, whichever is less, in Zones 1 through 3 for heated slabs.

j. Air tightness shall be demonstrated in accordance with Section 402.4.2.1.

k. "Cond or Tested" means that the duct system shall either be located within conditioned space or tested in accordance with Section 403.2.2. "Reduced Leakage" means that the duct system shall be located entirely within conditioned space and tested for total leakage and leakage to outside conditioned space. Leakage to outdoors shall be less than or equal to 3 cfm (84.9 L/min) per 100 ft2 (9.29 m2) of conditioned floor area, and the total leakage shall be less than or equal to 8 cfm (226.5 L/min) per 100 ft2 (9.29 m2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. Total leakage of not greater than 3 cfm per 100 ft2 of conditioned floor area at a pressure difference of 0.01 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure, shall be deemed to satisfy this requirement without measurement of leakage to outdoors.

l. Heating system performance tested in accordance with ASHRAE Standard 103 or ARI Standard 210/240 or equivalent. Coefficient of Performance (COP) is converted into HSPF by multiplying by 3.413. "Standard" represents the prevailing minimum efficiency acceptable under federal law.

m. Cooling system performance tested in accordance with ARI Standard 210/240 or equivalent. Energy Efficiency Ratio (EER) is converted to SEER by multiplying EER*1.143. "Standard" represents the prevailing minimum efficiency acceptable under federal law.

n. Water heater Energy Factor requirements for Gas (G) and Electric (E) water heaters. "Standard" represents the prevailing minimum efficiency acceptable under federal law.

o. Basement wall insulation is not required in warm-humid locations as defined by Figure 301.1 and Table 301.1.

Reason: This proposal will provide a significant increase in energy efficiency while also increasing flexibility and cost effectiveness by providing multiple paths in a way that facilitates easy demonstration of compliance. In each climate zone, four sets of equivalent alternative prescriptive requirements are provided. One path focuses on primarily envelope improvements, whereas the other three paths include a combination of improvements in envelope, air tightness, duct tightness, and equipment efficiency. When looking at above-code programs such as Building America, these high efficiency homes invariably include a combination of *all* these factors. The whole building must be considered, and it is wrong to only look at the envelope separately without also considering interactions with air sealing and equipment efficiency.

The four paths provided have been demonstrated to be equivalent in each climate zone through dozens of simulations using both REM/Rate™ and EnergyGuage software, and represent a significant increase in energy efficiency towards ICC's goals.

Additionally, this proposal will help facilitate enforcement, in that the flexibility of this table will lead to increased use of prescriptive options over the more complicated performance path. This table is intended to list the prescriptive description for packages of energy efficiency options that are commonly desired by designers. If using this alternative approach, the builder will simply indicate which of the four paths they are using, and building official will review the prescriptive requirements for that path.

Cost Impact: The code change proposal will increase the cost of construction, but improves cost effectiveness by offering multiple paths of compliance. Alternate choices give more flexibility and competition, improving cost effectiveness.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ZAREMBA-CULP-CONNER-EC-8-402.1.5-T. 402.1.4-RE-1-N1102.1.4-T. N1102.1.4

EC57–09/10

402.1.5 (New), Table 402.1.5 (New); IRC N1102.1.4 (New), Table N1102.1.4 (New)

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Add new text and table as follows:

402.1.5 Calculating opaque envelope component U-factors. When determining the U-factor of an opaque assembly as part of Sections 402.1.3, 402.1.4, or 404.5.2, Table 402.1.5 shall be used to calculate the U-factor by using a series-parallel calculation. Where actual insulation and framing fractions have been calculated for the proposed design, they shall be used; otherwise the default insulation and framing fractions in Table 402.1.5 shall be used. The *code official* may require: (1) actual insulation and framing fractions to be calculated and documented and (2) the calculated and documented values to be inspected and reviewed by an independent party *approved* by the *code official.*

TABLE 402.1.5
COMPONENT R-VALUE AND INSULATION AND FRAMING FRACTIONS BY ASSEMBLY TYPE

	Interior Air Film	Interior Layer	Cavity Insulation Layer	Insulation Fraction	Cavity Framing Layer	Framing Fraction	Insulating Sheathing Layer[c]	Structural Sheathing Layer[c]	Siding Layer	Exterior Air Film
	R-Value	R-Value	R-Values	Percent	R-Values	Percent	R-Value	R-Value	R-Value	R-Value
Wood Frame Ceiling	0.61	0.45	As Specified[a]	93%	R-1.25 per inch[b]	7%	-	-	-	0.61
Wood Frame Wall	0.68	0.45	As Specified	77%	R-1.25 per inch[b]	23%	0 or as specified	0.62	0.61	0.25
Steel Frame Wall	0.68	0.45	As Specified	-	-	-	0 or as specified	0.62	0.61	0.25
Mass Wall	0.68	0.45	As Specified	-	-	-	0 or as specified	0.62	0.61	0.25
Wood Frame Floor	0.92	1.23 + 0.94	As Specified	90%	R-1.25 per inch[b]	10%	-	-	-	0.92
Basement Wall	0.68	0.45	As Specified	-	-	-	0 or as specified	-	-	0.25
Crawlspace Wall	0.68	0.45	As Specified	-	-	-	0 or as specified	-	-	0.25

a. In the standard reference design, the depth of the insulation shall be calculated to account for limited depth at the edge of the ceiling based on a standard truss with available depth of 3.86 inches at the edge of the ceiling and a roof slope of 1 foot for every 3 feet across. In the proposed design, the ceiling insulation u-value shall be calculated with the actual insulation depths in the proposed design.

b. The depth of the wood framing shall be based on the actual depth of the wood framing. In the standard reference design, it shall be calculated as the cavity insulation R-Value divided by 4 and then rounded up to the following depths in inches: 3.5 for a 2x4 frame, 5.5 for a 2x6 frame, 7.5 for a 2x8 frame or 9.5 for a 2x10 frame.

c. If insulating sheathing is used in the standard reference design, only 80% of the net wall is assumed to be covered by the insulating sheathing. The other 20% is assumed to be covered with plywood. The proposed design shall be calculated with the actual percentage of insulating sheathing and structural sheathing.

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1102.1.4 Calculating opaque envelope component U-factors. When determining the U-factor of an opaque assembly as part of Section N1102.1.2 or N1102.1.3, Table N1102.1.4 shall be used to calculate the U-factor by using a series-parallel calculation. Where actual insulation and framing fractions have been calculated for the proposed design, they shall be used; otherwise the default insulation and framing fractions in Table N1102.1.4 shall be used. The *building official* may require: (1) actual insulation and framing fractions to be calculated and documented and (2) the calculated and documented values to be inspected and reviewed by an independent party *approved* by the *building official.*

TABLE N1102.1.4
COMPONENT R-VALUE AND INSULATION AND FRAMING FRACTIONS BY ASSEMBLY TYPE

	Interior Air Film	Interior Layer	Cavity Insulation Layer	Insulation Fraction	Cavity Framing Layer	Framing Fraction	Insulating Sheathing Layer[c]	Structural Sheathing Layer[c]	Siding Layer	Exterior Air Film
	R-Value	R-Value	R-Values	Percent	R-Values	Percent	R-Value	R-Value	R-Value	R-Value
Wood Frame Ceiling	0.61	0.45	As Specified[a]	93%	R-1.25 per inch[b]	7%	-	-	-	0.61
Wood Frame Wall	0.68	0.45	As Specified	77%	R-1.25 per inch[b]	23%	0 or as specified	0.62	0.61	0.25
Steel Frame Wall	0.68	0.45	As Specified	-	-	-	0 or as specified	0.62	0.61	0.25
Mass Wall	0.68	0.45	As Specified	-	-	-	0 or as specified	0.62	0.61	0.25
Wood Frame Floor	0.92	1.23 + 0.94	As Specified	90%	R-1.25 per inch[b]	10%	-	-	-	0.92
Basement Wall	0.68	0.45	As Specified	-	-	-	0 or as specified	-	-	0.25
Crawlspace Wall	0.68	0.45	As Specified	-	-	-	0 or as specified	-	-	0.25

a. In the standard reference design, the depth of the insulation shall be calculated to account for limited depth at the edge of the ceiling based on a standard truss with available depth of 3.86 inches at the edge of the ceiling and a roof slope of 1 foot for every 3 feet across. In the proposed design, the ceiling insulation u-value shall be calculated with the actual insulation depths in the proposed design.

b. The depth of the wood framing shall be based on the actual depth of the wood framing. In the standard reference design, it shall be calculated as the cavity insulation R-Value divided by 4 and then rounded up to the following depths in inches: 3.5 for a 2x4 frame, 5.5 for a 2x6 frame, 7.5 for a 2x8 frame or 9.5 for a 2x10 frame.

c. If insulating sheathing is used in the standard reference design, only 80% of the net wall is assumed to be covered by the insulating sheathing. The other 20% is assumed to be covered with plywood. The proposed design shall be calculated with the actual percentage of insulating sheathing and structural sheathing.

Reason: The calculations between the R-Values and U-Values for envelope components have not been available in the IECC or IRC. This proposal is intended to make the calculations within the code and the use of code consistent and transparent. The proposal does not change the insulation R-value or U-Value requirements, but rather is intended to be the means for future calculations to be consistent and for software tools to be consistent. This proposal makes the standard reference design and proposed design framing fractions explicit, along with all of the layers of the envelope components that are used in energy calculations.

Without explicit values that indicate how energy modeling tools are to model exact building envelope components, software tools have the discretion to select "appropriate" but inconsistent envelope layers. This inconsistency between modeling tools can create inconsistent results for what proposed designs comply with code. By adopting explicit component default value tables, the industry tools can increase consistency in how buildings are modeled.

This proposal offers an easy way to understand the true energy efficiency of the homes that are being constructed, by defining the home default construction values, the home building industry is encouraged to meet the standard construction techniques and improve to advanced framing construction techniques.

This proposal uses the values that are based on ASHRAE where possible and further supplemented with Rescheck, HERS and Washington State Energy code information.

This proposal also allows the code to be transparent where it is currently silent. Currently energy software and code officials do not have any official guidance from the code on the actual translation between R-Value and U-Value. This leads to confusion and lack of consistency in the implementation of code across the country.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-17-402.1.5-N1102.1.4

EC58–09/10
402.2.1, 502.2.1; IRC N1102.2.1

Proponent: Larry Wainright, Qualtim, Inc., representing the Structural Building components Industry

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

402.2.1 Ceilings with attic spaces. When Section 402.1.1 would require R-38 in the ceiling, R-30 shall be deemed to satisfy the requirement for R-38 wherever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Similarly, R-38 shall be deemed to satisfy the requirement for R-49 wherever the full height of uncompressed R-38 insulation extends over the wall top plate at the eaves. This reduction shall not apply to the *U*-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4. Where the required insulation depth is greater than the ceiling joist depth, no storage shall be permitted.

502.2.1 Roof assembly. The minimum thermal resistance (*R*-value) of the insulating material installed either between the roof framing or continuously on the roof assembly shall be as specified in Table 502.2(1), based on construction materials used in the roof assembly.

Exception: Continuously insulated roof assemblies where the thickness of insulation varies 1 inch (25 mm) or less and where the area-weighted *U*-factor is equivalent to the same assembly with the *R*-value specified in Table 502.2(1).

Where the required insulation depth is greater than the ceiling joist depth, no storage shall be permitted. Insulation installed on a suspended ceiling with removable ceiling tiles shall not be considered part of the minimum thermal resistance of the roof insulation.

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1102.2.1 Ceilings with attic spaces. When Section N1102.1 would require R-38 in the ceiling, R-30 shall be deemed to satisfy the requirement for R-38 wherever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Similarly R-38 shall be deemed to satisfy the requirement for R-49 wherever the full height of uncompressed R-38 insulation extends over the wall top plate at the eaves. This reduction shall not apply to the *U*-factor alternative approach in Section N1102.1.2 and the Total UA alternative in Section N1102.1.3. Where the required insulation depth is greater than the ceiling joist depth, no storage shall be permitted.

Reason: The intent of this provision is to prohibit attic spaces to be used for storage where the insulation would need to be compressed in order to accommodate the storage area, thereby rendering the insulation less effective. The insulation layer needs to be uncompressed to achieve its rated R-value. This provision will help assure the intended R-value is achieved.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WAINRIGHT-EC-1-402.2.1-RE-1-N1102.2.1

EC59–09/10

402.2.2 (New), Table 402.4.2, Chapter 6; IRC N1102.2.2 (New), Table N1102.4.2, Chapter 44

Proponent: Craig Conner, Building Quality, representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Add new text as follows:

402.2.2 Performance of loose fill insulation. Loose fill insulation shall provide the required performance at 75 degrees Fahrenheit mean temperature and no less than the required performance at winter design conditions. Performance of loose fill insulation at winter design conditions shall be determined in accordance with ASTM C1373-03.

Exception: Climate Zones 1 through 4.

2. Revise table as follows:

TABLE 402.4.2
AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

COMPONENT	CRITERIA
Air barrier and thermal barrier	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air permeable insulation is not used as a sealing material. Air permeable insulation is inside of an air barrier[a].

a. Air permeable insulation shall be permitted to be above the air barrier in attics in Climate Zones 1 through 4. Air permeable insulation shall be permitted to be above the air barrier in attics in Climate Zones 5 through 8 provided the exposed attic insulation meets the requirements of Section 402.2.2.

(Portions of table and footnotes not shown remain unchanged)

3. Add new standard to Chapter 6 as follows:

ASTM
C1373-03 Standard Practice for Determination of Thermal Resistance of Attic Insulation Systems Under Simulated Winter Conditions

PART II – IRC ENERGY

1. Add new text as follows:

N1102.2.2 Performance of loose fill insulation. Loose fill insulation shall provide the required performance at 75 degrees Fahrenheit mean temperature and no less than the required performance at winter design conditions. Performance of loose fill insulation at winter design conditions shall be determined in accordance with ASTM C1373-03.

Exception: Climate Zones 1 through 4.

TABLE N1102.2.2
AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

COMPONENT	CRITERIA
Air barrier and thermal barrier	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air permeable insulation is not used as a sealing material. Air permeable insulation is inside of an air barrier[a].

a. Air permeable insulation shall be permitted to be above the air barrier in attics in zones 1 to 4. Air permeable insulation shall be permitted to be above the air barrier in attics in zones 5 to 8 provided the exposed attic insulation meets the requirements of Section N1102.2.2.

(Portions of table and footnotes not shown remain unchanged)

3. Add new standard to Chapter 44 as follows:

ASTM
C1373-03 Standard Practice for Determination of Thermal Resistance of Attic Insulation Systems Under Simulated Winter Conditions

Reason: Low winter temperatures can induce convection in loose fill attic insulation, substantially degrading insulation performance. The use of products designed to perform in a cold winter alleviates this insulation performance problem. This proposed change is modeled on existing Minnesota code.

Testing has shown a significant problem with loose-fill insulation at cold temperatures due to heat loss from convection.
"*The Oak Ridge tests suggest that convection begins to occur at about 50°F mean insulation temperature; the Illinois tests showed performance degradation at about the same point. Both experiments show about 40%-50% loss of R-value at extremely cold temperatures.*"[1]

The Oak Ridge publication said
"*Testing with a loose-fill fiberglass insulation clearly showed that, under realistic cold winter conditions, thermal performance of the insulation was reduced considerably because of convective motion developing within t insulation."*[2a]

Loose-fill fiberglass is a common ceiling insulation. The same publication calls convention for most high-density fiberglass "*negligible*", so a fiberglass insulation that performs well in winter is available.

Why require a second test to demonstrate adequate winter performance in cold climates? Because the existing test does not account for convection and convection has a substantial impact in cold climate winters.

"*In particular, tests of fiberglass insulation with a small-scale heat flowmeter apparatus have never shown any evidence of convective motion. This small-scale apparatus is currently used as a standard method to test insulation, but it appears not to be sensitive to natural convection.*"[2b]

Typical uncovered low-density attic insulation, usually fiberglass, is exposed to the attic. Convention extending from the insulation into the attic space degrades the insulation on cold winter days.

"*The cold top surface of the insulation is open to the attic space. Convective motion may occur simultaneously above and within the insulation. When the top surface of the insulation is permeable, the flows in the insulation and in the attic are coupled.*"[2c]

The test proposed here measures performance when it is needed the most, at low winter temperatures in common attic construction. The figure below[2d] illustrates the dramatic effect of temperature on performance of low-density blown insulation. The typical attic is represented by the "*open with joists*" line on the figure, which loses the most performance. Note also the difference between "*closed*" (insulation covered by an air impermeable barrier) and "*open*" (insulation not covered). The figure shows performance drops off dramatically at low temperatures, especially for uncovered insulation.

Several solutions are straightforward- use insulation that is less air permeable (such as high density fiberglass or cellulose), use a greater insulation thickness, or add an air barrier over the insulation. Some fiberglass companies advertise products that meet this proposed requirement as insulation for Minnesota, where this requirement already exists. Their solution is either a higher density product or additional insulation. For example see:

http://www.idimn.com/products/insulation/blowing-wool.php?id=4

http://products.construction.com/Manufacturer/Guardian-Fiberglass-NST3447/products/Loose-Fill-Fiberglass-Insulation-NST10757-P

The use of higher density insulation seems likely to be the most common solution. This change will help ensure that insulation performs in cold Winters.

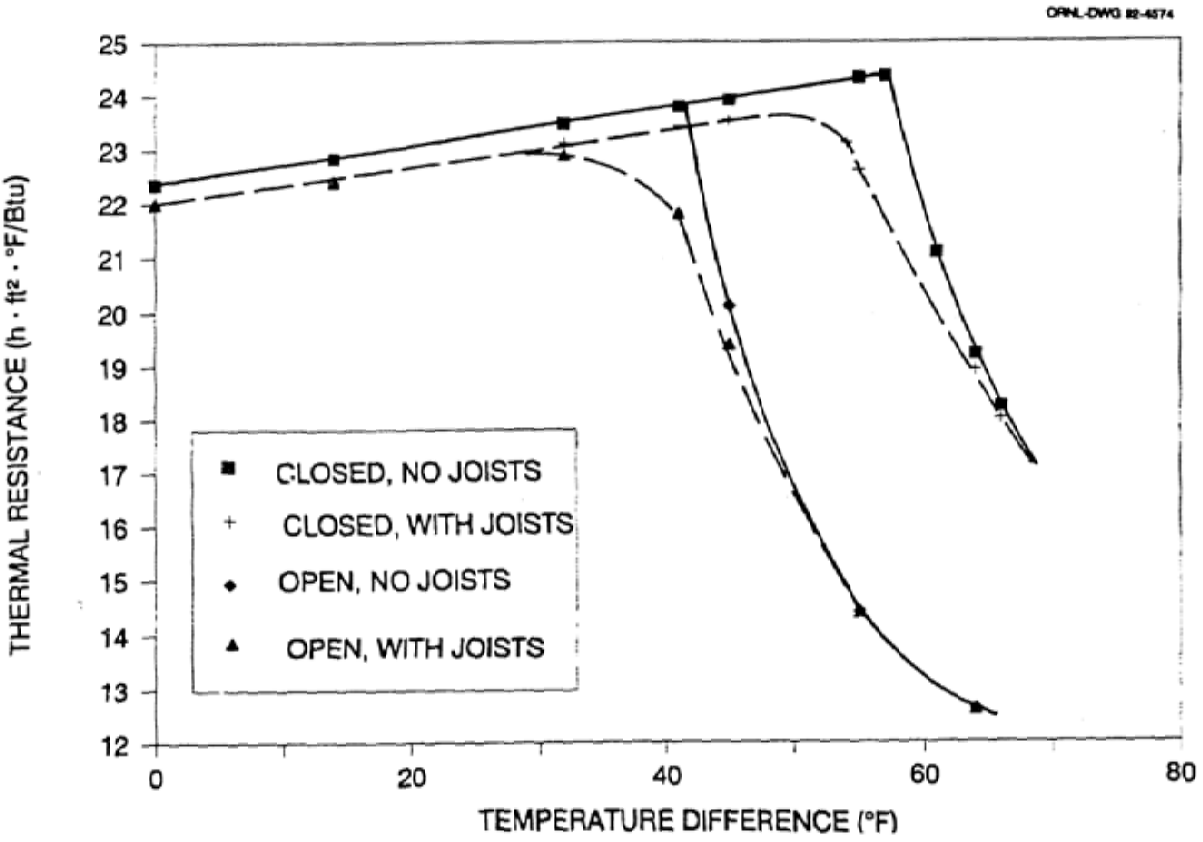


Fig. 4.3. Thermal resistance vs temperature difference in closed and open configurations with and without joists.

1 Energy Design Update, October 1991, page 1

2 Numerical Analysis of Heat Transfer by Conduction and Natural Convection in Loose-Fill Fiberglass Insulation – Effects of Convection on Thermal Performance, Agnes A. Delmas, Kenneth E. Wilkes, April 1992, ORNL/CON-338
(a) page xi, (b) page 2, (c) page 10, (d) page 31.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM C1373-03, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CONNER-EC-14-402.2.2 - N1102.2.2.DOC

EC60–09/10

202, 402.2.2; IRC Tables N1102.1, N1102.1.2, N1102.4.2

Proponent: Craig Conner, Building Quality, representing self; Shaunna Mozinga, City of Westminster, representing Colorado Chapter of ICC

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGYCOMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise definition as follows:

CONDITIONED SPACE. ~~An area or room within a building being heated or cooled, containing annulated ducts, or with a fixed opening directly into an adjacent conditioned space.~~ For energy purposes, space within a building that is provided with equipment or systems capable of maintaining, through design or heat loss/gain, 50°F (10°C) and 85°F (29°C) during the cooling season, or communicates directly with a conditioned space. For mechanical purposes, an area, room or space being heated or cooled by any equipment or appliance.

402.2.2 Ceilings without attic spaces. Where Section 402.1.1 would require insulation levels above R-30 and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section 402.1.1 shall be limited to 500 square feet (46 m^2) ~~or 20%~~ of ~~the total insulated~~ ceiling area~~, whichever is less.~~ This reduction shall not apply to the U-factor alternative approach in Section 402.1.3 and the Total UA alternative in Section 402.1.4.

PART II – IRC ENERGY

Revise tables as follows:

TABLE N1102.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT

CLIMATE ZONE	FENESTRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	GLAZED FENESTRATION SHGC	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE	FLOOR *R*-VALUE	BASEMENT WALL *R*-VALUE	SLAB *R*-VALUE & DEPTH	CRAWL SPACE WALL *R*-VALUE
1	1.20	0.75	~~0.40~~ 0.30	30	13	3 / 4	13	0	0	0
2	0.65	0.65	~~0.40~~ 0.30	30	13	4 / 6	13	0	0	0
3	0.50	0.65	~~0.40~~ 0.30	30	13	5 / 8	19	5/13[f]	0	5 / 13
4 except Marine	0.35	0.60	NR	38	13	5 / 10	19	10 / 13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5	13/17	30[f]	10/13	10,2ft	10/13
6	0.35	0.60	NR	49	20 or 13+5	15/19	30[f]	~~10/13~~ 15/19	10,4ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	~~30~~ 38[f]	~~10/13~~ 15/19	10,4ft	10/13

TABLE N1102.1.2
EQUIVALENT *U*-FACTORS[a]

CLIMATE ZONE	FENES-TRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	CEILING *U*-FACTOR	FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTORb	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	0.65	0.035	0.082	0.141	0.047	0.091[c]	0.136
4 except Marine	0.35	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	0.057	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	0.057	0.057	0.033	~~0.059~~ 0.050	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	~~0.033~~ 0.028	~~0.059~~ 0.050	0.065

TABLE N1102.4.2
AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

COMPONENT	CRITERIA
Air barrier and thermal barrier	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air permeable insulation is not used as a sealing material. Air permeable insulation is inside of an air barrier.

(Portions of table not shown remain unchanged)

Reason: This set of six changes is designed to align the IECC and IRC. Code users expect their family of I-codes to be consistent. This change corrects six inconsistencies left over from the major changes made in the energy requirements in the last code change cycle.

This change makes the IECC **definition of conditioned space** consistent with the existing IRC definition. The primary reason for preferring the IRC definition is that it is more useable.

The IECC now has **two separate limits on the ceiling area eligible for reduced R-value** due to the limited space for installing insulation (cathedral ceilings, EC46). The IRC has only one limit. The second limit could be added to the IRC or removed from the IECC. Both codes already have the simple area limit (500 ft^2). It would seem that having the simple limit of 500 ft^2 is enough; we don't need to have a "percentage of area" calculation too.

Three differences between the IECC and IRC are in R-value and U-factor tables. In each case the suggestion is to align the IRC and IECC by making in IRC consistent with what is in the IECC.

Lower southern SHGC requirements were approved in the IECC, but not the IRC. The lower SHGC from the IECC contributes significantly to limiting the cooling energy in the southern zones. This change modifies the IRC by duplicating the lower IECC SHGCs from zones 1 to 3. (Change is included in Table N1102.1.)

Basement insulation R-values in the IECC were increased in the northern zones 6 to 8. This change inserts the IECC basement insulation R-value and U-factors into the IRC. (Change is included in Tables N1102.1 and N1102.1.2.)

Floor insulation R-values in the IECC were increased to R-38 in zones 7 and 8. This change inserts the IECC floor insulation R-value and U-factors into the IRC. (Change is included in Tables N1102.1 and N1102.1.2.)

The **new "Air Barrier and Insulation Inspection Table"** was added to both the IECC and IRC. **One line was left out of the IRC** table. This adds back the missing line.

Cost Impact: The cost impact varies with the six changes.

PART I – IECC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

PART II – IRC BUILDING/ENERGY

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CONNER-MOZINGO-EC-1-402.2.2-T. N1102.1.DOC

EC61–09/10
402.2.2

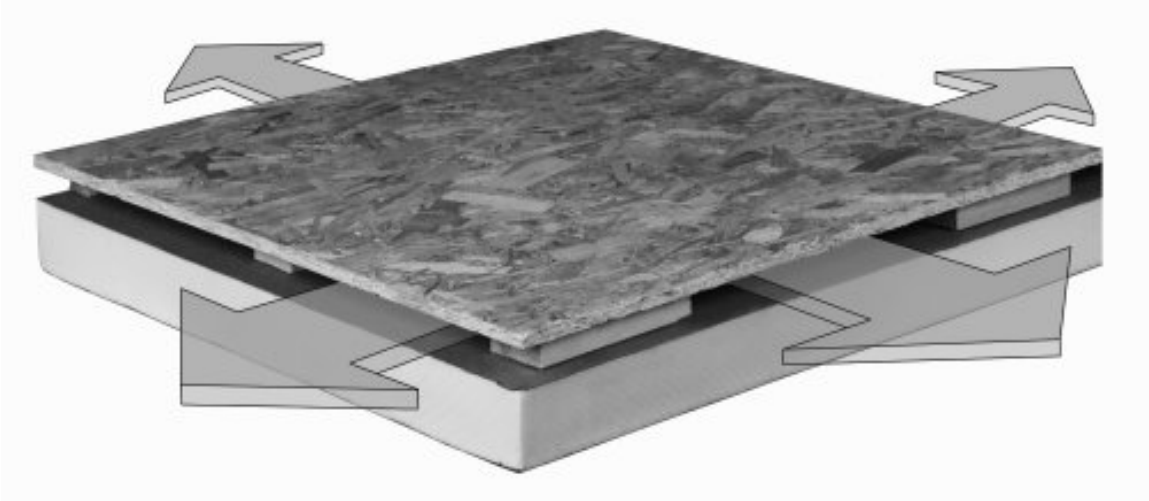
Proponent: Lorraine Ross, Intech Consulting, Inc., representing Polyiso Insulation Manufacturers Association

Revise as follows:

402.2.2 Ceilings without attic spaces. The requirements of Table 402.1.1 shall be met by a combination of insulation installed within the cavity under the roof deck and composite nailbase panels composed of rigid foam insulation that complies with Section 314, a 1, 1.5 or 2 inch airspace and a nailable wood structural panel installed on the topside of the roof deck. Composite panels shall be installed in accordance with manufacturers installation instructions. ~~based on the climate *zone* specified in Chapter 3.Where Section 402.1.1 would require insulation levels above R-30 and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30.This reduction of insulation from the requirements of Section 402.1.1 shall be limited to 500 square feet (46m2) or 20 percent of the total insulated ceiling area, whichever is less. This reduction shall not apply to the *U*-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4.~~

Reason: With the widespread availability of composite nail base panels, there is no reason to underinsulate a roof without attic spaces. A combination of insulation installed in the cavity along with insulation installed above the roof deck can easily meet the thermal performance of Table 402.1.

Composite nailbase insulated panels are available in all thicknesses that easily meet the energy code and have been available for many years with proven performance. This is an example of the product. There are spacer strips separating the nailable surface from the rigid insulation.



The use of asphalt shingles and other roof coverings has been successful over these composite insulation panels and the required ventilation is maintained.

This code change proposal also provides an easily installed and inspected insulation system. The nailable surface is composed of OSB or plywood.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROSS-EC-1-402.2.2

EC62–09/10
402.2.2

Proponent: Ken Sagan, National Association of Home Builders (NAHB)

Revise as follows:

402.2.2 Ceilings without attic spaces. Where Section 402.1.1 would require insulation levels above R-30 and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section

402.1.1 shall be limited to 500 square feet (46 m2) ~~or 20% of the total insulated ceiling area, whichever is less~~. This reduction shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4

Reason: The purpose of this proposal is to help alleviate the confusion in the 2009 International Energy Conservation Code (IECC). Without this amendment, the IECC would limit the ceiling areas eligible due to a framing cavity restriction for reduced R-value. The IECC already has a limit (500 sq. ft) for this application. This additional limit adds a calculation to determine the second limit and therefore is more confusing than it is worth. Typically, smaller homes have smaller rafter requirements based on shorter spans. Allowing the proper sized framing material to handle the loads is not only cost-effective, but saves our natural resources. Adding insulation alone can be cost effective. Installing larger rafters in order to meet minimum insulation requirements would not be considered a justified cost and would not be conserving our natural resources.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SAGAN-EC-2-402.2.2

EC63–09/10
402.2.3 (New); IRC N1102.2.3 (New)

Proponent: Craig Conner, Building Quality, representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Add new text as follows:

402.2.3 Wind wash baffle. For air permeable insulations in vented attics, a baffle shall be installed adjacent to soffit and eave vents. Baffles shall maintain an opening equal or greater than the size of the vent. The baffle shall extend over the top of the attic insulation inward until it is at least 4 inches vertically above the insulation at full height. The baffle shall be permitted to be any solid material such as cardboard or thin rigid insulating sheathing.

PART II – IRC ENERGY

N1102.2.3 Wind wash baffle. For air permeable insulations in vented attics, a baffle shall be installed adjacent to soffit and eave vents. Baffles shall maintain an opening equal or greater than the size of the vent. The baffle shall extend over the top of the attic insulation inward until it is at least 4 inches vertically above the insulation at full height. The baffle shall be permitted to be any solid material such as cardboard or thin rigid insulating sheathing.

Reason: Inexpensive wind wash baffles prevent the wind from blowing through air permeable insulation. Wind blowing through insulation lowers the insulation's effectiveness.

The baffle also keeps the wind from blowing insulation off parts of the ceiling directly next to the vents. Areas lacking insulation can create moisture problems.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CONNER-EC-4-402.2.3-N1102.2.3.DOC

EC64–09/10

402.2.3 (New), Table 402.2.3 (New); IRC N1102.2.2.1 (New), Table N1102.2.2 (New)

Proponent: Dwight Sheldon, Demilec (USA) LLC

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Add new text and table as follows:

402.2.3 Where recessed luminaries, exhaust fans, ducts or flues are installed in a ceiling without an attic space, the roofdeck above the recessed device shall be insulated for condensation control with air impermeable insulation equal to or greater than that prescribed in Table 402.2.3.

TABLE 402.2.3
INSULATION FOR CONDENSATION CONTROL

CLIMATE ZONE	MINIMUM RIGID BOARD OR AIR-IMPERMEABLE INSULATION R-VALUE[a]
2B and 3B tile roof only	0 (none required)
1, 2A, 2B, 3A, 3B, 3C	R-5
4C	R-10
4A, 4B	R-15
5	R-20
6	R-25
7	R-30
8	R-35

a. Contributes to but does not supersede prescriptive energy requirements.

PART II – IRC BUILDING/ENERGY

Add new text and table as follows:

1102.2.2.1 Where recessed luminaries, exhaust fans, ducts or flues are installed in a ceiling without an attic space, the roofdeck above the recessed device shall be insulated for condensation control with air impermeable insulation equal to or greater than that prescribed in Table 1102.2.2

TABLE 1102.2.2
INSULATION FOR CONDENSATION CONTROL

CLIMATE ZONE	MINIMUM RIGID BOARD OR AIR-IMPERMEABLE INSULATION R-VALUE[a]
2B and 3B tile roof only	0 (none required)
1, 2A, 2B, 3A, 3B, 3C	R-5
4C	R-10
4A, 4B	R-15
5	R-20
6	R-25
7	R-30
8	R-35

Reason: Recessed luminaries, exhaust fans, ducts and flues often consume most of the space between the ceiling and the roof deck in a ceiling without an attic space (sometimes referred to as roof/ceiling combination, cathedral ceiling or vaulted ceiling), and often do not have adequate insulation between the device and the roof deck to control condensation. This lack of insulation also contributes to significant energy loss in all climates and to ice damming in colder climates. The durability of the structure is compromised if condensation forms on the roof deck which can lead to mold, mildew and rot. Ice damming can lead to bulk water intrusion and substantial damage to the roof and walls.

Cost Impact: The cost for materials for rigid insulation in a ceiling joist cavity is estimated at:
R-10 = \$0.80/ft^2
R-20 = \$1.60/ft^2
R=30 = \$2.40/ft^2

(\$15 per 32ft^2 sheet, 1" thick, R-5.9 per inch)
A typical recessed luminary should require 1.5ft^2 – 2ft^2

Labor to install the insulation is estimated at less than 5-minutes per recessed luminary or exhaust fan, and about 2 - 5 minutes per 4 lineal feet of duct or flue.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SHELDON-EC-1-402.2.3-T. 402.2.3-RE-N1102.2.2.1-T. N1102.2.2

EC65–09/10
402.2.4, Chapter 6

Proponent: Rob Pickett, Rob Pickett & Associates, LLC, representing Log Homes Council

1. Revise as follows:

402.2.4 Mass walls. Mass walls for the purposes of this chapter shall be considered above-grade walls of concrete block, concrete, insulated concrete form (ICF), masonry cavity, brick (other than brick veneer), earth (adobe, compressed earth block, rammed earth) and solid timber/logs. The design and construction of log structures shall be in accordance with the provisions of ICC-400-2007 IS LOG.

2. Add new standard to Chapter 6 as follows:

ICC
400-07 IS LOG Standard on the Design and Construction of Log Structures

Reason: The purpose of this change is to direct users of the code who are evaluating log structures to the ICC consensus standard pertaining to this unique and traditional construction method.

Log structures employ alternative methods of construction that are fully covered by ICC-400 IS-LOG *Standard for the Design and Construction of Log Structures.* ICC400-2007 is an ANSI-approved document that represents industry standards and guidelines for this form of construction. It gives the code official an important tool for inspection and understanding log construction, including thermal performance. Carefully written to cover all forms of log construction, the standard explains how to respond to design conditions, but it does not establish those conditions.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ICC 400-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: PICKETT-EC-2-402.2.4

EC66–09/10
Table 402.2.5; IRC Table N1102.2.5

Proponent: Mark Nowak, representing Steel Framing Alliance

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise table as follows:

TABLE 402.2.5
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION (R-VALUE)

WOOD FRAME R-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT R-VALUE[a]
Steel Truss Ceilings[b]	
R-30	R-38 or R-30 + 3 or R-26 + 5
R-38	R-49 or R-38 + 3
R-49	R-38 + 5
Steel Joist Ceilings[b]	
R-30	R-38 in 2 x 4 or 2 x 6 or 2 x 8 R-49 in any framing
R-38	R-49 in 2 x 4 or 2 x 6 or 2 x 8 or 2 x 10
Steel-Framed Wall	
R-13	R-13 + ~~5~~ 3.2 or ~~R-15 + 4~~ R-19 + 2.1 or R-21 + ~~3~~ 2.0 or R-0 + ~~10~~ 8.4
~~R-19~~	~~R-13 + 9 or R-19 + 8 or R-25 + 7~~
R-20	R-0 + 12.5 or R-13 + 7.3 or R-19 + 6.2 or R-21 + 5.9
R-21	R-0 + 13.0 or R-13 + ~~10~~ 7.7 or R-19 + ~~9~~ 6.6 or R-21 + 6.4 or R-25 + 8
Steel Joist Floor	
R-13	R-19 in 2 x 6 R-19 + 6 in 2 x 8 or 2 x 10
R-19	R-19 + 6 in 2 x 6 R-19 + 12 in 2 x 8 or 2 x 10

a. Cavity insulation *R*-value is listed first, followed by continuous insulation *R*-value.
b. Insulation exceeding the height of the framing shall cover the framing.

PART II – IRC Energy

Revise table as follows:

TABLE N1102.2.5
STEEL-FRAME CEILING, WALL AND FLOOR INSULATION (R-VALUE)

WOOD FRAME R-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT R-VALUE[a]
Steel Truss Ceilings[b]	
R-30	R-38 or R-30 + 3 or R-26 + 5
R-38	R-49 or R-38 + 3
R-49	R-38 + 5
Steel Joist Ceilings[b]	
R-30	R-38 in 2 x 4 or 2 x 6 or 2 x 8 R-49 in any framing
R-38	R-49 in 2 x 4 or 2 x 6 or 2 x 8 or 2 x 10
Steel-Framed Wall	
R-13	R-13 + ~~5~~ 3.2 or ~~R-15 + 4~~ R-19 + 2.1 or R-21 + ~~3~~ 2.0 or R-0 + ~~10~~ 8.4
~~R-19~~	~~R-13 + 9 or R-19 + 8 or R-25 + 7~~
R-20	R-0 + 12.5 or R-13 + 7.3 or R-19 + 6.2 or R-21 + 5.9
R-21	R-0 + 13.0 or R-13 + ~~10~~ 7.7 or R-19 + ~~9~~ 6.6 or R-21 + 6.4 or R-25 + 8
Steel Joist Floor	
R-13	R-19 in 2 x 6 R-19 + 6 in 2 x 8 or 2 x 10
R-19	R-19 + 6 in 2 x 6 R-19 + 12 in 2 x 8 or 2 x 10

a. Cavity insulation *R*-value is listed first, followed by continuous insulation *R*-value.
b. Insulation exceeding the height of the framing shall cover the framing.

Reason: Currently, there are inconsistencies between ASHRAE 90.1, the IECC, and the IRC regarding determination of U-factors for steel framed walls. This proposal and its companion to the IECC serve to ensure that U-factors for steel framed walls are determined in accordance with ASHRAE 90.1 methodology across all codes. This change will remove confusion and simplify the code compliance process as well as permit greater transparency, consistency, and collaboration across codes.

ASHRAE 90.1 values should be used in this table and across the IECC and IRC for three reasons: first, because ASHRAE 90.1 is the only source of U-factors that were determined through the ANSI consensus process; second, because ASHRAE 90.1 clearly delineates their assumptions and methodology in calculating the U-factors (this is not done within the IRC or IECC); and third, because in some areas the IECC already uses the ASHRAE methodology for determining U-factors of steel framed walls (See IECC Table 502.2.1 and 502.2(1), which are sourced directly from ASHRAE 90.1-2007).

To ensure consistency with ASHRAE 90.1 and with the U-factors used in Table 502.1.2, U-factors for wood framed walls and their thermally equivalent steel framed wall counterparts were calculated based on ASHRAE 90.1 methodology as follows:

1. U-factors for wood framed walls were sourced from ASHRAE 90.1-2007, Table A 3.4 as follows: R-13 (0.089), R-20 (0.065, interpolated), R-21 (0.063). Note that IECC Table 502.1.2 uses identical U-factors where values overlap (e.g. 0.089 for R-13 wood framed wall).
2. The required cavity and continuous R-values for steel framed walls to match the U-factors for wood framed walls were then calculated based on guidance provided by ASHRAE 90.1-2007 Section A3.3.1, "Steel-Framed Walls, General", and Section A9.4, "Calculation Procedures and Assumptions." This methodology is the same calculation procedure that was used to derive Table A3.3 of ASHRAE 90.1, which provides a matrix of metal framed wall U-factors based on specified cavity and/or continuous insulation.
3. To be consistent with the formatting of prescriptive steel frame wall requirements in IECC Table 502.2(1), requirements for steel framed wall continuous insulation R-values were then rounded to the nearest 0.1.

Submitted below are ASHRAE 90.1-2007 Table A3.4 and Table A3.3, with mark-ups showing how wood framed wall U-factors were sourced and how steel framed wall equivalent R-values were sourced. Table A3.3 contains mark-ups that highlight steel framed wall insulation R-values that would result in thermal equivalence to an R-13 wood framed wall.

TABLE A3.4 Assembly U-Factors for Wood-Frame Walls

Framing Type and Spacing Width (Actual Depth)	Cavity Insulation R-Value: Rated (Effective Installed [see Table A9.4C])	Overall U-Factor for Entire Base Wall Assembly	Overall U-Factor for Assembly of Base Wall Plus Continuous Insulation — Rated R-Value of Continuous Insulation											
			R-1.00	R-2.00	R-3.00	R-4.00	R-5.00	R-6.00	R-7.00	R-8.00	R-9.00	R-10.00	R-11.00	R-12.00	R-13.00
Wood Studs at 16 in. on center															
3.5 in. depth	None (0.0)	**0.292**	0.223	0.181	0.152	0.132	0.116	0.104	0.094	0.086	0.079	0.073	0.068	0.064	0.060
	R-11 (11.0)	**0.096**	0.087	0.079	0.073	0.068	0.063	0.059	0.056	0.053	0.050	0.048	0.046	0.044	0.042
	R-13 (13.0)	**0.089**	0.080	0.074	0.068	0.063	0.059	0.056	0.053	0.050	0.047	0.045	0.043	0.041	0.040
	R-15 (15.0)	**0.083**	0.075	0.069	0.064	0.060	0.056	0.053	0.050	0.047	0.045	0.043	0.041	0.039	0.038
5.5 in. depth	R-19 (18.0)	**0.067**	0.062	0.058	0.054	0.051	0.048	0.046	0.044	0.042	0.040	0.038	0.037	0.036	0.034
	R-21 (21.0)	**0.063**	0.058	0.054	0.051	0.048	0.045	0.043	0.041	0.039	0.038	0.036	0.035	0.034	0.032

Targeted U-Factor for Thermal Equivalence with wood framed R-13 wall

Graphic A: ASHRAE 90.1-2007 Table A3.4. Provides the U-factor for an R-13 wood framed wall.

Targeted U-factor for thermal equivalence with R-13 wood framed wall = 0.089.

TABLE A3.3 Assembly U-Factors for Steel-Frame Walls

Framing Type and Spacing Width (Actual Depth)	Cavity Insulation R-Value: Rated (Effective Installed [see Table A9.2B])	Overall U-Factor for Entire Base Wall Assembly	Overall U-Factor for Assembly of Base Wall Plus Continuous Insulation — Rated R-Value of Continuous Insulation											
			R-1.00	R-2.00	R-3.00	R-4.00	R-5.00	R-6.00	R-7.00	R-8.00	R-9.00	R-10.00	R-11.00	R-12.00	R-13.00
Steel Framing at 16 in. on center															
3.5 in. depth	None (0.0)	**0.352**	0.260	0.207	0.171	0.146	0.128	0.113	0.102	0.092	0.084	0.078	0.072	0.067	0.063
	R-11 (5.5)	**0.132**	0.117	0.105	0.095	0.087	0.080	0.074	0.069	0.064	0.060	0.057	0.054	0.051	0.049
	R-13 (6.0)	**0.124**	0.111	0.100	0.091	0.083	0.077	0.071	0.066	0.062	0.059	0.055	0.052	0.050	0.048
	R-15 (6.4)	**0.118**	0.106	0.096	0.087	0.080	0.074	0.069	0.065	0.061	0.057	0.054	0.051	0.049	0.047
6.0 in. depth	R-19 (7.1)	**0.109**	0.099	0.090	0.082	0.076	0.071	0.066	0.062	0.058	0.055	0.052	0.050	0.047	0.045
	R-21 (7.4)	**0.106**	0.096	0.087	0.080	0.074	0.069	0.065	0.061	0.057	0.054	0.051	0.049	0.047	0.045

R-13 + 3.2

R-19 + 2.1

R-0 + 8.4

R-21 + 2.0

Graphic B: ASHRAE 90.1-2007 Table A3.3.

Additionally, this proposal removes the reference to R-19 since there is no longer a wood frame wall R-value prescription with this value that would require a steel framed thermal equivalent. An R-20 equivalent is added to provide an equivalent path to the R-20 wood framed wall prescription that was introduced in the 2009 code.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

PART II – IRC BUILDING/ENERGY

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: NOWAK-EC-4-T. 402.2.5-RE-1-T. N1102.2.5

EC67–09/10
202 (New), 402.2.7 (New), 502.2.2.1, 502.2.2.2

Proponent: Ronald Majette, representing US Department of Energy

1. Revise definitions as follows:

ABOVE-GRADE WALL. ~~A wall more than 50 percent above grade and enclosing *conditioned space*. This includes between-floor spandrels, peripheral edges of floors, roof and basement knee walls, dormer walls, gable end walls, walls enclosing a mansard roof and skylight shafts.~~ See Section 402.2.7 for residential buildings and Section 502.2.3 for commercial buildings.

BASEMENT WALL. ~~A wall 50 percent or more below grade and enclosing *conditioned space*.~~ See Section 402.2.7.

2. Add new definition as follows:

BELOW-GRADE WALL. See Section 502.2.3.

3. Add new text as follows:

402.2.7 Above grade walls. Where Section 402.1.1 would require insulation on above grade walls, those walls are those more than 50 percent above grade and enclosing *conditioned space.* This includes between floor spandrels, peripheral edges of floors, roof and basement knee walls, dormer walls, gable end walls, walls enclosing a mansard roof and surfaces associated with skylight shafts. Walls not considered above grade walls shall be considered basement walls as covered in Section 402.2.8.

4. Revise as follows:

502.2.2.1 Above-grade walls. Above-grade walls are those walls covered by Section 502.2.3 on the exterior of the building ~~and completely above-grade or walls that are more than 15 percent above grade~~ that are not below-grade walls.

502.2.2.2 Below-grade walls. Below-grade walls covered by Section 502.2.4 are ~~basement or first-story walls associated with the exterior of the building that are at least 85 percent below grade~~ those portions of walls associated with the building envelope that are entirely below the finish grade and in contact with the ground.

Reason: For consistency with ASHRAE Standard 90.1. The current definitions are appropriate for application to residential buildings. The revisions related to commercial buildings make it clear which walls are above grade and below grade and most importantly eliminate what appears to be an arbitrary distinction built around a 15/85% ratio of above and below grade.

Cost Impact: The code change proposal could increase or decrease the cost of construction to the degree that the current IECC would consider some walls above or below grade while ASHRAE 90.1-07 would consider them the opposite.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-36-202-402.2.7

EC68–09/10
402.2.11, 402.3.5; IRC N1102.2.11, N1102.3.5

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

402.2.11 Thermally isolated sunroom insulation. All *sunrooms* shall meet the insulation requirements of this code.

Exception: For *sunrooms* with *thermal isolation*, the following exceptions to the insulation *requirements* of this code shall apply: (1) The minimum ceiling insulation R-values shall be R-~~19~~24 in Zones 1 through 4 and R-~~24~~30 in Zones 5 through 8~~.~~; and (2) The minimum wall R-value shall be R-13 in all zones. New wall(s) separating a *sunroom* with *thermal isolation* from *conditioned space* shall meet the *building thermal envelope* requirements of this code.

402.3.5 Thermally isolated sunroom U-factor. All *sunrooms* shall meet the fenestration requirements of this code.

Exception: For *sunrooms* with *thermal isolation* in Zones 4 through 8, the following exceptions to the fenestration requirements of this code shall apply: (1) the maximum fenestration U-factor shall be ~~0.50~~ 0.45; and (2) the maximum skylight U-factor shall be 0.70~~5~~. New ~~windows and doors~~ fenestration separating the *sunroom* with *thermal isolation* from *conditioned space* shall meet the *building thermal envelope* requirements of this code.

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1102.2.11 Thermally isolated sunroom insulation. All *sunrooms* shall meet the insulation requirements of this code.

Exception: For *sunrooms* with *thermal isolation*, the following exceptions to the insulation *requirements* of this code shall apply: (1) The minimum ceiling insulation R-values shall be R-~~19~~24 in Zones 1 through 4 and R-~~24~~30 in Zones 5 through 8~~.~~; and (2). The minimum wall R-value shall be R-13 in all zones. New wall(s) separating a *sunroom* with *thermal isolation* from *conditioned space* shall meet the *building thermal envelope* requirements of this code.

N1102.3.5 Thermally isolated sunroom U-factor. All *sunrooms* shall meet the fenestration requirements of this code.

Exception: For *sunrooms* with *thermal isolation* in Zones 4 through 8, the following exceptions to the fenestration requirements of this code shall apply: (1) the maximum fenestration U-factor shall be ~~0.50~~ 0.45; and (2) the maximum skylight U-factor shall be 0.70~~5~~. New ~~windows and doors~~ fenestration separating the *sunroom* with *thermal isolation* from *conditioned space* shall meet the *building thermal envelope* requirements of this code.

Reason: This proposal editorially clarifies that the requirements for thermally isolated *sunrooms* in these sections are exceptions and only apply to *sunrooms* that have *thermal isolation* and that all other sunrooms must comply with all of the requirements of the code. The proposal also tightens the requirements in the exceptions. It is reasonable to require some improvement in *sunrooms* with *thermal isolation*, particularly given the amount of glass and the relatively minimal current requirements.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-18-402.2.11-N1102.2.11

EC69–09/10
402.2.12 (New); IRC N1102.2.12 (New)

Proponent: Ronald Majette, representing US Department of Energy

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Add new text as follows:

402.2.12 Common, party, and fire walls. Whenever continuity of the *building thermal envelope* is broken at walls separating dwelling units in Group R-2 building, including common, party, and fire walls, such walls shall be insulated to a minimum of R-10 on each side of the break in insulation continuity, and the walls shall be air sealed in accordance with Section 402.4.

PART II – IRC BUILDING/ENERGY

Add new text as follows:

N1102.2.12 Common, party, and fire walls. Whenever continuity of the *building thermal envelope* is broken at walls separating dwelling units in Group R-2 building, including common, party, and fire walls, such walls shall be insulated to a minimum of R-10 on each side of the break in insulation continuity, and the walls shall be air sealed in accordance with Section N1102.4.

Reason: Feedback we have received from the field is that party/fire walls in Low-Rise Multifamily dwellings are often a source of a considerable waste of energy. The problem is that these common walls are overlooked for their lack of insulation and air sealing, as they are often not considered to be exterior walls or part of the building thermal envelope for the purposes of the codes.

We know, however, from past experience with real-time performance testing of these common walls that they are often direct connections between the outside, unconditioned crawlspaces or basement, and unconditioned attics. This results in potential air infiltration/exfiltration issues, as well as conductive heat loss, since these walls are not insulated. The end result is energy loss and appurtenant utility bill increases and major comfort issues associated with these "cold" walls. This is why the EPA and NYSERDA Energy Star Homes programs require air sealing of these walls as well.

Cost Impact: The code change proposal will increase the cost of construction to the degree that these walls which may not now be insulated and sealed with have to be insulated and sealed. Costs of operation of the building will be reduced a commensurate amount to offset any increase cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-76-402.2.12-IRC N1102.2.12

EC70–09/10
202

Proponent: Ronald Majette, representing US Department of Energy

Revise definition as follows:

SKYLIGHT. Glass or other transparent or translucent glazing material installed at a slope of ~~15~~ less than 60 degrees (0.26 rad) ~~or more from vertical~~ from horizontal. Glazing material in skylights, including unit skylights, solariums, sunrooms, roofs and sloped walls is included in this definition.

Reason: For consistency with ASHRAE Standard 90.1. Currently ASHRAE 90.1-07 defines skylights as having a slope of less than 60 degrees from the horizontal plane. Other fenestration, even if mounted on the roof of a building, is considered *vertical fenestration*.

Cost Impact: The code change could increase or decrease the cost of construction to the degree that the current IECC would consider some glazing vertical fenestration while ASHRAE 90.1-07 would consider the same glazing a skylight. There are different thermal requirements for skylights and vertical fenestration.

Analysis: This will create a different definition than is currently in the IBC and IRC.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-37-202

EC71–09/10

202 (New), 402.3 (New), 402.3.1 (New), Table 402.3(1) (New), Chapter 6 (New); IRC R202 (New), N1102.3 (New), N1102.3.1 (New), Table N1102.3(1) (New), Chapter 44

Proponent: Ronald Majette, US Department of Energy

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

1. Add new definitions as follows:

REFLECTANCE, SOLAR. The ratio of reflected solar flux to incident solar flux.

ABSORPTANCE, SOLAR. The difference 1.0 minus the *solar reflectance*.

2. Add new text and table as follows:

402.3 Solar properties of opaque surfaces (Prescriptive).

402.3.1 Solar absorptance of roofs. Roofs in climate zones 1, 2, and 3 having a ratio of rise to run less than or equal to 2:12 (9.5 degrees from horizontal) shall be provided with roofing materials having a solar absorptance not exceeding 0.75, as tested in accordance with ASTM E1918 or C1549. For unrated roofing materials, solar absorptance values shall be taken from Table 402.3(1).

TABLE 402.3(1)
DEFAULT ROOF SOLAR ABSORPTANCE VALUES

ROOF MATERIAL	SOLAR ABSORPTANCE
White Composition Shingles	0.80
White Tile (including concrete)	0.60
White Metal	0.50
All Others	0.92

3. Add new standards to Chapter 6 as follows:

ASTM

E1918-06	Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field
C1549-04	Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field

PART II – IRC BUILDING/ENERGY

1. Add new definitions as follows:

REFLECTANCE, SOLAR. The ratio of reflected solar flux to incident solar flux.

ABSORPTANCE, SOLAR. The difference 1.0 minus the *solar reflectance*.

2. Add new text and table as follows:

N1102.3 Solar properties of opaque surfaces (Prescriptive).

N1102.3.1 Solar absorptance of roofs. Roofs in climate zones 1, 2, and 3 having a ratio of rise to run less than or equal to 2:12 (9.5 degrees from horizontal) shall be provided with roofing materials having a solar absorptance not exceeding 0.75, as tested in accordance with ASTM E1918 or C1549. For unrated roofing materials, solar absorptance values shall be taken from Table 402.3(1).

TABLE N1102.3(1)
DEFAULT ROOF SOLAR ABSORPTANCE VALUES

ROOF MATERIAL	SOLAR ABSORPTANCE
White Composition Shingles	0.80
White Tile (including concrete)	0.60
White Metal	0.50
All Others	0.92

3. Add new standards to Chapter 44 as follows:

ASTM

E1918-06	Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field
C1549-04	Standard Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field

Reason: The U.S. Department of Energy has estimated that reducing the solar absorptivity of all buildings and roads could affect the equivalent carbon reduction of removing all automobiles in the world from the road for 11 years. This proposal extends the solar absorptance currently used in the standard reference design of the Simulated Performance Alternative to the prescriptive compliance path. Provisions for solar reflectance ratings and default values for unrated materials are consistent with the 2006 Mortgage Industry National Home Energy Rating Systems Standards (RESNET 2006).

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM E1918-06 and ASTM C1549-04, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-66-202-CH 4-IRC R202-CH 11-REDONE

EC72–09/10

103.2, 202 (New), 402.3.3 (New), Table 402.3.3 (New); IRC R106.2, R202 (New), N1102.3.3 (New), Table N1102.3.3 (New)

Proponent: Thomas D. Culp, Ph.D., Birch Point Consulting LLC, representing Aluminum Extruders Council; Vickie Lovell, InterCode Incorporated, representing Association of Industrial Metallized Coaters and Laminators

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise as follows:

103.2 Information on construction documents. Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted when *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, as applicable, cardinal directions; insulation materials and their R-values; fenestration U-factors and SHGCs; area-weighted U-factor and SHGC calculations; permanent shading features with projection factor calculations; mechanical system design criteria; mechanical and service water heating system and equipment types, sizes and efficiencies; economizer description; equipment and systems controls; fan motor horsepower (hp) and controls; duct sealing, duct and pipe insulation and location; lighting fixture schedule with wattage and control narrative; and air sealing details.

***2*. Add new text as follows:**

SECTION 202
GENERAL DEFINITIONS

PROJECTION FACTOR. The ratio of the horizontal depth of an overhang, eave, or permanently attached shading device, divided by the distance measured vertically from the bottom of the fenestration glazing to the underside of the overhang, eave, or permanently attached shading device.

402.3.3 Glazed fenestration SHGC exception. In Climate Zones 1 through 3, permanently shaded vertical fenestration shall be permitted to satisfy the SHGC requirements. The projection factor of an overhang, eave, or permanently attached shading device shall be greater than or equal to the value listed in table 402.3.3 for the appropriate orientation. The minimum projection shall extend beyond each side of the glazing a minimum of 12 inches (0.3 m). Each orientation shall be rounded to the nearest cardinal orientation (+/-45 degrees or 0.79 rad) for purposes of calculations and demonstrating compliance.

TABLE 402.3.3
MINIMUM PROJECTION FACTOR REQUIRED BY ORIENTATION FOR SHGC EXCEPTION

ORIENTATION	PROJECTION FACTOR
North	>=0.40[a]
South	>=0.20
East	>=0.50
West	>=0.50

a. For the north orientation, a vertical projection located on the west-edge of the fenestration with equivalent PF >= 0.15 shall also satisfy the minimum projection factor requirement.

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

R106.2 Site plan or plot plan. The construction documents submitted with the application for permit shall be accompanied by a site plan showing the size and location of new construction and existing structures on the site, ~~and~~ distances from lot lines, and cardinal directions. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The building official is authorized to waive or modify the requirement for a site plan when the application for permit is for alteration or repair or when otherwise warranted.

2. Add new text as follows:

SECTION R202
DEFINITIONS

PROJECTION FACTOR. The ratio of the horizontal depth of an overhang, eave, or permanently attached shading device, divided by the distance measured vertically from the bottom of the fenestration glazing to the underside of the overhang, eave, or permanently attached shading device.

N1102.3.3 Glazed fenestration SHGC exception. In Climate Zones 1 through 3, permanently shaded vertical fenestration shall be permitted to satisfy the SHGC requirements. The projection factor of an overhang, eave, or permanently attached shading device shall be greater than or equal to the value listed in table N1102.3.3 for the appropriate orientation. The minimum projection shall extend beyond each side of the glazing a minimum of 12 inches (0.3 m). Each orientation shall be rounded to the nearest cardinal orientation (+/-45 degrees or 0.79 rad) for purposes of calculations and demonstrating compliance.

TABLE N1102.3.3
MINIMUM PROJECTION FACTOR REQUIRED BY ORIENTATION FOR SHGC EXCEPTION

ORIENTATION	PROJECTION FACTOR
North	>=0.40[a]
South	>=0.20
East	>=0.50
West	>=0.50

a. For the north orientation, a vertical projection located on the west-edge of the fenestration with equivalent PF >= 0.15 shall also satisfy the minimum projection factor requirement.

Reason
(Culp): This proposal would promote good shading practice through a prescriptive alternative to the SHGC requirements. The proposed requirements account for orientation differences, based on equivalent shading averaged over the relevant time period for each façade.

To aid enforcement, this proposal puts the requirement on the builder, not the code official, to substantiate projection factor calculations and indicate the cardinal directions on construction documents. Also, projection factor has already been in use for years in both the commercial chapter and ASHRAE 90.1, so this is merely an extension of current practice.

Shading has been part of good building design for millennia. The code should recognize and encourage this practice as we strive for ever increasing levels of energy efficiency.

(Lovell): The concept of using shading to reduce heat gain dates back to prehistoric times, when man and beast had the instinctive sense to seek shade during the hottest part of the day. It is integral to the architectural of some of the oldest world cultures. Shading in modern construction offers many possibilities, some yet to be fully explored.

This proposed code change allows for the use of overhangs to meet the solar heat gain coefficient requirements within the IECC. Permanent exterior shading features, such as overhangs are allowed to be used in IECC Chapter 5 as a prescriptive trade-off to meeting SHGC requirements within the code. The calculation for determining the projection factor for overhangs has been in the 2000, 2003, 2006, and 2009 IECC for commercial buildings and has been proven to be very simple to calculate, fitting well into a prescriptive approach. The use of the shading devices was previously allowed under the 2003 IECC and is currently allowed as a trade-off under the commercial provisions of the IECC.

Allowing flexibility in meeting the solar heat gain coefficient through the use of proven shading alternatives will increase the usability of the code for the building and design community while ensuring that the new fenestration is energy efficient. When credit for shading is permitted in the building code, it encourages an integrated approach to building designs, energy use, construction materials, renewable resources particularly as part of urban infrastructure, site and town planning and building design to be considered holistically. It also creates the opportunity for aesthetically pleasing and ingenious designs that might not otherwise be permitted.

Cost Impact:
(Culp)- The code change proposal will not increase the cost of construction. Wider overhangs, eaves, and shading devices will increase the cost relative to windows without shading, but this section is only a voluntary alternative.
(Lovell)-The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CULP-EC5-103.2 COMBINED WITH LOVELL EC1-103.2.DOC

EC73–09/10

103.2, 402.3.3 (New), Table 405.5.2(1); IRC R106.2, N1102.3.3 (New)

Proponent: Thomas D. Culp, Ph.D., Birch Point Consulting LLC, representing Quanta Technologies, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise as follows:

103.2 Information on construction documents. Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted when *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in

sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, as applicable, cardinal directions; insulation materials and their R-values; fenestration U-factors and SHGCs; area-weighted U-factor and SHGC calculations; mechanical system design criteria; mechanical and service water heating system and equipment types, sizes and efficiencies; economizer description; equipment and systems controls; fan motor horsepower (hp) and controls; duct sealing, duct and pipe insulation and location; lighting fixture schedule with wattage and control narrative; and air sealing details.

2. Add new text as follows:

402.3.3. Fenestration SHGC for south-facing glazing. In Climate Zones 5 through 8, fenestration facing within 30 degrees of south shall have a minimum SHGC of 0.30. For compliance with this section, the default SHGC for unlabeled fenestration shall be 0.27, and default SHGC values from Table 303.1.3(3) shall not be permitted.

(Renumber subsequent sections)

3. Revise table as follows:

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

Glazing[a]	Total area[b] = (a) The proposed glazing area; where the proposed glazing area is less than 15% of the conditioned floor area (b) 15% of the conditioned floor area; where the proposed glazing area is 15% or more of the conditioned floor area	As proposed
	Orientation: equally distributed to four cardinal compass orientations (N, E, S, & W)	As proposed
	U-factor: from Table 402.1.3	
	SHGC: From Table 402.1 and Section 402.3.3 except that for climates with no requirement (NR) SHGC = 0.40 shall be used	As proposed As proposed
	Interior shade fraction: Summer (all hours when cooling is required) = 0.70 Winter (all hours when heating is required) = 0.85[c]	Same as standard reference design
	External shading: none	As proposed

(Portions of table and footnotes not shown remain unchanged)

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

R106.2 Site plan or plot plan. The construction documents submitted with the application for permit shall be accompanied by a site plan showing the size and location of new construction and existing structures on the site, ~~and~~ distances from lot lines, and cardinal directions. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The building official is authorized to waive or modify the requirement for a site plan when the application for permit is for alteration or repair or when otherwise warranted.

2. Add new text as follows:

N1102.3.3. Fenestration SHGC for south-facing glazing. In Climate Zones 5 through 8, fenestration facing within 30 degrees of south shall have a minimum SHGC of 0.30. For compliance with this section, the default SHGC for unlabeled fenestration shall be 0.27, and default SHGC values from Table N1101.5(3) shall not be permitted.

(Renumber subsequent sections)

Reason: As the IECC and IRC move toward major increases in energy efficiency, first 30% and then 50%, we cannot continue to ignore a free source of renewable energy – the sun. Just as lower SHGC is important to reducing cooling loads in southern climates, it is equally important to use higher SHGC windows in northern climates to maximize the use of free solar energy to reduce heating loads that must otherwise be met using fossil fuels. However, there is a profound danger that this renewable energy source will be blocked from entering homes if very low SHGC windows intended for southern climates are allowed to be installed in northern homes, due to the current "No Requirement" or "NR" for northern SHGC.

This proposal would preserve solar access and ensure that northern homeowners capture solar gain all winter long, by requiring a modest minimum SHGC on south-facing exposures. Previous debates about the benefits of higher SHGC in cold climates have often centered on west-facing windows. However, there is no dispute that higher SHGC on south-facing windows saves energy, and in fact, homes have been designed for centuries to capture winter solar gains from south-facing windows. The U.S. Department of Energy has recently announced new criteria for Energy Star which reward higher SHGC in northern climates for all windows, regardless of which way they face.[1] Nonetheless, this proposal is limited to south-facing glazing, and does not change the requirements for west-facing glazing in any way.

Additionally, the minimum SHGC of 0.30 is easily achievable by products available from all of the major low-e glass producers, at the same or even lower cost. It is purposely designed to be a modest requirement which only limits the worst-performing products from being used.

The code must begin to recognize that using the same low SHGC glazing in Phoenix and Boston makes no sense. The benefits are obvious even to our best friends …

1. "ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0", U.S. Department of Energy, April 7, 2009. http://www.energystar.gov/ia/partners/prod_development/archives/downloads/windows_doors/WindowsDoorsSkylightsProgRequirements7Apr09.pdf

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CULP-EC-7-103.2-402.3.3-T. 405.5.2(1)-R106.2-N1102.3.3.DOC

EC74–09/10

402.3.3 (New), 402.3.3.1 (New), 402.3.3.2 (New), Table 402.3.3 (New); IRC N1102.3.3 (New), N1102.3.3.1 (New), N1102.3.3.2 (New), Table N1102.3 (New)

Proponent: Thomas S. Zaremba, representing Roetzel & Andress

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Add new text and table as follows:

402.3.3 External shading. As an alternative to the SHGC requirements of Table 402.1.1, vertical glazed fenestration shall be permitted to meet the SHGC requirements of Table 402.3.3 based upon the calculated projection factor of any overhang, eave, or permanently attached shading device that covers the full width of the glazing and extends a minimum of 12 inches (0.3 m) beyond each side of thereof.

402.3.3.1 Projection factor. The projection factor shall be determined in accordance with Equation 4-1.

$$PF = A/B \qquad \textbf{(Equation 4-1)}$$

where:

PF = Projection factor (decimal).
A = Distance measured horizontally from the furthest continuous extremity of any overhang, eave, or permanently attached shading device to the vertical surface of the glazing.
B = Distance measured vertically from the bottom of the glazing to the underside of the overhang, eave, or permanently attached shading device.

402.3.3.2 Differing PF values. Where different windows or glass doors have different *PF* values, they shall each be evaluated separately, or an area-weighted *PF* value shall be calculated and used for all windows and glass doors.

TABLE 402.3.3
EQUIVALENT SHGC REQUIREMENTS FOR VERTICAL GLAZED FENESTRATION WITH EXTERNAL SHADING

CLIMATE ZONE	1	2	3[a]
SHGC: *PF* 0.25	0.30	0.30	0.30
SHGC: 0.25 ≤ *PF* < 0.50	0.36	0.36	0.36
SHGC: *PF* ≥ *0.50*	0.45	0.45	0.45

a. There are no SHGC requirements in the Marine zone.

PART II – IRC BUILDING/ENERGY

Add new text and table as follows:

N1102.3.3 External shading. As an alternative to the SHGC requirements of Table N1102.1, vertical glazed fenestration shall be permitted to meet the SHGC requirements of Table N1102.3 based upon the calculated projection factor of any overhang, eave, or permanently attached shading device that covers the full width of the glazing and extends a minimum of 12 inches (0.3 m) beyond each side thereof.

N1102.3.3.1 Projection factor. The projection factor shall be determined in accordance with Equation N1102-1.

$$PF = A/B \qquad \textbf{(Equation N1102-1)}$$

where:

PF = Projection factor (decimal).
A = Distance measured horizontally from the furthest continuous extremity of any overhang, eave, or permanently attached shading device to the vertical surface of the glazing.
B = Distance measured vertically from the bottom of the glazing to the underside of the overhang, eave, or permanently attached shading device.

N1102.3.3.2 Differing PF values. Where different windows or glass doors have different *PF* values, they shall each be evaluated separately, or an area-weighted *PF* value shall be calculated and used for all windows and glass doors.

TABLE N1102.3
EQUIVALENT SHGC REQUIREMENTS FOR VERTICAL GLAZED FENESTRATION WITH EXTERNAL SHADING

CLIMATE ZONE	1	2	3[a]
SHGC: *PF* = 0.25	0.30	0.30	0.30
SHGC: 0.25 ≤ *PF* < 0.50	0.36	0.36	0.36
SHGC: *PF* ≥ *0.50*	0.45	0.45	0.45

a. There are no SHGC requirements in the Marine zone.

Reason: Long before window makers began marketing low-SHGC windows, shading was an accepted and effective architectural method for achieving solar control. It still is. Chapter 5 recognizes the benefits of controlling solar gain through the use of shading or projection factors for commercial buildings. A similar credit should be provided for residential occupancies.

The language starting with 403.3.3.1 and N1102.3 is similar to the language in the Chapter 5. The SHGC multipliers are based on multipliers given in ASHRAE 90.1 for different projection factors. For PF = 0.25 and 0.50, the multipliers were calculated as the weighted average from the ASHRAE 90.1 multiplier for west/south/east orientation (75%) and the multiplier for northern orientation (25%). In comparison, the commercial chapter is effectively using SHGC multipliers of 0.76 and 0.62 for these PF ranges, so this proposal is more conservative.

Cost Impact: The code change proposal will not increase the cost of construction and may reduce the cost of construction by offering an alternative compliance method.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ZAREMBA-EC-1-402.3.3-N1102.3.3

EC75–09/10
402.3.4

Proponent: Ron Nickson, representing the National Multi Housing Council

Revise as follows:

402.3.4 Opaque door exemption. One side-hinged opaque door assembly per dwelling unit up to 24 square feet (2.22 m^2) in area is exempted from the U-factor requirement in Section 402.1.1. This exemption shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4.

Reason: This change would allow the exemption for one door, as not having to comply to the insulation and fenestration criteria, to apply to the individual dwelling units in a multifamily structure. The change will allow the same flexibility in the design of R-2 occupancies as is now permitted in the design of R-3 occupancies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NICKSON-EC-2-402.3.4

EC76–09/10
402.3.4; IRC N1102.3.4

Proponent: Ken Sagan, National Association of Home Builders (NAHB)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

402.3.4 Opaque door exemption. One opaque side-hinged door assembly ~~side-hinged opaque door assembly up to 24 square feet (2.22 m2) in area is~~ shall be exempted from the *U*-factor requirement in Section 402.1.1. This exemption shall not apply to the U-factor alternative approach in Section 402.1.1 and the total U-factor alternative in Section 402.1.4.

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1102.3.4 Opaque door exemption. One opaque side-hinged door assembly ~~side-hinged opaque door assembly up to 24 square feet (2.22 m2) in area is~~ shall be exempted from the *U*-factor requirement in Section 402.1.1. This exemption shall not apply to the U-factor alternative approach in Section 402.1.1 and the total U-factor alternative in Section 402.1.4

Reason: The current language limits the area of the exempt door allowed in section 402.1.1. Creation of a limitation on the exemption for opaque doors to a single 24 sf. door is arbitrary and restricts options for Architectural doors.

The proposed amendment would allow the reuse of reclaimed and /or salvaged materials as listed in section 603.2 of the ICC 700 the National Green Building Standard.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENEGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SAGAN-EC-11-402.3.4-RE-3-N1102.3.4

EC77–09/10

402.3.7 (New), 502.3.3 (New); IRC N1102.3.7 (New)

Proponent: Thomas D. Culp, Ph.D., Birch Point Consulting LLC, representing Aluminum Extruders Council

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGYCOMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Add new text as follows:

402.3.7 Recycled content credit. Fenestration shall be allowed to have a maximum U-factor 0.05 Btu/h·ft^2·ºF (0.28 W/m2·K) greater than that specified in Table 402.1.1 provided the framing material contains at least 50% recycled content as determined by a nationally recognized certification program, such as the MBDC Cradle to Cradle Certification Program or the ICC Sustainable Attributes Verification and Evaluation Program.

502.3.3 Recycled content credit. Fenestration shall be allowed to have a maximum U-factor 0.05 Btu/h·ft^2·ºF (0.28 W/m2·K) greater than that specified in Table 502.3 provided the framing material contains at least 50% recycled content as determined by a nationally recognized certification program, such as the MBDC Cradle to Cradle Certification Program or the ICC Sustainable Attributes Verification and Evaluation Program.

PART II – IRC ENERGY

Add new text as follows:

N1102.3.7 Recycled content credit. Fenestration shall be allowed to have a maximum U-factor 0.05 Btu/h·ft^2·ºF (0.28 W/m2·K) greater than that specified in Table 402.1.1 provided the framing material contains at least 50% recycled content as determined by a nationally recognized certification program, such as the MBDC Cradle to Cradle Certification Program or the ICC Sustainable Attributes Verification and Evaluation Program.

Reason: We are proposing a new credit for recycled content, in which a credit towards meeting the fenestration U-factor criteria could be earned by using a higher amount of recycled material in the framing of the product. There has been a commendable focus on reducing energy use, but we believe the committee should look more broadly for opportunities to promote both sustainability and energy savings in materials.

More efficient use of materials reduces the ecological impact of a building. This includes reduced landfill waste, as well as reduced energy and emissions associated with manufacturing, transportation, and disposal. Additionally, for certain materials, emissions associated with incineration and/or decomposition are of particular concern.

Promoting the use of recycled materials would result in specific embodied energy savings associated with the fenestration product. This is consistent with the goals of the IECC and IRC to promote significant and measurable energy savings, while recognizing equivalent functionality and performance of different product technologies. Although the focus needs to be on overall ecological impact and not just embodied energy savings, the embodied energy savings from the use of recycled materials can by itself be as significant as the energy savings from proposed reductions in U-factor, particularly in the south.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CULP-EC-4-402.3.7-N1102.3.7.DOC

EC78–09/10

103.2, 202 (New), 402.3.7 (New), Table 402.3.7 (New), Table 405.5.2(1); IRC R106.1.1, R202 (New), N1102.3.7 (New), Table N1102.3.7 (New)

Proponent: Ronald Majette, representing US Department of Energy

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise as follows:

103.2 Information on construction documents. Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted when *approved* by the *code official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and show in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, as applicable, cardinal directions; insulation materials and their *R*-values; fenestration *U*-factors and SHGCs; area-weighted *U*-factor and SHGC calculations; mechanical system design criteria; mechanical and service water heating system and equipment types, sizes and efficiencies; economizer description; equipment and systems controls; fan motor horsepower (hp) and controls; duct sealing, duct and pipe insulation and location; lighting fixture schedule with wattage and control narrative; and air sealing details.

2. Add new definitions as follows:

VERTICAL GLAZING. Glazing other than skylights.

WEST-FACING GLAZING AREA. The area of vertical glazing facing between 45 degrees south of west and 30 degrees north of west, inclusive.

3. Add new text and table as follows:

402.3.7 West-facing glazing area. West-facing glazing area shall not exceed that specified in Table 402.3.7. For multifamily residential buildings, compliance shall be determined on the basis of an average west-facing glazing area per dwelling unit.

TABLE 402.3.7
MAXIMUM ALLOWABLE WEST-FACING GLAZING AREA (ft^2)

CLIMATE ZONE	MAX WEST-FACING GLAZING AREA
1	from Equation 4-1
2	from Equation 4-1
3	from Equation 4-1
4 except Marine	110
5 and Marine 4	110
6	110
7	110
8	110

$$WFGA_{\max} = 110 \times \left(\frac{SHGC_{ref}}{SHGC_{prop}} \right)$$ **(Equation 4-1)**

where

$WFGA_{max}$ = maximum allowable west-facing glazing area (ft^2);
$SHGC_{ref}$ = glazed fenestration SHGC from Table 402.1.1; and
$SHGC_{prop}$ = the proposed glazed fenestration SHGC.

4. Revise as follows:

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Glazing[a]	Total area[b] =	As proposed
	(c) The proposed glazing area; where the proposed glazing area is less than 15% of the conditioned floor area	
	(d) 15% of the conditioned floor area; where the proposed glazing area is 15% or more of the conditioned floor area	~~As proposed~~
	~~Orientation: equally distributed to four cardinal compass orientations (N, E, S, & W)~~	As proposed
	Glazing orientation:	
	Facing the West cardinal orientation, the smaller of	
	the proposed west-facing glazing area, or 110 ft^2	
	with the remainder equally distributed to the other three cardinal orientations (N, E, & S).	As proposed As proposed
	U-factor: from Table 402.1.3	
	SHGC: From Table 402.1 except that for climates with no requirement (NR) SHGC = 0.40 shall be used	Same as standard reference design
	Interior shade fraction:	
	Summer (all hours when cooling is required) = 0.70	As proposed
	Winter (all hours when heating is required) = 0.85[c]	
	External shading: none	

(Portions of table and footnotes not shown remain unchanged)

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

R106.1.1 Information on construction documents. *Construction documents* shall be drawn upon suitable material. Electronic media documents are permitted to be submitted when *approved* by the *building official*. *Construction documents* shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code and relevant laws, ordinances, rules and regulations, as determined by the *building official.* Where required by the *building official*, all braced wall lines, shall be identified on the *construction documents* and all pertinent information including, but not limited to, cardinal directions, bracing methods, location and length of braced wall panels, foundation requirements of braced wall panels at top and bottom shall be provided.

2. Add new definitions as follows:

VERTICAL GLAZING. Glazing other than skylights.

WEST-FACING GLAZING AREA. The area of vertical glazing facing between 45 degrees south of west and 30 degrees north of west, inclusive.

3. Add new text and table as follows:

N1102.3.7 West-facing glazing area. West-facing glazing area shall not exceed that specified in Table N1102.3.7. For multifamily residential buildings, compliance shall be determined on the basis of an average west-facing glazing area per dwelling unit.

TABLE N1102.3.7
MAXIMUM ALLOWABLE WEST-FACING GLAZING AREA (ft^2)

CLIMATE ZONE	MAX WEST-FACING GLAZING AREA
1	from Equation 11-1
2	from Equation 11-1
3	from Equation 11-1
4 except Marine	110
5 and Marine 4	110
6	110
7	110
8	110

$$WFGA_{\max} = 110 \times \left(\frac{SHGC_{ref}}{SHGC_{prop}} \right) \qquad \textbf{(Equation 11-1)}$$

where

$WFGA_{max}$ = maximum allowable west-facing glazing area (ft^2);
$SHGC_{ref}$ = glazed fenestration SHGC from Table N1102.1.1; and
$SHGC_{prop}$ = the proposed glazed fenestration SHGC.

Reason: The purpose of the proposed change is to reduce detrimental solar gains in IECC-compliant residences.

Currently the code's treatment of such gains is limited to a maximum allowable solar heat gain coefficient (SHGC) in climate zones 1-3. That prescriptive limit, however, applies universally to glazing on all faces of the home, and is unable to distinguish detrimental solar gains from beneficial gains. Its lack of sensitivity to orientation means it is not useful in reducing detrimental solar gains in colder climates because doing so would also reduce advantageous solar heat gains.

The Simulated Performance Alternative of the IECC currently allows a full accounting of the effects of solar gains by orientation, but establishes an atypical baseline assumption of glazing equally distributed to the four cardinal directions.

The proposed change would both establish a prescriptive specification to specifically limit detrimental solar gains and, for the IECC, establish a more typical home configuration as the baseline for simulated performance compliance. It does so by establishing a simple limit on the area of glazing on the west face of a building. Expressing the limit in terms of area (ft^2) rather than percentage (e.g., of total glazing area or floor area) avoids a number of complications in the code and its enforcement, and has the desirable effect of giving builders a great deal of flexibility in meeting the requirements without substantial--if any--additional cost.

The proposed change has the effect of encouraging builders to orient streets and lot layouts to achieve advantageous solar access while being flexible enough to allow a portion of lots to have less favorable orientation to accommodate views, terrain, and the basic necessities of street layout.

Via careful street/lot design and careful choice of home designs for the lots that cannot be advantageously oriented, builders can achieve maximum cooling energy savings at no additional cost. Indeed, because the proposed change reduces peak cooling loads, in many cases the builder may experience lower costs resulting from downsizing of air conditioning equipment.

The details behind the proposal and a thorough analysis of its energy impacts, based on more than 180,000 hourly simulations, is available at:

www.energycodes.gov/codedevelop/pdfs/west-facing-glazing-TSD.pdf

That analysis shows that, depending on the details of the home and the specific approach chosen by the builder to comply with the west-facing glazing area limit, the proposed change will reduce cooling energy consumption by anywhere from a few percent to 15% or more. Peak cooling loads are reduced by a similar amount. Furthermore, there is no detrimental impact on heating energy consumption and the proposed change introduces no perverse incentives.

Cost Impact: The code change proposal will increase the cost of construction in some homes, decrease the cost of construction in other homes, and have no impact on the cost of construction in most homes.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-83-103.2-202-402.3.7-IRC R106.1.1-R202-N1103.3.7-

EC79–09/10

402.4.1, 402.4.1.1 (New), Table 402.4.2, 402.4.2, 402.4.2.1, 402.4.1.2 (New), 402.4.1.2.1 (New), 402.4.2.2, 402.4.3, 403.5, Table 405.5.2(1); IRC N1102.4.1, N1102.4.1.1 (New), Table N1102.4.2, N1102.4.2, N1102.4.2.1, N1102.4.1.2 (New), N1102.4.1.2.1 (New), N1102.4.2.2, N1102.4.3, N1103.5

Proponent: Ronald Majette, representing US Department of Energy

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise as follows:

402.4 Air leakage (Mandatory).

402.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Sections 402.4.1.1 and 402.4.1.2. ~~be durably sealed to limit infiltration.~~ The sealing methods between dissimilar materials shall allow for differential expansion and contraction. ~~The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:~~

~~1. All joints, seams and penetrations.~~
~~2. Site-built windows, doors and skylights.~~
~~3. Openings between window and door assemblies and their respective jambs and framing.~~
~~4. Utility penetrations.~~
~~5. Dropped ceilings or chases adjacent to the thermal envelope.~~
~~6. Knee walls.~~
~~7. Walls and ceilings separating a garage from conditioned spaces.~~
~~8. Behind tubs and showers on exterior walls.~~
~~9. Common walls between dwelling units.~~
~~10. Attic access openings.~~
~~11. Rim joist junction.~~
~~12. Other sources of infiltration.~~

2. Add new text as follows:

402.4.1.1 Installation. The components of the *building thermal envelope* as listed in Table 402.4.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table 402.4.1.1, as applicable to the method of construction. Where required by the *code official*, an *approved* party shall inspect all components and verify compliance.

3. Revise as follows:

TABLE ~~402.4.2~~ 402.4.1.1
AIR BARRIER AND INSULATION ~~INSPECTION COMPONENT CRITERIA~~ INSTALLATION

COMPONENT	CRITERIA
Air barrier and thermal barrier	A continuous air barrier shall be installed in the building envelope. ~~Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier.~~ Breaks or joints in the air barrier ~~are filled or repaired~~ shall be sealed. Air permeable insulation ~~is~~ shall not be used as a sealing material. Any ~~A~~air permeable insulation shall be installed ~~is~~ inside of an air barrier.
Ceiling / attic	The air barrier in any dropped ceiling / soffit ~~is substantially~~ shall be aligned with the insulation and any gaps ~~are~~ in the air barrier sealed. ~~Attic access (except unvented attic), knee wall door, or drop down stair is sealed.~~ Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.
Walls	Corners and headers shall be ~~are~~ insulated and the~~.~~ junction of the foundation and sill plate ~~is~~ shall be sealed. The junction of the top plate and top of exterior walls shall be sealed. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier. Knee walls shall be sealed.
Windows, skylights and doors	The space between window/door jambs and framing and skylights and framing ~~is~~ shall be sealed.
Rim joists	Rim joists ~~are~~ shall be insulated and include ~~an~~ the air barrier.
Floors (including above garage and cantilevered floors)	Insulation ~~is~~ shall be installed to maintain permanent contact with underside of subfloor decking. The air barrier ~~is~~ shall be installed at any exposed edge of insulation.
Crawlspace walls	Where provided in lieu of floor insulation, insulation ~~is~~ shall be permanently attached to the crawlspace walls. Exposed earth in unvented crawlspaces ~~is~~ shall be covered with a class I vapor retarder with overlapping joints taped.
Shafts, penetrations	Duct shafts, utility penetrations, ~~knee walls,~~ and flue shafts opening to exterior or unconditioned space ~~are~~ shall be sealed.
Narrow cavities	Batts in narrow cavities ~~are~~ shall be cut to fit, or narrow cavities ~~are~~ shall be filled by ~~spayed/blown~~ insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing ~~is~~ shall be provided between the garage and conditioned spaces.
Recessed lighting	Recessed light fixtures installed in the building thermal envelope ~~are~~ shall be airtight, IC rated, and sealed to the drywall. ~~Exception: fixtures in conditioned space.~~
Plumbing and Wiring	~~Insulation is placed between outside and pipes.~~ Batt insulation ~~is~~ shall be cut neatly to fit around wiring and plumbing in exterior walls, or ~~sprayed/blown~~ insulation that on installation readily conforms to available space shall extend~~s~~ behind piping and wiring.
Shower / tub on exterior wall	Exterior walls adjacent to showers and tubs ~~on exterior walls~~ shall be ~~have~~ insulati~~on~~ed and ~~an~~ the air barrier installed separating them from the ~~exterior wall~~ showers and tubs.
Electrical / phone box on exterior walls	The air barrier ~~extends~~ shall be installed behind electrical or communication boxes or ~~an~~ air sealed ~~type~~ boxes ~~are~~ shall be installed.
Common wall	An air barrier ~~is~~ shall be installed in the common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building thermal envelope ~~are~~ shall be sealed to the subfloor or drywall.
Fireplace	An air barrier shall be installed on fireplace walls. ~~include an air barrier.~~ Fireplaces shall have gasketed doors.

~~**402.4.2 Air sealing and insulation.** Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2.~~

~~**402.4.2.1 Testing option.** Building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 33.5 psf (50 Pa). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.~~

402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding 7 air changes per hour (ACH50) in Climate Zones 1 and 2, and 5 air changes per hour in Climate Zones 3 through 8. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the *code official*, testing shall be conducted by an *approved* party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after rough in and creation of all penetrations of the *building thermal envelope*

Exception: Additions less than 1000 ft^2 are exempt from testing.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed~~;~~ beyond the intended weatherstripping or other infiltration control measures;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed, ~~including exhaust, intake, makeup air, backdraft and flue dampers~~ beyond intended infiltration control measures;
3. Interior doors, if installed at the time of test, shall be open;
4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling system(s), if installed at the time of the test, shall be turned off; and
6. ~~HVAC ducts shall not be sealed; and~~

~~7~~ 6. Supply and return registers, if installed at the time of the test, shall ~~not~~ be ~~sealed~~ fully open.

3. Add new text as follows:

402.4.1.2.1 Sampling. Where groups of seven or more buildings of similar design and construction are completed and are issued occupancy permits during a 120-day period, or where a multifamily structure contains more than four dwelling units, testing of less than 100 percent, but not less than 15 percent, of the buildings from a specific builder and/or contractor or of dwelling units in a multifamily structure shall be permitted when *approved* by the *code official*. The specific buildings or dwelling units to be tested shall be selected by the *code official*. If any tested building or dwelling unit fails to comply with the maximum air leakage requirement in Section 402.4.1.2 then all buildings or dwelling units shall be tested until a minimum of three consecutive buildings or dwelling units comply from that specific builder and/or contractor or multifamily structure before the *code official* may permit sampling to resume.

4. Delete without substitution:

~~**402.4.2.2 Visual inspection option.** Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table 402.4.2, applicable to the method of construction, are field verified. Where required by the *code official*, an *approved* party independent from the installer of the insulation shall inspect the air barrier and insulation.~~

5. Revise as follows:

402.4.3 Fireplaces. New wood-burning fireplaces shall have ~~gasketed doors and~~ outdoor combustion air.

403.5 Mechanical ventilation (Mandatory). The building shall be provided with ventilation that meets the requirements of Section M1507 of the *International Residential Code* or with other approved means of ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Air Exchange Rate	~~Specific leakage area (SLA)[d] = 0.00036~~ Air leakage rate of 7 air changes per hour in zones 1 and 2, and 5 air changes per hour in zones 3 through 8 at a pressure of 0.2 inches w.g. (50 Pa). ~~assuming no energy recovery~~. The mechanical ventilation rate shall be in addition to the air leakage rate and the same as in the proposed design, but no greater than 0.01 x *CFA* + 7.5 x (*Nbr*+1) where: *CFA* = conditioned floor area *Nbr* = number of bedrooms Energy recovery shall not be assumed for mechanical ventilation.	For residences that are not tested, the same air leakage rate as the standard reference design. ~~For residences without mechanical ventilation that are tested in accordance with ASHRAE 119, Section 5.1, the measured air exchange rate[e] but not less than 0.35 ACH~~ For tested residences ~~with mechanical ventilation that are tested in accordance with ASHRAE 119, Section 5.1~~, the measured air exchange rate[e] ~~combined with the proposed~~ mechanical ventilation rate, *f* ~~which shall not be less than 0.01 x *CFA* + 7.5 x (*Nbr*+1)~~ ~~where:~~ ~~*CFA* = conditioned floor area~~ ~~*Nbr* = number of bedrooms~~ The mechanical ventilation rate shall be in addition to the air leakage rate and shall be as proposed.

e. Where required by the *code official*, testing shall be conducted by an *approved* party. ~~Tested envelope leakage shall be determined and documented by an independent party approved by the *code official*.~~ Hourly calculations as specified in the ~~2001~~ASHRAE *Handbook of Fundamentals*~~, Chapter 26, page 26.21, Equation 40 (Sherman-Grimsrud model)~~ or the equivalent shall be used to determine the energy loads resulting from infiltration.

(Portions of table and footnotes not shown remain unchanged)

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

N1102.4 Air leakage (Mandatory).

N1102.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Sections N1102.4.1.1 and N1102.4.1.2. ~~be durably sealed to limit infiltration.~~ The sealing methods between dissimilar materials shall allow for differential expansion and contraction. ~~The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:~~

~~1. All joints, seams and penetrations.~~
~~2. Site-built windows, doors and skylights.~~
~~3. Openings between window and door assemblies and their respective jambs and framing.~~
~~4. Utility penetrations.~~
~~5. Dropped ceilings or chases adjacent to the thermal envelope.~~
~~6. Knee walls.~~
~~7. Walls and ceilings separating a garage from conditioned spaces.~~
~~8. Behind tubs and showers on exterior walls.~~
~~9. Common walls between dwelling units.~~
~~10. Attic access openings.~~
~~11. Rim joist junction.~~
~~12. Other sources of infiltration.~~

2. Add new text as follows:

N1102.4.1.1 Installation. The components of the *building thermal envelope* as listed in Table N1102.4.1.1 shall be

installed in accordance with the manufacturer's instructions and the criteria listed in Table N1102.4.1.1, as applicable to the method of construction. Where required by the *code official*, an *approved* party shall inspect all components and verify compliance.

3. Revise as follows:

TABLE N1102.4.~~2~~.1.1
AIR BARRIER AND INSULATION ~~INSPECTION COMPONENT CRITERIA~~ INSTALLATION

COMPONENT	CRITERIA
Air barrier and thermal barrier	A continuous air barrier shall be installed in the building envelope. ~~Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier.~~ Breaks or joints in the air barrier ~~are filled or repaired~~ shall be sealed. Air permeable insulation ~~is~~ shall not be used as a sealing material. Any air permeable insulation shall be installed ~~is~~ inside of an air barrier.
Ceiling / attic	The air barrier in any dropped ceiling / soffit ~~is substantially~~ shall be aligned with the insulation and any gaps ~~are~~ in the air barrier sealed. ~~Attic access (except unvented attic), knee wall door, or drop down stair is sealed.~~ Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.
Walls	Corners and headers shall be ~~are~~ insulated and the~~.~~ junction of the foundation and sill plate ~~is~~ shall be sealed. The junction of the top plate and top of exterior walls shall be sealed. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier. Knee walls shall be sealed.
Windows, skylights and doors	The space between window/door jambs and framing and skylights and framing ~~is~~ shall be sealed.
Rim joists	Rim joists ~~are~~ shall be insulated and include ~~an~~ the air barrier.
Floors (including above garage and cantilevered floors)	Insulation ~~is~~ shall be installed to maintain permanent contact with underside of subfloor decking. The air barrier ~~is~~ shall be installed at any exposed edge of insulation.
Crawlspace walls	Where provided in lieu of floor insulation, insulation ~~is~~ shall be permanently attached to the crawlspace walls. Exposed earth in unvented crawlspaces ~~is~~ shall be covered with a class I vapor retarder with overlapping joints taped.
Shafts, penetrations	Duct shafts, utility penetrations, ~~knee walls,~~ and flue shafts opening to exterior or unconditioned space ~~are~~ shall be sealed.
Narrow cavities	Batts in narrow cavities ~~are~~ shall be cut to fit, or narrow cavities ~~are~~ shall be filled by ~~spayed/blown~~ insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing ~~is~~ shall be provided between the garage and conditioned spaces.
Recessed lighting	Recessed light fixtures installed in the building thermal envelope ~~are~~ shall be airtight, IC rated, and sealed to the drywall. ~~Exception: fixtures in conditioned space.~~
Plumbing and Wiring	~~Insulation is placed between outside and pipes.~~ Batt insulation ~~is~~ shall be cut neatly to fit around wiring and plumbing in exterior walls, or ~~sprayed/blown~~ insulation that on installation readily conforms to available space shall extend~~s~~ behind piping and wiring.
Shower / tub on exterior wall	Exterior walls adjacent to showers and tubs ~~on exterior walls~~ shall be ~~have~~ insulati~~on~~ed and ~~an~~ the air barrier installed separating them from the ~~exterior wall~~ showers and tubs.
Electrical / phone box on exterior walls	The air barrier ~~extends~~ shall be installed behind electrical or communication boxes or ~~an~~ air sealed ~~type~~ boxes ~~are~~ shall be installed.
Common wall	An air barrier ~~is~~ shall be installed in the common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building thermal envelope ~~are~~ shall be sealed to the subfloor or drywall.
Fireplace	An air barrier shall be installed on fireplace walls. ~~include an air barrier.~~ Fireplaces shall have gasketed doors.

~~**N1102.4.2 Air sealing and insulation.** Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section N1102.4.2.1 or N1102.4.2.2.~~

~~**N1102.4.2.1 Testing option.** Building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 33.5 psf (50 Pa). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.~~

N1102.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding 7 air changes per hour (ACH50) in Climate Zones 1 and 2, and 5 air changes per hour in Climate Zones 3 through 8. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the *code official*, testing shall be conducted by an *approved* party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after rough in and creation of all penetrations of the *building thermal envelope*

Exception: Additions less than 1000 ft^2 are exempt from testing.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed~~,~~ beyond the intended weatherstripping or other infiltration control measures;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed, ~~including exhaust, intake, makeup air, backdraft and flue dampers~~ beyond intended infiltration control measures;
3. Interior doors, if installed at the time of test, shall be open;
4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling system(s), if installed at the time of the test, shall be turned off; and
6. ~~HVAC ducts shall not be sealed; and~~

~~7~~ 6. Supply and return registers, if installed at the time of the test, shall ~~not~~ be ~~sealed~~ fully open.

4. Add new text as follows:

N1102.4.1.2.1 Sampling. Where groups of seven or more buildings of similar design and construction are completed and are issued occupancy permits during a 120-day period, or where a multifamily structure contains more than four dwelling units, testing of less than 100 percent, but not less than 15 percent, of the buildings from a specific builder and/or contractor or of dwelling units in a multifamily structure shall be permitted when *approved* by the *code official*. The specific buildings or dwelling units to be tested shall be selected by the *code official*. If any tested building or dwelling unit fails to comply with the maximum air leakage requirement in Section N1102.4.1.2 then all buildings or dwelling units shall be tested until a minimum of three consecutive buildings or dwelling units comply from that specific builder and/or contractor or multifamily structure before the *code official* may permit sampling to resume.

5. Delete without substitution:

~~**N1102.4.2.2 Visual inspection option.** Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table N1102.4.2, applicable to the method of construction, are field verified. Where required by the *code official*, an *approved* party independent from the installer of the insulation shall inspect the air barrier and insulation.~~

6. Revise as follows:

N1102.4.3 Fireplaces. New wood-burning fireplaces shall have ~~gasketed doors and~~ outdoor combustion air.

N1103.5 Mechanical ventilation (Mandatory). The building shall be provided with ventilation that meets the requirements of Section M1507 of the *International Residential Code* or with other approved means of ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

Reason: The purpose of this proposal is to substantially improve the energy performance of residential buildings by reducing air infiltration. This proposal would require testing for envelope air leakage with associated maximum allowable leakage rates. The test is based on the air leakage through the building envelope as measured by air changes per hour when the building is pressurized to 50 Pascals. This is a commonly used metric

(for example, Energy Star uses ACH at 50 Pascals), there are other metrics such as specific leakage area that are acceptable as well and give similar results for most buildings.

The IECC and IRC already require the building envelope to be carefully sealed. The proposed maximum leakage rates are intended to insure proper enforcement of these sealing requirements.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-81-402.4-IRC N1102.4-

EC80–09/10
402.4.2.1.1 (New); IRC N1102.4.2.1.1 (New)

Proponent: Mike Moore, Newport Ventures, representing Broan NuTone

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Add new text as follows:

402.4.2.1.1 Mechanical ventilation requirement. If a dwelling unit of a one- and two-family dwellings or multiple single-family dwellings (townhouses) not more than three stories in height is determined to have an infiltration rate of less than five air changes per hour (ACH) when tested in accordance with Section 402.4.2.1, whole-house mechanical ventilation shall be provided in accordance with Section M1507 of the *International Residential Code*. Any other dwelling unit that is determined to have an infiltration rate of less than five air changes per hour (ACH) when tested in accordance with Section 402.4.2.1 shall be provided with mechanical ventilation in accordance with the *International Mechanical Code*.

PART II – IRC BUILDING/ENERGY

Add new text as follows:

1102.4.2.1.1 Mechanical ventilation requirement. If a dwelling unit of a one- and two-family dwellings or multiple single-family dwellings (townhouses) not more than three stories in height is determined to have an infiltration rate of less than five air changes per hour (ACH) when tested in accordance with Section N1102.4.2.1, whole-house mechanical ventilation shall be provided in accordance with Section M1507.

Reason: Everyone can agree that when homes become "too" tight, they need mechanical ventilation. The question is, "how tight is too tight?" This code change proposal offers five air changes per hour at 50 Pascal as the "too tight" limit, and directs builders to provide mechanical ventilation at this point.

Why is whole-house mechanical ventilation needed?

Indoor air quality has direct impact on the health of building occupants. Poor indoor air quality is listed by the EPA as being the fourth largest environmental threat to our country.[1] A 2007 California study revealed formaldehyde exposure in most new homes is beyond limits recommended by the California Air Resources Board. Multiple studies have shown that relying on window operation to provide ventilation is not sufficient in practice.[2,3] If unchecked, pollutants from cleaning chemicals, finishes, furniture, and occupant activities can cause serious health effects on building occupants. Whole-house mechanical ventilation reduces occupant exposure to such pollutants.

Why 5 ACH 50?

Traditionally, 0.35 natural air changes per hour has been the consensus ventilation rate at which it is believed that sufficient fresh air is being provided to building occupants. This ventilation rate was typically achieved without mechanical ventilation because homes were built without an effective air barrier. As building practices have improved, homes have become tighter, and as homes become tighter, mechanical ventilation must be introduced to provide sufficient levels of ventilation.

ASHRAE Standard 136 was developed to enable calculation of natural air changes per hour as a function of air changes at various pressures. By following the calculation procedures in this standard, it can be shown that a natural infiltration rate of 0.35 air changes per hour is equivalent to somewhere between 7 ACH 50 to 10 ACH 50, depending on the local climatic conditions of the home. Because most dwellings are built this tight, ASHRAE 62.2 requires mechanical ventilation for all homes, with few exceptions. However, based on ASHRAE 136, a conservative code might prescribe whole-house mechanical ventilation for any home with an infiltration leakage rate of 10 ACH 50 or less.

As a second point of reference, California's 2005 Title 24 Chapter 6 requires that, "Continuous mechanical ventilation (either exhaust or supply ventilation) must be installed when the target SLA is below 3.0". California's SLA of 3.0 is roughly equivalent to 6 ACH 50. As a third point of reference, NAHB's National Green Building Standard requires whole-house mechanical ventilation when the infiltration rate falls below 5.0 ACH 50. This requirement provides clear recognition from a consensus standard that whole-house mechanical ventilation should be provided for all homes that meet this threshold.

Based on the previous references, there is broad consensus across states and within consensus standards that whole-house mechanical ventilation should be required when a dwelling's infiltration falls below 5.0 ACH 50.

What states are now requiring whole-house mechanical ventilation?

Several states now require mechanical ventilation in dwellings, including MN, VT, WA, CA, and ME.

References:

1. ASHRAE Standard 62.2-2007 *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*. http://www.ashrae.org/technology/page/548
2. Price, P.N. and M.H. Sherman "Ventilation Behavior and Household Characteristics in New California Houses," April 2006. LBNL-59620 http://epb.lbl.gov/Publications/lbnl-59620.pdf
3. Offermann, F.J., et al., "Window usage, ventilation, and formaldehyde concentrations in new California homes: summer field sessions", in IAQ 2007, Healthy and Sustainable Buildings. 2007, American Society of Heating Refrigerating, and Air Conditioning Engineers, Inc.: Baltimore, MD. p. 497-526 (preprints); http://www.iee-sf.com/pdf/SummerFieldResults.pdf

Cost Impact: Where homes have infiltration rates less than 5.0 ACH 50, and those homes are not already providing whole-house mechanical ventilation, the cost of construction will increase.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MOORE-EC-1-402.4-RE-2-N1102.4.2.1

EC81–09/10

202 (New), 402.4.1, 402.4.2, 402.4.2.1, 402.4.2.2, 402.4.2.3, Table 402.4.2; IRC R202 (New), N1102.4.1, N1102.4.2, N1102.4.2.1, N1102.4.2.2, N1102.4.2.3, Table N1102.4.2

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Add new definition as follows:

SPECIFIC LEAKAGE AREA (SLA). The air leakage area (L) per conditioned floor area (CFA) of a home (L/CFA), where leakage area (L) is defined in accordance with Section 5.1 of ASHRAE 119 and where L and CFA are in the same units.

2. Revise as follows:

402.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Section 402.4.2 and be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:

1. All joints, seams and penetrations.
2. Site-built windows, doors and skylights.
3. Openings between window and door assemblies and their respective jambs and framing.
4. Utility penetrations.
5. Dropped ceilings or chases adjacent to the thermal envelope.

6. Knee walls.
7. Walls and ceilings separating a garage from conditioned spaces.
8. Behind tubs and showers on exterior walls.
9. Common walls between dwelling units.
10. Attic access openings.
11. Rim joist junction.
12. Other sources of infiltration.

402.4.2 Air sealing and insulation. The components of the *building thermal envelope* as listed in Table 402.4.2 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table 402.4.2, as applicable to the method of construction. Building envelope air tightness and insulation installation shall be demonstrated to comply with ~~one of~~ the ~~following options given~~ requirements established by Section 402.4.2.1 ~~or~~ and 402.4.2.2:

402.4.2.1 Performance testing requirement ~~option.~~ The building shall meet the air leakage standard set forth below as demonstrated by an air leakage test conducted as specified below:

1. Building envelope tightness ~~and insulation installation~~ shall be ~~considered acceptable when~~ tested by a party *approved* by the code official. Where required by the code official, the *approved* party shall be independent from both the builder and any other entity responsible for installing the insulation and air barrier and otherwise sealing the building. A written report specifying the results of the test and attesting to the accuracy of the results shall be signed by the party conducting the testing and provided to the builder and *code official*.
2. The building shall be required to have an air leakage ~~is~~ less than 0.00030 *specific leakage area (SLA)* ~~seven air changes per hour (ACH)~~ when tested with a blower door at a pressure of 33.5 psf (50 Pa). Testing shall occur any time after rough in and after (i) installation of all penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation, and combustion appliances, and (ii) completion of sealing of the *building thermal envelope* as required in section 402.4.1.
3. During testing:
    1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed beyond the weather-stripping, caulking and other intended permanent air infiltration control measures;
    2. Dampers shall be closed, but not sealed, including exhaust, intake, makeup air, backdraft, fireplace and flue dampers beyond intended permanent air infiltration control measures;
    3. Interior doors connecting conditioned spaces shall be open, doors connecting to unconditioned spaces closed but not sealed;
    4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
    5. Heating and cooling system(s) shall be turned off;
    ~~6. HVAC ducts systems shall not be sealed; and~~
    ~~7~~ 6. Supply and return registers shall be fully open at the time of the test ~~not be sealed~~.

        Exception: Multi-family residential buildings, with more than four dwelling units per building, may be individually exempted from the testing requirement only when meeting all of the following requirements:

        1. The exemption is approved by the *code official* after inspection of the sealing of thermal envelope in accordance with Section 402.4.1 and Table 402.4.2;
        2. At least 15 percent of the units are tested to have an air leakage less than 0.00036 *specific leakage area (SLA)* when tested with a blower door at a pressure of 33.5 psf (50 Pa), with the units to be tested specified by the code official; and
        3. The tests demonstrate compliance for such units.

When any tested dwelling unit subject to this exception fails to meet the maximum air leakage requirement stated in Section 402.4.2.1, then the builder must resolve any leakage problems so that such unit passes the test and then must continue to test each additional dwelling unit in such building until a minimum of three consecutive dwelling units pass the test before the builder can return to testing as specified in subpart (ii) of this Exception.

402.4.2.2 Visual insulation inspection ~~option~~ (Mandatory). Building envelope ~~tightness and~~ insulation installation shall be ~~considered acceptable when the items listed in Table 402.4.2, applicable to the method of construction, are~~ field verified to meet the Insulation Installation Criteria in Table 402.4.2. Where required by the *code official*, an *approved* party independent from the builder and the installer of the insulation, shall inspect the ~~air barrier and~~ insulation; in such case, a written inspection report, including a checklist demonstrating compliance shall be provided to the *code official* and builder before interior finish materials are applied.

3. Add new text as follows:

402.4.2.3 Visual air barrier inspection. For any building or dwelling unit not required to be tested under section 402.4.2.1, building envelope tightness shall be field verified to meet the Air Barrier Criteria in Table 402.4.2. Where required by the *code official*, an *approved* party independent from the builder and the installer of any air barrier materials, shall inspect the air barrier; in such case, a written inspection report, including a checklist demonstrating compliance shall be provided to the *code official* and builder before interior finish materials are applied. In cases where the building or dwelling unit satisfies the testing requirement of section 402.4.2.1, the *code official* may also require field verification to show that the building meets the Air Barrier Criteria if deemed necessary.

4. Delete Table 402.4.2 and substitute as follows:

~~**TABLE 402.4.2**~~
~~**AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA**~~

TABLE 402.4.2
VISUAL AIR BARRIER AND INSULATION INSPECTION

COMPONENT	INSULATION INSTALLATION CRITERIA	AIR BARRIER CRITERIA
General Requirements	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier.	A continuous air barrier is installed in the thermal envelope. Breaks or joints in the air barrier are sealed. Air permeable insulation is not used as a sealing material.
Ceiling / attic	In any dropped ceiling/soffit, the insulation is substantially aligned with the air barrier.	Air barrier in any dropped ceiling / soffit is substantially aligned with insulation and any gaps are sealed. Attic access, knee wall door or drop down stair to unconditioned attic is sealed.
Walls	All corners and headers are insulated. Insulation is in substantial contact and continuous alignment with air barrier.	Junction of foundation and sill plate is sealed. Junction of exterior wall and top plate is sealed. Junction of the exterior wall and floor sheathing is sealed. Knee wall is sealed.
Fenestration		Space between fenestration jambs and framing is sealed.
Rim joists	Rim joists are insulated.	Air barrier is installed at the rim joist.
Floors (including above garage and cantilevered floors)	Insulation is installed to maintain permanent contact with underside of subfloor decking.	Air barrier is installed at any exposed edge of insulation.
Crawl space walls	Insulation is permanently attached to walls.	Exposed earth in unvented crawlspaces is covered with Class I vapor retarder with overlapping joints taped.
Shafts, penetrations		Duct shafts, utility penetrations, knee walls, and flue shafts opening to exterior or unconditioned space are sealed.
Narrow cavities	Batts in narrow cavities are cut to fit; narrow cavities are filled by sprayed/blown insulation.	
Garage separation		Air sealing is provided between the garage and conditioned spaces.

COMPONENT	INSULATION INSTALLATION CRITERIA	AIR BARRIER CRITERIA
Recessed lighting		Recessed light fixtures installed in the building thermal envelope are airtight, IC rated, and sealed to drywall.
Plumbing and Wiring	Insulation is placed between the exterior of the wall assembly and pipes. Batt insulation is cut and fitted around wiring and plumbing, or sprayed/blown insulation extends between piping and wiring and to the exterior of the wall assembly.	All plumbing and wiring penetrations shall be sealed to the air barrier.
Shower / tub on exterior wall	Exterior walls adjacent to showers and tubs have insulation filling any gaps or voids between tub or shower walls and unconditioned space.	Exterior walls adjacent to showers and tubs have an air barrier separating the exterior wall from the shower and tubs.
Electrical / phone box on exterior walls	Insulation completely fills voids between the box and exterior sheathing	Air barrier extends behind boxes or air sealed type boxes are installed.
Common wall		Air barrier is installed in common wall between dwelling units.
HVAC register boots		HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.
Fireplace		Air barrier is installed on fireplace walls. Fireplace shall have gasketed doors.

PART II – IRC BUILDING/ENERGY

1. Add new definition as follows:

SPECIFIC LEAKAGE AREA (SLA). The air leakage area (L) per conditioned floor area (CFA) of a home (L/CFA), where leakage area (L) is defined in accordance with Section 5.1 of ASHRAE 119 and where L and CFA are in the same units.

2. Revise as follows:

N1102.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Section N1102.4.2 and be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material.

1. All joints, seams and penetrations.
2. Site-built windows, doors and skylights.
3. Openings between window and door assemblies and their respective jambs and framing.
4. Utility penetrations.
5. Dropped ceilings or chases adjacent to the thermal envelope.
6. Knee walls.
7. Walls and ceilings separating a garage from conditioned spaces.
8. Behind tubs and showers on exterior walls.
9. Common walls between dwelling units.
10. Attic access openings.
11. Rim joist junction.
12. Other sources of infiltration.

N1102.4.2 Air sealing and insulation. The components of the *building thermal envelope* as listed in Table N1102.4.2 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table N1102.4.2, as applicable to the method of construction. Building envelope air tightness and insulation installation shall be demonstrated to comply with ~~one of~~ the ~~following options given~~ requirements established by Section N1102.4.2.1 ~~or~~ and N1102.4.2.2.

N1102.4.2.1 Performance testing requirement ~~option~~. The building shall meet the air leakage standard set forth below as demonstrated by an air leakage test conducted as specified below:

1. Building envelope tightness shall be tested by a party *approved* by the code official. Where required by the building official, the *approved* party shall be independent from both the builder and any other entity responsible for installing the insulation and air barrier and otherwise sealing the building. A written report specifying the results of the test and attesting to the accuracy of the results shall be signed by the party conducting the testing and provided to the builder and *building official*.
2. ~~Tested~~ The building shall be required to have an air leakage ~~is~~ less than 0.00030 *specific leakage area (SLA)* ~~7 ACH~~ when tested with a blower door at a pressure of 33.5 psf (50 Pa) ~~pascals (0.007 psi)~~. Testing shall occur any time after rough in and after (i) installation of all penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation, and combustion appliances, and (ii) completion of sealing of the *building thermal envelope* as required in section N1102.4.1.

3. During testing:

    1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed beyond the weather-stripping, caulking and other intended permanent air infiltration control measures;
    2. Dampers shall be closed, but not sealed, including exhaust, intake, makeup air, backdraft, fireplace and flue dampers beyond intended permanent air infiltration control measures;
    3. Interior doors connecting conditioned spaces shall be open, doors connecting to unconditioned spaces closed but not sealed;
    4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
    5. Heating and cooling system(s) shall be turned off;
    ~~6. HVAC ducts systems shall not be sealed; and~~
    ~~7~~ 6. Supply and return registers shall be fully open at the time of the test ~~not be sealed~~.

        Exception: Multi-family residential buildings, with more than four dwelling units per building, may be individually exempted from the testing requirement only when meeting all of the following requirements:

        1. The exemption is approved by the *building official* after inspection of the sealing of thermal envelope in accordance with section N1102.4.1 and Table N1102.4.2;
        2. At least 15 percent of the units are tested to have an air leakage less than 0.00036 *specific leakage area (SLA)* when tested with a blower door at a pressure of 33.5 psf (50 Pa), with the units to be tested specified by the code official; and
        3. The tests demonstrate compliance for such units.

When any tested dwelling unit subject to this exception fails to meet the maximum air leakage requirement stated in Section N1102.4.2.1, then the builder must resolve any leakage problems so that such unit passes the test and then must continue to test each additional dwelling unit in such building until a minimum of three consecutive dwelling units pass the test before the builder can return to testing as specified in subpart (ii) of this Exception.

N1102.4.2.2 Visual insulation inspection ~~option~~. ~~The items listed in Table N1102.4.2, applicable to the method of construction, are~~ Building envelope insulation installation shall be field verified to meet the Insulation Installation Criteria in Table N1102.4.2. Where required by the building official, an *approved* party independent from the builder and the installer of the insulation, shall inspect the ~~air barrier and~~ insulation; in such case, a written inspection report, including a checklist demonstrating compliance shall be provided to the *building official* and builder before interior finish materials are applied.

3. Add new text as follows:

N1102.4.2.3 Visual air barrier inspection. For any building or dwelling unit not required to be tested under Section N1102.4.2.1, building envelope tightness shall be field verified to meet the Air Barrier Criteria in Table N1102.4.2. Where required by the *building official*, an *approved* party independent from the builder and the installer of any air barrier materials, shall inspect the air barrier; in such case, a written inspection report, including a checklist demonstrating compliance shall be provided to the *building official* and builder before interior finish materials are applied. In cases where the building or dwelling unit satisfies the testing requirement of Section N1102.4.2.1, the *building official* may also require field verification to show that the building meets the Air Barrier Criteria if deemed necessary.

4. Delete Table N1102.4.2 and substitute as follows:

~~**TABLE N1102.4.2**~~
~~**AIR BARRIER AND INSULATION INSPECTION**~~

TABLE N1102.4.2
VISUAL AIR BARRIER AND INSULATION INSPECTION

COMPONENT	INSULATION INSTALLATION CRITERIA	AIR BARRIER CRITERIA
General Requirements	Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with building envelope air barrier.	A continuous air barrier is installed in the thermal envelope. Breaks or joints in the air barrier are sealed. Air permeable insulation is not used as a sealing material.
Ceiling / attic	In any dropped ceiling/soffit, the insulation shall be substantially aligned with the air barrier.	Air barrier in any dropped ceiling / soffit is substantially aligned with insulation and any gaps are sealed. Attic access, knee wall door or drop down stair to unconditioned attic is sealed.
Walls	All corners and headers are insulated. Insulation shall be substantial contact and continuous alignment with air barrier.	Junction of foundation and sill plate is sealed. Junction of exterior wall and top plate is sealed. Junction of the exterior wall and floor sheathing is sealed. Knee wall is sealed.
Fenestration		Space between fenestration jambs and framing is sealed.
Rim joists	Rim joists are insulated.	Air barrier is installed at the rim joist.
Floors (including above garage and cantilevered floors)	Insulation is installed to maintain permanent contact with underside of subfloor decking.	Air barrier is installed at any exposed edge of insulation.
Crawl space walls	Insulation is permanently attached to walls.	Exposed earth in unvented crawlspaces is covered with Class I vapor retarder with overlapping joints taped.
Shafts, penetrations		Duct shafts, utility penetrations, knee walls, and flue shafts opening to exterior or unconditioned space are sealed.
Narrow cavities	Batts in narrow cavities are cut to fit; narrow cavities shall be filled by sprayed/blown insulation.	
Garage separation		Air sealing is provided between the garage and conditioned spaces.
Recessed lighting		Recessed light fixtures installed in the building thermal envelope are airtight, IC rated, and sealed to drywall.
Plumbing and Wiring	Insulation shall be placed between the exterior of the wall assembly and pipes. Batt insulation is cut and fitted around wiring and plumbing, or sprayed/blown insulation extends between piping and wiring and to the exterior of the wall assembly.	All plumbing and wiring penetrations shall be sealed to the air barrier.
Shower / tub on exterior wall	Exterior walls adjacent to showers and tubs have insulation filling any gaps or voids between tub or shower walls and unconditioned space.	Exterior walls adjacent to showers and tubs have an air barrier separating the exterior wall from the shower and tubs.
Electrical / phone box on exterior walls	Insulation completely fills voids between the box and exterior sheathing	Air barrier extends behind boxes or air sealed type boxes are installed.
Common wall		Air barrier is installed in common wall between dwelling units.
HVAC register boots		HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.
Fireplace		Air barrier is installed on fireplace walls. Fireplace shall have gasketed doors.

Reason: Properly controlling air leakage and properly installing insulation are both critical to achieving additional energy savings in homes. In particular, reasonable control of air leakage can have an enormous positive effect on building energy efficiency. Since the builder is already required to properly install insulation and seal the building, the only true incremental cost is the cost of testing and inspection. This cost is fairly small compared to the benefits of proper sealing and insulation installation.

The changes approved in the 2009 *IECC* and *IRC* in this area improved existing code language by setting out clear steps for inspection and offering a testing option for air leakage. We are submitting this proposed modification because we believe that the code language and requirements can be substantially improved. For example, while the testing option as written will address air leakage (if this option is utilized), it does not address proper insulation installation. On the other hand, the inspection option does not guarantee reduced air leakage; the only way to guarantee it is to require testing.

In order to address these important issues, the proposed modification includes the following major improvements:

1. Makes both testing (with a written report) and a more limited visual inspection required;
2. Permits the code official to require independent testing and inspection with written reports;
3. Reduces the burden on code officials by reducing their inspection requirements by eliminating those requirements no longer necessary as a result of the test;
4. Replaces air changes per hour (ACH) with Specific Leakage Area (SLA), a more accurate and consistent measure, as the standard, improves the testing protocol and requires better air leakage performance; and
5. Separates the insulation installation inspection criteria from the air barrier inspection criteria to allow for each to be required or exempted based on the whether testing is conducted.

These changes will make this code change more enforceable and a substantial improvement in energy efficiency over the language in the current code. The following table portrays estimated savings from these measures:

	Climate Zone 1	Climate Zone 2	Climate Zone 3	Climate Zone 4	Climate Zone 4M	Climate Zone 5	Climate Zone 6	Climate Zone 7	Climate Zone 8
Heating, Cooling, Hot Water Purchased Energy Cost Percent Savings	2.1%	3.2%	4.0%	6.3%	6.2%	7.4%	11.7%	9.2%	8.6%
Total Purchased Energy Cost Percent Savings (also including major appliances and lighting)	1.5%	2.3%	2.9%	4.8%	4.8%	5.6%	9.3%	7.0%	6.8%

These energy savings are among the largest of the package of proposals submitted by the EECC. It is thus especially crucial to attaining the overall goal of improving the IECC by 30%.

This proposal also requires multifamily housing in excess of four units to be tested to a testing requirement. However in recognition of the differences in this type of housing, the requirement is 20% less stringent than a single family home to account for leakage to other conditioned space. The multifamily testing exemption also allows for sampling of 15% of the units similar to other sampling procedures by ENERGY STAR and RESNET due to issues related to testing larger multifamily buildings.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-19-202-402.4-R202-N1102.2.4

EC82–09/10

402.4.1, 402.4.2, 402.4.2.1, 402.4.2.2, Table 402.4.2; IRC N1102.4.1, N1102.4.2, N1102.4.2.1, N1102.4.2.2, Table N1102.4.2

Proponent: Theresa Weston, PhD., representing DuPont Building Innovations

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise as follows:

402.4.1 Building thermal envelope. The *building thermal envelope* shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:

1. All joints, seams and penetrations.
2. Site-built windows, doors and skylights.
3. Openings between window and door assemblies and their respective jambs and framing.
4. Utility penetrations.
5. Dropped ceilings or chases adjacent to the thermal envelope.

6. Knee walls.
7. Walls and ceilings separating a garage from conditioned spaces
8. Behind tubs and showers on exterior walls.
9. Common walls between dwelling units.
10. Attic access openings.
11. Rim joist junction.
12. Junction of the foundation and sill plate.
13. Junction of the top plate and the interior wall.
14. Any exposed edge of insulation.
15. Fireplace walls.
~~12~~.16. Other sources of infiltration.

402.4.2 Air sealing and insulation installation. The components of the *building thermal envelope* listed in Section 402.4.1 shall be installed in accordance with the manufacturer's instructions and following criteria, as applicable to the method of construction:

1. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and alignment with building envelope air barrier.
2. Breaks or joints in the air barrier shall be filled or sealed.
3. Air permeable insulation shall not be used as a sealing material.
4. Air permeable insulation shall be enclosed in an air barrier.
5. Insulation to be installed in non-standard framing cavity spaced shall be cut to fit the cavity or the cavity shall be insulated with insulation that will readily conform to the cavity.
6. Recessed light fixtures that penetrate the building envelope shall be airtight, IC rated, and sealed to the drywall.

Building envelope air tightness and insulation installation shall be demonstrated to comply with ~~one of the following options given by~~ Sections 402.4.2.1 ~~or~~ and 402.4.2.2:

402.4.2.1 Whole building testing ~~option~~. Building envelope tightness and insulation installation shall be considered acceptable when tested to have a maximum specific leakage area (SLA) = 0.00036. Testing shall be in accordance with ASHRAE 119 Section 5.1.~~air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 33.5 psf (50 Pa).~~ Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.

~~During testing:~~

~~1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;~~
~~2. Dampers shall be closed, but not sealed, including exhaust, intake, makeup air, backdraft and flue dampers;~~
~~3. Interior doors shall be open;~~
~~4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;~~
~~5. Heating and cooling system(s) shall be turned off;~~
~~6. HVAC ducts shall not be sealed; and~~
~~7. Supply and return registers shall not be sealed~~.

402.4.2.2 Visual inspection ~~option~~. Building envelope tightness and insulation installation shall be considered acceptable when the ~~items~~ areas listed in ~~Table 402.4.2~~ Section 402.4.1 are installed as described in Section 402.4.2, ~~applicable to the method of construction,~~ are field verified. Where required by the *code official*, an *approved* party independent from the installer of the insulation shall inspect the air barrier and insulation.

2. Delete table without substitution:

~~**TABLE 402.4.2**~~
~~**AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA**~~

~~**COMPONENT**~~	~~**CRITERIA**~~
~~Air barrier and thermal barrier~~	~~Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air-permeable insulation is not used as a sealing material. Air-permeable insulation is inside of an air barrier.~~
~~Ceiling/attic~~	~~Air barrier in any dropped ceiling/soffit is substantially aligned with insulation and any gaps are sealed. Attic access (except unvented attic), knee wall door, or drop down stair is sealed.~~
~~Walls~~	~~Corners and headers are insulated. Junction of foundation and sill plate is sealed.~~
~~Windows and doors~~	~~Space between window/door jambs and framing is sealed.~~
~~Rim joists~~	~~Rim joists are insulated and include an air barrier.~~
~~Floors (including above-garage and cantilevered floors)~~	~~Insulation is installed to maintain permanent contact with underside of subfloor decking. Air barrier is installed at any exposed edge of insulation.~~
~~Crawl space walls~~	~~Insulation is permanently attached to walls. Exposed earth in unvented crawl spaces is covered with Class I vapor retarder with overlapping joints taped.~~
~~Shafts, penetrations~~	~~Duct shafts, utility penetrations, knee walls and flue shafts opening to exterior or unconditioned space are sealed.~~
~~Narrow cavities~~	~~Batts in narrow cavities are cut to fit, or narrow cavities are filled by sprayed/blown insulation.~~
~~Garage separation~~	~~Air sealing is provided between the garage and conditioned spaces.~~
~~Recessed lighting~~	~~Recessed light fixtures are air tight, IC rated, and sealed to drywall. Exception – fixtures in conditioned space.~~
~~Plumbing and wiring~~	~~Insulation is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing, or sprayed/blown insulation extends behind piping and wiring.~~
~~Shower/tub on exterior wall~~	~~Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.~~
~~Electrical/phone box on exterior walls~~	~~Air barrier extends behind boxes or air sealed type boxes are installed.~~
~~Common wall~~	~~Air barrier is installed in common wall between dwelling units.~~
~~HVAC register boots~~	~~HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.~~
~~Fireplace~~	~~Fireplace walls include an air barrier.~~

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

N1102.4.1 Building thermal envelope. The *building thermal envelope* shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material.

1. All joints, seams and penetrations.
2. Site-built windows, doors and skylights.
3. Openings between window and door assemblies and their respective jambs and framing.
4. Utility penetrations.
5. Dropped ceilings or chases adjacent to the thermal envelope.
6. Knee walls.
7. Walls and ceilings separating the garage from *conditioned spaces*.
8. Behind tubs and showers on *exterior walls*.
9. Common walls between *dwelling units*.

10. Attic access openings.
11. Rim joists junction.
12. Junction of the foundation and sill plate.
13. Junction of the top plate and the interior wall.
14. Any exposed edge of insulation.
15. Fireplace walls.
~~12.~~16. Other sources of infiltration.

N1102.4.2 Air sealing and insulation installation. The components of the *building thermal envelope* listed in Section N1102.4.1 shall be installed in accordance with the manufacturer's instructions and following criteria, as applicable to the method of construction:

1. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and alignment with building envelope air barrier.
2. Breaks or joints in the air barrier shall be filled or sealed.
3. Air permeable insulation shall not be used as a sealing material.
4. Air permeable insulation shall be enclosed in an air barrier.
5. Insulation to be installed in non-standard framing cavity spaced shall be cut to fit the cavity or the cavity shall be insulated with insulation that will readily conform to the cavity.
6. Recessed light fixtures that penetrate the building envelope shall be airtight, IC rated, and sealed to the drywall.

Building envelope air tightness and insulation installation shall be demonstrated to comply with ~~one of the following options given by~~ Sections N1102.4.2.1 ~~or~~ and N1102.4.2.2:

N1102.4.2.1 Whole building testing ~~option~~. ~~Tested air leakage is less than 7 ACH when tested with a blower door at a pressure of 50 pascals (0.007 psi).~~ Building envelope tightness and insulation installation shall be considered acceptable when tested to have a maximum specific leakage area (SLA) = 0.00036. Testing shall be in accordance with ASHRAE 119 Section 5.1. Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.

~~During testing:~~

~~1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;~~
~~2. Dampers shall be closed, but not sealed; including exhaust, intake, makeup air, back draft, and flue dampers;~~
~~3. Interior doors shall be open;~~
~~4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;~~
~~5. Heating and cooling system(s) shall be turned off;~~
~~6. HVAC ducts shall not be sealed; and~~
~~7. Supply and return registers shall not be sealed.~~

N1102.4.2.2 Visual inspection ~~option.~~ Building envelope tightness and insulation installation shall be considered acceptable when the areas listed in Section N1102.4.1 are installed as described in Section N1102.4.2 ~~The items listed in Table N1102.4.2, applicable to the method of construction,~~ are field verified. Where required by the code official, an *approved* party independent from the installer of the insulation, shall inspect the air barrier and insulation.

2. Delete without substitution:

~~TABLE N1102.4.2~~
~~AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA~~

~~COMPONENT~~	~~CRITERIA~~
~~Air barrier and thermal barrier~~	~~Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air-permeable insulation is not used as a sealing material.~~
~~Ceiling/attic~~	~~Air barrier in any dropped ceiling/soffit is substantially aligned with insulation and any gaps are sealed Attic access (except unvented attic), knee wall door, or drop down stair is sealed.~~
~~Walls~~	~~Corners and headers are insulated. Junction of foundation and sill plate is sealed.~~
~~Windows and doors~~	~~Space between window/door jambs and framing is sealed.~~
~~Rim joists~~	~~Rim joists are insulated and include an air barrier.~~
~~Floors (including above garage and cantilevered floors)~~	~~Insulation is installed to maintain permanent contact with underside of subfloor decking. Air barrier is installed at any exposed edge of floor.~~
~~Crawlspace walls~~	~~Insulation is permanently attached to walls. Exposed earth in unvented crawlspaces is covered with Class I vapor retarder with overlapping joints taped.~~
~~Shafts, penetrations~~	~~Duct shafts, utility penetrations, knee walls and flue shafts opening to exterior or unconditioned space are sealed.~~
~~Narrow cavities~~	~~Batts in narrow cavities are cut to fit, or narrow cavities are filled by sprayed/blown insulation.~~
~~Garage separation~~	~~Air sealing is provided between the garage and conditioned spaces.~~
~~Recessed lighting~~	~~Recessed light fixtures are airtight, IC rated and sealed to drywall. Exception – fixtures in conditioned space.~~
~~Plumbing and wiring~~	~~Insulation is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing, or sprayed/blown insulation extends behind piping and wiring.~~
~~Shower/tub on exterior wall~~	~~Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.~~
~~Electrical/phone box on exterior wall~~	~~Air barrier extends behind boxes or air sealed type boxes are installed.~~
~~Common wall~~	~~Air barrier is installed in common wall between dwelling units.~~
~~HVAC register boots~~	~~HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.~~
~~Fireplace~~	~~Fireplace walls include an air barrier.~~

Reason (Part I): This change removes options of either visual inspection or whole building testing and requires both. Air sealing cannot be accomplished without the attention to installation details that visual inspection ensures. But no list of visual inspection areas can cover all leakage points and so whole building testing is needed. This change also seeks to remove redundancies from and provide clarity to the existing code language. Table 402.4.2 which was largely redundant with the list in 402.4.1 is removed. Information in the table that was not redundant was extracted and inserted into the appropriate section of the code. The “testing option” test method and criteria were simplified to be the same those in Table 405.5.2 “air exchange rate” section.

Reason (Part II): This change removes options of either visual inspection or whole building testing and requires both. Air sealing cannot be accomplished without the attention to installation details that visual inspection ensures. But no list of visual inspection areas can cover all leakage points and so whole building testing is needed. This change also seeks to remove redundancies from and provide clarity to the existing code language. Table N1102.4.2 which was largely redundant with the list in N1102.4.1 is removed. Information in the table that was not redundant was extracted and inserted into the appropriate section of the code. The “testing option” test method and criteria were simplified to be the same those in the IECC Table 405.5.2 “air exchange rate” section.

Cost Impact (Part I): The code change proposal will increase the cost of construction.
Cost Impact (Part II): The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WESTON-EC-2-402.4-RE-2-N1102.4

EC83–09/10

402.4.1, 402.4.2, 402.4.2.1, 402.4.2.2, Table 402.4.2; IRC N1102.4.1, N1102.4.2, N1102.4.2.1, N1102.4.2.2, Table N1102.4.2

Proponent: Theresa Weston, PhD., representing DuPont Innovations

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise as follows:

402.4.1 Building thermal envelope. The *building thermal envelope* shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:

1. All joints, seams and penetrations.
2. Site-built windows, doors and skylights.
3. Openings between window and door assemblies and their respective jambs and framing.
4. Utility penetrations.
5. Dropped ceilings or chases adjacent to the thermal envelope.
6. Knee walls.
7. Walls and ceilings separating a garage from conditioned spaces
8. Behind tubs and showers on exterior walls.
9. Common walls between dwelling units.
10. Attic access openings.
11. Rim joist junction.
12. Junction of the foundation and sill plate.
13. Junction of the top plate and the interior wall.
14. Any exposed edge of insulation.
15. Fireplace walls.

~~12~~.16. Other sources of infiltration.

402.4.2 Air sealing and insulation installation. The components of the *building thermal envelope* listed in Section 402.4.1 shall be installed in accordance with the manufacturer's instructions and following criteria, as applicable to the method of construction:

1. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and alignment with building envelope air barrier.
2. Breaks or joints in the air barrier shall be filled or sealed.
3. Air permeable insulation shall not be used as a sealing material.
4. Air permeable insulation shall be enclosed in an air barrier.
5. Insulation to be installed in non-standard framing cavity spaced shall be cut to fit the cavity or the cavity shall be insulated with insulation that will readily conform to the cavity.
6. Recessed light fixtures that penetrate the building envelope shall be airtight, IC rated, and sealed to the drywall.

Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Sections 402.4.2.1 or 402.4.2.2:

402.4.2.1 Whole building testing option. Building envelope tightness and insulation installation shall be considered acceptable when tested to have a maximum specific leakage area (SLA) = 0.00036. Testing shall be in accordance with ASHRAE 119 Section 5.1.~~air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 33.5 psf (50 Pa).~~ Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.

~~During testing:~~

1. ~~Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;~~
2. ~~Dampers shall be closed, but not sealed, including exhaust, intake, makeup air, backdraft and flue dampers;~~
3. ~~Interior doors shall be open;~~
4. ~~Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;~~
5. ~~Heating and cooling system(s) shall be turned off;~~
6. ~~HVAC ducts shall not be sealed; and~~
7. ~~Supply and return registers shall not be sealed~~.

402.4.2.2 Visual inspection option. Building envelope tightness and insulation installation shall be considered acceptable when the ~~items~~ areas listed in ~~Table 402.4.2~~ Section 402.4.1 are installed as described in Section 402.4.2, ~~applicable to the method of construction,~~ are field verified. Where required by the *code official*, an *approved* party independent from the installer of the insulation shall inspect the air barrier and insulation.

2. Delete table without substitution:

~~TABLE 402.4.2~~
~~AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA~~

~~COMPONENT~~	~~CRITERIA~~
~~Air barrier and thermal barrier~~	~~Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air-permeable insulation is not used as a sealing material. Air-permeable insulation is inside of an air barrier.~~
~~Ceiling/attic~~	~~Air barrier in any dropped ceiling/soffit is substantially aligned with insulation and any gaps are sealed. Attic access (except unvented attic), knee wall door, or drop down stair is sealed.~~
~~Walls~~	~~Corners and headers are insulated. Junction of foundation and sill plate is sealed.~~
~~Windows and doors~~	~~Space between window/door jambs and framing is sealed.~~
~~Rim joists~~	~~Rim joists are insulated and include an air barrier.~~
~~Floors (including above-garage and cantilevered floors)~~	~~Insulation is installed to maintain permanent contact with underside of subfloor decking. Air barrier is installed at any exposed edge of insulation.~~
~~Crawl space walls~~	~~Insulation is permanently attached to walls. Exposed earth in unvented crawl spaces is covered with Class I vapor retarder with overlapping joints taped.~~
~~Shafts, penetrations~~	~~Duct shafts, utility penetrations, knee walls and flue shafts opening to exterior or unconditioned space are sealed.~~
~~Narrow cavities~~	~~Batts in narrow cavities are cut to fit, or narrow cavities are filled by sprayed/blown insulation.~~
~~Garage separation~~	~~Air sealing is provided between the garage and conditioned spaces.~~
~~Recessed lighting~~	~~Recessed light fixtures are air tight, IC rated, and sealed to drywall. Exception—fixtures in conditioned space.~~
~~Plumbing and wiring~~	~~Insulation is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing, or sprayed/blown insulation extends behind piping and wiring.~~
~~Shower/tub on exterior wall~~	~~Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.~~
~~Electrical/phone box on exterior walls~~	~~Air barrier extends behind boxes or air-sealed-type boxes are installed.~~
~~Common wall~~	~~Air barrier is installed in common wall between dwelling units.~~
~~HVAC register boots~~	~~HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.~~
~~Fireplace~~	~~Fireplace walls include an air barrier.~~

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

N1102.4.1 Building thermal envelope. The *building thermal envelope* shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material.

1. All joints, seams and penetrations.
2. Site-built windows, doors and skylights.
3. Openings between window and door assemblies and their respective jambs and framing.
4. Utility penetrations.
5. Dropped ceilings or chases adjacent to the thermal envelope.
6. Knee walls.
7. Walls and ceilings separating the garage from *conditioned spaces*.
8. Behind tubs and showers on *exterior walls*.
9. Common walls between *dwelling units*.
10. Attic access openings.
11. Rim joists junction.
12. Junction of the foundation and sill plate.
13. Junction of the top plate and the interior wall.
14. Any exposed edge of insulation.
15. Fireplace walls.

~~12.~~16. Other sources of infiltration.

N1102.4.2 Air sealing and insulation installation. The components of the *building thermal envelope* listed in Section N1102.4.1 shall be installed in accordance with the manufacturer's instructions and following criteria, as applicable to the method of construction:

1. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and alignment with building envelope air barrier.
2. Breaks or joints in the air barrier shall be filled or sealed.
3. Air permeable insulation shall not be used as a sealing material.
4. Air permeable insulation shall be enclosed in an air barrier.
5. Insulation to be installed in non-standard framing cavity spaced shall be cut to fit the cavity or the cavity shall be insulated with insulation that will readily conform to the cavity.
6. Recessed light fixtures that penetrate the building envelope shall be airtight, IC rated, and sealed to the drywall.

Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Sections N1102.4.2.1 or N1102.4.2.2:

N1102.4.2.1 Whole building testing option. ~~Tested air leakage is less than 7 ACH when tested with a blower door at a pressure of 50 pascals (0.007 psi).~~ Building envelope tightness and insulation installation shall be considered acceptable when tested to have a maximum specific leakage area (SLA) = 0.00036. Testing shall be in accordance with ASHRAE 119 Section 5.1. Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.

~~During testing:~~

1. ~~Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;~~
2. ~~Dampers shall be closed, but not sealed; including exhaust, intake, makeup air, back draft, and flue dampers;~~
3. ~~Interior doors shall be open;~~
4. ~~Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;~~
5. ~~Heating and cooling system(s) shall be turned off;~~
6. ~~HVAC ducts shall not be sealed; and~~
7. ~~Supply and return registers shall not be sealed.~~

N1102.4.2.2 Visual inspection option. Building envelope tightness and insulation installation shall be considered acceptable when the areas listed in Section N1102.4.1 are installed as described in Section N1102.4.2 ~~The items listed in Table N1102.4.2, applicable to the method of construction,~~ are field verified. Where required by the code official, an *approved* party independent from the installer of the insulation, shall inspect the air barrier and insulation.

2. Delete table without substitution:

~~**TABLE N1102.4.2**~~
~~**AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA**~~

~~*COMPONENT*~~	~~*CRITERIA*~~
~~Air barrier and thermal barrier~~	~~Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air-permeable insulation is not used as a sealing material.~~
~~Ceiling/attic~~	~~Air barrier in any dropped ceiling/soffit is substantially aligned with insulation and any gaps are sealed Attic access (except unvented attic), knee wall door, or drop down stair is sealed.~~
~~Walls~~	~~Corners and headers are insulated. Junction of foundation and sill plate is sealed.~~
~~Windows and doors~~	~~Space between window/door jambs and framing is sealed.~~
~~Rim joists~~	~~Rim joists are insulated and include an air barrier.~~
~~Floors (including above garage and cantilevered floors)~~	~~Insulation is installed to maintain permanent contact with underside of subfloor decking. Air barrier is installed at any exposed edge of floor.~~
~~Crawlspace walls~~	~~Insulation is permanently attached to walls. Exposed earth in unvented crawlspaces is covered with Class I vapor retarder with overlapping joints taped.~~
~~Shafts, penetrations~~	~~Duct shafts, utility penetrations, knee walls and flue shafts opening to exterior or unconditioned space are sealed.~~
~~Narrow cavities~~	~~Batts in narrow cavities are cut to fit, or narrow cavities are filled by sprayed/blown insulation.~~
~~Garage separation~~	~~Air sealing is provided between the garage and conditioned spaces.~~
~~Recessed lighting~~	~~Recessed light fixtures are airtight, IC rated and sealed to drywall. Exception – fixtures in conditioned space.~~
~~Plumbing and wiring~~	~~Insulation is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing, or sprayed/blown insulation extends behind piping and wiring.~~
~~Shower/tub on exterior wall~~	~~Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.~~
~~Electrical/phone box on exterior wall~~	~~Air barrier extends behind boxes or air sealed type boxes are installed.~~
~~Common wall~~	~~Air barrier is installed in common wall between dwelling units.~~
~~HVAC register boots~~	~~HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.~~
~~Fireplace~~	~~Fireplace walls include an air barrier.~~

Reason
(Part I)- This change seeks to remove redundancies from and provide clarity to the existing code language. Table 402.4.2 which was largely redundant with the list in 402.4.1 is removed. Information in the table that was not redundant was extracted and inserted into the appropriate section of the code. The "testing option" test method and criteria were simplified to be the same those in Table 405.5.2 "air exchange rate" section.
(Part II)- This change seeks to remove redundancies from and provide clarity to the existing code language. Table N1102.4.2 which was largely redundant with the list in N1102.4.1 is removed. Information in the table that was not redundant was extracted and inserted into the appropriate section of the code. The "testing option" test method and criteria were simplified to be the same those in the IECC Table 405.5.2 "air exchange rate" section.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WESTON-EC-4-402.4-RE-1-N1102.4

EC84–09/10
402.4.1.1; IRC N1102.4.6

Proponent: Wendy Johnson, Midway City, representing the Utah Chapter of ICC

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Add new text as follows:

402.4.1.1 Combustion air to rooms outside the thermal envelope. Where outside combustion air is supplied to liquid-, solid-, or fuel gas- burning appliances, a furnace or boiler room shall be provided to isolate the outside combustion air from the conditioned space. This room shall be insulated, isolated and sealed from the conditioned space per the requirements of this code. Supply and return ducts, and hot water lines located inside the room shall be insulated per the requirements this code. All water lines shall be protected from freezing. Outside combustion air ducts to this room, which pass through the conditioned space, shall be insulated and sealed in accordance with Section 403.2.

Exception:

1. Isolated rooms are not required where all liquid-, solid-, or fuel gas-appliances located inside the building envelope are direct vent.
2. Required combustion air for masonry fireplaces.

PART II – IRC BUILDING/ENERGY

Add new text as follows:

N 1102.4.6 Combustion air to rooms to be outside the thermal envelope. Where outside combustion air is supplied to liquid- solid-, or fuel gas- burning appliances, a furnace or boiler room shall be provided to isolate the outside combustion air from the conditioned space. This room shall be insulated, isolated and sealed from the conditioned space per the requirements of this code. Supply and return ducts, and hot water lines located inside the room shall be insulated per the requirements of this code. All water lines shall be protected from freezing. Outside combustion air ducts to this room, which pass through the conditioned space, shall be insulated and sealed in accordance with Section N1103.2.1.

Exception:

1. Isolated rooms are not required where all liquid-, solid-, or fuel-gas-appliances located inside the building envelope are direct vent.
2. Required combustion air for masonry fireplaces.

Reason: In areas where the seasonal interior/exterior temperature differential is significant, the combustion air ducts bring outside air, which is either quite cold or quite hot, into a mechanical room, crawl space, or unfinished basement. Unknowing homeowners often close off these ducts because the hot or cold air significantly impacts the temperature within the dwelling, or in extreme cases freezes water pipes. To have the 10", 11", or even 12" duct opening directly into what is then the thermal envelope of the structure is common practice, but certainly not what the energy code intends to happen. This new code section **clarifies** the intent of the code and outlines the minimum requirements for these spaces to meet the energy code.

Cost Impact: The code change proposal will increase the cost of construction, but lower energy consumption.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC Energy

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: JOHNSON(WENDY)-EC-1-402.4.1.1-RE-1-N1102.4.6

EC85–09/10
402.4.1, Table 402.4.2

Proponent: Ron Nickson, representing the National Multi Housing Council

Revise as follows:

402.4.1. Building thermal envelope. The *building thermal envelope* shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:

1. All joints, seams and penetrations.
2. Site-built window, doors and skylights.
3. Openings, between window and door assemblies and their respective jambs and framing.
4. Utility penetrations.
5. Dropped ceilings or chases adjacent to the thermal envelope.
6. Knee walls.
7. Walls and ceiling separating a garage from conditioned spaces.
8. Behind tubs and showers on exterior walls.
9. ~~Common walls between dwelling units.~~
10. ~~10.~~ 9. Attic access openings.
11. ~~11.~~10. Rim joists junctions.
12. ~~12.~~11. Other sources of infiltration.

TABLE 402.4.2
AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

COMPONENT	CRITERIA
Air barrier and thermal barrier	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air-permeable insulation is not used as a sealing material. Air-permeable insulation is inside of an air barrier.
Ceiling/attic	Air barrier in any dropped ceiling/soffit is substantially aligned with insulation and any gaps are sealed. Attic access (except unvented attic), knee wall door, or drop down stair is sealed.
Walls	Corners and headers are insulated. Junction of foundation and sill plate is sealed.
Windows and doors	Space between window/door jambs and framing is sealed.
Rim joists	Rim joists are insulated and include an air barrier.
Floors (including above-garage and cantilevered floors)	Insulation is installed to maintain permanent contact with underside of subfloor decking. Air barrier is installed at any exposed edge of insulation.
Crawl space walls	Insulation is permanently attaché to walls. Exposed earth in unvented crawl spaces is covered with Class I vapor retarder with overlapping joints taped.
Shafts, penetrations	Ducts shafts, utility penetrations, knee walls and flue shafts opening to exterior or unconditioned space are sealed.
Narrow cavities	Batts in narrow cavities are cut to fit, or narrow cavities are filled by sprayed/blown insulation.
Garage separation	Air sealing is provided between the garage and conditioned space.
Recessed lighting	Recessed light fixtures are air tight, IC rated, and sealed to drywall. Exception – fixtures in conditioned spaced.
Plumbing and wiring	Insulation is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing, or sprayed/blown insulation extends behind piping and wiring.
Shower/tub on exterior wall	Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.
Electrical/phone box on exterior wall	Air barrier extends behind boxes or air sealed-type boxes are installed.
~~Common wall~~	~~Air barrier is installed in common wall between dwelling units.~~
HVAC register boots	HV AC register boots that penetrate building envelope are sealed to subfloor or drywall.
Fireplace	Fireplace walls include an air barrier.

Reason: The change would remove the requirement for an air barrier in the common wall between dwelling units. This is not an energy issue in that heat or cooling moving between units does not increase or decrease the building energy usage. The wall separating dwelling units per Section 420.2 has to be a fire partition and the installation of a foreign material into the wall to comply with the requirement for the air barrier would not be in compliance with the fire resistance rating of the fire barrier wall. The construction of a fire barrier that complies with the code will provide most of, if not all of the intent of the requirement that the common wall between dwelling units have an air barrier.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NICKSON-EC-1-402.4.1

EC86–09/10
Table 402.4.2; IRC Table N1102.4.2

Proponent: Charles C. Cottrell, North American Insulation Manufacturers (NAIMA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGYCOMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

TABLE 402.4.2
VISUAL AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

COMPONENT	CRITERIA
Air barrier and thermal barrier	<u>Exterior thermal envelope contains a continuous air barrier</u> Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air permeable insulation is not used as a sealing material. ~~Air permeable insulation is inside of an air barrier.~~

(Portions of table not shown remain unchanged)

PART II – IRC ENERGY

TABLE N1102.4.2
VISUAL AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

COMPONENT	CRITERIA
Air barrier and thermal barrier	<u>Exterior thermal envelope contains a continuous air barrier</u> Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air permeable insulation is not used as a sealing material. ~~Air permeable insulation is inside of an air barrier.~~

(Portions of table not shown remain unchanged)

Reason: The current language requires that air permeable insulation be installed "inside of an air barrier." This would prohibit the use of the air-tight gypsum board air barrier practice which is an effective and widely used method of sealing the building envelope. This proposal would delete the language prohibiting this practice and add language stating, "Exterior thermal envelope contains a continuous air barrier," to clarify that the building envelope must contain an air barrier.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COTTRELL-EC-2-T. 402.4.2-T. N1102.4.2.DOC

EC87–09/10
402.4.2.1.1 (New), Chapter 6; IRC N1102.4.2.1.1 (New), Chapter 44

Proponent: Steve Ferguson, representing The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Add new text as follows:

402.4.2.1.1 Mechanical ventilation requirement. If a dwelling unit of a one- and two-family dwelling or multiple single-family dwelling (townhouse) not more than three stories in height is determined to have an infiltration rate of less than five air changes per hour (ACH) when tested in accordance with Section 402.4.2.1, whole-house mechanical ventilation shall be provided in accordance with ASHRAE 62.2. Any other dwelling unit that is determined to have an infiltration rate of less than five air changes per hour (ACH) when tested in accordance with Section 402.4.2.1 shall be provided with mechanical ventilation in accordance with the *International Mechanical Code*.

2. Add new standard to Chapter 6 as follows:

ANSI/ASHRAE

Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings

PART II – IRC BUILDING/ENERGY

1. Add new text as follows:

1102.4.2.1.1 Mechanical ventilation requirement. If a dwelling unit of a one- and two-family dwelling or multiple single-family dwelling (townhouse) not more than three stories in height is determined to have an infiltration rate of less than five air changes per hour (ACH) when tested in accordance with Section N1102.4.2.1, whole-house mechanical ventilation shall be provided in accordance with ASHRAE 62.2.

2. Add new standard to Chapter 6 as follows:

ANSI/ASHRAE

Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings

Reason: The purpose of this proposal is to provide modest levels of continuous mechanical ventilation in detached one- and two-family houses and low-rise townhouses in order to provide minimum levels of ventilation.

For health and safety reasons, minimum ventilation is necessary to provide acceptable indoor air quality. Modern homes are much tighter than the building stock and do not provide adequate ventilation through air leakage or infiltration. Occupants do not operating windows to provide minimum ventilation levels. Providing continuous mechanical ventilation is required to provide minimum ventilation rates in current construction.

Substantiation: Ventilation is used to control pollutant concentrations in buildings. These pollutants are emitted from building materials, consumer products, and from occupants themselves. Continuous mechanical ventilation reduces these large concentrations and reduces the large exposures for building occupants.

Because of the effects it has on health, comfort, and serviceability, indoor air quality in our homes is becoming of increasing concern to many people. According to the American Lung Association elements within our homes have been increasingly recognized as threats to our respiratory health. The Environmental Protection Agency lists poor indoor air quality as the forth-largest environmental threat to our country. Asthma is leading serious chronic illness of children in the U.S. Moisture-related construction defects and damage are on the increase in new houses. A 2007 California study revealed formaldehyde exposure in most new homes is beyond limits recommended by the California Air Resources Board. Minimum residential ventilation can improve many of these indoor air quality problems.

ASHRAE Standard 62.2-2007 is the only national consensus standard on residential ventilation rates. ASHRAE, the American Society of Heating, Refrigerating and Air-conditioning Engineers, has been setting minimum ventilation rates for buildings for over 100 years in order to provide acceptable indoor air quality. The rates in this proposal are the minimum rates as incorporated in the current version of Standard 62.2. As an ANSI standard, these rates represent the consensus of a balanced committee and have undergone extensive public review.

Sherman and Hodgson (2002) have shown that the rates in this proposal are barely sufficient to dilute the typical amount of formaldehyde emitted in typical new construction. The consensus of knowledgeable and balanced experts supports the ventilation rates in Standard 62.2-2007. As of the drafting of this proposal, several states have adopted similar ventilation requirements (e.g. MN, VT, WA, CA, ME). Of these, California and Maine have now adopted ASHRAE 62.2 by reference.

Price and Sherman (2006) have shown that occupants of new homes do not operate their windows and doors sufficiently to meet minimum ventilation requirements through controlled openings. While there are 20% of the population who would manage their windows effectively during mild periods, the vast majority of occupants keep their windows closed most of the time and do not get sufficient ventilation from window and door operation.

Sherman and Chan (2006) have reviewed air tightness data. New houses are substantially tighter than the existing stock and do not get enough ventilation through air infiltration and air leakage to meet minimum rates. Walker and Sherman (2006) have shown that the energy costs of meeting ASHRAE Standard 62.2 would be substantially higher for a house that was leaky enough to meet it through infiltration.

The reference to HVI 916 is provided to ensure that fans comply with industry standards for air flow verification. As a point of reference, MN state code 7672.1000 currently references HVI 916. HVI 916 is a consensus standard that is also referenced by Energy Star's Ventilation Fan Specification for measurement and verification of fan flow rates (note that NO on-site measurement or verification is required).

Bibliography: ASHRAE Standard 62.2-2007 *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings.* http://www.ashrae.org/technology/page/548

Price, P.N. and M.H. Sherman "Ventilation Behavior and Household Characteristics in New California Houses," April 2006. LBNL-59620 http://epb.lbl.gov/Publications/lbnl-59620.pdf

Sherman, M. H. and A.T. Hodgson. "Formaldehyde as a Basis for Residential Ventilation Rates", 2002. LBNL-49577. http://epb.lbl.gov/Publications/lbnl-49577.pdf

Walker, I. S. and M. H. Sherman "Evaluation of Existing Technologies for Meeting Residential Ventilation Requirements." 2006. LBNL-59998. http://epb.lbl.gov/Publications/lbnl-59998.pdf

Sherman, M.H., Chan W. R., "Building Airtightness: Research and Practice" in Building Ventilation: the state of the art, (Santamouris, Wouters, Eds) Earthscan ISBN-13: 978-1-84407-130-2 pp. 137-162, 2006, http://epb.lbl.gov/Publications/lbnl-53356.pdf

Offermann, F.J., et al., "Window usage, ventilation, and formaldehyde concentrations in new California homes: summer field sessions", in IAQ 2007, Healthy and Sustainable Buildings. 2007, American Society of Heating Refrigerating, and Air Conditioning Engineers, Inc.: Baltimore, MD. p. 497-526 (preprints); http://www.iee-sf.com/pdf/SummerFieldResults.pdf

Cost Impact: The code change proposal will increase the cost of construction modestly by requiring a mechanical fan system rated for continuous operation.

Analysis: A review of the standard(s) proposed for inclusion in the code, ANSI/ASHRAE 62.2-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FERGUSON-EC-4-402.4.2.1.1-CH 6-RE-1-N1102.4.2.1.1-CH 44

EC88–09/10
Table 402.4.2, Chapter 6

Proponent: Rob Pickett, Rob Pickett & Associates, LLC, representing Log Homes Council

1. Revise table as follows:

TABLE 402.4.2
AIR BARRIER AND INSULATION INSPECTION COMPONENT CRITERIA

COMPONENT	CRITERIA[a]

(No change to table contents)

a. Inspection of log structures shall be in accordance with the provisions of ICC-400-2007 IS LOG.

2. Add new standard to Chapter 6 as follows:

ICC
400-07 IS LOG Standard on the Design and Construction of Log Structures

Reason: The purpose of this change is to direct users of the code who are evaluating log structures to the ICC consensus standard pertaining to this unique and traditional construction method.

Log structures employ alternative methods of construction that are fully covered by ICC-400 IS-LOG *Standard for the Design and Construction of Log Structures.* ICC400-2007 is an ANSI-approved document that represents industry standards and guidelines for this form of construction. It gives the code official an important tool for inspection and understanding log construction, including thermal performance. Carefully written to cover all forms of log construction, the standard explains how to respond to design conditions, but it does not establish those conditions.

A major reason for this change is that field interpretations of the IECC requirements for log wall performance are often incorrect. ICC400-2007 addresses protection of air infiltration and vapor transfer in Section 305.1. In addition, log walls are designed to account for movement in the wall system per Section 304. These two sections combine to promote an effective air tight assembly as has been documented in many blower door tests and thermal imaging inspections. Since log walls offer an assembly that can be inspected at any stage of construction, the most crucial element of the inspection process is the assessment of settling as defined in ICC400-2007, Section 304.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ICC 400-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PICKETT-EC-3-T. 402.4.2

EC89–09/10

402.4.3, Chapter 6; IRC N1102.4.3

Proponent: Joseph Hill, RA, representing the New York State Department of State

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise as follows:

402.4.3 Fireplaces. ~~New wood-burning fireplaces shall have gasketed doors and outdoor combustion air.~~ Tight-fitting noncombustible gasketed fireplace doors to control infiltration losses shall be installed on the following fireplace openings:

1. Masonry fireplaces or fireplace units designed to allow an open burn.
2. Decorative appliances (ANSI Standard Z21.60 gas-log style unit) installed in vented solid fuel fireplaces.
3. Vented decorative gas fireplace appliances (ANSI Standard Z21.50 unit).

Fireplaces shall be provided with a source of combustion air as required by the fireplace construction provisions of the *International Residential Code, or* the *International Building Code*

2. Add new standards to Chapter 6 as follows:

ANSI

Z21.50−03	Vented Gas Fireplaces—with Addenda Z21.50a-2003
Z21.60−03	Decorative Gas Appliances for Installation in Solid Fuel Burning Fireplaces—with Addenda Z21.60a-2003

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1102.4.3 Fireplaces. ~~New wood-burning fireplaces shall have gasketed doors and outdoor combustion air.~~ Tight-fitting noncombustible gasketed fireplace doors to control infiltration losses shall be installed on the following fireplace openings:

1. Masonry fireplaces or fireplace units designed to allow an open burn.
2. Decorative appliances (ANSI Standard Z21.60 gas-log style unit) installed in vented solid fuel fireplaces.
3. Vented decorative gas fireplace appliances (ANSI Standard Z21.50 unit).

Fireplaces shall be provided with a source of combustion air as required by the fireplace construction provisions of Section R1006 of the *International Residential Code*.

Reason: For clarification and reference.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: ANSI Z21.50-03 and ANSI Z21.60-03 are currently referenced in the IRC.

PART I- IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART I- IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HILL-EC-5-402.4.3-RE-1-N1102.4.3

EC90–09/10
402.4.4; IRC N1102.4.4

Proponent: Jeff Burton, Director of Codes and Standards Association of Millwork Distributors, representing Association of Millwork Distributors

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

402.4.4 Fenestration air leakage. Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m^2), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m^2), when tested according to ~~NFRC400 or AAMA/WDMA/CSA101/I.S.2/A440~~ ASTM E283 by an accredited, independent laboratory, and listed and labeled by the manufacturer.

Exception: Site-built windows, skylights and doors.

PART II – IRC ENERGY

Revise as follows:

N1102.4.2 Fenestration air leakage. Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m^2), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m^2), when tested according to ~~NFRC400 or AAMA/WDMA/CSA101/I.S.2/A440~~ ASTM E283 by an accredited, independent laboratory, and listed and labeled by the manufacturer.

Exception: Site-built windows, skylights and doors.

Reason: This action would clarify the code by eliminating two standards and replacing with their referenced source air infiltration standard. Both the NFRC 400 and the AAMA/WDMA/CSA101.I.S.2/A440 reference the ASTM E283, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen as their method for testing air infiltration.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BURTON-EC-1-402.4.4-RE-1-N1102.4.2

EC91–09/10
402.4.4; IRC N1102.4.4

Proponent: Jeff Lowinski, Window and Door Manufacturers Association (WDMA)

THIS IS A 2 PART CODE CHANGE. PART WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

402.4.4 Fenestration air ~~leakage~~ infiltration. Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m2), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m2), when tested according to NFRC 400 or AAMA/WDMA/ CSA 101/I.S.2/A440 by an accredited, independent laboratory ~~and *listed*~~ and *labeled* by the manufacturer.

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1102.4.4 Fenestration air ~~leakage~~ infiltration. Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cubic foot per minute per square foot [1.5(L/s)/m^2], and ~~swinging~~ side-hinged doors no more than 0.5 cubic foot per minute per square foot [2.5(L/s)/m^2], when tested according to NFRC400 or AAMA/WDMA/CSA101/I.S.2/A440 by an accredited, independent laboratory, ~~and listed~~ and labeled by the manufacturer.

Reason (Part I): This proposal suggests several minor editorial revisions to make this language more consistent with other sections of the IECC. This proposal also resolves the issue that exterior fenestration are required to be labeled, but not listed, by other sections of the IECC. Exterior fenestration, for purposes of energy efficiency, is almost never listed. The exception is fire-rated exterior windows and doors which are listed for their fire rating.

Reason (Part II): This proposal suggests several minor editorial revisions to make this language more consistent with other sections of the IRC. This proposal also resolves the issue that exterior fenestration for residential applications are required to be labeled, but not listed, by other sections of the IRC. Exterior fenestration for residential applications is almost never listed. The exception may be fire-rated doors used between the attached garage and residential building.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Lowinski-RE-1-N1102.4.4-EC-402.4.4

EC92–09/10
402.4.5; IRC N1102.4.5

Proponent: Ronald Majette, representing US Department of Energy

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

402.4.5 Recessed lighting. Recessed luminaires installed in the *building thermal envelope* shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and labeled as having an air leakage rate not more than 2.0 cfm (0.944 L/s) ~~meeting ASTM E 283~~ when tested in accordance with ASTM E 283 at a 1.57 psf (75 Pa) pressure differential ~~with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity~~. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1102.4.5 Recessed lighting. Recessed luminaires installed in the *building thermal envelope* shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and labeled as having an air leakage rate not more than 2.0 cfm (0.944 L/s) ~~meeting ASTM E 283~~ when tested in accordance with ASTM E 283 at a 1.57 psf (75 Pa) pressure differential ~~with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity~~. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.

Reason: Clarification and consistency with other sections. It is appropriate to provide the criterion first and then the relevant test condition and reference standard. In addition it is not relevant to indicate where the air movement comes from or goes to as the issue of leakage rate is addressed in the standard. In addition the current text refers to sealing the housing and an interior wall yet the current text for testing refers only to ceiling cavity. This is inconsistent and is taken care of in the proposed text.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-80-402.4.5-IRC N1102.4.5

EC93–09/10
402.4.5, 502.4

Proponent: Ken Sagan, representing National Association of Home Builders (NAHB)

Revise as follows:

402.4.5 Recessed lighting. Recessed luminaires ~~installed in~~ that penetrate the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces, ~~All~~ and ~~recessed luminaires~~ shall be ~~IC-rated and~~ labeled as meeting ASTM E 283 when tested at 1.57 psi (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity. Recessed luminaires in contact with

insulation shall be listed and labeled as IC-rated. ~~All Recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.~~

502.4.8 Recessed lighting. Recessed luminaires ~~installed in~~ that penetrate the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces, ~~All~~ and ~~recessed luminaires~~ shall be ~~IC-rated and~~ labeled as meeting ASTM E 283 when tested at 1.57 psi (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity. Recessed luminaires in contact with insulation shall be listed and labeled as IC-rated. ~~All Recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.~~

Reason: As currently written, this provision requires an IC rated fixture, even in those interior ceilings and walls where insulation contact is not a consideration. If you look closely at the changes shown in the original proposal, the installation of recessed fixtures that "penetrate" the thermal envelope will need to comply with the stated requirements of ASTM E 283, only those recessed fixtures in contact with insulation will need to be IC rated. This is the same as is required by the NEC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SAGAN-EC-10-402.4.5-502.4

EC94–09/10
402.5

Proponent: Craig Conner, Building Quality, representing self; Vickie Lovell, InterCode Incorporated, representing the Association of Industrial Metallized Coaters and Laminators

Delete without substitution:

~~**402.5 Maximum fenestration *U*-factor and SHGC.** (Mandatory). The area-weighted average maximum fenestration *U*-factor permitted using trade-offs from Section 402.1.4 or Section 404 shall be 0.48 in zones 4 and 5 and 0.40 in zones 6 through 8 for vertical fenestration, and 0.75 in zones 4 through 8 for skylights. The area-weighted average maximum fenestration SHGC permitted using trade-offs from Section 404 in Zones 1 through 3 shall be 0.50.~~

Reason: (**Conner)** The limits on U-factor and SHGC trade-offs reduce flexibility without any compensating energy savings. This section was removed from the IRC so its removal from the IECC aligns the two codes. The statement of a limit on trade-offs is often confused with the actual requirement itself (in Table 402.1). The "area-weighted average" calculation in this section is a complication the code does not need.

Reason: (Lovell**)** Limits on fenestration U-factor and SHGC tradeoffs do not promote flexibility and place unfair restrictions on how code compliance can be achieved. Additionally, it causes confusion to designers, code officials and all other users of the code by over-complicating it. It creates a subset of prescriptive requirements in the performance path which is inappropriate and is not consistent with the intent of the performance objectives of the code. Perhaps most importantly, the restrictions on the UA trade-off approach do not save energy. These limitations have already been removed from the IRC and therefore, should be deleted from the IECC in order to maintain consistency, reduce confusion and improve and strengthen the code as it was originally intended.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CONNER-EC-3-Lovell-EC-2-402.5.DOC

EC95–09/10 (Number not used)

EC96–09/10
402.5; IRC N1102.3.6 (New)

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

402.5 Maximum fenestration U-factor and SHGC (Mandatory). The area-weighted average ~~maximum~~ ~~fenestration~~ U-factor permitted for fenestration products when complying with this code using trade offs under ~~from~~ Section 402.1.4 or Section 405 shall not exceed ~~be 0.48 in zones 4 and 5 and~~ 0.40 in zones ~~6~~ 4 through 8 for vertical fenestration, and 0.75 in zones 4 through 8 for skylights. The area-weighted average ~~maximum fenestration~~ SHGC permitted for fenestration products when complying with this code using trade-offs from Section 405 in Zones 1 through 3 shall not exceed ~~be~~ 0.45~~0~~.

PART II – IRC BUILDING/ENERGY

Add new text as follows:

N1102.3.6 Maximum fenestration U-factor and SHGC. The area-weighted average U-factor permitted for fenestration products when complying with this code using trade offs under Section N1102.1.3 or Section 405 of the IECC shall not exceed 0.40 in zones 4 through 8 for vertical fenestration, and 0.75 in zones 4 through 8 for skylights. The area-weighted average SHGC permitted for fenestration products when complying with this code using trade-offs from Section 405 in Zones 1 through 3 shall not exceed 0.45.

Reason: This proposal updates the fenestration U-factor and SHGC trade-off limits in the *IECC* to reflect the reductions in prescriptive U-factors and SHGCs in the *2009 IECC* and *IRC* and to ensure that effective, efficient glazing is being installed in all eight climate zones. The proposal also makes editorial changes to the language of this section to clarify the operation of the caps in response to criticisms from opponents to the caps in previous code cycles that the language was difficult to understand and/or confusing. Finally, it is proposed that this provision also be added to chapter 11 of the *IRC*, making the two codes consistent in this area.

Turning to the proposed changes in the requirements, this proposal replaces the 0.48 cap for climate zones 4-5 with the same 0.40 U-factor already applicable to zones 6-8. This change reflects the prescriptive U-factor changes last cycle, where a 0.35 U-factor is now the prescriptive requirement across all of these climate zones. Similarly, following the reduction in maximum SHGC in climate zones 1-3 from 0.40 in the *2006 IECC* to 0.30 SHGC in the *2009 IECC* and 0.35 in the *2009 IRC*, this proposal reduces the maximum value from 0.50 SHGC to 0.45 SHGC.

The fenestration trade-off limits currently found in Section 402.5 of the 2009 *IECC* are simple, mandatory measures that ensure all new homes contain high-quality, cost-effective windows that save energy, provide reasonable comfort, resist condensation in colder climates and block unwanted solar gain in warmer climates. Without the protection of Section 402.5, fenestration values could be traded away to levels unacceptable in modern building practice. Given the improvements to window efficiency brought about by the *2009 IECC* and the *2009 IRC* and our nation's high priority for energy efficiency, this proposal is a common-sense update to an effective code requirement.

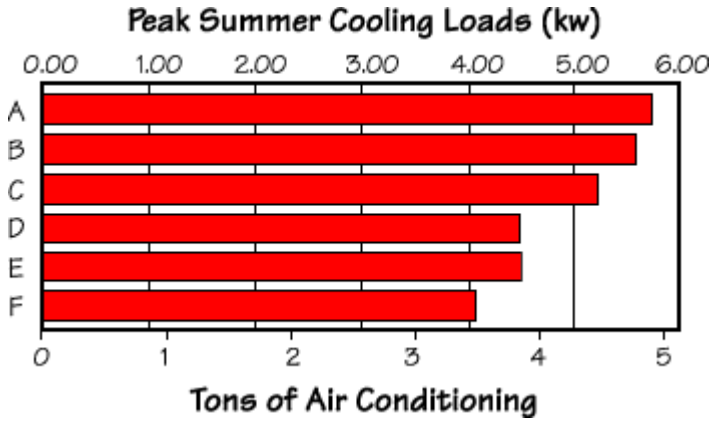
> **Compliance is simple.** The current fenestration maximums are effective and easy to understand. These requirements have been successfully applied for the past few years. All states that have already adopted the 2004, 2006, and 2009 *IECC* have adopted these maximums without amendment. They are also already seamlessly built into compliance software such as the Department of Energy's REScheck. Compliance could not be simpler.
>
> **The standard is flexible.** The area-weighted average approach embodied in Section 402.5 allows considerable flexibility for builders to install decorative glass, glass block, and other fenestration products, while maintaining a baseline performance for the home's overall glazing. In short, not all products are required to individually meet the maximum values; only the area-weighted average of all products in the home is required to meet the maximum values specified in this code provision. Thus, there is substantial room and flexibility for the builder to utilize products that are exceptions. For example, with the 0.45 proposed SHGC limit, up to half of the glass installed could be a 0.55 SHGC (perhaps for a passive solar application), so long as the remainder was at or below 0.35 (the weighted average would be 0.45). In short, the limits constitute a modest backstop that can be easily satisfied by most glazing products currently on the market in each climate zone. The codes currently employ a number of other mandatory measures (including mandatory maximum fenestration air leakage) to ensure that the minimum code house is reasonably constructed – *IECC* Section 402.5 is no different.
>
> **Maximums protect the consumer and the builder.** The maximums are a key safety net and provide important homeowner and builder protection against bad or impractical trade-offs.

Benefits of Section 402.5 Fenestration Maximums:

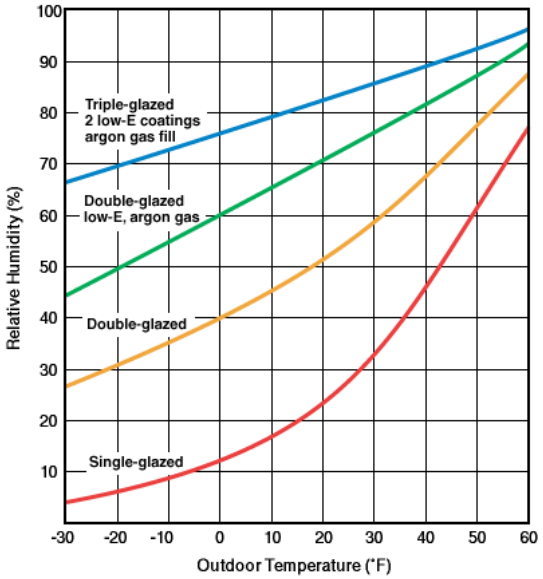
1. Quality Windows, Energy Savings and Peak Demand Savings Nationwide. The fenestration maximums encourage the use of cost-effective low-e windows nationwide. Efficient windows bring immediate cost savings to the builder who can downsize heating and cooling equipment, and bring long-term energy savings, greater comfort and reduced condensation for consumers. On a larger scale, because low-SHGC windows reduce energy consumption during the peak summer months in warmer climates, and low U-Factor windows reduce energy consumption during peak heating months in colder climates, high-quality windows can help reduce the strain on the electric grid and delay the need to build peak generation. They will also reduce the need for natural gas and help to reduce the amount of oil that is imported. Consumers also enjoy the reduced costs that come with economies of scale and market transformation. By avoiding extreme trade-offs of windows with resulting long-term detriment, fenestration maximums are a critical part of a well-functioning energy code.

The following chart, developed by the U.S. Department of Energy's Lawrence Berkley National Laboratory (LBNL), which is found on the Efficient Window Collaborative (EWC) website (www.efficientwindows.org), shows the potential for saving peak demand for different window types.

Window F is the low SHGC, low U-factor window that would satisfy the window maximums across the country (by contrast, window A is a single pane window). As is readily apparent, improved windows are crucial to lower peak cooling loads and smaller HVAC sizes (with lower costs).



2. Improved Condensation Resistance. Window condensation and the associated problems are a function of the window's U-factor, the indoor relative humidity, and the outside temperature. Glass with a lower U-factor maintains a higher room-side temperature, which means the glass can withstand lower exterior temperatures and more interior humidity without attracting condensation. Glass with a high U-factor will succumb to condensation much more easily. The following chart also provided by LBNL on the EWC website shows the condensation potential for different window types.

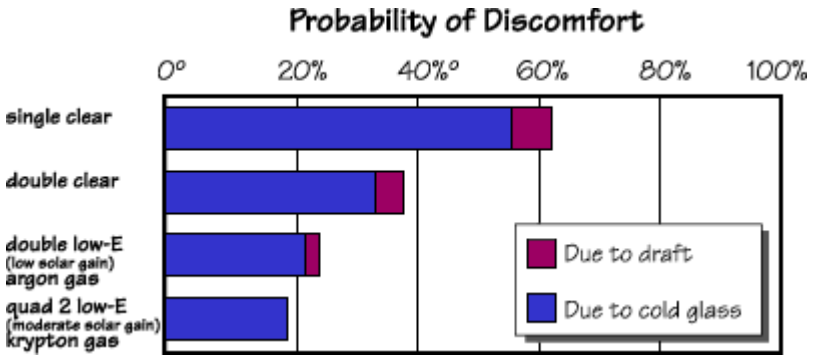


Note: Condensation occurs above the lines for each product type

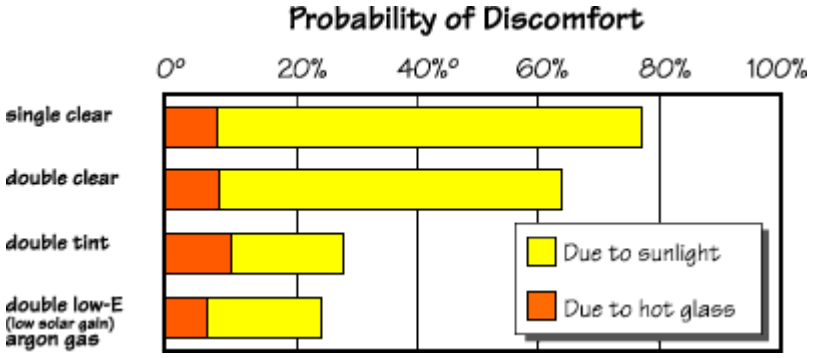
According to the chart, a typical double-glazed low-e window can withstand a 0 degree outdoor temperature and 60% relative humidity inside before condensation will begin to collect. By contrast, a regular double-glazed window can only withstand 40% humidity at the same outdoor temperature. In other words, a low-e window has a 50% more effective ability to resist condensation. A single-glazed *low-e* window is far worse – it can withstand less than 15% humidity at the same temperature – a virtual guarantee of damaging condensation. The fenestration maximums substantially reduce the likelihood of condensation in the colder months, enhancing durability and long-term benefits for the homeowner.

3. More Comfortable Homes and Less Energy Use. The energy code revolves around occupant comfort -- any perceived energy savings will be instantly lost if an occupant is uncomfortable and adjusts the thermostat. Incremental changes in window efficiency can have a disproportionate impact on occupant comfort because even the most efficient windows are, at best, still only the equivalent of an R-3 wall. Hot spots created by high solar gain in the summer and cold or drafty glass in the winter months can force an occupant to adjust the thermostat to compensate (which will increase cooling and heating bills at a time when natural gas costs about $1.20 per therm on the wholesale market and heating oil costs over $3.60 per gallon wholesale). The charts below, again produced by LBNL and displayed on the EWC website, show that occupant discomfort can double or triple, depending on the type of glass installed.

For example, the following chart shows the probability of discomfort during winter from poorer windows ranging from over 60% with single clear and almost 40% with double clear. This risk declines to almost 20% with a low-e window as specified by Section 402.5. This problem is due to the cold window -- at zero degrees outdoors, the single pane glass is less than 20 degrees on the inside surface, the double clear glass is slightly over 40 degrees, while the *low-e* glass is approaching 60 degrees. Obviously, the warmer the interior glass surface, the less likelihood of discomfort.



Similarly, the following chart shows the probability of discomfort during summer from sunlight and hot glass. The potential comfort problem from bad windows is even worse in the summer. The summertime probability of discomfort ranges from almost 80% with single clear and over 60% with double clear declining to almost 20% with windows as specified by Section 402.5.



In heating-dominated climates, a good low-e window will keep occupants more comfortable during the coldest months. In cooling-dominated climates, windows with low SHGC will protect against hot spots and occupant discomfort, and will make it less likely that occupants will need to adjust the thermostat and use more energy.

4. Conclusion. As shown above, the fenestration maximums serve an important role in ensuring residential energy efficiency. We recommend that the fenestration maximums in the *IECC* be updated to match the enhanced efficiency requirements in the 2009 *IECC* and also adopted for the *IRC*.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-20-402.5-N1102.3.6

EC97–09/10
402.5

Proponent: Ken Sagan, representing National Association of Home Builders (NAHB)

Delete without substitution:

~~**402.5 Maximum fenestration *U*-factor and SHGC. (Mandatory).** The area weighted average maximum fenestration *U*-factor permitted using tradeoffs from Section 402.1.4 or Section 404 shall be 0.48 in zones 4 and 5 and 0.40 in zones 6 through 8 for vertical fenestration, and 0.75 in zones 4 through 8 for skylights. The area weighted average maximum fenestration SHGC permitted using trade-offs from Section 404 in Zones 1 through 3 shall be 0.50.~~

Reason: Limits on fenestration U-factor and SHGC tradeoffs restrict ways by which code compliance can be achieved.

By definition, trade-offs are energy neutral, and do not save energy, so this section is not necessary. This requirement is difficult to explain and confuses most code users who often interpret it as another prescriptive code requirement comparable to the more stringent prescriptive U-factor in Tables 402.1.1 and 402.1.3. The code would be better if it relied only on the U-factor and SHGC requirements in the main table. As previously reported in the last code cycle, some common products, such as glass block and garden windows, never meet these "hard limits." In principle, a calculation or exemption would be required if more than a small area of these common products are used in new residences. Additions or renovations with significant areas of glass block or garden windows would be technically illegal.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SAGAN-EC-6-402.5

EC98–09/10

202, Chapter 6; IRC R202, Chapter 44

Proponent: Theresa Weston, PhD., representing DuPont Building Innovations

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise definition as follows:

AIR BARRIER. Material(s) assembled and joined together to provide a barrier to air leakage through the building envelope. An air barrier may be a single material or a combination of materials. Air barrier materials shall have an air permeance not to exceed 0.004 cfm/ft^2 under a pressure differential of 0.3 in. water (1.57psf) (0.02 L/s.m^2 @ 75 Pa) when tested in accordance with ASTM E 2178.

2. Add new standard to Chapter 6 as follows:

ASTM

E 2178-03	Standard Test Method for Air Permeance of Building Materials

PART II – IRC BUILDING/ENERGY

1. Revise definition as follows:

AIR BARRIER. Material(s) assembled and joined together to provide a barrier to air leakage through the building envelope. An air barrier may be a single material, or a combination of materials. Air barrier materials shall have an air permeance not to exceed 0.004 cfm/ft^2 under a pressure differential of 0.3 in. water (1.57psf) (0.02 L/s.m^2 @ 75 Pa) when tested in accordance with ASTM E 2178.

2. Add new standard to Chapter 44 as follows:

ASTM

E 2178-03	Standard Test Method for Air Permeance of Building Materials

Reason: Currently *air barriers* are defined but have no quantitative criteria. The proposed criteria for air barrier materials is used widely across the industry including in ICC-ES AC38 Acceptance Criteria for Water-Resistive Barriers and the Massachusetts State Energy Code (Section 1304.3.1) It originated from the air barrier material requirements of the Canadian Construction Materials Center (CCMC), which have been in effect since 1996.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: In the opinion of ICC staff, proposed referenced standard ASTM E 2178-03 complies with the standards policy given in Section 3.6 of CP28.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: WESTON-EC-1-202-RB-3-R202

EC99–09/10

202 (New), 403.5.1 (New), Table 403.5.1 (New), Chapter 6; IRC R202 (New), N1103.5.1 (New), Table N1103.5.1 (New), Chapter 44

Proponent: Mike Moore, Newport Ventures, representing Broan NuTone

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Add new definition as follows:

WHOLE HOUSE MECHANICAL VENTILATION SYSTEM. An exhaust system, supply system, or combination thereof that is designed to mechanically exchange indoor air with outdoor air for the purpose of diluting and removing indoor air contaminants. The system shall be designed to provide ventilation air continuously or through a programmed intermittent schedule to satisfy the ventilation rates required for the whole house. Local exhaust or supply fans are permitted to serve as such a system.

2. Add new text and table as follows:

403.5.1 Whole-house mechanical ventilation system fan efficacy. When installed to function as a whole house mechanical ventilation system, fans shall meet the efficacy requirements of Table 403.5.1.

Exception: Where whole-house mechanical ventilation fans are integral to tested and listed HVAC equipment, they shall be powered by an electronically commutated motor.

TABLE 403.5.1
WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM FAN EFFICACY

FAN LOCATION	AIR FLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY[A] (CFM/WATT)	AIR FLOW RATE MAXIMUM (CFM)
Range hoods	any	2.8 cfm/watt	any
In-line fan	any	2.8 cfm/watt	any
Bathroom, utility room	10	1.4 cfm/watt	<90
Bathroom, utility room	90	2.8 cfm/watt	any

a. When tested in accordance with HVI Standard 916

3. Add new standard to Chapter 6 as follows:

HVI Home Ventilating Institute
1000 North Rand Road
Suite 214
Wauconda, IL 60084

HVI
916-09 Airflow Test Procedure

PART II – IRC BUILDING/ENERGY

1. Add new definition as follows:

WHOLE HOUSE MECHANICAL VENTILATION SYSTEM. An exhaust system, supply system, or combination thereof that is designed to mechanically exchange indoor air with outdoor air for the purpose of diluting and removing indoor

air contaminants. The system shall be designed to provide ventilation air continuously or through a programmed intermittent schedule to satisfy the ventilation rates required for the whole house. Local exhaust or supply fans are permitted to serve as such a system.

2. Add new text and table as follows:

N1103.5.1 Whole-house mechanical ventilation system fan efficacy. Where installed to function as a whole house mechanical ventilation system, fans shall meet the efficacy requirements of Table N1103.5.1.

Exception: Where whole-house mechanical ventilation fans are integral to tested and listed HVAC equipment, they shall be powered by an electronically commutated motor.

TABLE N1103.5.1
WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM FAN EFFICACY

FAN LOCATION	AIR FLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY[a] (CFM/WATT)	AIR FLOW RATE MAXIMUM (CFM)
Range hoods	any	2.8 cfm/watt	any
In-line fan	any	2.8 cfm/watt	any
Bathroom, utility room	10	1.4 cfm/watt	<90
Bathroom, utility room	90	2.8 cfm/watt	any

a. When tested in accordance with HVI Standard 916

3. Add new standard to Chapter 44 as follows:

HVI Home Ventilating Institute
1000 North Rand Road
Suite 214
Wauconda, IL 60084

HVI
916-09 Airflow Test Procedure

Reason: Findings from a recent LBNL study commissioned by the U.S. Department of Energy and the California Energy Commission identified that energy consumption of whole-house mechanical ventilation systems is significant.[1] Furthermore, the study revealed that large disparities exist in the energy consumption and associated operating costs of whole-house mechanical ventilation systems in cold; mild; and hot, dry climates. Within the study, exhaust only systems, balanced heat recovery systems, supply only systems, and central fan integrated systems were all modeled to assess resultant energy use and associated costs. When ventilation, distribution, and conditioning energy were taken into account, it was revealed that ventilation energy consumption for whole-house mechanical ventilation systems was between 630 kWh and 4500 kWh beyond that of a non-mechanically vented base case. Based on the graphs provided by the study, energy and cost premiums above the base case are summarized below:

Temperate climate: 900 kWh – 2100 kWh; $70 - $190
Hot dry climate: 630 kWh – 3500 kWh; $60 - $425
Cold climate: 2100 kWh – 4500 kWh; $140 - $410

The most logical way to reduce the amount of energy consumed by residential mechanical ventilation systems is to address the power consumption of the fans that are powering the system. This is especially important when fans are being used as part of a whole-house ventilation system (as opposed to simply being used for bath exhaust, for example) because these fans will now operate many hours per day instead of a few minutes per day. This proposal offers energy efficacy levels for exhaust fans and also addresses the efficacy of central fans/blowers ONLY when these fans are used within a whole-house mechanical ventilation system, as defined. The efficacy levels proposed for exhaust fans are the same as current Energy Star ventilation fan specifications, so they are very familiar to manufacturers.[2] In fact, Energy Star lists over 400 fans in its database that currently meet these efficacy levels.

Because central fan/blower efficacies are not typically listed and labeled in Watts/cfm, the efficacy threshold for central fans/blowers is satisfied by the specification of an electronically commutated motor (ECM). ECMs for residential blowers are now offered by many manufacturers and have demonstrated over 70% reduction in annual fan energy use versus a permanent split capacitor motor when operated continuously.[3] Again, this requirement only exists if the central fan/blower is used within a whole-house mechanical ventilation system. Heating and energy recovery ventilators (HRVs and ERVs) are excluded from the fan efficacy requirements because these systems typically have efficiency advantages over central-fan integrated and exhaust only systems based on their heat recovery capabilities.

Besides saving energy, high efficacy fans can also have an excellent payback when operated in a whole-house ventilation system. For example, based on first and operational cost comparisons between two market-available fans (one baseline and one that meets the proposed high efficacy requirements provided), the estimated payback of a high efficacy fan is 1.2 years. Furthermore, baseline fans are typically not rated for continuous operation, and so they will likely need to be replaced more often than high efficacy fans, making the high efficacy fan that much more affordable. Results of the payback analysis are given in the table below.

Fan Type	Example Product	Exhaust Rate (cfm)	Initial Cost	Power Draw (Watts)	Annual Energy Consumed (kWh)	Annual Operational Cost ($)	Simple Payback (years)	Annual CO2 ***Savings*** (pounds)
High Efficacy Fan	Broan QTXE050	50	$103.13	33	289	$32.84	1.2	772
Baseline Fan	NuTone 696N	50	$22.90	99	867	$98.52	N/A	N/A

Key assumptions include: U.S. average electricity rate of $0.1136/kWh (source: 2008 U.S. DOE EIA), retail costs of bath fans (www.iaqsource.com), continuous operation (a likely condition if the fan is used for whole-house ventilation), 1.336 lbs CO2/kWh (source: U.S. DOE EIA).

The reference to HVI 916 is provided to ensure that fans comply with industry standards for air flow verification. As a point of reference, Minnesota state residential energy code 7672.1000 currently references HVI 916. HVI 916 is a consensus standard that is also referenced by Energy Star's Ventilation Fan Specification for measurement and verification of fan flow rates (note that NO on-site measurement or verification is required).

References:

1. Sherman, M. and Walker, I. 2007. "Energy Impact of Residential Ventilation Standards in California", LBNL 61282. Lawrence Berkeley National Laboratory, Berkeley, CA.
2. ENERGY STAR® Program Requirements for Residential Ventilating Fans, Partner Commitments. http://www.energystar.gov/ia/partners/product_specs/program_reqs/vent_fans_prog_req_v2.2.pdf.
3. "Effects of ECPM Furnace Motors on Electricity and Gas Use", Canada Mortgage and Housing Corporation, Technical Series 05-101, June 2005, https://www03.cmhc-schl.gc.ca/b2c/b2c/mimes/pdf/63818.pdf.
4. HVI 916 Airflow Test Procedure. http://www.hvi.org/assets/pdfs/HVI916_01March2009.pdf

Cost Impact: The code change proposal will not increase the cost of construction for a home that does not install a whole-house mechanical ventilation system. For those homes that install whole-house mechanical ventilation systems that would have otherwise installed a baseline fan, the cost of construction will increase. However, this cost is expected to be recovered by energy and cost savings.

Analysis: A review of the standard(s) proposed for inclusion in the code, HVI 916, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MOORE-EC-2-202-403-RE-1-R202-N1103

EC100–09/10

403.1, 403.1.3 (New); IRC N1103.1, N1103.1.3 (New)

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise as follows:

403.1 Controls (Mandatory). At least one thermostat shall be provided for each separate heating and cooling zone as defined by Section 403.1.3 ~~system~~.

2. Add new text as follows:

403.1.3 Heating and cooling zone. Each dwelling unit shall have at least one heating and cooling zone per story or per 1000 square feet of floor space, whichever requires fewer zones. Each zone shall have a separate return and supply. Each system shall be designed to operate within the equipment manufacturer's specifications. Each heating and cooling zone shall be served by:

1. An individual system or
2. An automatic air duct damper or automatic zone valve separately controlled by a thermostat for that zone for systems serving multiple zones. Each system serving multiple zones shall be capable of reducing or increasing the delivered air or water flow with a variable-speed fan or pump, and modulating the heating or cooling equipment output, based on a signal from the thermostat that the air duct damper or zone valve is being open of closed.

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

N1103.1 Controls. At least one thermostat shall be installed for each separate heating and cooling zone as defined by section N1103.1.3 ~~system~~.

2. Add new text as follows:

N1103.1.3 Heating and cooling zone. Each dwelling unit shall have at least one heating and cooling zone per story or per 1000 square feet of floor space, whichever requires fewer zones. Each zone shall have a separate return and supply. Each system shall be designed to operate within the equipment manufacturer's specifications. Each heating and cooling zone shall be served by:

1. An individual system or
2. An automatic air duct damper or automatic zone valve separately controlled by a thermostat for that zone for systems serving multiple zones. Each system serving multiple zones shall be capable of reducing or increasing the delivered air or water flow with a variable-speed fan or pump, and modulating the heating or cooling equipment output, based on a signal from the thermostat that the air duct damper or zone valve is being open of closed.

Reason: Significant energy can be wasted in buildings that have single zone conditioning. The www.energysavers.gov website from the DOE states that "zone heating can produce energy savings of more than 20% compared to heating both occupied and unoccupied areas of your house." This proposal sets a requirement to have separate HVAC zone control for homes that have combinations of floor area and building height that makes them susceptible to inefficient space conditioning.

Number of Stories:
Due to the fact that hot air rises and cool air settles to the lowest floor, conditioning multiple stories as one zoned space creates a large temperature difference between the hottest and coldest space in the home. This leads to overcooling some areas in summer and overheating some areas in winter. Zoning reduces the excess energy consumption that can result from single zoning by supplying heating or cooling to each zone on a separately-controlled basis.

Floor Area:
As homes get larger in floor area, controlling space temperatures across extensive area even on the same level becomes increasingly harder. Walls facing different directions experience solar loads that vary throughout the day and year, while other spaces experience differing internal heat gains throughout the day or year. Under such conditions, one space conditioning zone control simply cannot keep all spaces in the house comfortable without wasting energy. This proposal reduces such energy waste by requiring one zone per 1000 square feet of floor area of a given story.

Direct from www.toolbase.org:

> An HVAC "smart" zoning control system divides the home into two or three zones, with a thermostat in each zone. It works with single-stage gas, oil, heat pump or electric HVAC equipment or internally staged, multi-stage equipment. The control system includes automatic dampers that fit into the ducts and a control panel that allows for the feedback of information between the programmable thermostat, indoor climate and damper position. The drive damper actuator assembly does not use wear- and friction-producing gears for damper control. Instead, a synthetic cord transfers the motor rotation to the lever arm. Flexible-link or air-driven dampers are considered more reliable than typical gear-driven dampers for controlling HVAC system zone output. Mechanical, electric, digital, or programmable thermostats by other manufacturers or by RP can be used. It is cost-effective to install when the HVAC system is being replaced, or in new construction. Manufacturers claim that proper installation can result in 10 to 20% energy savings from thermostat setbacks that prevent over-conditioning zones. Comfort is more readily achieved in each zone, and additional, targeted thermostats are more convenient to control than those at a single location.

DOE Reference: www.energysavers.gov/your_home/space_heating_cooling/index.cfm/mytopic=12520

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: PRINDLE-EC-22-403.1-N1103.1

EC101–09/10

202 (New), 403.1.1, Table 403.1.1 (New); IRC R202 (New), N1103.1.1, Table N1103.1.1 (New)

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Add new definition as follows:

HEAT PUMP RECOVERY. A feature of a programmable thermostat that allows the heat pump to recover gradually from an energy-saving set point temperature to a comfort set point temperature. The heat pump recovery feature is designed to minimize the use of auxiliary heat while also minimizing the on-time of the system. This feature must prevent auxiliary or supplementary heat pump operation when the heat pump can meet the heating load.

2. Revise as follows:

403.1.1 Programmable thermostat. Where the primary heating system is a forced air furnace or forced air split system heat pump, packaged unit heat pump, water boiler, or steam boiler, at least one thermostat per dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain zone temperatures down to 55ºF (13ºC) or up to 85ºF (29ºC). The thermostat shall initially be programmed with a default heating and cooling temperature set points as detailed in Table 403.1.1 ~~no higher than 70ºF (21ºC) and a cooling temperature set point no lower than 78ºF (26ºC)~~. Programmable thermostat models installed for heat pump systems shall be equipped with a heat pump recovery system.

3. Add new table as follows:

TABLE 403.1.1
PROGRAMMABLE THERMOSTAT SET POINT TIMES & TEMPERATURES

SETTING TIME	SET POINT TEMPERATURE (HEAT)	SET POINT TEMPERATURE (COOL)
Wake: 6:00 a.m.	≤ 70° F	≥ 78° F
Day: 8:00 a.m.	Setback at least 8° F	Setup at least 7° F
Evening: 6:00 p.m.	≤ 70° F	≥ 78° F
Sleep: 10:00 p.m.	Setback at least 8° F	Setup at least 4° F

PART II – IRC BUILDING/ENERGY

1. Add new definition as follows:

HEAT PUMP RECOVERY. A feature of a programmable thermostat that allows the heat pump to recover gradually from an energy-saving set point temperature to a comfort set point temperature. The heat pump recovery feature is

designed to minimize the use of auxiliary heat while also minimizing the on-time of the system. This feature must prevent auxiliary or supplementary heat pump operation when the heat pump can meet the heating load.

2. Revise as follows:

N1103.1.1 Programmable thermostat. Where the primary heating system is a forced air furnace or forced air split system heat pump, packaged unit heat pump, water boiler, or steam boiler, at least one thermostat per dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain zone temperatures down to 55ºF (13ºC) or up to 85ºF (29ºC). The thermostat shall initially be programmed with a default heating and cooling temperature set points as detailed in Table N1103.1.1 ~~no higher than 70ºF (21ºC) and a cooling temperature set point no lower than 78ºF (26ºC)~~. Programmable thermostat models installed for heat pump systems shall be equipped with a heat pump recovery system.

3. Add new table as follows:

TABLE N1103.1.1
PROGRAMMABLE THERMOSTAT SET POINT TIMES & TEMPERATURES

SETTING TIME	SET POINT TEMPERATURE (HEAT)	SET POINT TEMPERATURE (COOL)
Wake: 6:00 a.m.	≤ 70° F	≥ 78° F
Day: 8:00 a.m.	Setback at least 8° F	Setup at least 7° F
Evening: 6:00 p.m.	≤ 70° F	≥ 78° F
Sleep: 10:00 p.m.	Setback at least 8° F	Setup at least 4° F

Reason: During the 2009 code cycle, the requirement for a programmable thermostat in homes with forced air furnaces was approved. This code proposal attempts to bring all equipment types that can utilize programmable thermostats into the same requirement for increased internal consistency in the code.

The language for Heat Pump Recovery is based on ENERGY STAR definition at the following website: http://www.energystar.gov/ia/partners/product_specs/eligibility/thermostats_elig.pdf and on the provisions of section IECC 503.2.4.1.1.

As noted in the ENERGY STAR document, heat pump recovery is a feature of a programmable thermostat that allows the heat pump to recover gradually from an energy-saving setpoint temperature to a comfort set-point temperature. The heat pump recovery feature is designed to minimize the use of auxiliary heat while also minimizing the on-time of the system.

The proposed change to the default heating temperature setpoints, set out in the new table is to encourage users to use the HVAC equipment at a lower setting to save energy. These default temperature setpoints, originally from the ENERGY STAR thermostat program, are consistent with commercially available product default settings today.

ENERGY STAR source: http://www.energystar.gov/index.cfm?c=thermostats.pr_thermostats

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-21-202-403.1.1-R202-N1103.1.1

EC102–09/10

Table 402.1.3, Table 405.5.2(1); IRC Table N1102.1.2

Proponent: Ronald Majette, representing US Department of Energy

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC CODE COMMITTEE AND PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

TABLE 402.1.3
EQUIVALENT U-FACTORS[a]

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Floor U-Factor	Basement Wall U-Factor[d]	Crawl Space Wall U-Factor[d]
1	1.20	0.75	0.035	0.082	0.197	0.064	~~0.360~~ 0.948	~~0.477~~ 0.948
2	0.65	0.75	0.035	0.082	0.165	0.064	~~0.360~~ 0.948	~~0.477~~ 0.948
3	0.50	0.65	0.035	0.082	0.141	0.047	~~0.091~~ 0.154[c]	~~0.136~~ 0.154
4 except Marine	0.40	0.60	0.030	0.082	0.141	0.047	~~0.059~~ 0.084	~~0.065~~ 0.084
5 and Marine 4	0.35	0.60	0.030	0.060	0.082	0.037	~~0.059~~ 0.084	~~0.065~~ 0.084
6	0.35	0.60	0.026	0.060	0.060	0.033	~~0.050~~ 0.059	~~0.065~~ 0.084
7 and 8	0.35	0.60	0.026	0.057	0.057	0.028	~~0.050~~ 0.059	~~0.065~~ 0.084

a. Nonfenestration U-factors shall be obtained from measurement, calculation or an approved source.
b. When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in zone 1, 0.14 in zone 2, 0.12 in zone 3, 0.10 in zone 4 except Marine, and the same as the frame wall U-factor in Marine zone 4 and zones 5 through 8.
c. Basement wall U-factor of ~~0.360~~ 0.948 in warm-humid locations as defined by Figure 301.1 and Table 301.2.
d. Foundation U-factor requirements include wall construction and interior air films but exclude soil conductivity and exterior air films. U-factors for determining code compliance in accordance with Section 402.1.4 (total UA alternative) or Section 405 (Simulated Performance Alternative) shall be modified to include soil conductivity and exterior air films.

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

Building Component	Standard Reference Design	Proposed Design
Foundations	Type: same as proposed foundation wall Area above and below grade: 2 ft. or same as proposed, whichever is less	As proposed As proposed

(Portions of table and footnotes not shown remain unchanged)

PART II – IRC BUILDING/ENERGY

Revise as follows:

TABLE N1102.1.2
EQUIVALENT U-FACTORS[a]

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Floor U-Factor	Basement Wall U-Factor[d]	Crawl Space Wall U-Factor[d]
1	1.20	0.75	0.035	0.082	0.197	0.064	~~0.360~~ 0.948	~~0.477~~ 0.948
2	0.65	0.75	0.035	0.082	0.165	0.064	~~0.360~~ 0.948	~~0.477~~ 0.948
3	0.50	0.65	0.035	0.082	0.141	0.047	~~0.091~~ 0.154[c]	~~0.136~~ 0.154
4 except Marine	0.40	0.60	0.030	0.082	0.141	0.047	~~0.059~~ 0.084	~~0.065~~ 0.084
5 and Marine 4	0.35	0.60	0.030	0.060	0.082	0.037	~~0.059~~ 0.084	~~0.065~~ 0.084
6	0.35	0.60	0.026	0.060	0.060	0.033	~~0~~.059 0.084	~~0.065~~ 0.084
7 and 8	0.35	0.60	0.026	0.057	0.057	0.033	~~0.059~~ 0.084	~~0.065~~ 0.084

a. Nonfenestration U-factors shall be obtained from measurement, calculation or an approved source.
b. When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in zone 1, 0.14 in zone 2, 0.12 in zone 3, 0.10 in zone 4 except Marine, and the same as the frame wall U-factor in Marine zone 4 and zones 5 through 8.
c. Basement wall U-factor of ~~0.360~~ 0.948 in warm-humid locations as defined by Figure N1101.2 and Table N1101.2.
d. Foundation U-factor requirements include wall construction and interior air films but exclude soil conductivity and exterior air films. U-factors for determining code compliance in accordance with Section N1102.1.3 (total UA alternative) shall be modified to include soil conductivity and exterior air films.

Reason: The purpose of this code change is to remove the ground (earth) conductance from the U-factor requirements in the IECC and Chapter 11 of the IRC. The ground is not an inherent characteristic of the building and is therefore an unnecessary and confusing element to include as part of

the code's U-factor requirements. Additionally, the code gives no information about how the ground conductance effect is to be accounted for in the U-factor requirements and it is therefore difficult for code users (including code compliance software developers) to correctly and consistently match their calculations to the code requirements.

The proposed U-factors include only the foundation structure and insulation elements. They are based on the assumption of solid concrete foundation walls with an R-value of 0.375 for an assumed 6 inches of concrete. Where R-13 cavity or R-10 continuous insulation is required, the U-factor proposed here is based on the assumption of a finished framed wall with R-13 cavity insulation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-71-T. 403.1.3-IRC T. N1102.1.2

EC103–09/10

403.2.1, 403.2.2, 403.2.3; IRC N1103.2.1, N1103.2.2, N1103.2.3

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

403.2.1 Insulation (Prescriptive). Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.

Exception: Where all ~~D~~ducts ~~or portions thereof~~ are located completely within *conditioned space* ~~inside the building thermal envelope~~, supply ducts shall be insulated to a minimum of R-4.

403.2.2 Sealing (Mandatory). All ducts, air handlers, and filter boxes~~, and building cavities used as ducts~~ shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the *International Residential Code* or Section 603.9 of the *International Mechanical Code,* as applicable.

Duct tightness shall be verified by a test performed by a party *approved* by the *code official* after construction is completed. Where required by the code official, testing shall be conducted by an approved party independent from the builder and the installer of the ducts. ~~either of the following:~~ A written report specifying the results of the test and attesting to the accuracy of the results shall be signed by the party conducting the testing and provided to the builder and the *code official*.

1. ~~Post-construction test: L~~ As tested, total duct l~~L~~eakage ~~to outdoors~~ shall be less than ~~or equal to 8 cfm (226.5 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* or a total leakage less than~~ or equal to 6 ~~12~~ cfm (226.5~~12~~ L/min) per 100 square feet (9.29 m^2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.
2. ~~Rough-in test: Total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the roughed-in system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm (113.3 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*.~~

Exceptions~~:~~ ~~Duct tightness test is not required if~~ Where the air handler and all ducts are located within conditioned space, total duct leakage shall not exceed 12 cfm per 100 square feet of conditioned floor area when tested as specified above.

403.2.3 Building cavities (Mandatory). Building framing cavities shall not be used as ~~supply~~ ducts.

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1103.2.1 Insulation. Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.

Exception: Where all ducts ~~or portions thereof~~ are located completely within *conditioned space* ~~inside the building thermal envelope~~, supply ducts shall be insulated to a minimum of R-4.

N1103.2.2 Sealing. All ducts, air handlers, and filter boxes~~, and building cavities used as ducts~~ shall be sealed. Joints and seams shall comply with Section M1601.4 of the *International Residential Code.*

Duct tightness shall be verified by a test performed by a party *approved* by the *building official* after construction is completed. Where required by the building official, testing shall be conducted by an approved party independent from the builder and the installer of the ducts. ~~either of the following:~~ A written report specifying the results of the test and attesting to the accuracy of the results shall be signed by the party conducting the testing and provided to the builder and the *building official*.

1. ~~Post-construction test: L~~ As tested, total duct l~~L~~eakage ~~to outdoors~~ shall be less than ~~or equal to 8 cfm (3.78 L/S) per 100 ft^2 (9.29 m^2) of conditioned floor area or a total leakage less than~~ or equal to 6 ~~12~~ cfm (226.5 L/min ~~5.66 L/S~~) per 100 square feet (9.29 m^2) of *conditioned floor area* when tested at a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler ~~end closure~~ enclosure. All register boots shall be taped or otherwise sealed during the test.
2. ~~Rough-in test: Total leakage shall be less than or equal to 6 cfm (2.83 L/S) per 100 ft^2 (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm (1.89 L/S) per 100 ft$_2$ (9.29 m^2) of conditioned floor area.~~

Exceptions: ~~Duct tightness test is not required if~~ Where the air handler and all ducts are located within conditioned space, total duct leakage shall not exceed 12 cfm per 100 square feet of conditioned floor area when tested as specified above.

N1103.2.3 Building cavities. Building framing cavities shall not be used as ~~supply~~ ducts.

Reason: This proposal is intended to substantially improve the code's current duct insulation, sealing and testing requirements. It is well-recognized that properly designed, constructed, insulated and sealed ducts are crucial for an energy efficient home and occupant comfort. Among other items, this proposal:

Reduces allowed total duct leakage by 50% in homes where ducts are not located in conditioned space;
Requires a less stringent duct tightness test for ducts in conditioned space to ensure that conditioned air is delivered to its intended destination;
Requires R-4 duct insulation when ducts are located in the conditioned space to address condensation and house durability issues;
Eliminates the use of building framing cavities as ducts;
Establishes requirements for a written test report, to increase and simplify enforceability and accountability;
Creates the ability for the code official to require an independent party to conduct the test;
Simplifies and makes consistent testing requirements by reducing the four possible tests to a single post-construction test of total duct leakage;
Requires final testing of the ducts when construction is complete to ensure that the home owner is receiving a home that meets the intent of the code.

Field experience with duct sealing shows that these reduced leakage rates are attainable with today's technology and practice. It also shows that duct leakage, even when ducts are in conditioned spaces, can induce energy losses. For example, a leaky duct that does not supply sufficient airflow to a given space can create negative pressure in that space, inducing air filtration that would not otherwise occur. Such a condition would also reduce comfort, and could cause occupants to adjust thermostat settings, increasing energy use for the whole zone or house.

These changes are relatively simple and yet add significant energy savings potential and improved enforcement. The estimated savings as shown in the table below are savings from this proposal in addition to the requirements in the 2009 IECC, which first established a requirement for testing or locating the ducts in conditioned space in the code. The additional cost for achieving the tested values in this proposal are minimal compared to energy savings.

	Climate Zone 1	Climate Zone 2	Climate Zone 3	Climate Zone 4	Climate Zone 4M	Climate Zone 5	Climate Zone 6	Climate Zone 7	Climate Zone 8
Heating, Cooling, Hot Water Purchased Energy Cost Percent Savings	2.8%	2.7%	2.5%	2.6%	2.6%	2.7%	2.9%	2.7%	2.5%
Total Purchased Energy Cost Percent Savings (also including major appliances and lighting)	2.0%	1.9%	1.8%	1.9%	2.0%	2.0%	2.3%	2.1%	2.0%

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-23-403.2.1-N1103.2.1

EC104–09/10

403.2.2, Chapter 6; IRC N1103.2.2, Chapter 44

Proponent: Craig Conner, Building Quality, representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Add new text as follows:

403.2.2 Sealed air handler. Air handlers shall have a manufacturer's designation for an air leakage of no more than 2 percent of the design air flow rate when tested accordance with ASHRAE 193.

2. Add new standard to Chapter 6 as follows:

ASHRAE 193 Method of Test for Determining the Air Leakage Rate for HVAC Equipment

PART II – IRC ENERGY

1. Add new text as follows:

N1103.2.2 Sealed air handler. Air handlers shall have a manufacturer's designation for an air leakage of no more than 2 percent of the design air flow rate when tested accordance with ASHRAE 193.

2. Add new standard to Chapter 44 as follows:

ASHRAE 193 Method of Test for Determining the Air Leakage Rate for HVAC Equipment

Reason: The requirement to "seal" the air handler is already in the IECC/IRC. Because the air inside the handler is under high pressure, even small leaks cause considerable air loss. The manufacturer sealing and testing the air handler in the factory is very cost-effective.

A manufacturer's designation (label) that the air handler is sealed simplifies compliance. Inspection becomes the simple act of verifying that the manufacturer designation is on the air handler. Most manufacturers are already testing at least some of their air handlers for air tightness.

The ASHRAE 193 standard provides the test for the air handler. ASHRAE 193 is expected to be completed before the end of this code cycle. If the ASHRAE 193 standard is not completed before the final action hearing then the reference to that standard cannot be put into the energy code.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASHRAE 193, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CONNER-EC-11-403.2.2 - N1103.2.2.DOC

EC105–09/10
403.2.2, 402.2.3, 403.6, Chapter 6

Proponent: Wesley R. Davis, Air Conditioning Contractors of America

1. Revise as follows:

403.2.2 Sealing (~~Mandatory~~ Prescriptive). All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the *International Residential Code*.

403.2.3 Sealing (Mandatory). Duct tightness shall be verified ~~by either of the following:~~ in accordance with ACCA 5 QI.

~~1. Postconstruction test: Leakage to outdoors shall be less than or equal to 8 cfm (226.5 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft2 (9.29 m^2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.~~

~~2. Rough-in test: Total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 ft2 (9.29 m2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm (113.3 L/min) per 100 ft2 (9.29 m2) of *conditioned floor area*.~~

~~**Exception:** Duct tightness test is not required if the air handler and all ducts are located within *conditioned space*.~~

~~**403.6 Equipment sizing (Mandatory).** Heating and cooling equipment shall be sized in accordance with Section M1401.3 of the *International Residential Code*.~~

403.6 HVAC equipment performance. Equipment shall meet the minimum requirements of ACCA 5 – QI when measured in accordance with the standard's acceptable procedures.

2. Add new standard to Chapter 6 as follows:

ACCA
ANSI/ACCA QI – 2007 HVAC Quality Installation Specifications

Reason: An HVAC system is comprised of equipment, ducts and components, How they interact determines the amount of energy they will use to deliver the desired comfort level. Referencing the ANSI/ACCA QI-2007 (HVAC Quality Installation Specification) will address each element of an HVAC system installation corporately rather than individually.

The ANSI/ACCA 5 QI specification was developed by a coalition of HVAC industry stakeholders to establish the minimum performance requirements, approved test procedures and required documentation to ensure proper HVAC system design and installation. Adoption of this standard will simplify the code and point to one, unified, free (www.acca.org/quality) reference for HVAC system installation. For example, the ACCA 5 QI provides the following requirements for duct leakage tolerances (to replace Section 403.2.2) and equipment sizing (to replace Section 403.6):

COMPARISON OF REQUIREMENTS IN IECC 2009 TO ANSI/ACCA 5-QI		
HVAC system installation element	IECC 2009	ANSI/ACCA 5 – QI
Duct leakage	4, 6, 8 or 12 cfm/100 sq. ft. (depending on the application)	4 cfm/100 sq. ft.
Equipment sizing	ACCA Manual J and Manual S	ACCA Manual J and Manual S

The standard, a level of performance that, if satisfactorily achieved, serves as an indicator that sound industry practices were likely used. It is available for free download.

Promotion of high HVAC equipment efficiency ratings, tight ducts and equipment selection are meaningless if the HVAC "system" is improperly designed or installed. The ANSI/ACCA 5 QI has been implemented by HVAC contractors across America. It is also the source document for a US EPA EnergyStar program to ensure their EnergyStar rated HVAC appliances are properly installed.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: Analysis: A review of the standard(s) proposed for inclusion in the code, ANSI/ACCA QI-2007, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: DAVIS-EC1-403.2.2.DOC

EC106–09/10
403.2.2 (New), Chapter 6; IRC N1103.2.2.1 (New), Chapter 44

Proponent: Ronald Majette, representing US Department of Energy

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Add new text as follows:

403.2.2.1 Sealed air handler. Air handlers shall have a manufacturer's designation for an air leakage of no more than 2 percent of the design air flow rate when tested accordance with ASHRAE 193.

2. Add new standard to Chapter 6 as follows:

ASHRAE
193 Method of Text for Determining the Air Leakage Rate for HVAC Equipment

PART II – IRC Energy

1. Add new text as follows:

N1103.2.2.1 Sealed air handler. Air handlers shall have a manufacturer's designation for an air leakage of no more than 2 percent of the design air flow rate when tested accordance with ASHRAE 193.

2. Add new standard to Chapter 44 as follows:

ASHRAE
193 Method of Text for Determining the Air Leakage Rate for HVAC Equipment

Reason: The proposed addition above addresses the issue of air handler tightness. Currently air handlers and other portions of the duct system are to be sealed. Duct tightness is verified by one of two tests. The proposed text adds a recognized test procedure and leakage metric for air handlers, which are technically not a part of the duct but are part of the duct system. Energy conservation measures in the air conditioning industry have driven the manufacturers of systems and components to establish compliance with leakage limits in ducts and air-handling units. The standards set by American Society of Heating Refrigerating and Air-conditioning Engineers (ASHRAE) form the basis for testing. Establishing an air handler leakage rate, given the availability of a uniform test procedure is prudent as any leakage in the air-handling units contributes to wastage of energy. The magnitude of leakage has a direct bearing on energy use and indoor air quality (IAQ).

Cost Impact: The code change proposal will increase the cost of construction to the degree that air handlers not currently meeting this criterion will now have to meet this criterion.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASHRAE 193, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-61-403.2.2.1-N1103.2.2.1

EC107–09/10
403.2.2; IRC N1103.2.2

Proponent: Ronald Majette, US Department of Energy

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IECC

Revise as follows:

403.2.2 Sealing (Mandatory). All ducts, air handlers, and filter boxes ~~and building cavities used as ducts~~ shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the *International Residential Code*.

Duct tightness shall be verified by either of the following:

1. Postconstruction test: Total leakage ~~to outdoors~~ shall be less than or equal to ~~8~~ 6 cfm (~~226.5~~ 113.3 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* ~~or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*~~ when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.
2. Rough-in test: Total leakage shall be less than or equal to ~~6~~ 4 cfm (~~169.9~~ 113.3 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the ~~roughed in~~ system, including the manufacturer's air handler enclosure. All register ~~boot~~s shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to ~~4~~ 3 cfm (~~113.3~~ 85.0 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*.

   Exceptions: Duct tightness test is not required if the air handler and all ducts are located within *conditioned space*.

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1103.2.2 Sealing (Mandatory). All ducts, air handlers, and filter boxes ~~and building cavities used as ducts~~ shall be sealed. Joints and seams shall comply with Section M1601.4. Duct tightness shall be verified by either of the following:

1. Postconstruction test: Total leakage ~~to outdoors~~ shall be less than or equal to ~~8~~ 6 cfm (~~226.5~~ 113.3 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* ~~or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*~~ when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.
2. Rough-in test: Total leakage shall be less than or equal to ~~6~~ 4 cfm (~~169.9~~ 113.3 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the ~~roughed in~~ system, including the manufacturer's air handler enclosure. All register ~~boot~~s shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to ~~4~~ 3 cfm (~~113.3~~ 85.0 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*.

   Exceptions: Duct tightness test is not required if the air handler and all ducts are located within *conditioned space*.

Reason: The purpose of this proposal is to substantially reduce duct leakage rates. Requirements related to testing of duct leakages were approved in the 07/08 code cycle. While testing of ducts was widely supported, many felt that the allowable leakage rates were excessively loose. For example, the 2009 IECC allows 288 cubic feet per minute of total leakage in a 2400 ft^2 house. This permits a block of air larger than 6 feet tall, 6 feet wide, and 6 feet long to leak out of the ducts every single minute at the test pressure level. This proposal significantly reduces the allowable leakage rate. This proposal limits the leakage test to total leakage (including leaks to both the inside and outside of the building), eliminating the alternative of measuring leakage to outdoors. Limiting the test to total leakage simplifies the code and gives a clearer indication of how well sealed the ducts are.

Cost Impact: The code change proposal may slightly increase the cost of construction by requiring more attention to detail when sealing ducts.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-73-403.2.2-IRC N1103.2.2

EC108–09/10
403.2.2, 403.6, 405.6.1, Table 404.5.2(1), Chapter 6

Proponent: Donald J. Vigneau, AIA, Northeast Energy Efficiency Partnerships, Inc.

1. Revise as follows:

403.2.2 Sealing (Mandatory). All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with ~~Section M1601.4.1 of the *International Residential Code*~~ ACCA Manual J. Duct tightness shall be verified by either of the following:

1. Post construction test: Leakage to outdoors shall be less than or equal to 8 cfm (226.5 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.
2. Rough-in test: Total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 ft2 (9.29 m2) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm (113.3 L/min) per 100 ft^2 (9.29 m^2) of *conditioned floor area*.

   Exceptions: Duct tightness test is not required if the air handler and all ducts are located within *conditioned space*.

403.6 Equipment sizing. Heating and cooling equipment shall be sized in accordance with ACCA Manual J-02. ~~M1401.3 of the *International Residential Code*~~.

405.6.1 Minimum capabilities. Calculation procedures used to comply with this section shall be software tools capable of calculating the annual energy consumption of all building elements that differ between the *standard reference design* and the *proposed design* and shall include the following capabilities:

1. Computer generation of the *standard reference design* using only the input for the *proposed design*. The calculation procedure shall not allow the user to directly modify the building component characteristics of the *standard reference design*.
2. Calculation of whole-building (as a single *zone*) sizing for the heating and cooling equipment in the *standard reference design* residence in accordance with ~~Section M1401.3 of the *International Residential Code*~~ ACCA Manual J.
3. Calculations that account for the effects of indoor and outdoor temperatures and part-load ratios on the performance of heating, ventilating and air-conditioning equipment based on climate and equipment sizing.
4. Printed *code official* inspection checklist listing each of the *proposed design* component characteristics from Table 405.5.2(1) determined by the analysis to provide compliance, along with their respective performance ratings (e.g., *R*-value, *U*-factor, SHGC, HSPF, AFUE, SEER, EF, etc.).

TABLE 404.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Heating systems[g, h]	As proposed Capacity: sized in accordance with ~~Section M1401.3 of the *International Residential Code*~~ ACCA Manual J	As proposed
Cooling systems[g, i]	As proposed Capacity: sized in accordance with ~~Section M1401.3 of the *International Residential Code*~~ ACCA Manual J	As proposed

(Portions of table and footnotes not shown remain unchanged)

2. Add new standards organization and standard to Chapter 6 as follows:

ACCA Air Conditioning Contractors of America
2800 Shirlington Road, Suite 300
Arlington, VA 22206

ACCA
Manual J-02 Residential Load Calculations Eighth Edition

Reason: The International Residential Code is a stand-alone code with its own references, covering R-4 and limited R-3 occupancies. It was designed to be adopted without reference to any other I-Codes, since it may be the only code allowed by law for adoption in certain jurisdictions (other codes adopted by different jurisdictions, such as state or county).
Therefore, references to specific provisions within the IRC should be limited to the IRC wherever possible.
References to specific code provisions should be found within the integrated I-Codes, should reference those document sources and not reference the IRC. The document is already approved for adoption in the International Residential Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ACCA, Manual J-02, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: VIGNEAU-EC-2-403.2.2

EC109–09/10
403.2.3; IRC N1103.2.3

Proponent: Ronald Majette, representing US Department of Energy

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

403.2.3 Building cavities. Building framing cavities shall not be used as ~~supply~~ ducts or plenums.

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1103.2.3 Building cavities. Building framing cavities shall not be used as ~~supply~~ ducts or plenums.

Reason: It is difficult to effectively use building framing cavities within the building envelope due to insulation requirements for the ducts and the thermal envelope and the difficulty in sealing them against air leakage. This is the basis for the current requirement in the code for supply ducts. Other than a lower temperature in return ducts their negative pressure in relation to the outside environment can and will draw unconditioned air into the HVAC system, increasing loads on the HVAC equipment and inducing building infiltration/exfiltration unless the cavities can be effectively

sealed. Just as cavities are not allowed for supply due in part to the difficulty in sealing they should also be precluded from being used as part of the return air duct system.

Cost Impact: The code change proposal may increase or decrease the cost of construction depending on the builder's choices with regard to duct system design, construction and location compared to previous expenses involved with framing, enclosing, and sealing building cavities as part of the duct system.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-75-403.2.3-IRC N1103.2.3-REDONE

EC110-09/10
403.3.1(New)

Proponent: Howard Ahern Plumberex, representing self

Add new text as follows:

403.3.1 Protection of piping insulation. Piping insulation exposed to weather shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind by means including, aluminum, sheet metal, painted canvas, or plastic cover or other protection suitable for outdoor service. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material. Adhesives tape shall not be permitted.

Reason: Outdoor piping insulation needs to be protected from weather, physical damage or from UV deterioration. Pipe insulation in outdoor locations is typically protected by an aluminum or sheet metal jacket, painted canvas, plastic cover, or coating that is water retardant and UV resistant.

All AC units require periodic maintenance. The frequency varies with how hard the unit operates, exterior temperature, preventive maintenance program, and many others. In every occasion, every maintenance provides an excuse for the Freon line insulation to be touched and removed. Adhesives Tape is not permitted as it will limit maintenance and damage insulations permeability characteristics..Removal of tape damages the integrity of the original insulation into pieces, specially, if the insulation has reached thermo set state. Protection can also keep silted pipe insulation from commonly separating thus saving additional energy cost. This simple common sense proposal is cost-effective as it will save energy and will prolong insulation life reducing replacement.

This proposal will save residential building energy cost following the same initiative being taken by the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) to improve energy efficiency levels by 30% in the **ASHRAE 90.1 2007 Section 6.4.4.1.1** commercial building standards. It also reflects the energy efficiency improvement approved by Congress American Recovery and Reinvestment Act of 2009 (ARRA).

ASHRAE 90.1 2007 Section 6.4.4.1.1:
Piping Insulation exposed to weather shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind but not limited to the following

A. Piping Insulation exposed to weather shall be suitable for outdoor service e.g., protected by aluminum, sheet metal, painted canvas, or plastic cover. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: AHERN-EC-1-403.3.1

EC111–09/10
403.4, 403.4 (New), 504.5, 505 (New), Section 505 (New), 505.1 (New)

Proponent: Gregory A. Farmer, PE, ASPE Legislative Committee, ASPE

1. Revise as follows:

403.4 Circulating hot water systems (Mandatory). All circulating service hot water piping shall be externally insulated with material having a thermal resistance rating ~~to at least~~ of not less than R-~~2~~ 4. Circulating hot water systems shall include an automatic or readily *accessible* manual switch that can turn off the hot-water circulating pump when the system is not in use.

2. Add new text as follows:

403.4 Potable water piping insulation (Mandatory). Hot and tempered water main distribution pipes and the branches from such pipes for a developed length of ten branch pipe diameters from the main distribution pipes shall be externally insulated. Cold water pipes located in spaces where conditions could cause condensation to form on the exterior of the pipes shall be externally insulated. The pipe insulation required by this section shall have a thermal resistance rating of not less than R-4.

(Renumber subsequent sections)

3. Revise as follows:

504.5 Pipe insulation. For automatic-circulating hot water systems, piping shall be externally insulated with a material having a thermal resistance rating of not less than R-4. ~~with 1 inch (25 mm) of insulation having a conductivity not exceeding 0.27 Btu per inch/h × ft^2 × °F (1.53 W per 25 mm/m^2 × K).~~ The first 8 feet (2438 mm) of piping in noncirculating systems served by equipment without integral heat traps shall be externally insulated. ~~with 0.5 inch (12.7 mm) of material having a conductivity not exceeding 0.27 Btu per inch/h × ft^2 × °F (1.53 W per 25 mm/m^2 × K)~~. Hot and tempered water main distribution pipes and the branches from such pipes for a developed length of ten branch pipe diameters from the main distribution pipes shall be externally insulated. The pipe insulation required by this section shall have a thermal resistance rating of not less than R-4.

4. Add new text as follows:

SECTION 505
COLD WATER PIPING
(Mandatory)

505.1 Cold water piping condensation control. Cold water pipes located in spaces where conditions could cause condensation to form on the exterior of the pipes shall be externally insulated. The pipe insulation shall have a thermal resistance rating of not less than R-4.

(Renumber subsequent sections)

Reason: Hot water piping losses considerable amounts of heat and wastes energy. Insulation of hot and tempered water piping will reduce energy costs and more than pay for the initial cost of insulation. However, non-circulated branches loss the heat energy regardless of the insulation, therefore it is not necessary to insulate non circulated branch piping, except where they will affect the heat loss in the adjacent circulated main. It is generally accepted in other industries that the temperature decay in non-circulated branch piping from the system temperature to ambient is ten pipe diameters of the branch. Insulation applied to cold water piping will eliminate damage to ceilings and significantly reduce pipe system corrosion due to condensation.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	D

ICCFILENAME: FARMER-EC1-403.4

EC112–09/10

202 (New), 403.4, 403.4.1, 403.4.2 (New), Table 403.4.2; IRC R202 (New), N1103.4, N1103.4.1, N1103.4.2 (New), Table N1103.4.2 (New)

Proponents: Ronald Majette, US Department of Energy; Craig Conner, Building Quality

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE AND PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Add new definition as follows:

DEMAND RECIRCULATION WATER SYSTEM. A water distribution system where pump(s) prime the service hot water piping with heated water upon demand for hot water.

2. Revise as follows:

403.4 Service hot water systems. Energy conservation measures for service hot water systems shall be in accordance with Sections 403.4.1 and 403.4.2.

403.4.1 Circulating hot water systems (Mandatory). ~~All circulating service hot water piping shall be insulated to at least R-2.~~ Circulating hot water systems shall ~~include~~ be provided with an automatic or readily *accessible* manual switch that can turn off the hot water circulating pump when not in use.

3. Add new text and table as follows:

403.4.2 Hot water pipe insulation (Prescriptive). Insulation for hot water pipe with a minimum thermal resistance (R-value) of at least R-3 shall be applied to the following:

1. Piping larger than 3/4 in. nominal diameter
2. Piping serving more than one dwelling unit
3. Piping from the water heater to kitchen outlets
4. Piping located outside the conditioned space
5. Piping from the water heater to a distribution manifold
6. Piping located under a floor slab
7. Buried piping
8. Supply and return piping in recirculation systems other than demand recirculation systems
9. Piping with run lengths greater than the maximum run lengths for the nominal pipe diameter given in Table 403.4.2.

TABLE 403.4.2
MAXIMUM RUN LENGTH (feet)[a]

Nominal Pipe Diameter of Largest Diameter Pipe in the Run (in.)	3/8	1/2	3/4	> 3/4
Maximum Run Length	30	20	10	5

a. Total length of all piping from the distribution manifold or the recirculation loop to a point of use.

PART II – IRC BUILDING/ENERGY

1. Add new definition as follows:

DEMAND RECIRCULATION WATER SYSTEM. A water distribution system where pump(s) prime the service hot water piping with heated water upon demand for hot water.

2. Revise as follows:

N1103.4 ~~Service~~ Hot water service systems. Energy conservation measures for hot water service systems shall be in accordance with Sections 403.4.1 and 403.4.2.

N1103.4.1 Circulating hot water systems (Mandatory). ~~All circulating service hot water piping shall be insulated to at least R-2.~~ Circulating hot water systems shall ~~include~~ be provided with an automatic or readily *accessible* manual switch that can turn off the hot water circulating pump when not in use.

3. Add new text and table as follows:

N1103.4.2 Hot water pipe insulation (Prescriptive). Insulation for hot water pipe with a minimum thermal resistance (R-value) of at least R-3 shall be applied to the following:

1. Piping larger than 3/4 in. nominal diameter
2. Piping serving more than one dwelling unit
3. Piping from the water heater to kitchen outlets
4. Piping located outside the conditioned space
5. Piping from the water heater to a distribution manifold
6. Piping located under a floor slab
7. Buried piping
8. Supply and return piping in recirculation systems other than demand recirculation systems
9. Piping with run lengths greater than the maximum run lengths for the nominal pipe diameter given in Table 403.4.2.

TABLE N1103.4.2
MAXIMUM RUN LENGTH (feet)[a]

Nominal Pipe Diameter of Largest Diameter Pipe in the Run (in.)	3/8	1/2	3/4	> 3/4
Maximum Run Length	30	20	10	5

a. Total length of all piping from the distribution manifold or the recirculation loop to a point of use.

Reason:
(Majette)- The purpose of this code change is to add pipe insulation requirements for domestic hot water. The IECC and IRC have minimal requirements for energy efficiency related to water heating. The proposed pipe insulation requirements represent a modest initial investment that will save energy for decade after decade. The proposed requirements are structured to allow "short and skinny" pipe runs as an alternative to pipe insulation in many cases. Either way, these requirements help save water and help limit the energy wasted when the faucet is turned off and the pipes are left full of hot water.
(Conner)- There are two parts to this proposal: insulation of hot water piping and reducing the volume of water in the hot water piping from the source of hot water to the outlets. Both parts are deemed essential because hot water piping is intended to be a long-lived subsystem of the building, lasting 50 years or more before it will be replaced and because much of the piping is not easily accessible to make modifications during this long period of time.

1. Insulation of hot water piping reduces the waste of energy, water and time during the delivery, use and cool-down phases of a hot water event. During the delivery phase, when the piping runs in unconditioned spaces, in a slab, when it is buried or when the flow rate is very low (less than 1 gpm) pipe insulation significantly reduces the heat loss and helps to ensure that hot enough water gets to the outlets. Getting the hot water to the outlets hotter, also gets it there quicker. During the use phase, the insulation keeps the water hotter by reducing the temperature drop from the source of hot water to the outlet. This saves energy by making it possible to reduce the storage temperature: every 1F reduction in storage temperature reduces standby heat losses by almost 2%. During the cool-down phase, pipe insulation increases the time it takes for the temperature of the water to cool down, roughly doubling the cool-down time for ½ inch nominal pipe and tripling it for ¾ inch nominal pipe. This saves energy, water and time for all those hot water events that are clustered between 10 and 45 minutes apart: think morning rush hour (getting ready for work and school) and evening plateau (coming home from school and work, preparing, eating and cleaning up from dinner and getting ready for bed), and of course lunch when people are home during the day.
2. Reducing the volume between the source of hot water and the outlet also saves energy, water and time. Volume is a combination of length and diameter. Less volume between the source and the outlet means less cost in hot and cold water piping and, if the floor plan is done well, in the drain lines too. In many homes today, little if any consideration is given to the layout of hot water outlets, resulting in very long waits for hot water (over 1 minute and more than 2 gallons are wasted) at the fixtures furthest from the water heater, which are often the master bathroom and the kitchen, the two most-used hot water locations in a home. Reducing the volume saves water and time during the delivery phase of a hot water event because less not-hot water needs to be cleared out when hot water is desired at the outlet. It saves energy during the use phase because for a given pipe diameter and flow rate, there is less temperature drop over a shorter distance. And during the cool-down phase, it saves energy because there is a smaller volume that that will lose its heat when the temperature of the water in the pipe cools down.

References:
Klein, Gary, "Hot Water Distribution Research," The Official Magazine, September-October 2006, pages 39-44.
Klein, Gary, "Designing 'Green' Hot Water Distribution Systems," PM Engineer, July 2008, pages 16-24.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

CCFILENAME: MAJETTE-EC-82-CONNER-EC-13-202-403.4-IRC R202-N1103.4-REDONE

EC113–09/10

403.4 (New), 403.4.1 (New), 403.4.2 (New), 403.4.3, 403.4.4 (New)

Proponents: Edward R. Osann, Potomac Resources, Inc.; Gary Klein, Affiliated International Management, LLC, Representing Alliance for Water Efficiency

1. Add new text as follows:

403.4 Service hot water piping (Mandatory). Service hot water piping shall be installed in accordance with Sections 403.4.1 through 403.4.4.

403.4.1 Pipe insulation. Service hot water piping installed below ground or in a mass floor or *mass wall* in contact with the ground shall be insulated to at least R-3.

403.4.2 Insulation protection. Insulated service hot water piping installed below ground shall be placed within a waterproof channel or conduit.

Exceptions:

1. Where pipe insulation is warranted as waterproof in underground applications in damp soil when installed according to the manufacturer's instructions.
2. Where pipe insulation is warranted as maintaining a value of R-3 in underground applications in damp soil when installed according to the manufacturer's instructions.

2. Revise as follows:

~~403.4~~ 403.4.3 Circulating hot water systems ~~(Mandatory)~~. All circulating service hot water piping shall be insulated to at least R-2. Circulating hot water systems shall include an automatic or readily *accessible* manual switch that can turn off the hot-water circulating pump when the system is not in use.

3. Add new text as follows:

403.4.4 Accommodation of pipe insulation. All hot water supply pipe to be insulated shall be strapped or affixed such that insulation is continuous. Building cavities shall be large enough to accommodate the combined diameter of the pipe plus the insulation, plus any other objects in the cavity that the piping must cross.

Reason: Roughly 1/3 of residential indoor per capita water consumption has been found to be attributable to faucets, showers, and baths – applications where warm to hot water is desirable, if not essential.[1] Hot water use represents 15 to 30% of total residential energy bills.[2] It is common practice for residents to draw water from hot water fittings without use until the hot water reaches the desired temperature. Such wait times have the effect of wasting energy and water while reducing consumer satisfaction. This proposal is needed to reduce this common waste of energy and water in residential buildings, and is most practical to achieve in new construction.

Insulation of hot water piping reduces the waste of energy, water, and time during the delivery, use, and cool-down phases of a hot water event. During the delivery phase, when the piping runs in unconditioned spaces, in a slab, when it is buried, or when the flow rate is very low (less than 1 gpm), pipe insulation significantly reduces the heat loss and helps to ensure that hot enough water gets to the outlets. Getting the hot water to the outlets hotter also gets it there quicker. During the use phase, the insulation keeps the water hotter by reducing the temperature drop from the source of hot water to the outlet. This saves energy by making it possible to reduce the storage temperature: every 1 degree F reduction in storage temperature reduces standby heat losses by almost 2%. During the cool-down phase, pipe insulation increases the time it takes for the temperature of the water to cool down, roughly doubling the cool-down time for ½ inch nominal pipe and tripling it for ¾ inch nominal pipe. This saves energy, water, and time for all those hot water events that are clustered between 10 and 45 minutes apart. These include morning "rush hour" (getting ready

for work and school) and evening plateau (coming home from school and work, preparing, eating, and cleaning up from supper, and getting ready for bed), and of course lunch when people are home during the day.[3 4]

Hot water service pipe insulation is particularly important when piping is installed in a mass floor or wall or is buried. Uninsulated pipe buried in damp conditions loses heat at 4 to nearly 9 times the rate of uninsulated pipes in room temperature air. Adding insulation to buried pipe in damp conditions reduces heat loss by about 90%.[5] Due to the inaccessibility of buried pipe once installed, care must be taken to prevent or slow the degradation of insulation value over time in damp soil conditions.

[1]Mayer, et al, *Residential End Uses of Water*, AWWA Research Foundation, 1999, p. 107.
[2]Klein, Gary, "Greening the Plumbing in Your Home and Business", slide 15 in a presentation made to classes sponsored by Pacific Gas and Electric Company and Southern California Gas Company in 2008 and 2009, Affiliated International Management, LLC.
[3]Klein, Gary, "Hot Water Distribution Research," *Official* Magazine, Sept-Oct 2006, pages 39-44.
[4]Klein, Gary, "Designing 'Green' Hot Water Distribution Systems," *PM Engineer*, July 2008, pages 16-24.
[5]Hiller, Carl, "Hot Water Distribution System Piping Heat Loss Factors, Both In-Air and Buried – Phase II Test Results," paper presented to ASHRAE Annual Meeting, Salt Lake City, June 22, 2008.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: OSANN-EC-1-403.4

EC114–09/10

403.4 (New), 403.4.1 (New), 403.4.2 (New), 403.4.3 (New); IRC N1103.4 (New), N1103.4.1 (New), N1103.4.2 (New), N1103.4.3 (New)

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Add new text as follows:

403.4 Service water heating (Mandatory). Service hot water piping shall be installed in accordance with Sections 403.4.1 through 403.4.3.

403.4.1 Pipe length and Insulation. Service hot water piping shall be no more than a total of 60 linear feet of pipe length to all fixtures being served by one service water heating unit. All service hot water piping shall be insulated to at least R-3 for pipes sized 1 inch in diameter or less and R-4 for pipes larger than 1 inch in diameter for the distance between the service water heating equipment to within 5 feet of each fixture connected to the hot water pipe. In addition, the first 5 feet of hot and cold water pipes from the storage tank for non-recirculating service water heating systems shall be insulated to at least R-3 for pipes sized 1 inch in diameter or less and R-4 for pipes larger than 1 inch in diameter.

Exception: Hot water distribution systems that supply hot water from one of the following sources (this exception does not apply to portions of hot water distribution systems located below ground or in a mass floor or mass wall in contact with the ground):

1. Condensing gas service water heating equipment,
2. Solar thermal water heating equipment that is designed to provide more than 50 percent of annual hot water requirements from solar heated water,
3. Heat pump electric service water heating equipment,
4. Tankless demand service gas water heating equipment, or
5. Tankless demand service electric heating equipment, where either:
   - 5.1. Heated water is provided through piping that is insulated to R-3 or
   - 5.2. There is no more than a total of 15 linear feet of pipe length to all fixtures being served by each unit.

2. Revise as follows:

403.4.2 ~~403.4~~ Circulating hot water systems ~~(Mandatory)~~. All circulating service hot water piping shall be insulated to at least R-3~~2~~ for pipes sized 1 inch in diameter or less and R-4 for pipes larger than 1 inch in diameter. Circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not in use.

3. Add new text as follows:

403.4.3 Heat traps. Water heating equipment not supplied with integral heat traps and serving non-circulating systems shall be provided with heat traps on the supply and discharge piping associated with the equipment.

PART II – IRC BUILDING/ENERGY

1. Add new text as follows:

N1103.4 Service water heating. Service hot water piping shall be installed in accordance with Sections 403.4.1 through 403.4.3.

N1103.4.1 Pipe length and Insulation. Service hot water piping shall be no more than a total of 60 linear feet of pipe length to all fixtures being served by one service water heating unit. All service hot water piping shall be insulated to at least R-3 for pipes sized 1 inch in diameter or less and R-4 for pipes larger than 1 inch in diameter for the distance between the service water heating equipment to within 5 feet of each fixture connected to the hot water pipe. In addition, the first 5 feet of hot and cold water pipes from the storage tank for non-recirculating service water heating systems shall be insulated to at least R-3 for pipes sized 1 inch in diameter or less and R-4 for pipes larger than 1 inch in diameter.

Exception: Hot water distribution systems that supply hot water from one of the following sources (this exception does not apply to portions of hot water distribution systems located below ground or in a mass floor or mass wall in contact with the ground):

1. Condensing gas service water heating equipment,
2. Solar thermal water heating equipment that is designed to provide more than 50 percent of annual hot water requirements from solar heated water,
3. Heat pump electric service water heating equipment,
4. Tankless demand service gas water heating equipment, or
5. Tankless demand service electric heating equipment, where either:
   - 5.1. Heated water is provided through piping that is insulated to R-3 or
   - 5.2. There is no more than a total of 15 linear feet of pipe length to all fixtures being served by each unit.

2. Revise as follows:

N1103.4.2 ~~N1103.4~~ Circulating hot water systems. All circulating service hot water piping shall be insulated to at least ~~R-~~2 R-3 for pipes sized 1 inch in diameter or less and R-4 for pipes larger than 1 inch in diameter. Circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not in use.

3. Add new text as follows:

N1103.4.3 Heat traps. Water heating equipment not supplied with integral heat traps and serving non-circulating systems shall be provided with heat traps on the supply and discharge piping associated with the equipment.

Reason: Water heating energy is becoming a large percentage of the overall energy use in homes due to significant improvements that have occurred to heating, cooling and lighting energy efficiency. This proposal is intended to improve hot water efficiency by requiring improvement of either the efficiency of the hot water distribution system or the water heating equipment (due to issues with federal NAECA preemption, the code cannot require an improved hot water heater, but can permit such an improvement as an exception to an alternative requirement not involving improved equipment).

The efficiency of the hot water distribution system is based on the pipe length, pipe diameter and pipe insulation. This proposal requires increased insulation as the pipe diameter increases in all homes. The proposal also requires system zoning if the distribution pipe from one system exceeds 60 linear feet. Assuming an average of 30 linear feet per 1000 SF of conditioned floor area for a typical hot water distribution system, this second requirement will promote more efficient distribution design in larger homes.

This proposal also allows high performance water heating equipment to be installed as an exception in lieu of improving the hot water distribution. The improvement in water heating equipment has a significant impact on the overall energy used for hot water in a home. The following table from ACEEE shows estimated annual energy use by equipment type, with the bold equipment selected for the exceptions.

Water Heater Type	**Efficiency (EF)**	**Yearly Energy Cost**
Conventional gas storage	0.60	$350
High-efficiency gas storage	0.65	$323
Condensing gas storage	**0.80**	**$262**
Demand gas (no pilot)	**0.82**	**$228**
Conventional oil-fired storage	0.55	$654
Minimum Efficiency electric storage	0.90	$463
High-eff. electric storage	0.95	$439
Electric heat pump water heater	**2.20**	**$190**
Solar with electric back-up	**1.20**	**$175**

source: http://www.aceee.org/consumerguide/waterheating.htm

Electric tankless demand water heating, while not analyzed by ACEEE in the study above, is also included due to increased EF ratings compared to electric storage as an exception with an additional requirement for insulation or the length of pipe serviced by the equipment. This additional requirement is meant to limit the electric demand impact and also improve the distribution efficiency for improved system performance. Literature shows that electric tankless heaters have very high efficiency ratings (around 0.98 and 0.99) and have opportunity to save significant energy when coupled with reduced distribution losses.

The US DOE (http://www.energysavers.gov/your_home/water_heating/index.cfm/mytopic=13060) states that "insulating your hot water pipes reduces heat loss and can raise water temperature 2ºF–4ºF hotter than uninsulated pipes can deliver, allowing for a lower water temperature setting". This is the main reason for having a strong focus on improving the hot water distribution which will allow for reduced energy use on the overall hot water system. The DOE also recommends insulation of all accessible hot water pipes, with the most important being within 3 feet of the water heater.

In addition to the insulation language, this proposal also adds language that requires a heat trap for systems that are not supplied with a heat trap. This language is exactly based on section 504.4 of the IECC and is being included to ensure that more energy is not lost from the hot water equipment to the piping based on the recommendation from the DOE:
http://www.energysavers.gov/your_home/water_heating/index.cfm/mytopic=13100

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-24-403.4-N1103.4

EC115–09/10
403.4; IRC N1103.4

Proponent: Michael Resetar, Armacell LLC; Roger Schmidt, K-Flex USA; Shawn Dunahue, Nomaco Insulation

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

403.4 Circulating hot water systems. All circulating service hot water piping shall be insulated to at least ~~R-2~~ R-4. Circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not in use.

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1103.4 Circulating hot water systems. All circulating service hot water piping shall be insulated to at least ~~R-2~~ R-4. Circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not in use.

Reason: Shifting from an R-2 requirement to an R-4 insulation requirement helps achieve 29.4% gain in performance efficiency. Focusing on all hot water piping will not only target energy efficiency but also help reduce water waste by maintaining a temperature above 105°F longer between uses. (Supporting Documents Attached)

Past History:

IECC 2000:
Had Table 504.5

SERVICE WATER HEATING TEMPERATURES °F.	PIPE SIZES[a]			
	Noncirculating runouts	Circulating mains and runouts		
	Up to 1²	Up to 1.25²	1.5² to 2²	Over 2²
170-180	0.5	1.0	1.5	2.0
140-160	0.5	0.5	1.0	1.5
100-130	0.5	0.5	0.5	1.0

For SI: 1 inch = 25.4 mm, °C. = [(°F.)-32]/1.8,
1 Btu per inch/h × ft.2 × °F. = 0.144 W/(m × K).
a Nominal iron pipe size and insulation thickness. Conductivity, *k* @ 0.27

IECC 2003:
Had Table 504.5

SERVICE WATER-HEATING TEMPERATURES (°F)	PIPE SIZES[a]			
	Noncirculating runouts	Circulating mains and runouts		
	Up to 1"	Up to 1.25"	1.5" to 2"	Over 2"
170 -180	½	1	1½	2
140 -169	½	½	1	1½
100 -139	½	½	½	1

For SI: 1 inch = 25.4 mm, °C = [(°F)-32]/1.8,
1 Btuh/inch · ft2 · °F = 0.144 W/(m · K).
a. Nominal iron pipe size and insulation thickness. Conductivity, *k* = 0.27.

IECC 2006:
Removed Table 504.5 and created Section 403 for SYSTEMS (Mandatory)
Moved all insulation to R-2
R-2 on Flat Surface calculation is equal a thickness of ½"
R-2 on Radial Surface calculation is equal a thickness of 3/8"

IRC 2007/2008:
All insulation stayed at R-2
R-2 on Flat Surface calculation is equal a thickness of ½"
R-2 on Radial Surface calculation is equal a thickness of 3/8"

IRC 2009/2010: (Proposal)
Increase all insulation to R-4
R-4 on Flat Surface calculation is equal a thickness of 1"
R-4 on Radial Surface calculation is equal a thickness of ¾"

TARGET:
30% Conservation Savings Achieved shifting from R-2 to R-4

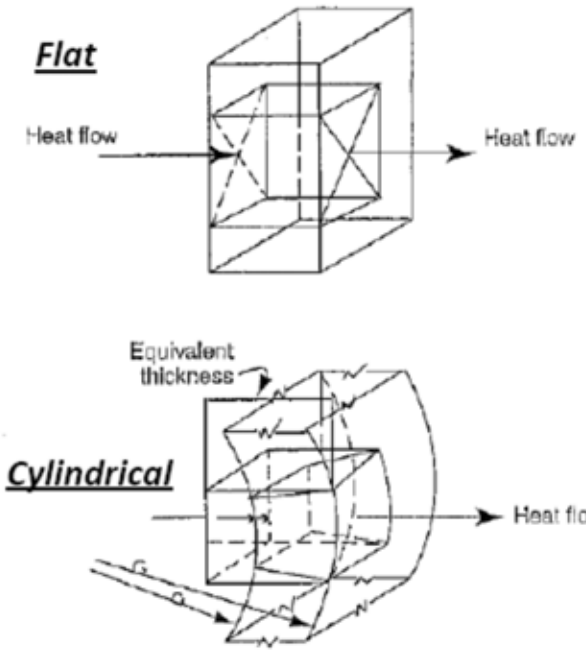
Conditional Information	Summer Performance		Winter Performance	
	R-2	R-3	R-2	R-3
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.36	0.49	0.36	0.49
Heat Flow of Pipe (Btu/(lin ft-h)	5.9	5.1	11.0	9.5
Btu savings	0.8		1.5	
Saving in %	13.6%		13.6%	

Conditional Information	Summer Performance		Winter Performance	
	R-3	R-4	R-3	R-4
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.49	0.76	0.49	0.76
Heat Flow of Pipe (Btu/(lin ft-h)	5.1	4.2	9.5	7.7
Btu savings	0.9		1.8	
Saving in %	17.6%		18.9%	

Conditional Information	Summer Performance		Winter Performance	
	R-2	R-4	R-2	R-4
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.36	0.76	0.36	0.76
Heat Flow of Pipe (Btu/(lin ft-h)	5.9	4.2	11.0	7.7
Btu savings	1.7		3.3	
Saving in %	28.8%		30.0%	

Data provided based on elastomeric pipe insulation

Don't compare typical flat sheet insulation "R" values with cylindrical pipe insulation "R" values.



Cylindrical Pipe Insulation "R" value Calculation:

$$R = \frac{r2\ln(\frac{r2}{r1})}{k}$$

Where r_1 = uninsulated pipe radius in inches
r_2 = insulated pipe radius in inches
k = thermal conductivity.

This equation yields an "R" value on a ***square foot basis***

R" value or thermal resistance is a measure of the ability of a material to retard heat flow. "R" is the numerical reciprocal of "C" (thermal conductance). Thermal resistance is used in combination with numerals to designate thermal resistance values. The higher the "R" value the higher the insulating value. This value is normally calculated on a square foot basis.

Flat Sheet Calculation Example:

$$R = \frac{\text{Thickness of Material}}{\text{Material Thermal Conductivity}}$$

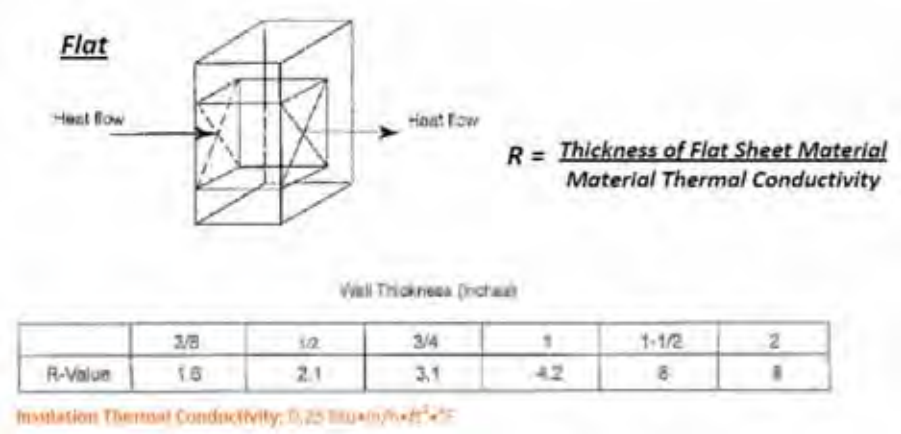
Sheet Insulation Thickness: 2"
Insulation Thermal Conductivity: 0.25 Btu•in/h•ft^2•°F
Resulting "R" Value : R-8.0 *(R-8 equals 8 resistance units)*

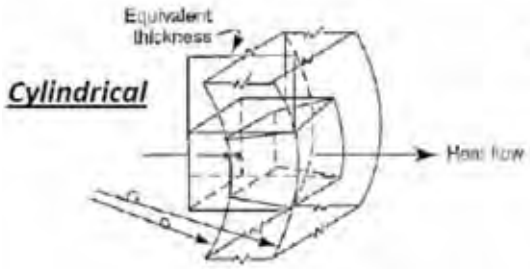
(*) It is common knowledge that with flat layer of insulation increasing the "R" value increases the thermal efficiency by the same factor.

The simple relations for flat sheet insulation do not hold true for when looking at cylindrical pipe insulations. For these materials, heat flow is not the simple straight –through heat flow found in flat surface/sheet material, but rather a radial heat flow. The reasoning is based on that fact that the inner radius surface area is much smaller than the outer radius surface area.

These differences in surface area support the need to calculate heat flow must be done using an equivalent thickness. For cylindrical pipe insulation the **Cylindrical Pipe Insulation "R" value Calculation** detailed above.

Don't compare typical flat sheet insulation "R" values with cylindrical pipe insulation "R" values.





Cylindrical Pipe Insulation "R" value Calculation:

$$R = \frac{r2\ln(\frac{r2}{r1})}{k}$$

Wall Thickness

Pipe Insulation ID Size	Nom. 3/8	Nom. 1/2	Nom. 3/4	Nom. 1	Nom. 1-1/2
3/8	2.9	3.4	5.7	7.4	—
1/2	2.7	3.3	5.5	7.2	—
5/8	2.5	3.3	5.5	7.1	11.4
3/4	2.4	3.3	5.4	6.9	10.8
7/8	2.3	3.3	5.4	6.9	10.3
1-1/8	2.2	3.2	5.3	7.2	9.6
1-3/8	2.1	3.1	5.1	7.3	9.0
1-5/8	2.4	3.1	4.9	7.2	8.6
1-1/2 IPS	2.3	3.1	4.8	6.9	8.3
2-1/8	2.3	3.1	4.7	6.7	8.1
2 IPS	2.2	3.1	4.6	6.6	7.8
2-5/8	2.2	3.0	4.5	6.4	7.7
2-1/2 IPS	2.2	3.0	4.4	6.3	7.5
3-1/8	2.2	2.9	4.3	6.2	7.4
3 IPS	2.1	2.9	4.3	6.1	7.2
3-5/8	2.1	2.9	4.2	6.0	7.1
4-1/8	2.1	2.8	4.2	5.9	7.0
4 IPS	2.1	2.8	4.1	5.8	6.8
5 IPS	2.1	2.8	4.0	5.6	6.6
6 IPS	2.0	2.7	3.9	5.5	6.4

Insulation Thermal Conductivity: 0.25 Btu•in/ft²•°F

Past History:

IRC 2000:
Had Table N1103.5

PIPING SYSTEM TYPES	FLUID TEMP RANGE (ºF)	INSULATION THICKNESS inches[b]
Heating systems		
Low pressure/temperature	201-250	1.5
Low temperature	120-200	1.0
Steam condensate (for feed water)	Any	1.5
Cooling systems		
Chilled water, refrigerant or brine	40-55	0.75
	Below 40	1.25

For SI: 1 inch = 25.4 mm, ºC = [(ºF)–32]/1.8.

a. The pipe insulation thicknesses specified in this table are based on insulation *R*-values ranging from R-4 to R-4.6 per inch of thickness. For materials with an *R*-value greater than R-4.6, the insulation thickness specified in this table may be reduced as follows:
New Minimum Thickness = 4.6 × Table Thickness / Actual R-Value
For materials with an R-value less than R-4, the minimum insulation thickness shall be increased as follows:
New Minimum Thickness = 4.0 × Table Thickness / Actual R-Value

b. For piping exposed to outdoor air, increase thickness by 0.5 inch.

Cold/Chilled Water Temperature: 40°F - 55°F (Insulation Thickness= ¾")
Low Temperature: 120°F - 200°F (Insulation Thickness= 1")

IRC 2003:
Had Table N1103.5

PIPING SYSTEM TYPES	FLUID TEMP RANGE (°F)	INSULATION THICKNESS (inches)[b]
Heating systems		
Low pressure/temperature	201-250	1.5
Low temperature	120-200	1.0
Steam condensate (for feed water)	Any	1.5
Cooling systems		
Chilled water, refrigerant or brine	40-55	0.75
	Below 40	1.25

For SI: 1 inch = 25.4 mm, °C =[(°F)-32]/1.8.

a. The pipe insulation thicknesses specified in this table are based on insulation *R*-values ranging from R-4 to R-4.6 per inch of thickness. For materials with an *R*-value greater than R-4.6, the insulation thickness specified in this table may be reduced as follows:

$$\text{New Minimum Thickness} = \frac{4.6 \times \text{Table Thickness}}{\text{Actual } R\text{-Value}}$$

For materials with an *R*-value less than R-4, the minimum insulation thickness shall be increased as follows:

$$\text{New Minimum Thickness} = \frac{4.0 \times \text{Table Thickness}}{\text{Actual } R\text{-Value}}$$

b. For piping exposed to outdoor air, increase thickness by 0.5 inch.

Cold/Chilled Water Temperature: 40°F - 55°F (Insulation Thickness= ¾")
Low Temperature: 120°F - 200°F (Insulation Thickness= 1")

IRC 2006:
Removed Table N1103.5
Moved all insulation to R-2
R-2 on Flat Surface calculation is equal a thickness of ½"
R-2 on Radial Surface calculation is equal a thickness of 3/8"

IRC 2007/2008:
All insulation remained at R-2
R-2 on Flat Surface calculation is equal a thickness of ½"
R-2 on Radial Surface calculation is equal a thickness of 3/8"

IRC 2009/2010: (Proposal)
Increase all insulation to R-4
R-4 on Flat Surface calculation is equal a thickness of 1"
R-4 on Radial Surface calculation is equal a thickness of ¾"

TARGET:
30% Conservation Savings Achieved shifting from R-2 to R-4

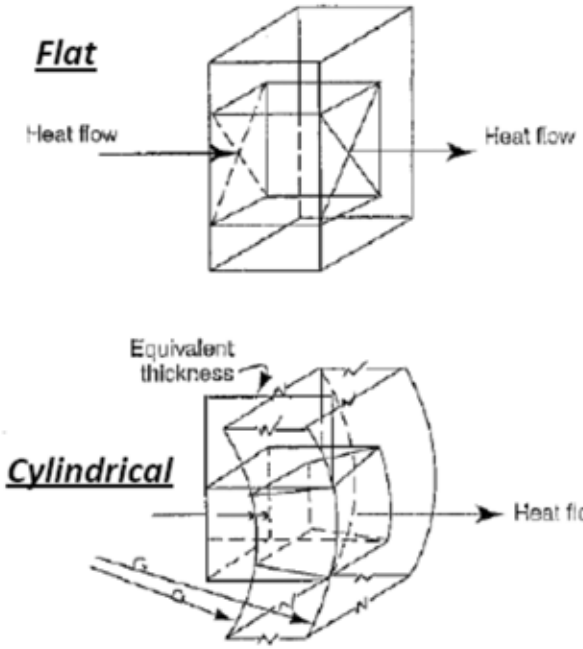
Conditional Information	Summer Performance		Winter Performance	
	R-2	R-3	R-2	R-3
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.36	0.49	0.36	0.49
Heat Flow of Pipe (Btu/(lin ft-h)	5.9	5.1	11.0	9.5
Btu savings	0.8		1.5	
Saving in %	13.6%		13.6%	

Conditional Information	Summer Performance		Winter Performance	
	R-3	R-4	R-3	R-4
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.49	0.76	0.49	0.76
Heat Flow of Pipe (Btu/(lin ft-h)	5.1	4.2	9.5	7.7
Btu savings	0.9		1.8	
Saving in %	17.6%		18.9%	

Conditional Information	Summer Performance		Winter Performance	
	R-2	R-4	R-2	R-4
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.36	0.76	0.36	0.76
Heat Flow of Pipe (Btu/(lin ft-h)	5.9	4.2	11.0	7.7
Btu savings	1.7		3.3	
Saving in %	28.8%		30.0%	

Data provided based on elastomeric pipe insulation

Don't compare typical flat sheet insulation "R" values with cylindrical pipe insulation "R" values.



Cylindrical Pipe Insulation "R" value Calculation:

$$R = \frac{r2\ln(\frac{r2}{r1})}{k}$$

Where r_1 = uninsulated pipe radius in inches
r_2 = insulated pipe radius in inches
k = thermal conductivity

This equation yields an "R" value on a ***square foot basis***

R" value or thermal resistance is a measure of the ability of a material to retard heat flow. "R" is the numerical reciprocal of "C" (thermal conductance). Thermal resistance is used in combination with numerals to designate thermal resistance values. The higher the "R" value the higher the insulating value. This value is normally calculated on a square foot basis.

Flat Sheet Calculation Example:

$$R = \frac{\text{Thickness of Material}}{\text{Material Thermal Conductivity}}$$

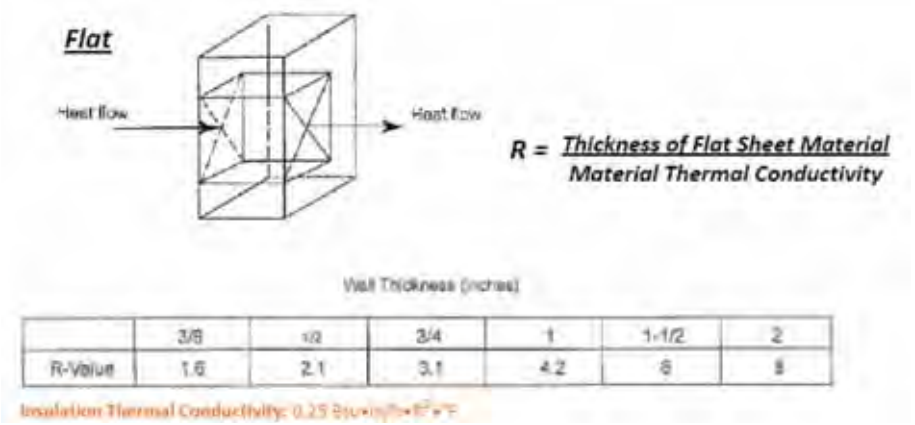
Sheet Insulation Thickness: 2"
Insulation Thermal Conductivity: 0.25 Btu•in/h•ft^2•°F
Resulting "R" Value : R-8.0 *(R-8 equals 8 resistance units)*

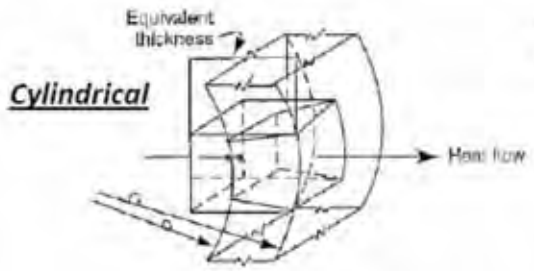
(*) It is common knowledge that with flat layer of insulation increasing the "R" value increases the thermal efficiency by the same factor.

The simple relations for flat sheet insulation do not hold true for when looking at cylindrical pipe insulations. For these materials, heat flow is not the simple straight –through heat flow found in flat surface/sheet material, but rather a radial heat flow. The reasoning is based on that fact that the inner radius surface area is much smaller than the outer radius surface area.

These differences in surface area support the need to calculate heat flow must be done using an equivalent thickness. For cylindrical pipe insulation the **Cylindrical Pipe Insulation "R" value Calculation** detailed above.

Don't compare typical flat sheet insulation "R" values with cylindrical pipe insulation "R" values.





Cylindrical Pipe Insulation "R" value Calculation:

$$R = \frac{r2\ln(\frac{r2}{r1})}{k}$$

Wall Thickness

Pipe Insulation ID Size	Nom. 3/8	Nom. 1/2	Nom. 3/4	Nom. 1	Nom. 1-1/2
3/8	2.9	3.4	5.7	7.4	—
1/2	2.7	3.3	5.5	7.2	—
5/8	2.5	3.3	5.5	7.1	11.4
3/4	2.4	3.3	5.4	6.9	10.8
7/8	2.3	3.3	5.4	6.9	10.3
1-1/8	2.2	3.2	5.3	7.2	9.6
1-3/8	2.1	3.1	5.1	7.3	9.0
1-5/8	2.4	3.1	4.9	7.2	8.6
1-1/2 IPS	2.3	3.1	4.8	6.9	8.3
2-1/8	2.3	3.1	4.7	6.7	8.1
2 IPS	2.2	3.1	4.6	6.6	7.8
2-5/8	2.2	3.0	4.5	6.4	7.7
2-1/2 IPS	2.2	3.0	4.4	6.3	7.5
3-1/8	2.2	2.9	4.3	6.2	7.4
3 IPS	2.1	2.9	4.3	6.1	7.2
3-5/8	2.1	2.9	4.2	6.0	7.1
4-1/8	2.1	2.8	4.2	5.9	7.0
4 IPS	2.1	2.8	4.1	5.8	6.8
5 IPS	2.1	2.8	4.0	5.6	6.6
6 IPS	2.0	2.7	3.9	5.5	6.4

Insulation Thermal Conductivity: 0.25 Btu•in/ft²•hr•°F

Cost Impact: Shifting from an R-2 requirement to an R-4 insulation requirement helps achieve 29.4% gain in performance efficiency.

PART I – IECC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

PART II – IRC BUILDING/ENERGY

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: RESETAR-SCHMIDT-DUNAHUE-EC-1-403.4-RE-2-N1103.4

EC116–09/10
403.4; IRC N1103.4

Proponent: Michael Resetar, Armacell LLC; Roger Schmidt, K-Flex USA; Shawn Dunahue, Nomaco Insulation

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

403.4 ~~Circulating~~ hot water systems. All ~~circulating~~ service hot water piping shall be insulated to at least ~~R-2~~ R-4. Circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not in use.

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1103.4 ~~Circulating~~ hot water systems. All ~~circulating service~~ hotwater piping shall be insulated to at least ~~R-2~~ R-4. Circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not in use.

Reason: Shifting from an R-2 requirement to an R-4 insulation requirement helps achieve 29.4% gain in performance efficiency. Focusing on all hot water piping will not only target energy efficiency but also help reduce water waste by maintaining a temperature above 105°F longer between uses.

Past History:

IECC 2000:
Had Table 504.5

SERVICE WATER HEATING TEMPERATURES °F.	PIPE SIZES[a]			
	Noncirculating runouts	Circulating mains and runouts		
	Up to 1²	Up to 1.25²	1.5² to 2²	Over 2²
170-180	0.5	1.0	1.5	2.0
140-160	0.5	0.5	1.0	1.5
100-130	0.5	0.5	0.5	1.0

For SI: 1 inch = 25.4 mm, °C. = [(°F.)-32]/1.8,
1 Btu per inch/h × ft.2 × °F. = 0.144 W/(m × K).
a Nominal iron pipe size and insulation thickness. Conductivity, *k* @ 0.27

IECC 2003:
Had Table 504.5

SERVICE WATER-HEATING TEMPERATURES (°F)	PIPE SIZES[a]			
	Noncirculating runouts	Circulating mains and runouts		
	Up to 1"	Up to 1.25"	1.5" to 2"	Over 2"
170 -180	½	1	1½	2
140 -169	½	½	1	1½
100 -139	½	½	½	1

For SI: 1 inch = 25.4 mm, °C = [(°F)-32]/1.8,
1 Btuh/inch · ft2 · °F = 0.144 W/(m · K).
a. Nominal iron pipe size and insulation thickness. Conductivity, *k* = 0.27.

IECC 2006:
Removed Table 504.5 and created Section 403 for SYSTEMS (Mandatory)
Moved all insulation to R-2
R-2 on Flat Surface calculation is equal a thickness of ½"
R-2 on Radial Surface calculation is equal a thickness of 3/8"

IRC 2007/2008:
All insulation stayed at R-2
R-2 on Flat Surface calculation is equal a thickness of ½"
R-2 on Radial Surface calculation is equal a thickness of 3/8"

IRC 2009/2010: (Proposal)
Increase all insulation to R-4
R-4 on Flat Surface calculation is equal a thickness of 1"
R-4 on Radial Surface calculation is equal a thickness of ¾"

TARGET:
30% Conservation Savings Achieved shifting from R-2 to R-4

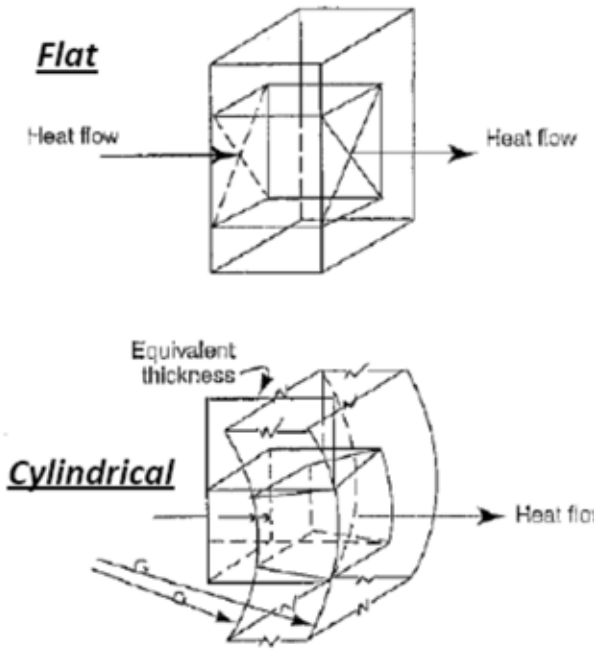
Conditional Information	Summer Performance		Winter Performance	
	R-2	R-3	R-2	R-3
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.36	0.49	0.36	0.49
Heat Flow of Pipe (Btu/(lin ft-h)	5.9	5.1	11.0	9.5
Btu savings	0.8		1.5	
Saving in %	13.6%		13.6%	

Conditional Information	Summer Performance		Winter Performance	
	R-3	R-4	R-3	R-4
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.49	0.76	0.49	0.76
Heat Flow of Pipe (Btu/(lin ft-h)	5.1	4.2	9.5	7.7
Btu savings	0.9		1.8	
Saving in %	17.6%		18.9%	

Conditional Information	Summer Performance		Winter Performance	
	R-2	R-4	R-2	R-4
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.36	0.76	0.36	0.76
Heat Flow of Pipe (Btu/(lin ft-h)	5.9	4.2	11.0	7.7
Btu savings	1.7		3.3	
Saving in %	28.8%		30.0%	

Data provided based on elastomeric pipe insulation

Don't compare typical flat sheet insulation "R" values with cylindrical pipe insulation "R" values.



Cylindrical Pipe Insulation "R" value Calculation:

$$R = \frac{r2 \ln(\frac{r2}{r1})}{k}$$

Where r_1 = uninsulated pipe radius in inches
r_2 = insulated pipe radius in inches
k = thermal conductivity.

This equation yields an "R" value on a ***square foot basis***

R" value or thermal resistance is a measure of the ability of a material to retard heat flow. "R" is the numerical reciprocal of "C" (thermal conductance). Thermal resistance is used in combination with numerals to designate thermal resistance values. The higher the "R" value the higher the insulating value. This value is normally calculated on a square foot basis.

Flat Sheet Calculation Example:

$$R = \frac{\textit{Thickness of Material}}{\textit{Material Thermal Conductivity}}$$

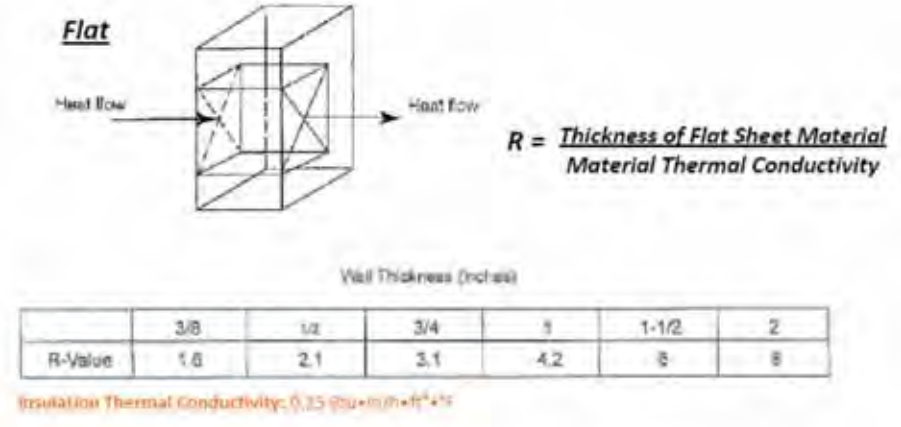
Sheet Insulation Thickness: 2"
Insulation Thermal Conductivity: 0.25 Btu•in/h•ft^2•°F
Resulting "R" Value : R-8.0 *(R-8 equals 8 resistance units)*

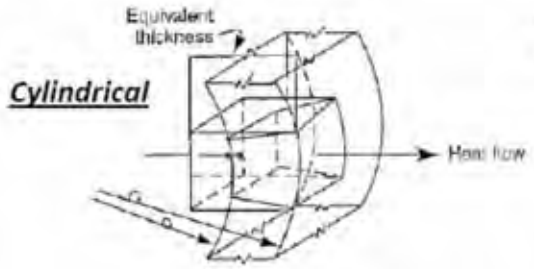
(*) It is common knowledge that with flat layer of insulation increasing the "R" value increases the thermal efficiency by the same factor.

The simple relations for flat sheet insulation do not hold true for when looking at cylindrical pipe insulations. For these materials, heat flow is not the simple straight –through heat flow found in flat surface/sheet material, but rather a radial heat flow. The reasoning is based on that fact that the inner radius surface area is much smaller than the outer radius surface area.

These differences in surface area support the need to calculate heat flow must be done using an equivalent thickness. For cylindrical pipe insulation the **Cylindrical Pipe Insulation "R" value Calculation** detailed above.

Don't compare typical flat sheet insulation "R" values with cylindrical pipe insulation "R" values.





Cylindrical Pipe Insulation "R" value Calculation:

$$R = \frac{r2\ln(\frac{r2}{r1})}{k}$$

Wall Thickness

Pipe Insulation ID Size	Nom. 3/8	Nom. 1/2	Nom. 3/4	Nom. 1	Nom. 1-1/2
3/8	2.9	3.4	5.7	7.4	—
1/2	2.7	3.3	5.5	7.2	—
5/8	2.5	3.3	5.5	7.1	11.4
3/4	2.4	3.3	5.4	6.9	10.8
7/8	2.3	3.3	5.4	6.9	10.3
1-1/8	2.2	3.2	5.3	7.2	9.6
1-3/8	2.1	3.1	5.1	7.3	9.0
1-5/8	2.4	3.1	4.9	7.2	8.6
1-1/2 IPS	2.3	3.1	4.8	6.9	8.3
2-1/8	2.3	3.1	4.7	6.7	8.1
2 IPS	2.2	3.1	4.6	6.6	7.8
2-5/8	2.2	3.0	4.5	6.4	7.7
2-1/2 IPS	2.2	3.0	4.4	6.3	7.5
3-1/8	2.2	2.9	4.3	6.2	7.4
3 IPS	2.1	2.9	4.3	6.1	7.2
3-5/8	2.1	2.9	4.2	6.0	7.1
4-1/8	2.1	2.8	4.2	5.9	7.0
4 IPS	2.1	2.8	4.1	5.8	6.8
5 IPS	2.1	2.8	4.0	5.6	6.6
6 IPS	2.0	2.7	3.9	5.5	6.4

Insulation Thermal Conductivity: 0.25 Btu•in/(ft²•°F)

Cost Impact: The material cost implications would be minimal and would be recovered (paid back) after a period of months due to system efficiency gains. Labor associated with the installation would remain constant to that of the current requirements.

Past History:

IRC 2000:
Had Table N1103.5

PIPING SYSTEM TYPES	FLUID TEMP RANGE (ºF)	INSULATION THICKNESS inches[b]
Heating systems		
Low pressure/temperature	201-250	1.5
Low temperature	120-200	1.0
Steam condensate (for feed water)	Any	1.5
Cooling systems		
Chilled water, refrigerant or brine	40-55	0.75
	Below 40	1.25

For SI: 1 inch = 25.4 mm, ºC = [(ºF)–32]/1.8.

a. The pipe insulation thicknesses specified in this table are based on insulation *R*-values ranging from R-4 to R-4.6 per inch of thickness. For materials with an *R*-value greater than R-4.6, the insulation thickness specified in this table may be reduced as follows:
New Minimum Thickness = 4.6 × Table Thickness / Actual R-Value
For materials with an R-value less than R-4, the minimum insulation thickness shall be increased as follows:
New Minimum Thickness = 4.0 × Table Thickness / Actual R-Value

b. For piping exposed to outdoor air, increase thickness by 0.5 inch.

Cold/Chilled Water Temperature: 40°F - 55°F (Insulation Thickness= ¾")
Low Temperature: 120°F - 200°F (Insulation Thickness= 1")

IRC 2003:

Had Table N1103.5

PIPING SYSTEM TYPES	FLUID TEMP RANGE (°F)	INSULATION THICKNESS (inches)[b]
Heating systems		
Low pressure/temperature	201-250	1.5
Low temperature	120-200	1.0
Steam condensate (for feed water)	Any	1.5
Cooling systems		
Chilled water, refrigerant or brine	40-55	0.75
	Below 40	1.25

For SI: 1 inch = 25.4 mm, °C =[(°F)-32]/1.8.

a. The pipe insulation thicknesses specified in this table are based on insulation *R*-values ranging from R-4 to R-4.6 per inch of thickness. For materials with an *R*-value greater than R-4.6, the insulation thickness specified in this table may be reduced as follows:

$$\text{New Minimum Thickness} = \frac{4.6 \times \text{Table Thickness}}{\text{Actual } R\text{-Value}}$$

For materials with an *R*-value less than R-4, the minimum insulation thickness shall be increased as follows:

$$\text{New Minimum Thickness} = \frac{4.0 \times \text{Table Thickness}}{\text{Actual } R\text{-Value}}$$

b. For piping exposed to outdoor air, increase thickness by 0.5 inch.

Cold/Chilled Water Temperature: 40°F - 55°F (Insulation Thickness= ¾")
Low Temperature: 120°F - 200°F (Insulation Thickness= 1")

IRC 2006:
Removed Table N1103.5
Moved all insulation to R-2
R-2 on Flat Surface calculation is equal a thickness of ½"
R-2 on Radial Surface calculation is equal a thickness of 3/8"

IRC 2007/2008:
All insulation remained at R-2
R-2 on Flat Surface calculation is equal a thickness of ½"
R-2 on Radial Surface calculation is equal a thickness of 3/8"

IRC 2009/2010: (Proposal)
Increase all insulation to R-4
R-4 on Flat Surface calculation is equal a thickness of 1"
R-4 on Radial Surface calculation is equal a thickness of ¾"

TARGET:
30% Conservation Savings Achieved shifting from R-2 to R-4

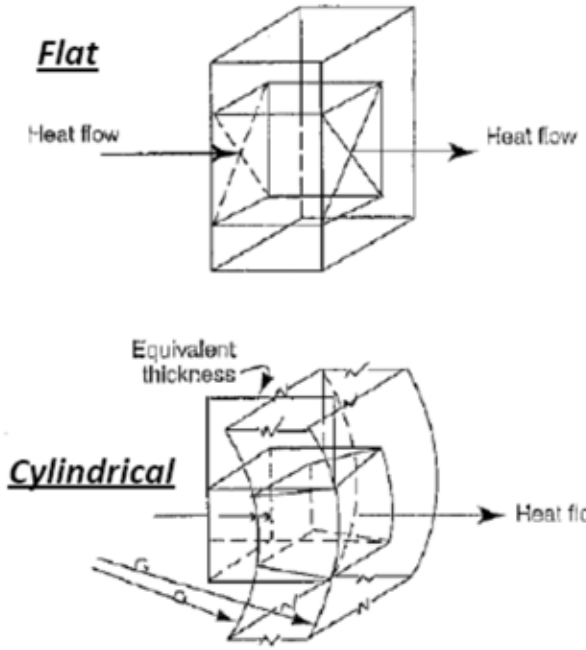
	Summer Performance		Winter Performance	
Conditional Information	**R-2**	**R-3**	**R-2**	**R-3**
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.36	0.49	0.36	0.49
Heat Flow of Pipe (Btu/(lin ft-h)	5.9	5.1	11.0	9.5
Btu savings	0.8		1.5	
Saving in %	13.6%		13.6%	

	Summer Performance		Winter Performance	
Conditional Information	**R-3**	**R-4**	**R-3**	**R-4**
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.49	0.76	0.49	0.76
Heat Flow of Pipe (Btu/(lin ft-h)	5.1	4.2	9.5	7.7
Btu savings	0.9		1.8	
Saving in %	17.6%		18.9%	

	Summer Performance		Winter Performance	
Conditional Information	**R-2**	**R-4**	**R-2**	**R-4**
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.36	0.76	0.36	0.76
Heat Flow of Pipe (Btu/(lin ft-h)	5.9	4.2	11.0	7.7
Btu savings	1.7		3.3	
Saving in %	28.8%		30.0%	

Data provided based on elastomeric pipe insulation

Don't compare typical flat sheet insulation "R" values with cylindrical pipe insulation "R" values.



Cylindrical Pipe Insulation "R" value Calculation:

$$R = \frac{r2\ln(\frac{r2}{r1})}{k}$$

Where r_1 = uninsulated pipe radius in inches
r_2 = insulated pipe radius in inches
k = thermal conductivity.

This equation yields an "R" value on a ***square foot basis***

R" value or thermal resistance is a measure of the ability of a material to retard heat flow. "R" is the numerical reciprocal of "C" (thermal conductance). Thermal resistance is used in combination with numerals to designate thermal resistance values. The higher the "R" value the higher the insulating value. This value is normally calculated on a square foot basis.

Flat Sheet Calculation Example:

$$R = \frac{\textit{Thickness of Material}}{\textit{Material Thermal Conductivity}}$$

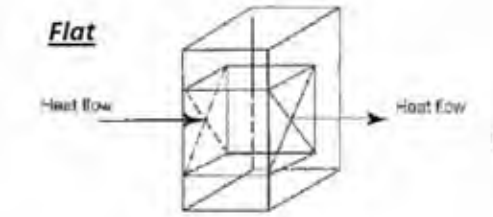
Sheet Insulation Thickness: 2"
Insulation Thermal Conductivity: 0.25 Btu•in/h•ft^2•°F
Resulting "R" Value : R-8.0 *(R-8 equals 8 resistance units)*

(*) It is common knowledge that with flat layer of insulation increasing the "R" value increases the thermal efficiency by the same factor.

The simple relations for flat sheet insulation do not hold true for when looking at cylindrical pipe insulations. For these materials, heat flow is not the simple straight –through heat flow found in flat surface/sheet material, but rather a radial heat flow. The reasoning is based on that fact that the inner radius surface area is much smaller than the outer radius surface area.

These differences in surface area support the need to calculate heat flow must be done using an equivalent thickness. For cylindrical pipe insulation the **Cylindrical Pipe Insulation "R" value Calculation** detailed above.

Don't compare typical flat sheet insulation "R" values with cylindrical pipe insulation "R" values.

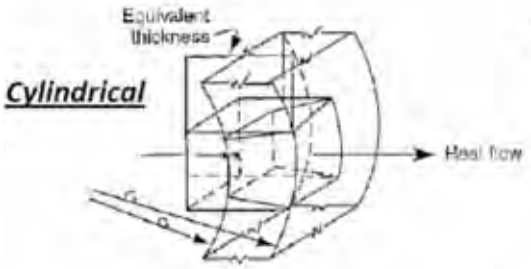


$$R = \frac{\textit{Thickness of Flat Sheet Material}}{\textit{Material Thermal Conductivity}}$$

Wall Thickness (inches)

	3/8	1/2	3/4	1	1-1/2	2
R-Value	1.6	2.1	3.1	4.2	6	8

Insulation Thermal Conductivity: 0.25 Btu•in/h•ft^2•°F



Cylindrical Pipe Insulatio
"R" value Calculation:

$$R = \frac{r2\ln(\frac{r2}{r1})}{k}$$

Wall Thickness

Pipe Insulation ID Size	Nom. 3/8	Nom. 1/2	Nom. 3/4	Nom. 1	Nom. 1-1/2
3/8	2.9	3.4	5.7	7.4	—
1/2	2.7	3.3	5.5	7.2	—
5/8	2.5	3.3	5.5	7.1	11.4
3/4	2.4	3.3	5.4	6.9	10.8
7/8	2.3	3.3	5.4	6.9	10.3
1-1/8	2.2	3.2	5.3	7.2	9.6
1-3/8	2.1	3.1	5.1	7.3	9.0
1-5/8	2.4	3.1	4.9	7.2	8.6
1-1/2 IPS	2.3	3.1	4.8	6.9	8.3
2-1/8	2.3	3.1	4.7	6.7	8.1
2 IPS	2.2	3.1	4.6	6.6	7.8
2-5/8	2.2	3.0	4.5	6.4	7.7
2-1/2 IPS	2.2	3.0	4.4	6.3	7.5
3-1/8	2.2	2.9	4.3	6.2	7.4
3 IPS	2.1	2.9	4.3	6.1	7.2
3-5/8	2.1	2.9	4.2	6.0	7.1
4-1/8	2.1	2.8	4.2	5.9	7.0
4 IPS	2.1	2.8	4.1	5.8	6.8
5 IPS	2.1	2.8	4.0	5.6	6.6
6 IPS	2.0	2.7	3.9	5.5	6.4

Insulation Thermal Conductivity: 0.25 [illegible]

PART I – IECC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

PART II – IRC BUILDING/ENERGY

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: RESETAR-SCHMIDT-DUNAHUE-EC-2-403.4-RE-3-N1103.4

EC117–09/10
403.3; IRC N1103.3

Proponent: Michael Resetar, Armacell LLC; Roger Schmidt, K-Flex USA; Shawn Dunahue, Nomaco Insulation

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

403.3 Mechanical system piping insulation (Mandatory). Mechanical system piping capable of carrying fluids above 105°F (41°C) or below 55°F (13°C) shall be insulated to a minimum of ~~R-3~~ R-4.

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1103.3 Mechanical system piping insulation. Mechanical system piping capable of carrying fluids above 105°F (40°C) or below 55°F (13°C) shall be insulated to a minimum of ~~R-3~~ R-4.

Reason: Shifting from an R-3 requirement to an R-4 insulation requirement in 2009/2010 helps achieve an 18.25% gain in performance efficiency and combined with the efficiency gains implemented in the 2007/2008 change from an R-2 to R-3 the combination would achieve a 29.4% gain in efficiency.

IECC 2000:
Had Table 503.3.3.1

PIPING SYSTEM TYPES	FLUID TEMPERATURE RANGE, °F	PIPE SIZES[a]					
		Run outs 2"[b]	1" and less	1¼" to 2"	2½" to 4"	5" to 6"	8" and larger
Heating systems							
Steam and hot water high pressure/temperature	306-450	1½	2½	2½	3	3½	3½
Medium pressure/temperature	251-305	1½	2	2½	2½	3	3
Low pressure/temperature	201-250	1	1½	1½	2	2	2
Low temperature	120-200	½	1	1	1½	1½	1½
Steam condensate (for feed water)	Any	1	1	1½	2	2	2
Cooling systems							
Chilled water	40-55	½	½	¾	1	1	1
Refrigerant or brine	below 40	1	1	1½	1½	1½	1½

For SI: 1 inch = 25.4 mm, °C. = [(°F.)-32]/1.8, 1 foot = 304.8 mm.
a For piping exposed to outdoor air, increase insulation thickness by ½ inch.
b Runouts not exceeding 12 feet in length to individual terminal units.

Cold/Chilled Water Temperature: 40°F - 55°F (Insulation Thickness=$^1/_2$")
Low Temperature: 120°F - 200°F (Insulation Thickness= 1")

IECC 2003:
Had Table 503.3.3.1

PIPING SYSTEM TYPES	FLUID TEMPERATURE RANGE, EF	PIPE SIZES[a]					
		Runouts up to 2"[b]	1" and less	1.25" to 2"	2.5" to 4"	5" to 6"	8" and larger
HEATING SYSTEMS							
Steam and hot water							
High pressure/temperature	306-450	$1^1/_2$	$2^1/_2$	$2^1/_2$	3	$3^1/_2$	$3^1/_2$
Medium pressure/temperature	251-305	$1^1/_2$	2	$2^1/_2$	$2^1/_2$	3	3
Low pressure/temperature	201-250	1	$1^1/_2$	$1^1/_2$	2	2	2
Low temperature	106-200	$^1/_2$	1	1	$1^1/_2$	$1^1/_2$	$1^1/_2$
Steam condensate (for feed water)	Any	1	1	$1^1/_2$	2	2	2
COOLING SYSTEMS							
Chilled water, refrigerant and brine	40-55	$^1/_2$	$^1/_2$	$^3/_4$	1	1	1
	Below 40	1	1	$1^1/_2$	$1^1/_2$	$1^1/_2$	$1^1/_2$

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, °C = [(°F)-32]/1.8.
a. For piping exposed to outdoor air, increase insulation thickness by 0.5 inch.
b. Runouts not exceeding 12 feet in length to individual terminal units.

Cold/Chilled Water Temperature: 40°F - 55°F (Insulation Thickness= ½")
Low Temperature: 120°F - 200°F (Insulation Thickness= 1")

IECC 2006:
Removed Table 503.3.3.1 and created Section 403 for SYSTEMS (Mandatory)
Moved all insulation to R-2
R-2 on Flat Surface calculation is equal a thickness of ½"

IRC 2007/2008:
Increased all insulation to R-3
R-3 on Flat Surface calculation is equal a thickness of ¾"
R-3 on Radial Surface calculation is equal a thickness of ½"

IRC 2009/2010: (Proposal)
Increase all insulation to R-4
R-4 on Flat Surface calculation is equal a thickness of 1"
R-4 on Radial Surface calculation is equal a thickness of ¾"

TARGET:
30% Conservation Savings Achieved shifting from R-2 to R-4

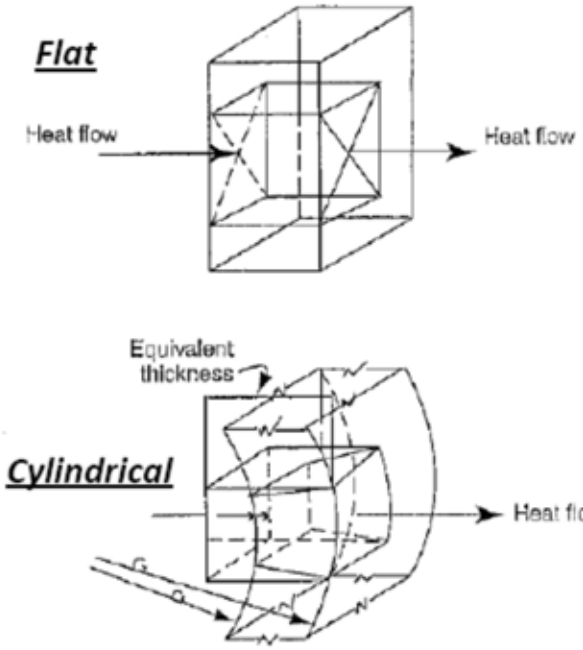
	Summer Performance		Winter Performance	
Conditional Information	**R-2**	**R-3**	**R-2**	**R-3**
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.36	0.49	0.36	0.49
Heat Flow of Pipe (Btu/(lin ft-h)	5.9	5.1	11.0	9.5
Btu savings	0.8		1.5	
Saving in %	13.6%		13.6%	

	Summer Performance		Winter Performance	
Conditional Information	**R-3**	**R-4**	**R-3**	**R-4**
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.49	0.76	0.49	0.76
Heat Flow of Pipe (Btu/(lin ft-h)	5.1	4.2	9.5	7.7
Btu savings	0.9		1.8	
Saving in %	17.6%		18.9%	

	Summer Performance		Winter Performance	
Conditional Information	**R-2**	**R-4**	**R-2**	**R-4**
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.36	0.76	0.36	0.76
Heat Flow of Pipe (Btu/(lin ft-h)	5.9	4.2	11.0	7.7
Btu savings	1.7		3.3	
Saving in %	28.8%		30.0%	

Data provided based on elastomeric pipe insulation

Don't compare typical flat sheet insulation "R" values with cylindrical pipe insulation "R" values.



Cylindrical Pipe Insulation "R" value Calculation:

$$R = \frac{r2\ln(\frac{r2}{r1})}{k}$$

Where r_1 = uninsulated pipe radius in inches
r_2 = insulated pipe radius in inches
k = thermal conductivity.

This equation yields an "R" value on a ***square foot basis***

R" value or thermal resistance is a measure of the ability of a material to retard heat flow. "R" is the numerical reciprocal of "C" (thermal conductance). Thermal resistance is used in combination with numerals to designate thermal resistance values. The higher the "R" value the higher the insulating value. This value is normally calculated on a square foot basis.

Flat Sheet Calculation Example:

$$R = \frac{\text{Thickness of Material}}{\text{Material Thermal Conductivity}}$$

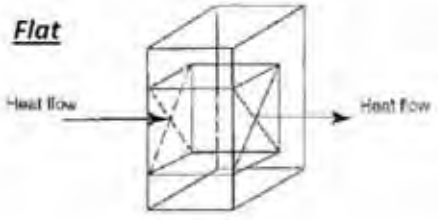
Sheet Insulation Thickness: 2"
Insulation Thermal Conductivity: 0.25 Btu•in/h•ft^2•°F
Resulting "R" Value : R-8.0 *(R-8 equals 8 resistance units)*

(*) It is common knowledge that with flat layer of insulation increasing the "R" value increases the thermal efficiency by the same factor.

The simple relations for flat sheet insulation do not hold true for when looking at cylindrical pipe insulations. For these materials, heat flow is not the simple straight –through heat flow found in flat surface/sheet material, but rather a radial heat flow. The reasoning is based on that fact that the inner radius surface area is much smaller than the outer radius surface area.

These differences in surface area support the need to calculate heat flow must be done using an equivalent thickness. For cylindrical pipe insulation the **Cylindrical Pipe Insulation "R" value Calculation** detailed above.

Don't compare typical flat sheet insulation "R" values with cylindrical pipe insulation "R" values.

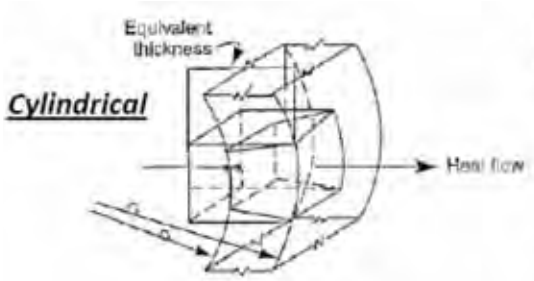


$$R = \frac{\text{Thickness of Flat Sheet Material}}{\text{Material Thermal Conductivity}}$$

Wall Thickness (inches)

	3/8	1/2	3/4	1	1-1/2	2
R-Value	1.6	2.1	3.1	4.2	6	8

Insulation Thermal Conductivity: 0.25 Btu•in/h•ft^2•°F



Cylindrical Pipe Insulation "R" value Calculation:

$$R = \frac{r2\ln(\frac{r2}{r1})}{k}$$

Wall Thickness

Pipe Insulation ID Size	Nom. 3/8	Nom. 1/2	Nom. 3/4	Nom. 1	Nom. 1-1/2
3/8	2.9	3.4	5.7	7.4	—
1/2	2.7	3.3	5.5	7.2	—
5/8	2.5	3.3	5.5	7.1	11.4
3/4	2.4	3.3	5.4	6.9	10.8
7/8	2.3	3.3	5.4	6.9	10.3
1-1/8	2.2	3.2	5.3	7.2	9.6
1-3/8	2.1	3.1	5.1	7.3	9.0
1-5/8	2.4	3.1	4.9	7.2	8.6
1-1/2 IPS	2.3	3.1	4.8	6.9	8.3
2-1/8	2.3	3.1	4.7	6.7	8.1
2 IPS	2.2	3.1	4.6	6.6	7.8
2-5/8	2.2	3.0	4.5	6.4	7.7
2-1/2 IPS	2.2	3.0	4.4	6.3	7.5
3-1/8	2.2	2.9	4.3	6.2	7.4
3 IPS	2.1	2.9	4.3	6.1	7.2
3-5/8	2.1	2.9	4.2	6.0	7.1
4-1/8	2.1	2.8	4.2	5.9	7.0
4 IPS	2.1	2.8	4.1	5.8	6.8
5 IPS	2.1	2.8	4.0	5.6	6.6
6 IPS	2.0	2.7	3.9	5.5	6.4

Insulation Thermal Conductivity: 0.25 Btu•in/(h•ft²•°F)

Cost Impact: The material cost implications would be minimal and would be recovered (paid back) after a period of months due to system efficiency gains. Labor associated with the installation would remain constant to that of the current requirements.

Past History:

IRC 2000:
Had Table N1103.5

PIPING SYSTEM TYPES	FLUID TEMP RANGE (ºF)	INSULATION THICKNESS inches[b]
Heating systems		
Low pressure/temperature	201-250	1.5
Low temperature	120-200	1.0
Steam condensate (for feed water)	Any	1.5
Cooling systems		
Chilled water, refrigerant or brine	40-55	0.75
	Below 40	1.25

For SI: 1 inch = 25.4 mm, ºC = [(ºF)–32]/1.8.

a. The pipe insulation thicknesses specified in this table are based on insulation *R*-values ranging from R-4 to R-4.6 per inch of thickness. For materials with an *R*-value greater than R-4.6, the insulation thickness specified in this table may be reduced as follows:
New Minimum Thickness = 4.6 × Table Thickness / Actual R-Value
For materials with an R-value less than R-4, the minimum insulation thickness shall be increased as follows:
New Minimum Thickness = 4.0 × Table Thickness / Actual R-Value

b. For piping exposed to outdoor air, increase thickness by 0.5 inch.

Cold/Chilled Water Temperature: 40°F - 55°F (Insulation Thickness= ¾")
Low Temperature: 120°F - 200°F (Insulation Thickness= 1")

IRC 2003:

Had Table N1103.5

PIPING SYSTEM TYPES	FLUID TEMP RANGE (°F)	INSULATION THICKNESS (inches)[b]
Heating systems		
Low pressure/temperature	201-250	1.5
Low temperature	120-200	1.0
Steam condensate (for feed water)	Any	1.5
Cooling systems		
Chilled water, refrigerant or brine	40-55	0.75
	Below 40	1.25

For SI: 1 inch = 25.4 mm, °C =[(°F)-32]/1.8.

a. The pipe insulation thicknesses specified in this table are based on insulation *R*-values ranging from R-4 to R-4.6 per inch of thickness. For materials with an *R*-value greater than R-4.6, the insulation thickness specified in this table may be reduced as follows:

$$\text{New Minimum Thickness} = \frac{4.6 \times \text{Table Thickness}}{\text{Actual } R\text{-Value}}$$

For materials with an *R*-value less than R-4, the minimum insulation thickness shall be increased as follows:

$$\text{New Minimum Thickness} = \frac{4.0 \times \text{Table Thickness}}{\text{Actual } R\text{-Value}}$$

b. For piping exposed to outdoor air, increase thickness by 0.5 inch.

Cold/Chilled Water Temperature: 40°F - 55°F (Insulation Thickness= ¾")
Low Temperature: 120°F - 200°F (Insulation Thickness= 1")

IRC 2006:
Removed Table N1103.5
Moved all insulation to R-2
R-2 on Flat Surface calculation is equal a thickness of ½"
R-2 on Radial Surface calculation is equal a thickness of 3/8"

IRC 2007/2008:
All insulation remained at R-2
R-2 on Flat Surface calculation is equal a thickness of ½"
R-2 on Radial Surface calculation is equal a thickness of 3/8"

IRC 2009/2010: (Proposal)
Increase all insulation to R-4
R-4 on Flat Surface calculation is equal a thickness of 1"
R-4 on Radial Surface calculation is equal a thickness of ¾"

TARGET:
30% Conservation Savings Achieved shifting from R-2 to R-4

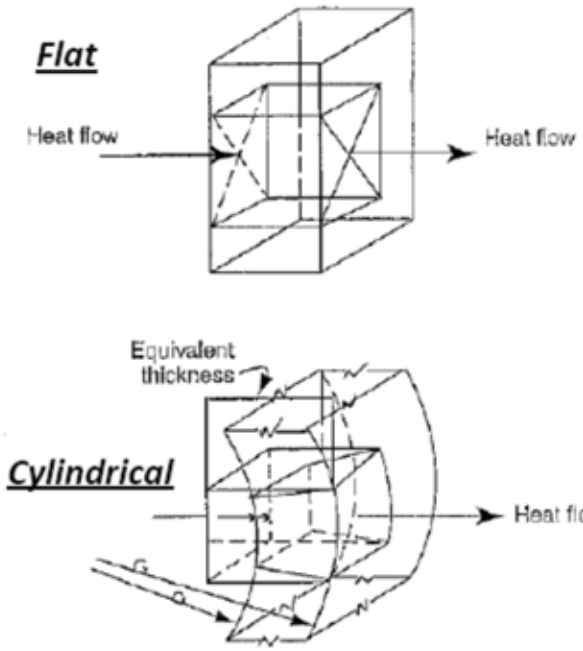
	Summer Performance		Winter Performance	
Conditional Information	**R-2**	**R-3**	**R-2**	**R-3**
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.36	0.49	0.36	0.49
Heat Flow of Pipe (Btu/(lin ft-h)	5.9	5.1	11.0	9.5
Btu savings	0.8		1.5	
Saving in %	13.6%		13.6%	

	Summer Performance		Winter Performance	
Conditional Information	**R-3**	**R-4**	**R-3**	**R-4**
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.49	0.76	0.49	0.76
Heat Flow of Pipe (Btu/(lin ft-h)	5.1	4.2	9.5	7.7
Btu savings	0.9		1.8	
Saving in %	17.6%		18.9%	

	Summer Performance		Winter Performance	
Conditional Information	**R-2**	**R-4**	**R-2**	**R-4**
Line temperature °F	40.0	40.0	105.0	105.0
Ambient temperature °F	75.0	75.0	40.0	40.0
Thermal conductivity (Btu•in/h•ft2•°F)	0.263	0.263	0.264	0.264
Surface Coeff. External (Btu•in/h•ft2•°F)	1.60	1.60	1.60	1.60
Outer diameter of pipe (inches)	0.875	0.875	0.875	0.875
Required thickness of insulation (inches)	0.36	0.76	0.36	0.76
Heat Flow of Pipe (Btu/(lin ft-h)	5.9	4.2	11.0	7.7
Btu savings	1.7		3.3	
Saving in %	28.8%		30.0%	

Data provided based on elastomeric pipe insulation

Don't compare typical flat sheet insulation "R" values with cylindrical pipe insulation "R" values.



Cylindrical Pipe Insulation "R" value Calculation:

$$R = \frac{r2 \ln\left(\frac{r2}{r1}\right)}{k}$$

Where r_1 = uninsulated pipe radius in inches
r_2 = insulated pipe radius in inches
k = thermal conductivity.

This equation yields an "R" value on a ***square foot basis***

R" value or thermal resistance is a measure of the ability of a material to retard heat flow. "R" is the numerical reciprocal of "C" (thermal conductance). Thermal resistance is used in combination with numerals to designate thermal resistance values. The higher the "R" value the higher the insulating value. This value is normally calculated on a square foot basis.

Flat Sheet Calculation Example:

$$R = \frac{\textit{Thickness of Material}}{\textit{Material Thermal Conductivity}}$$

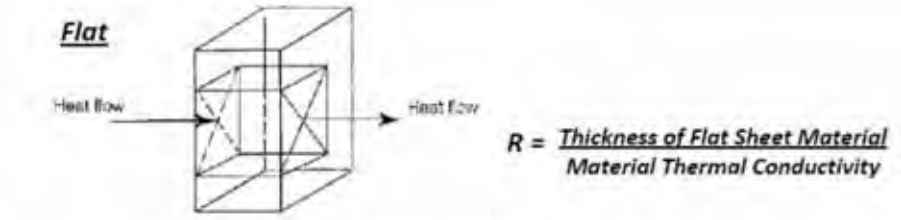
Sheet Insulation Thickness: 2"
Insulation Thermal Conductivity: 0.25 Btu•in/h•ft^2•°F
Resulting "R" Value : R-8.0 *(R-8 equals 8 resistance units)*

(*) It is common knowledge that with flat layer of insulation increasing the "R" value increases the thermal efficiency by the same factor.

The simple relations for flat sheet insulation do not hold true for when looking at cylindrical pipe insulations. For these materials, heat flow is not the simple straight –through heat flow found in flat surface/sheet material, but rather a radial heat flow. The reasoning is based on that fact that the inner radius surface area is much smaller than the outer radius surface area.

These differences in surface area support the need to calculate heat flow must be done using an equivalent thickness. For cylindrical pipe insulation the **Cylindrical Pipe Insulation "R" value Calculation** detailed above.

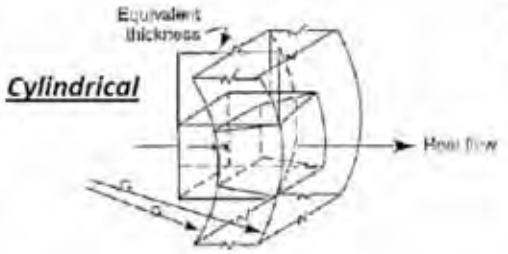
Don't compare typical flat sheet insulation "R" values with cylindrical pipe insulation "R" values.



Wall Thickness (inches)

	3/8	1/2	3/4	1	1-1/2	2
R-Value	1.9	2.1	3.1	4.2	6	8

Insulation Thermal Conductivity: 0.25 Btu•in/h•ft^2•°F



Cylindrical Pipe Insulation "R" value Calculation:

$$R = \frac{r2\ln(\frac{r2}{r1})}{k}$$

Wall Thickness

Pipe Insulation ID Size	Nom. 3/8	Nom. 1/2	Nom. 3/4	Nom. 1	Nom. 1-1/2
3/8	2.9	3.4	5.7	7.4	—
1/2	2.7	3.3	5.5	7.2	—
5/8	2.5	3.3	5.5	7.1	11.4
3/4	2.4	3.3	5.4	6.9	10.8
7/8	2.3	3.3	5.4	6.9	10.3
1-1/8	2.2	3.2	5.3	7.2	9.6
1-3/8	2.1	3.1	5.1	7.3	9.0
1-5/8	2.4	3.1	4.9	7.2	8.6
1-1/2 IPS	2.3	3.1	4.8	6.9	8.3
2-1/8	2.3	3.1	4.7	6.7	8.1
2 IPS	2.2	3.1	4.6	6.6	7.8
2-5/8	2.2	3.0	4.5	6.4	7.7
2-1/2 IPS	2.2	3.0	4.4	6.3	7.5
3-1/8	2.2	2.9	4.3	6.2	7.4
3 IPS	2.1	2.9	4.3	6.1	7.2
3-5/8	2.1	2.9	4.2	6.0	7.1
4-1/8	2.1	2.8	4.2	5.9	7.0
4 IPS	2.1	2.8	4.1	5.8	6.8
5 IPS	2.1	2.8	4.0	5.6	6.6
6 IPS	2.0	2.7	3.9	5.5	6.4

Insulation Thermal Conductivity 0.25 Btu•in/h•ft²•°F

Cost Impact: The material cost implications would be minimal and would be recovered (paid back) after a period of months due to system efficiency gains. Labor associated with the installation would remain constant to that of the current requirements.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RESETAR-SCHMIDT-DUNAHUE-EC-9-403.3-RE-1-N1103.3

EC118–09/10

403.5 (New), 504.5 (New); IPC 607.4 (New); IRC N1103.4 (New), P2903.11 (New)

Proponent: Ronald L, George, CIPE, CPD, President of Ron George Design & Consulting Services representing himself

THIS IS A 4 PART CODE CHANGE. PARTS I and II WILL BE HEARD BY THE IECC COMMITTEE. PARTS III & IV WILL BE HEARD BY THE IRC BUILDING AND ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Part I - IECC

Add new text as follows:

403.5 Pipe insulation for direct-burial applications. Hot water distribution piping and circulating hot water system piping that is direct-buried shall be externally insulated with material having a wall thickness of not less than 1 inch (25.4mm). The insulation shall be closed cell foam plastic, closed cell foam rubber or a material or system approved

by the manufacturer for direct-burial applications. The insulating materials or systems shall be installed, joined and sealed in accordance with the manufacturer's installation instructions. Where insulated piping is located below the building site water table, the insulated piping shall be encased in a waterproof conduit. Insulating materials or systems that are recommended by the manufacturer for submerged water service applications shall not be required to be encased in a waterproof conduit. Where the total developed length of direct-buried hot water distribution and circulating hot water piping does not exceed 20 feet (6100 mm), external insulation shall not be required on direct-buried water distribution piping.

(Renumber subsequent sections)

504.5 Pipe insulation for direct-burial applications. Hot water distribution piping and circulating hot water system piping that is direct-buried shall be externally insulated with material having a wall thickness of not less than 1 inch (25.4mm). The insulation shall be closed cell foam plastic, closed cell foam rubber or a material or system approved by the manufacturer for direct-burial applications. The insulating materials or systems shall be installed, joined and sealed in accordance with the manufacturer's installation instructions. Where insulated piping is located below the building site water table, the insulated piping shall be encased in a waterproof conduit. Insulating materials or systems that are recommended by the manufacturer for submerged water service applications shall not be required to be encased in a waterproof conduit.

(Renumber subsequent sections)

PART II – IPC

Add new text as follows:

607.4 Insulation required for direct-buried piping. Direct-buried hot water distribution piping and circulating hot water piping shall be externally insulated in accordance with Section 504.5 of the *International Energy Code*.

(Renumber subsequent sections)

PART III – IRC

Add new text as follows:

N1103.4 Pipe insulation for direct-burial applications. Hot water distribution piping and circulating hot water system piping that is direct-buried shall be externally insulated with material having a wall thickness of not less than 1 inch (25.4mm). The insulation shall be closed cell foam plastic, closed cell foam rubber or a material or system approved by the manufacturer for direct-burial applications. The insulating materials or systems shall be installed, joined and sealed in accordance with the manufacturer's installation instructions. Where insulated piping is located below the building site water table, the insulated piping shall be encased in a waterproof conduit. Insulating materials or systems that are recommended by the manufacturer for submerged water service applications shall not be required to be encased in a waterproof conduit. Where the total developed length of direct-buried hot water distribution and circulating hot water piping does not exceed 20 feet (6100 mm), external insulation shall not be required on direct-buried water distribution piping.

(Renumber subsequent sections)

PART IV- IRC

P2903.11 Insulation required for direct-buried piping. Direct-buried hot water distribution piping and circulating hot water piping shall be externally insulated in accordance with Section N1103.4.

Reason: I have seen several underground piping installations where long runs of hot water distribution pipes lose significant heat to the soil. I have also seen un-insulated hot and cold water pipes that were installed next to each other in the same trench and heat transfer caused problems with both the hot and cold water systems. In long runs of underground HW piping where cold water and hot water are installed in the same trench and the hot water is circulated, the cold water pipe heats up to close to the hot water distribution temperature. This code change requires insulation for all underground hot water distribution systems and hot water circulating systems so that heat loss to the earth and heat gain by cold water piping is minimized. All types of pipe materials conveying hot water are subject to loss of heat to the soil. The pipe material type does not matter as heat transfer always occurs but the rate of heat transfer varies depending on the type of pipe material.

Cost Impact: Minimal

PARTS I & II– IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PARTS III & IV – IRC-Building and Energy

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: George-EC-403.5

EC119–09/10

202 (New), 403.5 (New), Chapter 6; IRC R202 (New), N1103.5 (New), Chapter 44

Proponent: Ronald Majette, representing US Department of Energy

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Add new text as follows:

DESUPERHEATER/WATER HEATER. A factory-made assembly of elements by which the flows of refrigerant vapor and water are maintained in such heat transfer relationship that the refrigerant vapor is desuper-heated and the water is heated. A water circulating pump may be included as part of the assembly.

403.5 Desuperheater (Prescriptive). A desuperheater water heater tested and listed in accordance with ARI 470 and connected to the hot water storage tank shall be provided for a vapor compression air conditioner or heat pump with a cooling capacity of 3 tons or more installed in climate zones 1 and 2. Where multiple air conditioners or heat pumps and hot water storage tanks are installed only one of each shall be required to have a desuperheater.

Exceptions:

1. Heat pump water heaters
2. Water heaters provided with solar heating systems having a minimum Solar Fraction of 0.30 when tested in accordance with OG-300

2. Add new standards to Chapter 6 as follows:

AHRI
470-06 Performance Rating of Desuperheater/Water Heaters

SRCC
OG-300 Operating Guidelines and Minimum Standards for Certifying Solar Water Heating Systems

PART II – IRC BUILDING/ENERGY

1. Add new text as follows:

DESUPERHEATER/WATER HEATER. A factory-made assembly of elements by which the flows of refrigerant vapor and water are maintained in such heat transfer relationship that the refrigerant vapor is desuper-heated and the water is heated. A water circulating pump may be included as part of the assembly.

N1103.5 Desuperheater. A desuperheater water heater tested and listed in accordance with ARI 470 and connected to the hot water storage tank shall be provided for a vapor compression air conditioner or heat pump with a cooling capacity of 3 tons or more installed in climate zones 1 and 2. Where multiple air conditioners or heat pumps and hot water storage tanks are installed only one of each shall be required to have a desuperheater.

Exceptions:

1. Heat pump water heaters
2. Water heaters provided with solar heating systems having a minimum Solar Fraction of 0.30 when tested in accordance with OG-300

2. Add new standards to Chapter 44 as follows:

AHRI
470-06 Performance Rating of Desuperheater/Water Heaters

SRCC
OG-300 Operating Guidelines and Minimum Standards for Certifying Solar Water Heating Systems

Reason: There is considerable heat rejected in the summer by cooling equipment that can be reclaimed and used for other purposes. One such purpose that all residential buildings have is domestic hot water. Desuperheater/water heaters are simply a heat exchanger that transfers heat from the hot gas side of the cooling equipment to the hot water storage tank. Ten to 30% of the condenser heat rejected can be reclaimed and used to heat water at a rate of 5 to 8 gallons per hour per ton of cooling capacity. For a typical 3 ton central air conditioning unit, a desuperheater could provide a full tank of hot water every 3 hours.. Desuperheater savings estimates are shown in the table below *(source Energy Star*), for a typical household and an electric rate of 8¢ per kWh.

City	Annual Energy Savings From Desuperheater		
	(kWh/yr)	% of Total Hot Water Load	Cost Savings
Tampa	1910	40%	$153
Las Vegas	1410	32%	$113
Fort Worth	1210	25%	$97
Atlanta	910	18%	$73
Raleigh	820	16%	$66
Washington	790	15%	$63
Chicago	580	10%	$46

Source: Lawrence Berkeley National Laboratory. Estimates assume a family of four, 52 gallon electric water heater, and a 3 ton central air conditioner. Air conditioner efficiency is 12.5vSEER in cooling-dominant climates and 10.4 SEER in heating-dominant climates.

At the NWPPC Regional Technology Forum in August 2008 cost information for 3 systems was provided that showed installed cost from $900 to $1500. Annual electricity savings were 2053 kwh in Portland, 1903 in Seattle, 2526 in Phoenix and 1617 in Los Angeles. At $0.08 per kwh electric cost the savings for the electricity savings above would range from $129 to $202 per year. Considering the installed cost above that yields a simple payback range of 4.5 to 11.6 years.

Another study below from Technical Update Bulletin 458 by Jim Dulley (2008) addresses the issue of electricity cost, hot water usage, and other factors.

Hot Water Cost and Savings — Table 1						
Family Size	*Daily Hot Water Usage*	*Annual Water Heating Cost per Kw*				
		8.0¢	*8.5¢*	*9.0¢*	*9.5¢*	*10.0¢*
2	40 gal.	$239	$254	$269	$284	$299
3	55 gal.	$329	$350	$370	$391	$412
4	70 gal.	$419	$445	$471	$498	$524
5	85 gal.	$509	$541	$572	$604	$636
6	100 gal.	$599	$636	$673	$711	$748

The annual cost includes both heating up cold water to replace the hot water you use and the loss of heat from your water heater and piping between your uses of hot water. Calculate the savings by multiplying the annual cost figure from the table by the fraction of the year that you operate your air conditioning (i.e. 6/12 or 8/12 or 4/12 etc.)

Payback Example — for a family of 4 with a 3 ton A/C, 6 months of cooling and 9.0¢ per KwH electricity

Average installed cost of heat recovery	$600.00
Less: Hot water savings (6/12 x $471 = 235.50)	235.50
Less: A/C improvement savings (6 x $13 = $78.00)	78.00
Net First Year Cost	$286.50

Cost Impact: The proposed change will increase the first cost of construction but decrease operating expenses so as to reduce the overall cost of operating the subject building an amount greater than the increase in first cost.

Analysis: A review of the standard(s) proposed for inclusion in the code, AHRI 470-06 and SRCC OG-300, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-68-202-403.5-CH 6-IRC-R202-N1103.5-CH 44

EC120–09/10

403.6, Table 403.6, Chapter 6 (All new); IRC N1103.6, Table N1103.6, Chapter 44 (All new)

Proponent: Craig Conner, Building Quality, representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Add new text as follows:

403.6 Ventilation fan efficiency. Ventilation fans shall be tested and listed by an approved third party and shall meet the requirements of table 403.6.

Exception: Fans integral to tested and listed HVAC equipment.

TABLE 403.6
VENTILATION FAN EFFICIENCY

Fan location	Air flow rate (cfm)	Minimum efficiency[a]	Air flow rate (cfm)
Range hoods	any	2.8 cfm/watt	any
In-line fan	any	2.8 cfm/watt	any
Bathroom, utility room	<= 80	1.4 cfm/watt	<140 cfm
Bathroom, utility room	>80	2.8 cfm/watt	>= 140 cfm

a. When tested in accordance with HVI Standard 916

2. Add new standard to Chapter 6 as follows:

HVI Home Ventilating Institute
1000 North Rand Road
Suite 214
Wauconda, IL 60084

HVI 916-09 HVI Airflow Test Standards

PART II – IRC ENERGY

N1103.6 Ventilation fan efficiency. Ventilation fans shall be tested and listed by an approved third party and shall meet the requirements of table N1103.6.

Exception: Fans integral to tested and listed HVAC equipment.

TABLE N1103.6
VENTILATION FAN EFFICIENCY

Fan location	Air flow rate (cfm)	Minimum efficiency[a]	Air flow rate (cfm)
Range hoods	any	2.8 cfm/watt	any
In-line fan	any	2.8 cfm/watt	any
Bathroom, utility room	<= 80	1.4 cfm/watt	<140 cfm
Bathroom, utility room	>80	2.8 cfm/watt	>= 140 cfm

a. When tested in accordance with HVI Standard 916

2. Add new standard to Chapter 44 as follows:

HVI Home Ventilating Institute
1000 North Rand Road
Suite 214
Wauconda, IL 60084

HVI 916-09 HVI Airflow Test Standards

Reason: Residences continue to get tighter and therefore require more ventilation. The trend towards tighter construction and more mechanical ventilation will likely accelerate with changes made this code cycle.

The requirements in the table are the efficiency portion of the existing Energy Star ventilation fan requirements. The HVA Standard 916 defines a method for testing the efficiency with which a fan moves air. A substantial number of fans from multiple manufacturers can meet these requirements with existing products.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, HVI-916, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CONNER-EC-8-403.6 - N1103.6.DOC

EC121–09/10

403.6, Table 403.6 (New), Chapter 6; IRC N1103.6, Table N1103.6 (New), Chapter 44

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise as follows:

403.6 Equipment sizing (Mandatory). Heating and cooling equipment shall be sized in accordance with Section 503.2.1, 503.2.2 and Table 403.6 ~~M1401.3 of the *International Residential Code*~~.

2. Add new table as follows:

TABLE 403.6
HEATING AND COOLING EQUIPMENT SIZING

UNIT	MAXIMUM PERCENTAGE OVESIZING [a,b]	CLIMATE ZONE	MINIMUM EFFICIENCY & TEST PROCEDURES
Air Conditioners	15%	ALL	Air Cooled: AHRI 210/240
Multi-speed[c] Air-Source Heat Pumps and Ground-Source Heat Pumps	15%	ALL	Air Cooled: AHRI 210/240 Water or Ground: AHRA/ASHRAE 13256-1
Single -speed Air-Source Heat Pumps and Ground Source Heat Pumps	15% 25%	1-3 ---- 4-8	Air Cooled: AHRI 210/240 Water or Ground: AHRA/ASHRAE 13256-1 Packaged: AHRI 310/380
All fuel-fired heating appliances	40%	ALL	DOE 10 CFR Part 430 or: Gas Fired: ANSI Z21.47 Oil Fired: UL 727

a. Equipment shall be sized in accordance with ACCA Manual J:
   1. Indoor and outdoor coils shall be matched for size;
   2. Outdoor temperatures shall be the 99.0% and 1.0% design temperatures as published in the ASHRAE Handbook of Fundamentals for the most representative city for which design temperature data are available, or other approved source;
   3. Indoor temperatures shall be 75 F for cooling and 72 F for heating;
   4. Infiltration rate shall be assumed as 0.00036 Specific Leakage Area (SLA).

b. Once the appropriate equipment size is determined, if that specific size does not exist, the next larger size of manufactured equipment shall be acceptable, regardless of the percentage listed.

c. Multi-speed units shall be permitted to exceed the listed percentage only to the cooling capacity necessary to control humidity levels.

3. Add new standard to Chapter 6 as follows:

ACCA Manual J 2006 Residential Load Calculation

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

N1103.6 Equipment sizing. Heating and cooling *equipment* shall be sized ~~as specified~~ in accordance with Section M1401.3 and Table N1103.6.

2. Add new table as follows:

TABLE N1103.6
HEATING AND COOLING EQUIPMENT SIZING

UNIT	MAXIMUM PERCENTAGE OVESIZING [a,b]	CLIMATE ZONE	MINIMUM EFFICIENCY & TEST PROCEDURES
Air Conditioners	15%	ALL	Air Cooled: AHRI 210/240
Multi-speed[c] Air-Source Heat Pumps and Ground-Source Heat Pumps	15%	ALL	Air Cooled: AHRI 210/240 Water or Ground: AHRA/ASHRAE 13256-1
Single -speed Air-Source Heat Pumps and Ground Source Heat Pumps	15% 25%	1-3 ---- 4-8	Air Cooled: AHRI 210/240 Water or Ground: AHRA/ASHRAE 13256-1 Packaged: AHRI 310/380
All fuel-fired heating appliances	40%	ALL	DOE 10 CFR Part 430 or: Gas Fired: ANSI Z21.47 Oil Fired: UL 727

a. Equipment shall be sized in accordance with ACCA Manual J:
   1. Indoor and outdoor coils shall be matched for size;

2. Outdoor temperatures shall be the 99.0% and 1.0% design temperatures as published in the ASHRAE Handbook of Fundamentals for the most representative city for which design temperature data are available, or other approved source;
3. Indoor temperatures shall be 75 F for cooling and 72 F for heating;
4. Infiltration rate shall be assumed as 0.00036 Specific Leakage Area (SLA).

b. Once the appropriate equipment size is determined, if that specific size does not exist, the next larger size of manufactured equipment shall be acceptable, regardless of the percentage listed.

c. Multi-speed units shall be permitted to exceed the listed percentage only to the cooling capacity necessary to control humidity levels.

3. Add new standards to Chapter 44 as follows:

AHRI

210/240—03 Unitary Air-Conditioning and Air-Source Heat Pump Equipment

310/380—93 Standard for Packaged Terminal Air-conditioners and Heat Pumps

AHRA/ASHRAE

13256-1 (2005) Water-source Heat Pumps—Testing and Rating for Performance—Part 1: Water-to-air and Brine-to-air Heat Pumps (ANSI/ASHRAE/IESNA 90.1-2004)

ANSI

Z21.47-03 Gas-Fired Central Furnaces

DOE

10 CFR Part 430, Subpart B,
Appendix E (1998) Uniform Test Method for Measuring the Energy Consumption of Water Heaters

UL

727—06 Oil-fired Central Furnaces

Reason: By establishing specific requirements in the IECC for proper equipment sizing, this proposal is an important part of the goal to increase the energy efficiency in the code. Equipment that is excessively oversized utilizes more energy and fails to properly condition the space. Research and survey data is limited, but typically indicates that air conditioning equipment may be over-sized by more than 50%, resulting in increased energy consumption and adverse impacts on energy use, comfort and moisture control. Moreover, oversizing of equipment can lead to unnecessary higher construction cost.

The current *IECC* and *IRC* energy chapter merely reference section M1401.3 of the IRC. Section M1401.3 then directs the user to ACCA Manual J. In response to this concern, this proposal specifically directs the user to Manual J and adds Manual J as a referenced standard to the IECC. Since Manual J is already an approved referenced standard in the *IRC*, we believe that adding the reference to a second I-code (IECC) is not an issue. Additionally, since the test procedures (AHRI 210/240, AHRI 310/380, AHRA/ASHRAE 13256-1, ANSI Z21.47, DOE 10 CFR Part 430, UL 727) are referenced standards that are used in Chapter 5 of the IECC, we believe that adding these references to a second I-code (IRC) should also not be an issue.

Current code language, in M1401.3, references ACCA Manual J for load calculation, but does not require that the installed equipment meet a required size. The new language sets a requirement and includes explicit information needed for consistent load calculations and installed equipment size. The actual installed equipment size may be oversized and installed at the next available manufactured size.

The proposed requirements are primarily based on limits that are suggested in ACCA Manual S, which states the following:

Cooling-only equipment should be sized so that the total cooling capacity does not exceed the total cooling load by more than 15%.

If heat pump equipment (air-source or water-source) is installed in a warm or moderate climate, the total cooling capacity should not exceed the total cooling load by more than 15%.

If heat pump equipment (air-source or water-source) is installed in a cold climate (where heating costs are a primary concern), the total cooling capacity can exceed the total cooling load by as much as 25%.

Furnace and boiler oversizing is not recommended because comfort may be compromised when a furnace or boiler short-cycles. The output capacity of the furnace or boiler must be greater than the design load, but no more than 40% larger than the design heating load.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ACCA-06, AHRI 210/240, 310/380, AHRA/ASHRAE 13256-1, ANSI Z21.47, DOE 10 CFR Part 430, UL 727, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-25-403.6-N1103.6

EC122–09/10
403.7 (New), 504.2.1 (New); IRC P2801.1.2 (New)

Proponent: Mike Ashley, CBO, Ashco Consulting & Supply, representing Edward L. Jackson

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IECC

Add new text as follows:

403.7 Hot water circulating system required. In group R 1, R 2, R 3, and R 4 occupancies, where the furthest fixture requiring hot water is greater than 8 feet (2438 mm) in developed pipe length from the outlet of the source of hot water, a hot water circulating system shall be installed on the hot water distribution system. The circulating system shall be designed to make hot water available in the hot water distribution system at point that is not greater than 8 feet (2438 mm) in developed pipe length from the fixture requiring hot water. The circulating system pump shall be controlled by an automatic switch. Where point-of-use water heaters are provided for fixtures, a hot water circulating system shall not be required.

504.2.1 Hot water circulating system required. In group R 1, R 2, R 3, and R 4 occupancies, where the furthest fixture requiring hot water is greater than 8 feet (2438 mm) in developed pipe length from the outlet of the source of hot water, a hot water circulating system shall be installed on the hot water distribution system. The circulating system shall be designed to make hot water available in the hot water distribution system at point that is not greater than 8 feet (2438 mm) in developed pipe length from the fixture requiring hot water. The circulating system pump shall be controlled by an automatic switch. Where point-of-use water heaters are provided for fixtures, a hot water circulating system shall not be required.

PART II – IRC-P

Add new text as follows:

P2801.1.2 Hot water circulating system required. Where the furthest fixture requiring hot water is greater than 8 feet (2438 mm) in developed pipe length from the outlet of the source of hot water, a hot water circulating system shall be installed on the hot water distribution system. The circulating system shall be designed to make hot water available in the hot water distribution system at point that is not greater than 8 feet (2438 mm) in developed pipe length from the fixture requiring hot water. The circulating system pump shall be controlled by an automatic switch. Where point-of-use water heaters are provided for fixtures, a hot water circulating system shall not be required.

Reason: Water conservation and energy savings: To date studies have evaluated the water savings potential of instant hot water recirculation systems can result of water savings of up to 40 gallons per day or 15,000 gallons per year. This study utilized a set of assumptions about average plumbing layout, size and water use habits of the household. Mathematical formulas and methodologies were then applied to calculate potential water and energy savings derived from the recirculation systems.

Cost Impact: Average cost of the recirculation pump is $350.00 average water and sewer related saving in yearly cost is $400.00. Water saved 15,000 gallons per household.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Ashley-EC-1-504.2.1 & RP2801.1.2

EC123–09/10
403.7 (New); IRC N1103.3 (New)

Proponents: Brian Dean, ICF International; Don Vigneau, Northeast Energy Efficiency Partnerships

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Add new text as follows:

403.7 Space heating equipment (Mandatory). Electric resistance heating shall not be used for space heating. This includes but is not limited to: electric space heaters, electric furnaces, electric baseboard heaters, electric wall heaters, and electric thermal storage.

Exceptions:

1. Electric resistance heating may be installed in dwelling units with separate zone controls for spaces not exceeding 500 square feet in area, each controlled by an individual thermostat, where:
   - 1.1. Located in a county with less than 500 heating degree days (HDD); or
   - 1.2. Located in a county with less than 1,500 HDD and containing less than 1,000 square feet total conditioned floor area; or
   - 1.3. The dwelling unit has a peak heating rate not more than 6.8 Btu/h-ft2 or 2 Watt/ft2 and is located in any climate zone.
2. Where electric resistance heating is used for air-to-air heat pump supplementary heat in climate zones 1, 2, 3 and 4, excluding 4 Marine.
3. Portable plug-in temporary heaters.

(Renumber subsequent sections)

PART II – IRC ENERGY

Add new text as follows:

N1103.3 Space heating equipment. Electric resistance heating shall not be used for space heating. This includes but is not limited to: Electric Space Heaters, electric furnaces, electric baseboard heaters, electric wall heaters, and electric thermal storage.

Exceptions:

1. Electric resistance heating may be installed in dwelling units with separate zone controls for spaces not exceeding 500 square feet in area, each controlled by an individual thermostat, where:
   - 1.1. Located in a county with less than 500 heating degree days (HDD); or
   - 1.2. Located in a county with less than 1,500 HDD and containing less than 1,000 square feet total conditioned floor area; or
   - 1.3. The dwelling unit has a peak heating rate not more than 6.8 Btu/h-ft2 or 2 Watt/ft2 and is located in any climate zone.
2. Where electric resistance heating is used for air-to-air heat pump supplementary heat in Climate Zones 1, 2, 3 and 4, excluding 4 Marine.
3. Portable plug-in temporary heaters.

Reason: Electric resistance heating is very expensive to operate for a home owner compared to other heating sources. While the DOE states that there are some climates where heat pump heating may not be preferable to electric resistance heating, analysis shows that are very few locations where the savings is less than $100 per year given recent energy prices for a 2000 SF code minimum home. In the table below, it can be seen that homes with very small heating loads with heating degree days less than 250 are the only cases where annual savings from upgrading to a heat pump are less than $100. Therefore the increased cost of heat pump equipment is well worth the investment throughout most of the country.

HDD	City	Electric Resistance	Heat Pump (7.7 HSPF)	Savings
0	Honolulu, HI	$ 0	$ 0	$ 0
0	Hilo, HI	$ 0	$ 0	$ 0
200	Key West, FL	$ 13	$ 4	$ 9
62	Miami, FL	$ 33	$ 12	$ 21
236	W. Palm Beach, FL	$ 59	$ 24	$ 35
697	Tampa, FL	$ 201	$ 82	$ 119
609	Brownsville, TX	$ 217	$ 82	$ 135
1755	Daytona Beach, FL	$ 238	$ 95	$ 142
1437	Phoenix, AZ	$ 277	$ 113	$ 164
884	Corpus Christi, TX	$ 300	$ 118	$ 182
871	Tucson, AZ	$ 388	$ 167	$ 221
1554	Jacksonville , FL	$ 443	$ 195	$ 248
2100	Tallahassee, FL	$ 571	$ 269	$ 302
1308.5	Long Beach, CA	$ 552	$ 197	$ 354
2293	Las Vegas, NV	$ 699	$ 302	$ 397

Source: ICF International analysis with Beacon powered by DOE2.1e

This chart shows the basis for an exception for electric resistance heat in Zone 1 and an exception for air-to-air heat pumps in Zones 2, 3 & 4.

http://www.energysavers.gov/your_home/space_heating_cooling/index.cfm/mytopic=12520
DOE Reference:

> "Electric resistance heating converts nearly 100% of the energy in the electricity to heat. However, most electricity is produced from oil, gas, or coal generators that convert only about 30% of the fuel's energy into electricity. Because of electricity generation and transmission losses, electric heat is often more expensive than heat produced in the home or business using combustion appliances, such as natural gas, propane, and oil furnaces. If electricity is the only choice, heat pumps are preferable in most climates, as they easily cut electricity use by 50% when compared with electric resistance heating."

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DEAN-VIGNEAU-EC-1-403.7-N1103.3.DOC

EC124–09/10

403.9, 403.9.1, 403.9.2, 403.9.3; IRC N1103.8, N1103.8.1, N1103.8.2, N1103.8.3

Proponent: Ronald Majette, representing US Department of Energy

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

403.9 Pools, hot tubs and spas (Mandatory). Pools, hot tubs and spas shall ~~be provided with energy-conserving measures in accordance~~ shall comply with Sections 403.9.1 through 403.9.3.

403.9.1 ~~Pool~~ Heaters. All ~~pool~~ heaters shall be equipped with a readily *accessible* on-off switch to allow shutting off the heater without adjusting the thermostat setting. ~~Pool~~ Heaters fired by natural or LP gas shall not have continuously burning pilot lights.

403.9.2 Time switches. Time switches that can automatically turn off and on heaters and pumps according to a preset schedule shall be installed on ~~swimming pool~~ heaters and pumps.

Exceptions:

1. Where public health standards require 24-hour pump operation.
2. Where pumps are required to operate solar- and waste-heat-recovery ~~pool heating~~ systems.

403.9.3 ~~Pool~~ Covers. Heated pools, hot tubs and spas shall be ~~equipped~~ provided with a vapor-retardant ~~pool~~ cover ~~on or at the water surface~~. Pools, hot tubs and spas capable of being heated to more than 90°F (32°C) shall ~~have a pool~~ be provided with a cover ~~with~~ having a minimum insulation value of R-12.

~~**Exception:** Pools deriving over 60 percent of the energy for heating from site-recovered energy or solar energy source.~~

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1103.8 Pools, hot tubs and spas (Mandatory). Pools, hot tubs and spas shall ~~be provided with energy conserving measures in accordance~~ comply with Sections N1103.8.1 through N1103.8.3.

N1103.8.1 ~~Pool~~ Heaters. All ~~pool~~ heaters shall be equipped with a readily *accessible* on-off switch to allow shutting off the heater without adjusting the thermostat setting. ~~Pool~~ Heaters fired by natural or LP gas shall not have continuously burning pilot lights.

N1103.8.2 Time switches. Time switches that can automatically turn off and on heaters and pumps according to a preset schedule shall be installed on ~~swimming pool~~ heaters and pumps.

Exceptions:

1. Where public health standards require 24-hour pump operation.
2. Where pumps are required to operate solar- and waste-heat-recovery ~~pool heating~~ systems.

N1103.8.3 ~~Pool~~ Covers. Heated pools, hot tubs and spas shall be ~~equipped~~ provided with a vapor-retardant ~~pool~~ cover ~~on or at the water surface~~. Pools, hot tubs and spas capable of being heated to more than 90°F (32°C) shall ~~have a pool~~ be provided with a cover ~~with~~ having a minimum insulation value of R-12.

~~**Exception:** Pools deriving over 60 percent of the energy for heating from site-recovered energy or solar energy source.~~

Reason: Clarification. The current text does not apply to hot tubs and spas and it should. The text has been revised to address that issue. LP gas has been added for consistency with the current text in IECC Chapter 5. The text in 403.9.3 has been revised to be applied during inspection prior to approval of the subject pool, hot tub or spa. As written one could interpret the requirements as enforceable after a use permit has been issued. It is not likely code officials could nor would want to enforce the cover provisions in a post-occupancy condition as suggested by the current text. The exception for solar or site recovered energy has been eliminated simply because there is no rationale why a pool, hot tub or spa getting 39% of its energy from non-renewables should not be exempt and one getting 41% from renewable should. Also how is this provision even determined in plan review and capable of being readily enforced.

Cost Impact: The proposed code change will not increase the cost of construction other than pools that were heated with solar or site recovered energy systems will now require the use of a pool cover.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-77-403.9-IRC N1103.8

EC125–09/10
403.10 (New); IRC N1103.9 (New)

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. AND PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Add new text as follows:

403.10 Fireplace systems (Mandatory). Fireplace systems shall not have continuously burning pilot lights.

PART II – IRC BUILDING/ENERGY

Add new text as follows:

N1103.9 Fireplace systems. Fireplace systems shall not have continuously burning pilot lights.

Reason: This language is consistent with the ban on continuously burning pilot lights for pool heaters currently in the *IECC*. Under a recent US Department of Energy rulemaking, residential gas cooking equipment will also not be allowed to have continuously burning pilot lights.

According to the Hearth, Patio, and Barbecue Association, between 1.0 and 2.1 million gas fireplace / hearth systems are shipped to North America every year (about 54 to 69% of total hearth shipments. See http://www.hpba.org/index.php?id=238 for more details). Many of these units are shipped to new homes with pilot lights that are only capable of burning continuously, ranging from 800 to 1,200 Btu's per hour. For a fireplace that has a pilot light using 1,000 Btu/hr, and is in "standby" mode for 8000 hours per year (fireplace is used 5 hours per day for 150 days of the year), the pilot light uses 8 million Btu's, or 80 therms. At a national average cost of $1.20 per therm, the cost to a typical consumer is $96 per year.

As a reference point, according to AGA Gas Facts 2007, a typical gas range uses about 55 therms per year, and a typical clothes dryer uses about 50 therms per year (Table 10-1, page 78). In fact, according to the AGA publication, in the Pacific region of the US, residential natural gas fireplaces use almost as much energy (20.8 Mcf) as residential natural gas water heaters (21.3 Mcf).

Significant energy savings are available with current technology. With advanced controls (electronic spark ignition, for example), the standby energy losses are eliminated, and the average consumer saves at least $96, based on the example shown.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-26-403.10-N1103.9

EC126–09/10

202 (New), 403.11 (New), Table 405.5.2(1); IRC R202 (New), N1103.10 (New)

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Revise definition as follows:

ENERGY RECOVERY VENTILATION SYSTEM. Systems that employ air-to-air heat exchangers to recover energy from exhaust air for the purpose of preheating, precooling, humidifying or dehumidifying outdoor ventilation air prior to supplying the air to a space, either directly or as part of an HVAC system. Such systems include equipment referred to as an "energy recovery ventilator" (ERV) or as a "heat recovery ventilator" (HRV).

2. Add new definition as follows:

SPECIFIC LEAKAGE AREA (SLA). The air leakage area (L) per conditioned floor area (CFA) of a home (L/CFA), where leakage area (L) is defined in accordance with section 5.1 of ASHRAE 119 and where L and CFA are in the same units.

3. Add new text as follows:

403.11 *Energy recovery ventilation system* and air leakage supplemental requirements. The building shall meet the following the requirements:

1. An *energy recovery ventilation system* shall be installed. For warm humid counties as identified in Table 301.1, a dehumidifier with a built in humidistat shall be installed in addition to the *energy recovery ventilation system*.
2. Building air leakage shall be tested in accordance with the procedure prescribed in Section 402.4.2.1, except that the air leakage shall not exceed 0.00015 *specific leakage area (SLA)* for all buildings except multifamily, which shall not exceed 0.00018 *specific leakage area (SLA),* when tested with a blower door at a pressure of 33.5 psf (50 Pa) by an *approved* party independent of the builder and any contractors involved in any aspect of sealing the building.

   Exceptions:

   1. Buildings located in climate zones 1 or 2 with installed cooling equipment with an efficiency that exceeds prevailing federal minimum standards by at least 20% and meets or exceeds 12.5 EER.
   2. Buildings located in climate zones 3, 4 or 5 with installed heating and cooling equipment with an efficiency that exceeds prevailing federal minimum standards by at least 15% and cooling equipment that meets or exceeds 12.5 EER.
   3. Buildings located in climate zones 6, 7 or 8 with installed heating equipment with an efficiency that exceeds prevailing federal minimum standards by at least 20%.
   4. In the event the heating or cooling equipment specified in the exception applicable to a particular climate zone above is not commercially available, the equipment with the highest rated efficiency commercially available can be substituted, when *approved* by the *code official*,
   5. As an alternative to the heating equipment specified in Exceptions 2 and 3 above, a ground source heat pump with an efficiency of greater than or equal to 2.8 COP and 13 EER may be installed.

4. Revise table as follows:

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Air Exchange Rate	*Specific leakage area (SLA)*[d] = 0.0001536 ~~assuming no energy recovery.~~ with a 70% efficient *energy recovery ventilation system*. Exceptions: 1. For multifamily buildings, the specific leakage area shall be 0.00018 with a 70% efficient *energy recovery ventilation system*. 2. For buildings subject to the exceptions in section 403.11, SLA = 0.00030, assuming no energy recovery.	~~For residences that are not tested, the same as the standard reference design.~~ *Specific Leakage Area (SLA)* = the tested value for the proposed home and the tested value shall be in determined accordance with the methodology set out in section 402.4.2.1 and the ASHRAE 119, Section 5.1 and the SLA shall be: 1. For residences without mechanical ventilation ~~that are tested in accordance with ASHRAE 119, Section 5.1,~~ the measured air exchange rate[e] but not less than 0.35 ACH. 2. For residences with mechanical ventilation that is not an *energy recovery ventilation system* ~~that are tested in accordance with ASHRAE 119, Section 5.1,~~ the measured air exchange rate[e] combined with the mechanical ventilation rate, *f* which shall not be less than 0.01 x *CFA* + 7.5 x (N_{br} + 1) where: *CFA* = conditioned floor area N_{br} = number of bedrooms 3. For residences with *energy recovery ventilation systems*, the efficiency of the energy or heat recovery ventilation system shall be as proposed.

~~d. Where leakage area (L) is defined in accordance with Section 5.1 of ASHRAE 119 and where:~~

~~SLA = L/CFA~~
~~where L and CFA are in the same units.~~

(Portions of table and footnotes not shown remain unchanged)

PART II – IRC BUILDING/ENERGY

1. Add new definitions as follows:

ENERGY RECOVERY VENTILATION SYSTEM. Systems that employ air-to-air heat exchangers to recover energy from exhaust air for the purpose of preheating, precooling, humidifying or dehumidifying outdoor ventilation air prior to supplying the air to a space, either directly or as part of an HVAC system. Such systems include equipment referred to as an "energy recovery ventilator" (ERV) or as a "heat recovery ventilator" (HRV).

SPECIFIC LEAKAGE AREA (SLA). The air leakage area (L) per conditioned floor area (CFA) of a home (L/CFA), where leakage area (L) is defined in accordance with Section 5.1 of ASHRAE 119 and where L and CFA are in the same units.

2. Add new text as follows:

N1103.10 *Energy recovery ventilation system* and air leakage supplemental requirements. The building shall meet the following the requirements:

1. An *energy recovery ventilation system* shall be installed. For warm humid counties as identified in table N1101.2, a dehumidifier with a built in humidistat shall be installed in addition to the *energy recovery ventilation system*.
2. Building air leakage shall be tested in accordance with the procedure prescribed in Section N1102.4.2.1, except that the air leakage shall not exceed 0.00015 *specific leakage area (SLA)* for all buildings except multifamily, which shall not exceed 0.00018 *specific leakage area (SLA),* when tested with a blower door at a pressure of 33.5 psf (50 Pa) by an *approved* party independent of the builder and any contractors involved in any aspect of sealing the building.

   Exceptions:

   1. Buildings located in climate zones 1 or 2 with installed cooling equipment with an efficiency that exceeds prevailing federal minimum standards by at least 20 percent and meets or exceeds 12.5 EER.
   2. Buildings located in climate zones 3, 4 or 5 with installed heating and cooling equipment with an efficiency that exceeds prevailing federal minimum standards by at least 15 percent and cooling equipment that meets or exceeds 12.5 EER.
   3. Buildings located in climate zones 6, 7 or 8 with installed heating equipment with an efficiency that exceeds prevailing federal minimum standards by at least 20 percent.
   4. In the event the heating or cooling equipment specified in the exception applicable to a particular climate zone above is not commercially available, the equipment with the highest rated efficiency commercially available can be substituted, when *approved* by the *building official*,
   5. As an alternative to the heating equipment specified in Exceptions 2 and 3 above, a ground source heat pump with an efficiency of greater than or equal to 2.8 COP and 13 EER may be installed.

Reason: There is significant energy savings potential in homes through tested air leakage improvements with energy recovery ventilation equipment or though having higher efficiency equipment. This proposal creates a trade-up opportunity, where a home can achieve significant savings through either the primary requirements or the exceptions. This proposal also makes necessary changes to Table 405.4.2(1) of the IECC to incorporate the effects of this proposal into the Simulated Performance Alternative in Section 405.

For the primary requirements, this proposal achieves significant savings from tested air leakage improvements with energy recovery equipment. These base requirements achieve approximately 12-17% estimated heating and cooling energy savings or approximately 5 to 12% purchased energy savings (including appliances and lighting) depending on the location and home specifications.

One of the key criteria in the primary requirements is to install an energy recovery ventilation system (either ERV or HRV). This is critical for achieving energy savings from a tight home. Without the energy recovery ventilation system, no home or program can claim energy savings credit for substantially tight homes. Therefore, by tightening the house to levels that many houses today are already tightening them (0.00015), minimal to no savings are achieved depending on the location. However, by installing the energy recovery ventilator energy savings between $100-300 per year are achieved depending on the climate. The most savings are achieved in the coldest climates due to the extreme temperature difference between the inside and outside temperatures.

The exception has reasonable and sensible equipment requirements that can achieve approximately 10-16% heating and cooling energy savings or approximately 5-11% purchased energy savings depending on location and home specifications. Example specifications for the exemption include:

>15.6 SEER and 12.5 EER AC in Climate Zone 1 & 2
with available equipment up to 23 SEER
includes 46,375 records from AHRI directory of air conditioning equipment available

>14.95 SEER and 12.5 EER AC in Climate Zone 3, 4 and 5
with available equipment up to 23 SEER
includes 101,899 records from AHRI directory of air conditioning equipment available

> 89.7 AFUE in Climate Zone 3, 4 and 5
with available equipment up to 96+ AFUE
includes 5,100 records from AHRI directory of furnace equipment available

> 93.6 AFUE in Climate Zone 6, 7 and 8
with available equipment up to 96+ AFUE
includes 1,339 records from AHRI directory of furnace equipment available

> 8.86 HSPF in Climate Zone 3, 4 and 5
with available equipment up to 11 HSPF
includes 27,310 records from AHRI directory of heat pump equipment available

> 9.24 HSPF in Climate Zone 6, 7 and 8
with available equipment up to 11 HSPF
includes 9,051 records from AHRI directory of heat pump equipment available

In addition to having the improved efficiency requirement beyond federal minimum standards, this proposal also has improved EER rating in the exception that will ensure higher performance in peak temperature hours. Per ACEEE, for utilities, reducing peak demand is worth somewhere in the range of $1000/kW. That is an estimate of the costs avoided by not building new peak generation, plus the required reinforcements of transmission and distribution. In many cases, capacity constraints for the foreseeable future make avoiding peak demand even more valuable than saving energy. For a 3-ton central air conditioner the difference between EER 11.5 and EER 12 is about 0.13 kW on a 95ºF day. This difference is much of the justification for rebates in CA, for example, since by itself a 0.13 kW peak reduction is worth roughly $130. *(source: ACEEE)*

The exception that allows for ground source heat pumps (GSHP) with efficiency greater than or equal to 2.8 COP to be installed in climates 3 through 8, is based on DOE recommendations, while FEMP recommends GSHP efficiency levels of 3.3 COP of higher. It is also important to point out that maximum efficiency for GSHP are closer to 5 COP.
Source: http://www.energysavers.gov/your_home/space_heating_cooling/index.cfm/mytopic=12670
Source: http://www1.eere.energy.gov/femp/procurement/eep_groundsource_heatpumps.html

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-27-202-403.11-R202-N1103.10

EC127–09/10
404.1; IRC N1104.1

Proponent: Krista Braaksma, representing Washington State Building Code Council

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

404.1 Lighting equipment (Prescriptive). A minimum of 50 percent of the ~~lamps in~~ permanently installed ~~lighting fixtures~~ luminaires shall be high-efficacy ~~lamps~~ type.

PART II – IRC BUILDING/ENERGY

1104.1 Lighting equipment. A minimum of 50 percent of the ~~lamps in~~ permanently installed ~~lighting fixtures~~ luminaires shall be high-efficacy ~~lamps~~ type.

Reason: The current provision in effect requires use of Compact Fluorescent Lamps, which are not best for all applications and, when forced, result in refit/regression and hampered consumer acceptance. Market and industry data point to the need for alternative solutions to achieve the use of high-efficiency lighting and/or lighting controls.

Codes, to be effective, must be enforceable and sustainable in the long term. The enforcement community is already understaffed and overworked, and the current national and local situation means that the situation will not improve in the foreseeable future. State, city and county building departments as well are too understaffed to take on the additional responsibilities of counting lamps.

Cost Impact: The code change proposal will increase the cost of construction

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BRAAKSMA-EC-2-404.1

EC128–09/10
404.1

Proponent: Joseph Hill, RA, representing the New York State Department of State

Revise as follows:

404.1 Lighting equipment ~~(Prescriptive).~~ (Mandatory). A minimum of 50 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps.

Reason: Per Section 401, Compliance with the Energy Code is relegated to either *Prescriptive*, or *Performance* methodologies. Since there are no similar considerations within Section 405 Simulated *Performance Alternative for* high efficacy lamping, *Section 404.1 Lighting equipment,* the requirements for 50 percent high-efficacy lamps should be made mandatory for the continuity of the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HILL-EC-3-404.1

EC129–09/10
404.1; IRC R202 (New), N1104.1

Proponent: Ronald Majette, representing US Department of Energy

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

404.1 Lighting equipment (Prescriptive). A minimum of ~~50~~ seventy-five percent of the lamps in permanently installed lighting fixtures shall be high efficacy lamps or a minimum of seventy-five percent of the permanently installed lighting fixtures shall contain only high efficacy lamps.

Exception: Low-voltage lighting.

PART II – IRC BUILDING/ENERGY

1. Add new definition as follows:

LOW-VOLTAGE LIGHTING. Lighting equipment powered through a transformer such as a cable conductor, a rail conductor and track lighting.

2. Revise as follows:

N1104.1 Lighting equipment. A minimum of ~~50~~ seventy-five percent of the lamps in permanently installed lighting fixtures shall be high efficacy lamps or a minimum of seventy-five percent of the permanently installed lighting fixtures shall contain only high efficacy lamps.

Exception: Low-voltage lighting.

Reason: As reported from the Partnership for Advancing Technology in Housing program high efficacy lamps (e.g., CFL's) are up to four times as efficient and last up to 10 times as long as incandescent bulbs. A 22-watt CFL has about the same light output as a 100-watt incandescent. CFL's use 50 to 80 percent less energy than incandescent bulbs. Standard incandescent bulbs have an average lifetime of 750 to 2500 hours, while CFLs last from 6,000 to 10,000 hours. Although initially more expensive, you save money in the long run because CFL's use 1/3 the electricity and last up to 10 times as long as incandescent bulbs. A single 18-watt CFL used in place of a 75-watt incandescent will save about 570 kWh over its lifetime. At 8 cents per kWh, that equates to a $45 savings for one bulb over its lifetime. Newer CFL's give a warm, inviting light instead of the "cool white" light of older fluorescents. These were reasons presented during the last code cycle for approving this requirement for 50% CFL's. The intent of this proposal is to expand the high-efficacy requirement to a larger fraction of the home's lighting, while giving additional flexibility to the builder by allowing the required high-efficacy percentage to be based on either a count of lamps or a count of fixtures.

Cost Impact: The code change proposal will increase the cost of construction to the extent that incandescent lamps are replaced with higher-cost high-efficacy lamps. However, federal law will greatly restrict the availability of incandescent lamps a short time after this code goes into effect; thereafter, this code will not increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-72-404.1-IRC R202-N1104.1

EC130–09/10
404.1; IRC N1104.1

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

Revise as follows:

404.1 Lighting equipment (Mandatory) ~~(Prescriptive)~~. A minimum of ~~50~~ 60 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps.

PART II – IRC BUILDING/ENERGY

Revise as follows:

N1104.1 Lighting equipment. A minimum of ~~50~~ 60 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps.

Reason: This proposal is meant to bring increased consistency between the performance and prescriptive path of compliance in the IECC, by requiring all homes no matter what compliance method, to meet this requirement. There is no reason why buildings complying under the

performance path should not meet the same requirement, since lighting is currently not included in the simulated performance alternative analysis. This minimum lighting requirement is a cost effective and smart requirement for all homes.

In addition, this proposal has modest increased requirements for the amount of high efficacy lighting that is required in a home. Under U.S. Department of Energy rulemakings and federal legislation, the efficiency standards for general service fluorescent, general service incandescent, incandescent reflector lamps, and fluorescent lamp ballasts will increase in the next few years. More types of efficient lighting technologies, such as LED's, should be available by 2012, providing more options for builders to meet a higher percentage requirement.

This proposal gives the opportunity to have homes start with efficient lighting, even if the homeowners decide to change the lighting in the future. This proposal attempts to balance advancing energy efficiency with local adoption and enforcement issues and consumer backlash from having too high of a percent requirement. In addition, this proposal recognizes that while increased energy efficiency from lighting has the opportunity to save real energy in every home, non-permanent code lighting requirements also do not create permanent long term savings due to the relatively short life of a lamp, type and life of the light fixture and questions regarding the likelihood that a home owner will retain the efficient lamps over the life of the home. In addition, the lifetime savings of this code provision are estimated to be low due, since upcoming federal requirements are expected to require more efficient lighting anyway. This code proposal is simply helping to move American homes in the right direction with more efficient lighting which is simple and cost effective.

The cost of such lighting is minimal -- estimated to be about $20 per home depending on the number of permanently installed lighting fixtures.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-29-404.1-N1104.1

EC131–09/10

202 (New), 403.5, 404 (New), Table 405.5.2(1), Chapter 6; IRC R202 (New), N1103.5, N1104 (New), Chapter 44 (New)

Proponent: Craig Conner, Building Quality, representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IECC

1. Add new definitions as follows:

DESUPERHEATER/WATER HEATER. A factory-made assembly of elements by which the flows of refrigerant vapor and water are maintained in such heat transfer relationship that the refrigerant vapor is desuper-heated and the water is heated. A water circulating pump may be included as part of the assembly.

FURNACE ELECTRICITY RATIO. The ratio of furnace electricity use to total furnace energy computed as ratio = $(3.412*E_{AE})/(1000*E_F + 3.412*E_{AE})$, where E_{AE} (average annual auxiliary electrical consumption) and E_F (average annual fuel energy consumption) are defined in Appendix N to subpart B of part 430 of title 10 of the Code of Federal Regulations and E_F is expressed in millions of Btus per year.

2. Revise as follows:

403.5 Mechanical ventilation (Mandatory). The building shall be provided with ventilation that meets the requirements of Section M1507 of the *International Residential Code* or with other approved means of ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

All combustion equipment in new residences in Climate Zones 3 to 8 shall be direct vent or sealed combustion.

Exceptions: Stoves and ovens in kitchens with vents fireplaces that meet the applicable requirements of Section 402.

3. Add new text and tables as follows:

404. Equipment efficiency.

404.1 Heating equipment. New and replacement furnaces, boilers and heat pumps shall be a minimum of the efficiencies in Table 404.1.

Exception: Replacement of non-condensing furnaces.

Ground source heat pumps shall have a least the efficiency in Table 503.2.3(2). All-electric heated buildings in Climate Zones 3 through 8 shall utilize either an air-source or ground source heat pump.

TABLE 404.1
MINIMUM HEATING EQUIPMENT EFFICIENCY

ZONE	1 & 2	3 & 4	5 to 8
Gas furnace[a]	NR	90 AFUE	92 AFUE
Gas and oil boiler, oil furnace[a]	NR	85 AFUE	
Air source heat pump	NR	8.5 HSPF	

a. Furnaces in Climate Zones 3 through 8 shall have a furnace electricity ratio not greater than 2%.

404.2 Cooling equipment. New and replacement vapor compression air conditioners shall be a minimum of the efficiencies in Table 404.2. Ground source heat pumps shall have a minimum efficiency as specified in Table 503.2.3(2).

TABLE 404.2
MINIMUM COOLING EQUIPMENT EFFICIENCY

Zone	1 & 2	3 & 4	5 & 6	7 & 8
Air conditioner and Air source heat pump	SEER 16 EER 13	SEER 15 EER 12.5	SEER 14 EER 12.0	NR
Room air conditioner	11 EER < 20,000 Btu/hr 10 EER >= 20,000 Btu/hr			NR

404.3 Water heating. New and replacement gas water heaters shall be a minimum of 0.62 EF. New and replacement electric water heaters shall be a minimum of 0.95 EF.
Water heating in new homes shall include at least one of the following:

1. Desuperheater on a vapor compression air conditioner, heat pump, or ground source heat pump. The desuperheater shall be tested and listed in accordance with ARI 470 and connected to the hot water storage tank.
2. Electric water heater with a minimum of 2.0 EF.
3. Solar water heating system having a minimum Solar Fraction of 0.30 when tested in accordance with OG-300.
4. Gas water heater with a minimum of 0.80 EF.
5. Water heating provided by a ground source heat pump.
6. Tankless coil with a boiler with a minimum of 85 AFUE.

4. Revise as follows:

SECTION ~~405~~ 406
SIMULATED PERFORMANCE ALTERNATIVE
(Performance)

TABLE ~~405.5.2(1)~~ 406.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Heating systems[~~g, h~~, i]	~~As Proposed~~ Fuel type: same as proposed design Efficiencies as specified by Section 404.1: Electric: air-source heat pump Nonelectric furnaces: natural gas furnace Nonelectric boilers: natural gas boiler Capacity: sized in accordance with Section M1401.3 of the *International Residential Code*	~~As proposed~~ As proposed As proposed As proposed
Cooling systems[~~g, i~~h, j]	~~As Proposed~~ Fuel type: Electric Efficiencies as specified by Section 404.2: Capacity: sized in accordance with Section M1401.3 of the *International Residential Code*	~~As Proposed~~ As proposed As proposed As proposed
Service Water Heating[~~g, j, i~~, h, k]	~~As Proposed~~ Fuel type: same as proposed design for non-solar water heating. Where proposed design includes solar water heating, the standard reference shall include the equivalent capacity with fuel type same as the non-solar water heating. Efficiencies as specified by Section 404.3: Use: gal/day=30 + (10 x *Nor*) ~~Same as proposed design~~	~~As Proposed~~ As proposed As proposed Same as standard reference ~~Use: gal/day=30 + (10 x *Nor*)~~

(Portions of table and footnotes not shown remain unchanged)

5. Add new standards to Chapter 6 as follows:

AHRI
470-06 Performance Rating of Desuperheater/Water Heaters
SRCC
OG-300 Operating Guidelines and Minimum Standards for Certifying Solar Water Heating Systems

PART II – IRC ENERGY

1. Add new definitions as follows:

DESUPERHEATER/WATER HEATER. A factory-made assembly of elements by which the flows of refrigerant vapor and water are maintained in such heat transfer relationship that the refrigerant vapor is desuper-heated and the water is heated. A water circulating pump may be included as part of the assembly.

FURNACE ELECTRICITY RATIO. The ratio of furnace electricity use to total furnace energy computed as ratio = $(3.412*E_{AE})/(1000*E_F + 3.412*E_{AE})$, where E_{AE} (average annual auxiliary electrical consumption) and E_F (average annual fuel energy consumption) are defined in Appendix N to subpart B of part 430 of title 10 of the Code of Federal Regulations and E_F is expressed in millions of Btus per year.

2. Revise as follows:

N1103.5 Mechanical ventilation. The building shall be provided with ventilation that meets the requirements of Section M1507 or with other approved means of ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

All combustion equipment in new residences in Climate Zones 3 through 8 shall be direct vent or sealed combustion.

Exceptions: Stoves and ovens in kitchens with vents fireplaces that meet the applicable requirements of Section 402.

3. Add new text and tables as follows:

N1104. Equipment efficiency.

N1104.1 Heating equipment. New and replacement furnaces, boilers and heat pumps shall have at least the efficiencies in Table N1104.1.

Exception: Replacements for non-condensing furnaces.

Ground source heat pumps shall have a least the efficiency in IECC Table 503.2.3(2). All-electric heated buildings in Climate Zones 3 through 8 shall utilize either an air-source or ground source heat pump.

TABLE N1104.1
MINIMUM HEATING EQUIPMENT EFFICIENCY

ZONE	1 & 2	3 & 4	5 to 8
Gas furnace[a]	NR	90 AFUE	92 AFUE
Gas and oil boiler, oil furnace[a]	NR	85 AFUE	
Air source heat pump	NR	8.5 HSPF	

a. Furnaces in zones 3 to 8 shall have a furnace electricity ratio not greater than 2%.

N1104.2 Cooling equipment. New and replacement vapor compression air conditioners shall a minimum of the efficiencies in Table N1104.2. Ground source heat pumps shall have a minimum efficiency as specified in Table 503.2.3(2) of the *International Energy Conservation Code*.

TABLE N1104.2
MINIMUM COOLING EQUIPMENT EFFICIENCY

ZONE	1 & 2	3 & 4	5 & 6	7 & 8
Air conditioner and Air source heat pump	SEER 16 EER 13	SEER 15 EER 12.5	SEER 14 EER 12.0	NR
Room air conditioner	11 EER < 20,000 Btu/hr 10 EER >= 20,000 Btu/hr			NR

N1104.3 Water heating. New and replacement gas water heaters shall be a minimum of 0.62 EF. New and replacement electric water heaters shall be a minimum of 0.95 EF.

Water heating in new homes shall include at least one of the following:

1. Desuperheater on a vapor compression air conditioner, heat pump, or ground source heat pump. The desuperheater shall be tested and listed in accordance with ARI 470 and connected to the hot water storage tank.
2. Electric water heater with a minimum of a 2.0 EF.
3. Solar water heating system with a minimum Solar Fraction of 0.30 when tested in accordance with OG-300.
4. Gas water heater with a minimum of 0.80 EF.
5. Water heating provided by a ground source heat pump.
6. Tankless coil with a boiler with a minimum of 85 AFUE.

4. Add new standards to Chapter 44 as follows:

AHRI
470-06 Performance Rating of Desuperheater/Water Heaters

SRCC
OG-300 Operating Guidelines and Minimum Standards for Certifying Solar Water Heating Systems

Reason: Energy efficient buildings need high efficiency equipment. Inevitably the least costly and most effective designs for high efficiency buildings will include high efficiency heating, cooling, and water heating equipment, as well as insulation, air tightness, efficient windows, efficient lighting, etc. Many of the envelope measures are reaching a point of diminishing returns. The biggest group of remaining cost-effective opportunities that are in energy efficient equipment.

Historically Federal law (National Appliance Energy Conservation Act and others) has preempted any ability to specify higher efficiency for most equipment in the building codes. This change presumes the Federal restriction has been lifted as is currently proposed in congressional legislation.

Equipment efficiency affects existing residences too. Because equipment is replaced in existing residences, specifying high efficiency equipment achieves a much higher level of energy savings both on a per residence basis and in aggregate nationally. Although replacement

equipment doesn't usually involve a permit, a jurisdiction's requirement that replacement equipment have a specific level of efficiency is likely to be met by those supply and installing replacement equipment.

For heating and cooling this proposal sets levels based on the Consortium for Energy Efficiency (CEE) and Energy Star. CEE and Energy Star levels of efficiency result from substantial discussion and process. Energy Star is the best-known name in energy efficiency. CEE is a collaborative effort of utilities, environmental groups, and industry. CEE establishes energy efficiency "Tiers" after examining what is practical and available.

Equipment manufacturers do not want a patchwork of varying equipment requirements. Manufacturers legitimately desire large areas of uniform requirements. Large areas of uniform requirements are created by having multiple climate zones require the same equipment efficiency. Specifying large areas with a uniform equipment requirement results in lower cost equipment efficiency because the economics of scale in manufacturing and distributing mean lower cost efficiency is available due to large-scale production.

This change proposes a minimum gas furnace efficiency of 92 AFUE (CEE Tier II) in the northern zones and a minimum 90 AFUE (CEE Tier I, Energy Star) in zones 3 and 4.

In 2006 DOE completed an analysis of furnace efficiency options as part of a furnace rulemaking[1]. DOE's analysis determined that the higher AFUE furnaces were the most cost-effective in the mid/northern US and in new homes. Unfortunately DOE did not have the authority to set separate standards in the north or for new homes, and choose a disappointing 80 AFUE for most furnaces. Since the DOE furnace rule making natural gas prices have increased well beyond projections and the incremental cost of higher efficiency furnaces has decreased. The trends towards more expensive fuel and lower cost efficient equipment combine to make equipment efficiency more cost-effective. These same long-term trends towards higher fuel costs and lower incremental costs for efficient equipment also makes cooling and water heating efficiency more cost effective.

Condensing furnaces (90 AFUE and up) and non-condensing furnaces use significantly different venting. Condensing furnaces typically use a short horizontal plastic pipe, while non-condensing furnaces need a chimney. In new construction condensing furnaces are actually cheaper to vent than non-condensing furnaces. DOE estimated that in new homes the less expensive condensing furnace venting saves $138 (TSD, page 6-34, Table 6.5.7)[1].

The increased costs of a 90 AFUE furnace are between $500 and $1000[2,3]. After taking credit for reduced venting costs, a typical cost might be $700 to $800. The incremental cost of going from 90 to 92 AFUE is harder to estimate, but probably small since much of the equipment around 90 AFUE is actually closer to 92 AFUE.

Replacement of non-condensing furnaces with condensing furnaces can be significantly more expensive due to the need for an expensive chimney modification. Therefore, this proposal allows existing non-condensing furnaces to be replaced by non-condensing furnaces.

Gas-fired boilers requirements are set based on the Energy Star and CEE level of 85 AFUE. Oil furnaces are based on the Energy Star level of 85 AFUE. Currently there are not sufficient condensing gas boilers and oil heaters in the market to set the requirement above 85 AFUE.

This proposed change requires efficient fossil-fuel furnace fans. The fan blower motor accounts for most of fossil-fuel furnace electricity consumption, in some cases being the largest consumer of electricity in the household. Currently, no minimum efficiency requirement exists for furnace electricity use. The "furnace electricity ratio" specified in this proposal is based solely on efficiency information already provided by the manufacturers[4].

A simple payback for an efficient furnace fan motor can be estimated. Most furnace blowers use a permanent split capacitor (PSC) motor. The efficiency level proposed here is likely to be achieved using a brushless permanent magnet (BPM) motor also called an electronically commutated motor (ECM). Many furnaces with these efficient fans are available in the market today. A simple payback can be estimated from DOE's recent furnace rulemaking[1]. DOE estimated an annual energy savings of about 215 kwh per year (DOE TSD page 8.5-6), or about $21.5 per year for a BPM at $0.10/kwh. DOE estimated the cost of the new fan at about $213 (TSD page 6.4-2), perhaps decreasing by about 78% (TSD page 8.5-2) to about $166 by 2012 for a mature market costs. The simple payback would be about 8 years in a mature market. Estimated savings from other studies have been higher, as cited below[5]. Based on the cited estimates of savings the simple payback would be 3 to 8 years.

For cooling this change proposes CEE Tier III for zones 1 and 2, Tier II for zones 3 and 4, and Tier I for zones 5 and 6. The cost of a higher SEER varies, but is dropping. Some give the incremental cost of a SEER 16 as small as $500 for 13 to 16[6], although most prices would probably be closer to $1000 plus.

An EER (energy efficiency ratio) requirement is also proposed for cooling. EER is a term already used in chapter 5. The EER is a better indicator of performance in high temperatures that lead to utility peak loads. Specifying both a SEER and EER leads to equipment that performs well both seasonally and during peak loads.

Significantly increased water heating equipment efficiency is available. DOE's recent analysis of water heater options for Energy Star[7] yields favorable paybacks for many of these options. The base requirements for any new or existing water heating system have very favorable paybacks according to the DOE analysis[7]. The 0.62 gas water heater has an estimated cost increase of $70 with a payback of about 2.5 years. The 0.95 electric water heater has an estimated $50 cost with a payback of about 2 years. These two, the gas EF of 0.62 and electric EF of at least 0.95 are minimum for replacement of existing systems. For new homes one of the list of options is required. It is important that at least one of the options be cost-effective. The increased cost of the heat pump water heater is significant ($850) but the estimated payback is a quick 3 years. The gas 0.80 EF is achievable with a couple of options, a thankless water heater is the most common with an estimated cost increase of about $1100 and a payback of perhaps 10 years. The much less common condensing gas water heater was estimated at about $700 with a payback of about 7 years. Currently many major water heater manufacturers are introducing multiple new products, which will likely lower these prices and make efficient water heaters more available and more cost-effective.

Discussions with a water heater manufacturer indicated a strong request for requirements that were uniform nationally. Although the performance of some water heating options will vary with climate, these are uniform.

When the Federal restriction on equipment efficiency in the IECC is lifted, increased energy efficiency proposed here becomes the single largest source of energy efficiency available in the codes.

Notes:

1. U.S. DOE Federal Register Notice dated October 6, 2006. *Energy Conservation Program for Consumer Products: Energy Conservation Standards for Residential Furnaces and Boilers; Proposed Rule*, and its technical support document available at: http://www.eere.energy.gov/buildings/appliance_standards/residential/furnaces_boilers_1113_r.html
2. http://coolheatmechanical.com/tipsandinfo_biting_90_afue_bullet.shtml
3. http://www.greenhousing.umn.edu/factsheets/comp_heating.pdf
4. Consumers' Directory of Certified Efficiency Ratings. Gas Appliance Manufacture's Association.. http://www.gamanet.org/gama/inforesources.nsf/vContentEntries/Furnace+electrical+efficiency?OpenDocument
5. BPM Motors in Residential Gas Furnaces: What are the Savings? *James Lutz, Victor Franco, Alex Elko, and Gabrielle Wong-Parodi. Lawrence Berkeley National Laboratory, Berkeley, California.* LBNL-59866
6. http://www.consumersearch.com/central-air-conditioners/central-ac-pricing
7. ENERGY STAR® Residential Water Heaters: Final Criteria Analysis, April 1 2008. http://www.energystar.gov/ia/partners/prod_development/new_specs/downloads/water_heaters/WaterHeaterAnalysis_Final.pdf

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, AHRI 470-06 and SRCC OG-300, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IECC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CONNER-EC-7-202-404.1-3 - R202-N1104.1-3.DOC

EC132–09/10

405, 405.1, 405.1.1 (New), Table 405.5.2(1)

Proponent: Craig Conner, Building Quality, representing self

Revise as follows:

SECTION 405
SIMULATED PERFORMANCE ALTERNATIVE

405.1 Scope. This section establishes criteria for compliance using simulated energy performance analysis. Such analysis shall include heating, cooling, and service water heating energy only.

405.1.1 Performance level. Compliance with this section shall require the Proposed Design to be 10% more efficient than the Standard Reference Design.

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Heating systems[~~g, h~~, i]	~~As Proposed~~ Fuel type: same as proposed design Efficiencies: Electric: air-source heat pump with prevailing federal minimum efficiency Nonelectric furnaces: natural gas furnace with prevailing federal minimum efficiency Nonelectric boilers: natural gas boiler with prevailing federal minimum efficiency Capacity: sized in accordance with Section M1401.3 of the *International Residential Code*	~~As proposed~~ As proposed As proposed As proposed
Cooling systems[~~g, h~~, i]	~~As Proposed~~ Fuel type: Electric Efficiency: in accordance with prevailing federal minimum standards Capacity: sized in accordance with Section M1401.3 of the *International Residential Code*	~~As Proposed~~ As proposed As proposed As proposed
Service Water Heating[~~g, i, j~~, h, k]	~~As Proposed~~ Fuel type: same as proposed design for non-solar water heating. Where proposed design includes solar water heating, the standard reference shall include the equivalent capacity with fuel type same as the non-solar water heating. Efficiency: in accordance with prevailing federal minimum standards Use: gal/day=30 + (10 x *Nor*) ~~Same as proposed design~~	~~As Proposed~~ As proposed As proposed Same as standard reference ~~Use: gal/day=30 + (10 x *Nor*)~~

(No changes to portions of table and footnotes not shown.)

Reason: Energy efficient buildings need high efficiency equipment as one way to get efficiency. Changes in the last code cycle removed credit for high efficiency equipment from the performance approach. This change restores credit for high efficiency equipment.

The argument for not recognizing equipment efficiency in a performance calculation is that heating, cooling and water heating equipment does not last as long as envelop efficiency measures (insulation, air tightness, windows). Further, the relatively short-lived equipment may be used as a trade off to downgrade the envelope. The argument concludes that when the equipment wears out it may be replaced with less efficient equipment, leaving both inefficient equipment and inefficient envelopes. The argument apparently presumes the next generation of energy efficient buildings must choose either high efficiency envelopes or high efficiency equipment.

I say "no" to the argument above. More efficient and affordable buildings need high efficiency in both envelopes and equipment; therefore, the code should recognize both. Getting 30% more efficient than the 2006 IECC, the goal of many in this code cycle, is made more difficult and costly without equipment. Getting 50% more efficient (as in some draft Federal laws) is nearly impossible without high efficiency equipment.

This code cycle many will propose options for increased building efficiency that rely in part on higher equipment efficiency to get to the 30% increased efficiency goal. Ignoring equipment efficiency means those new options in the IECC would fail to comply under the IECC's own performance path, often fail by large margins.

Perhaps most important, not recognizing high efficiency equipment means treating some outstanding equipment choices as no better than minimum efficiency equipment. The code would treat a 95 AFUE condensing gas furnace as no better than a 78 AFUE furnace? A ground source heat pump is the same as an electric resistance heater? A 17 SEER air conditioner is treated the same as a 13 SEER air conditioner? Solar water heating is no better than the least efficient gas or electric water heater that can be purchased? A heat pump water heater has no advantage over an electric resistance water heater? The code needs to encourage efficient equipment by including it in the performance calculation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CONNER-EC-16-405.DOC

EC133–09/10
405.3, Table 405.3 (New)

Proponent: Ken Nittler, PE, Enercomp, Inc.

1. Revise as follows:

405.3 Performance-based compliance. Compliance based on simulated energy performance requires that a proposed residence (*proposed design*) be shown to have an annual energy cost that is less than or equal to the annual energy cost of the *standard reference design*. Energy prices shall be taken from a source *approved* by the *code official*, such as the Department of Energy, Energy Information Administration's *State Energy Price and Expenditure Report*. *Code officials* shall be permitted to require time-of-use pricing in energy cost calculations.

Exception: The energy use based on source energy expressed in Btu or Btu per square foot of *conditioned floor area* shall be permitted to be substituted for the energy cost~~.~~. ~~The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1.~~ using the source energy factors specified in Table 405.3.

2. Add new table as follows:

TABLE 405.3
SOURCE ENERGY FACTORS FOR ENERGY DELIVERED TO BUILDINGS

ENERGY SOURCE	SOURCE ENERGY FACTOR
Electricity	3.365
Natural Gas	1.092
Fuel Oil/Kerosene	1.158
Gasoline	1.187
LPG	1.151

Reason: This revision updates the values introduced during the last code cycle to cover more energy sources and to be consistent with the values used in the *Building America Research Benchmark*, Updated December 19, 2008.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: NITTLER-EC-1-T. 405.3

EC134–09/10
405.3, 506.3

Proponent: James Ranfone, representing the American Gas Association

Revise as follows:

405.3 Performance-based compliance. Compliance based on simulated energy performance requires that a proposed residence (proposed design) be shown to have an annual source energy ~~cost~~ use that is less than or equal to the annual source energy ~~cost~~ use of the standard reference design. ~~Energy prices shall be taken from a source approved by the code official, such as the Department of Energy, Energy Information Administration's State Energy Price and Expenditure Report. Code officials shall be permitted to require time-of-use pricing in energy cost calculations.~~

~~Exception:~~ ~~The energy use based on~~ Source energy use shall be expressed in Btu or Btu per square foot of conditioned floor area. ~~shall be permitted to be substituted for the energy cost.~~ The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1.

Exception: Emissions of carbon dioxide equivalents (CO_2e) used in lieu of source energy use, taken from a source approved by the code official, such as the Department of Energy, Energy Information Administration's Annual Energy Outlook.

506.3 Performance-based compliance. Compliance based total building performance requires that a proposed building (proposed design) be shown to have an annual source energy ~~cost~~ use that is less than or equal to the annual source energy ~~cost~~ use of the standard reference design. ~~Energy prices shall be taken from a source approved by the code official, such as the Department of Energy, Energy Information Administration's State Energy Price and Expenditure Report. Code officials shall be permitted to require time-of-use pricing in energy cost calculations.~~ Nondepletable energy collected off site shall be treated and ~~priced~~ calculated the same as purchased energy. Energy from nondepletable energy sources collected on site shall be omitted from the annual source energy ~~cost~~ use of the proposed design. Source energy use shall be expressed in Btu or Btu per square foot of conditioned floor area. The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1.

Exception: ~~Jurisdictions that require site energy (1 kWh=3413 Btu) rather than energy cost as the metric of comparison.~~ Emissions of carbon dioxide equivalents (CO_2e) used in lieu of source energy use, taken from a source approved by the code official, such as the Department of Energy, Energy Information Administration's Annual Energy Outlook.

Reason: Only through source (full fuel cycle) energy measurements can the IECC accurately gauge a building's total energy footprint. Source energy is fully defined and justified within U. S. Environmental Protection Agency (EPA) procedures for assessing energy and carbon footprints of commercial buildings under its Energy Star performance path rating methodology. The best method to gauge a building's global warming impact is through source energy emissions of CO_2 and CO_2 equivalents (CO_2e). The proposed changes include both methods. Energy cost does not reflect source energy consumption or CO2 and, further, is misleading in that energy cost for electricity and other fuels often vary widely by region and season. Therefore, energy cost is not capable of truly reflecting a building's energy or global warming impact. Energy cost has served as a useful tool for many years, but the new reality demands that the IECC and other energy conservation and environmental programs move toward the use of total energy or CO_2 emissions to measure energy & emission reductions. The IECC is the nation's premier energy code and must take the lead.
As required by Section 1802 of the Energy Policy Act of 2005, the National Academy of Sciences (NAS) issued their report "Review of Site (Point-of-Use) and Full-Fuel-Cycle Measurement Approaches to DOE/EERE Building Appliance Energy-Efficiency Standards." **This free report in PDF was downloaded from: http://www.nap.edu/catalog/12670.html** . The report recommends DOE to "consider moving over time toward the use of full-fuel-cycle measure of energy consumption for assessment of national and environmental impacts." The report found that using that metric would provide the public with more comprehensive information about the impacts of energy consumption on the environment, the economy, and other national concerns. DOE/EERE's current use of site energy consumption does not account for the total consumption of energy when more than one fuel is used in an appliance or when more than one fuel can be used for the same application. For these appliances, measuring full-fuel-cycle energy consumption would provide a more complete picture of energy used, allowing comparison across many different appliances as well as an improved assessment of impacts such as effects on energy security and the environment.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RANFONE-EC-1-405.3-506.3

EC135–09/10
405.3

Proponent: Steve Rosenstock, representing Edison Electric Institute (EEI)

Revise as follows:

405.3 Performance-based compliance. Compliance based on simulated energy performance requires that a proposed residence (*proposed design*) be shown to have an annual energy cost that is less than or equal to the annual energy cost of the *standard reference design*. Energy prices shall be taken from a source *approved* by the *code official*, such as the Department of Energy, Energy Information Administration's *State Energy Price and Expenditure Report*. *Code officials* shall be permitted to require time-of-use pricing in energy cost calculations.

~~**Exception:** The energy use based on source energy expressed in Btu or But per square foot of *conditioned floor area* shall be permitted to be substituted for the energy cost. The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1.~~

Exceptions:

1. Jurisdictions that require site energy (1 kWh = 3,413 Btu) rather than energy cost as the metric of comparison.
2. Jurisdictions that use both site energy and source energy estimates as the metrics of comparison. All source energy estimates shall be reviewed by independent third parties for technical accuracy and to ensure market and fuel neutrality.

Reason: This revision will provide more options for code officials and provide builders transparency about why certain building design options do not meet energy efficiency codes when using source energy.

Cost Impact: Increased due to third party verification of source energy methodology and numerical estimates.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROSENSTOCK-EC-1-405.3

EC136–09/10
405.3

Proponent: Steve Rosenstock, representing Edison Electric Institute (EEI)

Revise as follows:

405.3 Performance-based compliance. Compliance based on simulated energy performance requires that a proposed residence (*proposed design*) be shown to have an annual energy cost that is less than or equal to the annual energy cost of the *standard reference design*. Energy prices shall be taken from a source *approved* by the *code official*, such as the Department of Energy, Energy Information Administration's *State Energy Price and Expenditure Report*. *Code officials* shall be permitted to require time-of-use pricing in energy cost calculations.

~~**Exception:** The energy use based on source energy expressed in Btu or But per square foot of *conditioned floor area* shall be permitted to be substituted for the energy cost. The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1.~~

Exceptions:

1. Jurisdictions that require site energy (1 kWh = 3,413 Btu) rather than energy cost as the metric of comparison.
2. Jurisdictions that use both site energy and source energy estimates as the metrics of comparison. In states or localities with renewable portfolio standards or renewable energy goals, the source energy multiplier for electricity shall be 0.0. In other states or localities, the source energy multiplier for electricity shall be based on current and projected values in the locality, state, or region over a future 50 year period. For all other fuels, the source energy multiplier shall be based on energy losses from the production,

importation, flaring, transportation, and distribution losses. All source energy estimates shall be reviewed by independent third parties for technical accuracy and to ensure market and fuel neutrality.

Reason: This revision will provide more options for code officials and provide builders transparency about why certain building design options do not meet energy efficiency codes when using source energy.

Cost Impact: Increased due to third party verification of source energy methodology and numerical estimates.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: ROSENSTOCK-EC-2-405.3

EC137–09/10
Table 405.5.2(1)

Proponent: James Larsen, representing the Cardinal Glass Industries

Revise table as follows:

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Glazing[a]	Total area[b] = (a) The proposed glazing area; where proposed glazing area is less than 15% of the conditioned floor area. (b) 15% of the conditioned floor area; where the proposed glazing area is 15% or more of the conditioned floor area. Orientation: equally distributed to four cardinal compass orientations (N, E, S & W). *U*-factor: from Table 402.1.3 SHGC: From Table 402.1.1 except that for climates with no requirement (NR) SHGC = 0.40 shall be used. Interior shade fraction: 0.92-(0.21*SHGC for the standard reference design) ~~Summer (all hours when cooling is required) = 0.70~~ ~~Winter (all hours when heating is required) = 0.85~~[c] External shading: none	As proposed As proposed As proposed As proposed 0.92-(0.21*SHGC as proposed) ~~Same as standard reference design~~ As proposed

a through b. (No change to current text)

~~c. For fenestrations facing within 15 degrees (0.26 rad) of true south that are directly coupled to thermal storage mass, the winter interior shade fraction shall be permitted to be increased to 0.95 in the proposed design.~~

d. through k. (No change to current text)

Reason: The "Interior shade fraction" in the *IECC*'s section 405 performance compliance path is used in simulating the performance of the building as a multiplier to reduce effective SHGC and its impact on the conditioned space. This approach is intended to simulate the effects of interior shades on solar heat gain transmitted through the glazing. As a result, this multiplier is important because it can affect the choice of appropriate fenestration.

The current specifications for the Standard Reference Design and the Proposed Design incorrectly treat interior shade fraction as a constant without regard to the type of shade or the type of the glass. Recently completed research shows that it is not a constant. This proposal is intended to correct this issue by providing a simplified equation for determining interior shading fraction depending on the SHGC of the glazed fenestration product (this equation is based on the assumption of a specific type of interior shade, recognizing that the code has no control over the type of shade ultimately employed). This proposal also incorporates the assumption that shades are closed 50% of the time throughout the entire year, rather than assuming twice the shade usage in the summer than the winter. This proposal would allow the performance path to provide a more precise treatment of shade fraction depending on the SHGC of the glazing product.

ASHRAE recently completed a research project - 1311 RP – and published a 95 page final report on the effects of various shading devices on the building loads resulting from solar heat gain; specifically, Wright, J., et.al., *Improved Cooling Load Calculations for Fenestration with Shading Devices* (dated January 14, 2009). This report publishes tables of modifiers for 56 glass products and 34 types of interior shading devices.

Shade combinations studied in the report included:

Louvered Shades
- 3 colors (dark, medium, light)
- 5 positions (rotated from closed down to open to closed up)

Fabric Drapes
- 3 colors
- 4 weave densities (closed, semi-open, open, sheer)

Roller Shades
- 3 colors

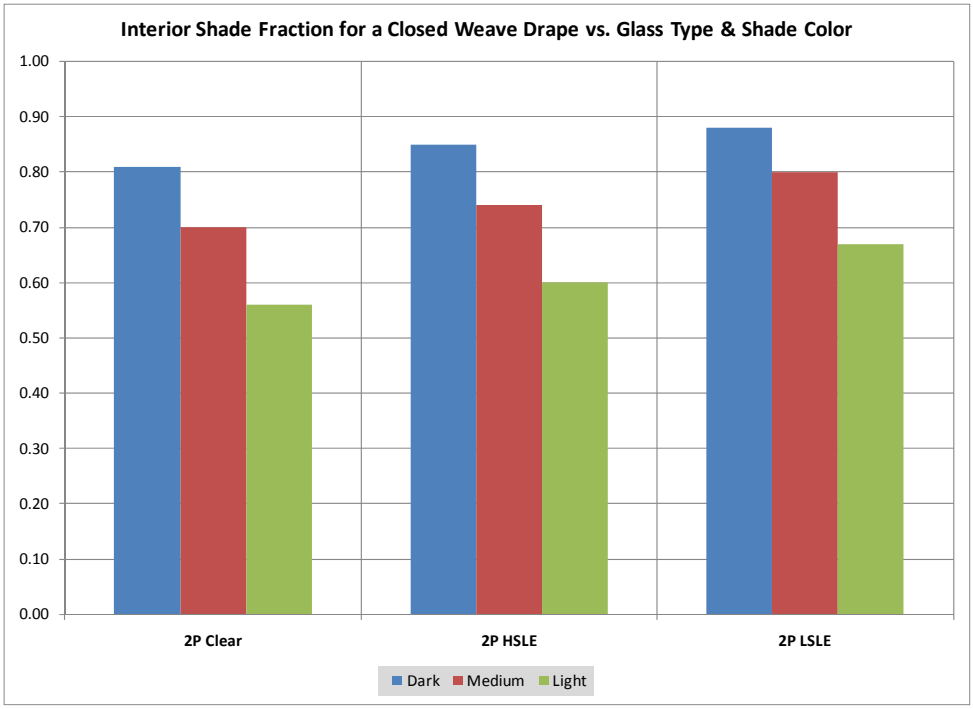
o 2 density (opaque, translucent)
Insect Screen (1)

According to the report, the shading values vary remarkably depending on the type of shade and the type of glass. In fact, one could reasonably conclude that it is impossible to set any meaningful shade fraction without reference to a specific shade and a specific window in each case. Reference to specific shades and window combinations in the code obviously would be complex at best, and would certainly be impractical, since the type of interior shades for each window is typically not controlled by the builder and would require a separate calculation for each window with a different shade. As a result, we are faced with two options – either eliminate interior shade fraction from the performance calculations, or make a simplifying assumption as to a standard shade. For this proposal, we have selected the latter course and propose to assume use of the most effective drape (from a shade fraction perspective), which is a light-colored tight-weave fabric drape.

A review and analysis of the data in the report does show, however, that for each shade type, as SHGC is reduced, the impact of the interior shade is also reduced. Intuitively this makes sense – as the glazing takes on the role of solar control, interior shades will have less impact on solar performance. In effect, what happens is that as the SHGC of the window decreases, more of the light energy that is reflected back to the window due to the interior shade is retained in the building (increasing cooling load and reducing heating load) – in other words, more light energy is trapped inside the conditioned space and prevented from retransmission to the outside by the lower SHGC. Since the builder does determine the SHGC of the window, at least this factor can be incorporated into the performance analysis. This impact is expressed in the [-0.21*SHGC] component of the proposed new shade fraction equation in Table 405.5.2(1).

The graphs below demonstrate how the interior shade fraction varies for the same light-colored, closed-weave drape with 3 common types of double glazing:

Clear
High Solar Gain Low-E (HSLE)
Low Solar Gain Low-E LSLE)



The interior shade fractions shown in the graph above are for the drape fully closed all of the time and would need to be modified by an expected shade usage pattern. We are aware of no evidence as to typical actual usage patterns by homeowners. However, reverse engineering the current summer/winter interior shade fractions in Table 405.5.2(1) suggests that the *IECC* currently assumes that the homeowner's usage pattern would be shades closed 2/3 of the time in the summer and closed 1/3 of the time in the winter (this assumes the "legacy" values were derived with clear glass and light colored tight weave drape). We do not believe that this is a valid assumption without data. As a result, the proposed 0.92/0.21 coefficients were calculated for the proposed interior shade fraction equation assuming a 50% drape closure year round. In other words, it assumes that the home owner is just as likely to open the drape as close it throughout the entire year.

Should the committee feel a different usage pattern is appropriate, for either winter, or summer, or both, the table below shows coefficients as a function of shade closure over total daylight hours. The equation form is $\mathbf{C_1}$ – ($\mathbf{C_2}$*SHGC).

Closure	C_1	C_2
25%	0.96	0.10
33%	0.95	0.14
50%	**0.92**	**0.21**
67%	0.89	0.28
75%	0.88	0.31
100%	0.84	0.42

The proposed equation was developed and these coefficient values were calculated based on the data from the report.

It is also important to ensure that the Proposed Design properly reflects the shade fraction as a result of the SHGC of the actual product used in the Proposed Design (that is, as proposed), rather than simply repeating the shade fraction based on the SHGC from the Standard Reference Design. As a result, we propose to incorporate the same equation in the Proposed Design, but using the actual product SHGC in lieu of the SHGC in the Standard Reference Design.

This proposal should be adopted to reflect more accurately the effects of the glazing SHGC on the interior shade fraction.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARSEN-EC-1-T. 405.5.2(1)

EC138–09/10
Table 405.5.2(1)

Proponent: Ronald Majette, representing US Department of Energy

Revise table as follows:

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Heating systems [g h]	As proposed <u>for other than electric heating without a heat pump. Where the proposed design utilizes electric heating without a heat pump the standard reference design shall be an air source heat pump meeting the requirements of Section 503</u>. Capacity: sized in accordance with Section M1401.3 of the *International Residential Code*	As proposed

(Portions of table and footnotes not shown remain unchanged)

Reason: The purpose of this code change is restore language from the 2006 IECC that appears to have been inadvertently removed in the 2009 IECC. The language relates to the standard reference design assumptions when electric resistance heating systems are used in the simulated performance alternative. The 2006 IECC sets an air-source heat pump as the standard reference design heating system if electric heating was used in the proposed design. The 2009 IECC effectively reduces energy efficiency in the simulated performance alternative (section 405) compared to the 2006 IECC if electric resistance heating is used in a proposed design as a less efficient system is assumed in the standard design. This reduction in energy efficiency appears to be an unintentional oversight. This proposal does not alter the code if the proposed design has an electric heat pump or any non-electric system.

Cost Impact: The code change proposal will increase the cost of construction to the degree that it precludes the application and use of the simulated performance alternative to establish an energy performance metric that is artificially high and then use that metric as a baseline for verifying code compliance.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-69-T. 405.5.2(1)

EC139–09/10
Table 405.5.2(1)

Proponent: Ronald Majette, representing US Department of Energy

Revise table as follows:

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Thermal distribution systems	A thermal distribution system efficiency (DSE) of 0.88 shall be applied to both the heating and cooling system efficiencies for all systems other than tested duct systems. Duct insulation: From Section 403.2.1. For tested duct systems, the leakage rate shall be the applicable maximum rate from Section 403.2.2	<u>Thermal distribution system efficiency shall be as</u> ~~As~~ tested or as specified by Table 405.5.2(2) if not tested<u>. Duct insulation shall be as proposed.</u>

(Portions of table and footnotes not shown remain unchanged)

Reason: The purpose of this code change is to clarify that the duct insulation in the proposed design is simply whatever is proposed. The proposed duct insulation is not necessarily the same as the duct insulation in the standard design, but must be at least R-6 as specified in section 405.2. This proposal is not intended to change any requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: MAJETTE-EC-78-T. 405.5.2(1)

EC140–09/10
Table 405.5.2(1)

Proponent: Mark Nowak, representing Steel Framing Alliance

Revise table as follows:

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

Building Component	Standard Reference Design	Proposed Design
Heating Systems [g, h]	~~As proposed~~ ~~Capacity: sized in accordance with Section M1401.3 of the *International Residential Code*~~ Fuel Type: same as proposed Design Efficiencies: Electric: Air-source heat pump with prevailing federal minimum efficiency Nonelectric furnaces: natural gas furnace with prevailing federal minimum efficiency Nonelectric boilers: natural gas boiler efficiency Capacity: sized in accordance with Section M1401.3 of the *International Residential Code*	~~As Proposed~~ As Proposed Same as standard reference [l] Same as standard reference [l] Same as standard reference [l] As Proposed
Cooling Systems [g, i]	~~As proposed~~ ~~Capacity: sized in accordance with Section M1401.3 of the International Residential Code~~ Fuel type: Electric Efficiency: in accordance with prevailing federal minimum standards Capacity: sized in accordance with Section M1401.3 of the *International Residential Code*	~~As Proposed~~ As Proposed Same as standard reference [l] As Proposed
Service Water Heating [g, i, j, k]	~~As proposed~~ ~~Use: same as proposed design~~ Fuel type: same as proposed design Efficiency: in accordance with prevailing federal minimum standards Use: same as proposed design	~~As proposed~~ ~~gal/day = 30 + (10 x N_{br})~~ As Proposed Same as standard reference [l] As proposed gal/day = 30 + (10 x N_{br})

l. Proposed design shall be as proposed when the building meets minimum wall cavity insulation requirements in Section 402 or when providing a thermally equivalent wall assembly to the same.

(Portions of table and footnotes not shown remain unchanged)

Reason: The purpose of the performance path is to provide flexibility for builders as they comply with code. However, this flexibility is severely limited if increases in mechanical efficiency are not taken into account in performance path compliance. Currently the code creates a disincentive for builders to use any heating, cooling or water heating system other than code minimum, making the performance path essentially unusable.

This proposal reintroduces heating, cooling, and water heating efficiency into the performance path, offering more flexibility for code compliance, while encouraging builders to use higher than minimum efficiency mechanical equipment. It fills a hole in the 2009 IECC, which has no method to encourage energy savings through mechanical equipment.

Concerns have been raised about the ability to trade off mechanical equipment efficiency against wall cavity insulation because wall cavity insulation is difficult and expensive to access during a home renovation. Therefore increases to cavity insulation are less practical for home owners than other energy saving measures. This proposal limits mechanical tradeoffs to situations in which the builder meets the minimum cavity insulation requirement (or equivalent assembly). Therefore, builders can use heating, cooling, and water heating equipment efficiency in their performance path compliance, but only if they meet the minimum cavity insulation requirements in Section 402.

This change will increase flexibility and increase the use of high efficiency heating, cooling, and water heating equipment, while maintaining reasonable limits on wall insulation requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: NOWAK-EC-2-T. 405.5.2(1)

EC141–09/10
Table 405.5.2(1)

Proponent: Ken Sagan, representing National Association of Home Builders (NAHB)

Revise table as follows:

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Heating systems[g, h],	~~As proposed~~ Fuel type: same as proposed design Efficiencies: Electric: air-source heat pump with prevailing federal minimum efficiency Nonelectric furnaces: natural gas furnace with prevailing federal minimum efficiency Nonelectric boilers: natural gas boiler with prevailing federal minimum efficiency Capacity: sized in accordance with Section M1401.3 of the *International Residential Code*	As proposed As proposed As proposed
Cooling system[g, i],	~~As proposed~~ Fuel type: Electric Efficiency: in accordance with prevailing federal minimum standards Capacity: sized in accordance with Section M1401.3 of the *International Residential Code*	As proposed As proposed As proposed
Service Water Heating[g, i, j, k]	~~As proposed~~ Fuel type: same as proposed design Efficiency: in accordance with prevailing Federal minimum standards Use: gal/day = 30 + 10 × *Nbr* Tank temperature: 120°F ~~Use: same as proposed design~~	As proposed As proposed Same as standard reference Same as standard reference ~~gal/day = 30 + 10 × *Nbr*~~

(Portions of table and footnotes not shown remain unchanged)

Reason: The purpose of this proposal is to retain the original equipment trade-off provisions from the 2006 *International Energy Conservation Code* (IECC) for the heating systems, cooling systems, and service water heating. By retaining these, builders have an opportunity to optimize a code-compliant house design by using energy efficient equipment.

Eliminating the ability to use equipment efficiency as a means to achieve whole-house energy conservation will discourage the use of higher efficiency equipment. Quite often, the use of this high efficiency equipment provides a more cost effective solution to achieve code compliance. Eliminating this ability discourages the concept of the “house as a system” approach which is a cornerstone of many state energy programs and the Federal Energy Star Program. In fact, without this proposal the current practice for constructing an Energy Star home in certain jurisdictions would be disallowed.

Significant improvements in the efficiency of HVAC and water heating equipment have been made in the last 20 years. With the increased emphasis on new and improved technologies, this trend will continue and will result in even higher energy savings in future years. Eliminating the ability to recognize the value of these technologies in the marketplace will prove detrimental to all builders and ultimately the homeowners.

By inserting the equipment trade-off tables, this amendment provides a reasonable cost-effective solution to achieve compliance.

Cost Impact: The code change proposal will not increase the cost of construction.

EC142–09/10
Table 405.5.2(1)

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

Revise as follows:

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
~~Doors~~	~~Area: 40 ft^2~~ ~~Orientation: North~~ ~~*U* Factor: same as fenestration from Table 402.1.3~~	~~As proposed~~ ~~As proposed~~ ~~As proposed~~
~~Glazing~~[a] Fenestration	Total area[b] = (a) The proposed ~~glazing~~fenestration area; where the proposed ~~glazing~~fenestration area is less than 15% of the conditioned floor area (b) 15% of the conditioned floor area; where the proposed ~~glazing~~fenestration area is 15% or more of the conditioned floor area	As proposed
	Opaque Door: opaque door (SHGC = 0) as proposed up to 40 ft^2 shall be included in proposed total fenestration area and oriented the same as in the proposed design	As proposed
	Orientation: all fenestration other than the opaque door equally distributed to four cardinal compass orientations (N, E, S & W)	As proposed
	U-Factor: from Table 402.1.3 SHGC: from Table 402.1.1 except that for climates with no requirement (NR) SHGC = 0.40 shall be used.	As proposed As proposed
	Interior shade fraction: Summer (all hours when cooling is required) = 0.70 Winter (all hours when heating is required) = 0.85[c]	Same as standard reference design
	External shading: none	As proposed

~~a. Glazing shall be defined as sunlight transmitting fenestration, including the area of sash, curbing or other framing elements, that enclose conditioned space. Glazing includes the area of sunlight transmitting fenestration assemblies in walls bounding conditioned basements. For doors where the sunlight transmitting opening is less than 50% of the door area, the glazing area is the sunlight transmitting opening area. For all other doors, the glazing area is the rough frame opening area for the door including the door and the frame.~~

(Portions of table and footnotes not shown remain unchanged)

Reason: The IECC defines fenestration (Section 202) to include all windows, skylights and doors, whether glazed or opaque. Yet, table 404.5.2(1), treats "doors" a separate component. It is unclear how glazed and un-glazed doors are supposed to be treated under this approach (e.g., are glazed doors included in doors or glazing?). This proposal simplifies and tightens the performance path by including all fenestration—doors, vertical glazing, and skylights—in a single calculation. In order to do so, the proposal replaces the two terms "doors" and "glazing" with "fenestration," and sets an SHGC in the standard reference design for both glazed and opaque doors.

This simplification will strengthen the code by ensuring that all fenestration is properly accounted for in the proposed design. The result will also be an increase in efficiency and energy savings, since it eliminates a separate assumption of 40 square feet of opaque doors in the standard reference design, instead including such doors in fenestration area, like all other fenestration.

Cost Impact: The code change proposal will not increase the cost of construction.

EC143–09/10
Table 405.5.2(1)

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

Revise table as follows:

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
~~Doors~~	~~Area: 40 ft^2~~ ~~Orientation: North~~ ~~*U* Factor: same as fenestration from Table 402.1.3~~	~~As proposed~~ ~~As proposed~~ ~~As proposed~~
~~Glazing~~[a] Fenestration	Total area[b] = (a) The proposed ~~glazing~~fenestration area; where the proposed ~~glazing~~fenestration area is less than 15% of the conditioned floor area (b) 15% of the conditioned floor area; where the proposed ~~glazing~~fenestration area is 15% or more of the conditioned floor area	As proposed
	Opaque Door: opaque door (SHGC = 0) as proposed up to 40 ft^2 shall be included in proposed total fenestration area and oriented the same as in the proposed design	As proposed
	Orientation: all fenestration other than the opaque door equally distributed to four cardinal compass orientations (N, E, S & W)	As proposed
	U-Factor: from Table 402.1.3 SHGC: from Table 402.1.1 except that for climate zones with no requirement (NR) SHGC = 0.40 shall be used.	As proposed As proposed
	Interior shade fraction: Summer (all hours when cooling is required) = 0.70 Winter (all hours when heating is required) = 0.85[c]	Same as standard reference design
	External shading: none	As proposed

~~a. Glazing shall be defined as sunlight-transmitting fenestration, including the area of sash, curbing or other framing elements, that enclose conditioned space. Glazing includes the area of sunlight-transmitting fenestration assemblies in walls bounding conditioned basements. For doors where the sunlight-transmitting opening is less than 50% of the door area, the glazing area is the sunlight-transmitting opening area. For all other doors, the glazing area is the rough frame opening area for the door including the door and the frame.~~

(Portions of table and footnotes not shown remain unchanged)

Reason: The IECC defines fenestration (section 202) to include all windows, skylights and doors, whether glazed or opaque. Yet, table 404.5.2(1), treats "doors" a separate component. It is unclear how glazed and un-glazed doors are supposed to be treated under this approach (e.g., are glazed doors included in doors or glazing?). This proposal simplifies and tightens the performance path by including all fenestration—doors, vertical glazing, and skylights—in a single calculation. In order to do so, the proposal replaces the two terms "doors" and "glazing" with "fenestration," and sets an SHGC in the standard reference design for both glazed and opaque doors.

This simplification will strengthen the code by ensuring that all fenestration is properly accounted for in the proposed design. The result will also be an increase in efficiency and energy savings, since it eliminates a separate assumption of 40 square feet of opaque doors in the standard reference design, instead including such doors in fenestration area, like all other fenestration.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: PRINDLE-EC-31-T. 405.5.2(1)

EC144–09/10
Table 405.5.2(1)

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

Revise table as follows:

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Heating systems [g, h, i]	As Proposed Capacity: sized in accordance with Section M1401.3 of the *International Residential Code*	As Proposed
Cooling systems [g, ~~i~~, J]	As Proposed Capacity: sized in accordance with Section M1401.3 of the *International Residential Code*	As Proposed
Service Water Heating [g, ~~i, j,~~ k]	As Proposed Use: Same as proposed design	As Proposed Use: gal/day=30 + (10 x N_{br})

i. For a proposed design without a proposed heating system, a heating system with the prevailing minimum efficiency shall be assumed for both the standard reference design and the proposed design. For electric resistance heating systems, the prevailing federal minimum efficiency air-source heat pump shall be used for the standard reference design.
j. For a proposed design home without a proposed cooling system, an electric air conditioner with the prevailing minimum efficiency shall be assumed for both the standard reference design and the proposed design.

(Portions of table and footnotes not shown remain unchanged)

Reason: This proposal ensures that the proper notes for the systems are connected to the proper systems. Note "i", which states that "for electric heating systems, the prevailing minimum efficiency shall be assumed for the standard reference design" is very important to ensure that consistent performance path modeling is conducted for electric heating systems. Previously this note was tied to the cooling systems, however, it should be tied to the heating system as proposed.

In addition note "i" has been modified to clarify that only electric resistance heating systems should have the standard reference design as the prevailing federal minimum efficiency air-source heat pump. This is to ensure that electric heating is not used in the standard reference design as a baseline home for achieving minimum code.

In addition, there is the deletion of footnote "i" and addition of footnote "J" to the cooling system, to clarify the intent of those two notes. The note change has been marked with the capital J to ensure that the lowercase i and j are not confused with the underline, as may have been done in previous code change cycles.

In the service water heating section there is a removal of footnotes i and j, which relate to heating and cooling only and also the addition of the word "Use:" to clarify what the gal/day equation is for.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: PRINDLE-EC-32-T. 405.5.2(1)

EC145–09/10
Table 405.5.2(1)

Proponent: Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

Revise as follows:

TABLE 405.5.2(1)
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Glazing [a]	Total area [b] = (a) The proposed glazing area; where the proposed glazing area is less than 15% of the conditioned floor area (b) 15% of the conditioned floor area; where the proposed glazing area is 15% or more of the conditioned floor area Orientation: equally distributed to four cardinal compass orientations (N,E,S, & W) U-factor: from Table 402.1.3 SHGC: From Table 402.1.1 except that for climates with no requirement (NR) SHGC = 0.40 shall be used Interior shade fraction: Summer (all hours when cooling is required) = ~~0.70~~ 0.90 Winter (all hours when heating is required) = ~~0.85~~ 0.90 [c] Exterior shading: none	As proposed As proposed As proposed As proposed Same as standard reference design As proposed

(Portions of table and footnotes not shown remain unchanged)

Reason: This proposal corrects a long-term flaw in the performance path – an unfounded assumption that interior shades are consistently used twice as much in the summer as in the winter – by setting the interior shade fraction at the same 0.90 level for both summer and winter. Another option would be to eliminate interior shading altogether, just as the performance path already assumes no exterior shading. Either approach would allow for the energy efficiency improvements of the home to be treated consistently throughout the year without impact from occupant behavior between seasons. Because there is no valid evidence as to actual, consistent human behavior in using shades, and indeed shade use is ultimately up to each individual occupant, we propose to treat all seasons equally.

The benefits of reducing solar heat gain for homes is well-known. However, it is not so well known that the code-assumed interior shading values reduce the perceived benefits of shading windows or reducing the SHGC of windows.

This proposal makes the performance path more accurate by establishing an equal interior shade fraction in all seasons. The current standard reference design assumes a 30% reduction in the benefit of reducing solar heat gain in the hottest time of the year when the solar heat gain reduction is most important to reducing the electric grid overload during peak hours. By contrast, the standard reference design assumes only 15% is blocked in the winter. These numbers are not supported by objective data or any studies, and the imbalance between the shading fractions creates inaccuracies in modeling programs. Because the performance path assumes that interior shading is used twice as much in the summer as in the winter, the equation shows higher relative energy use in the heating months than in the cooling months. In the performance path calculation, this translates to an artificially inflated heating budget and a bias in favor of measures used to reduce heating energy. This assumption is similar to assuming that heating equipment will operate 30% more efficiently due to occupant behavior. It is not accurate and promotes less efficiency. The assumption also makes no climate zone-specific distinctions, but rather assumes that shading tendencies are static nationally. The result is that the performance path may favor compliance measures that reduce heating energy over measures that reduce cooling energy, even in cooling-dominated climates.

Because there is no data to support the currently unbalanced assumptions of interior shading fractions, this proposal neutralizes the assumptions in the standard reference design at a uniform, conservative level. It assumes that a typical occupant will not radically alter behavior with regards to interior shade operation by season. It also makes the conservative assumption that the majority of windows will not have shades drawn during daytime hours to block solar radiation. As a result, the purchased energy estimated using the performance approach will be more accurate and representative of an actual residential building.

Although it can be argued that a conscientious building occupant may reduce heating or cooling loads by operating shades to minimize sunlight during the summer and maximize sunlight during winter, there is no data to suggest that occupants actually engage in these practices for the purpose of saving energy. There are many reasons why shades are operated throughout the year, and almost all of them have nothing to do with energy use.

The *2005 ASHRAE Handbook of Fundamentals* outlines a number of variables affecting user-operated shading devices, each of which may have significant impacts on the effectiveness of the devices:

Shading devices vary in their operational effectiveness. Some devices, such as overhangs, light shelves, and tinted glazings, do not require operation, have long life expectancies, and do not degrade significantly over their effective life. **Other types of shading devices, especially operable interior shades, may have reduced effectiveness because of less than optimal operation and degradation of effectiveness over time. It is important to evaluate operational effectiveness when considering the actual heat rejection potential of shading devices**.

Handbook, at 31.54, emphasis added. The *Handbook* lists six reasons why shades are more or less effectively operated, and only one of them (radiant energy protection) has anything to do with energy use or changing seasons: Radiant Energy Protection, Outward Vision, Privacy, Brightness Control, View Modification, and Sound Control. *See Handbook* at 31.54-55.

In reality, a home's occupant will operate shades for any number of these reasons, without thinking of the potential negative energy impacts. For example, interior shades should be operated to reflect radiant energy during the hottest months of the year. However, in northern climates, because glass temperatures during winter months can drop below room temperature, it is common practice to use shades *more often* during the winter months for the perceived insulating benefits. In addition, direct sunlight or reflected light can make occupants uncomfortable, leading to more shade usage (even in winter months).

Windows are often installed for a view of particular external geographical features, such as landscape or city views. A beautiful view or day-lighting interest may induce an occupant to leave shades open year-round. In other cases, because of a home's proximity to other homes, certain windows may be shaded year-round for privacy concerns. Users may also install heavy draperies to reduce road noise or other sounds.

Every building will have unique shading characteristics based on the climate zone, shade type, window type, orientation, exterior shading, and most importantly, the occupant's priorities. Because there is no reliable data to support the current bias in the performance path, the shading fraction should be neutralized so that heating and cooling measures will be treated similarly. Moreover, given the lack of data as to actual operation,

the safer assumption is that shades are largely left open (justifying a higher fraction); after all, it is reasonable to assume that the average person buys windows for views and light. This proposal sets the assumption at a conservative 0.90, which means that the shades are blocking 10% of the solar heat gain annually. Another sensible option is to assume no interior shading, just as the standard reference design assumes no exterior shading.

Cost Impact: The code change proposal will not increase the cost of construction. This change is not intended to affect the overall stringency of the code.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PRINDLE-EC-33-T. 405.5.2(1)

EC146–09/10
202, Chapter 5

Proponent: Eric Makela, Britt, representing Makela Group; Ken Baker, representing K energy; Craig Conner, Building Quality

1. Add new definitions as follows:

SECTION 202
GENERAL DEFINITIONS

FENESTRATION PRODUCT, FIELD-FABRICATED is a fenestration product including a exterior glass door whose frame is made at the construction site of standard dimensional lumber or other materials that were not previously cut, or otherwise formed with the specific intention of being used to fabricate a fenestration product or exterior door. Field fabricated does not include site-built fenestration with a label certificate or products required to have temporary or permanent labels.

FENESTRATION PRODUCT, SITE-BUILT is fenestration designed to be field-glazed or field assembled units using specific factory cut or otherwise factory formed framing and glazing units. Examples of site-built fenestration include storefront systems, curtain walls, and atrium roof systems.

FURNACE ELECTRICITY RATIO. The ratio of furnace electricity use to total furnace energy computed as ratio = $(3.412*E_{AE})/(1000*E_F + 3.412*E_{AE})$, where E_{AE} (average annual auxiliary electrical consumption) and E_F (average annual fuel energy consumption) are defined in Appendix N to subpart B of part 430 of title 10 of the Code of Federal Regulations and E_F is expressed in millions of Btu's per year.

ON-SITE RENEWABLE ENERGY. Energy derived from solar radiation, wind, waves, tides, landfill gas, biomass, or the internal heat of the earth. The energy system providing on-site renewable energy shall be located on or adjacent to the project site.

2. Revise as follows:

COMMERCIAL ENERGY EFFICIENCY

SECTION 501
GENERAL

501.1 Scope. The requirements contained in this chapter are applicable to commercial buildings, or portions of commercial buildings. ~~These commercial buildings shall meet either requirements of ASHRAE/IESNA Standard 90.1, *Energy Standard for Buildings Except for Low-Rise Residential Buildings*, or the requirements contained in this chapter.~~

501.2 Application. The *commercial building* project shall comply with the requirements in Sections 502 ~~(Building envelope requirements),~~ 503 ~~(Building mechanical systems)~~, 504~~(Service water heating)~~, 505 ~~(Electrical power and lighting systems)~~ in its entirety. As an alternative the *commercial building* project shall exceed by at least 25% ~~comply with~~ the requirements of ASHRAE/IESNA Standard 90.1, Energy Standard for Buildings Except for Low Rise Residential Buildings, Appendix G in its entirety.

Exceptions:

1. Buildings conforming to Section 506, provided Sections 502.4, 503.2, 504, 505.2, 505.3, 505.4, 505.6 and 505.7 are each satisfied. Building energy cost shall be equal to or less than 75% of the standard reference design building.
2. Additions, alterations and repairs shall comply with the applicable requirements in Sections 502, 503, 504, and 505 only or with ASHRAE/IESNA 90.1.

3. Revise as follows

SECTION 502
BUILDING ENVELOPE REQUIREMENTS

502.1 General (Prescriptive).

502.1.1 Insulation and fenestration criteria. The *building thermal envelope* shall meet the requirements of Tables 502.2(1) and 502.3 based on the climate *zone* specified in Chapter 3. Commercial buildings or portions of commercial buildings enclosing Group R occupancies shall use the *R*-values from the "Group R" column of Table 502.2(1). Commercial buildings or portions of commercial buildings enclosing occupancies other than Group R shall use the *R*-values from the "All other" column of Table 502.2(1). Buildings with a vertical fenestration area or skylight area that exceeds that allowed in Table 502.3 shall comply with the building envelope provisions of ASHRAE/IESNA-90.1.

TABLE 502.1.2
BUILDING ENVELOPE REQUIREMENTS OPAQUE ELEMENT, MAXIMUM U-FACTORS

CLIMATE ZONE	1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Roofs														
Insulation entirely above deck	~~U-0.063~~ U-0.048	U-0.048	U-0.048	U-0.048	U-0.048	U-0.048	~~U-0.048~~ U-0.039	~~U-0.048~~ U-0.039	~~U-0.048~~ U-0.039	~~U-0.048~~ U-0.039	~~U-0.048~~ U-0.032	~~U-0.048~~ U-0.032	~~U-0.039~~ U-0.028	~~U-0.039~~ U-0.028
Metal buildings	~~U-0.065~~ U-0.044	~~U-0.065~~ U-0.035	~~U-0.055~~ U-0.035	~~U-0.055~~ U-0.035	~~U-0.055~~ U-0.035	~~U-0.055~~ U-0.035	~~U-0.055~~ U-0.035	~~U-0.055~~ U-0.035	~~U-0.055~~ U-0.035	~~U-0.055~~ U-0.035	~~U-0.049~~ U-0.031	~~U-0.049~~ U-0.031	~~U-0.049~~ U-0.029	~~U-0.049~~ U-0.029
Attic and other	~~U-0.034~~ U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027~~1~~	U-0.027~~1~~	U-0.027~~1~~	U-0.027~~1~~	U-0.027~~1~~
Walls, Above Grade														
Mass	~~U-0.58?~~ Ext U-0.142 Int U-0.094	~~U-0.151~~ Ext U-0.142 Int U-0.094	~~U-0.151~~ Ext U-0.142 Int U-0.094	Ext U-0.123 Int U-0.094	~~U-0.123~~ Ext U-0.110 Int U-0.094	Ext U-0.104 Int U-0.094	Ext U-0.104 Int U-0.085	Ext U-0.090 Int U-0.085	~~U-0.090~~ Ext U-0.078 Int U-0.085	~~U-0.080~~ Ext U-0.078 Int U-0.085	~~U-0.080~~ Ext U-0.078 Int U-0.060	Ext U-0.071 Int U-0.060	~~U-0.071~~ Ext U-0.061 Int U-0.060	~~U-0.071~~ Ext U-0.061 Int U-0.060
Metal building	~~U-0.093~~ U-0.179	~~U-0.093~~ U-0.079	~~U-0.093~~ U-0.079	~~U-0.093~~ U-0.052	~~U-0.084~~ U-0.079	~~U-0.084~~ U-0.052	~~U-0.084~~ U-0.052	~~U-0.084~~ U-0.052	~~U-0.069~~ U-0.052	~~U-0.069~~ U-0.052	~~U-0.069~~ U-0.052	~~U-0.069~~ U-0.052	U-0.057 U-0.052	U-0.057 U-0.039
Metal framed	~~U-0.124~~ U-0.077	~~U-0.124~~ U-0.077	~~U-0.124~~ U-0.077	U-0.064	~~U-0.084~~ U-0.077	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.057	U-0.064	U-0.052
Wood framed and other	~~U-0.089~~ U-0.064	~~U-0.089~~ U-0.064	~~U-0.089~~ U-0.064	~~U-0.089~~ U-0.064	~~U-0.089~~ U-0.064	~~U-0.089~~ U-0.064	~~U-0.089~~ U-0.064	U-0.064	U-0.064	U-0.051	U-0.051	U-0.051	U-0.051	U-0.051
Walls, Below Grade														
Below-grade	C-1.140	C-1.140	C-1.140	C-1.140	C-1.140	C-1.140	~~C-1.140~~	Ext	Ext	Ext	Ext	Ext	~~C-0.119~~	Ext

wall[a]							Ext	C-0.119	C-0.119	C-0.119	C-0.119	C-0.119	Ext	C-0.092
							C-0.119	Int	Int	Int	Int	Int	C-0.092	Int
							Int	C-0.063	C-0.063	C-0.063	C-0.063	C-0.063	Int	C-0.060
							C-0.063						C-0.060	
Floors														
Mass	U-0.322	U-0.322	U-0.107	U-0.087	~~U-0.107~~ U-0.076	~~U-0.087~~ U-0.076		~~U-0.087~~ U-0.076	U-0.074	U-0.074	U-0.064	U-0.064	U-0.057	~~U-0.064~~ U-0.055
Joist/Framing	~~U-0.282~~ U-0.066	~~U-0.282~~ U-0.066	~~U-0.052~~ U-0.033	~~U-0.052~~ U-0.033	~~—~~ U-0.033	U-0.033		U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033
Slab-on-Grade Floors														
Unheated slabs	F-0.73	F-0.73	F-0.73	F-0.73	F-0.73	F-0.73	~~F-0.73~~ F-0.54		F-0.54	~~F-0.73~~ F-0.54	F-0.54	F-0.54	F-0.52	~~F-0.52~~ F-0.40
Heated slabs	~~F-1.02~~ F-0.70	~~F-1.02~~ F-0.70	~~F-1.02~~ F-0.70	~~F-1.02~~ F-0.70	~~F-0.90~~ F-0.70	~~F-0.90~~ F-0.70		F-0.65	~~F-0.86~~ F-0.65	~~F-0.86~~ F-0.58	~~F-0.860~~ F-0.58	~~F-0.860~~ F-0.58	~~F-0.688~~ F-0.58	~~F-0.83~~ F-0.55

TABLE 502.2(1)
BUILDING ENVELOPE REQUIREMENTS – OPAQUE ASSEMBLIES

6	1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Roofs																
Insulation entirely above deck	R-15 R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20 R-25ci	R-20 R-25ci	R-20 R-25ci	R-20 R-25ci	R-20 R-30ci	R-20 R-30ci	R-25 R-35ci	R-25 R-35ci	R-25 R-35ci	R-25 R-35ci
Metal buildings (with R-5 R-3.5 thermal blocks [a,b])	R-19 R-19 + R11Ls	R-19 R-19 + R11Ls	R-13 + R-13 R-19 + R11Ls	R-13 + R-13 R-13 + R19	R-13 + R-13 R-19 + R11Ls	R-19 R-19 + R11Ls	R-13 + R-13 R-19 + R11Ls	R-19 R-19 + R11Ls	R-13 + R-13 R-19 + R11Ls	R-19 R-19 + R11Ls	R-13 + R-19 R-25 + R11Ls	R-19 R-25 + R11Ls	R-13 + R-19 R-30 + R11Ls	R-19 + R-10xx R-30 + R11Ls	R-11xx + R-19 R-30 + R11Ls	R-19 + R-10xx R-30 + R11Ls
Attic and other	R-30 R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38 R-49	R-38 R-49	R-38 R-49	R-38 R-49	R-49	R-49
Walls, Above Grade																
Mass	NR R-5.7ci	R-5.7ci	R-5.7ci	R-7.6ci	R-7.6ci	R-9.5ci	R-9.5ci	R-11.4ci	R-11.4ci	R-13.3ci	R-13.3ci	R-15.2ci	R-15.2ci	R-15.2ci	R-25ci	R-25ci
Metal building[b]	R-16 R-13+ R-6,5c.i.	R-16 R-13+ R-6,5c.i.	R-16 R-13+ R-6,5c.i.	R-16 R-13+ R-13c.i.	R-19 R-13+ R-6,5c.i	R-16 R-13+ R-13c.i	R-16 R-13+ R-13c.i	R-16 R-13+ R-13c.i	R-13 + R-5.6ci R-13+ R-13c.i	R-13 + R-5.6ci R-13+ R-13c.i	R-13 + R-5.6ci R-13+ R-13c.i	R-13 + R-5.6ci R-13+ R-13c.i	R-19 + R-5.6ci R-13+ R-13c.i	R-19 + R-5.6ci R-13+ R-19.5c.i	R-19 + R-5.6ci R-13+ R-13c.i	R-19 + R-5.6ci R-13+ R-26c.i
Metal framed	R-13 + R-5 ci	R-13 + R-5 ci	R-13 + R-5 ci	R-13 + R-7.5ci	R-13 + R-3.8ci R-5 ci	R-13 + R-7.5ci	R-13 + R-7.5	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-15.6ci	R-13 + R-7.5ci	R-13 + R-18.8ci
Wood framed and other	R-13 + 3.8c.i. or R-20	R-13 + 3.8c.i. or R-20	R-13 + 3.8c.i or R-20	R-13 + 3.8c.i. or R-20	R-13 + 3.8c.i. or R-20	R-13 + 3.8c.i. or R-20	R-13 + 3.8c.i. or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8 7.5 c.i.	R-13 + R-7.5 c.i.	R-13 + R-7.5 c.i.	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-15.6ci	R-13 + R-15.6ci
Walls, Below Grade																
Below-grade wall[d]	NR	NR	NR	NR	NR	NR	NR R-7.5ci	R-7.5ci	R-7.5ci	R-7.5ci	R-7.5ci	R-7.5ci	R-7.5ci R-10ci	R-10ci R-10ci	R-7.5ci R-10ci	R-12.5ci
Floors																
Mass	NR	NR	R-6.3ci	R-8.3ci	R-6.3ci R-10ci	R-8.3ci R-10ci	R-10ci	R-10.4ci	R-10ci	R-12.5ci	R-12.5ci	R-14.6ci	R-15ci	R-16.7ci	R-15ci	R-16.7ci
Joist/Framing	NR	NR	R-19	R-30	R-19	R-30	R-30	R-30	R-30	R-30	R-30	R-30[e]	R-30	R-30[e]	R-30[e]	R-30[e]
Slab-on-Grade Floors																
Unheated slabs	NR	NR	NR	NR	NR	NR	NR R-10 for 24 in. below	R-10 for 12 24 in. below	NR R-10 for 24 in. below	R-10 for 24 in. below	R-10 for 24 in. below	R-15 for 24 in. below	R-15 for 24 in. below	R-15 for 24 in. below	R-15 for 24 in. below	R-20 for 24 in. below
Heated slabs	R-7.5 for 12 in. below	R-7.5 for 12 in. below	R-7.5 for 12 in. below	R-7.5 for 12 in. below	R-10 for 24 in. below	R-10 for 24 in. below	R-15 for 24 in. below	R-15 for 24 in. below	R-15 for 24 36 in. below	R-15 for 24 36 in. below	R-15 for 24 36 in. below	R-20 for 48 in. below	R-20 for 24 in. below	R-20 for 48 in. below	R-20 for 48 in. below	R-20 for 48 in. below
Opaque Doors																
Swinging	U-0.70 U-0.61	U-0.70 U-0.61	U-0.70 U-0.61	U-0.70 U-0.61	U-0.70 U-0.61	U-0.70 U-0.61	U-0.70 U-0.61	U-0.70 U-0.61	U-0.70 U-0.37	U-0.70 U-0.37	U-0.70 U-0.37	U-0.70 U-0.37	U-0.50 U-0.37	U-0.50 U-0.37	U-0.50 U-0.37	U-0.50 U-0.37
Roll-up or sliding	U-1.45 R-4.75	U-1.45 R-4.75	U-1.45 R-4.75	U-1.45 R-4.75	U-1.45 R-4.75	U-1.45 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75

For SI: 1 inch = 25.4 mm.

ci = Continuous insulation. NR = No requirement.

a. When using *R*-value compliance method, a thermal spacer block is required, otherwise use the *U*-factor compliance method. [see Tables 502.1.2 and 502.2(2)].

b. Assembly descriptions can be found in Table 502.2(2).

c. R-5.7 ci is allowed to be substituted with concrete block walls complying with ASTM C 90, ungrouted or partially grouted at 32 inches or less on center vertically and 48 inches or less on center horizontally, with ungrouted cores filled with material having a maximum thermal conductivity of 0.44 Btu-in./h-f2 F.

d. When heated slabs are placed below grade, below-grade walls must meet the exterior insulation requirements for perimeter insulation according to the heated slab-on-grade construction.

e. Steel floor joist systems shall to be R-38.

~~**TABLE 502.2(2)**~~
~~**BUILDING ENVELOPE REQUIREMENTS-OPAQUE ASSEMBLIES**~~

~~**ROOFS**~~	~~**DESCRIPTION**~~	~~**REFERENCE**~~
~~R-19~~	~~Standing seam roof with single fiberglass insulation layer. This construction is R-19 faced fiberglass insulation batts draped perpendicular over the purlins. A minimum R-3.5 thermal spacer block is placed above the purlin/batt, and the roof deck is secured to the purlins.~~	~~ASHRAE/IESNA 90.1 Table A2.3 including Addendum "G"~~
~~R-13 + R-13 R-13 + R-19~~	~~Standing seam roof with two fiberglass insulation layers. The first *R*-value is for faced fiberglass insulation batts draped over purlins. The second *R*-value is for unfaced fiberglass insulation batts installed parallel to the purlins. A minimum R-3.5 thermal spacer block is placed above the purlin/batt, and the roof deck is secured to the purlins.~~	~~ASHRAE/IESNA 90.1 Table A2.3 including Addendum "G"~~
~~R-11 + R-19 FC~~	~~Filled cavity fiberglass insulation. A continuous vapor barrier is installed below the purlins and uninterrupted by framing members. Both layers of uncompressed, unfaced fiberglass insulation rest on top of the vapor barrier and are installed parallel, between the purlins. A minimum R-3.5 thermal spacer block is placed above the purlin/batt, and the roof deck is secured to the purlins.~~	~~ASHRAE/IESNA 90.1 Table A2.3 including Addendum "G"~~
~~**WALLS**~~		
~~R-16, R-19~~	~~Single fiberglass insulation layer. The construction is faced fiberglass insulation batts installed vertically and compressed between the metal wall panels and the steel framing.~~	~~ASHRAE/IESNA 90.1 Table A3.2 including Addendum "G"~~
~~R-13 + R-5.6 ci R-19 + R-5.6 ci~~	~~The first *R*-value is for faced fiberglass insulation batts installed perpendicular and compressed between the metal wall panels and the steel framing. The second rated *R*-value is for continuous rigid insulation installed between the metal wall panel and steel framing, or on the interior of the steel framing.~~	~~ASHRAE/IESNA 90.1 Table A3.2 including Addendum "G"~~

TABLE 502.2(2)
BUILDING ENVELOPE REQUIREMENTS-OPAQUE ASSEMBLIES

ROOFS	**DESCRIPTION**	**REFERENCE**
R-19+R-11 LS R-25+R-11 LS R-30+R-11 LS	Liner System with thermal spacer block. A continuous membrane is installed below the purlins and uniterrupted by framing members. Uncompressed, unfaced insulation rests on top of the membrane between the purlins.	ASHRAE/IESNA 90.1 A2.3.2.4 and Table A2.3 including proposed 90.1-2007 Addendum "bb"
WALLS	-	-
R-19	Single layer fiberglass insulation. The layer of R-19 fiberglass insulation is installed continuously perpendicularto the girts and is compressed when the metal skin is attached to the girts.	ASHRAE/IESNA 90.1 A2.3.2.4 and Table A2.3 including proposed 90.1-2007 Addendum "bb"
R-13+R-6.5c.i. R-13+ R-13 c.i. R-13+ R-19.5 c.i R-13+ R-26 c.i	Single layer fiberglass insulation with continuous insulation. The first R-value is for faced insulation batts installed perpendicular and compressed between the metal wall panels and the steel framing. The second rated R-value is for continuous rigid insulation installed between the metal panel and steel framing, or on the interior of the steel framing..	ASHRAE/IESNA 90.1 A2.3.2.4 and Table A2.3 including proposed 90.1-2007 Addendum "bb"

TABLE 502.3
BUILDING ENVELOPE REQUIREMENTS: FENESTRATION

CLIMATE ZONE	1	2	3	4, except Marine	5 and Marine 4	6	7	8
Vertical Fenestration (40% maximum of above-grade wall)								
Framing materials other than metal with or without metal reinforcement or cladding								
U-Factor[a]	1.20/ 0.57	~~0.75~~ 0.57	~~0.65~~ 0.40	~~0.40~~ 0.35	0.35	0.35	0.35	0.35
Metal framing with or without thermal break								
Curtain Wall/Storefront *U*-Factor[a]	1.0/ 0.57	~~0.70~~ 0.57	~~0.60~~ 0.50	~~0.50~~ 0.42	~~0.45~~ 0.42	~~0.45~~ 0.42	0.40	0.40
Entrance Door *U*-Factor	1.20	1.10	0.90	0.85	0.80	0.80	0.80	0.80
All Other *U*-Factor[a,b]	1.20/ 0.65	~~0.75~~ 0.65	~~0.65~~ 0.60	~~0.55~~ 0.50	~~0.55~~ 0.50	~~0.55~~ 0.50	0.45	~~0.45~~ 0.40
SHGC- All Frame Types								
SHGC: PF < 0.25	0.25	0.25	0.25	0.40	0.40	0.40	0.45	0.45
SHGC: 0.25 ≤ PF <0.5	0.33	0.33	0.33	NR	NR	NR	NR	NR
SHGC: PF ≥ 0.5	0.40	0.40	0.40	NR	NR	NR	NR	NR
Skylights (3% maximum, 5% maximum with automatic day lighting controls[c])								
U-Factor	0.75	~~0.75~~ 0.65	~~0.65~~ 0.55	~~0.60~~ 0.50	~~0.60~~ 0.50	~~0.60~~ 0.50	~~0.60~~ 0.50	~~0.60~~ 0.50
SHGC[d]	0.35	0.35	0.35	0.40	0.40	0.40	NR	NR

NR = No requirement.
PF = Projection factor (see Section 502.3.2).
a. The first U-factor applies when impact rated glazing is installed.
b. All others includes operable windows, fixed windows, and ~~nonentrance~~ doors other than entrance doors.
c. Automatic day lighting controls shall meet the requirements of Section 505.2.2.3.1.
d. The SHGC for Climate Zones 1 – 6 can be increased to SHGC no greater than 0.60 if the Visible Transmittance (VT) is not less than 0.60 and automatic day lighting controls are installed that meet the requirements of Section 505.2.2.3.1.

502.4 Air leakage (Mandatory)

502.4.1 Air Barriers. The building envelope shall be designed and constructed with a continuous air barrier that complies with Section 502.4.1.1 and 502.4.1.2 to control air leakage into, or out of, the conditioned space. Construction documents shall identify the air barrier components for each assembly, including detailing joints, interconnections and sealing of penetrations. The opaque building envelope air barrier may be located on the inside, outside, or integral with the building envelope; or any combination thereof.

Exception: Building envelopes of buildings in climate Zones 1, 2 and 3.

Section 502.4.1.1 The *continuous air barrier* shall have the following characteristics:

1. It shall be continuous throughout the envelope (at the lowest *floor*, exterior *walls*, and ceiling or *roof*). Air barrier joints and seams shall be sealed; including sealing transitions in planes and changes in materials. Air barrier penetrations shall be sealed.

2. The air barrier component of each assembly shall be joined and sealed in a flexible manner to the air barrier component of adjacent assemblies. The joints and seals shall allow for the relative movement of the assemblies and materials without damage to the air seal.

3. The air barrier shall be installed in accordance with the *manufacturer's* instructions in a manner that achieves the performance requirements.

4. Where lighting *fixtures* with ventilation holes or other similar objects are to be installed in such a way as to penetrate the *continuous air barrier*, provisions shall be made to maintain the integrity of the *continuous air barrier*.

Exception: Buildings that comply with Section 502.4.1.2(3) below are not required to comply with either 1 or 4.

Section 502.4.1.2 Air barrier compliance options. A continuous air barrier for the opaque building envelope shall meet the requirements of at least one of the compliance options in Section 502.4.1.2(1), 502.4.1.2(2), or 502.4.1.2(3).

502.4.1.2.1 Materials. Individual materials shall have an air permeability not to exceed 0.02 L/s·m^2 under a pressure differential of 75 Pa (0.004 cfm/ft^2 under a pressure differential of 0.3 in. water (1.57 lb/ft^2)) when tested in accordance

with ASTM E2178. The following materials comply with this requirement when all joints are sealed:

1. Plywood - minimum 3/8 in (10 mm)
2. Oriented strand board - minimum 3/8 in (10 mm)
3. Extruded polystyrene insulation board - minimum 3/4 in (19 mm)
4. Foil-back urethane insulation board - minimum 3/4 in (19 mm)
5. Closed cell spray foam meeting air permeability requirement
6. Open cell spray foam meeting air permeability requirement
7. Weather resistant barrier meeting air permeability requirement
8. Exterior or interior gypsum board - minimum 1/2 in (12 mm)
9. Cement board - minimum 1/2 in (12 mm)
10. Built up roofing membrane
11. Modified bituminous roof membrane
12. Fully adhered single-ply roof membrane
13. A Portland cement/sand parge, or gypsum plaster minimum 5/8 in (16 mm) thick
14. Cast-in-place and precast concrete.
15. Fully grouted concrete block masonry.
16. Sheet steel or aluminum

502.4.1.2.2 Assemblies. The following assemblies shall comply when all joints are sealed:

1. Assemblies of materials and components that have an average air leakage not to exceed 0.2 L/s·m2 @ 75 Pa (0.04 cfm/ft2 under a pressure differential of 0.3" w.g. (1.57psf)) when tested in accordance with ASTM E2357 or ASTM E1677.

2. Provided that all joints are sealed and every characteristic in Section 502.4.4.1.1 is met, assemblies that comply with Section 502.4.1.2(2) include, but are not limited to,
   2.1. Concrete masonry walls coated with one application either of block filler and two applications of a paint or sealer coating;
   2.2. A Portland cement/sand parge, stucco or plaster minimum 1/2 in (12 mm) thick.

502.4.1.2.3 Building Test. Testing the completed building and demonstrating that the air leakage rate of the *building envelope* does not exceed 2.0 L/s·m^2 @ 75 Pa (0.40 cfm/ft^2 at a pressure differential of 0.3" w.g. (1.57 psf)) in accordance with ASTM E779 or an equivalent method approved by the code official.

502.4.2 Air Barrier Penetrations. All penetrations of the air barrier and paths of air infiltration / exfiltration shall be made air tight and shall be sealed with caulking materials or closed with gasketing systems compatible with the construction materials and location. Joints and seals shall be sealed in the same manner or taped or covered with a moisture vapor-permeable wrapping material. Sealing materials spanning joints between construction materials shall allow for expansion and contraction of the construction materials.

502.4.3 ~~502.4.1~~ Window and door assemblies. The air leakage of windows, skylights, and ~~sliding or swinging~~ door assemblies that are part of the building envelope shall be determined in accordance with AAMA/WDMA/CSA 101/I.S.2/A440, or NFRC 400 by an accredited, independent laboratory, and labeled and certified by the manufacturer. ~~and shall not exceed the values in Section 402.4.2~~ Windows and skylights shall have an air leakage rate of no more than 0.2 cfm per square foot (1.0 L/s/m2) when tested at a pressure of at least 1.57 pounds per square foot (psf) (75 Pa), or 0.3 cfm per square foot (1.5 L/S/m2) when tested at a pressure of at least 6.24 pounds per square foot (psf) (300 Pa). Door assemblies shall have an air leakage rate of no more than 0.3 cfm per square foot (1.5 L/s/m2).

Exceptions:

1. ~~Site-constructed~~ Field-fabricated fenestration products ~~windows and doors~~ that are ~~weatherstripped or~~ sealed in accordance with Section 502.4.~~3~~1
2. Commercial entrance doors covered by Section 502.4.4.
3. Garage doors shall be permitted to use air leakage determined in accordance with ANSI/ DASMA 105 at standard test conditions.

~~**502.4.3 Sealing of the building envelope.** Openings and penetrations in the building envelope shall be sealed with caulking materials or closed with gasketing systems compatible with the construction materials and location. Joints and seams shall be sealed in the same manner or taped or covered with a moisture vapor-permeable wrapping material.~~

~~Sealing materials spanning joints between construction materials shall allow for expansion and contraction of the construction materials.~~

502.4.4 ~~502.4.2~~ Curtain wall, storefront glazing and commercial entrance doors. Curtain wall, storefront glazing and commercial-glazed swinging entrance doors and revolving doors shall be tested for air leakage at a pressure of at least 1.57 pounds per square foot (psf) (75 Pa) in accordance with ASTM E 283. For curtain walls and storefront glazing, the maximum air leakage rate shall be ~~0.3~~ 0.06 cubic foot per minute per square foot (cfm/ft2) (~~5.5~~ 1.1 m3/h × m2) of fenestration area. For commercial glazed swinging entrance doors and revolving doors, the maximum air leakage rate shall be 1.00 cfm/ft2 (18.3 m3/h × m2) of door area when tested in accordance with ASTM E 283.

Exception: Site-built fenestration products that are sealed in accordance with Section 502.4.1.

502.4.5 Doors and Access Openings to Shafts, Chutes, Stairwells, and Elevator Lobbies. These doors and access openings shall either meet the requirements of 502.4.3 or shall be equipped with weather seals.

Exception: Weatherseals on elevator lobby doors are not required when a smoke control system is installed.

502.4.6 ~~502.4.4~~ Hot gas bypass limitation. (No change to current text.)

502.4.7 ~~502.4.5~~ Outdoor air intakes and exhaust openings. Stair and elevator shaft vents and other outdoor air intakes and exhaust openings ~~integral to the building envelope~~ that penetrate the air barrier shall be equipped with not less than a Class I motorized, leakage-rated damper with a maximum leakage rate of 4 cfm per square foot (6.8 L/s · C m2) at 1.0 inch water gauge (w.g.) (1250 Pa) when tested in accordance with AMCA 500D.

Such dampers shall be set in the closed position and automatically open upon:

1. The activation of any fire alarm initiating device of the building's fire alarm system;
2. The interruption of power to the damper.

Exception: Gravity (non-motorized) dampers are permitted to be used in buildings less than three stories in height above grade.

502.4.8 ~~502.4.6~~ Loading dock weatherseals. *(No change to current text)*

502.4.9 ~~502.4.7~~ Vestibules. *(No change to current text)*

502.4.10 ~~502.4.8~~ Recessed lighting. *(No change to current text)*

SECTION 503
BUILDING MECHANICAL SYSTEMS

503.2.1 Calculation of heating and cooling loads. Design loads shall be determined in accordance with the procedures described in the ASHRAE/ACCA Standard 183. The design loads shall account for the building envelope, lighting, ventilation and occupancy loads based on the project design. Heating and cooling loads shall be adjusted to account for load reductions that are achieved when energy recovery systems are utilized in the HVAC system in accordance with the ASHRAE *HVAC Systems and Equipment Handbook*. Alternatively, design loads shall be determined by an *approved* equivalent computation procedure, using the design parameters specified in Chapter 3.

TABLE 503.2.3(1)
UNITARY AIR CONDITIONERS AND CONDENSING UNITS, ELECTRICALLY OPERATED, MINIMUM EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY[b]	TEST PROCEDUREa
Air conditioners, Air cooled	< 65,000 Btu/h[d]	Split system	~~13.0 SEER~~ For zones 1 to 5: 15.0 SEER, 12.5 EER For zones 6 to 8: 14 SEER, 12 EER	AHRI 210/240
		Single package	~~13 SEER~~ For zones 1 to 5: 15.0 SEER, 12.0 EER For zones 6 to 8: 14.0 SEER 11.6 EER	
	≥ 65,000 Btu/h and ~~< 135,000 Btu/h~~ < 240,000 Btu/h	Split system and single package	~~10.3 EERc (before Jan 1, 2010) 11.2 EERc (as of Jan 1, 2010)~~ For zones 1 to 5: 12.0 EER[b,] 12.4 IPLV[b] For zones 6 to 8: 11.5 EER[b], 11.9 IPLV[b]	
	~~≥ 135,000 Btu/h and < 240,000 Btu/h~~	~~Split system and single package~~	~~9.7 EER[c] (before Jan 1, 2010) 11.0 EER[c] (as of Jan 1, 2010)~~	AHRI 340/360
	≥ 240,000 Btu/h and < 760,000 Btu/h	Split system and single package	~~9.5 EER[c] 9.7 IPLV[c] (before Jan 1, 2010) 10.0 EER[c 9].7 IPLV[g] (as of Jan 1, 2010)~~ For zones 1 to 5: 10.8 EER[b], 12.0 IPLV[b] For zones 6 to 8: 10.5 EER[b], 10.9 IPLV[b]	
	≥ 760,000 Btu/h	Split system and single package	~~9.2 EER[c] 9.4 IPLV[c] (before Jan 1, 2010) 9.7 EER[c] 9.4 IPLV[c] (as of Jan 1, 2010)~~ For zones 1 to 5: 10.2 EER[b], 11.0 IPLV[b] For zones 6 to 8: 9.7 EER[b], 11.0 IPLV[b]	
Through-the-wall, Air cooled	< 30,000 Btu/h[d]	Split system	10.9 SEER (before Jan 23, 2010) 12.0 SEER (as of Jan 23, 2010)	AHRI 210/240
		Single package	10.6 SEER (before Jan 23, 2010) 12.0 SEER (as of Jan 23, 2010)	
Air conditioners, Water and evaporatively cooled	~~< 65,000 Btu/h~~	Split system and single package	~~12.1 EER~~ 14.0 EER	AHRI 210/240
	~~≥ 65,000 Btu/h and < 135,000 Btu/h~~	~~Split system and single package~~	~~11.5 EER[c]~~	
	~~≥ 135,000 Btu/h and < 240,000 Btu/h~~	~~Split system and single package~~	~~11.0 EER[c]~~	AHRI 340/360
	~~≥ 240,000 Btu/h~~	~~Split system and single package~~	~~11.5 EER[c]~~	

For SI: 1 British thermal unit per hour = 0.2931 W.

a. Chapter 6 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

b. IPLVs are only applicable to equipment with capacity modulation.

~~c. Deduct 0.2 from the required EERs and IPLVs for units with a heating section other than electric resistance heat.~~

~~d. Single-phase air-cooled air conditioners , 65,000 Btu/h are regulated by the National Appliance Energy Conservation Act of 1987 (NAECA); SEER values are those set by NAECA.~~

TABLE 503.2.3(2)
UNITARY AIR CONDITIONERS AND CONDENSING UNITS, ELECTRICALLY OPERATED, MINIMUM EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY[b]	TEST PROCEDURE[a]
Air cooled (Cooling mode)	< 65,000 Btu/h[d]	Split system	~~13.0 SEER~~ For zones 1 to 5: 15.0 SEER, 12.5 EER For zones 6 to 8: 14.0 SEER, 12.0 EER	AHRI 210/240
		Single package	~~13.0 SEER~~ For zones 1 to 5: 15.0 SEER, 12.0 EER For zones 6 to 8: 14.0 SEER, 11.6 EER	
	≥ 65,000 Btu/h and ~~< 135,000 Btu/h~~ < 240,000 Btu/h	Split system and single package	~~10.1 EER[c] (before Jan 1, 2010) 11.0 EER[c] (as of Jan 1, 2010)~~ For zones 1 to 5: 12.0 SEER, 12.4 EER For zones 6 to 8: 11.5 EERb, 11.9 IPLV[b]	
	~~≥135,000 Btu/h and < 240,000 Btu/h~~	~~Split system and single package~~	~~9.3 EER[c] (before Jan 1, 2010) 10.6 EER[c] (as of Jan 1, 2010)~~	AHRI 340/360
	≥ 240,000 Btu/h	Split system and single package	~~9.0 EER[c] 9.2 IPLV[c] (before Jan 1, 2010) 9.5 EER[c] 9.2 IPLV[c] (as of Jan 1, 2010)~~ For zones 1 to 5: 12.0 SEER, 12.4 EER For zones 6 to 8: 10.5 EER[b], 10.9 IPLV[b]	
Through-the-Wall (Air cooled, cooling mode)	<30,000 Btu/h[d]	Split system	10.9 SEER (before Jan 23, 2010) 12.0 SEER (as of Jan 23, 2010)	AHRI 210/240
		Single package	10.6 SEER (before Jan 23, 2010) 12.0 SEER (as of Jan 23, 2010)	
Water source (Cooling mode)	~~< 17,000 Btu/h~~	~~86°F entering water~~	~~11.2 EER~~	~~AHRI/ASHRAE-13256-1~~
	~~≥ 17,000 Btu/h and~~ < 135,000 Btu/h	~~86°F~~ 85°F entering water	~~12.0~~ 14.0 EER	AHRI/ASHRAE-13256-1
Groundwater source (Cooling mode)	< 135,000 Btu/h	59°F entering water	16.2 EER	AHRI/ASHRAE-13256-1
Ground source (Cooling mode)	< 135,000 Btu/h	77°F entering water	13.4 EER	AHRI/ASHRAE 13256-1
Air cooled (Heating mode)	< 65,000 Btu/h[d] (Cooling capacity)	Split system	~~7.7 HSPF~~ For zones 1 to 5: 9.0 HSPF For zones 6 to 8: 8.5 HSPF	AHRI 210/240
		Single package	~~7.7 HSPF~~ For zones 1 to 5: 8.5 HSPF For zones 6 to 8: 8.0 HSPF	

EQUIPMENT TYPE	SIZE CATEGORY	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY[b]	TEST PROCEDURE[a]
	≥ 65,000 Btu/h and < 135,000 Btu/h (Cooling capacity)	47°F db/43°F wb outdoor air	~~3.2 COP (before Jan 1, 2010)~~ ~~3.3 COP (as of Jan 1, 2010)~~ 3.4 COP	
		17°F db/15°F wb outdoor air	2.4 COP	
	≥ 135,000 Btu/h (Cooling capacity)	47°F db/43°F wb outdoor air	~~3.1 COP (before Jan 1, 2010)~~ 3.2 COP ~~(as of Jan 1, 2010)~~	AHRI 340/360
		77°F db/15°F wb outdoor air	2.1 COP	
Through-the-wall (Air cooled, heating mode)	<30,000 Btu/h	Split system	7.1 HSPE (before Jan 23, 2010) 7.4 HSPF (as of Jan 23, 2010)	AHRI 210/240
		Single package	7.0 HSPF (before Jan 23, 2010) 7.4 HSPF (as of Jan 23, 2010)	
Water source (Heating mode)	< 135,000 Btu/h (Cooling capacity)	~~68°F entering water~~ 70°F entering water	~~4.2 COP~~ 4.6 COP	ARI/ASHRAE-13256-1
Groundwater source (Heating mode)	< 135,000 Btu/h (Cooling capacity)	50°F entering water	3.6 COP	ARI/ASHRAE-13256-1
Ground Source (Heating mode)	< 135,000 Btu/h (Cooling capacity)	32°F entering water	3.1 COP	ARI/ASHRAE-13256-1

For SI: °C = [(°F) - 32]/1.8, 1 British thermal unit per hour = 0.2931 W.
db = dry-bulb temperature, °F; wb = wet-bulb temperature, °F.
a. Chapter 6 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.
b. IPLVs and Part load rating conditions are only applicable to equipment with capacity modulation.
~~c. Deduct 0.2 from the required EERs and IPLVs for units with a heating section other than electric resistance heat.~~
~~d. Single-phase air-cooled heat pumps < 65,000 Btu/h are regulated by the National Appliance Energy Conservation Act of 1987 (NAECA), SEER and HSPF values are those set by NAECA~~

TABLE 503.2.3(3)
PACKAGED TERMINAL AIR CONDITIONERS AND PACKAGED TERMINAL HEAT PUMPS

EQUIPMENT TYPE	SIZE CATEGORY (INPUT)	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY[b]	TEST PROCEDURE[a]
~~PTAC (Cooling mode) New construction~~	~~All capacities~~	~~95°F db outdoor air~~	~~12.5 - (0.213 × Cap/1000) EER~~	ARI 310/380
~~PTAC (Cooling mode) Replacements[c]~~	~~All capacities~~	~~95°F db outdoor air~~	~~10.9 - (0.213 · Cap/1000) EER~~	
~~PTHP (Cooling mode) New construction~~	~~All capacities~~	~~95°F db outdoor air~~	~~12.3 - (0.213 · Cap/1000) EER~~	
~~PTHP (Cooling mode) Replacements[c]~~	~~All capacities~~	~~95°F db outdoor air~~	~~10.8 - (0.213 · Cap/1000) EER~~	
~~PTHP (Heating mode) New construction~~	~~All capacities~~	~~—~~	~~3.2 - (0.026 · Cap/1000) COP~~	
~~PTHP (Heating mode) Replacements[c]~~	~~All capacities~~	~~—~~	~~2.9 - (0.026 · Cap/1000) COP~~	
Air conditioners	< 7,000 Btu / h		11.9 EER	
& Heat Pumps (Cooling Mode)	7,000 Btu / h and < 10,000 Btu / h		11.3 EER	
	10,000 Btu / h and < 13,000 Btu / h		10.7 EER	
	> 13,000 Btu / h		9.5 EER	

For SI: ºC - [(ºF) - 32]/1.8, 1 British thermal unit per hour - 0.2931 W.

db = dry-bulb temperature, ºF.
wb = wet-bulb temperature, ºF.
a. Chapter 6 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.
b. Cap means the rated cooling capacity of the product in Btu/h. If the unit's capacity is less than 7,000 Btu/h, use 7,000 Btu/h in the calculation. If the unit's capacity is greater than 15,000 Btu/h, use 15,000 Btu/h in the calculation.
~~c. Replacement units must be factory labeled as follows: "MANUFACTURED FOR REPLACEMENT APPLICATIONS ONLY: NOT TO BE INSTALLED IN NEW CONSTRUCTION PROJECTS." Replacement efficiencies apply only to units with existing sleeves less than 16 inches (406 mm) high and less than 42 inches (1067 mm) wide.~~

TABLE 503.2.3(4)
WARM AIR FURNACES AND COMBINATION WARM AIR FURNACES/AIR-CONDITIONING UNITS, WARM AIR DUCT FURNACES AND UNIT HEATERS, MINIMUM EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY (INPUT)	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY[d, e]	TEST PROCEDURE[a]
Warm air furnaces, gas fired	< 225,000 Btu/h	—	~~78% AFUE~~ ~~or~~ ~~80% *Et* c~~ For zones 1 & 2, NR. For zones 3 & 4 90 AFUE or 90 Et For zones 4-8 are 92 AFUE or 92 Et	DOE 10 CFR Part 430 or ANSI Z21.47
	≥ 225,000 Btu/h	Maximum capacity[e]	~~80% *Et* f~~ 90% E[c] note h	ANSI Z21.47
Warm air furnaces, oil fired	< 225,000 Btu/h	—	~~78% AFUE~~ ~~or~~ ~~80% *Et*~~ For zones 1 & 2, NR. For zones 3 to 8 are 85 AFUE or 85 Et	DOE 10 CFR Part 430 or UL 727
	≥ 225,000 Btu/h	Maximum capacity[b]	~~81% *Et*[g]~~ 85% Et, [d]	UL 727
Warm air duct furnaces, gas fired	All capacities	Maximum capacity[b]	~~80% *Ec*~~ *90% Ec*	ANSI Z83.8
Warm air unit heaters, gas fired	All capacities	Maximum capacity[b]	~~80% *Ec*~~ *90% Ec*	ANSI Z83.8
Warm air unit heaters, oil fired	All capacities	Maximum capacity[b]	~~80% *Ec*~~ *90% Ec*	UL 731

For SI: 1 British thermal unit per hour = 0.2931 W.
a. Chapter 6 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.
~~b. Minimum and maximum ratings as provided for and allowed by the unit's controls.~~
~~c. Combination units not covered by the National Appliance Energy Conservation Act of 1987 (NAECA) (3-phase power or cooling capacity greater than or equal to 65,000 Btu/h [19 kW]) shall comply with either rating.~~
~~d~~ b. *Et* = Thermal efficiency. See test procedure for detailed discussion.
~~e~~ c. *Ec* = Combustion efficiency (100% less flue losses). See test procedure for detailed discussion.
~~f. *Ec* = Combustion efficiency. Units must also include an IID, have jackets not exceeding 0.75 percent of the input rating, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space.~~
~~g. *Et* = Thermal efficiency. Units must also include an IID, have jacket losses not exceeding 0.75 percent of the input rating, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space.~~
d. Units must also include an IID (intermittent ignition device), have jackets not exceeding 0.75 percent of the input rating, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space.
Where there two ratings units not covered by the National Appliance Energy Conservation Act of 1987 (NAECA) (3-phase power or cooling capacity greater than or equal to 65,000 Btu/h [19 kW]) shall comply with either rating.
Et = Thermal efficiency.
Ec = Combustion efficiency (100% less flue losses).
Efficient furnace fan: All fossil fuel furnaces in zones 3 to 8 shall have a furnace electricity ratio not greater than 2% and shall include a manufacturer's designation of the furnace electricity ratio.

TABLE 503.2.3(5)
BOILERS, GAS- AND OIL-FIRED, MINIMUM EFFICIENCY REQUIREMENTS

EQUIPMENT TYPEf	SIZE CATEGORY (INPUT)	SUBCATEGORY OR RATING CONDITION	MINIMUM EFFICIENCY[c, d, e]	TEST PROCEDURE[a]
~~Boilers, Gas fired~~	~~< 300,000 Btu/h~~	~~Hot water~~	~~80% AFUE~~	~~DOE 10 CFR Part 430~~
		~~Steam~~	~~75% AFUE~~	
	~~≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h~~	~~Minimum capacityb~~	~~75% *Et* and 80% *Ec* (See Note c, d)~~	~~DOE 10 CFR Part 431~~
	~~>2,500,000 Btu/hf~~	~~Hot water~~	~~80% *Ec* (See Note c, d)~~	
		~~Steam~~	~~80% *Ec* (See Note c, d)~~	
~~Boilers, Oil fired~~	~~< 300,000 Btu/h~~	~~—~~	~~80% AFUE~~	~~DOE 10 CFR Part 430~~
	~~≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h~~	~~Minimum capacityb~~	~~78% *Et* and 83% *Ec* (See Note c, d)~~	~~DOE 10 CFR Part 431~~
	~~> 2,500,000 Btu/hf~~	~~Hot water~~	~~83% *Ec* (See Note c, d)~~	
		~~Steam~~	~~83% *Ec* (See Note c, d)~~	
~~Boilers, Oil fired (Residual)~~	~~≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h~~	~~Minimum capacityb~~	~~78% *Et* and 83% *Ec* (See Note c, d)~~	~~DOE 10 CFR Part 431~~
	~~> 2,500,000 Btu/hf~~	~~Hot water~~	~~83% *Ec* (See Note c, d)~~	
		~~Steam~~	~~83% *Ec* (See Note c, d)~~	
Gas Hot Water	< 300,000 Btu / h		90% Et	DOE 10 CFR Part 430
	> 300,000 Btu / h and > 2.5 mBtu/h		89% Et	DOE 10 CFR Part 431
Gas Steam	< 300,000 Btu / h		89% Et	DOE 10 CFR Part 430
	> 300,000 Btu / h		89% Et	DOE 10 CFR Part 431
Oil	< 300,000 Btu / h		90% Et	DOE 10 CFR Part 430
	> 300,000 Btu / h		89% Et	DOE 10 CFR Part 431
Et = thermal efficiency				

~~For SI: 1 British thermal unit per hour = 0.2931 W.~~

a. Chapter 6 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

~~b. Minimum ratings as provided for and allowed by the unit's controls.~~

~~c~~ b. *Ec* = Combustion efficiency (100 percent less flue losses). See reference document for detailed information.

~~d~~ c. *Et* = Thermal efficiency. See reference document for detailed information.

~~e. Alternative test procedures used at the manufacturer's option are ASME PTC 4.1 for units greater than 5,000,000 Btu/h input, or ANSI Z21.13 for units greater than or equal to 300,000 Btu/h and less than or equal to 2,500,000 Btu/h input.~~

~~f. These requirements apply to boilers with rated input of 8,000,000 Btu/h or less that are not packaged boilers, and to all packaged boilers. Minimum efficiency requirements for boilers cover all capacities of packaged boilers.~~

TABLE 503.2.3(6)
CONDENSING UNITS, ELECTRICALLY OPERATED, MINIMUM EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY	MINIMUM EFFICIENCY[b]	TEST PROCEDURE[a]
Condensing units, air cooled	≥ 135,000 Btu/h	10.1 EER 11.2 IPLV	ARI 365
Condensing units, water or evaporatively cooled	≥ 135,000 Btu/h	13.1 EER 13.1 IPLV	
Air Cooled, Single Effect		0.60, allowed only in heat recovery applications	
Water Cooled, Single Effect		0.70, allowed only in heat recovery applications	
Double Effect - Direct Fired		1.0 (1.05)	
Double Effect - Indirect Fired		1.20	

For SI: 1 British thermal unit per hour = 0.2931 W.
a. Chapter 6 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.
b. IPLVs are only applicable to equipment with capacity modulation.

TABLE 503.2.3(7)
WATER CHILLING PACKAGES, EFFICIENCY REQUIREMENTS[a]

EQUIPMENT TYPE	SIZE CATEGORY	UNITS	BEFORE 1/1/2010 REQUIRED EFFICIENCY-CHILLERS		AS OF 1/1/2010C PATH A OPTIONAL COMPLIANCE PATH - REQUIRED EFFICIENCY - CHILLERS WITH VSD		PATH B		TEST PROCEDURE[b]
			FULL LOAD (KW /TON)	IPLV (KW /TON)	FULL LOAD (KW /TON)	IPLV (KW /TON)	FULL LOAD	IPLV	
Air-Cooled Chillers w/ Condenser	<150 tons All	EER	≥9.562 1.2	≥10.416 1.0	≥9.562 N/A	≥12.500 N/A	NA[d]	NA[d]	AHRI 550/590
	≥150 tons	EER			≥9.562 N/A	≥12.750 N/A	NA[d]	NA[d]	
Air-Cooled without Condenser, Electrical Operated	All Capacities	EER	≥10.586 1.08	≥11.782 1.08	Air-cooled chillers without condensers must be rated with matching condensers and comply with the air-cooled chiller efficiency requirements				
					N/A	N/A			
Water cooled, Electrically Operated, Reciprocating	All Capacities	kW/ton	≤0.837 0.840	≤0.696 0.630	Reciprocating units must comply with water cooled positive displacement efficiency requirements				
					N/A	N/A			
Water Cooled, Electrically Operated, Positive Displacement Rotary Screw and Scroll	<75 90 tons	kW/ton	≤0.790 0.780	≤0.676 0.600	≤0.780 N/A	≤0.630 N/A	≤0.800	≤0.600	
	≥75 90 tons and < 150 tons	kW/ton	0.730	0.550	≤0.775 N/A	≤0.615 N/A	≤0.790	≤0.586	
	≥ 150 tons and < 300 tons	kW/ton	≤0.717 0.610	≤0.627 0.510	≤0.680 N/A	≤0.580 N/A	≤0.718	≤0.540	
	≥300 tons	kW/ton	≤0.639 0.600	≤0.571 0.490	≤0.620 N/A	≤0.540 N/A	≤0.639	≤0.490	

EQUIPMENT TYPE	SIZE CATEGORY	~~UNITS~~	~~BEFORE 1/1/2010~~ REQUIRED EFFICIENCY- CHILLERS		~~AS OF 1/1/2010C~~				TEST PROCEDURE[b]
					~~PATH A~~ OPTIONAL COMPLIANCE PATH - REQUIRED EFFICIENCY - CHILLERS WITH VSD		~~PATH B~~		
			FULL LOAD (KW /TON)	IPLV (KW /TON)	FULL LOAD (KW /TON)	IPLV (KW /TON)	~~FULL LOAD~~	~~IPLV~~	
Water Cooled, ~~Electrically Operated,~~ Centrifugal	<150 tons	~~kW/ton~~	~~≤0.703~~ 0.610	~~≤0.669~~ 0.620	~~≤0.634~~ 0.630	~~≤0.596~~ 0.400	~~≤0.639~~	~~≤0.450~~	
	≥150 tons and < 300 tons	~~kW/ton~~	~~≤0.634~~ 0.590	~~≤0.596~~ 0.560	0.600	0.400			
	~~≥~~300 tons and < 600 tons	~~kW/ton~~	~~≤0.576~~ 0.570	~~≤0.549~~ 0.510	~~≤0.576~~ 0.580	~~≤0.549~~ 0.400	~~≤0.600~~	~~≤0.400~~	
	≥600 tons	~~kW/ton~~	~~≤0.576~~ 0.550	~~≤0.549~~ 0.510	~~≤0.570~~ 0.550	~~≤0.539~~ 0.400	~~ARI 560~~	~~≤0.400~~	
~~Air Cooled Absorption Single Effect~~	~~All Capacities~~	~~COP~~	~~≥0.600~~	~~NR[e]~~	~~≥0.600~~	~~NR[e]~~	~~NA[d]~~	~~NA[d]~~	~~AHRI 560~~
~~Water-Cooled Absorption Single Effect~~	~~All Capacities~~	~~COP~~	~~≥0.700~~	~~NR[e]~~	~~≥0.700~~	~~NR[e]~~	~~NA[d]~~	~~NA[d]~~	
~~Absorption Double Effect Indirect-Fired~~	~~All Capacities~~	~~COP~~	~~≥1.000~~	~~≥1.050~~	~~≥1.000~~	~~≥1.050~~	~~NA[d]~~	~~NA[d]~~	
~~Absorption Double Effect Direct Fired~~	~~All Capacities~~	~~COP~~	~~≥1.000~~	~~≥1.000~~	~~≥1.000~~	~~≥1.000~~	~~NA[d]~~	~~NA[d]~~	

For SI: 1 ton = 907 kg, 1 British thermal unit per hour = 0.2931 W.

a. The chiller equipment requirements do not apply for chillers used in low-temperature applications where the design leaving fluid temperature is<40ºF.

b. Section 12 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

~~c. Compliance with this standard can be obtained by meeting the minimum requirements of Path A or B. However, both the full load and IPLV must be met to fulfill the requirements of Path A or B.~~

d. NA means that this requirement is not applicable and cannot be used for compliance.

~~e. NR means that there are no minimum requirements for this category.~~

a. Compliance with full load efficiency numbers and IPLV numbers are both required.

b. Only Chillers with Variable Speed Drives (VSD) may use the optional compliance path for chiller efficiency.
N/A – No credit can be taken for this option

503.2.5.1 Demand controlled ventilation. Demand control ventilation (DCV) is required for spaces larger than 500 ft^2 (50m^2) and with an average occupant load of ~~40~~ 25 people per 1000 ft^2 (93 m^2) of floor area (as established in Table 403.3 of the *International Mechanical Code*) and served by systems with one or more of the following:

1. An air-side economizer;
2. Automatic modulating control of the outdoor air damper; or
3. A design outdoor airflow greater than 3,000 cfm (1400 L/s).

Exceptions:

1. Systems with energy recovery complying with Section 503.2.6.
2. Multiple-zone systems without direct digital control of individual zones communicating with a central control panel.
3. System with a design outdoor airflow less than 1,200 cfm (600 L/s).
4. Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1,200 cfm (600 L/s).
5. Building spaces where the primary ventilation needs are for process loads.

~~**503.2.9 HVAC system completion.** Prior to the issuance of a certificate of occupancy, the design professional shall provide evidence of system completion in accordance with Sections 503.2.9.1 through 503.2.9.3.~~

~~**503.2.9.1 Air system balancing.** Each supply air outlet and *zone* terminal device shall be equipped with means for air balancing in accordance with the requirements of Chapter 6 of the *International Mechanical Code*. Discharge dampers are prohibited on constant volume fans and variable volume fans with motors 10 horsepower (hp) (7.4 kW) and larger.~~

~~**503.2.9.2 Hydronic system balancing.** Individual hydronic heating and cooling coils shall be equipped with means for balancing and pressure test connections.~~

~~**503.2.9.3 Manuals.** The construction documents shall require that an operating and maintenance manual be provided to the building owner by the mechanical contractor.~~

~~The manual shall include, at least, the following:~~

1. ~~Equipment capacity (input and output) and required maintenance actions.~~
2. ~~Equipment operation and maintenance manuals.~~
3. ~~HVAC system control maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions. Desired or field-determined setpoints shall be permanently recorded on control drawings, at control devices or, for digital control systems, in programming comments.~~
4. ~~A complete written narrative of how each system is intended to operate.~~

503.2.9 Mechanical systems commissioning and completion requirements. Mechanical systems commissioning and completion shall be in accordance with the provisions of Section 503.2.9.1 through 503.2.9.3.4.

503.2.9.1 System commissioning. Commissioning is a process that verifies and documents that the selected building systems have been designed, installed, and function according to the owner's project requirements and construction documents, and to minimum code requirements. Drawing notes shall require commissioning and completion requirements in accordance with this section. Drawing notes may refer to equipment specifications for further requirements. Copies of all documentation shall be given to the owner. The building official may request commissioning documentation for review purposes. At the time of plan submittal, the building jurisdiction shall be provided, by the submittal authority, a letter of intent to commission the building in accordance with this code.

503.2.9.1.1 Commissioning plan. A commissioning plan shall include as a minimum the following items:

1. A detailed explanation of the building's project requirements for mechanical design,
2. A narrative describing the activities that will be accomplished during each phase of commissioning, including guidance on who accomplishes the activities and how they are completed,
3. Equipment and systems to be tested, including the extent of tests,
4. Functions to be tested (for example calibration, economizer control, etc.),
5. Conditions under which the test shall be performed (for example winter and summer design conditions, full outside air, etc.), and
6. Measurable criteria for acceptable performance.

503.2.9.1.2 Systems adjusting and balancing. All HVAC systems shall be balanced in accordance with generally accepted engineering standards. Air and water flow rates shall be measured and adjusted to deliver final flow rates within 10% of design rates. Test and balance activities shall include as a minimum the following items:

1. Air systems balancing: Each supply air outlet and zone terminal device shall be equipped with means for air balancing in accordance with the requirements of Chapter 6 of the International Mechanical Code. Discharge dampers are prohibited on constant volume fans and variable volume fans with motors 10 hp (18.6 kW) and larger. Air systems shall be balanced in a manner to first minimize throttling losses then, for fans with system power of greater than 1 hp, Fan speed shall be adjusted to meet design flow conditions.

   Exception: Fan with fan motors of 1 hp or less.

2. Hydronic systems balancing: Individual hydronic heating and cooling coils shall be equipped with means for balancing and pressure test connections. Hydronic systems shall be proportionately balanced in a manner to first minimize throttling losses, then the pump impeller shall be trimmed or pump speed shall be adjusted to meet design flow conditions. Each hydronic system shall have either the ability to measure pressure across the pump, or test ports at each side of each pump.

Exceptions

1. Pumps with pump motors of 5 hp or less.
2. When throttling results in no greater than 5 percent of the nameplate horsepower draw above that required if the impeller were trimmed.

503.2.9.1.3 Functional performance testing. Equipment functional performance testing shall be in accordance with Section 503.2.9.1.3.1. Functional testing of HVAC controls shall be in accordance with Section 503.2.9.1.3.2.

503.2.9.1.3.1 Equipment functional performance testing. Equipment functional performance testing shall demonstrate the correct installation and operation of components, systems, and system-to-system interfacing relationships in accordance with approved plans and specifications. This demonstration is to prove the operation, function, and maintenance serviceability for each of the commissioned systems. Testing shall include all modes of operation, including:

1. All modes as described in the sequence of operation,
2. Redundant or automatic back-up mode,
3. Performance of alarms, and
4. Mode of operation upon a loss of power and restored power.

Exception: Unitary or packaged HVAC equipment listed in Tables 503.2.3 (1) through (3) that do not require supply air economizers.

503.2.9.1.3.2 Controls functional performance testing. HVAC control systems shall be tested to document that control devices, components, equipment, and systems are calibrated, adjusted and operate in accordance with approved plans and specifications. Sequences of operation shall be functionally tested to document they operate in accordance with approved plans and specifications.

503.2.9.1.4 Preliminary commissioning report. A preliminary report of commissioning test procedures and results shall be completed and provided to the owner. The report shall be identified as “Preliminary Commissioning Report” and shall identify:

1. Itemization of deficiencies found during testing required by this section which have not been corrected at the time of report preparation and the anticipated date of correction;
2. Deferred tests which cannot be performed at the time of report preparation due to climatic conditions; and
3. Climatic conditions required for performance of the deferred tests, and the anticipated date of each deferred test.

503.2.9.2 Acceptance. Buildings, or portions thereof, required by this code to comply with this section shall not be issued a final certificate of occupancy allowing occupation until such time that the code official has received a letter of transmittal from the building owner that states they have received the Preliminary Commissioning Report as required by Section 503.2.9.1.4. At the request of the code official, a copy of the Preliminary Commissioning Report shall be made available for review.

503.2.9.3 Completion requirements. The construction documents shall require that within 90 days after the date of final certificate of occupancy, the documents described in this section be provided to the building owner.

503.2.9.3.1 Drawings. Construction documents shall include as a minimum the location and performance data on each piece of equipment.

503.2.9.3.2 Manuals. An operating manual and a maintenance manual shall be in accordance with industry-accepted standards and shall include, at a minimum, the following:

1. Submittal data stating equipment size and selected options for each piece of equipment requiring maintenance.
2. Manufacturer’s operation manuals and maintenance manuals for each piece of equipment requiring maintenance, except equipment not furnished as part of the project. Required routine maintenance actions shall be clearly identified.
3. Names and addresses of at least one service agency.

4. HVAC controls system maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions. Desired or field-determined setpoints shall be permanently recorded on control drawings at control devices or, for digital control systems, in programming comments.
5. A complete narrative of how each system is intended to operate, including suggested setpoints.

503.2.9.3.3 System balancing report. A written report describing the activities and measurements completed in accordance with Section 503.2.9.1.2

503.2.9.3.4 Final Commissioning Report. A complete report of test procedures and results identified as "Final Commissioning Report" shall include:

1. Results of all functional performance tests.
2. Disposition of all deficiencies found during testing, including details of corrective measures used or proposed.
3. All functional performance test procedures used during the commissioning process including measurable criteria for test acceptance, provided herein for repeatability.

   Exception: Deferred tests which cannot be performed at the time of report preparation due to climatic conditions.

503.3.1 Economizers. ~~Supply air economizers shall be provided on each cooling system as shown in Table 503.3.1(1).~~

~~Economizers shall be capable of providing 100-percent outdoor air, even if additional mechanical cooling is required to meet the cooling load of the building. Systems shall provide a means to relieve excess outdoor air during economizer operation to prevent over-pressurizing the building. The relief air outlet shall be located to avoid recirculation into the building. Where a single room or space is supplied by multiple air systems, the aggregate capacity of those systems shall be used in applying this requirement.~~

~~Exceptions:~~

1. ~~Where the cooling equipment is covered by the minimum efficiency requirements of Table 503.2.3(1) or 503.2.3(2) and meets or exceeds the minimum cooling efficiency requirement (EER) by the percentages shown in Table 503.3.1(2).~~
2. ~~Systems with air or evaporatively cooled condensers and which serve spaces with open case refrigeration or that require filtration equipment in order to meet the minimum ventilation requirements of Chapter 4 of the *International Mechanical Code*.~~

Each cooling system that has a fan shall include either an air or water economizer meeting the requirements of Sections 503.3.1.1 through 503.4.1.4.

Exceptions: Economizers are not required for the following systems:

1. Individual fan-cooling units with a supply capacity less than the minimum listed in Table 503.3.1(1).
2. Systems that require filtration equipment in order to meet the minimum ventilation requirements of Chapter 4 of the *International Mechanical Code.*
3. Where more than 25 percent of the air designed to be supplied by the system is to spaces that are designed to be humidified above 35°F dew-point temperature to satisfy process needs.
4. Systems that include a condenser heat recovery system required by Section 503.4.6.
5. Systems that serve *residential* spaces where the system capacity is less than five times the requirement listed in Table 503.3.1(1).
6. Systems that serve spaces whose sensible cooling load at design conditions, excluding transmission and infiltration loads, is less than or equal to transmission and infiltration losses at an outdoor temperature of 60°F.
7. Systems expected to operate less than 20 hours per week.
8. Where the use of *outdoor air* for cooling will affect supermarket open refrigerated casework systems.
9. Where the cooling *efficiency* meets or exceeds the *efficiency* requirements in Table 503.3.1(2).

TABLE 503.3.1(1)
ECONOMIZER REQUIREMENTS

CLIMATE ZONES	ECONOMIZER REQUIREMENT
1A, 1B, 2A, 7, 8	No requirement
2B, 3A, 3B, 3C, 4A, 4B, 4C, 5A, 5B, 5C, 6A, 6B	Economizers on all cooling systems ≥ 54,000 Btu/h[a]

For SI: 1 British thermal unit per hour = 0.293 W.

a. The total capacity of all systems without economizers shall not exceed 480,000 Btu/h per building, or 20 percent of its air economizer capacity, whichever is greater.

TABLE 503.3.1(2)
EQUIPMENT EFFICIENCY PERFORMANCE
EXCEPTION FOR ECONOMIZERS

CLIMATE ZONES	COOLING EQUIPMENT PERFORMANCE IMPROVEMENT (EER OR IPLV)
2B	10% Efficiency Improvement
3B	15% Efficiency Improvement
4B	20% Efficiency Improvement

~~**503.4.1 Economizers.** Supply air economizers shall be provided on each cooling system according to Table 503.3.1(1). Economizers shall be capable of operating at 100 percent outside air, even if additional mechanical cooling is required to meet the cooling load of the building.~~

~~**Exceptions:**~~

1. ~~Systems utilizing water economizers that are capable of cooling supply air by direct or indirect evaporation or both and providing 100 percent of the expected system cooling load at outside air temperatures of 50°F (10°C) dry bulb/45°F (7°C) wet bulb and below.~~
2. ~~Where the cooling equipment is covered by the minimum efficiency requirements of Table 503.2.3(1), 503.2.3(2), or 503.2.3(6) and meets or exceeds the minimum EER by the percentages shown in Table 503.3.1(2)~~
3. ~~Where the cooling equipment is covered by the minimum efficiency requirements of Table 503.2.3(7) and meets or exceeds the minimum integrated part load value (IPLV) by the percentages shown in Table 503.3.1(2).~~

503.3.1.1 Air Economizers. Air econimizers shall be provided for each cooling system in accordance with Sections 503.3.1.1.1 through 503.3.1.1.4.

503.3.1.1.1 Design Capacity. Air economizer systems shall be capable of modulating *outdoor air* and return air dampers to provide up to 100 percent of the design supply air quantity as *outdoor air* for cooling.

503.1.1.2 Control Signal. Economizer dampers shall be capable of being sequenced with the mechanical cooling equipment and shall not be controlled by only mixed air temperature.

Exception: The use of mixed air temperature limit control shall be permitted for systems controlled from space temperature (such as single-zone systems).

503.3.1.1.3 High-Limit Shutoff. All air economizers shall be capable of automatically reducing *outdoor air* intake to the design minimum *outdoor air* quantity when *outdoor air* intake will no longer reduce cooling energy usage. High-limit shutoff control types for specific climates shall be chosen from Table 503.3.1.1.3(1). High-limit shutoff control settings for these control types shall be those listed in Table 503.3.1.1.3(2).

TABLE 503.3.1.1.3(1)
HIGH-LIMIT SHUTOFF CONTROL OPTIONS FOR AIR ECONOMIZERS

CLIMATE ZONES	ALLOWED CONTROL TYPES	PROHIBITED CONTROL TYPES
1b, 2b, 3b, 3c, 4b, 4c, 5b, 5c, 6b, 7, 8	Fixed dry bulb Differential dry bulb Electronic enthalpy[a] Differential enthalpy Dew-point and dry-bulb temperatures	Fixed enthalpy
1a, 2a, 3a, 4a	Fixed dry bulb Fixed enthalpy Electronic enthalpy[a] Differential enthalpy Dew-point and dry-bulb temperatures	Differential dry bulb
All other climates	Fixed dry bulb Differential dry bulb Fixed enthalpy Electronic enthalpy[a] Differential enthalpy Dew-point and dry-bulb temperatures	-

a. Electronic enthalpy controllers are devices that use a combination of humidity and dry-bulb temperature in their switching algorithm.

Table 503.3.1.1.3(2)
HIGH-LIMIT SHUTOFF CONTROL SETTING FOR AIR ECONOMIZERS

DEVICE TYPE	CLIMATE	REQUIRED HIGH LIMIT (ECONOMIZER OFF WHEN):	
		EQUATION	DESCRIPTION
Fixed dry bulb	1b, 2b, 3b, 3c, 4b, 4c, 5b, 5c, 6b, 7, 8,	T_{OA}>75°F	Outdoor air temperature exceeds 75°F
	5a, 6a, 7a	T_{OA}>70°F	Outdoor air temperature exceeds 70°F
	All other zones	T_{OA}>65°F	Outdoor air temperature exceeds 65°F
Differential dry bulb	1b, 2b, 3b, 3c, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 7, 8	T_{OA}>T_{RA}	Outdoor air temperature exceeds return air temperature
Fixed enthalpy	All	h_{OA}> 28 Btu/lb[a]	Outdoor air enthalpy exceeds 28 Btu/lb of dry air[a]
Electronic Enthalpy	All	(T_{OA} , RH_{OA}) > A	Outdoor air temperature/RH exceeds the "A" setpoint curve[b]
Differential enthalpy	All	h_{OA}> h_{RA}	Outdoor air enthalpy exceeds return air enthalpy
Dew-point and dry bulb temperatures	All	DP_{OA}>55°F or T_{OA}>75°F	Outdoor air dry bulb exceeds 75°F or outside dew point exceeds 55°F (65 gr/lb)

a. At altitudes substantially different than sea level, the Fixed Enthalpy limit shall be set to the enthalpy value at 75°F and 50% relative humidity. As an example, at approximately 6000 ft elevation the fixed enthalpy limit is approximately 30.7 Btu/lb.
b. Setpoint "A" corresponds to a curve on the psychometric chart that goes through a point at approximately 75°F and 40% relative humidity and is nearly parallel to dry-bulb lines at low humidity levels and nearly parallel to enthalpy lines at high humidity levels.

503.3.1.1.4 Relief of Excess Outdoor Air. Systems shall provide a means to relieve excess *outdoor air* during air economizer operation to prevent over-pressurizing the building. The relief air outlet shall be located to avoid recirculation into the building.

~~**503.4.1 Economizers**. Supply air economizers shall be provided on each cooling system according to Table 503.3.1(1). Economizers shall be capable of operating at 100 percent outside air, even if additional mechanical cooling is required to meet the cooling load of the building.~~

~~**Exceptions:**~~

1. ~~Systems utilizing water economizers that are capable of cooling supply air by direct or indirect evaporation or both and providing 100 percent of the expected system cooling load at outside air temperatures of 50°F (10°C) dry bulb/45°F (7°C) wet bulb and below.~~
2. ~~Where the cooling equipment is covered by the minimum efficiency requirements of Table 503.2.3(1), 503.2.3(2), or 503.2.3(6) and meets or exceeds the minimum EER by the percentages shown in Table 503.3.1(2)~~
3. ~~Where the cooling equipment is covered by the minimum efficiency requirements of Table 503.2.3(7) and meets or exceeds the minimum integrated part load value (IPLV) by the percentages shown in Table 503.3.1(2).~~

503.4.1 Economizers. Economizer systems for complex HVAC Equipment shall be provided for each cooling system in accordance with Sections 503.4.1.1 through 503.4.1.4.

503.4.1.1 Design Capacity. Water economizer systems shall be capable of cooling supply air by indirect evaporation and providing up to 100 percent of the expected system cooling load at *outdoor air* temperatures of 50°F dry bulb/45° wet bulb and below.

Exception: Systems in which a water economizer is used and where dehumidification requirements cannot be met using outdoor air temperatures of 50°F dry bulb/ 45°F wet bulb must satisfy 100 percent of the expected system cooling load at 45°F dry bulb/40°F wet bulb.

503.4.1.2 Maximum Pressure Drop. Pre-cooling coils and water-to-water heat exchangers used as part of a water economizer system shall either have a water-side pressure drop of less than 15 feet of water or a secondary loop shall be created so that the coil or heat exchanger pressure drop is not seen by the circulating pumps when the system is in the normal cooling (non-economizer) mode.

503.4.1.3 Integrated Economizer Control. Economizer systems shall be integrated with the mechanical cooling system and be capable of providing partial cooling even when additional mechanical cooling is required to meet the remainder of the cooling load.

Exceptions:

1. Direct expansion systems that include controls that reduce the quantity of *outdoor air* required to prevent coil frosting at the lowest step of compressor unloading, provided this lowest step is no greater than 25 percent of the total system capacity.
2. Individual direct expansion units that have a rated cooling capacity less than 54,000 Btu/h and use non-integrated economizer controls that preclude simultaneous operation of the economizer and mechanical cooling.
3. Systems in climate zones 1A, 1B, 2A, 7, 8.

503.4.1.4 Economizer Heating System Impact. HVAC system design and economizer controls shall be such that economizer operation does not increase the building heating energy use during normal operation.

Exception: Economizers on VAV systems that cause zone level heating to increase due to a reduction in supply air temperature.

503.4.2 Variable air volume (VAV) fan control. Individual VAV fans with motors of ~~10~~ 7.5 horsepower (~~7.5~~ 5.6 kW) or greater shall be:

1. Driven by a mechanical or electrical variable speed drive; or
2. The fan motor shall have controls or devices that will result in fan motor demand of no more than 30 percent of their design wattage at 50 percent of design airflow when static pressure set point equals one-third of the total design static pressure, based on manufacturer's certified fan data.

For systems with direct digital control of individual *zone* boxes reporting to the central control panel, the static pressure set point shall be reset based on the *zone* requiring the most pressure, i.e., the set point is reset lower until one *zone* damper is nearly wide open.

4. Revise as follows

SECTION 505
ELECTRICAL POWER AND LIGHTING SYSTEMS
(Mandatory)

505.2.1 Interior lighting controls. Each area enclosed by walls or floor-to-ceiling partitions shall have at least one manual control for the lighting serving that area. The required controls shall be located within the area served by the controls or be a remote switch that identifies the lights served and indicates their status.

Exceptions:

1. Areas designated as security or emergency areas that must be continuously lighted.
2. Lighting in stairways or corridors that are elements of the means of egress.

505.2.2 Additional controls. Each area that is required to have a manual control shall have additional controls that meet the requirements of Sections 505.2.2.1 and 505.2.2.2.

505.2.2.1 Light reduction controls. Each area that is required to have a manual control shall also allow the occupant to reduce the connected lighting load in a reasonably uniform illumination pattern by at least 50 percent. Lighting reduction shall be achieved by one of the following or other *approved* method:

1. Controlling all lamps or luminaires;
2. Dual switching of alternate rows of luminaires, alternate luminaires or alternate lamps;
3. Switching the middle lamp luminaires independently of the outer lamps; or
4. Switching each luminaire or each lamp.

Exceptions:

1. Areas that have only one luminaire.
2. Areas that are controlled by an occupant-sensing device.
3. Corridors, storerooms, restrooms or public lobbies.
4. *Sleeping unit* (see Section 505.2.3).
5. Spaces that use less than 0.6 watts per square foot (6.5 W/m2).
6. Daylight spaces complying with Section 505.2.2.2.3 Automatic Daylighting Controls

505.2.2.2 Automatic lighting controls. All commercial buildings shall be equipped with automatic control devices to shut off lighting in compliance with one of the following automatic control technologies:

1. Section 505.2.2.2.1 Occupancy Sensors
2. Section 505.2.2.2.2 Time Clock Controls

Exception:

1. Spaces complying with Section 505.2.2.3 Daylight Zone Control.

505.2.2.2.1 Occupancy sensors. Occupancy sensors shall be installed in all classrooms, conference/meeting rooms, employee lunch and break rooms, private offices, restrooms, storage rooms and janitorial closets, and other spaces 300 sf. or less enclosed by ceiling height partitions. These automatic control devices shall be installed to automatically turn off lights within 30 minutes of all occupants leaving the space, except spaces with multi-scene control.

505.2.2.2.2 Time Clock Controls In areas not controlled by occupancy sensors, automatic time switch control devices shall be used. It shall incorporate an override switching device that:

1. Is readily accessible.
2. Is located so that a person using the device can see the lights or the area controlled by that switch, or so that the area being lit is annunciated.

3. Is manually operated.
4. Allows the lighting to remain on for no more than 4 hours when an override is initiated.
5. Controls an area not exceeding 5,000 square feet (465 m2).

Exceptions:

1. In malls and arcades, auditoriums, single-tenant retail spaces, industrial facilities and arenas, where captive-key override is utilized, override time may exceed 2 hours.
2. In malls and arcades, auditoriums, single-tenant retail spaces, industrial facilities and arenas, the area controlled may not exceed 20,000 square feet (1860 m2).

505.2.2.3 Daylight Zone Control.

~~**505.2.2.3.1. Daylight Controls**~~ Daylight zones ~~as defined by this code,~~ shall be provided with automatic daylight controls ~~individual controls~~ that control the lights independent of general area lighting. Contiguous daylight zones adjacent to vertical fenestration are allowed to be controlled by a single controlling device provided that they do not include zones facing more than two adjacent cardinal orientations (i.e. north, east, south, west). Daylight zones under skylights more than 15 feet from the perimeter shall be controlled separately from daylight zones adjacent to vertical fenestration. The daylight controls shall meet the requirements of Section 505.2.2.3.1. and 505.2.2.3.2.

Exception: Daylight spaces enclosed by walls or ceiling height partitions and containing two or fewer light fixtures are not required to have a separate switch for general area lighting.

505.2.2.3.1 Automatic daylight controls. Automatic controls installed in daylight zones shall control lights in the daylit areas separately from the non-daylit areas. Controls for calibration adjustments to the lighting control device shall be readily accessible to authorized personnel. Each daylight control zone shall not exceed 2,500 square feet. Automatic daylighting controls must incorporate an automatic shut-off ability based on time or occupancy in addition to lighting power reduction controls.

Controls will automatically reduce lighting power in response to available daylight by either one of the following methods:

1. Continuous dimming using dimming ballasts and daylight-sensing automatic controls that are capable of reducing the power of general lighting in the daylit zone continuously to less than 35 percent of rated power at maximum light output.
2. Stepped Dimming using multi-level switching and daylight-sensing controls that are capable of reducing lighting power automatically. The system should provide a minimum of two control channels per zone and be installed in a manner such that at least one control step shall reduce power of general lighting in the daylit zone by 30 percent to 50 percent of rated power and another control step that reduces lighting power by 65 percent to 100 percent. Stepped dimming control is not allowed in continuously occupied areas with ceiling heights of 14 feet or lower.

   Exception: Daylight spaces enclosed by walls or ceiling height partitions and containing 2 or fewer luminaire are not required to have a separate switch for general area lighting.

505.2.2.3.2 Daylight controls functional performance testing. Automatic daylighting control systems shall be tested to document that control devices are calibrated and adjusted to operate in accordance with approved plans and specifications. A letter of certification of lighting calibration shall be submitted to the code official prior to issuance of the final certificate of occupancy.

~~**505.2.2.2 Automatic lighting shutoff.** Buildings larger than 5,000 square feet (465m2) shall be equipped with an automatic control device to shut off lighting in those areas. This automatic control device shall function on either:~~

~~1. A scheduled basis, using time-of-day, with an independent program schedule that controls the interior lighting in areas that do not exceed 25,000 square feet (2323 m2) and are not more than one floor; or~~
~~2. An occupant sensor that shall turn lighting off within 30 minutes of an occupant leaving a space; or~~
~~3. A signal from another control or alarm system that indicates the area is unoccupied.~~

~~**Exception:** The following shall not require an automatic control device:~~

1. ~~*Sleeping unit* (see Section 505.2.3).~~
2. ~~Lighting in spaces where patient care is directly provided.~~
3. ~~Spaces where an automatic shutoff would endanger occupant safety or security.~~

~~**505.2.2.2.1 Occupant override.** Where an automatic time switch control device is installed to comply with Section 505.2.2.2, Item 1, it shall incorporate an override switching device that:~~

1. ~~Is readily *accessible*.~~
2. ~~Is located so that a person using the device can see the lights or the area controlled by that switch, or so that the area being lit is annunciated.~~
3. ~~Is manually operated.~~
4. ~~Allows the lighting to remain on for no more than 2 hours when an override is initiated.~~
5. ~~Controls an area not exceeding 5,000 square feet (465 m2).~~

~~**Exceptions:**~~

1. ~~In malls and arcades, auditoriums, single-tenant retail spaces, industrial facilities and arenas, where captive-key override is utilized, override time shall be permitted to exceed 2 hours.~~
2. ~~In malls and arcades, auditoriums, single-tenant retail spaces, industrial facilities and arenas, the area controlled shall not exceed 20,000 square feet (1860 m2).~~

~~**505.2.2.2.2 Holiday scheduling.** If an automatic time switch control device is installed in accordance with Section 505.2.2.2, Item 1, it shall incorporate an automatic holiday scheduling feature that turns off all loads for at least 24 hours, then resumes the normally scheduled operation.~~

~~**Exception:** Retail stores and associated malls, restaurants, grocery stores, places of religious worship and theaters.~~

~~**505.2.2.3 Daylight zone control.** Daylight zones, as defined by this code, shall be provided with individual controls that control the lights independent of general area lighting. Contiguous daylight zones adjacent to vertical fenestration are allowed to be controlled by a single controlling device provided that they do not include zones facing more than two adjacent cardinal orientations (i.e., north, east, south, west). Daylight zones under skylights more than 15 feet (4572 mm) from the perimeter shall be controlled separately from daylight zones adjacent to vertical fenestration.~~

~~**Exception:** Daylight spaces enclosed by walls or ceiling height partitions and containing two or fewer light fixtures are not required to have a separate switch for general area lighting.~~

505.2.2.4 Specific Application Controls. Specific application controls shall be provided for the following:

1. Display/Accent Lighting—display or accent lighting shall have a separate control device.
2. Case Lighting—lighting in cases used for display purposes shall have a separate control device.
3. Hotel and Motel Guest Room Lighting—hotel and motel guest rooms and guest suites shall have a master control device at the main room entry that controls all permanently installed luminaires and switched receptacles.
4. Task Lighting—supplemental task lighting, including permanently installed under-shelf or under-cabinet lighting, shall have a control device integral to the luminaires or be controlled by a wall-mounted control device provided the control device is readily accessible and located so that the occupant can see the controlled lighting.
5. Non-visual Lighting—lighting for non-visual applications, such as plant growth and food warming, shall have a separate control device.
6. Demonstration Lighting—lighting equipment that is for sale or for demonstrations in lighting education shall have a separate control device.

Exception: Items 1, 2, and 4 Where LED lighting is used no additional control is required.

505.5.2 Interior lighting power. The total interior lighting power (watts) is the sum of all interior lighting powers for all areas in the building covered in this permit. The interior lighting power is the floor area for each building area type listed in Table 505.5.2 times the value from Table 505.5.2 for that area. For the purposes of this method, an “area”

shall be defined as all contiguous spaces that accommodate or are associated with a single building area type as *listed* in Table 505.5.2. When this method is used to calculate the total interior lighting power for an entire building, each building area type shall be treated as a separate area.

TABLE 505.5.2
INTERIOR LIGHTING POWER ALLOWANCES

LIGHTING POWER DENSITY	
Building Area Typea	**(W/ft2)**
Automotive Facility	0.9
Convention Center	1.2
Court House	1.2
Dining: Bar Lounge/Leisure	1.3
Dining: Cafeteria/Fast Food	1.4
Dining: Family	1.6
Dormitory	1.0
Exercise Center	1.0
Gymnasium	1.1
Healthcare-Clinic	1.0
Hospital	1.2
Hotel	1.0
Library	1.3
Manufacturing Facility	1.3
Motel	1.0
Motion Picture Theater	1.2
Multi-Family	0.7
Museum	1.1
Office	1.0
Parking Garage	0.3
Penitentiary	1.0
Performing Arts Theater	1.6
Police/Fire Station	1.0
Post Office	1.1
Religious Building	1.3
Retailb	1.5
School/University	1.2
Sports Arena	1.1
Town Hall	1.1
Transportation	1.0
Warehouse	0.8
Workshop	1.4

For SI: 1 foot = 304.8 mm, 1 watt per square foot = W/0.0929 m2.

TABLE 505.5.2
INTERIOR LIGHTING POWER ALLOWANCES
LIGHTING POWER DENSITY

BUILDING AREA TYPE[a]	(Watts/Ft^2)
AUTOMOTIVE FACILITY	0.79
CONVENTION CENTER	1.16
COURTHOUSE	1.08
DINING: BAR LOUNGE/LEISURE	1.19
DINING: CAFETERIA/FAST FOOD	1.34
DINING:FAMILY	1.50
DORMITORY	0.90
EXERCISE CENTER	0.92
FIRE STATIONS	0.74
GYMNASIUM	1.07
HEALTHCARE CLINIC	0.89
HOTEL	0.90
LIBRARY	1.00
MANUFACTURINBG FACILITY	1.24
MOTEL	0.90
MOTION PICTURE THEATER	1.18
MUSEUM	1.04
OFFICE	0.80
PERFORMING ARTS THEATER	1.46
POLICE STATIONS	0.89
POST OFFICE	0.98
RELIGIOUS BUILDINGS	1.18
RETAIL	1.30
RETAIL: SPECIALTY	1.40
RETAIL: SUPERMARKET	1.30
SCHOOL/UNIVERSITY	1.01
TOWN HALL	0.94
TRANSPORTATION	0.85
WAREHOUSE[b]	0.60
WORKSHOP	1.20

For SI: 1 foot = 304.8 mm, 1 watt per square foot = W/0.0929 m2.

a. In cases where both a general building area type and a more specific building area type are listed, the more specific building area type shall apply.

b. At least one half of the floor area shall be in the daylight zone. Automatic daylighting controls shall be installed in daylit zones and shall meet the requirements of Section 505.2.2.2.3.

~~b. Where lighting equipment is specified to be installed to highlight specific merchandise in addition to lighting equipment specified for general lighting and is switched or dimmed on circuits different from the circuits for general lighting, the smaller of the actual wattage of the lighting equipment installed specifically for merchandise, or additional lighting power as determined below shall be added to the interior lighting power determined in accordance with this line item.~~

~~Calculate the additional lighting power as follows:~~

~~Additional Interior Lighting Power Allowance = 1000watts + (Retail Area 1 X 0.6~~ 4W/ft2) ~~+ (Retail Area 2 X 0.6 W/ft2) + (Retail Area 3 X 1.4~~ 0.9 ~~W/ft2) + (Retail Area 4 X 2.5~~ 1.5 ~~W/ft2).~~

~~where:~~

~~Retail Area 1 = The floor area for all products not listed in Retail Area 2, 3 or 4.~~
~~Retail Area 2 = The floor area used for the sale of vehicles, sporting goods and small electronics.~~
~~Retail Area 3 = The floor area used for the sale of furniture, clothing, cosmetics and artwork.~~
~~Retail Area 4 = The floor area used for the sale of jewelry, crystal and china.~~

~~**Exception:** Other merchandise categories are permitted to be included in Retail Areas 2 through 4 above, provided that justification documenting the need for additional lighting power based on visual inspection, contrast, or other critical display is *approved* by the authority having jurisdiction.~~

Add new standards to Chapter 6 as follows:

E779-03	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization
E1677-95 (2000)	Standard Specification for an Air Retarder (AR) Material or System for Low-Rise Framed Building Walls
E2178-03	Standard Test Method for Air Permeance of Building Materials
E2357-05	Standard Test Method for Determining Air Leakage of Air Barrier Assemblies

Reason: The proponents believe that the 20-30% reductions in commercial and high-rise residential building energy use based on this proposal are practical, feasible, and necessary. This proposal employs improvements to design practices and use of widely available products to improve energy efficiency. Many of the elements have been previously published in New Buildings Institute's *Core Performance Guide* and implemented in programs or codes at the local and state levels. Incorporating these enhancements in a national model code will help move building practices and markets more quickly, addressing national concerns for energy and the environment in a pragmatic and cost-effective way.

This proposal contains measures that may be dependent on the passage of federal legislation pending as of the date of submittal.

SUBSTANTIATING MATERIAL

The bibliography of substantiating material, along with the technical information and technical substantiation, can be found at www.newbuildings.org/iecc.htm.

THE PROPOSAL

This proposal substantially revises Chapter 5 of the IECC with a series of measures that are integrated to achieve significant energy savings over current national model code. The proposal builds on and updates from 2009 IECC, and introduces some new elements such as commissioning of critical systems and automatic control of daylighting. Key elements of the proposal are:

Building Envelope - Includes continuous air barriers, significant improvements in most glazing, and enhancements to opaque envelope performance.
Mechanical Systems – Improves sections regarding economizers, incorporates more use of demand controlled ventilation, includes efficiency improvements in mechanical equipment with some climate-specific flexibility, and provides additional calculation procedures for determining loads and equipment sizing.
Quality Assurance – Incorporates requirements for testing and commissioning of mechanical systems and performance testing of daylight-related controls.
Lighting - Reduces energy needed for lighting based on more efficient illuminating equipment and the use of several lighting control strategies.
Daylighting – Includes additional availability of daylight sources combined with automatic daylight controls, and comprehensive control strategy for all daylit zones.

Cost Impact: This code change proposal will increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM E779-03, E1677-95 (00), E2178-03, and E2357-05, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Makela-Baker-Conner-EC-1-202-Ch 5-Ch 6FF

EC147–09/10
202, 101.2, Chapter 5

Proponent: David C. Hewitt, New Buildings Institute, John Loyer, American Institute of Architects, Ronald Majette, representing US Department of Energy

1. Revise as follows:

101.2 Scope. This code applies to *residential* and *commercial buildings* and the building site and associated systems and equipment.

2. Revise as follows:

BUILDING. Any structure used or intended for supporting or sheltering any use or occupancy, including any mechanical systems, service water heating systems and electric power and lighting systems located on the building site and supporting the building.

BUILDING COMMISSIONING. A process that verifies and documents that the selected building systems have been designed, installed, and function according to the owner's project requirements and construction documents, and to minimum code requirements.

BUILDING SITE. A contiguous area of land that is under the ownership or control of one entity.

BUILDING THERMAL ENVELOPE. The basement walls, exterior walls, floor, roof, and any other building element that encloses *conditioned space*. This boundary also includes the boundary between *conditioned space* and any exempt or unconditioned space or provides a boundary between *conditioned space* and exempt or unconditioned space.

CONTINUOUS AIR BARRIER. A combination of materials and assemblies that restrict or prevent the passage of air through the building thermal envelope.

FENESTRATION PRODUCT, FIELD-FABRICATED is a fenestration product including an exterior glass door whose frame is made at the construction site of standard dimensional lumber or other materials that were not previously cut, or otherwise formed with the specific intention of being used to fabricate a fenestration product or exterior door. Field fabricated does not include site-built fenestration with a label certificate or products required to have temporary or permanent labels.

FENESTRATION PRODUCT, SITE-BUILT is fenestration designed to be field-glazed or field assembled units using specific factory cut or otherwise factory formed framing and glazing units. Examples of site-built fenestration include storefront systems, curtain walls, and atrium roof systems.

FURNACE ELECTRICITY RATIO. The ratio of furnace electricity use to total furnace energy computed as ratio = $(3.412*E_{AE})/(1000*E_F + 3.412*E_{AE})$, where E_{AE} (average annual auxiliary electrical consumption) and E_F (average annual fuel energy consumption) are defined in Appendix N to subpart B of part 430 of title 10 of the Code of Federal Regulations and E_F is expressed in millions of Btu's per year.

ON-SITE RENEWABLE ENERGY. Energy derived from solar radiation, wind, waves, tides, landfill gas, biomass, or the internal heat of the earth. The energy system providing on-site renewable energy shall be located on or adjacent to the project site.

3. Revise as follows:

501.1 Scope. The requirements contained in this chapter are applicable to commercial buildings, or portions of commercial buildings. These commercial buildings shall meet either requirements of ASHRAE/IESNA Standard 90.1, *Energy Standard for Buildings Except for Low-Rise Residential Buildings*, or the requirements contained in this chapter.

4. Revise as follows:

501.2 Application. The *commercial building* project shall comply with the requirements in Sections 502 (Building envelope requirements), 503 (Building mechanical systems), 504(Service water heating), 505 (Electrical power and

~~lighting systems)~~ in its entirety, and one of the additional options as presented in Section 506. As an alternative the *commercial building* project shall exceed by at least 25% ~~comply with~~ the requirements of ASHRAE/IESNA Standard 90.1, Energy Standard for Buildings Except for Low Rise Residential Buildings, Appendix G in its entirety.

Exceptions:

1. Buildings conforming to Section 507, provided Sections 502.4, 503.2, 504, 505.2, 505.3, 505.4, 505.6 and 505.7 are each satisfied. Building energy cost shall be equal to or less than 75% of the standard reference design building.
2. Additions, alterations and repairs shall comply with the applicable requirements in Sections 502, 503, 504, and 505 only or with ASHRAE/IESNA 90.1.

5. Revise as follows:

502.2.1 Roof assembly. The minimum thermal resistance (*R*-value) of the insulating material installed either between the roof framing or continuously on the roof assembly shall be as specified in Table 502.2(1), based on construction materials used in the roof assembly. Skylight curbs shall be insulated to the level of roofs with insulation entirely above deck or R-5, whichever is less.

Exception: Continuously insulated roof assemblies where the thickness of insulation varies 1 inch (25 mm) or less and where the area-weighted *U*-factor is equivalent to the same assembly with the *R*-value specified in Table 502.2(1).

Insulation installed on a suspended ceiling with removable ceiling tiles shall not be considered part of the minimum thermal resistance of the roof insulation.

6. Add new text as follows:

502.2.1.1 Roof solar reflectance and thermal emittance. Roofs in climate zones 1 to 3 not over ventilated attics or not over cooled spaces shall have a minimum three-year aged - solar reflective index (SRI) of 64 when determined in accordance with the SRI method in ASTM E1980 using a convection coefficient of (12W/m^2·K) or a minimum three-year-aged solar reflectance of 0.55 when tested in accordance with ASTM C1549, ASTM E903 or ASTM E1918 and a minimum three-year-aged thermal emittance of at least 0.75 when testing in accordance with ASTM C1371 or ASTM E408.

Exceptions:

1. Ballasted roofs with a minimum stone ballast of 17 lbs/ft2 (74 kg/m2) or 23 lbs/ft2 pavers (117 kg/m2).
2. Roofs, where a minimum of 75% of the roof area is shaded during the peak sun angle on June 21st by permanent features of the building and/or is covered by off-set photovoltaic arrays, building-integrated photovoltaic arrays, or solar water collectors.
3. Metal building roofs or asphaltic membranes in climate zone 3.

7. Revise as follows:

502.2.6 Slabs on grade. The minimum thermal resistance (*R*-value) of the insulation around the perimeter of unheated or heated slab-on-grade floors shall be as specified in Table 502.2(1). The insulation shall be placed on the outside of the foundation or on the inside of ~~a~~ the foundation wall. The insulation shall extend downward from the top of the slab for a minimum distance as shown in the table or to the top of the footing, whichever is less, or downward to at least the bottom of the slab and then horizontally to the interior or exterior for the total distance shown in the table. Where extending outside of the foundation the insulation shall be covered by pavement or by soil a minimum of 10 in. thick. For the purposes of this section a slab on grade floor is a slab floor that is in contact with the ground and that is either above grade or less than or equal to 24 in. below the final elevation of the nearest exterior grade.

8. Revise Table as follows:

TABLE 502.3
BUILDING ENVELOPE REQUIREMENTS: FENESTRATION

CLIMATE ZONE	1	2	3	4 EXCEPT MARINE	5 AND MARINE 4	6	7	8
Vertical fenestration (~~40~~ 30% maximum of above-grade wall)								
U-factor								

(Portions of Table not shown, remain unchanged)

9. Delete and substitute as follows:

~~**502.4.1 Window and door assemblies.** The air leakage of window and sliding or swinging door assemblies that are part of the building envelope shall be determined in accordance with AAMA/WDMA/CSA 101/I.S.2/A440, or NFRC 400 by an accredited, independent laboratory, and *labeled* and certified by the manufacturer and shall not exceed the values in Section 402.4.2.~~

~~**Exception:** Site-constructed windows and doors that are weatherstripped or sealed in accordance with Section 502.4.3.~~

~~**502.4.2 Curtain wall, storefront glazing and commercial entrance doors.** Curtain wall, *storefront* glazing and commercial- glazed swinging entrance doors and revolving doors shall be tested for air leakage at 1.57 pounds per square foot (psf) (75 Pa) in accordance with ASTM E 283. For curtain walls and *storefront* glazing, the maximum air leakage rate shall be 0.3 cubic foot per minute per square foot (cfm/ft_2) (5.5 m_3/h × m_2) of fenestration area. For commercial glazed swinging entrance doors and revolving doors, the maximum air leakage rate shall be 1.00 cfm/ft_2 (18.3 m_3/h × m_2) of door area when tested in accordance with ASTM E 283.~~

~~**502.4.3 Sealing of the building envelope.** Openings and penetrations in the building envelope shall be sealed with caulking materials or closed with gasketing systems compatible with the construction materials and location. Joints and seams shall be sealed in the same manner or taped or covered with a moisture vapor-permeable wrapping material. Sealing materials spanning joints between construction materials shall allow for expansion and contraction of the construction materials.~~

502.4.1 Air Barriers. The building envelope shall be designed and constructed with a continuous air barrier that complies with Section 502.4.1.1 and 502.4.1.2 to control air leakage into, or out of, the conditioned space. Construction documents shall identify the air barrier components for each assembly, including detailing joints, interconnections and sealing of penetrations. The opaque building envelope air barrier shall be located on the inside or, outside of, or be integral with the building envelope; or any combination thereof.

Exception: Buildings in climate Zones 1, 2 and 3.

502.4.1.1 The *continuous air barrier* shall have the following characteristics:

1. It shall be continuous throughout the envelope (at the lowest *floor*, exterior *walls*, and ceiling or *roof*). Air barrier joints and seams shall be sealed; including sealing transitions in planes and changes in materials. Air barrier penetrations shall be sealed.
2. The air barrier component of each assembly shall be joined and sealed in a flexible manner to the air barrier component of adjacent assemblies. The joints and seals shall allow for the relative movement of the assemblies and materials without damage to the air seal.
3. The air barrier shall be installed in accordance with the *manufacturer's* instructions in a manner that achieves the performance requirements.
4. Where lighting *fixtures* with ventilation holes or other similar objects are to be installed in such a way as to penetrate the *continuous air barrier*, provisions shall be made to maintain the integrity of the *continuous air barrier*.

Exception: Buildings that comply with Section 502.4.1.2(3) below are not required to comply with either 1 or 4.

502.4.1.2 Air barrier compliance options. A continuous air barrier for the opaque building envelope shall meet the requirements of at least one of the compliance options in Section 502.4.1.2.1, 502.4.1.2.2, or 502.4.1.2.3

502.4.1.2.1 Materials. Individual materials shall have an air permeability not to exceed 0.02 L/s·m^2 under a pressure differential of 75 Pa (0.004 cfm/ft^2 under a pressure differential of 0.3 in. water (1.57 lb/ft^2)) when tested in accordance with ASTM E2178. The following materials comply with this requirement when all joints are sealed:

1. Plywood - minimum 3/8 in (10 mm)
2. Oriented strand board - minimum 3/8 in (10 mm)
3. Extruded polystyrene insulation board - minimum 3/4 in (19 mm)
4. Foil-back urethane insulation board - minimum 3/4 in (19 mm)
5. Closed cell spray foam meeting air permeability requirement
6. Open cell spray foam meeting air permeability requirement
7. Weather resistant barrier meeting air permeability requirement
8. Exterior or interior gypsum board - minimum 1/2 in (12 mm)
9. Cement board - minimum 1/2 in (12 mm)
10. Built up roofing membrane
11. Modified bituminous roof membrane
12. Fully adhered single-ply roof membrane
13. A Portland cement/sand parge, or gypsum plaster minimum 5/8 in (16 mm) thick
14. Cast-in-place and precast concrete.
15. Fully grouted concrete block masonry.
16. Sheet steel or aluminum

502.4.1.2.2 Assemblies. Assemblies of materials and components shall have an average air leakage not to exceed 0.2 L/s·m2 @ 75 Pa (0.04 cfm/ft2 under a pressure differential of 0.3" w.g. (1.57psf)) when tested in accordance with ASTM E2357 or ASTM E1677. The following assemblies comply with this requirement when all joints are sealed and every characteristic in Section 502.4.4.1.1 is met:,

1. Concrete masonry walls coated with one application either of block filler and two applications of a paint or sealer coating;
2. A Portland cement/sand parge, stucco or plaster minimum 1/2 in (12 mm) thick.

502.4.1.2.3 Building Test. The completed building shall be tested and the air leakage rate of the *building envelope* shall not exceed 2.0 L/s·m^2 @ 75 Pa (0.40 cfm/ft^2 at a pressure differential of 0.3" w.g. (1.57 psf)) in accordance with ASTM E779 or an equivalent method approved by the code official.

502.4.2 Air Barrier Penetrations. All penetrations of the air barrier and paths of air infiltration / exfiltration shall be made air tight and shall be sealed with caulking materials or closed with gasketing systems compatible with the construction materials and location. Joints and seals shall be sealed in the same manner or taped or covered with a moisture vapor-permeable wrapping material. Sealing materials spanning joints between construction materials shall allow for expansion and contraction of the construction materials.

502.4.3 Fenestration and doors. The air leakage of fenestration assemblies and doors shall meet the provisions of Table 502.4.3. Testing shall be performed in accordance with the applicable reference test standard by an accredited and independent testing laboratory and all fenestration assemblies *listed* and *labeled*.

Exception: Site built fenestration assemblies that are sealed in accordance with Section 502.4.1.

10. Add new Table as follows:

Table 502.4.3
Maximum Air Infiltration Rate for Fenestration Assemblies

Fenestration Assembly	Maximum Rate
Windows	0.20 [a]
Sliding Doors	0.20 [a]
Swinging Doors	0.20 [a]
Skylights	0.20 [a]
Curtain Walls	0.06 [b]
Storefront Glazing	0.06 [b]
Commercial Glazed Swinging Entrance Doors	1.00 [c]
Revolving Doors	1.00 [c]
Rolling doors	1.00 [c]

a. cfm per square foot of fenestration or door area when tested in accordance with NFRC 400 or AAMA/WDMA/CSA101/I.S.2/A440 at 1.57 psf (75 Pa). Alternatively the maximum rate is permitted to be 0.3 cfm per square foot of fenestration or door area when tested in accordance with AAMA/WDMA/CSA101/I.S.2/A440 at 6.24 psf (300 Pa)
b. cfm per square foot of fenestration area when tested in accordance with NFRC 400 or ASTM E283 at 1.57 psf (75 Pa)
c. cfm per square foot of fenestration or door area when tested in accordance with NFRC 400, AAMA/WDMA/CSA101/I.S.2/A440, or ASTM E283 at 1.57 psf (75 Pa)

11. Add new text as follows:

502.4.4 Doors and Access Openings to Shafts, Chutes, Stairwells, and Elevator Lobbies. These doors and access openings shall either meet the requirements of 502.4.3 or shall be equipped with weather seals.

Exception: Weatherseals on elevator lobby doors are not required when a smoke control system is installed.

12. Revise Section 502.4.5 as follows:

502.4.5 Outdoor air intakes and exhaust openings. Stair and elevator shaft vents and other outdoor air intakes and exhaust openings ~~integral to the building envelope shall be equipped with not less than a Class I motorized dampers, leakage- rated damper with a maximum leakage rate of 4 cfm per square foot (6.8 L/s · C m2) at 1.0 inch water gauge (w.g.) (1250 Pa) when tested in accordance with AMCA 500D~~ shall be provided with dampers in accordance with Sections 502.4.5.1 and 502.4.5.2.

Dampers shall be installed with controls so that they are capable of automatically opening upon:

1. The activation of any fire alarm initiating device of the building's fire alarm system;
2. The interruption of power to the damper.

502.4.5.1 Stair and shaft vents. Stair and shaft vents shall be provided with Class IA motorized dampers with a maximum leakage rate of 3 cfm per square foot (5.1 L/s · C m2) at 1.0 inch water gauge (w.g.) (1250 Pa) when tested in accordance with AMCA 500D.

502.4.5.2 Outdoor air intakes and exhausts. *Outdoor air* supply and exhaust openings shall be provided with Class IA motorized dampers with a maximum leakage rate of 3 cfm per square foot (5.1 L/s · C m2) at 1.0 inch water gauge (w.g.) (1250 Pa) when tested in accordance with AMCA 500D.

Exception: Gravity (nonmotorized) dampers having a maximum leakage rate of 20 cfm per square foot (34 L/s · C m2) at 1.0 inch water gauge (w.g.) (1250 Pa) when tested in accordance with AMCA 500D are permitted to be used ~~in buildings less than three stories in height above grade~~ where the design *outdoor air* intake or exhaust capacity does not exceed 300 cfm.

13. Revise Section 502.4.8 as follows:

502.4.8 Recessed lighting. Recessed luminaires installed in the *building thermal envelope* shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and labeled as having an air leakage rate or no more 2.0 cfm (0.944 L/s) ~~meeting ASTM E 283~~ when tested in accordance with ASTM E 283 at a 1.57 psf (75 Pa) pressure differential ~~with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity~~. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.

14. Revise as follows:

503.2.1 Calculation of heating and cooling loads. Design loads shall be determined in accordance with the procedures described in the ASHRAE/ACCA Standard 183. The design loads shall account for the building envelope, lighting, ventilation and occupancy loads based on the project design. Heating and cooling loads shall be adjusted to account for load reductions that are achieved when energy recovery systems are utilized in the HVAC system in accordance with the ASHRAE *HVAC Systems and Equipment Handbook*. Alternatively, design loads shall be determined by an *approved* equivalent computation procedure, using the design parameters specified in Chapter 3.

15. Revise as follows:

503.2.2 Equipment and system sizing. ~~Equipment and system sizing.~~ The output capacity of ~~H~~heating and cooling equipment and systems ~~capacity~~ shall not exceed the loads calculated in accordance with Section 503.2.1. A single

piece of equipment providing both heating and cooling must satisfy this provision for one function with the capacity for the other function as small as possible, within available equipment options.

16. Add new text as follows:

503.2.4.3.3 Automatic start capabilities. Controls designed to automatically adjust the start time of an HVAC system each day to allow for automatically brining the space to desired occupied temperature levels immediately before scheduled occupancy shall be provided on each system.

17. Revise as follows:

503.2.5.1 Demand controlled ventilation. Demand control ventilation (DCV) is required for spaces larger than 500 ft^2 (50m^2) and with an average occupant load of ~~40~~ 25 people per 1000 ft^2(93 m^2) of floor area (as established in Table 403.3 of the *International Mechanical Code*) and served by systems with one or more of the following:

1. An air-side economizer;
2. Automatic modulating control of the outdoor air damper; or
3. A design outdoor airflow greater than 3,000 cfm (1400 L/s).

Exceptions:

1. Systems with energy recovery complying with Section 503.2.6.
2. Multiple-zone systems without direct digital control of individual zones communicating with a central control panel.
3. System with a design outdoor airflow less than 1,200 cfm (600 L/s).
4. Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1,200 cfm (600 L/s).
5. Building spaces where the primary ventilation needs are for process loads.

18. Revise Section 503.2.6 as follows:

503.2.6 Energy recovery ventilation systems. ~~Individual fan systems that have both a design supply air capacity of 5,000 cfm (2.36 m3/s) or greater and a minimum outside air supply of 70 percent or greater of the design supply air quantity shall have an energy recovery system that provides a change in the enthalpy of the outdoor air supply of 50 percent or more of the difference between the outdoor air and return air at design conditions. Provision shall be made to bypass or control the energy recovery system to permit cooling with outdoor air where cooling with outdoor air is required.~~ Each fan system shall have an energy recovery system when the system's supply airflow rate exceeds the value listed in Table 503.2.6 based on the climate zone and percentage of *outdoor air* at design conditions. Required energy recovery systems shall have the capability to provide a change in the enthalpy of the *outdoor air* supply equal to at least 50% of the difference between the *outdoor air* and return air enthalpies at design conditions. Provision shall be made to bypass or control the energy recovery system to permit air economizer operation as required by Section 503.4

Exception: An energy recovery ventilation system shall not be required in any of the following conditions:

1. Where energy recovery systems are prohibited by the *International Mechanical Code*.
2. Laboratory fume hood systems that include at least one of the following features:
   2.1. Variable-air-volume hood exhaust and room supply systems capable of reducing exhaust and makeup air volume to 50 percent or less of design values.
   2.2. Direct makeup (auxiliary) air supply equal to at least 75 percent of the exhaust rate, heated no warmer than 2°F (1.1°C) above room setpoint, cooled to no cooler than 3°F (1.7°C) below room setpoint, no humidification added, and no simultaneous heating and cooling used for dehumidification control.
3. Systems serving spaces that are not cooled and are heated to less than 60°F (15.5°C).
4. Where more than 60 percent of the outdoor heating energy is provided from site-recovered or site solar energy.
5. ~~Heating systems in climates with less than 3,600 HDD.~~ Heating energy recovery in climate zones 1 and 2.
6. ~~Cooling systems in climates with a 1-percent cooling design wet-bulb temperature less than 64_F (18_C).~~
6. Cooling energy recovery in climate zones 3c, 4c, 5b, 5c, 6b, 7, and 8.
7. Systems requiring dehumidification that employ series-style energy recovery coils wrapped around the cooling coil.

Table 503.2.6 Energy Recovery Requirement

Zone	% *Outdoor* air at full design airflow rate					
	≥30% and < 40%	≥40% and < 50%	≥50% and < 60%	≥60% and < 70%	≥70% and < 80%	≥80%
	Design Supply Fan airflow rate (cfm)					
3B, 3C, 4B, 4C, 5B	NR	NR	NR	NR	≥5000	≥5000
1B, 2B,5C	NR	NR	≥26000	≥12000	≥5000	≥4000
6B	≥11000	≥5500	≥4500	≥3500	≥2500	≥1500
1A, 2A, 3A, 4A, 5A, 6A	≥5500	≥4500	≥3500	≥2000	≥1000	>0
7,8	≥2500	≥1000	>0	>0	>0	>0

19. Delete and substitute as follows:

~~**503.2.9 HVAC system completion.** Prior to the issuance of a certificate of occupancy, the design professional shall provide evidence of system completion in accordance with Sections 503.2.9.1 through 503.2.9.3.~~

~~**503.2.9.1 Air system balancing.** Each supply air outlet and *zone* terminal device shall be equipped with means for air balancing in accordance with the requirements of Chapter 6 of the *International Mechanical Code*. Discharge dampers are prohibited on constant volume fans and variable volume fans with motors 10 horsepower (hp) (7.4 kW) and larger.~~

~~**503.2.9.2 Hydronic system balancing.** Individual hydronic heating and cooling coils shall be equipped with means for balancing and pressure test connections.~~

~~**503.2.9.3 Manuals.** The construction documents shall require that an operating and maintenance manual be provided to the building owner by the mechanical contractor. The manual shall include, at least, the following:~~

1. ~~Equipment capacity (input and output) and required maintenance actions.~~
2. ~~Equipment operation and maintenance manuals.~~
3. ~~HVAC system control maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions. Desired or field-determined setpoints shall be permanently recorded on control drawings, at control devices or, for digital control systems, in programming comments.~~
4. ~~A complete written narrative of how each system is intended to operate.~~

503.2.9 Mechanical systems commissioning and completion requirements. Mechanical systems commissioning and completion shall be in accordance with the provisions of Section 503.2.9.1 through 503.2.9.3.4.

503.2.9.1 System commissioning. The construction documents shall require commissioning and completion requirements in accordance with this section. The construction documents shall be permitted to refer to equipment specifications for further requirements. Copies of all documentation shall be given to the owner by the registered design professional. The building official may request commissioning documentation for review purposes. At the time of plan submittal, the *code official* shall be provided, by the permitee, a letter of intent to commission the building in accordance with this code.

503.2.9.1.1 Commissioning plan. A commissioning plan shall be prepared and shall include as a minimum the following items:

1. A detailed explanation of the building's project requirements for mechanical design,
2. A narrative describing the activities that will be accomplished during each phase of commissioning, including guidance on who accomplishes the activities and how they are completed,
3. Equipment and systems to be tested, including the extent of tests,
4. Functions to be tested (for example calibration, economizer control, etc.),
5. Conditions under which the test shall be performed (for example winter and summer design conditions, full outside air, etc.), and
6. Measurable criteria for acceptable performance.

503.2.9.1.2 Systems adjusting and balancing. All HVAC systems shall be balanced in accordance with generally accepted engineering standards. Air and water flow rates shall be measured and adjusted to deliver final flow rates within 10% of design rates. Test and balance activities shall include as a minimum the following items:

1. Air systems balancing: Each supply air outlet and zone terminal device shall be equipped with means for air balancing in accordance with the requirements of Chapter 6 of the International Mechanical Code. Discharge dampers are prohibited on constant volume fans and variable volume fans with motors 10 hp (18.6 kW) and larger. Air systems shall be balanced in a manner to first minimize throttling losses then, for fans with system power of greater than 1 hp, Fan speed shall be adjusted to meet design flow conditions.

   Exception: Fans with fan motors of 1 hp or less.

2. Hydronic systems balancing: Individual hydronic heating and cooling coils shall be equipped with means for balancing and pressure test connections. Hydronic systems shall be proportionately balanced in a manner to first minimize throttling losses, then the pump impeller shall be trimmed or pump speed shall be adjusted to meet design flow conditions. Each hydronic system shall have either the ability to measure pressure across the pump, or test ports at each side of each pump.

   Exceptions:

   1. Pumps with pump motors of 5 hp or less.
   2. When throttling results in no greater than 5% of the nameplate horsepower draw above that required if the impeller were trimmed.

503.2.9.1.3 Functional performance testing. Equipment functional performance testing shall be in accordance with Section 503.2.9.1.3.1. Functional testing of HVAC controls shall be in accordance with Section 503.2.9.1.3.2.

503.2.9.1.3.1 Equipment functional performance testing. Equipment functional performance testing shall demonstrate the correct installation and operation of components, systems, and system-to-system interfacing relationships in accordance with approved plans and specifications. This demonstration is to prove the operation, function, and maintenance serviceability for each of the commissioned systems. Testing shall include all modes of operation, including:

1. All modes as described in the Sequence of Operation,
2. Redundant or automatic back-up mode,
3. Performance of alarms, and
4. Mode of operation upon a loss of power and restored power.

   Exception: Unitary or packaged HVAC equipment listed in Tables 503.2.3 (1) through (3) that do not require supply air economizers.

503.2.9.1.3.2 Controls functional performance testing. HVAC control systems shall be tested to document that control devices, components, equipment, and systems are calibrated, adjusted and operate in accordance with approved plans and specifications. Sequences of operation shall be functionally tested to document they operate in accordance with approved plans and specifications.

503.2.9.1.4 Preliminary commissioning report. A preliminary report of commissioning test procedures and results shall be completed and provided to the building owner. The report shall be identified as “Preliminary Commissioning Report” and shall identify:

1. Itemization of deficiencies found during testing required by this section which have not been corrected at the time of report preparation and the anticipated date of correction.
2. Deferred tests which cannot be performed at the time of report preparation due to climatic conditions.
3. Climatic conditions required for performance of the deferred tests, and the anticipated date of each deferred test.

503.2.9.2 Acceptance. Buildings, or portions thereof, required to comply with this section shall not be issued a final certificate of occupancy until such time that the *code official* has received a letter of transmittal from the building owner that states they have received the Preliminary Commissioning Report as required by Section 503.2.9.1.4. At the request of the code official, a copy of the Preliminary Commissioning Report shall be made available for review.

503.2.9.3 Completion requirements. The construction documents shall require that within 90 days of system acceptance by the *code official*, the documents described in Section 503.2.9 .3.1 and 503.2.9.3.2 shall be provided to the building owner or their designated representative by the mechanical contractor.

503.2.9.3.1 Drawings. Construction documents shall include as a minimum the location and performance data on each piece of equipment.

503.2.9.3.2 Manuals. An operating manual and a maintenance manual shall be in accordance with industry-accepted standards and shall include, at a minimum, the following:

1. Capacity (input and output) and required maintenance actions for each piece of equipment.
2. Operation and maintenance manuals for each piece of equipment.
3. Manufacturer's operation manuals and maintenance manuals for each piece of equipment requiring maintenance, except equipment not furnished as part of the project. Required routine maintenance actions shall be clearly identified.
4. Names and addresses of at least one service agency.
5. HVAC controls system maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions. Desired or field-determined setpoints shall be permanently recorded on control drawings at control devices or, for digital control systems, in programming comments.
6. A complete narrative of how each system is intended to operate, including ~~suggested~~ recommended setpoints.

503.2.9.3.3 System balancing report. A written report describing the activities and measurements completed in accordance with Section 503.2.9.1.2

503.2.9.3.4 Final Commissioning Report. A complete report of test procedures and results identified as "Final Commissioning Report" shall include:

1. Results of all Functional Performance Tests.
2. Disposition of all deficiencies found during testing, including details of corrective measures used or proposed.
3. All Functional Performance Test procedures used during the commissioning process including measurable criteria for test acceptance, provided herein for repeatability.

   Exception: Deferred tests which cannot be performed at the time of report preparation due to climatic conditions.

20. Revise as follows:

TABLE 503.2.10.1(1)
FAN POWER LIMITATION
(No change to Table)

where:

CFMS = The maximum design supply airflow rate to conditioned spaces served by the system in cubic feet per minute.
Hp = The maximum combined motor nameplate horsepower.
Bhp = The maximum combined fan brake horsepower.
A = Sum of [*PD* _ CFMD / 4131].

where:

PD = Each applicable pressure drop adjustment from Table 503.2.10.1(2) in. w.c.
CFM_D – The design airflow through each applicable device from Table 503.2.10.1(2) in cubic feet per minute.

21. Revise Section 503.3 as follows:

503.3 Simple HVAC systems and equipment (Prescriptive). This section applies to buildings served by unitary or packaged HVAC equipment listed in Tables 503.2.3(1) through 503.2.3(5), each serving one *zone* and controlled by a single thermostat in the zone served. It also applies to two-pipe heating systems serving one or more zones, where no cooling system is installed.

~~This section does not apply to fan systems serving multiple zones, nonunitary or nonpackaged HVAC equipment and systems or hydronic or steam heating and hydronic cooling equipment and distribution systems that provide cooling or cooling and heating which are covered by Section 503.4.~~

503.3.1 Economizers. ~~Supply air economizers shall be provided on each cooling system as shown in Table 503.3.1(1).~~

~~Economizers shall be capable of providing 100 percent outdoor air, even if additional mechanical cooling is required to meet the cooling load of the building. Systems shall provide a means to relieve excess outdoor air during economizer operation to prevent over-pressurizing the building. The relief air outlet shall be located to avoid recirculation into the building. Where a single room or space is supplied by multiple air systems, the aggregate capacity of those systems shall be used in applying this requirement.~~

~~Exceptions:~~

1. ~~Where the cooling equipment is covered by the minimum efficiency requirements of Table 503.2.3(1) or 503.2.3(2) and meets or exceeds the minimum cooling efficiency requirement (EER) by the percentages shown in Table 503.3.1(2).~~
2. ~~Systems with air or evaporatively cooled condensers and which serve spaces with open case refrigeration or that require filtration equipment in order to meet the minimum ventilation requirements of Chapter 4 of the *International Mechanical Code*.~~

Each cooling system that has a fan shall include either an air or water economizer meeting the requirements of Sections 503.3.1.1 through 503.4.1.4.

Exceptions: Economizers are not required for the systems listed below.

1. Individual fan-cooling units with a supply capacity less than the minimum listed in Table 503.3.1(1).
2. Systems that require filtration equipment in order to meet the minimum ventilation requirements of Chapter 4 of the *International Mechanical Code.*
3. Where more than 25% of the air designed to be supplied by the system is to spaces that are designed to be humidified above 35°F dew-point temperature to satisfy process needs.
4. Systems that include a condenser heat recovery system required by Section 503.4.6.
5. Systems that serve *residential* spaces where the system capacity is less than five times the requirement listed in Table 503.3.1(1).
6. Systems that serve spaces whose sensible cooling load at design conditions, excluding transmission and infiltration loads, is less than or equal to transmission and infiltration losses at an outdoor temperature of 60°F.
7. Systems expected to operate less than 20 hours per week.
8. Where the use of *outdoor air* for cooling will affect supermarket open refrigerated casework systems.
9. Where the cooling *efficiency* meets or exceeds the *efficiency* requirements in Table 503.3.1(2).

TABLE 503.3.1(1)
ECONOMIZER REQUIREMENTS

CLIMATE ZONES	ECONOMIZER REQUIREMENT
1A, 1B, 2A, 7, 8	No requirement
2B, 3A, 3B, 3C, 4A, 4B, 4C, 5A, 5B, 5C, 6A, 6B	Economizers on all cooling systems ≥ 54,000 Btu/h[a]

For SI: 1 British thermal unit per hour = 0.293 W.

a. The total capacity of all systems without economizers shall not exceed480,000 Btu/h per building, or 20 percent of its air economizer capacity, whichever is greater.

TABLE 503.3.1(2)
EQUIPMENT EFFICIENCY PERFORMANCE
EXCEPTION FOR ECONOMIZERS

CLIMATE ZONES	COOLING EQUIPMENT PERFORMANCE IMPROVEMENT (EER OR IPLV)
2B	10% Efficiency Improvement
3B	15% Efficiency Improvement
4B	20% Efficiency Improvement

~~**503.4.1 Economizers.** Supply air economizers shall be provided on each cooling system according to Table 503.3.1(1). Economizers shall be capable of operating at 100 percent outside air, even if additional mechanical cooling is required to meet the cooling load of the building.~~

~~**Exceptions:**~~

1. ~~Systems utilizing water economizers that are capable of cooling supply air by direct or indirect evaporation or both and providing 100 percent of the expected system cooling load at outside air temperatures of 50°F (10°C) dry bulb/45°F (7°C) wet bulb and below.~~
2. ~~Where the cooling equipment is covered by the minimum efficiency requirements of Table 503.2.3(1), 503.2.3(2), or 503.2.3(6) and meets or exceeds the minimum EER by the percentages shown in Table 503.3.1(2)~~
3. ~~Where the cooling equipment is covered by the minimum efficiency requirements of Table 503.2.3(7) and meets or exceeds the minimum integrated part load value (IPLV) by the percentages shown in Table 503.3.1(2).~~

503.3.1.1 Air Economizers. Air econimizers shall be designed in accordance with Sections 503.3.1.1.1 through 503.3.1.1.4**.**

503.3.1.1.1 Design Capacity. Air economizer systems shall be capable of modulating *outdoor air* and return air dampers to provide up to 100% of the design supply air quantity as *outdoor air* for cooling.

503.3.1.1.2 Control Signal. Economizer dampers shall be capable of being sequenced with the mechanical cooling equipment and shall not be controlled by only mixed air temperature.

Exception: The use of mixed air temperature limit control shall be permitted for systems controlled from space temperature (such as single-zone systems).

503.3.1.1.3 High-Limit Shutoff. All air economizers shall be capable of automatically reducing *outdoor air* intake to the design minimum *outdoor air* quantity when *outdoor air* intake will no longer reduce cooling energy usage. High-limit shutoff control types for specific climates shall be chosen from Table 503.3.1.1.3(1). High-limit shutoff control settings for these control types shall be those listed in Table 503.3.1.1.3(2).

TABLE 503.3.1.1.3(1)
HIGH-LIMIT SHUTOFF CONTROL OPTIONS FOR AIR ECONOMIZERS

CLIMATE ZONES	ALLOWED CONTROL TYPES	PROHIBITED CONTROL TYPES
1b, 2b, 3b, 3c, 4b, 4c, 5b, 5c, 6b, 7, 8	Fixed dry bulb Differential dry bulb Electronic enthalpy[a] Differential enthalpy Dew-point and dry-bulb temperatures	Fixed enthalpy
1a, 2a, 3a, 4a	Fixed dry bulb Fixed enthalpy Electronic enthalpy[a] Differential enthalpy Dew-point and dry-bulb temperatures	Differential dry bulb
All other climates	Fixed dry bulb Differential dry bulb Fixed enthalpy Electronic enthalpy[a] Differential enthalpy Dew-point and dry-bulb temperatures	-

a. Electronic enthalpy controllers are devices that use a combination of humidity and dry-bulb temperature in their switching algorithm.

TABLE 503.3.1.1.3(2)
HIGH-LIMIT SHUTOFF CONTROL SETTING FOR AIR ECONOMIZERS

DEVICE TYPE	CLIMATE	REQUIRED HIGH LIMIT (ECONOMIZER OFF WHEN):	
		EQUATION	DESCRIPTION
Fixed dry bulb	1b, 2b, 3b, 3c, 4b, 4c, 5b, 5c, 6b, 7, 8,	T_{OA}>75°F	Outdoor air temperature exceeds 75°F
	5a, 6a, 7a	T_{OA}>70°F	Outdoor air temperature exceeds 70°F
	All other zones	T_{OA}>65°F	Outdoor air temperature exceeds 65°F
Differential dry bulb	1b, 2b, 3b, 3c, 4b, 4c, 5a, 5b, 5c, 6a, 6b, 7, 8	T_{OA}>T_{RA}	Outdoor air temperature exceeds return air temperature
Fixed enthalpy	All	h_{OA}> 28 Btu/lb[a]	Outdoor air enthalpy exceeds 28 Btu/lb of dry air[a]
Electronic Enthalpy	All	(T_{OA} , RH_{OA}) > A	Outdoor air temperature/RH exceeds the "A" setpoint curve[b]
Differential enthalpy	All	h_{OA}> h_{RA}	Outdoor air enthalpy exceeds return air enthalpy
Dew-point and dry bulb temperatures	All	DP_{OA}>55°F or T_{OA}>75°F	Outdoor air dry bulb exceeds 75°F or outside dew point exceeds 55°F (65 gr/lb)

a. At altitudes substantially different than sea level, the Fixed Enthalpy limit shall be set to the enthalpy value at 75°F and 50% relative humidity. As an example, at approximately 6000 ft elevation the fixed enthalpy limit is approximately 30.7 Btu/lb.

b. Setpoint "A" corresponds to a curve on the psychometric chart that goes through a point at approximately 75°F and 40% relative humidity and is nearly parallel to dry-bulb lines at low humidity levels and nearly parallel to enthalpy lines at high humidity levels.

503.3.1.1.4 Relief of Excess Outdoor Air. Systems shall provide a means to relieve excess *outdoor air* during air economizer operation to prevent over-pressurizing the building. The relief air outlet shall be located to avoid recirculation into the building.

22. Delete and substitute as follows:

~~**503.4.1 Economizers.** Supply air economizers shall be provided on each cooling system according to Table 503.3.1(1). Economizers shall be capable of operating at 100 percent outside air, even if additional mechanical cooling is required to meet the cooling load of the building~~.

~~**Exceptions:**~~

1. ~~Systems utilizing water economizers that are capable of cooling supply air by direct or indirect evaporation or both and providing 100 percent of the expected system cooling load at outside air temperatures of 50°F (10°C) dry bulb/45°F (7°C) wet bulb and below.~~
2. ~~Where the cooling equipment is covered by the minimum efficiency requirements of Table 503.2.3(1), 503.2.3(2), or 503.2.3(6) and meets or exceeds the minimum EER by the percentages shown in Table 503.3.1(2)~~
3. ~~Where the cooling equipment is covered by the minimum efficiency requirements of Table 503.2.3(7) and meets or exceeds the minimum integrated part load value (IPLV) by the percentages shown in Table 503.3.1(2).~~

503.4.1 Economizers. Economizer systems for complex HVAC Equipment shall be designed in accordance with Sections 503.4.1.1 through 503.4.1.4.

503.4.1.1 Design Capacity. Water economizer systems shall be capable of cooling supply air by indirect evaporation and providing up to 100% of the expected system cooling load at *outdoor air* temperatures of 50°F dry bulb/45° wet bulb and below.

Exception: Systems in which a water economizer is used and where dehumidification requirements cannot be met using outdoor air temperatures of 50°F dry bulb/ 45°F wet bulb must satisfy 100% of the expected system cooling load at 45°F dry bulb/40°F wet bulb.

503.4.1.2 Maximum Pressure Drop. Pre-cooling coils and water-to-water heat exchangers used as part of a water economizer system shall either have a water-side pressure drop of less than 15 ft of water or a secondary loop shall be created so that the coil or heat exchanger pressure drop is not seen by the circulating pumps when the system is in the normal cooling (non-economizer) mode.

503.4.1.3 Integrated Economizer Control. Economizer systems shall be integrated with the mechanical cooling system and be capable of providing partial cooling even when additional mechanical cooling is required to meet the remainder of the cooling load.

Exceptions:

1. Direct expansion systems that include controls that reduce the quantity of *outdoor air* required to prevent coil frosting at the lowest step of compressor unloading, provided this lowest step is no greater than 25% of the total system capacity.
2. Individual direct expansion units that have a rated cooling capacity less than 54,000 Btu/h and use non-integrated economizer controls that preclude simultaneous operation of the economizer and mechanical cooling.
3. Systems in climate zones 1A, 1B, 2A, 7, 8.

503.4.1.4 Economizer Heating System Impact. HVAC system design and economizer controls shall be such that economizer operation does not increase the building heating energy use during normal operation.

Exception: Economizers on VAV systems that cause zone level heating to increase due to a reduction in supply air temperature.

23. Revise as follows:

503.4.2 Variable air volume (VAV) fan control. Individual VAV fans with motors of ~~10~~ 7.5 horsepower (~~7.5~~ 5.6 kW) or greater shall be:

1. Driven by a mechanical or electrical variable speed drive;
2. Driven by a vane-axial fan with variable-pitch blades; or
~~2~~3. The fan ~~motor~~ shall have controls or devices that will result in fan motor demand of no more than 30 percent of their design wattage at 50 percent of design airflow when static pressure set point equals one-third of the total design static pressure, based on manufacturer's certified fan data.

Static pressure sensors used to control VAV fans shall be placed in a position such that the controller setpoint is no greater than one-third the total design fan static pressure, except for systems with direct digital control. If this results in the sensor being located downstream of major duct splits, multiple sensors shall be installed in each major branch to ensure the static pressure can be maintained in each branch.

For systems with direct digital control of individual *zone* boxes reporting to the central control panel, the static pressure set point shall be reset based on the *zone* requiring the most pressure, i.e., the set point is reset lower until one *zone* damper is nearly wide open.

24. Revise Section 505.1 as follows:

505.1 General (Mandatory). This section covers lighting system controls, the connection of ballasts, the maximum lighting power for interior applications and minimum acceptable lighting equipment for exterior applications.

Lighting within dwelling units where ~~50~~ 75 percent or more of the permanently installed interior light fixtures are fitted with high-efficacy lamps or a minimum of 75 percent of the permanently installed lighting fixtures shall contain only high efficacy lamps.

Exception: Low-voltage lighting.

25. Revise Section 505.2 as follows:

505.2.1 Interior lighting controls. Each area enclosed by walls or floor-to-ceiling partitions shall have at least one manual control for the lighting serving that area. The required controls shall be located within the area served by the controls or be a remote switch that identifies the lights served and indicates their status.

Exceptions:

1. Areas designated as security or emergency areas that must be continuously lighted.
2. Lighting in stairways or corridors that are elements of the means of egress.

505.2.2 Additional controls. Each area that is required to have a manual control shall have additional controls that meet the requirements of Sections 505.2.2.1 and 505.2.2.2.

505.2.2.1 Light reduction controls. Each area that is required to have a manual control shall also allow the occupant to reduce the connected lighting load in a reasonably uniform illumination pattern by at least 50 percent. Lighting reduction shall be achieved by one of the following or other *approved* method:
1. Controlling all lamps or luminaires;
2. Dual switching of alternate rows of luminaires, alternate luminaires or alternate lamps;
3. Switching the middle lamp luminaires independently of the outer lamps; or
4. Switching each luminaire or each lamp.

Exceptions:

1. Areas that have only one luminaire.
2. Areas that are controlled by an occupant-sensing device.
3. Corridors, storerooms, restrooms or public lobbies.
4. *Sleeping unit* (see Section 505.2.3).
5. Spaces that use less than 0.6 watts per square foot (6.5 W/m2).
6. Daylight spaces complying with Section 505.2.2.2.3 Automatic Daylighting Controls

505.2.2.2 ~~505.2.2.3~~ Daylight Zone Control. Daylight zones shall be provided with individual controls which control the lights independent of general area lighting. Contiguous daylight zones adjacent to vertical fenestration are allowed to be controlled by a single controlling device provided that they do not include zones facing more than two adjacent cardinal orientations (i.e. north, east, south, west). Daylight zones under skylights more than 15 feet from the perimeter shall be controlled separately from daylight zones adjacent to vertical fenestration.

Exception: Daylight spaces enclosed by walls or ceiling height partitions and containing two or fewer light fixtures are not required to have a separate switch for general area lighting.

~~**505.2.2.2 Automatic lighting shutoff.** Buildings larger than 5,000 square feet (465m2) shall be equipped with an automatic control device to shut off lighting in those areas. This automatic control device shall function on either:~~

1. ~~A scheduled basis, using time-of-day, with an independent program schedule that controls the interior lighting in areas that do not exceed 25,000 square feet (2323 m2) and are not more than one floor; or~~
2. ~~An occupant sensor that shall turn lighting off within 30 minutes of an occupant leaving a space; or~~
3. ~~A signal from another control or alarm system that indicates the area is unoccupied.~~

~~**Exception:** The following shall not require an automatic control device:~~

1. ~~*Sleeping unit* (see Section 505.2.3).~~
2. ~~Lighting in spaces where patient care is directly provided.~~
3. ~~Spaces where an automatic shutoff would endanger occupant safety or security.~~

~~**505.2.2.2.1 Occupant override.** Where an automatic time switch control device is installed to comply with Section 505.2.2.2, Item 1, it shall incorporate an override switching device that:~~

1. ~~Is readily *accessible*.~~
2. ~~Is located so that a person using the device can see the lights or the area controlled by that switch, or so that the area being lit is annunciated.~~
3. ~~Is manually operated.~~
4. ~~Allows the lighting to remain on for no more than 2 hours when an override is initiated.~~
5. ~~Controls an area not exceeding 5,000 square feet (465 m2).~~

~~**Exceptions:**~~

1. ~~In malls and arcades, auditoriums, single-tenant retail spaces, industrial facilities and arenas, where captive-key override is utilized, override time shall be permitted to exceed 2 hours.~~
2. ~~In malls and arcades, auditoriums, single-tenant retail spaces, industrial facilities and arenas, the area controlled shall not exceed 20,000 square feet (1860 m2).~~

~~**505.2.2.2.2 Holiday scheduling.** If an automatic time switch control device is installed in accordance with Section 505.2.2.2, Item 1, it shall incorporate an automatic holiday scheduling feature that turns off all loads for at least 24 hours, then resumes the normally scheduled operation.~~

~~**Exception:** Retail stores and associated malls, restaurants, grocery stores, places of religious worship and theaters.~~

~~**505.2.2.3 Daylight zone control.** Daylight zones, as defined by this code, shall be provided with individual controls that control the lights independent of general area lighting. Contiguous daylight zones adjacent to vertical fenestration are allowed to be controlled by a single controlling device provided that they do not include zones facing more than two adjacent cardinal orientations (i.e., north, east, south, west). Daylight zones under skylights more than 15 feet (4572 mm) from the perimeter shall be controlled separately from daylight zones adjacent to vertical fenestration.~~

~~**Exception:** Daylight spaces enclosed by walls or ceiling height partitions and containing two or fewer light fixtures are not required to have a separate switch for general area lighting.~~

505.2.2.3 Automatic lighting controls. All commercial buildings shall be equipped with automatic control devices to shut off lighting in compliance with one of the following automatic control technologies:

1. Section 505.2.2.3.1 Occupancy Sensors

2. Section 505.2.2.3.2 Time Clock Controls
3. Section 505.2.2.3.3 Automatic Daylighting Controls

Any lighting control required in Sections 505.2.2.3.1, 505.2.2.2.3.2 and 505.2.2.3.3 shall either be manual on or shall be controlled to automatically turn the lighting on to not more than 50% power unless otherwise provided in Sections 505.2.2.3.1, 505.2.3.2 or 505.2.2.3.3.

Exception: Full automatic-on controls shall be permitted to control lighting in public corridors, stairways, restrooms, primary building entrance areas and lobbies, and areas where manual-on operation would endanger the safety or security of the room or building occupants.

505.2.2.3.1 Occupancy sensors. Occupancy sensors shall be installed in all classrooms, conference/meeting rooms, employee lunch and break rooms, private offices, restrooms, storage rooms and janitorial closets, and other spaces 300 sf. or less enclosed by ceiling height partitions. These automatic control devices shall be installed to automatically turn off lights within 30 minutes of all occupants leaving the space, except spaces with multi-scene control.

505.2.2.3.2 Time Clock Controls In areas not controlled by occupancy sensors, automatic time switch control devices shall be used. It shall incorporate an override switching device that:

1. Is readily accessible.
2. Is located so that a person using the device can see the lights or the area controlled by that switch, or so that the area being lit is annunciated.
3. Is manually operated.
4. Allows the lighting to remain on for no more than 2 hours when an override is initiated.
5. Controls an area not exceeding 5,000 square feet (465 m2).

Exceptions:

1. In malls and arcades, auditoriums, single-tenant retail spaces, industrial facilities and arenas, where captive-key override is utilized, override time may exceed 2 hours.
2. In malls and arcades, auditoriums, single-tenant retail spaces, industrial facilities and arenas, the area controlled may not exceed 20,000 square feet (1860 m2).

505.2.2.3.3 Automatic daylighting controls. Automatic controls installed in daylight zones shall control lights in the daylit areas separately from the non-daylit areas. Controls for calibration adjustments to the lighting control device shall be readily accessible to authorized personnel. Each daylight control zone shall not exceed 2,500 square feet. Automatic daylighting controls must incorporate an automatic shut-off ability based on time or occupancy in addition to lighting power reduction controls.

Controls will automatically reduce lighting power in response to available daylight by either one of the following methods:

1. Continuous dimming using dimming ballasts and daylight-sensing automatic controls that are capable of reducing the power of general lighting in the daylit zone continuously to less than 35% of rated power at maximum light output.
2. Stepped Dimming using multi-level switching and daylight-sensing controls that are capable of reducing lighting power automatically. The system should provide a minimum of two control channels per zone and be installed in a manner such that at least one control step shall reduce power of general lighting in the daylit zone by 30% to 50% of rated power and another control step that reduces lighting power by 65% to 100%. Stepped dimming control is not allowed in continuously occupied areas with ceiling heights of 14 feet or lower.

   Exception: Daylight spaces enclosed by walls or ceiling height partitions and containing 2 or fewer luminaire are not required to have a separate switch for general area lighting.

505.2.3 Specific Application Controls. Specific application controls shall be provided for the following:

1. Display/Accent Lighting—display or accent lighting shall have a separate control device.
2. Case Lighting—lighting in cases used for display purposes shall have a separate control device.
3. Hotel and Motel Guest Room Lighting—hotel and motel guest rooms and guest suites shall have a master control device at the main room entry that controls all permanently installed luminaires and switched receptacles.

4. Task Lighting—supplemental task lighting, including permanently installed under-shelf or under-cabinet lighting, shall have a control device integral to the luminaires or be controlled by a wall-mounted control device provided the control device is readily accessible and located so that the occupant can see the controlled lighting.
5. Non-visual Lighting—lighting for non-visual applications, such as plant growth and food warming, shall have a separate control device.
6. Demonstration Lighting—lighting equipment that is for sale or for demonstrations in lighting education shall have a separate control device.

Exceptions: Where LED lighting is used no additional control is required for items 1., 2. and 4.

505.2.4 Functional Testing. Controls for automatic lighting systems shall be tested prior to and as a condition for issuance of an approval under Section 104.8. Testing shall ensure that control hardware and software are calibrated, adjusted, programmed, and in proper working condition in accordance with the construction documents and manufacturer's installation instructions. The construction documents shall state the party who will conduct the required functional testing. The party responsible for the functional testing shall not be directly involved in the design or construction of the project and shall provide documentation to the *code official* certifying that the installed lighting controls meet the provisions of Section 505.

When *occupant sensors*, time switches, programmable schedule controls, *photosensors or daylighting controls* are installed, at a minimum, the following procedures shall be performed:

1. Confirm that the placement, sensitivity and time-out adjustments for *occupant sensors* yield acceptable performance, i.e. lights turn off only after space is vacated and do not turn on unless space is occupied.
2. Confirm that the time switches and programmable schedule controls are programmed to turn the lights off.
3. Confirm that photosensor controls reduce electric light based on the amount of usable daylight in the space as specified.

~~**505.2.3**~~ **505.2.5 Sleeping unit controls.** *(No change to current text)*

505.2.4 Exterior lighting controls. *(No change to current text)*

26. Delete and substitute as follows as follows:

~~**TABLE 505.5.2**~~
~~**INTERIOR LIGHTING POWER ALLOWANCES**~~

~~**Building Area Typea**~~	~~**(W/ft2)**~~
~~Automotive Facility~~	~~0.9~~
~~Convention Center~~	~~1.2~~
~~Court House~~	~~1.2~~
~~Dining: Bar Lounge/Leisure~~	~~1.3~~
~~Dining: Cafeteria/Fast Food~~	~~1.4~~
~~Dining: Family~~	~~1.6~~
~~Dormitory~~	~~1.0~~
~~Exercise Center~~	~~1.0~~
~~Gymnasium~~	~~1.1~~
~~Healthcare—clinic~~	~~1.0~~
~~Hospital~~	~~1.2~~
~~Hotel~~	~~1.0~~
~~Library~~	~~1.3~~
~~Manufacturing Facility~~	~~1.3~~
~~Motel~~	~~1.0~~
~~Motion Picture Theater~~	~~1.2~~

~~Building Area Typea~~	~~(W/ft2)~~
~~Multifamily~~	~~0.7~~
~~Museum~~	~~1.1~~
~~Office~~	~~1.0~~
~~Parking Garage~~	~~0.3~~
~~Penitentiary~~	~~1.0~~
~~Performing Arts Theater~~	~~1.6~~
~~Police/Fire Station~~	~~1.0~~
~~Post Office~~	~~1.1~~
~~Religious Building~~	~~1.3~~
~~Retailb~~	~~1.5~~
~~School/University~~	~~1.2~~
~~Sports Arena~~	~~1.1~~
~~Town Hall~~	~~1.1~~
~~Transportation~~	~~1.0~~
~~Warehouse~~	~~0.8~~
~~Workshop~~	~~1.4~~

TABLE 505.5.2
LIGHTING POWER DENSITY

Building Area Type[a]	**Whole Building**	**Space by Space**
	(W/ft2)	
Active Storage		0.8
Atrium – First Three Floors		0.6
Atrium – Each Additional Floor		0.2
AUTOMOTIVE FACILITY	0.9	
Classroom/lecture/training		1.3
Conference/Meeting/Multipurpose		1.1
Corridor/Transition		0.5
Electrical/Mechanical		1.1
Food Preparation		1.2
Inactive Storage		0.2
Lobby		1.1
Restroom		0.8
Stairway		0.6
CONVENTION CENTER	1.2	
Exhibit Space		1.3
Audience/Seating Area		0.9
COURTHOUSE	1.2	
Audience/Seating Area		0.9
Courtroom		1.9
Confinement Cells		0.9
Judges Chambers		1.3
Dressing/Locker/Fitting Room		0.6
DINING: BAR LOUNGE/LEISURE	1.3	
Lounge/Leisure Dining		1.4
DINING: CAFETERIA/FAST FOOD	1.4	
DINING: FAMILY	1.6	
Dining		1.4
Kitchen		1.2
DORMITORY	1	
Living Quarters		1.1

Building Area Type[a]	Whole Building	Space by Space
Bedroom		0.5
Study Hall		1.4
EXERCISE CENTER	1	
Dressing/Locker/Fitting Room		0.6
Audience/Seating Area		0.3
Exercise Area		0.9
Exercise Area/Gymnasium		0.9
RETAIL: SUPERMARKET	1.3	
GYMNASIUM	1.1	
Dressing/Locker/Fitting Room		0.6
Audience/Seating Area		0.4
Playing Area		1.4
Exercise Area		0.9
HEALTHCARE CLINIC	1	
Corridors w/patient waiting, exam		1
Exam/Treatment		1.5
Emergency		2.7
Public & Staff Lounge		0.8
Hospital/Medical supplies		1.4
Hospital - Nursery		0.6
Nurse station		1
Physical therapy		0.9
Patient Room		0.7
Pharmacy		1.2
Hospital/Radiology		0.4
Operating Room		2.2
Recovery		0.8
Active storage		0.9
Laundry-Washing		0.6
HOTEL	1	
Dining Area		1.3
Guest quarters		1.1
Reception/Waiting		2.5
Lobby		1.1
LIBRARY	1.3	
Library-Audio Visual		0.7
Stacks		1.7
Card File & Cataloguing		1.1
Reading Area		1.2
MANUFACTURING FACILITY	1.3	
MOTEL	1	
Dining Area		1.2
Guest quarters		1.1
Reception/Waiting		2.1
MOTION PICTURE THEATER	1.2	
Audience/Seating Area		1.2
Lobby		1
MULTI-FAMILY	0.7	
MUSEUM	1.1	
Active Storage		0.8
General exhibition		1
Restoration		1.7
OFFICE	0.9	
Enclosed		1
Open Plan		1
PARKING GARAGE	0.3	
PENITENTIARY	1.0	

Building Area Type[a]	Whole Building	Space by Space
PERFORMING ARTS THEATER	1.6	
Audience/Seating Area		2.6
Lobby		3.3
Dressing/Locker/Fitting Room		1.1
POLICE STATIONS	1	
FIRE STATIONS	0.8	
Fire Station Engine Room		0.8
Sleeping Quarters		0.3
Audience/Seating Area		0.8
Police Station Laboratory		1.4
POST OFFICETS/SF	1.1	
Sorting Area		1.2
Lobby		1
RELIGIOUS BUILDINGS	1.3	
Lobby		0.6
Worship/Pulpit/Choir		2.4
RETAIL	1.3	
Department Store Sales Area		1.3
Specialty Store Sales Area		1.8
Fine Merchandise Sales Area		2.9
Supermarket Sales Area		1.3
Personal Services Sales Area		1.3
Mass Merchandising Sales Area		1.3
Mall Concourse		1.7
SCHOOL/UNIVERSITY	1.2	
Classroom		1.3
Audience		0.7
Dining		1.1
Office		1.1
Corridor		0.5
Storage		0.5
Laboratory		1.1
RETAIL: SPECIALTY b	1.6	
TOWN HALL	1.1	
TRANSPORTATION	1	
Dining Area		2.1
Baggage Area		1
Airport - Concourse		0.6
Terminal - Ticket Counter		1.5
Reception/Waiting		0.5
SPORTS ARENA	1.1	
WAREHOUSE	0.6	
Fine Material		1.4
Medium/Bulky Material		0.6
WORKSHOP	1.4	

For SI: 1 foot = 304.8 mm, 1 watt per square foot = W/0.0929 m2~~.~~

~~a. In cases where both a general building area type and a more specific building area type are listed, the more specific building area type shall apply~~.

b. Where lighting equipment is specified to be installed to highlight specific merchandise in addition to lighting equipment specified for general lighting and is switched or dimmed on circuits different from the circuits for general lighting, the smaller of the actual wattage of the lighting equipment installed specifically for merchandise, or additional lighting power as determined below shall be added to the interior lighting power determined in accordance with this line item.

Calculate the additional lighting power as follows:

Additional Interior Lighting Power Allowance = ~~1000watts +~~ (Retail Area 1 X 0.~~6~~ 4W/ft2) + (Retail Area 2 X 0.6 W/ft2) + (Retail Area 3 X ~~1.4~~ 0.9 W/ft2) + (Retail Area 4 X ~~2.5~~ 1.5 W/ft2).

where:

Retail Area 1 = The floor area for all products not listed in Retail Area 2, 3 or 4.
Retail Area 2 = The floor area used for the sale of vehicles, sporting goods and small electronics.
Retail Area 3 = The floor area used for the sale of furniture, clothing, cosmetics and artwork.
Retail Area 4 = The floor area used for the sale of jewelry, crystal and china.

Exception: Other merchandise categories are permitted to be included in Retail Areas 2 through 4 above, provided that justification documenting the need for additional lighting power based on visual inspection, contrast, or other critical display is *approved* by the authority having jurisdiction.

27. Add new text as follows:

SECTION 506
ADDITIONAL EFFICIENCY PACKAGE OPTIONS

506.1 Requirements. Buildings shall comply with at least one of the following:

1. 506.2 Efficient HVAC Performance Requirement
2. 506.3 Efficient Lighting System Requirement
3. 506.4 On-Site Supply of Renewable Energy

At the time of plan submittal, the *code official* shall be provided, by the permittee, documentation designating the intent to comply with Section 506.2, 506.3 or 506.4 in their entirety. Individual tenant spaces must comply with either 506.2 or 506.3 in their entirety unless documentation can be provided that demonstrates compliance with Section 506.4 for the entire building.

506.2 Efficient Mechanical Equipment. Equipment shall meet the minimum efficiency requirements of Tables 506.2.(1) through 506.2(7) in addition to the requirements in Section 503. This section shall only be used where an equipment efficiency option is available.

TABLE 506.2(1)
UNITARY AIR CONDITIONERS AND CONDENSING UNITS, ELECTRICALLY OPERATED, EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY	SUBCATEGORY OR RATING CONDITION	REQUIRED EFFICIENCYa
Air conditioners, Air cooled	< 65,000 Btu/hd	Split system	For zones 1 to 5: 15.0 SEER, 12.5 EER For zones 6 to 8: 14 SEER, 12 EER
		Single package	For zones 1 to 5: 15.0 SEER, 12.0 EER For zones 6 to 8: 14.0 SEER 11.6 EER
	≥ 65,000 Btuh/h and < 240,000 Btu/h	Split system and single package	For zones 1 to 5: 12.0 EERb, 12.4 IPLVb For zones 6 to 8: 11.5 EERb, 11.9 IPLVb
	≥ 240,000 Btu/h and < 760,000 Btu/h	Split system and single package	For zones 1 to 5: 10.8 EERb, 12.0 IPLVb For zones 6 to 8: 10.5 EERb, 10.9 IPLVb
	≥ 760,000 Btu/h		For zones 1 to 5: 10.2 EERb, 11.0 IPLVb For zones 6 to 8: 9.7 EERb, 11.0 IPLVb
Air conditioners, Water and evaporatively cooled		Split system and single package	14.0 EER

For SI: 1 British thermal unit per hour = 0.2931 W.

a. IPLVs are only applicable to equipment with capacity modulation.

b. Deduct 0.2 from the required EERs and IPLVs for units with a heating section other than electric resistance heat.

TABLE 506.2(2)
UNITARY AND APPLIED HEAT PUMPS, ELECTRICALLY OPERATED, EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY	SUBCATEGORY OR RATING CONDITION	REQUIRED EFFICIENCYa
Air cooled (Cooling mode)	< 65,000 Btu/hd	Split system	For zones 1 to 5: 15.0 SEER, 12.5 EER For zones 6 to 8: 14.0 SEER, 12.0 EER
		Single package	For zones 1 to 5: 15.0 SEER, 12.0 EER For zones 6 to 8: 14.0 SEER, 11.6 EER
	≥ 65,000 Btu/h and < 240,000 Btu/h	Split system and single package	For zones 1 to 5: 12.0 SEER, 12.4 EER For zones 6 to 8: 11.5 EERb, 11.9 IPLVb
	≥ 240,000 Btu/h	Split system and single package	For zones 1 to 5: 12.0 SEER, 12.4 EER For zones 6 to 8: 10.5 EERb, 10.9 IPLVb
Water SOURCES (Cooling mode)	< 135,000 Btu/h	85°F entering water	14.0 EER
Air cooled (Heating mode)	< 65,000 Btu/hd (Cooling capacity)	Split system	For zones 1 to 5: 9.0 HSPF For zones 6 to 8: 8.5 HSPF
		Single package	For zones 1 to 5: 8.5 HSPF For zones 6 to 8: 8.0 HSPF
	≥ 65,000 Btu/h and < 135,000 Btu/h (Cooling capacity)	47°F db/43°F wb outdoor air	3.4 COP
		17°F db/15°F wb outdoor air	2.4 COP
	≥ 135,000 Btu/h (Cooling capacity)	47°F db/43°F wb outdoor air	3.2 COP
		77°F db/15°F wb outdoor air	2.1 COP
Water SOURCES (Heating mode)	< 135,000 Btu/h (Cooling capacity)	70°F entering water	4.6 COP

For SI: °C = [(°F) - 32] / 1.8, 1 British thermal unit per hour = 0.2931 W.
db = dry-bulb temperature, °F; wb = wet-bulb temperature, °F
a. IPLVs and Part load rating conditions are only applicable to equipment with capacity modulation.
b. Deduct 0.2 from the required EERs and IPLVs for units with a heating section other than electric resistance heat.

TABLE 506.2(3)
PACKAGED TERMINAL AIR CONDITIONERS AND PACKAGED TERMINALHEAT PUMPS

EQUIPMENT TYPE	SIZE CATEGORY	REQUIRED EFFICIENCYb
Air conditioners & Heat Pumps (Cooling Mode)	< 7,000 Btu / h	11.9 EER
	7,000 Btu / h and < 10,000 Btu / h	11.3 EER
	10,000 Btu / h and < 13,000 Btu / h	10.7 EER
	> 13,000 Btu / h	9.5 EER

a. Replacement units must be factory labeled as follows: "MANUFACTURED FOR REPLACEMENT APPLICATIONS ONLY: NOT TO BE INSTALLED IN NEW CONSTRUCTION PROJECTS." Replacement efficiencies apply only to units with existing sleeves less than 16 inches (406 mm) high and less than 42 inches (1067 mm) wide.

TABLE 506.2(4)
WARM AIR FURNACES AND COMBINATION WARM AIR FURNACES/AIR-CONDITIONING UNITS, WARM AIR DUCT FURNACES AND UNIT HEATERS, EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY (INPUT)	SUBCATEGORY OR RATING CONDITION	REQUIRED EFFICIENCY	TEST PROCEDURE
Warm air furnaces, gas fired	< 225,000 Btu/h	—	For zones 1 & 2, NR. For zones 3 & 4 90 AFUE or 90 Et For zones 4-8 are 92 AFUE or 92 Et	DOE 10 CFR Part 430 or ANSI Z21.47
	≥ 225,000 Btu/h	Maximum capacity	90% Ec note 1	ANSI Z21.47
Warm air furnaces, oil fired	< 225,000 Btu/h	—	For zones 1 & 2, NR. For zones 3 to 8 are 85 AFUE or 85 Et	DOE 10 CFR Part 430 or UL 727
	≥ 225,000 Btu/h	Maximum capacity	85% Et, Note 1	UL 727
Warm air duct furnaces, gas fired	All capacities	Maximum capacity	*90% Ec*	ANSI Z83.8
Warm air unit heaters, gas fired	All capacities	Maximum capacity	*90% Ec*	ANSI Z83.8
Warm air unit heaters, oil fired	All capacities	Maximum capacity	*90% Ec*	UL 731

For SI: 1 British thermal unit per hour = 0.2931 W.

1 Units must also include an IID (intermittent ignition device), have jackets not exceeding 0.75 percent of the input rating, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space.
Where there two ratings units not covered by the National Appliance Energy Conservation Act of 1987 (NAECA) (3-phase power or cooling capacity greater than or equal to 65,000 Btu/h [19 kW]) shall comply with either rating.
Et = Thermal efficiency.
Ec = Combustion efficiency (100% less flue losses).
Efficient furnace fan: All fossil fuel furnaces in zones 3 to 8 shall have a furnace electricity ratio not greater than 2% and shall include a manufacturer's designation of the furnace electricity ratio.

TABLE 506.2(5)
BOILER, EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY	TEST PROCEEDURE	REQUIRED EFFICIENCY
Gas Hot Water	< 300,000 Btu / h	DOE 10 CFR Part 430	90% Et
	> 300,000 Btu / h and > 2.5 mBtu/h	DOE 10 CFR Part 431	89% Et
Gas Steam	< 300,000 Btu / h	DOE 10 CFR Part 430	89% Et
	> 300,000 Btu / h	DOE 10 CFR Part 431	89% Et
Oil	< 300,000 Btu / h	DOE 10 CFR Part 430	90% Et
	> 300,000 Btu / h	DOE 10 CFR Part 431	89% Et
Et = thermal efficiency			

TABLE 506.2(6)
CHILLERS - EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY	REQUIRED EFFICIENCY- CHILLERS		OPTIONAL COMPLIANCE PATH - REQUIRED EFFICIENCY - CHILLERS WITH VSD	
		Full Load (KW /TON)	IPLV (KW /TON)	Full Load (KW /TON)	IPLV (KW /TON)
Air Cooled w/ Condenser	All	1.2	1.0	N/A	N/A
Air Cooled w/o Condenser	All	1.08	1.08	N/A	N/A
Water Cooled, Reciprocating	All	0.840	0.630	N/A	N/A
Water Cooled, Rotary Screw and Scroll	< 90 tons	0.780	0.600	N/A	N/A
	[3]90 tons and < 150 tons	0.730	0.550	N/A	N/A
	[3]150 tons and < 300 tons	0.610	0.510	N/A	N/A
	> 300 tons	0.600	0.490	N/A	N/A
Water Cooled, Centrifugal	< 150 tons	0.610	0.620	0.630	0.400
	[3] 150 tons and < 300 tons	0.590	0.560	0.600	0.400
	300 tons and < 600 tons	0.570	0.510	0.580	0.400
	> 600 tons	0.550	0.510	0.550	0.400

a. Compliance with full load efficiency numbers and IPLV numbers are both required.
b. Only Chillers with Variable Speed Drives (VSD) may use the optional compliance path-for chiller efficiency.
N/A – No credit can be taken for this option

TABLE 506.2(7)
ABSORPTION CHILLERS - EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	REQUIRED EFFICIENCY FULL LOAD COP (IPLV)
Air Cooled, Single Effect	0.60, allowed only in heat recovery applications
Water Cooled, Single Effect	0.70, allowed only in heat recovery applications
Double Effect - Direct Fired	1.0 (1.05)
Double Effect - Indirect Fired	1.20

506.3 Efficient Lighting System. Whole Building Lighting Power Density (Watts/sf) shall meet the requirements *of Table 506.3. and automatic daylighting control requirements in Section 506.3.2.*

506.3.1 Reduced Lighting Power Density - The total interior lighting power (watts) is the sum of all interior lighting powers for all areas in the building. The interior lighting power is the floor area for the building times the value from Table 506.3.

TABLE 506.3
REDUCED INTERIOR LIGHTING POWER

BUILDING TYPE[a]	**REDUCED WHOLE BUILDING** (Watts/Ft^2)
AUTOMOTIVE FACILITY	0.79
CONVENTION CENTER	1.16
COURTHOUSE	1.08
DINING: BAR LOUNGE/LEISURE	1.19
DINING: CAFETERIA/FAST FOOD	1.34
DINING:FAMILY	1.50
DORMITORY	0.90
EXERCISE CENTER	0.92
FIRE STATIONS	0.74
GYMNASIUM	1.07
HEALTHCARE CLINIC	0.89
HOTEL	0.90
LIBRARY	1.00
MANUFACTURINBG FACILITY	1.24
MOTEL	0.90
MOTION PICTURE THEATER	1.18
MUSEUM	1.04
OFFICE	0.80
PERFORMING ARTS THEATER	1.46
POLICE STATIONS	0.89
POST OFFICE	0.98
RELIGIOUS BUILDINGS	1.18
RETAIL	1.30
RETAIL: SPECIALTY	1.40
RETAIL: SUPERMARKET	1.30
SCHOOL/UNIVERSITY	1.01
TOWN HALL	0.94
TRANSPORTATION	0.85
WAREHOUSE[b]	0.60
WORKSHOP	1.20

For SI: 1 foot = 304.8 mm, 1 watt per square foot = W/0.0929 m2.

a. In cases where both a general building area type and a more specific building area type are listed, the more specific building area type shall apply.

b. At least one half of the floor area shall be in the daylight zone. Automatic daylighting controls shall be installed in daylit zones and shall meet the requirements of Section 505.2.2.2.3.

506.3.2 Automatic Daylighting Controls. Automatic daylighting controls shall be installed in all daylight zones and shall meet the requirements of Section 505.2.2.2.

506.4 On-site Supply of Renewable Energy The building or surrounding property shall supply 3% or more of the building energy use associated with systems and equipment covered by this code through on-site renewable energy. On-site power generation using nonrenewable sources does not meet this requirement.

The *code official* shall be provided with an energy analysis as described in Section 507 that documents on-site renewable energy production is capable of providing at least 3% of the total estimated annual purchased energy for the building functions regulated by this code, or a calculation demonstrating that on-site renewable energy production has a nominal (maximum) rating of at least 1.75 BTUs or at least 0.50 watts per square foot of conditioned floor area.

28. Add new standards to Chapter 6 as follows:

ASTM

E779-03	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization
E1677-95 (2000)	Standard Specification for an Air Retarder (AR) Material or System for Low-Rise Framed Building Walls
E2178-03	Standard Test Method for Air Permeance of Building Materials
E2357-05	Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
C1371-04	Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers
C1549	Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer
E408-71 (02)	Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques
E1918-97	Standard Test Method for Measuring Solar Reflectance of Horizontal or Low-Sloped Surfaces in the Field

Reason: *New Buildings Institute (NBI)-American Institute of Architects (AIA)*

NBI and AIA believe that the 20-30% reductions in commercial and high-rise residential building energy use based on this proposal are practical, feasible, and necessary. This Proposal employs improvements to design practices and use of widely available products to improve energy efficiency. Many of the elements have been previously published in NBI's *Core Performance Guide* and implemented in programs or codes at the local and state levels. Incorporating these enhancements in a national model code will help move building practices and markets more quickly, addressing national concerns for energy and the environment in a pragmatic and cost-effective way.

SUBSTANTIATING MATERIAL

The bibliography of substantiating material, along with the technical information and technical substantiation, can be found at www.newbuildings.org/iecc.htm.

THE PROPOSAL

This proposal substantially revises Chapter 5 of the IECC with a series of measures that are integrated to achieve significant energy savings over current national model code. The proposal builds on and updates from 2009 IECC, plus it introduces some new elements such as commissioning of critical systems and a section on "additional efficiency package options" to offer flexibility in achieving these significant savings. Key elements of the Proposal are:

Building Envelope - Includes continuous air barriers, significant improvements in most glazing, and enhancements to opaque envelope performance.

Mechanical Systems – Improves sections regarding economizers, incorporates more use of demand controlled ventilation, and provides additional calculation procedures for determining loads and equipment sizing.

Quality Assurance – Incorporates requirements for testing and commissioning of mechanical systems and performance testing of daylight-related controls.

Lighting - Reduces energy needed for lighting based on more efficient illuminating equipment and the use of several lighting control strategies.

Daylighting – Includes additional availability of toplight sources when combined with automatic daylight controls, and comprehensive control strategy for all daylit zones.

Advanced Efficiency Package Options - Section 506 contains three approximately energy-equivalent packages to add to the savings in this Proposal: These three options are focused on Efficient HVAC Equipment, Reduced Lighting Power Density plus Automatic Daylight Controls, or Onsite Renewable Energy Generation. These options round out the savings in the Proposal and also offer important flexibility in getting to higher levels of efficiency. As energy codes move to higher efficiency levels with new types of strategies, building flexibility into prescriptive codes will offer additional pathways to support market adoption and compliance.

Cost Impact: None given.

Public Hearing:				
Committee:	AS	AM	D	
Assembly:	ASF	AMF	DF	

ICCFILENAME: HEWLETT-LOYER-MAJETTE-EC1-202-501.2

EC148–09/10

501.1, 501.2, 502.1.1

Proponent: Mark Nowak, representing Steel Framing Alliance

Revise as follows:

501.1 Scope. The requirements contained in this chapter are applicable to commercial buildings, or portions of commercial buildings. These commercial buildings shall meet either the requirements of ASHRAE/IESNA Standard

90.1, *Energy Standard for Buildings Except for Low-Rise Residential Buildings*, or the requirements contained in this chapter.

Exception: Wall insulation requirements under ASHRAE/IESNA Standard 90.1 shall not be required to exceed the maximum thicknesses of continuous insulation specifically allowed by the exterior finish manufacturer instructions or other applicable building code requirements.

501.2 Application. The *commercial building* project shall comply with the requirements in Sections 502 (Building envelope requirements), 503 (Building mechanical systems), 504 (Service water heating) and 505 (Electrical power and lighting systems) in its entirety. As an alternative the *commercial building* project shall comply with the requirements of ASHRAE/IESNA 90.1 in its entirety.

Exception: Buildings conforming to Section 506, provided Sections 502.4, 503.2, 504, 505.2, 505.3, 505.4, 505.6 and 505.7 are each satisfied.

Exception: Wall insulation requirements under ASHRAE/IESNA Standard 90.1 shall not be required to exceed the maximum thicknesses of continuous insulation specifically allowed by the exterior finish manufacturer instructions or other applicable building code requirements.

502.1.1 Insulation and fenestration criteria. The *building thermal envelope* shall meet the requirements of Tables 502.2(1) and 502.3 based on the climate *zone* specified in Chapter 3. Commercial buildings or portions of commercial buildings enclosing Group R occupancies shall use the *R*-values from the "Group R" column of Table 502.2(1). Commercial buildings or portions of commercial buildings enclosing occupancies other than Group R shall use the *R*-values from the "All other" column of Table 502.2(1).
Buildings with a vertical fenestration area or skylight area that exceeds that allowed in Table 502.3 shall comply with the building envelope provisions of ASHRAE/IESNA90.1.

Exception: Wall insulation requirements under ASHRAE/IESNA Standard 90.1 shall not be required to exceed the maximum thicknesses of continuous insulation specifically allowed by the exterior finish manufacturer instructions or other applicable building code requirements.

Reason: This exception is intended to limit the applicability of ASHRAE/IESNA Standard 90.1 due to concerns of code conflict and liability issues.

Addendum-bb, voted out for public comment during the January 2009 meeting of ASHRAE SSPC 90.1, contains requirements for opaque wall assemblies (Tables 5.5-1 to 5.5-8) that raise concerns about code conflicts, significant departure from standard industry practice, and liability and warranty issues. Ultimately these issues, if 90.1 continues to be referenced in the IECC, will create conflicts with both the IRC and IBC.

In current versions of both the IECC and ASHRAE 90.1, the insulation requirements for light framed wall assemblies in most climates never reach beyond R13 in the cavity with R 7.5 continuous insulation (R13+R7.5). The proposed values in 90.1 Addendum-bb begin to increase to R13 cavity with R 18.8 continuous insulation (R13+R18.8) starting in climate zone 4.

Assuming ASHRAE Handbook of Fundamentals R-values for different continuous insulation materials, to reach a value of R18.8 continuous insulation, a builder would need to use 3 inches of Polyisocyanurate; over 3 inches of Extruded Polystyrene; and almost 5 inches of Expanded Polystyrene. This represents a dramatic departure from current industry practice and will cause conflicts in warranties and code enforcement as detailed below.

Warranty, liability, and code conflicts exist when using thick levels of continuous insulation due to limitations cited in manufacturer installation instructions for exterior finishes. Research into these installation requirements for exterior finishes (vinyl siding, fiber cement siding, wood siding, stucco, brick and stone veneers) installed over continuous insulation revealed that in many cases, installation instructions limit continuous insulation applications to 0.5 inches to 1.5 inches of thickness.

In situations where exterior finishes limit the amount of continuous insulation that their product can be applied over, requiring continuous insulation thicknesses beyond these limitations becomes a liability and a conflict within code. Virtually all product warranties in the building industry include a clause that voids the warranty if materials are not installed per the manufacturer's installation instructions.

Even when no direct limitation of continuous insulation thickness exists in a manufacturer's installation instructions, there is still often recommended levels of insulation. Research found no examples of recommended thicknesses of insulation above 1.5 inches. A wide variety of exterior finishes from multiple manufacturers would have their warranties voided when installed at many of the thicknesses required in Addendum-bb.

In addition, general practice in building codes is to require installation per the manufacturer's instructions. Therefore, not only would thick levels of insulation void warranties, making builders or building owners liable, it would also violate code in many cases. Specific examples of code requiring exterior finishes to be installed per manufacturer's installation instructions can be found in IBC 2009 (section 1405) and IRC 2009 (section R703). In any case where the continuous insulation has been limited by the installation instructions of the exterior finish manufacturer, installing insulation thicker than allowed would violate code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Nowak-EC-1-501.1-501.2-502.1.1

EC149–09/10
501.1, 501.2, Chapter 6

Proponent: Ken Sagan, National Association of Home Builders (NAHB)

1. Revise as follows:

501.1 Scope. The requirements contained in this chapter are applicable to commercial buildings, or portions of commercial buildings. These commercial buildings shall meet either the requirements of ~~ASHRAE/IESNA Standard 90.1, *Energy Standard for Buildings Except for Low-Rise Residential Buildings*~~, or the requirements contained in this chapter.

501.2 Application. The requirements in Sections 502 (Building envelope), 503 (Building mechanical systems), 504 (Service water heating) and 505 (Lighting) shall each be satisfied on an individual basis. ~~Where one or more of these sections is not satisfied, compliance for that section(s) shall be demonstrated in accordance with the applicable provisions of ASHRAE/IESNA 90.1.~~
Exception: Buildings conforming to Section 506, provided Sections 502.4, 502.5, 503.2, 504, 505.2, 505.3, 505.4, 505.6 and 505.7 are each satisfied.

2. Delete standards from Chapter 6 as follows:

ASHRAE
~~90.1-2004~~ ~~Energy Standard for Buildings Except Low-rise Residential Buildings (ANSI/ASHRAE/IESAN 90.1-2004~~)

IESNA
~~90.1-2001~~ ~~Energy Standard for Buildings Except Low-rise Residential Buildings~~

Reason: The IECC is a stand-alone energy code complete with prescriptive and performance compliance paths. IECC has up-dated the code on a three-year cycle to keep current with the developments made in the energy efficiency industry and using the consensus process has optimized the provisions to require energy savings. On the other hand, ASHRAE has not kept up with the requirements on energy efficiency. ASHRAE /IESNA Standard 90.1 -2001 Section 6, is no longer current or up-to-date. The reference of outdated sections of ASHRAE 90.1 Standard is not consistent with the requirements of stringency of the IECC. The wholesale reference to ASHRAE 90.1 does not add value to the IECC. ASHRAE has been trying to impose its overly complex standard directly into the body of the commercial portion of the IECC to eliminate any reference to the IECC. Individuals electing to build to the ASHRAE Standard find difficulty in understanding and complying with the Standard.

If a state or local jurisdiction desires to have ASHRAE 90.1 as their alternative code, they are free to do this.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Sagan-EC-12-501.1-501.2

EC150–09/10
501.1, 501.2

Proponent: Larry Spielvogel, PE, Consulting Engineer

Revise as follows:

501.1 Scope. The requirements contained in this chapter are applicable to commercial buildings, or portions of commercial buildings. These commercial buildings shall meet ~~either the requirements of ASHRAE/IESNA Standard 90.1, *Energy Standard for Buildings Except for Low-Rise Residential Buildings*, or~~ the requirements contained in this chapter.

501.2 Application. The *commercial building* project shall comply with the requirements in Sections 502 (Building envelope), 503 (Building mechanical systems), 504 (Service water heating) and 505 (Lighting) in its entirety. ~~As an alternative the *commercial building* project shall comply with the requirements of ASHRAE/IESNA 90.1 in its entirety.~~

Exception: Buildings conforming to Section 506, provided Sections 502.4, 503.2, 504, 505.2, 505.3, 505.4, 505.6 and 505.7 are each satisfied.

Reason: The purpose of this code change is to delete the current option that exists to use ASHRAE 90.1 in lieu of all of the requirements in Chapter 5 of the IECC. This code change will make the IECC simpler, less expensive to use, and will prevent people from using ASHRAE 90.1 to get around the provisions of IECC Chapter 5.

1. **Circumvents IECC Requirements.** The current option to use the less stringent ASHRAE 90.1 in lieu of the requirements in IECC Chapter 5 provides the user with multiple ways to circumvent many of the IECC and other I Code requirements. Thus, compliance with ASHRAE 90.1 conserves less energy than with IECC compliance. The lighting provisions in Section 9.6 of ASHRAE 90.1 are less stringent than those in 505.5.2 of IECC. For example, office lighting in IECC Table 505.5.2 is limited to 1.0 watts per square foot, while in Table 9.6.1 of ASHRAE 90.1 the limit is 1.1 watts per square foot-10% higher. ASHRAE 90.1 also allows additional lighting power allowances in Section 9.6.2 that are much higher than those in IECC Table 505.5.2. The IECC should not allow people to circumvent adopted lighting power allowances without justification. Finally, IECC 502.4.5 requires the use of the 2007 AMCA standard 500D for dampers in Chapter 6, while ASHRAE 90.1 requires the use of the 1998 AMCA Standard 500D in Section 12. Thus, the option to use ASHRAE 90.1 circumvents the IECC required use of the current 2007 AMCA damper standard.

2. **ASHRAE 90.1 Unenforceable.** ASHRAE 90.1 is unenforceable because the requirements are so numerous and so complex that most code officials do not have and cannot readily or economically get the extensive training and experience to be able to understand and enforce the ASHRAE 90.1 requirements. There are almost no local training courses or programs on ASHRAE 90.1 for code officials. At best, there may be a dozen or so competent and comprehensive training programs on ASHRAE 90.1 each year in the entire country, mostly in a few major cities, and none of those is specifically for code officials. Learning and understanding ASHRAE 90.1 is also difficult even for most practicing architects, engineers, and contractors, making it difficult for them to comply, thus imposing an even greater burden on code officials to verify compliance. Even the ASHRAE 90.1 committee itself has difficulty writing and understanding the standard, since they issue dozens of addenda, errata, formal interpretations, and informal interpretations every single year in attempts to change or clarify their intent and rectify their own numerous errors. The current erratum for the ASHRAE 90.1 Users Manual is 12 pages long and is the fourth edition in less than a year. Thus, the criteria and requirements in ASHRAE 90.1 change almost weekly. Just the 44 addenda shown in Appendix F of ASHRAE 90.1 represent hundreds of changes from the prior 2004 edition. Nor are the changes from the prior edition marked, as they are in the IECC. Which of these many documents and provisions are to be enforced for any specific permit application on any specific day?

3. **Not Coordinated.** The IECC is coordinated with the other International Codes, and ASHRAE 90.1 is not. This results in conflicts and contradictions. For example, the IECC has at least eight references to and requirements for compliance with the International Mechanical Code, while ASHRAE 90.1 has none. While some of the provisions in IECC are similar to ASHRAE, ASHRAE 90.1 has many more requirements and exceptions that do not exist in the IECC, providing more latitude and less stringency than IECC.

4. **Not Unified.** Providing the option to use ASHRAE 90.1 in lieu of IECC Chapter 5 diverts efforts from pursuing a unified and comprehensive set of International Codes. The option to use ASHRAE 90.1 in lieu of IECC Chapter 5 provides an unsupervised and unmonitored path for special and vested interests to include their provisions in ASHRAE 90.1 that would never be accepted in the IECC. Thus, the "back door" to ASHRAE 90.1 opens wider than that for the IECC, especially since so many of the ASHRAE 90.1 voting members work for or represent special interests, so they can pursue those interests from the inside. For example, a significant percentage of the members of the ASHRAE 90.1 Mechanical Subcommittee are employed by manufacturers of heating, air conditioning, and water heating equipment, or by their trade associations. Most of the other voting members of the ASHRAE 90.1 committee do not know enough to debate and vote intelligently on those issues, which are then adopted and included in the standard. As another example, the majority of the voting members of the ASHRAE 90.1 committee know little or nothing about lighting, so there is a great tendency to "rubber stamp" recommendations that come from the Lighting Subcommittee. Accordingly, many provisions in ASHRAE 90.1 diverge substantially from those in IECC.

5. **Copies unavailable.** ASHRAE does not provide free copies of 90.1 ($119 per copy) to code officials. Very few jurisdictions have budgets to purchase copies for each plan checker and inspector, much less the estimated thousands of dollars per user to purchase the many references needed to determine compliance. Few jurisdictions, and similarly few architectural, engineering, or construction firms have the sophisticated software, training, and experience, much less the time and computers required to run the Section 11 Energy Cost Budget (ECB) Method calculations allowed by ASHRAE 90.1 for further compliance options.

6. **Use of ASHRAE 90.1 Not Precluded.** Most, if not all relevant provisions of ASHRAE 90.1 can still be used at the discretion of the user, so long as they are at least as stringent as Chapter 5 of IECC. People who wish to comply with ASHRAE 90.1 for other reasons, such as, but not limited to LEED® certification can still do so, provided they also meet the requirements of Chapter 5 of IECC.

Cost Impact: There will be a cost savings since code officials and users of the IECC will not have to buy additional standards and references or take the time and pay for additional training. The provisions proposed for deletion are simply optional.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Spielvogel-EC-1-501.1

EC151–09/10
501.2

Proponent: Steve Ferguson, representing The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

Revise as follows:

501.2 Application. The *commercial building* project shall comply with the requirements in Sections 502 (Building envelope requirements), 503 (Building mechanical systems), 504 (Service water heating) and 505 (Electrical power and lighting systems) in its entirety. As an alternative the *commercial building* project shall comply with the requirements of ASHRAE/IESNA 90.1 in its entirety.

Exceptions:

1. Buildings conforming to Section 506, provided Sections 502.4, 503.2, 504, 505.2, 505.3, 505.4, 505.6 and 505.7 are each satisfied.
2. The use of the Space-by-Space method, ASHRAE/IES 90.1 Section 9.6, shall be permitted to determine the Interior Power Allowance in either method of compliance.

Reason: The current IECC 2009 language does not allow the use of just the 90.1 Lighting section for compliance if the IECC is used. This restricts flexibility in lighting design and compliance in many cases because lighting envelope and mechanical disciplines do not always coordinate on methods of compliance.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Ferguson-EC-1-501.2

EC152–09/10
501.2, 506

Proponent: Ronald Majette, representing US Department of Energy

1. Revise as follows:

501.2 Application. The *commercial building* project shall comply with the requirements in Sections 502 (Building envelope requirements), 503 (Building mechanical systems), 504 (Service water heating) and 505 (Electrical power and lighting systems) in its entirety. As an alternative the *commercial building* project shall comply with the requirements of ASHRAE/IESNA 90.1 in its entirety.

~~**Exception:** Buildings conforming to Section 506, provided Sections 502.4, 503.2, 504, 505.2, 505.3, 505.4, 505.6 and 505.7 are each satisfied.~~

Delete Section 506 without substitution:

~~**SECTION 506**~~
~~**TOTAL BUILDING PERFORMANCE**~~

Reason: ASHRAE Standard 90.1 has a well defined and regularly updated approach for assessing a building design on the basis of performance equivalency. The continued maintenance of Section 506 in Chapter 5 takes time and more importantly creates the opportunity for the IECC and Standard 90.1 to grow apart. The intent of Chapter 5 is to provide a simplified approach for commercial buildings that minimizes the need to consult the referenced Standard 90.1. If one cannot meet the provisions of Chapter 5 then it seems logical to refer them to Standard 90.1 to address compliance.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Majette-EC-41-501.2

EC153–09/10
501.2, 507 (New), 507.1 (New), 507.1.1 (New)

Proponent: Krista Braaksma, representing Washington State Building Code Council

Revise as follows:
501.2 Application. The *commercial building* project shall comply with the requirements in Sections 502 (Buildings envelope requirements), 503 (Building mechanical systems), 504 (Service water heating), ~~and~~ 505 (Electrical power and lighting systems), and 507 (Energy consuming mechanisms) in its entirety.

SECTION 507
ENERGY CONSUMING MECHANISMS (Mandatory)

507.1 General (Mandatory). This section establishes criteria for the control of energy consuming mechanisms other than those covered under Section 505 that serve commercial buildings.

507.1.1 Pedestrian escalators and moving pedestrian walkways. Each pedestrian escalator or moving pedestrian walkway shall be equipped with an automatic control device to prevent operation of escalators and moving walkways when the mechanisms are unoccupied.

Reason: The proposal would add a requirement for controls on escalators and moving walkways to prevent continuous operation when they are not in use. This would provide significant energy savings and would also prolong the lifetime of the equipment. These systems automatically detect approaching passengers and the equipment runs only when needed. This technology is becoming more and more common and provides a method to reduce both energy use and greenhouse gas emissions.

According to Xcel Energy, a system installed in the Denver International Airport is estimated to save 30-40% of the electrical use on escalators and moving walkways, representing a reduction of over 2.0 million kilowatt-hours (kWh) per year and will reduce carbon dioxide emissions by four million pounds per year with a 3 year payback. (http://www.powerefficiencycorp.com/article/article_25mar08.php)

Cost Impact: The code change proposal will increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BRAAKSMA-EC-6-501.2-507

EC154–09/10
202

Proponent: Julie Ruth, JRuth Code Consulting, representing American Architectural Manufacturers Association (AAMA)

Revise definition as follows:

STOREFRONT. A non-residential ~~system of doors and windows mulled as a~~ composite fenestration structure that has been designed to resist heavy use. Storefront systems include, but are not limited to, exterior fenestration systems that span from the floor level or above to the ceiling of the same story on commercial buildings, with or without mulled windows and doors.

Reason: The purpose of this proposal is to clarify that a storefront system can consist of just windows, just doors, or a combination of the two. Some parties have interpreted the first sentence of the current definition as indicating that both doors and windows must be present in a composite fenestration structure in order for it to be considered storefront, which is not the intent of the definition.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: RUTH-EC-1-202

EC155–09/10
502.1.1

Proponent: James Bowman, American Forest and Paper Association

Revise as follows:

502.1.1 Insulation and fenestration criteria. The *building thermal envelope* shall meet the requirements of Tables 502.2(1) and 502.3 based on the climate *zone* specified in Chapter 3. Commercial buildings or portions of commercial buildings enclosing Group R occupancies shall use the *R*-values from the "Group R" column of Table 502.2(1). Commercial buildings or portions of commercial buildings enclosing occupancies other than Group R shall use the *R*-values from the "All other" column of Table 502.2(1). Buildings with a vertical fenestration area or skylight area that exceeds that allowed in Table 502.3 shall comply with the building envelope provisions of ASHRAE/IESNA90.1. Where required, insulation board shall be installed in compliance with its listing and not alter the approved application of wood structural panels or the lateral force resisting system of the assembly.

Reason: With the increased specification of insulation-board only options, it may make the use of WSP more problematic in high-wind and seismic zones, where compliant structural components and connections are crucial. Each of these components must be attached per their listings, engineered designs and comply with structural code provisions of the IBC. This proposal simply reinforces and provides a reference to the need to adhere to pertinent attachment requirements and not use one set of fasteners for multiple panels or otherwise use inadequate attachments.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: BOWMAN-EC-1-502.1.1.DOC

EC156 –09/10

Tables 502.1.2, 502.2(1), 502.2(2)

Proponent: Casey Harkins, representing Thermal Design, Inc.

Revise as follows:

TABLE 502.1.2
BUILDING ENVELOPE REQUIREMENTS OPAQUE ELEMENT, MAXIMUM *U*-FACTORS

Climate Zone	1		2		3		4 Except Marine		5 And Marine 4		6		7		8	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Roofs																
Insulation entirely above deck	U-0.063	U-0.048	U-0.048	U-0.048	U-0.048	U-0.048	U-0.048	U-0.048	U-0.048	U-0.048	U-0.048	U-0.048	U-0.039	U-0.039	U-0.039	U-0.039
Metal buildings	~~U-0.065~~ U-0.035	~~U-0.065~~ U-0.035	~~U-0.055~~ U-0.035	~~U-0.055~~ U-0.035	~~U-0.055~~ U-0.035	~~U-0.055~~ U-0.035	~~U-0.055~~ U-0.035	~~U-0.055~~ U-0.031	~~U-0.055~~ U-0.031	~~U-0.055~~ U-0.031	~~U-0.049~~ U-0.029	~~U-0.049~~ U-0.029	~~U-0.049~~ U-0.029	~~U-0.049~~ U-0.029	~~U-0.035~~ U-0.026	~~U-0.035~~ U-0.026
Attic and other	U-0.034	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027
Walls, Above Grade																
Mass	U-0.058	U-0.151	U-0.151	U-0.123	U-0.123	U-0.104	U-0.104	U-0.090	U-0.090	U-0.080	U-0.080	U-0.071	U-0.071	U-0.071	U-0.071	U-0.052
Metal building	~~U-0.093~~ U-0.147	~~U-0.093~~ U-0.049	~~U-0.093~~ U-0.079	~~U-0.093~~ U-0.049	~~U-0.084~~ U-0.072	~~U-0.084~~ U-0.049	~~U-0.084~~ U-0.049	~~U-0.084~~ U-0.049	~~U-0.069~~ U-0.049	~~U-0.069~~ U-0.039	~~U-0.069~~ U-0.049	~~U-0.069~~ U-0.039	~~U-0.057~~ U-0.039	~~U-0.057~~ U-0.039	~~U-0.057~~ U-0.039	~~U-0.057~~ U-0.039

(Remainder of table and footnotes unchanged)

TABLE 502.2(1)
BUILDING ENVELOPE REQUIREMENTS - OPAQUE ASSEMBLIES

Climate Zone	1		2		3		4 Except Marine		5 And Marine 4		6		7		8	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Roofs																
Insulation entirely above deck	R-15ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-25ci	R-25ci	R-25ci	R-25ci
Metal buildings (with R-~~5~~3 thermal blocks[a,b])	~~R-19~~ R-19 + R-11 LS	~~R-19~~ R-19 + R-11 LS	~~R-13 + R-13~~ R-19 + R-11 LS	~~R-13 + R-13~~ R-19 + R-11 LS	~~R-13 + R-13~~ R-19 + R-11 LS	~~R-19~~ R-19 + R-11 LS	~~R-13 + R-13~~ R-19 + R-11 LS	~~R-19~~ R-25 + R-11 LS	~~R-13 + R-13~~ R-25 + R-11 LS	~~R-19~~ R-25 + R-11 LS	~~R-13 + R-19~~ R-30 + R-11 LS	~~R-19~~ R-30 + R-11 LS	~~R-13 + R-19~~ R-30 + R-11 LS	~~R-19 + R-10~~ R-30 + R-11 LS	~~R-11 + R-19~~ R-25 + R-11 + R-11 LS	~~R-19 + R-10~~ R-25 + R-11 + R-11 LS
Attic and other	R-30	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-49	R-49
Walls, Above Grade																
Mass	NR	R-5.7ci	R-5.7ci	R-7.6ci	R-7.6ci	R-9.5ci	R-9.5ci [c]	R-11.4ci	R-11.4ci	R-13.3ci	R-13.3ci	R-15.2ci	R-15.2ci	R-15.2ci	R-25ci	R-25ci
Metal building[b]	~~R-16~~ R-19	~~R-16~~ R-19.5ci	~~R-16~~ R-13 + R-6.5ci	~~R-16~~ R-19.5ci	~~R-19~~ R-13ci	~~R-19~~ R-19.5ci	~~R-19~~ R-19.5ci	~~R-19~~ R-19.5ci	~~R-13 + R-5.6ci~~ R-19.5ci	~~R-13 + R-5.6ci~~ R-13 + R-19.5ci	~~R-13 + R-5.6ci~~ R-19.5ci	~~R-13 + R-5.6ci~~ R-13 + R-19.5ci	~~R-19 + R-5.6ci~~ R-13 + R-19.5ci	~~R-19 + R-5.6ci~~ R-13 + R-19.5ci	~~R-19 + R-5.6ci~~ R-13 + R-19.5ci	~~R-19 + R-5.6ci~~ R-13 + R-19.5ci

(Remainder of table and footnotes unchanged)

2. Delete and substitute as follows:

~~**TABLE 502.2(2)**~~
~~**BUILDING ENVELOPE REQUIREMENTS - OPAQUE ASSEMBLIES**~~

TABLE 502.2(2)
METAL BUILDING ASSEMBLY DESCRIPTIONS

ROOFS	DESCRIPTION
R-19+R-11 LS R-25+R-11 LS R-30+R-11 LS R-25+R-11+R-11 LS	Fiberglass liner system with thermal spacer block. A continuous membrane is installed below the purlins and uninterrupted by framing members. Uncompressed, unfaced fiberglass insulation rests on top of the membrane between the purlins. For multilayer installations, the last R-Value of insulation is for unfaced insulation draped over purlins and then compressed when the metal roof panels are attached. A minimum R-3 thermal spacer block between the purlins and the metal roof panels is required.
WALLS	
R-19	Single layer faced fiberglass insulation. The layer of R-19 faced fiberglass insulation is installed continuously perpendicular to the girts and is compressed when the metal skin is attached to the girts.
R-13ci R-19.5ci	Continuous insulation. The continuous insulation is installed on the interior plane of the girts and uninterrupted by the framing members.
R-13 + R-6.5ci R-13 + R-19.5ci	Single layer faced fiberglass insulation with continuous insulation. The first *R*-Value is for faced fiberglass insulation installed continuously perpendicular to the girts and is compressed when the metal skin is attached to the girts. The second *R*-Value is for continuous insulation installed on the interior plane of the girts and uninterrupted by the framing members.

Reason: The purpose of this proposal is to correct erroneous metal building U-Factors specified in the Code, correct an inappropriate redefinition of a metal building assembly description added in the last code cycle and to improve metal building roof and wall requirements for all climate zones, based on revised U-Factor and cost data developed by the Metal Building Task Group of the ASHRAE SSPC 90.1 Envelope Subcommittee.

Previous versions of the IECC, in addition to the DOE's COMcheck software and numerous State Codes, have relied upon the metal building assembly descriptions and U-Factors defined in Appendix A of the ASHRAE 90.1 Standard (90.1-1999 through 90.1-2007). Even before U-Factors themselves were added to the IECC in the 2009 version, the intended performance of the prescriptive R-Value requirements were based on the assumption that the prescribed R-Values achieved the level of performance claimed in the 90.1 Standard. Unfortunately, these performance claims for most of the metal building insulation assemblies were based on invalid assumptions, most significantly the geometry of the insulation as it is typically installed in a metal building roof or wall. After a tremendous amount of discussion and debate since December 2006, primarily in the ASHRAE SSPC 90.1 Envelope Subcommittee, a Metal Building Task Group was formed which reviewed available information, gathered additional data as needed, and developed more accurate U-Factors for these metal building insulation assemblies. This task group presented their findings and recommendations to the SSPC 90.1 Envelope Subcommittee in October 2008, which unanimously accepted the revised U-Factors. These revisions appear in the proposed 90.1-2007 Addendum bb. The revised U-Factors show that the previous U-Factors for metal building insulation

assemblies relied on by ASHRAE, IECC and others were overstated by nearly 40%. This has resulted in flawed economic analysis leading in most cases to less than economic criteria for metal building roofs and walls being published. Architects, engineers, contractors, owners and code compliance officials that have relied on these performance claims have unintentionally allowed buildings to be built and approved that fall far below the intended stringency of these Standards and Codes. The owners are stuck with higher energy costs for the life of their buildings as a result. This proposal addresses these issues by incorporating the opaque metal building roof and wall prescriptive criteria, the more accurate U-Factors for metal building insulation assemblies, and associated assembly descriptions proposed in ASHRAE 90.1-2007 Addendum bb.

There are numerous methods of installing insulation in metal building roofs and walls. The most commonly used is conventionally referred to as "Over-the-Purlin" or "Over-the-Girt". The double layer variation is conventionally referred to as "Sag-and-Bag". These assemblies are referred to as "Single Layer" and "Double Layer" in ASHRAE 90.1-1999 through ASHRAE 90.1-2007 and account for all but one of the metal building assemblies listed in Appendix A of the 90.1 Standards (90.1-1999 through 90.1-2007). I will refer to all of these single and double layer roof and wall assemblies collectively as "Over-the-Purlin" assemblies. This type of installation starts with a layer of faced metal building insulation which is installed perpendicular to the secondary structural members (purlins for roofs, girts for walls), pulled tight and then compressed when the metal roof or wall panels are attached. The double layer "Sag-and-Bag" variation, only used in roofs, adds an additional layer of unfaced insulation positioned above the first layer, parallel to and centered between the purlins. The compression of the insulation in both the single layer and double layer variations occurs across the entire assembly, not just at the junction between the roof or wall panels and each underlying structural member.

The problem with and subsequent discussion about the previous performance claims of these Over-the-Purlin metal building roof and wall assemblies arise from the assumptions used in the thermal modeling of the assemblies. Unfortunately, most of the technical data from the modeling was apparently destroyed in some sort of house fire. What remains is a single summary report which lacks specifics on the geometry of modeled assemblies (installed insulation thickness across each assembly). While some other problematic assumptions are listed in the modeling summary report (e.g. thermal spacer block thicknesses and insulation thickness combinations which exceed metal building manufacturers recommendations), the most significant problem appears to be the undisclosed assumed geometry. The report does contain some images of thermal models which suggest that the insulation was assumed to recover to its full nominal insulation thickness within 8 to 12 inches of the purlin and continue to span the space between the purlins maintaining this same full nominal thickness to within 8 to 12 inches of the adjacent purlin.

In the past couple years, two groups studying metal building assemblies independently arrived at the same conclusion: Over-the-Purlin metal building insulation assemblies form a parabolic thickness profile between adjacent purlins when installed. Dr. Merle McBride and others at the Owens-Corning Technical Center arrived at this conclusion when developing new thermal modeling of metal building assemblies. They noted this observation in a presentation to the ASHRAE SSPC 90.1 Envelope Subcommittee in April 2008. Dr. Les Christianson, Professor Emeritus at the University of Illinois Urbana-Champaign, also observed this in his research which looked specifically at the typical installed thicknesses of metal building assemblies. The recognition of the parabolic thicknesses profile contradicts what appears to be the assumption used in previous thermal modeling where the insulation maintains a uniform thickness across the majority of the space between adjacent purlins.

In response to concerns repeatedly raised by Thermal Design, a Metal Building Task Group was created by the ASHRAE SSPC 90.1 Envelope Subcommittee in April 2008 to review the available data from all parties and give guidance to the Envelope Subcommittee on revisions to the 90.1 Standard to address any problems identified. The task group included Dr. McBride, Dr. Christianson as well as a representative from the Metal Building Manufacturers Association (MBMA), the president-elect of the Metal Building Contractors and Erectors Association (MBCEA), a representative from our company and was chaired by an independent party from outside the metal building industry. This task group reviewed and expanded upon the previous research by Thermal Design, Dr. Christianson and Dr. McBride to produce more accurate U-Factors for the metal building assemblies listed in Appendix A of the 90.1 Standard which are intended to reflect the thermal performance of these assemblies as typically installed in the field. As indicated previously, these revised U-Factors were presented to the ASHRAE SSPC 90.1 Envelope Subcommittee at their interim meeting in October 2008 and were unanimously accepted. The work of this task group will be the subject of the "ASHRAE Standard 90.1 Metal Building U-Factors" transaction session at the ASHRAE 2010 Winter Conference in Orlando, FL.

The one other metal building assembly appearing in Appendix A of 90.1-1999 through 90.1-2007 is the "Filled Cavity" roof assembly, conventionally referred to as "long tabs" in the industry. This assembly utilizes extra long side tabs of facing that extend beyond the width of the insulation. The first layer is installed parallel with and between the purlins by attaching the long tabs to the top face of the purlin. Assuming no bracing exists between the purlins, this first layer can expand to the full depth of the insulation between the purlins. The purlins themselves, including the fasteners protruding through the top flange, are exposed to the inside conditioned space. The second layer of insulation is positioned above the first layer, either parallel to and between the purlins, or perpendicular to the purlins. The performance of this assembly also appears to have been overstated in 90.1-1999 through 90.1-2007, but appears to be a result of miscopying from the original source, rather than invalid assumptions in thermal modeling. The ASHRAE 90.1-1999 through 90.1-20007 Standards listed a U-Factor of U-0.041 for this assembly, while the source cited by ASHRAE lists a U-Factor of U-0.057.

A new "Liner System" assembly was added to Appendix A in 90.1-2007 Addendum g. This assembly separates the vapor retarder from the insulation, so that it can be spanned continuously below the structural members, isolating the highly conductive steel purlins and fasteners from the conditioned space. The continuous vapor retarder membrane is held in place by a support structure, typically a grid network of steel strapping. Unfaced insulation is installed parallel to and between the purlins. Because the vapor retarder is separate from the insulation, the insulation can be easily cut to fit around purlin bracing that are common between the purlins. The top layer of unfaced insulation can either be installed parallel to and between the purlins, or installed perpendicular to and over the top of the purlins. This assembly was also added to the IECC in the last code cycle and appears at least as the requirement for "All Other" in climate zone 8. However, the change proposal which added this assembly to the IECC inappropriately renamed it Filled Cavity, though the description in 502.2(2) and the U-Factor in 502.1.2 are for the Liner System assembly from ASHRAE 90.1-2007 Addendum g. The Filled Cavity and Liner System assemblies in ASHRAE 90.1 Addendum g are two entirely different assemblies with different thermal performance. This inappropriate renaming could likely cause confusion in the marketplace, leading to the use of an assembly that performs about 35% below the intended performance of the IECC prescriptive criteria.

The requirements set forth in this proposal are identical to those proposed in the first public review draft of ASHRAE 90.1-2007 Addendum bb and are based on the standard scalar ratio economic optimization procedure used by the ASHRAE SSPC 90.1 Envelope Subcommittee.

Bibliography:

Proposed Addendum bb (First Public Review - March 2009) to Standard 90.1-2007, Energy Standard for Buildings Except Low-Rise Residential Buildings. American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

Cost Impact: This proposal will increase the cost of construction. However, it should be noted that in some cases the assemblies prescribed in this proposal may not increase the cost of construction over assemblies which actually meet the intended performance of previous versions of the IECC. For example, to meet the previously prescribed U-Factor performance of U-0.065, the revised U-Factors from the ASHRAE 90.1 Envelope Subcommittee's Metal Building Task Group show you would need an R-19+R-19 double layer (Sag-and-Bag) assembly (U-0.060). The R-19+R-11 Liner System assembly significantly exceeds this performance (U-0.035) and would likely cost less than the R-19+R-19 assembly. This proposal inherently reduces the cost of HVAC equipment and associated infrastructure and in some cases could reduce the net cost of the whole building.

Public Hearing: Committee:	AS	AM	D	
Assembly:	ASF	AMF	DF	

ICCFILENAME: Harkin-EC-1-T. 502.1.2-T. 502.2(1)-(2)

EC157–09/10
Table 502.1.2, Table 502.2(1), Table 502.2(2)

Proponent: David C. Hewitt, New Buildings Institute, John Loyer, American Institute of Architects

Revise as follows:

SECTION 502
BUILDING ENVELOPE REQUIREMENTS

502.1 General (Prescriptive).

502.1.1 Insulation and fenestration criteria. The *building thermal envelope* shall meet the requirements of Tables 502.2(1) and 502.3 based on the climate *zone* specified in Chapter 3. Commercial buildings or portions of commercial buildings enclosing Group R occupancies shall use the *R*-values from the "Group R" column of Table 502.2(1). Commercial buildings or portions of commercial buildings enclosing occupancies other than Group R shall use the *R*-values from the "All other" column of Table 502.2(1). Buildings with a vertical fenestration area or skylight area that exceeds that allowed in Table 502.3 shall comply with the building envelope provisions of ASHRAE/IESNA-90.1.

TABLE 502.1.2
BUILDING ENVELOPE REQUIREMENTS OPAQUE ELEMENT, MAXIMUM U-FACTORS

CLIMATE ZONE	1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Roofs																
Insulation entirely above deck	U-0.063 U-0.048	U-0.048	U-0.048	U-0.048	U-0.048	U-0.048	U-0.048 U-0.039	U-0.048 U-0.039	U-0.048 U-0.039	U-0.048 U-0.039	U-0.048 U-0.032	U-0.048 U-0.032	U-0.039 U-0.028	U-0.039 U-0.028	U-0.039 U-0.028	U-0.039 U-0.028
Metal buildings	U-0.065 U-0.044	U-0.065 U-0.035	U-0.055 U-0.035	U-0.055 U-0.035	U-0.055 U-0.035	U-0.055 U-0.035	U-0.055 U-0.035	U-0.055 U-0.035	U-0.055 U-0.035	U-0.055 U-0.035	U-0.049 U-0.031	U-0.049 U-0.031	U-0.049 U-0.029	U-0.049 U-0.029	U-0.035 U-0.029	U-0.035 U-0.029
Attic and other	U-0.034 U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.027	U-0.0271	U-0.0271	U-0.0271	U-0.0271	U-0.0271	U-0.0271	U-0.0271
Walls, Above Grade																
Mass	U-0.58? U-0.142	U-0.151 U-0.142	U-0.151 U-0.142	U-0.123	U-0.123 U-0.110	U-0.104	U-0.104	U-0.090	U-0.090 U-0.078	U-0.080 U-0.078	U-0.080 U-0.078	U-0.071	U-0.071 U-0.061	U-0.071 U-0.061	U-0.071 U-0.061	U-0.052 U-0.061
Metal building	U-0.093 U-0.179	U-0.093 U-0.079	U-0.093 U-0.079	U-0.093 U-0.052	U-0.084 U-0.079	U-0.084 U-0.052	U-0.084 U-0.052	U-0.084 U-0.052	U-0.069 U-0.052	U-0.069 U-0.052	U-0.069 U-0.052	U-0.069 U-0.052	U-0.057 U-0.052	U-0.057 U-0.039	U-0.057 U-0.052	U-0.057 U-0.031
Metal framed	U-0.124 U-0.077	U-0.124 U-0.077	U-0.124 U-0.077	U-0.064	U-0.084 U-0.077	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.064	U-0.057	U-0.064	U-0.052	U-0.064 U-0.045	U-0.037
Wood framed and other	U-0.089 U-0.064	U-0.089 U-0.064	U-0.089 U-0.064	U-0.089 U-0.064	U-0.089 U-0.064	U-0.089 U-0.064	U-0.089 U-0.064	U-0.064	U-0.064	U-0.051	U-0.051	U-0.051	U-0.051	U-0.051	U-0.036	U-0.036
Walls, Below Grade																
Below-grade wall[a]	C-1.140	C-1.140	C-1.140	C-1.140	C-1.140	C-1.140	C-1.140 C-0.119	C-0.119	C-0.119	C-0.119	C-0.119	C-0.119	C-0.119 C-0.092	C-0.092	C-0.119 C-0.092	C-0.075 C-0.092
Floors																
Mass	U-0.322	U-0.322	U-0.107	U-0.087	U-0.107 U-0.076	U-0.087 U-0.076	U-0.087 U-0.076	U-0.074	U-0.074	U-0.064	U-0.064	U-0.057	U-0.064 U-0.055	U-0.051	U-0.057 U-0.055	U-0.051
Joist/Framing	U-0.282 U-0.066	U-0.282 U-0.066	U-0.052 U-0.033	U-0.052 U-0.033	--- U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033	U-0.033
Slab-on-Grade Floors																
Unheated slabs	F-0.73	F-0.73	F-0.73	F-0.73	F-0.73	F-0.73	F-0.73 F-0.54	F-0.54	F-0.73 F-0.54	F-0.54	F-0.54	F-0.52	F-0.52 F-0.40	F-0.52 F-0.40	F-0.52 F-0.40	F-0.51 F-0.40
Heated slabs	F-1.02 F-0.70	F-1.02 F-0.70	F-1.02 F-0.70	F-1.02 F-0.70	F-0.90 F-0.70	F-0.90 F-0.70	F-0.65	F-0.86 F-0.65	F-0.86 F-0.58	F-0.860 F-0.58	F-0.860 F-0.58	F-0.688 F-0.58	F-0.83 F-0.55	F-0.688 F-0.55	F-0.688 F-0.55	F-0.688 F-0.55

Table 502.2(1)
BUILDING ENVELOPE REQUIREMENTS – OPAQUE ASSEMBLIES

CLIMATE ZONE	1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Roofs																
Insulation entirely above deck	R-15 R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20 R-25ci	R-20 R-25ci	R-20 R-25ci	R-20 R-25ci	R-20 R-30ci	R-20 R-30ci	R-25 R-35ci	R-25 R-35ci	R-25 R-35ci	R-25 R-35ci
Metal buildings (with R-5 R-3.5 thermal blocks [a,b])	R-19 R-19 + R11Ls	R-19 R-19 + R11Ls	R-13 + R-13 R-19 + R11Ls	R-13 + R-13 R-13 + R19	R-13 + R-13 R-19 + R11Ls	R-19 R-19 + R11Ls	R-13 + R-13 R-19 + R11Ls	R-19 R-19 + R11Ls	R-13 + R-13 R-19 + R11Ls	R-19 R-19 + R11Ls	R-13 + R-19 R-25 + R11Ls	R-19 R-25 + R11Ls	R-13 + R-19 R-30 + R11Ls	R-19 + R-10xx R-30 + R11Ls	R-11xx + R-19 R-30 + R11Ls	R-19 + R-10xx R-30 + R11Ls
Attic and other	R-30 R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38 R-49	R-38 R-49	R-38 R-49	R-38 R-49	R-49	R-49
Walls, Above Grade																
Mass	NR R-5.7ci	R-5.7ci	R-5.7ci	R-7.6ci	R-7.6ci	R-9.5ci	R-9.5ci	R-11.4ci	R-11.4ci	R-13.3ci	R-13.3ci	R-15.2ci	R-15.2ci	R-15.2ci	R-25ci	R-25ci
Metal building[b]	R-16 R-13+ R-6.5c.i.	R-16 R-13+ R-6.5c.i.	R-16 R-13+ R-6.5c.i.	R-16 R-13+ R-13c.i.	R-19 R-13+ R-6.5c.i	R-16 R-13+ R-13c.i	R-16 R-13+ R-13c.i	R-16 R-13+ R-13c.i	R-13 + R-5.6ci R-13+ R-13c.i	R-13 + R-5.6ci R-13+ R-13c.i	R-13 + R-5.6ci R-13+ R-13c.i	R-13 + R-5.6ci R-13+ R-13c.i	R-19 + R-5.6ci R-13+ R-13c.i	R-19 + R-5.6ci R-13+ R-19.5c.i	R-19 + R-5.6ci R-13+ R-13c.i	R-19 + R-5.6ci R-13+ R-26c.i
Metal framed	R-13 + R-5 ci	R-13 + R-5 ci	R-13 + R-5 ci	R-13 + R-7.5ci	R-13 + R-3.8ci R-5 ci	R-13 + R-7.5ci	R-13 + R-7.5	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-15.6ci	R-13 + R-7.5ci	R-13 + R-18.8ci
Wood framed and other	R-13 + 3.8c.i. or R-20	R-13 + 3.8c.i. or R-20	R-13 + 3.8c.i or R-20	R-13 + 3.8c.i. or R-20	R-13 + 3.8c.i. or R-20	R-13 + 3.8c.i. or R-20	R-13 + 3.8c.i. or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8 7.5 c.i.	R-13 + R-7.5 c.i.	R-13 + R-7.5 c.i.	R-13 + R-7.5ci	R-13 + R-7.5ci	R-13 + R-15.6ci	R-13 + R-15.6ci
Walls, Below Grade																
Below-grade wall[d]	NR	NR	NR	NR	NR	NR	NR R-7.5ci	R-7.5ci	R-7.5ci	R-7.5ci	R-7.5ci	R-7.5ci	R-7.5ci R-10ci	R-10ci	R-7.5ci R-10ci	R-12.5ci
Floors																
Mass	NR	NR	R-6.3ci	R-8.3ci	R-6.3ci R-10ci	R-8.3ci R-10ci	R-10ci	R-10.4ci	R-10ci	R-12.5ci	R-12.5ci	R-14.6ci	R-15ci	R-16.7ci	R-15ci	R-16.7ci
Joist/Framing	NR	NR	R-19	R-30	R-19	R-30	R-30	R-30	R-30	R-30	R-30	R-30[e]	R-30	R-30[e]	R-30[e]	R-30[e]
Slab-on-Grade Floors																
Unheated slabs	NR	NR	NR	NR	NR	NR	NR R-10 for 24 in. below	R-10 for 12 24 in. below	NR R-10 for 24 in. below	R-10 for 24 in. below	R-10 for 24 in. below	R-15 for 24 in. below	R-15 for 24 in. below	R-15 for 24 in. below	R-15 for 24 in. below	R-20 for 24 in. below
Heated slabs	R-7.5 for 12 in. below	R-7.5 for 12 in. below	R-7.5 for 12 in. below	R-7.5 for 12 in. below	R-10 for 24 in. below	R-10 for 24 in. below	R-15 for 24 in. below	R-15 for 24 in. below	R-15 for 24 36 in. below	R-15 for 24 36 in. below	R-15 for 24 36 in. below	R-20 for 48 in. below	R-20 for 24 in. below	R-20 for 48 in. below	R-20 for 48 in. below	R-20 for 48 in. below
Opaque Doors																
Swinging	U-0.70 U-0.61	U-0.70 U-0.61	U-0.70 U-0.61	U-0.70 U-0.61	U-0.70 U-0.61	U-0.70 U-0.61	U-0.70 U-0.61	U-0.70 U-0.61	U-0.70 U-0.37	U-0.70 U-0.37	U-0.70 U-0.37	U-0.70 U-0.37	U-0.50 U-0.37	U-0.50 U-0.37	U-0.50 U-0.37	U-0.50 U-0.37
Roll-up or sliding	U-1.45 R-4.75	U-1.45 R-4.75	U-1.45 R-4.75	U-1.45 R-4.75	U-1.45 R-4.75	U-1.45 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75	U-0.50 R-4.75

For SI: 1 inch = 25.4 mm.

ci = Continuous insulation. NR = No requirement.

a. When using *R*-value compliance method, a thermal spacer block is required, otherwise use the *U*-factor compliance method. [see Tables 502.1.2 and 502.2(2)].

b. Assembly descriptions can be found in Table 502.2(2).

c. R-5.7 ci is allowed to be substituted with concrete block walls complying with ASTM C 90, ungrouted or partially grouted at 32 inches or less on center vertically and 48 inches or less on center horizontally, with ungrouted cores filled with material having a maximum thermal conductivity of 0.44 Btu-in./h-f2 F.

d. When heated slabs are placed below grade, below-grade walls must meet the exterior insulation requirements for perimeter insulation according to the heated slab-on-grade construction.

e. Steel floor joist systems shall to be R-38.

~~**TABLE 502.2(2)**~~
~~**BUILDING ENVELOPE REQUIREMENTS-OPAQUE ASSEMBLIES**~~

~~**ROOFS**~~	~~**DESCRIPTION**~~	~~**REFERENCE**~~
~~R-19~~	~~Standing seam roof with single fiberglass insulation layer.~~ ~~This construction is R-19 faced fiberglass insulation batts draped perpendicular over the purlins. A minimum R-3.5 thermal spacer block is placed above the purlin/batt, and the roof deck is secured to the purlins.~~	~~ASHRAE/IESNA 90.1 Table A2.3 including Addendum "G"~~
~~R-13 + R-13 R-13 + R-19~~	~~Standing seam roof with two fiberglass insulation layers.~~ ~~The first *R*-value is for faced fiberglass insulation batts draped over purlins. The second *R*-value is for unfaced fiberglass insulation batts installed parallel to the purlins. A minimum R-3.5 thermal spacer block is placed above the purlin/batt, and the roof deck is secured to the purlins.~~	~~ASHRAE/IESNA 90.1 Table A2.3 including Addendum "G"~~
~~R-11 + R-19 FC~~	~~Filled cavity fiberglass insulation.~~ ~~A continuous vapor barrier is installed below the purlins and uninterrupted by framing members. Both layers of uncompressed, unfaced fiberglass insulation rest on top of the vapor barrier and are installed parallel, between the purlins. A minimum R-3.5 thermal spacer block is placed above the purlin/batt, and the roof deck is secured to the purlins.~~	~~ASHRAE/IESNA 90.1 Table A2.3 including Addendum "G"~~
~~**WALLS**~~		
~~R-16, R-19~~	~~Single fiberglass insulation layer.~~ ~~The construction is faced fiberglass insulation batts installed vertically and compressed between the metal wall panels and the steel framing.~~	~~ASHRAE/IESNA 90.1 Table A3.2 including Addendum "G"~~
~~R-13 + R-5.6 ci R-19 + R-5.6 ci~~	~~The first *R*-value is for faced fiberglass insulation batts installed perpendicular and compressed between the metal wall panels and the steel framing. The second rated *R*-value is for continuous rigid insulation installed between the metal wall panel and steel framing, or on the interior of the steel framing.~~	~~ASHRAE/IESNA 90.1 Table A3.2 including Addendum "G"~~

TABLE 502.2(2)
BUILDING ENVELOPE REQUIREMENTS-OPAQUE ASSEMBLIES

ROOFS	**DESCRIPTION**	**REFERENCE**
R-19+R-11 LS R-25+R-11 LS R-30+R-11 LS	Liner System with thermal spacer block. A continuous membrane is installed below the purlins and uninterrupted by framing members. Uncompressed, un-faced insulation rests on top of the membrane between the purlins.	ASHRAE/IESNA 90.1 A2.3.2.4 and Table A2.3 including proposed 90.1-2007 Addendum "bb"
WALLS	-	-
R-19	Single layer fiberglass insulation. The layer of R-19 fiberglass insulation is installed continuously perpendicular to the girts and is compressed when the metal skin is attached to the girts.	ASHRAE/IESNA 90.1 A2.3.2.4 and Table A2.3 including proposed 90.1-2007 Addendum "bb"
R-13+R-6.5 c.i. R-13+ R-13 c.i. R-13+ R-19.5 c.i R-13+ R-26 c.i	Single layer fiberglass insulation with continuous insulation. The first R-value is for faced insulation batts installed perpendicular and compressed between the metal wall panels and the steel framing. The second rated R-value is for continuous rigid insulation installed between the metal panel and steel framing, or on the interior of the steel framing..	ASHRAE/IESNA 90.1 A2.3.2.4 and Table A2.3 including proposed 90.1-2007 Addendum "bb"

Reason: This Building Envelope proposal provides opaque wall tables to complement the comprehensive proposal submitted on behalf of New Buildings Institute and the American Institute of Architects. These tables provide significant reductions in thermal bridging and increases in

insulation levels for the model code. The envelope assemblies and u-values include specifications from *Core Performance Guide*, 2009 IECC and proposed ASHRAE 90.1-2010.

Cost Impact: This code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: HEWIIT-LOYER-EC1-T502.1.2

EC158–09/10

Table 502.1.2, Table 502.2(1), Table 502.2(2)

Proponent: Ronald Majette, representing US Department of Energy

1. Revise as follows:

TABLE 502.1.2
BUILDING ENVELOPE REQUIREMENTS OPAQUE ELEMANT, MAXIMUM U-FACTORS

CLIMATE ZONE	1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Roofs																
Insulation entirely above deck	~~U-0.063~~ U-0.048	~~U-0.048~~ U-0.039	~~U-0.048~~ U0.039	~~U-0.048~~ U-0.03	~~U-0.048~~ U-0.039	~~U-0.048~~ U-0.039	~~U-0.048~~ U-0.03	~~U-0.048~~ U-0.03	~~U-0.048~~ U-0.03	~~U-0.048~~ U-0.03	~~U-0.048~~ U-0.03	~~U-0.048~~ U-0.03	~~U-0.039~~ U-0.028	~~U-0.039~~ U-0.02	~~U-0.03~~ U-0.01	~~U-0.039~~ U-0.02
Metal buildings	~~U-0.065~~ U-0.035	~~U-0.065~~ U-0.035	~~U-0.055~~ U-0.035	~~U-0.055~~ U-0.03	~~U-0.055~~ U-0.035	~~U-0.055~~ U-0.035	~~U-0.055~~ U-0.03	~~U-0.055~~ U-0.03	~~U-0.055~~ U-0.03	~~U-0.055~~ U-0.03	~~U-0.048~~ U-0.02	~~U-0.048~~ U-0.02	~~U-0.048~~ U-0.029	~~U-0.048~~ U-0.02	~~U-0.03~~ U-0.01	~~U-0.039~~ U-0.02
Attic and other	~~U-0.034~~ U-0.021	U-0.027 ~~U-0.027~~ U-0.017	~~U-0.027~~ U-0.021	~~U-0.027~~ U-0.01	~~U-0.027~~ U-0.021	~~U-0.027~~ U-0.017	~~U-0.027~~ U-0.01	~~U-0.027~~ U-0.01	~~U-0.027~~ U-0.01	U-0.01	~~U-0.027~~ U-0.0	~~U-0.027~~ U-0.0	~~U-0.027~~ U-0.017	~~U-0.027~~ U-0.01	~~U-0.027~~ U-0.01	~~U-0.027~~ U-0.01
Walls, Above Grade																
Mass	U-0.058	U-0.151	U-0.151	U-0.12	U-0.123	U-0-104	U-0.10	U-0.09	U-0.09	~~U-0.080~~ U-0.047	~~U-0.08~~ U-0.04	~~U-0.07~~ U-0.04	~~U-0.071~~ U-0.047	~~U-0.07~~ U-0.04	~~U-0.07~~ U-0.04	~~U-0.05~~ U-0.04
Metal building	~~U-0.093~~ U-0.147	~~U-0.093~~ U-0.049	~~U-0.093~~ U-0.079	~~U-0.09~~ U-0.04	~~U-0.084~~ U-0.072	~~U-0.084~~ U-0.049	~~U-0.08~~ U-0.04	~~U-0.08~~ U-0.04	~~U-0.06~~ U-0.04	~~U-0.065~~ U-0.039	~~U-0.06~~ U-0.04	~~U-0.06~~ U-0.03	~~U-0.057~~ U-0.039	~~U-0.05~~ U-0.03	~~U-0.05~~ U-0.03	~~U-0.05~~ U-0.03
Metal framed	~~U-0.124~~ U-0.064	~~U-0.124~~ U-0.064	~~U-0.124~~ U-0.064	U-0.06	~~U-0.084~~ U-0.064	U-0.064	U-0.06	~~U-0.064~~ U-0.03	~~U-0.064~~ U-0.04	~~U-0.064~~ U-0.037	~~U-0.06~~ U-0.03	~~U-0.05~~ U-0.03	~~U-0.064~~ U-0.037	~~U-0.05~~ U-0.03	~~U-0.06~~ U-0.0	U-0.03
Wood framed and other	U-0.089	~~U-0.089~~ U-0.051	~~U-0.089~~ U-0.064	~~U-0.08~~ U-0.05	~~U-0.089~~ U-0.064	~~U-0.089~~ U-0.051	~~U-0.08~~ U-0.05	~~U-0.06~~ U-0.03	~~U-0.06~~ U-0.05	~~U-0.051~~ U-0.036	~~U-0.05~~ U-0.0	~~U-0.05~~ U-0.03	~~U-0.051~~ U-0.03	~~U-0.05~~ U-0.03	~~U-0.03~~ U-0.03	~~U-0.03~~ U-0.03
Walls, Below Grade																
Below-grade wall[a]	C-1.140	C-1.140	C-1.140	C-1.14	C-0.119	C-0.119	~~C-1.14~~ C-0.11	~~C-0.119~~ C-0.092	C-0.119	~~C-0.119~~ C-0.075	~~C-0.11~~ C-0.07	~~C-0.11~~ C-0.05	~~C-0.119~~ C-0.063	~~C-0.09~~ C-0.04	~~C-0.11~~ C-0.05	~~C-0.07~~ C-0.03
Floors																
Mass	U-0.322	U-0.322	~~U-0.107~~ U-0.074	~~U-0.08~~ U-0.06	~~U-0.107~~ U-0.064	~~U-0.08~~ U-0.064	~~U-0.08~~ U-0.05	~~U-0.07~~ U-0.05	~~U-0.07~~ U-0.05	~~U-0.064~~ U-0.05	~~U-0.06~~ U-0.0	~~U-0.05~~ U-0.03	~~U-0.064~~ U-0.042	~~U-0.05~~ U-0.03	~~U-0.05~~ U-0.03	~~U-0.05~~ U-0.03
Joist/Framing - Metal	~~U-0.282~~ U-0.350	~~U-0.282~~ U-0.350	~~U-0.052~~ U-0.038	~~U-0.05~~ U-0.03	--- U-0.038	~~U-0.03~~ U-0.03	~~U-0.03~~ U-0.03	~~U-0.03~~ U-0.02	~~U-0.03~~ U-0.03	~~U-0.03~~ U-0.024	~~U-0.03~~ U-0.02	~~U-0.03~~ U-0.02	~~U-0.033~~ U-0.024	~~U-0.03~~ U-0.02	~~U-0.03~~ U-0.01	~~U-0.03~~ U-0.02
Joist/Framing - Wood and Other	U-0.282	U-0.282	U-0.033	U-0.03	U-0.033	U-0.033	U-0.02	U-0.02	U-0.02	U-0.018	U-0.02	U-0.01	U-0.018	U-0.01	U-0.01	U-0.01
Slab-on-Grade Floors																
Unheated slabs	F-0.73	F-0.73	F-0.73	F-0.73	F-0.73	F-0.73	~~F-0.73~~ F-0.52	F-0.52	~~F-0.73~~ F-0.528	~~F-0.54~~ F-0.510	~~F-0.54~~ F-0.51	~~F-0.52~~ F-0.43	~~F-0.52~~ F-0.510	~~F-0.52~~ F-0.434	~~F-0.52~~ F-0.43	~~F-0.51~~ F-0.424
Heated slabs	F-1.02	F-1.02	~~F-1.02~~ F-0.90	~~F-1.02~~ F-0.86	~~F-0.90~~ F-0.86	~~F-0.90~~ F-0.86	F-0.84	~~F-0.86~~ F-0.688	~~F-0.86~~ F-0.688	~~F-0.860~~ F-0.688	~~F-0.86~~ F-0.68	~~F-0.68~~ F-0.67	~~F-0.83~~ F-0.671	~~F-0.68~~ F-0.671	~~F-0.68~~ F-0.67	~~F-0.688~~ F-0.373

a. When heated slabs are placed below-grade, below grade walls must meet the *F*-factor requirements for perimeter insulation according to the heated slab-on-grade construction.

TABLE 502.2(1)
BUILDING ENVELOPE REQUIREMENTS - OPAQUE ASSEMBLIES

CLIMATE ZONE	1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8	
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R
Roofs																
Insulation entirely above deck	R-~~15~~20ci	R-~~20~~5ci	R-~~20~~5ci	R-~~20~~5ci	R-~~20~~5ci	R-~~20~~5ci	R-~~2~~30ci	R-~~2~~30ci	R-~~2~~30ci	R-~~2~~30ci	R-~~2~~30ci	R-~~2~~30ci	R-~~2~~35ci	R-~~2~~35ci	R-~~2~~35ci	R-~~2~~35ci
Metal buildings (with R-5 thermal blocks[a,b])	R-~~19~~+ R-11	R-~~19~~+ R-11	R-~~13~~9+ R-~~13~~1	R-~~13~~9+ R-~~13~~1	R-~~13~~9+ R-~~13~~1	R-~~19~~+ R-11	R-~~13~~9+ R-~~13~~1	R-~~19~~25+ R-11	R-~~13~~25+ R-~~13~~1 Ls	R-~~19~~25+ R-11	R-~~13~~30+ R-~~11~~31 Ls	R-~~19~~30+ R_11	R-~~13~~30+ R-~~11~~31 Ls	R-~~19~~30+ R-~~10~~1	R-~~11~~25+ R-~~19~~11 + R-11	R-~~19~~225+ R-~~10~~1 + R-11
Attic and Other	R-~~30~~49	R-~~38~~60	R-~~38~~49	R-~~38~~60	R-~~38~~49	R-~~38~~60	R-~~38~~49	R-~~38~~60	R-~~38~~60	R-~~38~~60	R-~~38~~60	R-~~38~~60	R-~~38~~60	R-~~38~~60	R-~~49~~60	R-~~49~~60
Walls, Above Grade																
Mass	NR	R-5.7ci	R-5.7ci	R-7.6ci	R-7.6ci	R-9.5ci	R-9.5ci[e]	R-11.4ci	R-11.4ci	R-~~13.3~~ 19.5ci	R-~~13.3~~ 19.5ci	R-~~15.2~~ 19.5ci	R-~~15.2~~ 19.5ci	R-~~15.2~~ 19.5ci	R-19.5ci	R-19.5ci
Metal building[b]	R-~~16~~9	R-~~16-~~ 0+ R-19.5ci	R-~~16~~3+ R-6.5ci	R-~~16-~~0+ R-19.5ci	R-~~19~~0+ R-13ci	R-~~19~~0+ R-19.5ci	R-~~19~~0+ R-19.5ci	R-~~19~~0+ R-19.5ci	R-~~19~~0+ R-19.5ci	R-13+ R-18.~~85~~.6ci	R-~~30~~+R-~~5.6~~19.5ci	R-13+ R-~~5.6~~19.5ci	R-~~19~~13+R-~~5.6~~19.5ci	R-~~19~~13+R-~~5.6~~19.5ci	R-~~19~~13+R-~~5.6~~19.5ci	R-~~19~~13+R-~~5.6~~19.5ci
Metal framed	R-13+ R-7.5ci	R-13+ R-7.5ci	R-13+ R-7.5ci	R-13+ R-7.5ci	R-13+ R-~~3.8~~7.5ci	R-13+ R-7.5ci	R-13+ R-7.5ci	R-13+ R-~~7.5~~18.8ci	R-13+ R-~~7.5~~15.6ci	R-13+ R-~~7.5~~18.8ci	R-13+ R-~~7.5~~18.8ci	R-13+ R-~~7.5~~18.8ci	R-13+ R-~~7.5~~18.8ci	R-13+R-~~15.6~~18.8ci	R-13+ R-~~7.5~~18.8ci	R-13+ R-18.8ci
Wood framed and other	R-13	R-13+ R-7.5ci	R-13+ R-3.8ci	R-13+ R-7.5ci	R-13+ R-3.8ci	R-13+ R-7.5ci	R-13+ R-7.5ci	R-13+ R-~~3.8~~15.6ci	R-13+ R-~~3.8~~7.5ci	R-13+ R-~~3.8~~18.8ci	R-13+ R-~~7.5~~18.8ci	R-13+ R-~~7.5~~18.8ci	R-13+ R-~~7.5~~15.6ci	R-13+ R-~~7.5~~18.8ci	R-13+ R-~~15.6~~18.8ci	R-13+ R-~~15.6~~18.8ci
Wall, Below Grade																
Below grade wall[d]	NR	NR	NR	NR	~~NR~~ R-13 + R-3.8ci	NR	~~NR~~ R-7.5ci	R-~~7.5~~10ci	R-7.5ci	R-~~7.5~~ 12.5ci	~~NR~~ R-~~7.5~~12.5ci	R-17.5ci	R-~~7.5~~15ci	R-~~12~~0ci	R-17.5ci	R-~~12.5~~25ci
Floors																
Mass	NR	NR	R-~~6.3~~ 10.4ci	R-~~8.3~~12.5ci	R-~~6.3~~12.5ci	R-~~8.3~~12.5ci	R-~~10~~14.6ci	R-~~10.4~~ 16.7ci	R-~~10~~ 16.7ci	R-~~12.5~~ 16.7ci	R-~~12.5~~ 16.7ci	R-~~14.6~~ 23ci	R-~~15~~20.9ci	R-~~16.7~~25.1ci	R-~~15~~23ci	R-~~16.7~~29.3ci
Steel ~~Joist/framing~~ Steel/(wood)	NR	NR	R-~~19~~30	R-30	R-~~19~~30	R-~~30~~8	R-~~30~~8	R-~~30~~49	R-~~30~~8	R-~~30~~60	R-~~30~~49	R-~~30~~60	R-~~30~~60	R-~~30~~60	R-~~30~~60	R-~~30~~60
Wood Framing	NR	NR	R-30	R-30	R-30	R-30	R-38	R-49	R-49	R-60	R-49	R-60	R-60	R-60	R-60	R-60
Slab-on-Grade Floors																
Unheated slabs	NR	NR	NR	NR	NR	NR	~~NR~~R-15 for 24 in. below	R-~~10~~5 for 24 in. below	~~NR~~R-15 for 24 in. below	R-~~12~~0 for 24 in. below	R-~~12~~0 for 24 in. below	R-~~15~~20 for ~~24~~48 in. below	R-~~15~~20 for 24 in. below	R-~~15~~20 for ~~24~~48 in. below	R-~~15~~20 for ~~24~~48 in. below	R-~~20~~5 for ~~24~~48 in. below
Heated slabs	R-7.5 for 12 in. below	R-7.5 for 12 in. below	R-~~7.5~~10 for ~~12~~24 in. below	R-~~7.5~~15 for ~~12~~24 in. below	R-~~10~~5 for 24 in. below	R-~~10~~5 for 24 in. below	R-~~15~~20 for 24 in. below	R-~~15~~20 for ~~24~~48 in. below	R-~~15~~20 for ~~24~~48 in. below	R-~~15~~20 for ~~24~~48 in. below	R-~~15~~20 for ~~24~~48 in. below	R-~~20~~5 for 48 in. below	R-20 for ~~24~~48 in. below	R-~~20~~5 for 48 in. below	R-~~20~~5 for 48 in. below	R-20 ~~for 48 in. below~~ full slab
Opaque doors																
Swinging	U-0.70	U-0.~~75~~0	U-0.70	U-0.~~75~~0	U-0.70	U-0.~~75~~0	U-0.~~75~~0	U-0.~~75~~0	U-0.~~75~~0	U-0.~~75~~0	U-0.~~75~~0	U-0.50	U-0.50	U-0.50	U-0.50	U-0.50
Roll-up or sliding	U-1.45	U-~~1.450~~ 0.50	U-~~1.450~~ 0.50	U-~~1.450~~ 0.50	U-~~1.450~~ 0.50	U-~~1.450~~ 0.50	U-0.50	U-0.50	U-0.50	U-0.50	U-0.50	U-0.50	U-0.50	U-0.50	U-0.50	U-0.50

For SI: 1 inch = 25.4 mm.

ci = Continuous insulation. NR = No requirement.

a. When using *R*-value compliance method, a thermal spacer block is required, otherwise use the *U*-factor compliance method. [see Tables 502.1.2 and 502.2(2)].

b. Assembly descriptions can be found in Table 502.2(2).

c. R-5.7 ci is allowed to be substituted with concrete block walls complying with ASTM C 90, ungrouted or partially grouted at 32 inches or less on center vertically and 48 inches or less on center horizontally, with ungrouted cores filled with material having a maximum thermal conductivity of 0.44 Btu-in./h-f2 F.

d. When heated slabs are placed below grade, below-grade walls must meet the exterior insulation requirements for perimeter insulation according to the heated slab-on-grade construction.

e. Steel floor joist systems shall to be R-38.

2. Delete and substitute as follows:

~~**TABLE 502.2(2)**~~
~~**BUILDING ENVELOPE REQUIREMENTS–OPAQUE ASSEMBLIES**~~

~~ROOFS~~	~~DESCRIPTION~~	~~REFERENCE~~
~~R-19~~	~~Standing seam roof with single fiberglass insulation layer. This construction is R-19 faced fiberglass insulation batts draped perpendicular over the purlins. A minimum R-3.5 thermal spacer block is placed above the purlin/batt, and the roof deck is secured to the purlins.~~	~~ASHRAE/IESNA 90.1 Table A2.3 including Addendum "G"~~
~~R-13 + R-13 R-13 + R-19~~	~~Standing seam roof with two fiberglass insulation layers. The first R-value is for faced fiberglass insulation batts draped over purlins. The second R-value is for unfaced fiberglass insulation batts installed parallel to the purlins. A minimum R-3.5 thermal spacer block is placed above the purlin/batt, and the roof deck is secured to the purlins.~~	~~ASHRAE/IESNA 90.1 Table A2.3 including Addendum "G"~~
~~R-11 + R-19 FC~~	~~Filled cavity fiberglass insulation. A continuous vapor barrier is installed below the purlins and uninterrupted by framing members. Both layers of uncompressed, unfaced fiberglass insulation rest on top of the vapor barrier and are installed parallel, between the purlins. A minimum R-3.5 thermal spacer block is placed above the purlin/batt, and the roof deck is secured to the purlins.~~	~~ASHRAE/IESNA 90.1 Table A2.3 including Addendum "G"~~
~~WALLS~~		
~~R-16, R-19~~	~~Single fiberglass insulation layer. The construction is faced fiberglass insulation batts installed vertically and compressed between the metal wall panels and the steel framing.~~	~~ASHRAE/IESNA 90.1 Table A3.2 including Addendum "G"~~
~~R-13 + R-5.6 ci R-19 + R-5.6 ci~~	~~The first R-value is for faced fiberglass insulation batts installed perpendicular and compressed between the metal wall panels and the steel framing. The second rated R-value is for continuous rigid insulation installed between the metal wall panel and steel framing, or on the interior of the steel framing.~~	~~ASHRAE/IESNA 90.1 Table A3.2 including Addendum "G"~~

TABLE 502.2(2)
BUILDING ENVELOPE REQUIREMENTS – OPAQUE AQSSEMBLIES

ROOFS	**DESCRIPTION**	**REFERENCE**
R-19 + R-11 R-25 + R-11 R-30 + R-11	Standing seam roof with two fiberglass insulation layers. The first *R*-value is for faced fiberglass insulation batts draped over purlins. The second *R*-value is for unfaced fiberglass insulation batts installed parallel to the purlins. A minimum R-5.0 thermal spacer block is placed above the purlin/batt, and the roof deck is secured to the purlins.	ASHRAE/IESNA 90.1
R-25 + R-11 + R-11	The first *R*-value is for faced fiberglass insulation batts draped over purlins. The second *R*-value is for unfaced fiberglass insulation batts installed parallel to the purlins. A minimum R-5.0 thermal spacer block is placed above the purlin/batt, and the roof deck is secured to the purlins. The third R-value is for unfaced fiberglass insulation batts installed under the purlins with a continuous vapor barrier liner installed below the purlins and uninterrupted by framing members.	ASHRAE/IESNA 90.1
WALLS		
R-19	Single fiberglass insulation layer. The construction is faced fiberglass insulation batts installed vertically and compressed between the metal wall panels and the steel framing.	ASHRAE/IESNA 90.1
R-0 + R-19 ci R-13 + R-18.8 ci R-13 + R 19.5 ci	The first *R*-value is for faced fiberglass insulation batts installed perpendicular and compressed between the metal wall panels and the steel framing. The second rated *R*-value is for continuous rigid insulation installed between the metal wall panel and steel framing, or on the interior of the steel framing.	ASHRAE/IESNA 90.1

Reason: For consistency with Standard 90.1. This proposal is based on ongoing analysis efforts within ASHRAE designed to create a Standard 90.1-2010 that is 30% better than Standard 90.1-2004 in response to Federal legislation. Paralleling those efforts and considering that the IECC Chapter 5 is intended to be technically compatible with that standard to facilitate adoption and implementation, DOE is interested in keeping Chapter 5 of the 2012 IECC aligned with ANSI/ASHRAE/IESNA Standard 90.1-2010. Due to the timing of the code development process and ASHRAE standards processes this proposal was submitted in anticipation that by the final action hearings the work to update the standard would be complete.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Majette-EC-55-T. 502.1.2-

EC159–09/10
502.2

Proponent: Ronald Majette, representing US Department of Energy

Revise as follows:

502.2 Specific insulation requirements (Prescriptive). Opaque assemblies shall comply with Table 502.2(1). Where two or more layers of rigid insulation board are used in a construction assembly, the edge joints between each layer of boards shall be staggered.

Reason: For consistency with Standard 90.1. This proposal is based on ongoing analysis efforts within ASHRAE designed to create a Standard 90.1-2010 that is 30% better than Standard 90.1-2004 in response to Federal legislation. Paralleling those efforts and considering that the IECC Chapter 5 is intended to be technically compatible with that standard to facilitate adoption and implementation, DOE is interested in keeping Chapter 5 of the 2012 IECC aligned with ANSI/ASHRAE/IESNA Standard 90.1-2010. Due to the timing of the code development process and ASHRAE standards processes this proposal was submitted in anticipation that by the final action hearings the work to update the standard would be complete.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Majette-EC-2-502.2

EC160–09/10
Table 502.2(1)

Proponent: James Bowman, American Forest and Paper Association

Revise table as follows:

Expand the insulation options in Climate Zones 4 through 8 by adding R-value choices that don't force the use of insulation board to the exclusion of other equally efficient products.

Table 502.2(1) (Limited to Changes)
BUILDING ENVELOPE REQUIREMENTS -- OPAQUE ASSEMBLIES

Climate Zone	1		2		3		4 Except Marine		5 and Marine 4		6		7		8	
	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R
Walls, Above Grade																
Wood Framed and Other	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-3.8ci or R-20	R-13 + R-7.5ci or R-21	R-13 + R-7.5ci or R-21	R-13 + R-7.5ci or R-21	R-13 + R-7.5ci or R-21	R-13 + ~~R-15.6ci~~ R-7.5ci or R-21	R-13 + R-15.6ci or R-25

(Portions of table and footnotes not shown unchanged)

Reason: Specifying insulation board-only prescriptive options restricts flexibility, eliminates blown-in foam options in Zones 4-6 and removes the option to choose equally efficient insulation products. Limiting compliance to insulation-board only options also may make the use of WSP more problematic in high-wind and seismic zones, where structural components and connections are crucial. Each of these components must be attached per their listings, engineered designs and comply with structural code provisions.

The insulation values for walls in Zone 8, "All Other", should never be in excess of those for steel and are erroneous. Contrary to other requirements in this table, steel wall insulation values in this Zone 8 category are now less at R13+ 7.5 than those for wood at R-13+15.6. There is no plausible justification for flipping these values.

In the interest of maintaining realistic building practices and the marginal efficiency impact in Zone 8 of added wall insulation, which is primarily in Northern Alaska, an R-25 option is proposed for residential, which still exceeds the efficiency of an equivalent steel wall.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: BOWMAN-EC-2-T. 502.2(1).DOC

EC161–09/10
Table 502.2(1)

Proponent: Mark Nowak, representing Steel Framing Alliance

Revise table as follows:

TABLE 502.2(1)
BUILDING ENVELOPE REQUIREMENTS - OPAQUE ASSEMBLIES

							4		5							
	1		2		3		EXCEPT MARINE		AND MARINE 4		6		7		8	
CLIMATE ZONE	**All other**	**Group R**	**All other**	**Group R**	**All other**	**Group R**	**All other**	**Group R**	**All other**	**Group R**	**All other**	**Group R**	**All other**	**Group R**	**All other**	**Group R**
Walls, Above Grade																
Metal Framed	R-13	R-13	R-13	R-13~~+R-7.5 ci~~	R-13~~+R-3.8 ci~~	R-13~~+R-7.5 ci~~	R-13+R-7.5 ci	R-13+R-7.5 ci	R-13+R-7.5 ci	R-13+R-7.5 ci	R-13+R-7.5 ci	R-13+R-7.5 ci	R-13+R-7.5 ci	R-13+R-15.6 ci	R-13+R-7.5 ci	R-13+R18.8 ci

(No change to remainder of table or footnotes)

Reason: In climate zone 2 Group R and climate zone 3, a change was made to Table 502.2(1) to return the R-value requirements for metal framed walls to that used in the 2006 IECC. The increased stringencies for climate zones 2 and 3 that were passed in the 2009 IECC are changes that result in significant construction costs but scant energy savings. Energy conservation could be better accomplished in other areas of the building envelope where more energy could be conserved for each dollar invested. Following is an analysis of Group R construction that was conducted in two cities in climate zone 2 and three cities in climate zone 3 that shows the costs and benefits associated with specifying a metal framed wall with the 2006 IECC requirements versus the 2009 requirements. The selected cities are the representative cities developed by PNNL for these respective climate zones. Based on this analysis, which shows simple paybacks from 25 to 65 years, the Steel Framing Alliance believes that there is not sufficient justification to retain the insulation requirements at the 2009 level.

	Climate Zone 2				**Climate Zone 3**					
	Houston		Phoenix		Memphis		El Paso		San Francisco	
Benefits of Continuous Insulation*	R-13	R-13+7.5	R-13	R-13+7.5	R-13	R-13+7.5	R-13	R-13+7.5	R-13	R-13+7.5
Annual Compressor Electricity Use per Dwelling, heating and cooling (kWh)	3,438	3,327	3,289	3,165	3,376	3,176	2,545	2,402	1,333	1,289
Annual Compressor Energy Savings Per Dwelling in going from R-13 to R-13+7.5 steel framed walls (kWh)	111		124		200		143		45	
Annual Dollar Savings Per Dwelling in specifying R-13+7.5 versus R-13 steel framed walls	$14		$12		$16		$18		$6	
Cost of Electricity ($/kWh)	$0.12		$0.10		$0.08		$0.12		$0.12	
Cost of Continuous Insulation**										
2" expanded polystyrene, R7.7 installed cost, cost to general contractor ($/sqft)	$0.98		$1.01		$1.04		$0.98		$0.92	
2" expanded polystyrene, installed cost per Dwelling unit, includes 20% markup by GC	$445		$455		$471		$445		$418	
Simple Payback, years***	32		38		30		25		65	

*Energy use was derived through an annual hourly-based simulation using Energy Gauge Summit Premier from Florida Solar Energy Center, which uses DOE 2.1E as the simulation engine. The building modeled was a 32 unit multifamily residential building with individual dwellings of 1,000 sqft. Federal minimum efficiency air source heat pumps were modeled to provide space heating and cooling. In all cases except the R-13 steel framed wall, the building envelope was modeled to meet minimum prescriptive requirements of the 2009 IECC. Cost of electricity was based on U.S. DOE EIA 2007 state residential average retail price. The analysis was conducted by Newport Ventures, which maintains certified HERS raters and professional engineers on staff to conduct energy analyses of residential buildings.

**Costs of continuous insulation were estimated based on RS Means; costs do not include extra charges for jamb extensions.

***Time required to recoup costs to building owner based on energy savings expected

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Nowak-EC-3-T. 502.2(1)

EC162–09/10
Table 502.3

Proponent: Julie Ruth, JRuth Code Consulting, representing American Architectural Manufacturers Association (AAMA)

Revise as follows:

TABLE 502.3
BUILDING ENVELOPE REQUIREMENTS: FENESTRATION

Climate Zone	1	2	3	4 except Marine	5 & Marine 4	6	7	8
Vertical Fenestration (40% maximum of above-grade wall)								
U-Factor								
~~**All Others**[a]~~								
~~Framing materials other than metal with or without metal reinforcement or cladding~~								
~~*U-factor*~~	~~1.20~~	~~0.75~~	~~0.65~~	~~0.40~~	~~0.35~~	~~0.35~~	~~0.35~~	~~0.35~~
~~Metal framing with or without thermal break~~								
Curtain Wall/Storefront *U*-Factor	1.0	0.70	0.60	0.50	0.45	0.45	0.40	0.40
Entrance Door *U*-Factor	1.20	1.10	0.90	0.85	0.80	0.80	0.80	0.80
All Others[a]								
Metal framing with or without thermal break								
~~All Other~~ *U*-Factor	1.20	0.75	0.65	0.55	~~0.55~~0.50	~~0.55~~0.50	0.45	0.45
Framing materials other than metal, with or without metal reinforcement or cladding.								
U-factor	1.20	0.65	0.50	0.35	0.35	0.35	0.35	0.35
Remainder of table unchanged.								

NR = No requirement.
PF = Projection factor (see Section 502.3.2).
a. All others includes operable windows, fixed windows and ~~non-entrance~~ doors other than entrance doors.

Reason: This proposal seeks to address an ongoing concern of the fenestration industry that Table 502.3 of the IECC is not material neutral, by removing separation by framing material for certain end product categories. The end products addressed by this proposal, specifically curtainwall, storefront and entrance doors, are often required by other provisions of the International Codes to meet higher levels of performance than other fenestration products in commercial buildings with regards to characteristics such as structural design load, durability, compliance with ADA, fire resistance rating and noncombustibility, etc.

To allow the designer of these products, and the architect, contractor and others associated with the design and construction of a commercial building, more options to meet these other requirements in a cost effective manner, Table 502.3 allows them more lenient U-factors in some climate zones. This should be permitted regardless of the framing material used. Removing the distinction for curtainwall, storefront and entrance doors recognizes this, and would allow future focus on the more troublesome "All Others" category.

Cost Impact: This code change will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Ruth-EC-2-T. 502.3

EC163–09/10
Table 502.3

Proponent: Thomas D. Culp, Ph.D., Birch Point Consulting LLC, representing Aluminum Extruders Council

Revise table as follows:

TABLE 502.3
BUILDING ENVELOPE REQUIREMENTS: FENESTRATION

Climate Zone	1	2	3	4 except Marine	5 and Marine 4	6	7	8
Vertical Fenestration (40% maximum of above-grade wall)								
***U*-factor**								
~~**Framing materials other than metal with or without metal reinforcement of cladding**~~								
~~*U*-factor~~	~~1.20~~	~~0.75~~	~~0.65~~	~~0.40~~	~~0.35~~	~~0.35~~	~~0.35~~	~~0.35~~
~~**Metal framing with or without thermal break**~~								
Curtain wall/storefront *U*-factor	~~1.20~~ 0.57[c]	~~0.70~~ 0.57	~~0.60~~ 0.50	~~0.50~~ 0.42	~~0.45~~ 0.42	~~0.45~~ 0.42	0.40	0.40
Entrance door *U*-factor	1.20	1.10	0.90	0.85	0.80	0.80	0.80	0.80
All other *U*-factor[a,b]								
Performance class LC, CW, AW	~~1.20~~ 0.65[c]	~~0.75~~ 0.65	~~0.65~~ 0.60	~~0.55~~ 0.50	~~0.55~~ 0.50	~~0.55~~ 0.50	0.45	0.45
Performance class R	0.57[c]	0.57	0.40	0.35	0.35	0.35	0.35	0.35

(Portions of table not shown remain unchanged)

a. All others includes operable windows, fixed windows, and ~~nonentrance~~ doors other than entrance doors.
b. Performance class determined in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.
c. For impact rated fenestration complying with Section R301.2.1.2 of the *International Residential Code* or Section 1608.1.2 of the *International Building Code*, the maximum *U*-factor shall be 1.20.

Reason: In past cycles, certain groups have voiced concerns about having separate metal vs. nonmetal fenestration frame categories in Table 502.3 on the basis that they are not "material neutral". We do not agree with those statements, in that there are specific technical reasons for having separate frame categories, and there is nothing inherently wrong with having separate requirements based on material. Material-based requirements are common throughout the I-codes (e.g. wood, metal, and mass wall requirements). In previous cycles, the committee has agreed and repeatedly rejected proposals to remove the metal vs. nonmetal framing categories.

Nonetheless, in a positive effort to address these concerns, we offer this proposal which would be "material neutral", yet also preserve the original reason for having separate metal vs. nonmetal categories – structural performance. This proposal would reformat the table, putting the window requirements in terms of the AAMA/WDMA/CSA 101/I.S.2/A440 performance classes (R vs. LC, CW, AW) instead of by material type. 101/I.S.2/A440 testing is already required by the IBC, and for air leakage in the IECC. (This is just for windows and non-entrance doors. Curtain wall, storefront, and entrance doors do not require 101/I.S.2/A440 testing, and their criteria remain separate in this table.)

At the same time, we have taken the opportunity to also increase stringency, based on requirements being proposed by the New Buildings Institute.

Cost Impact: The code change proposal will increase the cost of construction. There are increased costs associated with the increased stringency in U-factor, most notably with the requirement for double glazing in zone 1 and the increased use of thermally broken frames across several zones. However, these changes are felt to be justified at the levels proposed including the allowance for single glazing for hurricane products in zone 1.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CULP-EC-1-T. 502.3.DOC

EC164–09/10
Table 502.3

Proponent: Jeff Lowinski, representing the Window and Door Manufacturers Association (WDMA)

Revise as follows:

Table 502.3
BUILDING ENVELOPE REQUIREMENTS: FENESTRATION

CLIMATE ZONE	1	2	3	4 Except Marine	5 and Marine 4	6	7	8
Vertical Fenestration (40% maximum of above-grade wall)								
***U*-Factor**								
~~**Framing materials other than metal with or without metal reinforcement or cladding**~~								
~~*U*-Factor~~ Fixed and operable windows, non-entrance doors	1.20	0.75	0.65	0.40	0.35	0.35	0.35	0.35
~~**Metal framing with or without thermal break**~~								
Curtain Wall/Storefront ~~*U*-Factor~~	1.0	0.70	0.60	0.50	0.45	0.45	0.45	0.45
Entrance Door ~~*U*-Factor~~	1.20	1.10	0.90	0.85	0.80	0.80	0.80	0.80
~~All Other *U*-Factor[a]~~	1.20	0.75	0.65	0.55	0.55	0.55	0.50	0.50
SHGC-All Frame Types								
SHGC: PF < 0.25	0.25	0.25	0.25	0.40	0.40	0.40	NR	NR
SHGC: 0.25 ≤ PF <0.5	0.33	0.33	0.33	NR	NR	NR	NR	NR
SHGC: PF ≥ 0.5	0.40	0.40	0.40	NR	NR	NR	NR	NR
Skylights (3% maximum)								
U-Factor	0.75	0.75	0.65	0.60	0.60	0.60	0.60	0.60
SHGC	0.35	0.35	0.35	0.40	0.40	0.40	NR	NR

NR = No requirement
PF = Projection factor (see Section 502.3.2).
~~a. All others includes operable windows, fixed windows and nonentrance doors.~~

Reason: The current prescriptive requirements in Table 502.3 give preferential treatment to particular types of products by providing different rules depending upon the frame material used. Non-metal frame windows are generally more energy efficient than aluminum and metal windows, yet their use is restricted by the imposition of the prescriptive values that discriminate against wood, vinyl, and composite windows.
This proposal removes that preferential treatment (one that conflicts with the foundational principles of the IECC as reproduced below) and uses the current prescriptive values for non-metal frames as the baseline. The use of less efficient windows should not occur without a consideration of other efficiency measures such as increased insulation. This proposal makes no change in requirements for curtainwall, storefront, entrance doors, or non-metal frames. Buildings constructed with elements such as metal framed windows perform differently, and thus should qualify using the performance path.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Lowinski-EC-1-T. 502.3

EC165–09/10
Table 502.3

Proponent: David C. Hewitt, New Buildings Institute, John Loyer, American Institute of Architects

Revise as follows:

TABLE 502.3
BUILDING ENVELOPE REQUIREMENTS: FENESTRATION

CLIMATE ZONE	1	2	3	4, except Marine	5 and Marine 4	6	7	8
Vertical Fenestration (~~40~~30% maximum of above-grade wall)								
Framing materials other than metal with or without metal reinforcement or cladding								
U-Factor[a]	1.20/ 0.57	~~0.75~~ 0.57	~~0.65~~ 0.40	~~0.40~~ 0.35	0.35	0.35	0.35	0.35
Metal framing with or without thermal break								
Curtain Wall/Storefront *U*-Factor[a]	1.0/ 0.57	~~0.70~~ 0.57	~~0.60~~ 0.50	~~0.50~~ 0.42	~~0.45~~ 0.42	~~0.45~~ 0.42	0.40	0.40
Entrance Door *U*-Factor	1.20	1.10	0.90	0.85	0.80	0.80	0.80	0.80
All Other *U*-Factor[a,b]	1.20/ 0.65	~~0.75~~ 0.65	~~0.65~~ 0.60	~~0.55~~ 0.50	~~0.55~~ 0.50	~~0.55~~ 0.50	0.45	~~0.45~~ 0.40
SHGC- All Frame Types								
SHGC: PF < 0.25	0.25	0.25	0.25	0.40	0.40	0.40	0.45	0.45
SHGC: 0.25 ≤ PF <0.5	0.33	0.33	0.33	NR	NR	NR	NR	NR
SHGC: PF ≥ 0.5	0.40	0.40	0.40	NR	NR	NR	NR	NR
Skylights (3% maximum, 5% maximum with automatic day lighting controls[c])								
U-Factor	0.75	~~0.75~~ 0.65	~~0.65~~ 0.55	~~0.60~~ 0.50	~~0.60~~ 0.50	~~0.60~~ 0.50	~~0.60~~ 0.50	~~0.60~~ 0.50
SHGC[d]	0.35	0.35	0.35	0.40	0.40	0.40	NR	NR

NR = No requirement.
PF = Projection factor (see Section 502.3.2).
a. The first U-factor applies when impact rated glazing is installed.
b. "All others" includes operable windows, fixed windows, and ~~nonentrance~~ doors other than entrance doors.
c. Automatic day lighting controls shall meet the requirements of Section 505.2.2.3.3.
d. The SHGC for Climate Zones 1 – 6 can be increased to SHGC no greater than 0.60 if the Visible Transmittance (VT) is not less than 0.60 and automatic day lighting controls are installed that meet the requirements of Section 505.2.2.3.3.

Reason: This Building Envelope proposal provides the fenestration tables to complement the comprehensive proposal submitted on behalf of New Buildings Institute, the American Institute of Architects and the U.S. Department of Energy. This table provides significant improvements in glazing performance for the model code. The u-values and SHGC values include specifications from *Core Performance Guide*, 2009 IECC and proposed ASHRAE 90.1-2010.

Cost Impact: This code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: HEWITT-LOYER-EC1-T502.3

EC166–09/10
202 (New), Table 502.3, Table 502.3(1) (New), 502.3.2, Table 502.3(2) (New)

Proponent: Ronald Majette, representing US Department of Energy

1. Add new definitions as follows:

OPAQUE PERMANENT PROJECTION. Permanent shading devices attached to the building or consisting of portions of the building such as overhangs or eaves, including open louvers that do not allow the sun to penetrate the louvers during the peak sun angle on June 21 (December 21 southern hemisphere).

VISIBLE TRANSMITTANCE, *VT*: The ratio of visible radiation entering the space through the fenestration product to the incident visible radiation, determined as the spectral transmittance of the total fenestration system, weighted by the photopic response of the eye and integrated into a single dimensionless value.

2. Revise as follows:

502.3.2 Maximum *U*-factor and SHGC. For vertical fenestration and skylights, the maximum *U*-factor and solar heat gain coefficient (SHGC) and minimum visible transmittance (VT) shall be as specified in Table 502.3(1) ~~, based on the window projection factor~~. ~~For skylights, the maximum *U*-factor and solar heat gain coefficient (SHGC) shall be as specified in Table 502.3.~~ The window projection factor shall be determined in accordance with Equation 5-1.

$PF = A/B$ **(Equation 5-1)**

where:

PF = Projection factor (decimal).
A = Distance measured horizontally from the furthest continuous extremity of any overhang, eave, or permanently attached shading device to the vertical surface of the glazing.
B = Distance measured vertically from the bottom of the glazing to the underside of the overhang, eave, or permanently attached shading device.

Where different windows or glass doors have different *PF* values, they shall each be evaluated separately, or an area-weighted *PF* value shall be calculated and used for all windows and glass doors.

3. Revise and renumber as follows:

TABLE ~~502.3~~ 502.3(1)
BUILDING ENVELOPE REQUIREMENTS: FENESTRATION

Vertical fenestration (40% maximum of ~~above grade~~ walls associated with the building envelope)								
***U*-factor**								
~~Framing materials other than metal with or without metal reinforcement or cladding~~								
Nonmetal framing *U*-factor	~~1.20~~ 0.32	~~0.75~~ 0.32	~~0.65~~ 0.28	~~0.40~~ 0.28	~~0.35~~ 0.28	~~0.35~~ 0.28	~~0.35~~ 0.20	~~0.35~~ 0.20
~~Metal framing with or without thermal break~~								
~~Curtain Wall/Storefront *U*-factor~~ Metal framing, fixed	~~1.0~~ 0.50	~~0.70~~ 0.50	~~0.60~~ 0.46	~~0.50~~ 0.38	~~0.45~~ 0.38	~~0.45~~ 0.35	~~0.40~~ 0.26	~~0.40~~ 0.26
Metal framing, operable	0.65	0.65	0.60	0.44	0.44	0.42	0.34	0.34
Metal framing, commercial ~~E~~entrance ~~D~~door	~~1.20~~ 0.83	~~1.10~~ 0.83	~~0.90~~ 0.77	~~0.85~~ 0.77	~~0.80~~ 0.77	~~0.80~~ 0.77	~~0.80~~ 0.77	~~0.80~~ 0.77
Metal framing, residential entrance door	0.83	0.77	0.68	0.68	0.68	0.68	0.68	0.68
~~All Other *U*-factora~~	~~1.20~~	~~0.75~~	~~0.65~~	~~0.55~~	~~0.55~~	~~0.55~~	~~0.45~~	~~0.45~~
SHGC- All Frame Types								
Max. SHGC (assembly)~~: PF < 0.25~~	0.25	0.25	0.25	~~0.40~~ 0.26	~~0.40~~ 0.26	~~0.40~~ 0.35	~~0.45~~ 0.40	~~0.45~~ 0.40
~~SHGC: 0.25 ≤ PF <0.5~~	~~0.33~~	~~0.33~~	~~0.33~~	~~NR~~	~~NR~~	~~NR~~	~~NR~~	~~NR~~
~~SHGC: PF ≥ 0.5~~	~~0.40~~	~~0.40~~	~~0.40~~	~~NR~~	~~NR~~	~~NR~~	~~NR~~	~~NR~~
Min. VT/SHGC (assembly)								
Vertical fenestration <=20% wall area	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Vertical fenestration > 20 to <=40% wall area	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Skylights (3% maximum)								
U-Factor (assembly)	0.75	0.75	0.65	0.60	0.60	0.60	0.60	0.60
Max. SHGC (assembly)	0.35	0.35	0.35	0.40	0.40	0.40	NR	NR

NR = No requirement
PF = Projection factor (see Section 502.3.2)
~~a. All others includes operable windows, fixed windows and nonentrance doors.~~

4. Revise as follows:

502.3.2Maximum*U*-factor and SHGC. For vertical fenestration, the maximum *U*-factor and solar heat gain coefficient (SHGC) shall be as specified in Table 502.3, based on the window projection factor. For skylights, the maximum *U*-factor and solar heat gain coefficient (SHGC) shall be as specified in Table 502.3.

The window projection factor shall be determined in accordance with Equation 5-1.

$PF = A/B$ **(Equation 5-1)**

where:

PF = Projection factor (decimal).

A = Distance measured horizontally from the furthest continuous extremity of any overhang, eave, or permanently attached shading device to the vertical surface of the glazing.

B = Distance measured vertically from the bottom of the glazing to the underside of the overhang, eave, or permanently attached shading device.

Where different windows or glass doors have different *PF* values, they shall each be evaluated separately, or an area-weighted *PF* value shall be calculated and used for all windows and glass doors.

The maximum SHGC for v*ertical fenestration* specified in Table 502.3 and shaded by *opaque permanent projections* shall be permitted to be increased using the multipliers in Table 502.3(2) based on PF as determined in accordance with Equation 5-1 and the orientation of the fenestration.

All *vertical fenestration* within 45 degrees of a south orientation shall be provided with *opaque permanent projections* having a PF of a least 0.5 as determined in accordance with Equation 5-1. All *vertical fenestration* within 45 degrees of an east or west orientation shall be provided with *opaque permanent projections* having a PF of a least 0.5 as determined in accordance with Equation 5-1.

5. Add new table as follows:

TABLE 502.3(2)
VERTICAL FENESTRATION SHGC ADJUSTMENT FACTORS

PF	SHGC Multiplier (over 45 degrees from true north)	SHGC Multiplier (within 45 degrees of true north)
0 – 0.10	1.00	1.00
>0.10 – 0.20	1.10	1.05
>0.10 – 0.20	1.22	1.10
>0.20 – 0.30	1.35	1.15
>0.30 – 0.40	1.49	1.19
>0.40 – 0.50	1.64	1.23
>0.60 – 0.70	1.79	1.28
>0.70 – 0.80	1.96	1.32
>0.80 – 0.90	2.13	1.33
>0.90 – 1.00	2.27	1.37

Reason: For consistency with ASHRAE Standard 90.1-07 addenda “bb and “bm”. This proposal is based on ongoing analysis efforts within ASHRAE designed to create a Standard 90.1-2010 that is 30% better than Standard 90.1-2004 in response to Federal legislation. Paralleling those efforts and considering that the IECC Chapter 5 is intended to be technically compatible with that standard to facilitate adoption and implementation, DOE is interested in keeping Chapter 5 of the 2012 IECC aligned with ANSI/ASHRAE/IESNA Standard 90.1-2010. Due to the timing of the code development process and ASHRAE standards processes this proposal was submitted in anticipation that by the final action hearings the work to update the standard would be complete. The definition of VT is needed as it is relevant in NFRC 200, which is used for fenestration property evaluation.

Cost Impact: The code change proposal will increase the cost of construction to the degree that more efficient products will be required for vertical fenestration.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Majette-EC-52-202-T. 502.3-

EC167–09/10
Table 502.3

Proponent: Ronald Majette, representing US Department of Energy

Revise as follows:

TABLE 502.3
BUILDING ENVELOPE REQUIREMENTS: FENESTRATION

CLIMATE ZONE	1	2	3	4 EXCEPT MARINE	5 AND MARINE 4	6	7	8
Vertical fenestration (40% maximum of above-grade wall)								
U-factor								
Framing materials other than metal with or without metal reinforcement or cladding								
U-factor	1.20	0.75	0.65	0.40	0.35	0.35	0.35	0.35
Metal framing with or without thermal break								
Curtain wall/storefront U-factor	1.0	0.70	0.60	0.50	0.45	0.45	0.40	0.40
Entrance door U-factor	1.20	1.10	0.90	0.85	0.80	0.80	0.80	0.80
All other U-factora	1.20	0.75	0.65	0.55	0.55	0.55	0.45	0.45
SHGC-all frame types								
SHGC: PF < 0.25	0.25	0.25	0.25	0.40	0.40	0.40	0.45	0.45
SHGC: 0.25 ≤ PF< 0.5	0.33	0.33	0.33	NR	NR	NR	NR	NR
SHGC: PF ≥ 0.5	0.40	0.40	0.40	NR	NR	NR	NR	NR
Skylights (~~3~~ 5% maximum)								
U-factor	0.75	0.75	0.65	0.60	0.60	0.60	0.60	0.60
SHGC	0.35	0.35	0.35	0.40	0.40	0.40	NR	NR

NR = No requirement.
PF = Projection factor (see Section 502.3.2).
a. All others includes operable windows, fixed windows and nonentrance doors.

Reason: For consistency with ASHRAE Standard 90.1-07. Since 90.1-07 provides prescriptive provisions for skylights up to 5% of the roof area then for consistency the IECC should allow Table 502.3 to be used up to that percentage as well.

Cost Impact: The code change proposal will increase the cost of construction to the degree that more efficient products will be required.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Majette-EC-53-T. 502.3

EC168–09/10
Table 502.3

Proponent: Garrett Stone, Brickfield, Burchette, Ritts & Stone, representing Cardinal Glass Industries

Revise as follows:

TABLE 502.3
BUILDING ENVELOPE REQUIREMENTS: FENESTRATION

Climate Zone	1	2	3	4 Except Marine	5 and Marine 4	6	7	8
Vertical fenestration (40% maximum of above-grade wall)								
~~***U*-factor**~~								
~~**Framing materials other than metal with or without metal reinforcement or cladding**~~								
~~*U*-factor~~	~~1.20~~	~~0.75~~	~~0.65~~	~~0.40~~	~~0.35~~	~~0.35~~	~~0.35~~	~~0.35~~
Metal framing with or without thermal break								
Curtain wall/storefront *U*-factor	1.20	0.70	0.60	0.50	0.45	0.45	0.40	0.40
Entrance door *U*-factor	1.20	1.10	0.90	0.85	0.80	0.80	0.80	0.80
All other *U*-factor[a]	1.20	~~0.75~~ 0.65	~~0.65~~ 0.50	~~0.55~~ 0.45	~~0.55~~ 0.45	~~0.55~~ 0.45	0.45	0.45
SHGC – all glazed vertical fenestration ~~frame types~~								
SHGC: PF < 0.25	0.25	0.25	0.25	0.40	0.40	0.40	0.45	0.45
SHGC: 0.25 ≤ PF < 0.5	0.33	0.33	0.33	NR	NR	NR	NR	NR
SHGC: PF ≥ 0.5	0.40	0.40	0.40	NR	NR	NR	NR	NR
Skylights (3% maximum)								
U-factor	0.75	0.75	0.65	0.60	0.60	0.60	0.60	0.60
SHGC	0.35	0.35	0.35	0.40	0.40	0.40	NR	NR

NR = No requirement
PF = Projection factor (see Section 502.3.2).
a. All other~~s~~ U-factor includes all other vertical fenestration such as ~~including~~ operable windows, fixed windows and nonentrance doors.

Reason: This proposal eliminates separate categories of window U-factor requirements based on framing materials and combines all windows (other than curtainwall, storefront and entrance doors) under one category with one uniform set of requirements. It is unreasonable and anticompetitive that a building's energy efficiency depends on the material selected for window frames. The proposal removes the incentive to install less-efficient windows and establishes a set of U-factor requirements that, on balance, will increase energy efficiency.

Given complaints at previous code hearings that metal framed products cannot reach the values applicable to non-metal windows, this proposal uses 0.45 as the lowest U-factor for "All other U-factor," which is proposed to include all metal and nonmetal framed fenestration other than curtain wall/storefront and entrance doors. 0.45 is a reasonable U-factor for this category, because fenestration with metal frames are currently required to meet 0.45 in zones 7-8. Extending this 0.45 U-factor to more zones would be a reasonable improvement in the code in this time where energy efficiency improvements are crucial to our nation. Moreover, according to the *2005 ASHRAE Handbook of Fundamentals*, a typical operable low-e with argon, double-pane aluminum thermal break window would have a U-factor of 0.44, while the comparable fixed window would meet a 0.37. (*See* Table 4, at page 31.8.) In fact, this data suggests that an even lower U-factor than 0.45 could be set (perhaps 0.40), but in order to be conservative, this proposal uses 0.45.

Because a uniform U-factor of 0.45 is somewhat weaker than the current requirement for nonmetal framed fenestration in climate zones 4-8, this proposal extends the 0.45 down through zone 4 and then uses the more stringent U-factors from the residential side for zones 1-3 in order to obtain energy savings to offset the theoretical potential for increased energy use in the northern zones (note that in the 2006 IECC the residential values and commercial values for non-metal frames were the same, but in the 2009 IECC the residential values are more stringent in southern climates).

While some might claim this approach weakens the requirements for non-metal-framed windows, as a practical matter this is not the case. For any non-metal framed window to meet the 0.45 U-factor, as a practical matter that window will have a reasonable IG unit with low-e and likely argon. As a result, in almost all cases, it will still have a U-factor equal to or less the current 0.35 requirement. Moreover, since metal-framed windows are predominant in commercial construction, the improved requirements for these windows will save far more energy, offsetting any losses on the non-metal side.

It should be noted that in the current draft proposal under review, ASHRAE 90.1 is proposing 0.26 for metal frames for fixed windows and 0.34 for metal frames in operable windows in the coldest zones (7-8), increasing to 0.36/0.42 for zone 6 and 0.38/0.44 for zones 4-5. *See First Public Review Draft of Proposed Addendum bb to ASHRAE Standard 90.1-2007*, Tables 5.5-1 – 5.5-8. The proposal above takes a more moderate approach, implementing uniformity and more flexibility in these climate zones.

Opponents of a uniform U-factor requirement often claim that metal-framed windows are desirable because of "structural benefits," and that a reduction in energy efficiency is an appropriate trade-off. We believe that a direct trade-off between structural requirements and energy efficiency is a bad precedent for the International Codes, because structural requirements and efficiency requirements should be set at optimum levels, individually. Just as it makes no sense to reduce the structural requirements of a building because it is more energy efficient, it makes no sense to reduce efficiency requirements because of perceived "structural benefits" afforded by different window frame types. However, this proposal accomplishes both objectives by requiring more efficient windows, but still permitting metal-framed windows to participate without resort to the performance path.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Stone-EC-1-T. 592.3

EC169–09/10
Table 502.3

Proponent: Garrett Stone, Brickfield, Burchette, Ritts & Stone, representing Cardinal Glass Industries

Revise as follows:

TABLE 502.3
BUILDING ENVELOPE REQUIREMENTS: FENESTRATION

Climate Zone	1	2	3	4 Except Marine	5 and Marine 4	6	7	8
Vertical fenestration (40% maximum of above-grade wall)								
***U*-factor**								
Framing materials other than metal with or without metal reinforcement or cladding								
U-factor	1.20	0.75	0.65	0.40	0.35	0.35	0.35	0.35
Metal framing with or without thermal break								
Curtain wall/storefront *U*-factor	1.20	0.70	0.60	0.50	0.45	0.45	0.40	0.40
Entrance door *U*-factor	1.20	1.10	0.90	0.85	0.80	0.80	0.80	0.80
All other *U*-factor[a]	1.20	0.75	0.65	0.55	0.55	0.55	0.45	0.45
SHGC – all frame types								
SHGC: PF < 0.25	0.25	0.25	0.25	~~0.40~~ 0.25	~~0.40~~ 0.25	~~0.40~~ 0.25	0.45	0.45
SHGC: 0.25 ≤ PF < 0.5	0.33	0.33	0.33	~~NR~~ 0.33	~~NR~~ 0.33	~~NR~~ 0.33	NR	NR
SHGC: PF ≥ 0.5	0.40	0.40	0.40	~~NR~~ 0.40	~~NR~~ 0.40	~~NR~~ 0.40	NR	NR
Skylights (3% maximum)								
U-factor	0.75	0.75	0.65	0.60	0.60	0.60	0.60	0.60
SHGC	0.35	0.35	0.35	0.40	0.40	0.40	NR	NR

NR = No requirement
PF = Projection factor (see Section 502.3.2).
a. All others includes operable windows, fixed windows and nonentrance doors.

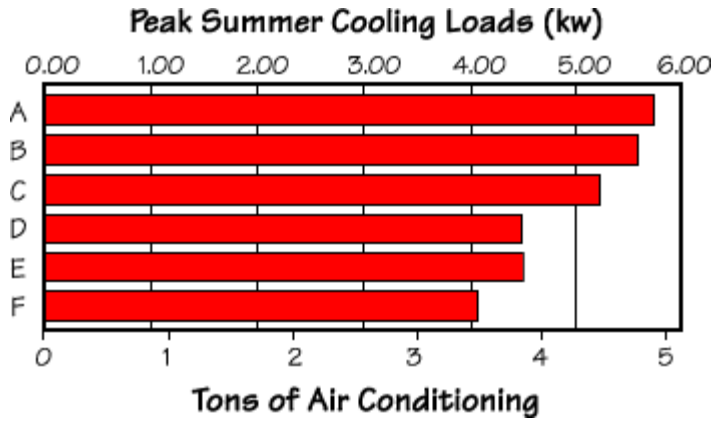
Reason: This proposal will save energy, reduce energy costs and reduce peak electricity demand with virtually no negative construction cost impact by establishing SHGC requirements for climate zones 4-6 consistent with the existing requirements for climate zones 1-3. This proposal will reduce the solar heat gain for buildings permitted in these climate zones by at least 37.5%.

The SHGC requirements for high-rise residential and commercial fenestration in the 2009 IECC and ASHRAE 90.1-2007 already recognize that SHGC should be controlled in all climate zones. (There is a maximum SHGC currently extending through climate zone 8 in both codes.) Likewise, the *Core Performance Guide* published by the New Buildings Institute sets a maximum SHGC for commercial buildings in all climate zones similar to the values proposed above, even when paired with effective shading. *See* Table 2.6.1. The current proposed revisions for ASHRAE 90.1 propose similar improvements, setting the SHGC at 0.26 in zones 4-5 and 0.35 in zone 6. *See First Public Review Draft of Proposed Addendum bb to ASHRAE Standard 90.1-2007*, Tables 5.5-1 – 5.5-8. Now is the time to improve the values in the *IECC*.

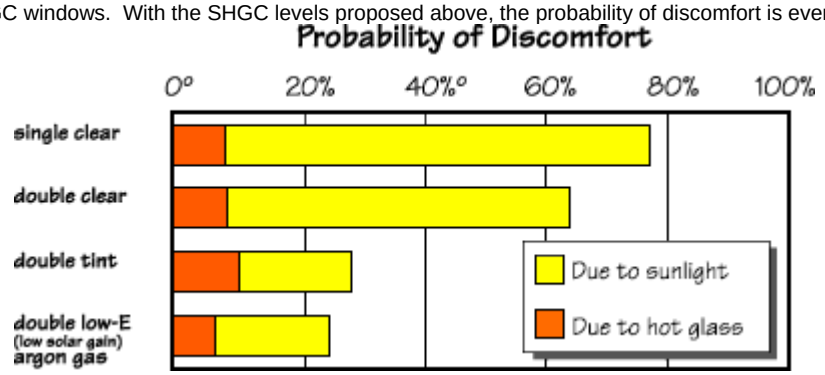
The types of buildings regulated under chapter 5 are typically internal-heat load dominated, and usually reach their maximum energy intensity during summer peak electricity times of the day and year. Despite a more northerly location, the electric utility systems of states throughout these climates zones peak in the summer, just like most of their southern counterparts, primarily due to air conditioning loads for commercial and residential buildings. As a result, demand is the highest at these times, requiring electric utilities to use expensive peaking plants or older, highly inefficient plants, to meet the demand. The result is exponentially higher cost and more pollution. Many states are currently embroiled in debates over how to meet (and pay for) rising electric peak demand and where to site new power plants.

Low SHGC fenestration is the obvious answer to this growing problem. The following chart, developed by the U.S. Department of Energy's Lawrence Berkley National Laboratory (LBNL), which is found on the Efficient Window Collaborative (EWC) website (www.efficientwindows.org), shows the potential for saving peak demand (and tons of HVAC) for different window types. While this is a residential home illustration, the point is equally valid for commercial buildings, which use basically the same glass.

Window E is a higher solar gain low-e double-pane window that meets the current U-factor requirement in climate zone 4. Window F is the low SHGC, low U-factor window that would meet the current U-factor requirement plus the SHGC maximum of this proposal. The reduction in peak cooling load is nearly half of a kW, reducing by almost a half ton the size of the air conditioning unit. As is readily apparent, improved windows will lead to smaller HVAC sizes (with lower costs to the building owner) and lower peak cooling loads (saving the state from building additional peak capacity).



Similarly, the following chart from the same source shows the probability of discomfort during summer from sunlight and hot glass. Again, this is an issue that is even more important for commercial than residential construction, since commercial buildings are more likely to be occupied during the daytime when the potential for discomfort is greatest. The summertime probability of discomfort ranges from over 60% with double pane clear glass to almost 20% with lower SHGC windows. With the SHGC levels proposed above, the probability of discomfort is even lower.



Windows with low SHGC will reduce the volatility of temperatures in the building. This will reduce occupant discomfort and make it less likely that occupants will need to adjust the thermostats down resulting in much greater energy cost.

In sum, lower SHGCs directly result in smaller electric loads, reduced HVAC sizing, greater comfort, less pollution and reduced energy use and cost in commercial buildings. Moreover, construction cost is not an issue since:

(1) the upgrade to lower SHGC comes for little or no cost since low-e fenestration is already specified by both the U-factor and SHGC requirements for these climate zones, making the SHGC merely a function of the particular version of low-e coating chosen; and

(2) far more dollars can be saved in downsizing HVAC systems.

Moreover, this result can be achieved with little impact on visible light transmission. We estimate that a 37.5% reduction in the requirement from 0.40 SHGC to 0.25 SHGC need only cost about 7-10% of the visible light (the center of glass VT of a product that would meet the 0.40 is around 70 – 72%% while there are glazing products that will meet 0.25 with center-of-glass VTs around 65%).

Studies have shown that reasonable improvements in building energy codes are some of the least expensive means of curbing electrical peak demand. The consulting firm McKinsey & Co. found in its recent report, *Reducing U.S. Greenhouse Emissions: How Much at What Cost*?, that improvements to residential and commercial buildings, including the thermal envelope, are among the most cost-effective means of reducing electric demand (and greenhouse gas emissions). *See* Pages 20, 61-62. The report also found that buildings are not currently built to optimum economic and efficiency levels. *See* Page 39.

Since lowering the SHGC to 0.25 from 0.40 (the current requirement for zones 4-6) comes at no cost and yields energy-saving and peak-reducing benefits, there is no reason not to capture the benefits of lower SHGC for these climates.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Stone-EC-4-T. 502.3

EC170–09/10
Table 502.3, 502.3.2

Proponent: Garrett Stone, Brickfield, Burchette, Ritts & Stone, representing Cardinal Glass Industries

Revise as follows:

TABLE 502.3
BUILDING ENVELOPE REQUIREMENTS: FENESTRATION

Climate Zone	1	2	3	4 Except Marine	5 and Marine 4	6	7	8
Vertical fenestration (40% maximum of above-grade wall)								
***U*-factor**								
Framing materials other than metal with or without metal reinforcement or cladding								
U-factor	1.20	0.75	0.65	0.40	0.35	0.35	0.35	0.35
Metal framing with or without thermal break								
Curtain wall/storefront *U*-factor	1.20	0.70	0.60	0.50	0.45	0.45	0.40	0.40
Entrance door *U*-factor	1.20	1.10	0.90	0.85	0.80	0.80	0.80	0.80
All other *U*-factor[a]	1.20	0.75	0.65	0.55	0.55	0.55	0.45	0.45
SHGC – all frame types								
SHGC~~: PF < 0.25~~	0.25	0.25	0.25	0.40	0.40	0.40	0.45	0.45
~~SHGC: 0.25 ≤ PF < 0.5~~	~~0.33~~	~~0.33~~	~~0.33~~	~~NR~~	~~NR~~	~~NR~~	~~NR~~	~~NR~~
~~SHGC: PF ≥ 0.5~~	~~0.40~~	~~0.40~~	~~0.40~~	~~NR~~	~~NR~~	~~NR~~	~~NR~~	~~NR~~
Skylights (3% maximum)								
U-factor	0.75	0.75	0.65	0.60	0.60	0.60	0.60	0.60
SHGC	0.35	0.35	0.35	0.40	0.40	0.40	NR	NR

NR = No requirement
~~PF = Projection factor (see Section 502.3.2).~~
a. All others includes operable windows, fixed windows and nonentrance doors.

502.3.2 Maximum *U*-Factor and SHGC. For vertical fenestration and skylights, the maximum *U*-factor and solar heat gain coefficient (SHGC) shall be as specified in Table 502.3~~, based on the window projection factor~~. ~~For skylights, the maximum *U*-factor and solar heat gain coefficient (SHGC) shall be as specified in Table 502.3.~~

~~The window projection factor shall be determined in accordance with Equation 5-1.~~

~~PF = A/B **(Equation 5-1)**~~

~~Where:~~

~~PF = Projection factor (decimal).~~
~~A = Distance measured horizontally from the furthest continuous extremity of any overhang, eave, or permanently attached shading device to the vertical surface of the glazing.~~
~~B = Distance measured vertically from the bottom of the glazing to the underside of the overhang, eave, or permanently attached shading device.~~

~~Where different windows or glass doors have different *PF* values, they shall be evaluated separately, or an area-weighted *PF* value shall be calculated and used for all windows and glass doors.~~

Reason: This proposal saves energy and simplifies the commercial building prescriptive path by removing inaccurate projection factor trade-offs for SHGC. Users may continue to use projection factors in the more detailed Total Building Performance compliance option in Section 506, where orientation and the specific impact of each overhang are more precisely measured and calculated.

There are more detailed and accurate methods to calculate the benefits of projection factors, such as an alternative proposal submitted in this cycle which applies a simplified version of the calculation used in ASHRAE 90.1-2007. However, by eliminating complicated calculations for overhangs, the proposal above simplifies compliance and enforcement efforts, consistent with the purpose of the simplified prescriptive path in section 502 of the IECC. In addition, the proposal ensures reduced energy cost, energy usage, peak demand, and smaller HVAC sizing.

Simpler Calculations. The current fenestration table in the IECC allows a weaker fenestration SHGC when projection factors are incorporated into the building's design. This extra set of calculations is difficult for code officials and designers alike, because (when it is done correctly) an accurate projection factor must be calculated for each window, and then worked into an area-weighted average. Similarly, the code official must inspect and measure each overhang to determine if the exception is properly applied. The proposed change is easier for a building official to enforce, and it allows more design freedom and greater certainty for the designer because it reduces the number of calculations and gives certain values for window performance. The proposal does not prevent the addition of overhangs, it simply gives no energy efficiency credit for such a design feature in the prescriptive path. This approach recognizes that given the cost differential between the cost of an overhang and improved SHGC, that no designer would add overhangs for cost reasons to meet the code.

More Uniformity. **The SHGC projection factor trade-off is irregularly applied in the table, and the values do not conform with accepted methods of calculation. The trade-off ratios change depending on climate zone for no particular reason. For example, it makes no sense in climate zones 4-6 that there is no SHGC requirement once the projection factor reaches 0.25. The effects of projection factor values recorded in Table 502.3 cannot be duplicated using the more accurate method employed in ASHRAE 90.1-2007. The prescriptive path should contain only requirements that can be consistently applied and enforced, and the end result should vary as little as possible from building to building.**

More Guaranteed Efficiency. Good solar control in windows can substantially increase comfort for the occupant and reduce electrical peak demands and HVAC sizing. However, solar control can be more or less effective, depending on the orientation of the building, climate zone, reflection, and percentage of the window exposed to the sun. Because these variables are not properly incorporated into the IECC's calculation of projection factor, the projection factor trade-off is highly inaccurate. To make matters worse, the projection factor is traded off against windows with low SHGC (as tested and certified according to objective criteria), which consistently block unwanted heat gain regardless of the building's orientation. The current method for determining projection factor in the IECC is far too inaccurate to trade away the guaranteed efficiency of an SHGC rating. To save energy and remove unnecessary complexity, this trade-off should be removed from the prescriptive path.

Cost Impact: This proposal should not add to the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Stone-EC-6-T. 502.3-502.3.2

EC171–09/10

502.3.1 (New), Chapter 6 (New)

Proponent: Craig Conner, Building Quality, representing self

1. Add new text as follows:

502.3.1 Storefront and curtain wall in commercial buildings: U-factors and SHGC for storefront and curtain wall in commercial buildings is permitted to be determined in accordance with AAMA 507. When AAMA 507 is used, the product performance shall be documented by a certificate of compliance, as described in AAMA 507, that is signed and submitted to the code official by a registered design professional. The product line testing and simulation, as described in AAMA 507, shall be conducted in accordance with NFRC 100 and NFRC 200 by an approved, accredited, independent laboratory.

(Renumber subsequent sections)

2. Add new standard to Chapter 6 as follows:

AAMA

507-07 Standard Practice for Determining the Thermal Performance Characteristics of Fenestration Systems Installed in Commercial Buildings

Reason: The IECC requires windows to be rated for energy efficiency. However, the rating procedure specified is too slow for the construction process for certain types of commercial windows. An optional alternative procedure is needed for "site built" store front and curtain wall windows. The process needs to produce a rating in time to respond to the normal commercial bid process. The time between bid and construction can be days or weeks. The NFRC web site stated, "it will take on average approximately 100 days to obtain a Label Certificate." The AAMA 507 procedure can be used to rate a window within a few days or less and produces the same rating.

Commercial window makers bid windows for a specific commercial building. Unlike residential windows, combination of glazing and frame are often produced in response to a specific commercial building design. The combinations of available glass and window frames are too numerous to rate all combinations in advance. However, the characteristics of each separate frame and glass option are known in advance. Using the AAMA 507 standard, commercial window makers can quickly and inexpensively use the frame and glass characteristics to produce a timely rating for windows tailored to the specifications for a particular building. Therefore, the AAMA 507 produces a practical window rating that can be used in the commercial site-built bid process and will further encourage energy-efficient commercial windows.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, AAMA 507-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CONNER-EC-5-502.3.1-CH 6.DOC

EC172–09/10
502.3.1 (New), Chapter 6

Proponent: Julie Ruth, PE, JRuth Code Consulting; Margaret Webb, IGMA; Rand Baldwin, AEC; David Walker, NGA; Donn Harter, AGA; Kim Mann; Bill Koffel, representing American Architectural Manufacturers Association, Insulating Glass Manufacturers Alliance, Aluminum Extruders Council, National Glass Association, Americas Glass Association, Glass Association of North America, Glazing Industry Code Committee

1. Add new text as follows:

502.3.1 Storefront and curtainwall in commercial buildings. U-factors and SHGC for storefront and curtainwall in commercial buildings are permitted to be determined in accordance with AAMA 507. When AAMA 507 is used, the product performance shall be documented by a certificate of compliance, as described in AAMA 507, that is signed and submitted to the code official by a registered design professional. The product line testing and simulation, as described in AAMA 507, shall be conducted in accordance with NFRC 100 and NFRC 200 by an approved, accredited, independent laboratory.

2. Add standards to Chapter 6 as follows:

AAMA

507-07 Standard Practice for Determining the Thermal Performance Characteristics of Fenestration Systems Installed Commercial Buildings

Reason: For the last few cycles AAMA has sought approval of code change proposals that would clarify that use of AAMA 507 meets the requirements of the *International Energy Conservation Code* and therefore may be used to determine U-factor and SHGC for fenestration in commercial buildings. This code change proposal again seeks to place that clarification within the IECC by responding to the three principal concerns raised during the previous cycles in the following manner:

1. Concern that if approved, residential window manufacturers might try to use the new code text to avoid having to label their products in compliance with NFRC 100 or NFRC 200.

This proposal limits the use of AAMA 507 to curtainwall and storefront in commercial buildings in two distinct ways -- with the express language used - and with the placement of the provisions in Chapter 5 of the IECC. Placing the new text in Chapter 5 strengthens the intent of limiting the use of AAMA 507 to commercial buildings.

2. Concern that the results of AAMA 507 may not be consistent with those of NFRC 100 and NFRC 200.

Although there are provisions within AAMA 507 that permit use of other methods for product line testing and simulation when determining fenestration U-factor and SHGC, the proposal specifically limits performing product line testing and simulation: they must be done in accordance with NFRC procedures. This would include the mandatory use of NFRC stipulated sizes.

When this approach is taken, previous analysis has found and verified that the variation between AAMA 507 and NFRC 100 for U-factor and NFRC 200 for SHGC is never greater than 0.06%. A variation that is only 6/100 of 1% is not statistically significant.

3. Concern that relying upon the Certificate of Compliance, provided in accordance with AAMA 507 and this code change proposal, would result in less oversight of the final product than the current requirements of the IECC provide.

The key oversight tool within AAMA 507 is the Certificate of Compliance. It is developed using NFRC procedures, using accredited, independent laboratories and simulators, as required by NFRC. As a result, the values that are listed on the certificate are developed with the same level of oversight as any other values that would come from an NFRC accredited laboratory. Previous editions of AAMA 507 did not mandate the use of the Certificate of Compliance, but AAMA 507 was revised to mandate the use of the Certificate of Compliance, primarily to respond to concerns raised by this issue during earlier code change cycles.

Beyond that, AAMA 507 and this proposal rely upon the contractual relationship existing on all commercial jobs between the registered design professional, the general contractor and the glazing contractor to provide assurance that the actual product installed in the field is the same as that specified in the approved construction documents. This is the same relationship that is relied upon for many other aspects of commercial construction, including the structural framework of the building itself if it is constructed of structural steel.

Furthermore, this combination of the Certificate of Compliance and the contract documents, memorializing the agreement between the contractors and designers, actually provides a stronger level of oversight than what is currently required by the IECC for the determination of U-factor and SHGC. Section 303.1.3 of the 2009 *International Energy Conservation Code* requires *U*-factors of fenestration products (windows, doors and skylights) to be "determined in accordance with NFRC 100 by an accredited, independent laboratory, and labeled and certified by the manufacturer". Similarly, the same section requires the SHGC of fenestration products to be "determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer". Although the use of the word "labeled" in the International Codes often implies a requirement for third party certification, the ICC has issued a Formal Interpretation (ICC Committee Interpretation 18-08) stating that the text (of then Section 102.1.3 of the 2006 IECC - now of Section 303.1.3 of the 2009 IECC) does not require third party labeling of the product. The key here is the phrase "labeled and certified by the manufacturer". The Formal Interpretation then goes on to say that the process to be used to determine U-factor and SHGC in compliance with the IECC is that manufacturers "have their products rated by an accredited and independent testing laboratory. The manufacturer then labels their products demonstrating their commitment to provide accurate energy and energy-related performance information. The code does not require that the labeling be done by an approved third party agency."

This code change proposal requires, as Sec. 303.1.3 of IECC 2009 does, that the U-factor and SHGC of the product be determined by accredited and independent laboratories. Beyond the requirements of Section 303.1.3, the proposal requires that the Certificate of Compliance, signed by the registered design professional, and developed in accordance with AAMA 507, be provided to verify the performance of the actual installation. This proposed protocol actually provides a significantly greater level of oversight than what the IECC currently requires.

Therefore, permitting use of AAMA 507 to determine the U-factors and SHGC of curtainwall and storefront does not weaken the IECC. If the glazing contractor decides in favor of using this approach, they are actually engaging in a more stringent program than that currently required by the IECC.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, AAMA 507-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Ruth-EC-5-502.3.1-Ch 6

EC173–09/10
502.3.2 (New), Chapter 6 (New)

Proponent: Ronald Majette, representing US Department of Energy

Add new text as follows:

502.3.2 Minimum *Skylight* Fenestration Area. In *enclosed spaces* greater than 10,000 square feet, (900 m^2), directly under a roof with ceiling heights greater than 15 feet (4.6 m), and used as an office, lobby, atrium, concourse, corridor, storage, gymnasium/exercise center, convention center, automotive service, manufacturing, non-refrigerated warehouse, retail store, distribution/sorting area, transportation, or workshop, the total *daylight zone under skylights* shall be a minimum of half the floor area and provide a minimum *skylight* area to *daylight zone under skylights* of 3 percent with a skylight VLT of at least 0.40 or provide a minimum skylight effective aperture of at least 1 percent.

Skylights shall have a glazing material or diffuser with a measured haze value greater than 90% when tested according to ASTM D1003. General lighting in the daylight area shall be controlled as described in Section 505.2.2.3.

Exceptions:

1. In climate zones 6 through 8
2. Where the designed *general lighting* power densities less than 0.5 W/ft^2 (5.4 W/m^2)
3. Areas where it is documented that existing structures or natural objects block direct beam sunlight on at least half of the roof over the enclosed area for more than 1,500 daytime hours per year between 8 am and 4 pm.
4. Where the daylight area under rooftop monitors is greater than 50% of the enclosed space floor area.

3. Add new standard to Chapter 6 as follows:

ASTM	
D 1003-07e1	Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics

Reason: This proposal is based on ongoing analysis efforts within ASHRAE designed to create a Standard 90.1-2010 that is 30% better than Standard 90.1-2004 in response to Federal legislation. Paralleling those efforts and considering that the IECC Chapter 5 is intended to be technically compatible with that standard to facilitate adoption and implementation, DOE is interested in keeping Chapter 5 of the 2012 IECC aligned with ANSI/ASHRAE/IESNA Standard 90.1-2010. Due to the timing of the code development process and ASHRAE standards processes this proposal was submitted in anticipation that by the final action hearings the work to update the standard would be complete. To promote energy use reduction through daylighting. For background documentation on the analysis used to derive these proposed requirements, go to

http://www.h-m-g.com/ASHRAE_Daylighting/

Cost Impact: The code change proposal can increase or decrease the cost of construction depending on the cost of any additional skylights to be installed and the reduced cost in lighting equipment.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM D1003-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Majette-EC-3-502.3.2-

EC174–09/10
502.3.2, Table 502.3

Proponent: Garrett Stone, Brickfield, Burchette, Ritts & Stone, representing Cardinal Glass Industries

Revise as follows:

502.3.2 Maximum *U*-Factor and SHGC. For vertical fenestration the maximum *U*-factor and solar heat gain coefficient (SHGC) shall be as specified in Table 502.3, based on the window projection factor. For skylights, the maximum *U*-factor and solar heat gain coefficient (SHGC) shall be as specified in Table 502.3.

Exception:
Where the fenestration projection factor for a specific vertical fenestration product is measured and calculated and determined to be greater than or equal to 0.2, the required SHGC from Table 502.3 shall be adjusted by multiplying the required maximum SHGC by the following multipliers corresponding with the orientation of the fenestration product and the projection factor:

Projection Factor	Oriented Within 45 Degrees of True North	All Other Orientation
0.2 ≤ PF < 0.5	1.1	1.2
PF ≥ 0.5	1.2	1.6

The window projection factor shall be determined in accordance with Equation 5-1.

PF = A/B **(Equation 5-1)**

Where:

PF = Projection Ffactor (decimal).

A = Distance measured horizontally from the furthest continuous extremity of any overhang, eave, or permanently attached shading device to the vertical surface of the glazing.

B = Distance measured vertically from the bottom of the glazing to the underside of the overhang, eave, or permanently attached shading device.

Where different windows or glass doors have different *PF* values, they shall be evaluated separately~~, or an area-weighted *PF* value shall be calculated and used for all windows and glass doors~~.

TABLE 502.3
BUILDING ENVELOPE REQUIREMENTS: FENESTRATION

Climate Zone	1	2	3	4 Except Marine	5 and Marine 4	6	7	8
Vertical fenestration (40% maximum of above-grade wall)								
***U*-factor**								
Framing materials other than metal with or without metal reinforcement or cladding								
U-factor	1.20	0.75	0.65	0.40	0.35	0.35	0.35	0.35
Metal framing with or without thermal break								
Curtain wall/storefront *U*-factor	1.20	0.70	0.60	0.50	0.45	0.45	0.40	0.40
Entrance door *U*-factor	1.20	1.10	0.90	0.85	0.80	0.80	0.80	0.80
All other *U*-factor[a]	1.20	0.75	0.65	0.55	0.55	0.55	0.45	0.45
SHGC – all frame types								
SHGC~~: PF < 0.25~~	0.25	0.25	0.25	0.40	0.40	0.40	0.45	0.45
~~SHGC: 0.25 ≤ PF < 0.5~~	~~0.33~~	~~0.33~~	~~0.33~~	~~NR~~	~~NR~~	~~NR~~	~~NR~~	~~NR~~
~~SHGC: PF ≥ 0.5~~	~~0.40~~	~~0.40~~	~~0.40~~	~~NR~~	~~NR~~	~~NR~~	~~NR~~	~~NR~~
Skylights (3% maximum)								
U-factor	0.75	0.75	0.65	0.60	0.60	0.60	0.60	0.60
SHGC	0.35	0.35	0.35	0.40	0.40	0.40	NR	NR

NR = No requirement

~~PF = Projection factor (see Section 502.3.2).~~

a. All others includes operable windows, fixed windows and nonentrance doors.

Reason: This proposal improves the code by:
(1) incorporating the more precise ASHRAE 90.1 projection factor adjustment methodology into the IECC;
(2) recognizing that projection factors vary by orientation;
(3) allowing the projection factor adjustment as an exception where the projection factor of each window has actually been measured; and
(4) eliminating the area-weighted average approach from this exception.

While eliminating the projection factor trade-off would be the best solution, if a projection factor trade-off is to be retained by the IECC for buildings subject to chapter 5 of the IECC, it should be developed so as to accurately establish a trade-off while maintaining reasonable simplicity for ease of application in code compliance and enforcement. This proposal meets these objectives.

Simple, But More Accurate Adjustment Multiplier. ASHRAE 90.1 provides an adjustment multiplier that must be applied individually to each window, based on projection factor and orientation. This is a more precise and accurate approach to calculate projection factor and determine its effects than the prescriptive table in the current IECC, because the current IECC does not take into account the orientation of the windows and it allows a weighted-average approach. However, the ASHRAE method requires a great deal of calculation, because the adjustment must be applied to the SHGC of each individual window to determine compliance. In contrast, the above proposal is written to overcome this hurdle – specifically, the adjustment multiplier is applied as an adjustment to the prescriptive maximum SHGC requirement, thereby eliminating the need to recalculate the value for every window – instead, the multipliers need only be applied once to the prescriptive value for each zone to determine the appropriate requirements.

To further simplify the calculation, the proposal retains only two categories, but modifies the first category from 25%-50% to 20%-50% to better match the categories in ASHRAE, and the multipliers have all been rounded off.

Orientation. For many years, ASHRAE 90.1 has recognized that projection factor is more or less effective depending on the orientation of the window. Ideally, good passive solar design should incorporate precise window orientation and window selection on all sides of the building in order to ensure proper use (and shading) of the sun throughout the year. However, ASHRAE 90.1 has simplified the calculation into two general categories: Fenestration oriented within 45 degrees of true north; and all other orientation. The above proposal has adopted these general categories to maintain consistency with ASHRAE 90.1, and to introduce a simple element of orientation into the projection factor calculation.

Measurement. In the case of projection factor trade-offs, where SHGC values (which are tested and labeled according to objective national standards) are being traded off for building components that are not objectively tested (and are typically determined in the design and permitting phase), the IECC should ensure that projection factor is being properly measured and calculated for each window taking advantage of the projection factor exception.

Area-Weighting. An area-weighted average approach does not make sense for the projection factor calculation because additional shading on some windows does not balance out the lack of shading on others, especially when those windows are oriented differently. For example, 100% shading on a north-facing window, where shading provides little benefit, cannot compensate for a west-facing window with complete sun exposure. However, an area-weighted average approach would simply average the two windows regardless of the actual shading benefits. The above proposal eliminates the area-weighting approach from the projection factor calculation and requires calculation for each window, benefiting designers who are properly orienting and shading all the windows of the home. It should be noted that current SHGC requirements for these buildings do not allow area-weighting of product SHGCs; it is inconsistent with this requirement to allow area-weighting in the case of projection factors.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Stone-EC-2-502.3.2-T. 502.3

EC175–09/10
502.3.2, Table 502.3

Proponent: Garrett Stone, Brickfield, Burchette, Ritts & Stone, representing Cardinal Glass Industries

Revise as follows:

502.3.2 Maximum *U*-Factor and SHGC. For vertical fenestration the maximum *U*-factor and solar heat gain coefficient (SHGC) shall be as specified in Table 502.3, based on the window projection factor. The applicable maximum U-factor for all vertical fenestration other than curtainwall, storefront and entrance doors shall be determined by the total vertical fenestration area as a percentage of above grade wall area as specified in Table 502.3. An area-weighted average of vertical fenestration products shall be permitted to satisfy the U-factor requirements for each category of products. For skylights, the maximum *U*-factor and solar heat gain coefficient (SHGC) shall be as specified in Table 502.3.

U-factor and solar heat gain coefficient (SHGC) shall be as specified in Table 502.3.

The window projection factor shall be determined in accordance with Equation 5-1.

$PF = A/B$ **(Equation 5-1)**

where:

PF = Projection factor (decimal).

A = Distance measured horizontally from the furthest continuous extremity of any overhang, eave, or permanently attached shading device to the vertical surface of the glazing.

B = Distance measured vertically from the bottom of the glazing to the underside of the overhang, eave, or permanently attached shading device.

Where different windows or glass doors have different *PF* values, they shall each be evaluated separately, or an area-weighted *PF* value shall be calculated and used for all windows and glass doors.

TABLE 502.3
BUILDING ENVELOPE REQUIREMENTS: FENESTRATION

Climate Zone	1	2	3	4 Except Marine	5 and Marine 4	6	7	8
Vertical fenestration (40% maximum of above-grade wall)								
***U*-factor**								
~~**Framing materials other than metal with or without metal reinforcement or cladding**~~								
~~*U*-factor~~	~~1.20~~	~~0.75~~	~~0.65~~	~~0.40~~	~~0.35~~	~~0.35~~	~~0.35~~	~~0.35~~
~~**Metal framing with or without thermal break**~~								
Curtain wall/storefront *U*-factor	1.20	0.70	0.60	0.50	0.45	0.45	0.40	0.40
Entrance door *U*-factor	1.20	1.10	0.90	0.85	0.80	0.80	0.80	0.80
All Other Vertical Fenestration U-factor								
Total Fenestration Area > 25% and ≤ 40%of Above Grade Wall [a]	0.65	0.50	0.40	0.35	0.35	0.32	0.32	0.32
~~All other *U*-factor~~ [a] Total Fenestration Area ≤ 25% of Above Grade Wall [a]	~~1.20~~ 0.95	~~0.75~~ 0.71	~~0.65~~ 0.57	~~0.55~~ 0.50	~~0.55~~ 0.50	~~0.55~~ 0.47	~~0.45~~ 0.47	~~0.45~~ 0.47

NR = No requirement
PF = Projection factor (see Section 502.3.2).
a. Total Fenestration Area includes the area of all vertical fenestration, including curtainwall, storefront, entrance doors, etc. ~~All others includes operable windows, fixed windows and nonentrance doors.~~

Reason: This proposal is a stepped approach (based on fenestration area) to fenestration U-factor requirements that increases energy efficiency by rewarding energy efficient design choices, while reasonably increasing flexibility. The proposal eliminates the current *IECC* practice of distinguishing between fenestration requirements based on frame material type (e.g., metal v. non-metal). It is unreasonable and anti-competitive that a building's energy efficiency requirements depend on the material selected for window frames. The current practice actually creates an incentive to select much less efficient fenestration, simply on the basis of frame selection. This proposal removes this incentive while leaving options for construction with all frame types.

To fix this problem, the above proposal establishes:

(1) two levels of vertical fenestration area (40% and 25% of above-grade wall);
(2) a U-factor requirement that all of the vertical fenestration (other than curtainwall, storefront and entrance doors) must meet on a for each level of fenestration area; and
(3) an area-weighted average option for U-factor compliance.

Although the proposed U-factor requirements are more stringent on average, the combination of a weighted-average U-factor and fenestration-area-dependent requirement ensures flexibility and a wide range of choices for designers and builders.

The proposal begins with the requirements in the 2009 IECC for non-metal-framed fenestration as the baseline for 40% fenestration area. The U-factors at these levels are improved where reasonably feasible based on proposals from the 07/08 ICC cycle for residential fenestration. Using these values as a baseline, the proposal then develops an alternative set of requirements for 25% window area by using a simple, straightforward UA calculation to determine comparable values at this level. For purposes of the UA calculation, the proposal assumes the opaque wall U-factor to be equal to the highest wall U-factor from Table 502.1.2 for each climate zone.

The result is a flexible U-factor requirement that rewards designers and builders who incorporate more energy efficiency into buildings, rather than arbitrarily rewarding builders who select certain types of fenestration or framing materials (which are not always the most efficient option). The proposal will also save energy since the baseline requirements are more stringent than current code and the requirements for 25% glazing are generally comparable to current requirements for metal-framed windows.

Complaints at previous code hearings that metal-framed products cannot reach increasing energy efficient values have often stymied significant improvements in glazing requirements for commercial and high-rise residential buildings. This proposal addresses this problem squarely by offering a compliance path at 25% glazing geared to values that these products can meet. Opponents of a uniform U-factor requirement often claim that metal-framed windows are desirable because of "structural benefits," and that a reduction in energy efficiency is an appropriate trade-off. We believe that a direct trade-off between structural requirements and energy efficiency is a bad precedent for the International Codes, because structural requirements and efficiency requirements should be set at optimum levels, individually. Just as it makes no sense to reduce the structural requirements of a building because it is more energy efficient, it makes no sense to reduce efficiency requirements because of perceived "structural benefits" afforded by different window frame types. This proposal resolves these issues fairly and reasonably.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Stone-EC-5-502.3.2-T. 502.3

EC176–09/10
502.3.3 (New)

Proponent: Thomas D. Culp, Ph.D., Birch Point Consulting LLC, representing Aluminum Extruders Council

Add new text as follows:

502.3.3 Area-weighted U-factor. An area-weighted average shall be permitted to satisfy the *U*-factor requirements for each fenestration product category listed in Table 502.3. Individual fenestration products from different fenestration product categories listed in Table 502.3 shall not be combined in calculating area-weighted average *U*-factor.

Reason: This proposal clarifies that area-weighted averages may be used to comply with the U-factor requirements in Table 502.3, similar to what is allowed in Chapter 4 and in ASHRAE 90.1. Currently, it is ambiguous whether each individual fenestration product must meet the specified requirement, or whether the overall average of all the individual products within that product type may be used.

There is a large diversity of fenestration products in commercial construction, and enforcement issues can arise where there are a small number of minority products which do not meet the prescriptive requirements, yet the overall performance of all fenestration assemblies is well below the requirement. Area-weighted averaging would alleviate this problem. Enforcement by the building official should not be a problem in that Section 103.2 already requires that area-weighted U-factor calculations be provided on construction documents.

This proposal also clarifies that different product categories (skylight, curtainwall, entrance door, etc.) may not be mixed in the area-weighted calculation, because it would then be uncertain which U-factor requirement would be used for code compliance.

A similar proposal was rejected last cycle because it also included area weighted averaging for SHGC. The committee correctly pointed out that it is not appropriate to average SHGC on different sides of the building (e.g. west and north). Therefore, this proposal does not include SHGC, and only addresses U-factor.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CULP-EC-3-502.3.3.DOC

EC177–09/10
202 (New), 502.3.3 (New)

Proponent: Ronald Majette, representing US Department of Energy

1. Add new definition as follows:

OPAQUE PERMANENT PROJECTION. Permanent shading devices attached to the building or consisting of portions of the building such as overhangs or eaves, including open louvers that do not allow the sun to penetrate the louvers during the peak sun angle on June 21 (December 21 southern hemisphere).

2. Add new text as follows:

502.3.3. Fenestration Orientation. The *vertical fenestration area* shall meet the following requirement:

$A_S \geq A_W$ *and* $A_S \geq A_E$

where:

A_S = south oriented *vertical fenestration area* (oriented less than 45 degrees of true south)
A_n = north oriented *vertical fenestration area* (oriented less than 45 degrees of true north)
A_w = west oriented *vertical fenestration area* (oriented less than or equal to 45 degrees of true west)
A_e = east oriented *vertical fenestration area* (oriented less than or equal to 45 degrees of true east)

Exceptions:

1. *Vertical fenestration* that is shaded by *opaque permanent projections.*
2. Buildings that have an existing building or existing permanent infrastructure within 20 ft (6 m) to the south which is at least half as tall as the proposed building.
3. Buildings with shade on 75 percent of the west and east façade from existing buildings, existing permanent infrastructure, or topography at 9 AM and 3 pm on the summer solstice.
4. *Alterations* and *additions* with no increase in *vertical fenestration area*.

Reason: This proposal is based on ongoing analysis efforts within ASHRAE designed to create a Standard 90.1-2010 that is 30% better than Standard 90.1-2004 in response to Federal legislation. Paralleling those efforts and considering that the IECC Chapter 5 is intended to be technically compatible with that standard to facilitate adoption and implementation, DOE is interested in keeping Chapter 5 of the 2012 IECC aligned with ANSI/ASHRAE/IESNA Standard 90.1-2010. Due to the timing of the code development process and ASHRAE standards processes this proposal was submitted in anticipation that by the final action hearings the work to update the standard would be complete.

This proposed change is intended to limit poorly oriented fenestration. Compliance can be shown by having more south facing fenestration than west facing fenestration. For those buildings affected by this requirement, this reduces envelope loads, energy usage and thereby costs. This approach gives flexibility to building design teams to work with building sitting and fenestration orientation as well as fenestration area to comply with the requirement. This change provides exceptions for retail glass and buildings potentially shaded from the south or west. Also, an exception is provided for certain additions and alterations.

Cost Impact: The code change proposal could increase or decrease the cost of construction based on the difference in orientation and fenestration location that occurs compared to what would have occurred without this requirement. It is likely this requirement will cause some additional thinking about orientation and shape of the building that will reduce the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Majette-EC-4-502.3.3

EC178–09/10

502.3.3 (New)

Proponent: Ronald Majette, representing US Department of Energy

Add new text as follows:

502.3.3 Fenestration orientation. Fenestration on walls facing directly west shall be limited to 10 percent of the total fenestration area of the building. As a wall facing within 45 degrees of west is oriented from true west toward the north the percentage shall be permitted to be increased by 1 percent for each 2.5 degrees of orientation of the wall toward the north. As a wall facing within 45 degrees of west is oriented from true west toward the south the percentage shall be permitted to be increased by 1 percent for each 5 degrees of orientation of the wall toward the south.

Reason: This proposal is based on ongoing analysis efforts within ASHRAE designed to create a Standard 90.1-2010 that is 30% better than Standard 90.1-2004 in response to Federal legislation. Paralleling those efforts and considering that the IECC Chapter 5 is intended to be technically compatible with that standard to facilitate adoption and implementation, DOE is interested in keeping Chapter 5 of the 2012 IECC aligned with ANSI/ASHRAE/IESNA Standard 90.1-2010. Due to the timing of the code development process and ASHRAE standards processes this proposal was submitted in anticipation that by the final action hearings the work to update the standard would be complete.

Cost Impact: The code change proposal could increase or decrease the cost of construction based on the difference in orientation and fenestration location that occurs compared to what would have occurred without this requirement. It is likely this requirement will cause some additional thinking about orientation and shape of the building that will reduce the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Majette-EC-5-502.3.3

EC179–09/10

202 (New), 502.3.3 (New), 505.2.5 (New), Chapter 6

Proponent: Julie Ruth, PE, JRuth Code Consulting, representing American Architectural Manufacturers Association; Tom Culp, Birchpoint Consulting, representing Aluminum Extruders Council

1. Add new definitions as follows:

GENERAL LIGHTING: Lighting that provides a uniform level of illumination throughout an area. General lighting shall not include emergency lighting; decorative lighting or lighting that provides a dissimilar level of illumination to serve a specialized application or feature within such area.

MULTI-LEVEL LIGHTING CONTROLS. Systems that automatically reduce the lighting power draw in a series of at least two levels or by continuous dimming in response to availability of daylight within the interior space (sometimes referred to as “photo control”).

HAZE VALUE. The ratio of diffusely transmitted light to total light transmitted.

2. Add new text as follow:

502.3.3 Minimum daylighting. In spaces enclosed by walls or floor-to-ceiling partitions that are greater than 25,000 square feet (2000 m^2) in area and directly under a roof with ceiling heights greater than 15 feet (4.6 m), in single story buildings of Group E, F-1, F-2, M, S-1 or S-2 occupancies, a minimum of 50 percent of the floor area shall be in a daylight zone. The maximum percentage of gross roof assembly area that is permitted to be roof mounted fenestration (including but not limited to skylights, tubular daylighting devices, light-transmitting smoke vents, and roof windows) in these spaces shall be 6 percent. All lighting in this daylight zone shall be controlled by multi-level lighting controls that comply with Section 505.2.5.

Roof mounted fenestration in these spaces shall meet the following criteria:

1. The haze value of the combined glazing materials or diffuser in the assembly shall be identified by a manufacturer's designation that indicates manufacturer, testing laboratory, haze value and test method used. The haze shall be 90 percent or greater when tested according to ASTM D1003.
2. The minimum fenestration VT shall be 0.60 when determined in accordance with ASTM E972 or NFRC 200.
3. The maximum U-factor of the fenestration shall meet the requirements of Table 502.3. The maximum SHGC shall be 0.60.

Exceptions:

1. Spaces in climate zones 6 through 8.
2. Auditoriums, theaters, museums, places of worship, and refrigerated warehouses.
3. Spaces with general lighting power densities less than 0.5 W/ft2 (5.4 W/m2).

505.2.5 Multi-level lighting controls. When multi-level lighting controls are required by this code, the general lighting in the daylight zone shall be separately controlled by at least one multi-level lighting control that reduces the lighting power in response to daylight available in the space. When the daylit illuminance in the space is greater than the rated illuminance of the general lighting of daylight zones, the general lighting shall be automatically controlled so that its power draw is no greater than 35 percent of its rated power. The multi-level lighting control shall be located so that calibration and set point adjustment controls are readily accessible and separate from the light sensor.

3. Add new standards to Chapter 6 as follows:

ASTM

D1003-00	*Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics*
E972-96(2002)	*Standard Test Method for Solar Photometric Transmittance of Sheet Materials Using Sunlight*

Reason: This proposal seeks to take advantage of the tremendous energy savings that can be achieved by incorporating daylighting into building design. A recent study conducted by TIAX LLC for the U.S. Department of Energy found that energy savings of between $0.10 to $0.32/sq foot /year can be achieved by incorporating skylights with lighting controls into the design of commercial buildings.

This proposal would mandate daylighting of those types of spaces for which the report predicted the shortest payback period (4 to 10 years), which are large, open spaces (in the case of this proposal > 25,000 sq. ft) with high ceilings (in the case of this proposal > 15 ft.). Also, the proposal is limited to those occupancies where manual control of daylighting for purposes of the processes that take place within the building are least likely to be needed (educational, mercantile, factory and storage).

Although previous studies have found that significant (>10%) energy savings can be achieved by incorporating skylights with automatic lighting controls with the characteristics defined in this proposal in all climate zones, the greatest savings (20 to 35%) occur in Climate zones 1 to 5. Therefore, this proposal does not require mandatory daylighting in climate zones 6 to 8.

The proposal leaves the exact distribution of skylights to the designer. Requiring the 50% threshold to be met by skylights in no more than 6% of the roof area together with vertical glazing would require the designer to distribute the skylights well over the surface of the roof.

The criteria for the skylights themselves are based either upon the criteria used in the DOE study or current requirements of the IECC. To provide meaningful reduction in lighting load the Visible Transmittance of the skylights must be 0.60 or greater, as was assumed for the study. Visible Transmittance is directly proportional to SHGC, so the lower the SHGC, the lower the VT and the less light transmitted into the interior space. A comparison of VT vs. SHGC of domed skylights listed on the NFRC database on March 30, 2009 yielded the results shown in the graph below.

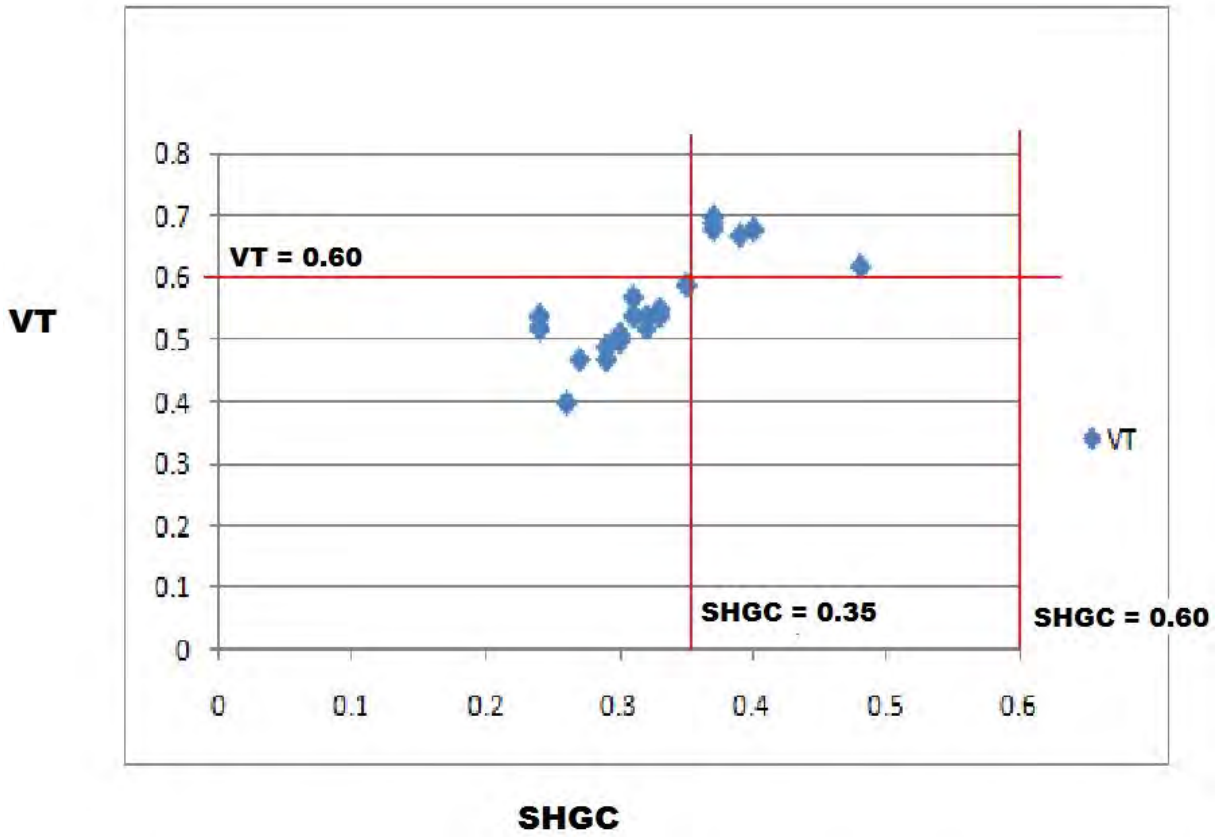


Figure 1 Comparison of VT to SHGC for domed skylights listed in NFRC Database

The TIAX/DOE study found that for skylight to roof area ratios of 6% or less, the energy savings were greater when domed skylights with SHGC of 0.53 were used than when flat skylights with SHGC = 0.35 were used.

As can be seen in the graph above, if a maximum SHGC of 0.35 is required, a domed skylight product with VT > 0.60 is not currently available. The baseline skylight used in the study had an SHGC = 0.53 and VT = 0.65. The study also found energy savings would be achieved for domed skylights with SHGC = 0.59 and VT = 0.62. As can be seen in the graph above, once the SHGC maximum limit of 0.35 is removed, domed skylights with VT > 0.60 are available. Therefore the proposal requires a minimum VT = 0.60 and a maximum SHGC = 0.60.

The proposal relies upon the current requirements of the IECC for maximum U-factor for the skylights used. These are more stringent than the study's baseline skylight U-factor of 0.81. The proposal also adds new criteria for Visible Transmittance and Diffusion of skylights to the IECC, when mandatory daylighting is required. Finally, the proposal relies upon Table 502.3 for vertical glazing, and does not modify any of those requirements for the purposes of providing daylighting to the spaces addressed by this proposal.

Copies of the study quoted "Commercial Building Toplighting: Energy Savings Potential and Potential Paths Forward" NTIS # PB2008-111197 by TIAX LCC, can be obtained from National Technical Information Service (NTIS), U.S. Department of Commerce, Springfield, VA 22161, 703-487-4650. The report has also been posted on the AAMA website, and can be accessed at http://www.aamanet.org/mp/TIAX_DOE-BT_Toplighting_Final_Report.pdf

Cost Impact: There will be some increased cost to construction due to this requirement. It is anticipated, however, that these initial costs will be offset over time by the energy cost savings. As discussed in the TIAX/DOE study, the anticipated payback period is 10 years or less. In some cases (depending upon climate zone, lighting design level, etc) the payback period will be 4 years or less.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM D1003-003 and E972-96 (02), for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Ruth-EC-3-202-502.3.3-505.2.6-Ch 6

EC180–09/10

502.3.3 (New)

Proponent: Garrett Stone, Brickfield, Burchette, Ritts & Stone, representing Cardinal Glass Industries

Add new text as follows:

502.3.3 Visible Transmittance. For all glazed fenestration products, the area-weighted average ratio of *visible transmittance / solar heat gain coefficient* shall be greater than 1.5.

Reason: The effective use of daylighting in commercial construction has long been recognized as bringing energy savings and benefits to a building's occupants. This proposal implements a standard for visible light transmittance (VT) designed to maximize useful daylighting in commercial buildings while maintaining effective control over solar heat gain. While the VT may later be combined with use of automatic lighting controls, this proposal sets a ratio of VT to SHGC acceptable for typical commercial occupancies.

Because commercial buildings are predominantly occupied during daylight hours and internal heat load dominated, building design should maximize both daylighting and appropriate solar control. Historically, designers incorporated tinted glass to control solar heat gain, but the reduced transmission of daylight required more artificial light (requiring additional energy and creating additional internal heat loads). As spectrally selective glazing technologies have been perfected, designers are increasingly using glazing that maximizes the amount of visible light entering buildings, while limiting the solar heat gain. Achieving a high VT/SHGC ratio should not add significant cost to commercial glazing since the technology (low-e coatings) is basically the same for both high and low visible light transmission glass with low SHGCs.

Recognizing the range of VT and SHGC ratings of products currently on the market, this proposal uses the "light-to-solar-gain ratio" method used in the ASHRAE Handbook. *See 2005 ASHRAE Handbook of Fundamentals*, at 31.59. This ratio simply divides the VT (expressed as a number between 0 and 1) by the SHGC (also expressed as a number between 0 and 1). This proposal adopts the VT/SHGC ratio specified in the *Core Performance Guide* (2007) published by the New Buildings Institute, which is >1.5 for all climate zones. which will allow reasonable design flexibility and product selection. *See* Table 2.6.1.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Stone-EC-7-502.3.3

EC181–09/10

502.4.1, 502.4.2, 502.4.3, 502.4.4, 502.4.5

Proponent: Mr. Laverne Dalgleish, Building Professionals, representing Air Barrier Association of America, Inc.

Revise as follows:

502.4 Air leakage (Mandatory).

502.4.1 Air barriers. The building envelope shall be designed and constructed with a continuous air barrier to control air leakage into, or out of the conditioned space. An air barrier system shall also be provided for interior separations between conditioned space and a space designed to maintain temperature levels higher than 50 degrees for heating and less than 85 degrees for cooling or spaces that are designed to operate with humidity levels of less than 20 percent or more than 60 percent relative humidity.

The air barrier shall have the following characteristics:

1. It shall be continuous, with all joints made airtight.
2. Materials used for the air barrier system shall have an air permeability not to exceed 0.004 cfm/ft² under a pressure differential of 0.3 in. water (1.57psf) (0.02 L/s·m² @ 75 Pa) when tested in accordance with ASTM E 2178. Air barrier materials shall be taped or sealed in accordance with the manufacturer's instructions.
3. Air barrier materials shall be maintainable, or, if inaccessible, shall meet the durability requirements for the service life of the envelope assembly.
4. The air barrier material of an envelope assembly shall be joined and sealed in a flexible manner to the air barrier material of adjacent assemblies, allowing for the relative movement of assemblies due to thermal and moisture variations and creep.

Connections shall be made between:

1. Joints around *fenestration* and *door* frames.
2. Junctions between *walls* and foundations, between *walls* at building corners, between *walls* and structural. *floors* or *roofs*, and between *walls* and *roof* or *wall* panels.
3. Openings at penetrations of utility services through *roofs*, *walls*, and *floors.*
4. Site-built *fenestration* and *doors.*
5. Building assemblies used as ducts or plenums.
6. Joints, seams, and penetrations of vapor retarders.
7. All other openings in the *building envelope.*

502.4.2 Air barrier penetrations. All penetrations of the air barrier and paths of air infiltration/exfiltration shall be made air tight.

~~502.4.1~~ **502.4.3 Window and door assemblies.** The air leakage of window and sliding or swinging door assemblies that are part of the building envelope shall be determined in accordance with AAMA/WDMA/CSA 101/I.S.2/A440, or NFRC 400 by an accredited, independent laboratory, and *labeled* and certified by the manufacturer and shall not exceed the values in Section 402.4.2.

Exceptions:

1. Site-constructed windows and doors that are weatherstripped or sealed in accordance with Section 502.4.3.
2. Field-fabricated fenestration and doors that are weather stripped.
3. For garage *doors*, air leakage determined by test at standard test conditions in accordance with ANSI/ DASMA 105 shall be an acceptable alternate for compliance with air leakage requirements.

502.4.4 Doors and access openings to shafts, chutes, stairwells, and elevator lobbies. These doors and access openings shall either meet the requirements of Section 502.4.3 or shall be equipped with weather seals.

Exception: Weatherseals on elevator lobby doors are not required when a smoke control system is installed.

~~**502.4.3 Sealing of the building envelope.** Openings and penetrations in the building envelope shall be sealed with caulking materials or closed with gasketing systems compatible with the construction materials and location. Joints and seams shall be sealed in the same manner or taped or covered with a moisture vapor-permeable wrapping material. Sealing materials spanning joints between construction materials shall allow for expansion and contraction of the construction materials.~~

502.4.5 Outdoor air intakes and exhaust openings. Stair and elevator shaft vents and other outdoor air intakes and exhaust openings ~~integral to the building envelope~~ that penetrate the air barrier shall be equipped with not less than a Class I motorized, leakage-rated damper with a maximum leakage rate of 4 cfm per square foot (6.8 L/s · C m_2) at 1.0 inch water gauge (w.g.) (1250 Pa) when tested in accordance with AMCA 500D.

Such dampers shall be set in the closed position and automatically open upon:

1. The activation of any fire alarm initiating device of the building's fire alarm system;
2. The interruption of power to the damper.

Exception: Gravity (nonmotorized) dampers are permitted to be used in buildings less than three stories in height above grade.

Reason: Airtight buildings significantly contribute to the reduction of energy use of a building. By installing an air barrier in a building, the heating and cooling load of a building is reduced as air that infiltrates into a building to replace the air that has exfiltrated needs to be conditioned. Reduction in infiltrated air means a reduction in the energy used to condition it. As many existing building materials meet the requirement for air permeance, they only need to be sealed. Sealing of the building envelope was an existing requirement so no additional costs are incurred. The modifications make it easier for the authority having jurisdiction to determine compliance with this part of the IECC.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DALGLEISH-EC-1-502.4.DOC

EC182–09/10

202 (New), 502.4, 502.8 (New)

Proponent: Ronald Majette, representing US Department of Energy

1. Add new definition as follows:

SITE. A contiguous area of land that is under the ownership or control of one entity.

2. Add new text as shown:

502.4 Building Integrated Renewable Energy System (Prescriptive). Each building shall be equipped with a renewable energy system, which has the capacity to provide 5 percent of the total energy use of the building on an

annual basis. The renewable energy system shall be permitted to be located anywhere on the *building site* and must be capable of being used during daylight hours to provide power for the systems covered in Section 505.7 before being used elsewhere in the building, stored on site and/or transferred back to the grid.

505.7 Hallway and Loading Dock Lighting (Prescriptive). All hallway and loading dock lighting shall be provided with dedicated electrical circuits powered by a renewable energy system.

Exceptions:

1. Loading dock areas for law enforcement, fire, ambulance, and other emergency service vehicles
2. Loading docks and hallways that are not intended for daytime use
3. Where approved by the code official due to building site conditions or lack of building surface areas to support the necessary renewable energy system

3. Revise as follows:

~~**505.7**~~ **505.8 Electrical energy consumption. (Mandatory).** In buildings having individual dwelling units, provisions shall be made to determine the electrical energy consumed by each tenant by separately metering individual dwelling units.

Reason: The availability of renewable energy resources to provide electric power is well known and technology exists today to provide cost effective solutions to replace power generated from non-renewables with power from renewables. This proposal requires such use where the building site or building surfaces will accommodate such installations.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Majette-EC-32-502.4-

EC183–09/10
502.4.1, 502.4.2

Proponent: Thomas D. Culp, Ph.D., Birch Point Consulting LLC, representing Aluminum Extruders Council

Revise as follows:

502.4 Air leakage (Mandatory).

502.4.1 Window and door assemblies. The air leakage of windows, skylights, and ~~sliding or swinging~~ door assemblies that are part of the building envelope shall be determined in accordance with AAMA/WDMA/CSA 101/I.S.2/A440, or NFRC 400 by an accredited, independent laboratory, and labeled and certified by the manufacturer. ~~and shall not exceed the values in Section 402.4.2.~~ Windows and skylights shall have an air leakage rate of no more than 0.2 cfm per square foot (1.0 L/s/m^2) when tested at a pressure of at least 1.57 pounds per square foot (psf) (75 Pa), or 0.3 cfm per square foot (1.5 L/S/m^2) when tested at a pressure of at least 6.24 pounds per square foot (psf) (300 Pa). Door assemblies shall have an air leakage rate of no more than 0.3 cfm per square foot (1.5 L/s/m^2).

Exception: Site-constructed windows and doors that are weatherstripped or sealed in accordance with Section 502.4.3, and commercial entrance doors covered by Section 502.4.2.

502.4.2 Curtain wall, storefront glazing and commercial entrance doors. Curtain wall, storefront glazing and commercial-glazed swinging entrance doors and revolving doors shall be tested for air leakage at a pressure of at least 1.57 pounds per square foot (psf) (75 Pa) in accordance with ASTM E 283. For curtain walls and storefront glazing, the maximum air leakage rate shall be ~~0.3~~ 0.06 cubic foot per minute per square foot (cfm/ft2) (~~5.5~~ 1.1 m3/h × m^2) of fenestration area. For commercial glazed swinging entrance doors and revolving doors, the maximum air leakage rate shall be 1.00 cfm/ft^2 (18.3 m3/h × m^2) of door area when tested in accordance with ASTM E 283.

Exception: Site-constructed fenestration and door products that are weatherstripped or sealed in accordance with Section 502.4.3.

Reason: The fenestration air leakage requirements have not been updated for many years, and there is an opportunity to increase stringency of this section. This proposal includes a significant yet realistic improvement in the air leakage for both curtainwall and commercial windows. Air leakage for both residential and commercial fenestration products are currently required to be measured in accordance with ASTM E283 at a test pressure of 1.57 psf. However, in actual practice, architectural specifications often require a higher test pressure of 6.24 psf, where commercial and architectural grade windows commonly achieve 0.3 cfm/ft2 or even 0.1 cfm/ft2 air leakage, and even lower for curtainwall. The air leakage increases with pressure by a factor of L2/L1 = (P2^n)/(P1^n) where n is between 1/2 and 1. Therefore, testing at 6.24 psf is 2-4 times more stringent than the standard testing at 1.57 psf. Put another way, these architectural grade windows would achieve an air leakage rate of between 0.08 – 0.15 cfm/ft2 at the normal test pressure – far below the current requirement.

Therefore, there is a reasonable opportunity for additional energy savings by further strengthening the air leakage requirement. The current language references the residential air leakage requirements in Section 402.4.2. This proposal is intended for commercial products, so rather than referring to the residential chapter, separate and more stringent requirements are explicitly spelled out here in the commercial chapter. We propose to moderately decrease the window and skylight requirement from 0.3 cfm/ft2 to 0.2 cfm/ft2 when being tested at the more standard 1.57 psf, but also leave the 0.3 cfm/ft2 for those products tested at the higher 6.24 psf. This is actually more stringent at the higher test pressure (equivalent to 0.08-0.15 cfm/ft2 at the lower pressure), but we did not feel comfortable lowering the corresponding air leakage at the lower 1.57 psf test pressure to below 0.2 cfm/ft2 to account for lighter products used in light commercial applications. The curtainwall value was reduced to 0.06 cfm/ft2, which our curtainwall manufacturers have confirmed as realistic and appropriate, considering the large fixed glazing area and lower ratio of perimeter frame length to glass area.

For a medium office building (3-story, 56,000 ft2, 40% WWR), the whole building energy savings are estimated to be 1-2% site energy / 0.5-1% source energy for windows, and 2-4.5% site energy / 1-2.5% source energy for curtainwall.

Cost Impact: The code change proposal will not increase the cost of construction, as current products are already achieving these performance levels.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CULP-EC-2-502.4.1-502.4.2.DOC

EC184–09/10
502.4.1 (New), 502.4.3

Proponent: Theresa Weston, PhD., representing DuPont Building Innovations

1. Add new text as follows:

502.4.1 Air Barriers. The building envelope shall be designed and constructed with a continuous air barrier to control air leakage into, or out of the conditioned space. An air barrier system shall also be provided for interior separations between conditioned space and a space designed to maintain temperature levels higher than 50 degrees for heating and less than 85 degrees for cooling or spaces that are designed to operate with humidity levels of less than 20% or more than 60 percent relative humidity.

The air barrier shall have the following characteristics:

1. It shall be continuous, with all joints made airtight per Section 502.4.4
2. Materials used for the air barrier system shall have an air permeability not to exceed 0.004 cfm/ft2 under a pressure differential of 0.3 in. water (1.57psf) (0.02 L/s.m2 @ 75 Pa) when tested in accordance with ASTM E 2178. Air barrier materials shall be taped or sealed in accordance with the manufacturer's instructions.
3. Air barrier materials shall be maintainable, or, if inaccessible, shall meet the durability requirements for the service life of the envelope assembly.

2. Revise as follows:

~~502.4.3~~ 502.4.4 Sealing of the opaque building envelope. Openings and penetrations in the building envelope shall be sealed with caulking materials or closed with gasketing systems compatible with the construction materials and location. Joints and seams shall be sealed in the same manner or taped or covered with a moisture vapor-permeable wrapping material. Sealing materials spanning joints between construction materials shall allow for expansion and contraction of the construction materials due to thermal and moisture variations and creep. Connections shall be made between:

1. Joints around *fenestration* and *door* frames
2. Junctions between *walls* and foundations, between *walls* at building corners, between *walls* and structural *floors* or *roofs*, and between *walls* and *roof* or *wall* panels
3. Openings at penetrations of utility services through *roofs*, *walls*, and *floors*
4. Site-built *fenestration* and *doors*
5. Building assemblies used as ducts or plenums

6. All other openings in the *building envelope*

Reason: Although the code currently contains requirements parts of the building, the code lacks a comprehensive statement of how air sealing of the whole building is achieved. This proposal introduces a framework to tie together existing language on sealing individual parts of the buildings. This IECC code proposal also includes quantitative, measurable air leakage rates for air barrier materials in order to significantly improve envelope performance and reduce a building's energy consumption.

Building envelope airtightness can have a significant impact on HVAC energy use. Many references exist on the impact of air leakage on HVAC energy use. According to DOE, NRCC, and others, uncontrolled air movement through the building envelope (infiltration and exfiltration) can account for up to 50% of heating and a significant part of cooling loads, representing up to 30% of a building's annual HVAC costs [1, 2, 3, 4, 5, 6, 7].

Air Barriers are well known technologies for achieving airtightness for the opaque building envelope. The air barrier materials must have a very low air leakage rate. The National Building Code of Canada and the Massachusetts Building Code consider 0.004 cfm at 75 Pa (the air permeance of ½" unpainted gypsum board) as the maximum air leakage rate for the air barrier material as part of the opaque envelope. When essentially airtight materials are assembled together by sealing, taping, etc., the assembly will have a higher leakage than the original air barrier material, primarily due to higher leakage at the joints. Likewise, as the assemblies are joined together in a building, that building enclosure will leak more than the individual assemblies, once again primarily due to increased leakage at the joints between assemblies and at unanticipated openings. In order to achieve a reasonable whole building airtightness, the basic materials selected for the air barrier must be resistant to air leakage.

In spite of the common believe that the recent buildings are more airtight, analysis of field data show that whole building leakage rates far exceed the levels generally considered acceptable and the levels that were generally assumed were not being achieved. Clearly, the lack of quantitative air leakage rate standards has allowed very leaky buildings.

An Air Barrier proposal was developed by ASHRAE 90.1, and it is currently out for public review. This proposal requires that materials and assemblies that are acceptable as part of the continuous air barrier for the opaque building envelope shall comply with one of the following requirements (Section 5.4.3.1.3):

a. Materials air permeance not to exceed 0.004 cfm/ft2 under a pressure differential of 0.3" w.g. (1.57psf) (0.02 L/s.m2 @ 75 Pa) when tested in accordance with ASTM E 2178.

b. Assemblies average air leakage not to exceed 0.04 cfm/ft2 under a pressure differential of 0.3" w.g. (1.57psf) (0.2 L/s.m2 @ 75 Pa) when tested in accordance with ASTM E 2357 or ASTM E 1677.

References:

About Air Barriers, Air Barrier Association of America, www.airbarrier.org/aboutairbarriers.htm

Air Leakage, University of Waterloo, Building Engineering Group, www.civil.uwaterloo.ca/beg/air_leaks.htm

Air Leakage of Office Buildings, BSRIA, Technical Note 8/95, I. N. Potter, T. J. Jones, and W. B. Booth, www.construction-index.com/docbsriairle.html

Air Sealing, DOE, EERE, Technology Fact Sheet, www.eere.energy.gov/buildings/info/documents/pdfs/26448.pdf

Air Tightness Testing, A Guide for Clients and Contractors, BSRIA, Technical Note 19/2001, Nigel Potter

Energy Impacts of Air Leakage in U.S. Office Buildings, D. A. VanBronkhorst; A. K. Persily; S. J. Emmerich, http://fire.nist.gov/bfrlpubs/build95/PDF/b95024.pdf

Understanding and Controlling Air Flow in Buildings Enclosures, John Straube, www.civil.uwaterloo.ca/beg/Downloads/8thBSTC%20Air%20Flow%20Control.pdf

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Weston-EC-3-502.4.1

EC185–09/10
202 (New), 502.4.7

Proponent: Ronald Majette, representing US Department of Energy

1. Add new definition as follows:

BUILDING ENTRANCE. Any door, set of doors, doorway, or other form of portal that is used to gain access to the building from the outside by the public.

2. Revise as follows:

502.4.7 Vestibules. All *building entrances* ~~A door that separates *conditioned space* from the exterior~~ shall be protected with an enclosed vestibule, with all doors opening into and out of the vestibule equipped with self-closing devices. Vestibules shall be designed so that in passing through the vestibule it is not necessary for the interior and exterior doors to open at the same time. The installation of one or more revolving doors in the building entrance shall not eliminate the requirement that a vestibule be provided for any doors adjacent to revolving doors.

Exceptions:

1. Buildings in climate Zones 1 and 2 as indicated in Figure 301.1 and Table 301.1.
2. Doors not intended to be used ~~as a building *entrance door*~~ by the public, such as doors to mechanical or electrical equipment rooms or intended solely for employee use.
3. Doors opening directly from a *sleeping unit* or dwelling unit.
4. Doors that open directly from a space less than 3,000 square feet (298 m2) in area.
5. ~~Revolving doors.~~
6. 5. Doors used primarily to facilitate vehicular movement or material handling and adjacent personnel doors.

Reason: Currently it is unclear in the application of the IECC what door situations require vestibules. One reason for that is the term building entrance is not defined. It is defined in ASHRAE 90.1-07 and for consistency Chapter 5 should lead users to the same end point as Standard 90.1-07. Currently it does not and as a result doors that should have vestibules do not. An example are doors in large retail buildings that have adjacent but exterior sales areas that are separated by the building thermal envelope from the interior of the building and are constantly being used by customers. Application with respect to revolving doors is clarified in that the code can be interpreted that if a revolving door is in the entrance that no vestibule is needed at all.

Cost Impact: The code change will increase the cost of construction to the degree that some doors that would not otherwise have vestibules under the current IECC will now be required to provide them.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Majette-EC-44-202-502.4.7

EC186–09/10
502.9 (New)

Proponent: Ronald Majette, representing US Department of Energy

Add new text as follows:

502.9 Insulation of radiant heating systems. Radiant panels, and associated U-bends and headers, designed for sensible heating of an indoor space through heat transfer from the thermally effective panel surfaces to the occupants and/or indoor space by thermal radiation and natural convection and the bottom surfaces of floor structures incorporating radiant heating shall be insulated with a minimum of R-3.5 (0.62 m2/K*W).

Reason: For consistency with Standard 90.1. This proposal is based on ongoing analysis efforts within ASHRAE designed to create a Standard 90.1-2010 that is 30% better than Standard 90.1-2004 in response to Federal legislation. Paralleling those efforts and considering that the IECC Chapter 5 is intended to be technically compatible with that standard to facilitate adoption and implementation, DOE is interested in keeping Chapter 5 of the 2012 IECC aligned with ANSI/ASHRAE/IESNA Standard 90.1-2010. Due to the timing of the code development process and ASHRAE standards processes this proposal was submitted in anticipation that by the final action hearings the work to update the standard would be complete.

Radiant heating and radiant cooling panels transfer heat to and from occupied spaces primarily via radiation. In some applications (e.g. radiant panels in lay-in ceilings), the back sides of the panels are exposed to unconditioned, indirectly conditioned, or semiheated spaces. In these applications heat transfer from the backs of radiant panels are of less value (and in some conditions negative value). This proposal recommends adding a requirement for insulating the surfaces of radiant panels that do not face conditioned spaces because it will save energy.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Majette-EC-6-502.9

EC187–09/10
202 (New)

Proponent: Ronald Majette, representing US Department of Energy

Add new definitions as follows:

COEFFICENT OF PERFORMANCE (COP)—COOLING. The ratio of the rate of heat removal to the rate of energy input, in consistent units, for a complete refrigerating system or some specific portion of that system under designated operating conditions.

COEFFICIENT OF PERFORMANCE (COP)—HEATING. The ratio of the rate of heat removal to the rate of heat delivered to the rate of energy input, in consistent units, for a complete heat pump system, including the compressor and, if applicable, auxiliary heat, under designated operating conditions.

INTEGRATED PART LOAD VALUE (IPLV). A single-number figure of merit based on part-load EER, COP, or kW/ton expressing part-load efficiency for air-conditioning and heat pump equipment on the basis of weighted operation at various load capacities for equipment.

NONSTANDARD PART LOAD VALUE (NPLV). A single-number part-load efficiency figure of merit calculated and referenced to conditions other than IPLV conditions, for units that are not designed to operate at ARI standard rating conditions.

Reason: These terms are used in Section 503.2.3. The proposed definitions are from ASHRAE Standard 90.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAJETTE-EC-31-202

EC188–09/10
503

Proponent: David Cohan, representing Northwest Energy Efficiency Alliance

Revise as follows:

SECTION 503
BUILDING MECHANICAL SYSTEMS

503.2.1 Calculation of heating and cooling loads. Design loads shall be determined in accordance with the procedures described in the ASHRAE/ACCA Standard 183. The design loads shall account for the building envelope, lighting, ventilation and occupancy loads based on the project design. Heating and cooling loads shall be adjusted to account for load reductions that are achieved when energy recovery systems are utilized in the HVAC system in accordance with the ASHRAE *HVAC Systems and Equipment Handbook*. Alternatively, design loads shall be determined by an *approved* equivalent computation procedure, using the design parameters specified in Chapter 3.

503.2.5.1 Demand controlled ventilation. Demand control ventilation (DCV) is required for spaces larger than 500 ft^2 (50m^2) and with an average occupant load of 40 25 people per 1000 ft^2(93 m^2) of floor area (as established in Table 403.3 of the *International Mechanical Code*) and served by systems with one or more of the following:

1. An air-side economizer;
2. Automatic modulating control of the outdoor air damper; or
3. A design outdoor airflow greater than 3,000 cfm (1400 L/s).

Exceptions:

1. Systems with energy recovery complying with Section 503.2.6.
2. Multiple-zone systems without direct digital control of individual zones communicating with a central control panel.
3. System with a design outdoor airflow less than 1,200 cfm (600 L/s).
4. Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1,200 cfm (600 L/s).
5. Building spaces where the primary ventilation needs are for process loads.

~~**503.2.9 HVAC system completion.** Prior to the issuance of a certificate of occupancy, the design professional shall provide evidence of system completion in accordance with Sections 503.2.9.1 through 503.2.9.3.~~

~~**503.2.9.1 Air system balancing.** Each supply air outlet and *zone* terminal device shall be equipped with means for air balancing in accordance with the requirements of Chapter 6 of the *International Mechanical Code*. Discharge dampers are prohibited on constant volume fans and variable volume fans with motors 10 horsepower (hp) (7.4 kW) and larger.~~

~~**503.2.9.2 Hydronic system balancing.** Individual hydronic heating and cooling coils shall be equipped with means for balancing and pressure test connections.~~

~~**503.2.9.3 Manuals.** The construction documents shall require that an operating and maintenance manual be provided to the building owner by the mechanical contractor.~~

~~The manual shall include, at least, the following:~~

1. ~~Equipment capacity (input and output) and required maintenance actions.~~
2. ~~Equipment operation and maintenance manuals.~~
3. ~~HVAC system control maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions. Desired or field-determined setpoints shall be permanently recorded on control drawings, at control devices or, for digital control systems, in programming comments.~~
4. ~~A complete written narrative of how each system is intended to operate.~~

503.2.9 Mechanical systems commissioning and completion requirements. Mechanical systems commissioning and completion shall be in accordance with the provisions of Section 503.2.9.1 through 503.2.9.3.4.

503.2.9.1 System commissioning. Commissioning is a process that verifies and documents that the selected building systems have been designed, installed, and function according to the owner's project requirements and construction documents, and to minimum code requirements. Drawing notes shall require commissioning and completion requirements in accordance with this section. Drawing notes may refer to equipment specifications for further requirements. Copies of all documentation shall be given to the owner. The building official may request commissioning documentation for review purposes. At the time of plan submittal, the building jurisdiction shall be provided, by the submittal authority, a letter of intent to commission the building in accordance with this code.

503.2.9.1.1 Commissioning plan. A commissioning plan shall include as a minimum the following items:

1. A detailed explanation of the building's project requirements for mechanical design,
2. A narrative describing the activities that will be accomplished during each phase of commissioning, including guidance on who accomplishes the activities and how they are completed,
3. Equipment and systems to be tested, including the extent of tests,
4. Functions to be tested (for example calibration, economizer control, etc.),
5. Conditions under which the test shall be performed (for example winter and summer design conditions, full outside air, etc.), and
6. Measurable criteria for acceptable performance.

503.2.9.1.2 Systems adjusting and balancing. All HVAC systems shall be balanced in accordance with generally accepted engineering standards. Air and water flow rates shall be measured and adjusted to deliver final flow rates within 10% of design rates. Test and balance activities shall include as a minimum the following items:

1. **Air systems balancing**: Each supply air outlet and zone terminal device shall be equipped with means for air balancing in accordance with the requirements of Chapter 6 of the International Mechanical Code. Discharge dampers are prohibited on constant volume fans and variable volume fans with motors 10 hp (18.6 kW) and larger. Air systems shall be balanced in a manner to first minimize throttling losses then, for fans with system power of greater than 1 hp, Fan speed shall be adjusted to meet design flow conditions.

   Exception: Fan with fan motors of 1 hp or less.

2. **Hydronic systems balancing:** Individual hydronic heating and cooling coils shall be equipped with means for balancing and pressure test connections. Hydronic systems shall be proportionately balanced in a manner to first minimize throttling losses, then the pump impeller shall be trimmed or pump speed shall be adjusted to meet design flow conditions. Each hydronic system shall have either the ability to measure pressure across the pump, or test ports at each side of each pump.

   Exceptions:

   1. Pumps with pump motors of 5 hp or less.
   2. When throttling results in no greater than 5% of the nameplate horsepower draw above that required if the impeller were trimmed.

503.2.9.1.3 Functional performance testing. Equipment functional performance testing shall be in accordance with Section 503.2.9.1.3.1. Functional testing of HVAC controls shall be in accordance with Section 503.2.9.1.3.2.

503.2.9.1.3.1 Equipment functional performance testing. Equipment functional performance testing shall demonstrate the correct installation and operation of components, systems, and system-to-system interfacing relationships in accordance with approved plans and specifications. This demonstration is to prove the operation, function, and maintenance serviceability for each of the Commissioned systems. Testing shall include all modes of operation, including:

1. All modes as described in the Sequence of Operation,
2. Redundant or automatic back-up mode,
3. Performance of alarms, and
4. Mode of operation upon a loss of power and restored power.

   Exception: Unitary or packaged HVAC equipment listed in Tables 503.2.3 (1) through (3) that do not require supply air economizers.

503.2.9.1.3.2 Controls functional performance testing. HVAC control systems shall be tested to document that control devices, components, equipment, and systems are calibrated, adjusted and operate in accordance with approved plans and specifications. Sequences of operation shall be functionally tested to document they operate in accordance with approved plans and specifications.

503.2.9.1.4 Preliminary commissioning report. A preliminary report of commissioning test procedures and results shall be completed and provided to the Owner. The report shall be identified as "Preliminary Commissioning Report" and shall identify:

1. Itemization of deficiencies found during testing required by this section which have not been corrected at the time of report preparation and the anticipated date of correction.
2. Deferred tests which cannot be performed at the time of report preparation due to climatic conditions.
3. Climatic conditions required for performance of the deferred tests, and the anticipated date of each deferred test.

503.2.9.2 Acceptance. Buildings, or portions thereof, required by this code to comply with this section shall not be issued a final certificate of occupancy allowing public or owner occupation until such time that the building official has received a letter of transmittal from the building owner that states they have received the Preliminary Commissioning Report as required by Section 503.2.9.1.4. At the request of the code official, a copy of the Preliminary Commissioning Report shall be made available for review.

503.2.9.3 Completion requirements. The construction documents shall require that within 90 days after the date of final certificate of occupancy, the documents described in this section be provided to the building owner.

503.2.9.3.1 Drawings. Construction documents shall include as a minimum the location and performance data on each piece of equipment.

503.2.9.3.2 Manuals. An operating manual and a maintenance manual shall be in accordance with industry-accepted standards and shall include, at a minimum, the following:

1. Submittal data stating equipment size and selected options for each piece of equipment requiring maintenance.
2. Manufacturer's operation manuals and maintenance manuals for each piece of equipment requiring maintenance, except equipment not furnished as part of the project. Required routine maintenance actions shall be clearly identified.
3. Names and addresses of at least one service agency.
4. HVAC controls system maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions. Desired or field-determined setpoints shall be permanently recorded on control drawings at control devices or, for digital control systems, in programming comments.
5. A complete narrative of how each system is intended to operate, including suggested setpoints.

503.2.9.3.3 System balancing report. A written report describing the activities and measurements completed in accordance with Section 503.2.9.1.2

503.2.9.3.4 Final commissioning report. A complete report of test procedures and results identified as "Final Commissioning Report" shall include:

1. Results of all Functional Performance Tests.
2. Disposition of all deficiencies found during testing, including details of corrective measures used or proposed.
3. All Functional Performance Test procedures used during the commissioning process including measurable criteria for test acceptance, provided herein for repeatability.

   Exception: Deferred tests which cannot be performed at the time of report preparation due to climatic conditions.

Reason: This proposal takes a large step toward ensuring that the energy savings potential inherent in the IECC is actually achieved in buildings. Commissioning is a systematic process of verification and documentation that ensures that the selected building systems have been designed, installed and function properly, efficiently, and can be maintained in accordance with the contract documents in order to satisfy the building owner's design intent and operational requirements. Almost 20 years of well-documented experience show that, in the absence of commissioning, building systems commonly do not operate as designed or intended. This results in poor energy performance and uncomfortable occupants.

In 2004, Lawrence Berkeley National Laboratory published a study entitled "THE COST-EFFECTIVENESS OF COMMERCIAL-BUILDINGS COMMISSIONING, A Meta-Analysis of Energy and Non-Energy Impacts in Existing Buildings and New Construction in the United States" which analyzed results from 224 buildings across 21 states, representing 30.4 million square feet of commissioned floor area (73 percent in existing buildings and 27 percent in new construction). These projects collectively represent $17 million ($2003) of commissioning investment. The new-construction cohort represents $1.5 billion of total construction costs.

For existing buildings, they found median commissioning costs of $0.27/ft2, whole-building energy savings of 15 percent, and payback times of 0.7 years. For new construction, median commissioning costs were $1.00/ft2 (0.6 percent of total construction costs), yielding a median payback time of 4.8 years (excluding quantified non-energy impacts). These results are conservative insofar as the scope of commissioning rarely spans all fuels and building systems in which savings may be found, not all recommendations are implemented, and significant first-cost and ongoing non-energy benefits are rarely quantified.

The study notes that, "Some view commissioning as a luxury and 'added' cost, yet it is only a barometer of the cost of errors promulgated by other parties involved in the design, construction, or operation of buildings. Commissioning agents are just the 'messengers'; they are only revealing and identifying the means to address pre-existing problems". The study concludes that "commissioning is one of the most cost-effective means of improving energy efficiency in commercial buildings."

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COHAN-EC-2-503.DOC

EC189–09/10
503.2.1

Proponent: Ronald Majette, representing US Department of Energy

Revise and relocate as follows:

~~**302.1** **503.2.1 Calculation of heating and cooling loads.** Design loads shall be determined in accordance with the procedures described in the ASHRAE/ACCA Standard 183. Heating and cooling loads shall be adjusted to account for load reductions that are achieved when energy recovery systems are utilized in the HVAC system in accordance with the ASHRAE *HVAC Systems and Equipment Handbook*. Alternatively, design loads shall be determined by an *approved* equivalent computation procedure, using ~~the design parameters specified in Chapter 3.The~~ an interior design temperature~~s used for heating and cooling load calculations shall be a maximum of~~ no more than 72ºF (22ºC) for heating and ~~minimum of~~ no less than 75ºF (24ºC) for cooling.

Reason: The current title of Chapter 3 is not consistent with the content of the Chapter. The content of Section 302 is more relevant to Section 503.2.1 and is proposed to be located therein with the issue of load calculations and equipment sizing. The deletion of design conditions from Chapter 3 on climate zones eliminates the need to reference those design loads as an alternative in Section 503.2.1. The content in Section 303 is more appropriate in Chapters 4 and 5 at locations where it is relevant and is not related to climate zones.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Majette-EC-60-503.2.1

EC190–09/10
503.2.10.3 (New)

Proponent: Krista Braaksma, representing Washington State Building Code Council

Add new text as follows:

503.2.10.3 Motor efficiency. Single-speed, polyphase, 500 horsepower or less, 2, 4, and 6 pole, squirrel cage induction motors, not addressed elsewhere in this Code, shall meet or exceed the nominal energy efficiency levels of NEMA Design A or B, Premium Efficiency Motors. Evidence of compliance shall be by a visible label stating that the motor is a "NEMA Premium" product.

Reason: Electric motors have a significant impact on the total energy operating cost for industrial, institutional and commercial buildings.

Electric motors vary in terms of energy efficiency. The NEMA Premium program assists purchasers to identify higher efficient motors.

Based on U.S. Department of Energy data, it is estimated that the NEMA Premium motor program would save 5,800 gigawatts of electricity and prevent the release of nearly 80 million metric tons of carbon into the atmosphere over the next ten years. This is equivalent to keeping 16 million cars off the road.

The Federal Government has recently incentivized the purchase of NEMA Premium motors by creating a federal rebate program. The IECC should recognize the significant savings to be gained through the use of the most energy efficient technology and construction currently available for motors.

Cost Impact: The code change proposal will increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BRAAKSMA-EC-3-503.2.10.3

EC191–09/10
503.2.3, Table 503.2.3(8) (New), Table 503.2.3(9) (New), Chapter 6

Proponent: Steve Ferguson, representing The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

1. Revise as follows:

503.2.3 HVAC equipment performance requirements. Equipment shall meet the minimum efficiency requirements of Tables 503.2.3(1), 503.2.3(2), 503.2.3(3), 503.2.3(4), 503.2.3(5), 503.2.3(6) ~~and~~ 503.2.3(7), and 503.2.3(8) when tested and rated in accordance with the applicable test procedure. Requirements for plate type liquid to liquid heat exchangers can be found in Table 503.2.3(9). The efficiency shall be verified through certification under an *approved* certification program or, if no certification program exists, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein.

Exception: Water-cooled centrifugal water-chilling packages listed in Table 503.2.3(7) not designed for operation at ARHI Standard 550/590 test conditions of 44°F (7°C) leaving chilled water temperature and 85°F (29°C) entering condenser water temperature with 3 gpm/ton (0.054 l/s.kW) condenser water flow shall have maximum full load and NPLV ratings adjusted using the following equations:

Adjusted maximum full load kW/ton rating = [full load kW/ton from Table 503.2.3(7)]/K_{adj}

Adjusted maximum NPLV rating = [IPLV from Table 503.2.3(7)]/K_{adj}

where:

$K_{adj} = 6.174722 - 0.303668(X) + 0.00629466(X)^2 - 0.000045780(X)^3$

$X = DT_{std} + LIFT$

DT_{std} = {24+[full load kW/ton from Table 503.2.3(7)] × 6.83}/Flow

Flow = Condenser water flow (GPM)/Cooling Full Load Capacity (tons)

LIFT = CEWT – CLWT (°F)

CEWT = Full Load Condenser Entering Water Temperature (°F)

CLWT = Full Load Leaving Chilled Water Temperature (°F)

The adjusted full load and NPLV values are only applicable over the following full-load design ranges:

Minimum Leaving Chilled Water Temperature: 38°F (3.3°C)

Maximum Condenser Entering Water Temperature: 102°F (38.9°C)

Condensing Water Flow: 1 to 6 gpm/ton 0.018 to 0.1076 l/s ◦ kW) and X ≥ 39 and ≤ 60

Chillers designed to operate outside of these ranges or applications utilizing fluids or solutions with secondary coolants (e.g., glycol solutions or brines) with a freeze point of 27°F (-2.8°C) or lower for freeze protection are not covered by this code.

2. Add new table as follows:

TABLE 503.2.3(8)
HEAT REJECTION EQUIPMENT, MINIMUM EFFICIENCY REQUIREMENTS

Equipment Type[d]	Total System Heat Rejection Capacity at Rated Conditions	Subcategory or Rating Condition	Performance Required[a,b,c]	Test Procedure[e,d]
Propeller or Axial Fan Open Circuit Cooling Towers	All	95°F Entering Water 85°F Leaving Water 75°F Entering wb	≥38.2 gpm/hp	CTI ATC-105 and CTI STD-201
Centrifugal Fan Open Circuit Cooling Towers	All	95°F Entering Water 85°F Leaving Water 75°F Entering wb	≥20.0 gpm/hp	CTI ATC-105 and CTI STD-201
Propeller or Axial Fan Closed Circuit Cooling Towers	All	102°F Entering Water 90°F Leaving Water 75°F Entering wb	≥14.0 gpm/hp	CTI ATC-105S and CTI STD-201
Centrifugal Closed Circuit Cooling Towers	All	102°F Entering Water 90°F Leaving Water 75°F Entering wb	≥ 7.0 gpm/hp	CTI ATC-105S and CTI STD-201
Air-Cooled Condensers	All	125°F Condensing Temperature R-22 Test Fluid 190°F Entering Gas Temperature 15°F Subcooling 95°F Entering db	≥176,000 Btu/h·hp	ARI 460

For SI: °C - [(°F)-32]/1.8, L/s·kW – (gpm/hp)/(11.83), COP – (Btu/h·hp)/(2550.7)
db = dry bulb temperature, °F
wb = wet bulb temperature, °F
a. For purposes of this table, *open circuit cooling tower performance* is defined as the water flow rating of the tower at the thermal rating condition listed in Table 6.8.1G divided by the fan nameplate rated motor power.
b. For purposes of this table, *closed circuit cooling tower performance* is defined as the water flow rating of the tower at the thermal rating condition listed in Table 6.8.1G divided by the sum of the fan nameplate rated motor power and the spray pump nameplate rated motor power.
c. For purposes of this table, *air-cooled condenser performance* is defined as the heat rejected from the refrigerant divided by the fan nameplate rated motor power.
d. Section 12 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.
e. The efficiencies and test procedures for both open and closed circuit cooling towers are not applicable to hybrid cooling towers that contain a combination of wet and dry heat exchange sections.

TABLE 503.2.3(9)
HEAT TRANSFER EQUIPMENT

Equipment Type	Subcategory	Minimum Efficiency*	Test Procedure†
Liquid to Liquid Heat Exchangers	Plate Type	NR	ARI 400

***** NR = No Requirement
† Section 12 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

3. Add new standards as follows:

CTI Cooling Technology Institute,
2611 FM 1960 West, Suite A-101
Houston, TX 77068-3730;
P.O. Box 73383
Houston, TX 77273-3383

CTI ATC-105 (00) Acceptance Test Code for Water Cooling Towers
CTI STD-201 (04) Standard for Certification of Water Cooling Tower Thermal Performance

AHRI
ARI 400-2001 with Addendum 2 Liquid to Liquid Heat Exchangers

Reason: Adding these tables into the IECC will set minimum efficiencies for open and closed circuit cooling towers along with air cooled condensers. These tables also require the use of independently certified open circuit cooling towers, closed circuit cooling towers, and plate type liquid to liquid heat exchangers.

This proposal will make the IECC consistent with requirements published in addenda "a", "L", and "ad" to ASHRAE Standard 90.1 –2007.

Cost Impact: None. Most manufacturers already meet these requirements due to similar requirements in ASHRAE SSPC 90.1. Updating the IECC will further reinforce the use of these requirements.

Analysis: A review of the standard(s) proposed for inclusion in the code, ARI 400-01, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Ferguson-EC-5-503.2.3-T. 503.2.3(8)-Ch 6

EC192–09/10

503.2.3, 503.2.3.1 (New), 503.2.3.2 (New), Table 503.2(7)

Proponent: Ronald Majette, representing US Department of Energy

1. Revise as follows:

503.2.3 HVAC equipment performance requirements. Equipment shall meet the minimum efficiency requirements of Tables 503.2.3(1), 503.2.3(2), 503.2.3(3), 503.2.3(4), 503.2.3(5), 503.2.3(6) and 503.2.3(7) when tested and rated in accordance with the applicable test procedure. The efficiency shall be verified through certification under an *approved* certification program or, if no certification program exists, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein.

503.2.3.1 ~~Exception:~~ Water-cooled centrifugal chilling packages. ~~Water-cooled centrifugal water-chilling packages~~ Equipment ~~listed in Table 503.2.3(7)~~ not designed for operation at ARHI Standard 550/590 test conditions of 44°F (7°C) leaving chilled water temperature and 85°F (29°C) entering condenser water temperature with 3 gpm/ton (0.054 l/s.kW) condenser water flow, and as such whose testing results cannot be readily evaluated against the requirements in Table 503.2.3(7), shall have maximum full load and ~~N~~IPLV ratings in Table 503.2.3(7) adjusted using the following equations and the actual equipment ratings evaluated against the adjusted IPLV:

Adjusted maximum full load kW/ton rating = [full load kW/ton from Table 503.2.3(7)]/*K*adj

Adjusted maximum NPLV rating = [IPLV from Table 503.2.3(7)]/*K*adj

where:

$K\text{adj} = 6.174722 - 0.303668(X) + 0.00629466(X)^2 - 0.000045780(X)^3$
$X = DT\text{std} + \text{LIFT}$
$DT\text{std} = \{24+[\text{full load kW/ton from Table 503.2.3(7)}] \times 6.83\}/\text{Flow}$

Flow = Condenser ~~water~~ fluid flow (GPM)/Cooling Full Load Capacity (tons)
LIFT = CEWT – CLWT (_F)
CEWT = Full Load Condenser Entering ~~Water~~ Fluid Temperature (°F)
CLWT = Full Load Leaving Chilled ~~Water~~ Fluid Temperature (°F)

The adjusted full load and NPLV rating values are only applicable to centrifugal chillers meeting all of ~~over~~ the following full-load design ranges:

Minimum Leaving Chilled ~~Water~~ Fluid Temperature: 38°F (3.3°C)

Maximum Condenser Entering ~~Water~~ Fluid Temperature: 102°F (38.9°C)

Condensing ~~Water~~ Fluid Flow: 1 to 6 gpm/ton (0.018 to 0.1076 1/s · kW) and X >= 39 and <= 60

Centrifugal ~~C~~chillers designed to operate outside of these ranges ~~or applications utilizing fluids or solutions with secondary coolants (e.g., glycol solutions or brines) with a freeze point of 27°F (-2.8°C) or lower for freeze protection~~ are not covered by this code.

2. Add new text as follows:

503.2.3.2 Positive displacement (air- and water-cooled) chilling packages. Equipment with a leaving fluid temperature higher than 32°F (0°C), shall meet the requirements of Table 503.2.3(7) when tested or certified with water at standard rating conditions, per the referenced test procedure.

3. Revise table footnote as follows:

TABLE 503.2.3(7)
WATER CHILLING PACKAGES, EFFICIENCY REQUIREMENTS[a]
(No change to table content)

For SI: 1 ton = 907 kg, 1 British thermal unit per hour = 0.2931 W.

a. The centrifugal chiller equipment requirements, after adjustment in accordance with Section 503.2.3.1 or 503.2.3.2, do not apply ~~for~~ to chillers used in low-temperature applications where the design leaving fluid temperature is < ~~40~~ 38ºF. The requirements do not apply to positive displacement chillers with leaving fluid temperatures <= 32 ºF. ~~The requirements do not apply to absorption chillers with design leaving fluid temperatures < 40ºF.~~

b. through e. (No change)

Reason: This proposal is based on ongoing analysis efforts within ASHRAE designed to create a Standard 90.1-2010 that is 30% better than Standard 90.1-2004 in response to Federal legislation. Paralleling those efforts and considering that the IECC Chapter 5 is intended to be technically compatible with that standard to facilitate adoption and implementation, DOE is interested in keeping Chapter 5 of the 2012 IECC aligned with ANSI/ASHRAE/IESNA Standard 90.1-2010. Due to the timing of the code development process and ASHRAE standards processes this proposal was submitted in anticipation that by the final action hearings the work to update the standard would be complete.

It was not the intent of Standard 90.1 upon which Chapter 5 is based to exempt all chillers with secondary coolants (glycol or brine) for freeze protection from coverage by Table 503.2.3(7) with adjustments per what was the exception and is now a new Section 503.2.3.1. This proposed change corrects the intent of the 90.1 and removes ambiguity. It brings more chillers under the scope of the IECC and therefore will save energy to the degree that some equipment is currently not regulated.

For example, positive-displacement (both air- and water-cooled) chillers with glycol added for freeze protection when the unit is off or for winter operation, would likely have used a secondary coolant with a freeze point below 27°F [-.8°C]. If the positive-displacement chiller were being designed to create a cooling temperature above 32°F [0°C], there is no reason it shouldn't be expected to comply with the proposed code language at the rating conditions and fluid listed in the referenced test procedure. Below 32°F [0°C], machine changes might hinder its ability to meet the requirements.

In addition, centrifugal chillers are outside the scope of Standard 90.1 when the design leaving fluid temperature is below 38°F [3.3°C], and the intent was that they would comply with water as the tested fluid at covered temperature and flow combinations. ARI Standard 550/590 does not allow for testing with secondary coolants, and it is impractical to require it in manufacturer's test facilities used for certification and performance tests.

This proposal changes footnote a to Table 503.2.3(7) in recognition of lower practical scope limits for positive displacement (both air- and water-cooled) and corrects for the lower limit introduced in Addendum M to Standard 90.1-07 for centrifugal chillers.

Cost Impact: The code change proposal will increase the cost of construction only to the degree that equipment that was not previously regulated will now have to satisfy minimum efficiency requirements.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Majette-EC-20-503.2.3

EC193–09/10
Tables 503.2.3(1) and 503.2.3(2) (New)

Proponent: Steve Ferguson, representing The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

Delete Tables 503.2.3(1)-(2) and substitute as follows:

TABLE 503.2.3(1)
UNITARY AIR CONDITIONERS AND CONDENSING UNITS,
MINIMUM EFFICIENCY REQUIREMENTS

Equipment Type	Size Category	Heating Section Type	Sub-Category or Rating Condition	Minimum Efficiency[a]	Test Procedure[b]
Air Conditioners, Air Cooled	≥65,000 Btu/h and <135,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	11.4 IEER	ARI 340/360
		All other	Split System and Single Package	11.2 IEER	
	≥135,000 Btu/h and <240,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	11.2 IEER	
		All other	Split System and Single Package	11.0 IEER	
	≥240,000 Btu/h and <760,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	10.1 IEER	
		All other	Split System and Single Package	9.9 IEER	
	≥760,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	9.8 IEER	
		All other	Split System and Single Package	9.6 IEER	
Air Conditioners, Water and Evaporatively Cooled	< 65,000 Btu/h	All	Split System and Single Package	12.3 IEER	ARI 210/240
	≥65,000 Btu/h and <135,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	11.7 IEER	ARI 340/360
		All other	Split System and Single Package	11.5 IEER	
	≥135,000 Btu/h and <240,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	11.2 IEER	
		All other	Split System and Single Package	11.0 IEER	
	≥240,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	11.1 IEER	
		All other	Split System and Single Package	10.9 IEER	

TABLE 503.2.3(2)
UNITARY AND APPLIED HEAT PUMPS, ELECTRICALLY OPERATED, MINIMUM EFFICIENCY REQUIREMENTS

Equipment Type	Size Category	Heating Section Type	Sub-Category or Rating Condition	Minimum Efficiency[a]	Test Procedure[b]
Air Cooled (Cooling Mode)	≥65,000 Btu/h and <135,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	11.2 IEER	ARI 340/360
		All other	Split System and Single Package	11.0 IEER	
	≥135,000 Btu/h and <240,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	10.7 IEER	
		All other	Split System and Single Package	10.5 IEER	
	≥240,000 Btu/h	Electric Resistance (or None)	Split System and Single Package	9.6 IEER	
		All other	Split System and Single Package	9.4 IEER	
Air Cooled (Heating Mode)	≥65,000 Btu/h and <135,000 Btu/h (Cooling Capacity)	–	47ºF db/43ºF wb Outdoor Air	3.3 COP	ARI 340/360
			17ºF db/15ºF wb Outdoor Air	2.25 COP	
	≥135,000 Btu/h (Cooling Capacity)	–	47ºF db/43ºF wb Outdoor Air	3.2 COP	
			17ºF db/15ºF wb Outdoor Air	2.05 COP	

Reason: This proposal updates Tables 503.2.3 (1) & (2) and makes them consistent with Tables 6.8.1 A & B published in the supplement to ASHRAE 90.1-2007. The new tables update the COP at 17°F efficiency levels for commercial heat pumps and introduce a new part load energy efficiency descriptor for all commercial unitary products above 65,000 Btu/h of cooling capacity. The new descriptor, called Integrated Energy Efficiency Ratio or IEER is proposed as a replacement to IPLV. The proposed IEER is a significant improvement over IPLV as it allows for uniform rating of all products including single and multi stage units. It is based on a weighted average of performance at 100%, 75%, 50% and 25% of capacity. The new part load metric is expected to more accurately rate the part load performance of commercial unitary equipment.

The new proposed IEER and COP at 17°F were derived based on the expected performance of commercial unitary products meeting the new full load EER and COP at 47°F requirements that will take effect on January 1, 2010. In addition, IEER values are now proposed for product classes with cooling capacities between 65,000 and 240,000 Btu/h, which previously had no IPLV minimums. This proposal will save energy and make the IECC consistent with the supplement to ASHRAE 90.1-2007.

Cost Impact: There are incremental cost increases based on the higher efficiency requirements. These increased efficiency requirements have been approved by ASHRAE and have been published in the supplement to ASHRAE 90.1-2007.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Ferguson-EC-2-T. 503.2.3(1)-(2)

EC194–09/10
Table 503.2.3(2), Chapter 6

Proponent: Ronald Majette, representing US Department of Energy

1. Delete Table 503.2.3(2) and substitute as follows:

~~**TABLE 503.2.3(2)**~~
~~**UNITARY AIR CONDITIONERS AND CONDENSING UNITS,**~~
~~**ELECTRICALLY OPERATED, MINIMUM EFFICIENCY REQUIREMENTS**~~

Equipment Type	Total System Heat Rejection Capacity at Rated Conditions	Subcategory or Rating Condition	Performance Required[a,b]	Test Procedure[c]
Propeller or axial fan cooling towers	All	95°F entering water 85°F leaving water 75°F wb *outdoor air*	≥38.2 gpm/hp	CTI ATC-105 and CTI STD-201
Centrifugal fan cooling towers	All	95°F entering water 85°F leaving water 75°F wb *outdoor air*	≥20.0 gpm/hp	CTI ATC-105 and CTI STD-201
Air-cooled condensers	All	125°F condensing temperature R-22 test fluid 190°F entering gas temperature 15°F subcooling 95°F entering db	≥176,000 Btu/h·hp	ARI 460

[a] For purposes of this table, cooling tower performance is defined as the maximum flow rating of the tower divided by the fan nameplate rated motor power.
[b] For purposes of this table, air-cooled condenser performance is defined as the heat rejected from the refrigerant divided by the fan nameplate rated motor power.
[c] Section 12 contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

2. Add new standard to Chapter 6 as follows:

CTI Cooling Tower Institute
2611 FM 1960 West
Suite A-101
Houston, TX 77068

CTI ARC-105(00) Acceptance Test Code for Water Cooling Towers
CTI STD-201(04) Standard for Certification of Water Cooling Tower Thermal Performance

Reason: For consistency with ASHRAE Standard 90.1.

Cost Impact: The code change proposal could increase the cost of construction to the degree that units of this nature previously having unregulated minimum efficiency will now have to satisfy these minimum requirements.

Analysis: A review of the standard(s) proposed for inclusion in the code, CTI ARC-105-00 and CTI STD-201-04, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Majette-EC-28-T. 503.2.3(2)

EC195–09/10
Table 503.2.3(2), Chapter 6

Proponent: Ronald Majette, representing US Department of Energy

1. Revise as follows:

TABLE 503.2.3(2)
UNITARY AIR CONDITIONERS AND CONDENSING UNITS,
ELECTRICALLY OPERATED, MINIMUM EFFICIENCY REQUIREMENTS

Equipment Type	Size Category	Heating Section Type	Subcategory or Rating Condition	Minimum Efficiency[a]	Test Procedure[b]
Water source water to water (cooling mode)	<135,000 Btu/h	All	86°F entering water	10.6 EER	ISO-13256-2
Groundwater source water to water (cooling mode)	<135,000 Btu/h	All	59°F entering water	16.3 EER	ISO-13256-2
Ground source Brine to water (cooling mode)	<135,000 Btu/h	All	77°F entering water	12.1 EER	ISO-13256-2
Water source water to water (heating mode)	<135,000 Btu/h (cooling capacity)	---	68°F entering water	3.7 COP	ISO-13256-2
Groundwater source water to water (heating mode)	<135,000 Btu/h (cooling capacity)	---	50°F entering water	3.1 COP	ISO-13256-2
Ground source brine to water (heating mode)	<135,000 Btu/h (cooling capacity)	---	32°F entering water	2.5 COP	ISO-13256-2

(No change to portions of table or footnotes not shown)

2. Add new standards to Chapter 6 as follows:

ISO International Organization for Standardization
1, rue de Varembe, Case postale 56,
CH-1211
Geneve, Switzerland

ISO 13256-2 (1998) Water-Source Heat Pumps—Testing and Rating for Performance—
Part 2: Water-to-Water and Brine-to-Water Heat Pumps

Reason: This proposal is based on ongoing analysis efforts within ASHRAE designed to create a Standard 90.1-2010 that is 30% better than Standard 90.1-2004 in response to Federal legislation. Paralleling those efforts and considering that the IECC Chapter 5 is intended to be technically compatible with that standard to facilitate adoption and implementation, DOE is interested in keeping Chapter 5 of the 2012 IECC aligned with ANSI/ASHRAE/IESNA Standard 90.1-2010. Due to the timing of the code development process and ASHRAE standards processes this proposal was submitted in anticipation that by the final action hearings the work to update the standard would be complete.

Water-to-water heat pumps are systems used in many buildings covered by the IECC and ASHRAE 90.1. These heat pumps use water to carry cooling and heating through the building. In recent years, the demand for water to water heat pumps has increased significantly. However, the IECC has no minimum energy efficiency requirements for this equipment. This proposal establishes for the first time a product class for water-to-water heat pumps. The intent is to recognize the technology by requiring minimum energy efficiency standards. Cooling EERs and heating COPs are proposed for products with cooling capacities below 135,000 Btu/h at standard rating conditions listed in ISO standard 13256-2.

Cost Impact: The code change proposal could increase the cost of construction to the degree that units of this nature previously having unregulated minimum efficiency will now have to satisfy these minimum requirements.

Analysis: A review of the standard(s) proposed for inclusion in the code, ISO 13256-2-98, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Majette-EC-59-T. 503.2.3(2)

EC196–09/10
Table 503.2.3(5)

Proponent: Ronald Majette, representing US Department of Energy

Delete Table 503.2.3(5) and replace as follows:

TABLE 503.2.3(5)
BOILERS, GAS- AND OIL-FIRED, MINIMUM EFFICIENCY REQUIREMENTS

Equipment Type[a]	Subcategory or Rating Condition	Size Category (Input)	Minimum Efficiency[b,c]	Test Procedure
Boilers, hot water	Gas-fired	<300,000 Btu/h	80% AFUE	10 CFR Part 430
		≥300,000 Btu/h and ≤2,500,000 Btu/h[d]	80% E_t	10 CFR Part 431
		>2,500,000 Btu/h[a]	82% E_c	
	Oil-fired[e]	<300,000 Btu/h	80% AFUE	10 CFR Part 430
		≥300,000 Btu/h and ≤2,500,000 Btu/h[d]	82% E_t	10 CFR Part 431
		>2,500,000 Btu/h[a]	84% E_c	
Boilers, steam	Gas-fired	<300,000 Btu/h	75% AFUE	10 CFR Part 430
	Gas-fired—all, except natural draft	≥300,000 Btu/h and ≤2,500,000 Btu/h[d]	79% E_t	10 CFR Part 431
		>2,500,000 Btu/h[a]	79% E_t	
	Gas-fired—natural draft	≥300,000 Btu/h and ≤2,500,000 Btu/h[d]	77% E_t	
		>2,500,000 Btu/h[a]	77% E_t	
	Oil-fired[e]	<300,000 Btu/h	80% AFUE	10 CFR Part 430
		≥300,000 Btu/h and ≤2,500,000 Btu/h[d]	81% E_t	10 CFR Part 431
		>2,500,000 Btu/h[a]	81% E_t	

[a] These requirements apply to boilers with rated input of 8,000,000 Btu/h or less that are not packaged boilers and to all packaged boilers. Minimum efficiency requirements for boilers cover all capacities of packaged boilers.
[b] E_c = combustion efficiency (100% less flue losses). See reference document for detailed information.
[c] E_t = thermal efficiency. See reference document for detailed information.
[d] Maximum capacity – minimum and maximum ratings as provided for and allowed by the unit's controls.
[e] Includes oil-fired (residual).

Reason: For consistency with Standard 90.1.

Cost Impact: The proposal will not increase the cost of construction as the proposed requirements are consistent with minimum federal law regulating boiler efficiency.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Majette-EC-25-T. 503.2.3(5)

EC197–09/10
503.2.4.4

Proponent: Randall R. Dahmen, WI Registered PE, WI Licensed Commercial Building Inspector, representing self

Revise as follows:

503.2.4.4 Shutoff damper controls. Both outdoor air supply and exhaust ducts shall be equipped with motorized dampers that will automatically shut when the systems or spaces served are not in use.

Exceptions:

1. Gravity dampers shall be permitted in buildings less than three stories in height.
2. Gravity dampers shall be permitted for buildings of any height located in Climate Zones 1, 2 and 3.
3. Gravity dampers shall be permitted for outside air intake or exhaust airflows of 300 cfm (0.14 m_3/s) or less.
4. No motorized dampers shall be installed in exhaust hoods that vent commercial cooking appliances which use fuel gas.

Reason: The 2006 IFGC, Section 505.1.1, requires that no dampers be installed in an exhaust system used to vent commercial cooking fuel gas appliances. As currently written, under IECC Section 503.2.4.4, there is no exception to the requirement of installing a motorized damper as it has to do with the limitations of IFGC Section 505.1.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAHMEN-EC3-503.2.4.4.DOC

EC198–09/10
503.2.7 (New), Table 503.2.7 (New)

Proponent: Ronald Majette, US Department of Energy

Add new text and table as follows:

503.2.7 Kitchen Exhaust Systems. Replacement air introduced directly into the exhaust hood cavity shall not exceed 10% of the hood exhaust airflow rate. Conditioned supply air delivered to any space containing a kitchen hood shall not exceed the greater of the ventilation rate required to meet the space heating or cooling load or the hood exhaust flow minus the available transfer air from adjacent space where available transfer air is considered that portion of outdoor ventilation air not required to satisfy other exhaust needs, such as restrooms, and not required to maintain pressurization of adjacent spaces

When total kitchen hood exhaust airflow rate is greater than 5,000 cfm each hood shall have a maximum exhaust rate in accordance with Table 503.2.7 and shall meet one of the following:

1. At least 50 percent of all replacement air is transfer air that would otherwise be exhausted.
2. Demand ventilation system(s) on at least 75 percent of the exhaust air that are capable of at least 50 percent reduction in exhaust and replacement air system airflow rates, including controls necessary to modulate airflow in response to appliance operation and to maintain full capture and containment of smoke, effluent and combustion products during cooking and idle.
3. Listed energy recovery devices with a sensible heat recovery effectiveness of at least 40 percent on at least 50 percent of the total exhaust airflow.

When a single hood, or hood section, is installed over appliances with different duty ratings, then the maximum allowable flow rate for the hood or hood section shall be based on the requirements for the highest appliance duty rating under the hood or hood section.

Exception: When at least 75 percent of all the replacement air is transfer air that would otherwise be exhausted

TABLE 503.2.7
MAXIMUM NET EXHAUST FLOW RATE, CFM PER LINEAR FOOT OF

Type of Hood	Light Duty Equipment	Medium Duty Equipment	Heavy Duty Equipment	Extra Heavy Duty Equipment
Wall-mounted canopy	140	210	280	385
Single island	280	350	420	490
Double island (per side)	175	210	280	385
Eyebrow	175	175	Not allowed	Not allowed
Backshelf/Pass-over	210	210	280	Not allowed

Reason: For consistency with Standard 90.1. This proposal is based on ongoing analysis efforts within ASHRAE designed to create a Standard 90.1-2010 that is 30% better than Standard 90.1-2004 in response to Federal legislation. Paralleling those efforts and considering that the IECC Chapter 5 is intended to be technically compatible with that standard to facilitate adoption and implementation, DOE is interested in keeping Chapter 5 of the 2012 IECC aligned with ANSI/ASHRAE/IESNA Standard 90.1-2010. Due to the timing of the code development process and ASHRAE standards processes this proposal was submitted in anticipation that by the final action hearings the work to update the standard would be complete.

The proposal basically outlaws "short-circuit" hoods. Research by the American Gas Association Research and California Energy Commission has shown that direct supply of makeup air, in excess of 10% of hood exhaust airflow, into the hood cavity significantly deteriorates the Capture and Containment (C&C) performance of hoods. This research has also demonstrated that short-circuit hoods waste energy and degrade kitchen environment and hygiene. If we assume a generic baseline C&C rate for a cooking process, studies show the exhaust rates for short-circuit hoods generally exceed those for exhaust-only hoods by at least the amount of air short-circuited, thus decreasing performance and increasing energy consumption.

Engineers are often in the habit of simply providing makeup air units in kitchens to provide makeup air equal to the exhaust flow rate even when "free" transfer air is available from adjacent spaces. Adding makeup air when transfer air is available is a wasteful design practice and should be prohibited. Using available transfer air saves energy and reduces the first cost of the makeup unit and exhaust system in the adjacent spaces. It simply requires some engineering and coordination to provide a path for the transfer air.

The proposed change is also intended to get rid of a wasteful common practice: specifying excessive exhaust airflow by selecting hoods that are not listed or have not been subjected to a recognized performance test. The exhaust airflow flow rates in Table 503.2.7 are 30% below the minimum airflow rates in ASHRAE Standard 154-2003.

ASHRAE Research Project 1202 shows that hoods listed per UL Standard 710 and/or are engineered and tested per ASTM/ANSI 1704 have exhaust rates that are at least 30% less than the exhaust airflow requirements for unlisted or untested hoods. The intent is to conserve energy through the use of engineered hoods or performance based hoods that have been validated based on consensus standard test methods. It should be noted that ASHRAE research has not demonstrated that exhaust rate reductions substantially beyond the 30% can or should be recommended at this time. This requirement should not increase first cost and in many cases will reduce first cost through downsizing of exhaust, supply and cooling equipment.

The 5,000 CFM threshold recognizes small restaurants. In addition, makeup air can be fully conditioned. As a result there are now cost effective opportunities to reduce energy with demand ventilation systems or energy recovery devices.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Majette-EC-10-503.2.7-

EC199–09/10
503.2.7

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

503.2.7 Duct and plenum insulation and sealing. All supply and return air ducts and plenums shall be insulated with a minimum of ~~R-5~~ R-6 insulation when located in unconditioned spaces and with a minimum of R-8 insulation when located outside the building. When located within a building envelope assembly, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by a minimum of R-8 insulation.

Exceptions:

1. When located within equipment.

2. When the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15°F (8°C).

Reason: This R-value is inconsistent with Section 403.2.1 which calls for R-6. R-5 isn't being manufactured in flexible duct or insulating sleeving material. R-4.6 is the lowest Flex available.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: McMann-EC-1-503.2.7

EC200–09/10
503.2.7

Proponent: Michael Resetar, Armacell LLC; Roger Schmidt, K-Flex USA; Shawn Dunahue, Nomaco Insulation

Revise as follows:

503.2.7 Duct and plenum insulation and sealing. All supply and return air ducts and plenums shall be insulated with a minimum of ~~R-5~~ R-6 insulation when located in unconditioned spaces and with a minimum of R-8 insulation when located outside the building. When located within a building envelope assembly, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by a minimum of R-8 insulation.

Exceptions:

1. When located within equipment.
2. When the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15°F (8°C).

All ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with Section 603.9 of the *International Mechanical Code*.

Reason: Changes in the associated R value for supply and duct and plenums for conditioned spaces should be changed from an R-5 to R-6 based to maintain consistency between IECC Section 403.2.1 and this change would also provide a 20% gain in energy efficiency.

	Summer Performance		**Winter Performance**	
Conditional Information	**R-5**	**R-6**	**R-5**	**R-6**
Line temperature °F	55	55	90	90
Ambient temperature °F	100	100	30	30
Thermal conductivity (Btu•in/h•ft^2•°F)	0.265	0.265	0.265	0.265
Surface Coeff. Internal (Btu/(ft^2-h)	5.3	5.3	1.60	1.60
Surface Coeff. External (Btu/(ft^2-h)	1.6	1.6	1.6	1.6
Required thickness of insulation (inches)	1.25	1.5	1.25	1.5
Heat Flow of Flat Surface (Btu/(ft^2-h)	8.1	6.9	10.7	9.2
Btu savings	1.2		1.5	
Saving in %	14.9%		14.1%	

Cost Impact: The material cost implications would be minimal and would be recovered (paid back) after a period of months due to system efficiency gains. Labor associated with the installation would remain constant to that of the current requirements.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Resetar-Schmidt-Dunahue-EC-3-503.2.7

EC201–09/10
503.2.7

Proponent: Michael Resetar, Armacell LLC; Roger Schmidt, K-Flex USA; Shawn Dunahue, Nomaco Insulation

Revise as follows:

503.2.7 Duct and plenum insulation and sealing. All supply and return air ducts and plenums shall be insulated with a minimum of R-5 insulation when located in unconditioned spaces and with a minimum of R-8 insulation when located outside the building. When located within a building envelope assembly, the duct or plenum shall be separated from the building exterior ~~or unconditioned or exempt spaces~~ by a minimum of R-8 insulation.

Exceptions:

1. When located within equipment.
2. When the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15°F (8°C).

All ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with Section 603.9 of the *International Mechanical Code*.

Reason: The current language is confusing. We feel the intent of the code is more clearly stated as written above with the removal of "or unconditioned or exempt spaces"

Cost Impact: The material cost implications would be minimal and would be recovered (paid back) after a period of months due to system efficiency gains. Labor associated with the installation would remain constant to that of the current requirements.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Resetar-Schmidt-Dunahue-EC-5-503.2.7

EC202–09/10
503.2.7.1.3

Proponent: Randall R. Dahmen, WI Registered PE, WI Licensed Commercial Building Inspector, representing self

Revise as follows:

503.2.7.1.3 High-pressure duct systems. Ducts designed to operate at static pressures in excess of 3 inches w.g. (746 Pa) shall be insulated and sealed in accordance with Section 503.2.7. In addition, ducts and plenums shall be leak-tested in accordance with the SMACNA *HVAC Air Duct Leakage Test Manual* with the rate of air leakage (*CL*) less than or equal to 6.0 as determined in accordance with Equation 5-2.

~~*CL* = *Fx P* $^{0.65}$~~ $CL = F/P^{0.65}$ **(Equation 5-2)**

where:

F = The measured leakage rate in cfm per 100 square feet of duct surface.
P = The static pressure of the test.

Documentation shall be furnished by the designer demonstrating that representative sections totaling at least 25 percent of the duct area have been tested and that all tested sections meet the requirements of this section.

Reason: The 2006 IECC Chapter Referenced Standards adopts SMACNA HVAC Air Duct Leakage Test Manual-1985 under Chapter 6. Equation 5-2 of the IECC is in conflict with Equation 1 of the SMACNA HVAC Air Duct Leakage Manual. This code change proposal corrects this discrepancy.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAHMEN-EC2-503.2.7.1.3.DOC

EC203–09/10
503.2.8 (New)

Proponent: Ronald Majette, representing US Department of Energy

Add new text as follows:

503.2.8 Laboratory Exhaust Systems. Buildings with laboratory exhaust systems having a total exhaust rate greater than 5,000 cfm shall be provided with:

1. A VAV laboratory exhaust and room supply system capable of reducing exhaust and makeup air flow rates to the minimum required in the *International Mechanical Code*
2. A heat recovery system to precondition makeup air from laboratory exhaust that has a percentage that the exhaust and makeup air flow rates can be reduced from design conditions plus a percentage *sensible recovery effectiveness* totaling at least 50 percent.
3. Direct makeup (auxiliary) air supply equal to at least 75 percent of the exhaust air flow rate capable of being heated and cooled to the design temperatures in Section 302.1.

Reason: For consistency with Standard 90.1. This proposal is based on ongoing analysis efforts within ASHRAE designed to create a Standard 90.1-2010 that is 30% better than Standard 90.1-2004 in response to Federal legislation. Paralleling those efforts and considering that the IECC Chapter 5 is intended to be technically compatible with that standard to facilitate adoption and implementation, DOE is interested in keeping Chapter 5 of the 2012 IECC aligned with ANSI/ASHRAE/IESNA Standard 90.1-2010. Due to the timing of the code development process and ASHRAE standards processes this proposal was submitted in anticipation that by the final action hearings the work to update the standard would be complete.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Majette-EC-11-503.2.8

EC204–09/10
503.2.8, Table 503.2.8

Proponent: Ronald Majette, representing US Department of Energy

1. Revise as follows:

503.2.8 Piping insulation. All piping serving as part of a heating or cooling system shall be thermally insulated in accordance with Table 503.2.8 based on the expected operating hours of the HVAC system commensurate with the building type.

Exceptions:

1. Factory-installed piping within HVAC equipment tested and rated in accordance with a test procedure referenced by this code.
2. Factory-installed piping within room fan-coils and unit ventilators tested and rated according to AHRI 440 (except that the sampling and variation provisions of Section 6.5 shall not apply) and 840, respectively.
3. Piping that conveys fluids that have a design operating temperature range between ~~55~~ 60°F (13°C) and 105°F (41°C).
4. Piping that conveys fluids that have not been heated or cooled through the use of fossil fuels or electric power.
5. ~~Runout piping not exceeding 4 feet (1219 mm) in length and 1 inch (25 mm) in diameter between the control valve and HVAC coil.~~ Strainers, control valves, and balancing valves associated with piping 1 inch or less in diameter.
6. Direct buried piping that conveys fluids at or below 60°F (13°C)

Delete and substitute as follows:

~~**TABLE 503.2.8**~~
~~**MINIMUM PIPE INSULATION**~~
~~**(thickness in inches)**~~

~~**FLUID**~~	~~**NOMINAL PIPE DIAMETER**~~	
	~~**≤1.5"**~~	~~**>1.5"**~~
~~Steam~~	~~$1\frac{1}{2}$~~	~~3~~
~~Hot water~~	~~$1\frac{1}{2}$~~	~~2~~
~~Chilled water, brine or refrigerant~~	~~$1\frac{1}{2}$~~	~~$1\frac{1}{2}$~~

~~For SI: 1 inch = 25.4 mm.~~

~~a. Based on insulation having a conductivity (k) not exceeding 0.27 Btu per inch/h · ft^2 · °F.~~

~~b. For insulation with a thermal conductivity not equal to 0.27Btu · inch/h · ft^2 · °F at a mean temperature of 75°F, the minimum required pipe thickness is adjusted using the following equation;~~

~~$T = r\{(1+t/r)^{K/k} - 1\}$~~

~~where:~~

~~T = Adjusted insulation thickness (in).~~
~~r = Actual pipe radius (in).~~
~~t = Insulation thickness from applicable cell in table (in).~~
~~K = New thermal conductivity at 75°F (Btu · in/hr · ft^2 · °F).~~
~~k = 0.27 Btu · in/hr · ft^2 · °F.~~

TABLE 503.2.8
MINIMUM PIPE INSULATION THICKNESS
(thickness in inches)[a]

Fluid Operating Temperature Range (F) and Usage	Insulation Conductivity		Nominal Pipe or Tube Size(in)				
	Conductivity Btu·in./(h·ft^2· F)[b]	Mean Rating Temperature, F	<1	1 to <1-1/2	1-1/2 to <4	4 to <8	≥8
>350 F	**0.32-0.34**	**250**					
Low Use (<4,400 h/yr)			2.5	3.0	3.0	4.0	4.0
High Use (≥4,400 h/yr)			4.5	5.0	5.0	5.0	5.0
251 – 350 F	**0.29 – 0.32**	**200**					
Low Use (<4,400 h/yr)			2.5	2.5	3.0	3.0	3.0
High Use (≥4,400 h/yr)			3.0	4.0	4.5	4.5	4.5
201 -250 F	**0.27 – 0.30**	**150**					
Low Use (<4,400 h/yr)			1.5	1.5	2.0	2.0	2.0
High Use (≥4,400 h/yr)			2.5	3.0	3.0	3.5	3.5
141 – 200 F	**0.25 – 0.29**	**125**					
Low Use (<4,400 h/yr)			1.0	1.5	1.5	1.5	1.5
High Use (≥4,400 h/yr)			2.5	2.5	2.5	2.5	2.5
105 – 140 F	**0.22 – 0.28**	**100**					
Low Use (<4,400 h/yr)			1.0	1.0	1.0	1.5	1.5
High Use (≥4,400 h/yr)			1.5	1.5	1.5	2.0	2.0
40 - 60 F	**0.22-0.28**	**100**					
Low Use (<4,400 h/yr)			0.5	0.5	1.0	1.0	1.0
High Use (≥4,400 h/yr)			0.5	0.5	1.0	1.0	1.0
<40 F	**0.22 – 0.28**	**100**					
Low Use (<4,400 h/yr)			0.5	1.0	1.0	1.0	1.5
High Use (≥4,400 h/yr)			1.0	1.0	1.0	1.5	1.5

a. For piping smaller than 1½" and located within interior partitions, reduction of these thicknesses by 1" shall be permitted (before thickness adjustment required in footnote a) but not to thicknesses below 1".

b. For piping smaller than 1½" and located within interior partitions, reduction of these thicknesses by 1" shall be permitted (before thickness adjustment required in footnote a) but not to thicknesses below 1". For insulation outside the stated conductivity range, the minimum thickness (T) shall be determined as follows:

$$T = r\{(1 + t/r)^{K/k} - 1\}$$

where

T = minimum insulation thickness (in.),
r = actual outside radius of pipe (in.),
t = insulation thickness listed in the table for applicable fluid temperature and pipe size,
K = conductivity of alternate material at mean rating temperature indicated for the applicable fluid temperature (Btu·in./h·ft2·°F); and
k = the upper value of the conductivity range listed in the table for the applicable fluid temperature.

c. For direct-buried heating and hot water system piping, reduction of these thicknesses by 1.5" shall be permitted (before thickness adjustment required in footnote a) but not to thicknesses below 1".

Reason: This proposal is based on ongoing analysis efforts within ASHRAE designed to create a Standard 90.1-2010 that is 30% better than Standard 90.1-2004 in response to Federal legislation. Paralleling those efforts and considering that the IECC Chapter 5 is intended to be technically compatible with that standard to facilitate adoption and implementation, DOE is interested in keeping Chapter 5 of the 2012 IECC aligned with ANSI/ASHRAE/IESNA Standard 90.1-2010. Due to the timing of the code development process and ASHRAE standards processes this proposal was submitted in anticipation that by the final action hearings the work to update the standard would be complete.

Cost Impact: The code change proposal would increase or decrease the cost of construction in some but not all instances.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Majette-EC-12-503.2.8

EC205–09/10
503.2.8

Proponent: James R. Paschal, Paschal Engineering, representing Aquatherm, Inc.

Revise as follows:

503.2.8 Piping insulation. All piping serving as part of a heating or cooling system shall be thermally insulated in accordance with Table 503.2.8.

Exceptions:

1. Factory-installed piping within HVAC equipment tested and rated in accordance with a test procedure referenced by this code.
2. Factory-installed piping within room fan-coils and unit ventilators tested and rated according to AHRI 440 (except that the sampling and variation provisions of Section 6.5 shall not apply) and 840, respectively.
3. Piping that conveys fluids that have a design operating temperature range between 55°F (13°C) and 105°F (41°C).
4. Piping that conveys fluids that have not been heated or cooled through the use of fossil fuels or electric power.
5. Runout piping not exceeding 4 feet (1219 mm) in length and 1 inch (25 mm) in diameter between the control valve and HVAC coil.
6. For piping smaller than 1-1/2 inch nominal size and located within interior partitions, the thicknesses in Table 503.2.8 may be reduced by 1 inch (before any thickness adjustment made per footnote a.), but not to thicknesses below 1 inch.
7. For direct-buried cooling system piping insulation is not required..
8. For direct-buried heating and hot water system piping, these thicknesses may be reduced by 1.5 inches (before any thickness adjustment made per footnote a.) but not to thicknesses below 1 inch.

Reason: For these applications, the cost of insulation and energy required to produce the insulation is much higher than any energy savings over the expected life of the project. This proposal is also consistent with the proposed revisions to ASHRAE 90.1, *Energy Standard for Buildings Except Low-Rise Residential Buildings*. The current IECC only recognizes the use of and reference to ASHRAE 90.1 if used in its entirety, and otherwise requires compliance with Chapter 5 for commercial buildings. While there are other areas where it may make sense to not be consistent between the two, the pipe insulation requirements should be equivalent from an energy conservation perspective.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Paschal-EC-1-503.2.8

EC206–09/10
Table 503.2.8

Proponent: Michael Resetar, Armacell LLC; Roger Schmidt, K-Flex USA; Shawn Dunahue, Nomaco Insulation

Revise as follows:

TABLE 503.2.8
MINIMUM PIPE INSULATION[a]
~~(thickness in inches)~~

FLUID	NOMINAL PIPE DIAMETER	
	≤ 1.5"	**> 1.5"**
Steam or fluid temperatures > 200°F	~~1-1/2"~~ R-6	~~3"~~ R-12
Hot water: 105°F to 200°F	~~1-1/2"~~ R-6	~~2"~~ R-8
Chilled water, brine or refrigerant: ≤ 55°F	~~1-1/2"~~ R-6	~~1-1/2"~~ R-6

(No change to footnotes)

Reason: Converting wall thickness requirement to an "R" value to be consistent with other insulation requirements within ICC codes and the addition operational temperature ranges help define the three categories.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Resetar-Schmidt-Dunahue-EC-4-T 503.2.8

EC207–09/10
503.2.8.1 (New)

Proponent: Howard Ahern, Plumberex, Palm Springs, CA

Add new text as follows:

503.2.8.1 Protection of piping insulation. Piping Insulation exposed to weather shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind by means including, aluminum, sheet metal, painted canvas, or plastic cover or other protection suitable for outdoor service. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material. Adhesives tape shall not be permitted.

Reason: Outdoor Piping Insulation needs to be protected from weather, physical damage or from UV deterioration. Pipe insulation in outdoor locations is typically protected by an aluminum or sheet metal jacket, painted canvas, plastic cover, or coating that is water retardant and UV resistant.

All AC units require periodic maintenance. The frequency varies with how hard the unit operates, exterior temperature, preventive maintenance program, and many others. In every occasion, every maintenance provides an excuse for the Freon line insulation to be touched and removed. Adhesives Tape is not permitted as it will limit maintenance and damage insulations permeability characteristics..Removal of tape damages the integrity of the original insulation into pieces, specially, if the insulation has reached thermo set state. Protection can also keep silted pipe insulation from commonly separating thus saving additional energy cost. This simple common sense proposal is cost-effective as it will save energy and will prolong insulation life reducing replacement.

This proposal will save building energy cost following the same initiative being taken by the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) to improve energy efficiency levels by 30% in the **ASHRAE 90.1 2007 Section 6.4.4.1.1** commercial building standards. It also reflects the energy efficiency improvement approved by Congress American Recovery and Reinvestment Act of 2009 (ARRA).

ASHRAE 90.1 2007 Section 6.4.4.1.1:
Piping Insulation exposed to weather shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind but not limited to the following

A. Piping Insulation exposed to weather shall be suitable for outdoor service e.g., protected by aluminum, sheet metal, painted canvas, or plastic cover. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Ahern-EC-2-503.2.8.1

EC208–09/10
Table 503.2.8

Proponent: James R. Paschal, Paschal Engineering, representing Aquatherm, Inc.

Revise as follows:

TABLE 503.2.8
MINIMUM PIPE INSULATION
(thickness in inches)
(No change to table contents)

a. and b. (No change)

c. The table is based on metal pipe. Non-metallic pipes schedule 80 thickness or less shall use the table values. For other non-metallic pipes having thermal resistance greater than that of steel or copper pipe, reduced insulation thicknesses are permitted if documentation is provided showing that the pipe with the proposed insulation has no more heat gain or loss per foot than steel or copper pipe of the same nominal size with the insulation thickness shown in the table.

Reason: Plastic pipe with a heavier wall thickness can provide a significant insulating effect, thereby reducing the amount of external insulation necessary to achieve the same thermal performance. The requirements and values in the table assume that the pipe itself does not contribute to the overall thermal performance of the pipe/insulation combination. The addition of this footnote will explicitly allow recognition of this enhanced performance, while meeting the intent of the table by requiring the same or better performance from the pipe/insulation combination. This proposal is also consistent with the recently revised ASHRAE 90.1, *Energy Standard for Buildings Except Low-Rise Residential Buildings*, which recognizes that piping materials with low thermal conductivity and sufficient wall thickness can provide an insulating effect and thereby reduce the overall insulation required to achieve equivalent performance.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Paschal-EC-2-T. 503.2.8

EC209–09/10
Table 503.2.8

Proponent: Michael Resetar, Armacell LLC; Roger Schmidt, K-Flex USA; Shawn Dunahue, Nomaco Insulation

Revise as follows:

TABLE 503.2.8
MINIMUM PIPE INSULATION[a]
~~(thickness in inches)~~

FLUID	NOMINAL PIPE DIAMETER	
	~~≤ 1.5"~~	~~> 1.5"~~
Steam or fluid temperatures > 200°F	~~1-1/2"~~ R6	~~3"~~ R12
Hot water: 105°F to 200°F	~~1-1/2"~~ R4	~~2"~~ R6
Chilled water, brine or refrigerant: ≤ 55°F	~~1-1/2"~~ R6	~~1-1/2"~~ R6

(No change to footnotes)

Reason: Converting wall thickness requirement to an "R" value to be consistent with other insulation requirements within ICC codes and the addition operational temperature ranges help define the three categories while helping to equalize BTU loss requirement between three categories. The change in hot water reflects compatibility with current requirements within IECC and ASHRAE 90.1.

PAST HISTORY

IECC 2000:
Had Table 803.3.7

FLUID	NOMINAL PIPE DIAMETER	
	≤ 1.5"	**> 1.5"**
Steam	1.5	3.0
Hot water	1.0	2.0
Chilled water, brine, or refrigerant	1.0	1.5

For **SI**: 1 inch = 25.4 mm, Btu per inch/h × ft^2 × °F = W per 25 mm/K× m^2.
a. Based on insulation having a conductivity not exceeding 0.27 Btu per inch/h × ft^2 × °F.

Steam:
1.5" wall on Flat Surface calculation is equal a "R" value of 6
1.5" wall on Radial Surface calculation is equal a "R" value of 6.4 to 11.4 *(I.D. Dependent)*
3.0" wall on Flat Surface calculation is equal a "R" value of 12
Hot and Chilled Water, brine or refrigerant:
1.0" wall on Flat Surface calculation is equal a "R" value of 4.2
1.0" wall on Radial Surface calculation is equal a "R" value of 5.5 to 7.4 *(I.D. Dependent)*
1.5" wall on Flat Surface calculation is equal a "R" value of 6
1.5" wall on Radial Surface calculation is equal a "R" value of 6.4 to 11.4 *(I.D. Dependent)*
2.0" wall on Flat Surface calculation is equal a "R" value of 8

IECC 2003:
Had Table 803.3.7

FLUID	NOMINAL PIPE DIAMETER	
	≤ 1.5"	**> 1.5"**
Steam	1½	3
Hot water	1	2
Chilled water, brine or refrigerant	1	1½

For SI: 1 inch = 25.4 mm, British thermal unit per inch/h · ft^2 ·°F = W per 25 mm/K · m^2 .
a. Based on insulation having a conductivity (k) not exceeding 0.27 Btu per inch/h · ft^2 ·°F.

Same Equivalent R Values as IECC 2000

IECC 2006:
Table 803.3.7 converted to Table 503.2.8

FLUID	NOMINAL PIPE DIAMETER	
	≤ 1.5"	**> 1.5"**
Steam	1½	3
Hot water	1	2
Chilled water, brine or refrigerant	1	1½

For SI: 1 inch = 25.4 mm, British thermal unit per inch/h ft^2 °F = W per 25 mm/K · m^2
a. Based on insulation having a conductivity (k) not exceeding 0.27 Btu per inch/h ft^2 · °F.

Same Equivalent R Values as IECC 2000

IECC 2007/2008:
Had Table 503.2.8

FLUID	NOMINAL PIPE DIAMETER	
	≤ 1.5"	**<1.5"**
Steam	11/2	3
Hot water	11/2	2
Chilled water, brine or refrigerant	11/2	11/2

For SI: 1 inch = 25.4 mm.
a. Based on insulation having a conductivity (*k*) not exceeding 0.27 Btu per inch/h · ft2 · °F.

b. For insulation with a thermal conductivity not equal to 0.27Btu · inch/h · ft2 · °F at a mean temperature of 75°F, the minimum required pipe thickness is adjusted using the following equation;

$T = r[(1+tlr)K/k-1]$

where:

T = Adjusted insulation thickness (in).
r = Actual pipe radius (in).
t = Insulation thickness from applicable cell in table (in).
K = New thermal conductivity at 75°F (Btu · in/hr · ft2 · °F).
k = 0.27 Btu · in/hr · ft2 · °F.

Steam:
1.5" wall on Flat Surface calculation is equal a "R" value of 6
1.5" wall on Radial Surface calculation is equal a "R" value of 6.4 to 11.4 *(I.D. Dependent)*
3.0" wall on Flat Surface calculation is equal a "R" value of 12
Hot and Chilled Water, brine or refrigerant:
1.0" wall on Flat Surface calculation is equal a "R" value of 4.2
1.0" wall on Radial Surface calculation is equal a "R" value of 5.5 to 7.4 *(I.D. Dependent)*
1.5" wall on Flat Surface calculation is equal a "R" value of 6
1.5" wall on Radial Surface calculation is equal a "R" value of 6.4 to 11.4 *(I.D. Dependent)*
2.0" wall on Flat Surface calculation is equal a "R" value of 8

IEEC 2009/2010: (Proposal)
Convert Insulation to "R" value by category

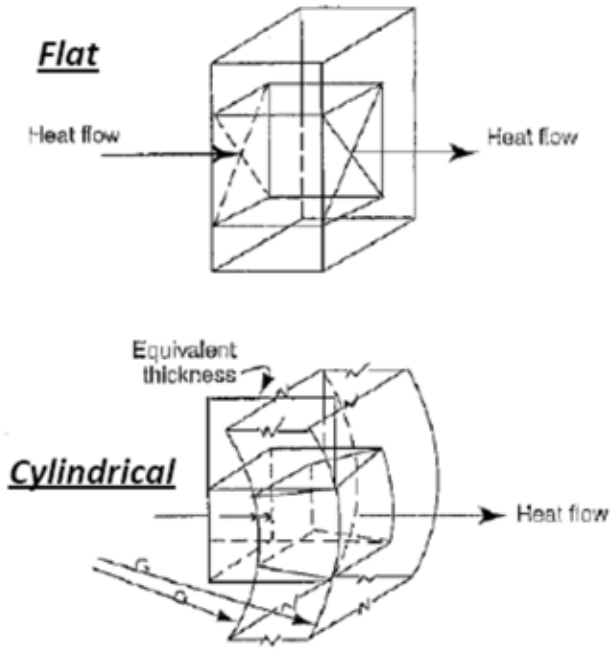
Steam:
R -12 with Flat Surface calculation is equal to a thickness of 3"
R -12 with Radial Surface calculation is equal to a thickness of 2" *(I.D. Dependent)*
Hot and Chilled Water, brine or refrigerant:
R- 6 with Flat Surface calculation is equal to a thickness of 1-1/2"
R -6 with Radial Surface calculation is equal to a thickness of 1" *(I.D. Dependent)*

BTU Loss Example based on 2009/2010 proposal:

	1" Pipe			4" Pipe		
	Temp °F	Insulation R Value	BTU Loss	Temp °F	Insulation R Value	BTU Loss
Steam or fluid temperatures > 200°F	300	R-6	-31	300	R-12	-39
Hot water: 105°F to 200°F	180	R-4	-17	180	R-6	-35
Chilled water, brine or refrigerant; < 55°F	40	R-6	-4	40	R-6	-11
Ambient Temp	75			75		

(*) Chilled water is also addressing condensation concerns with the R-6 requirement

Don't compare typical flat sheet insulation "R" values with cylindrical pipe insulation "R" values.



Cylindrical Pipe Insulation "R" value Calculation:

$$R = \frac{r2 \ln(\frac{r2}{r1})}{k}$$

Where r_1 = uninsulated pipe radius in inches
r_2 = insulated pipe radius in inches
k = thermal conductivity.

This equation yields an "R" value on a ***square foot basis***

R" value or thermal resistance is a measure of the ability of a material to retard heat flow. "R" is the numerical reciprocal of "C" (thermal conductance). Thermal resistance is used in combination with numerals to designate thermal resistance values. The higher the "R" value the higher the insulating value. This value is normally calculated on a square foot basis.

Flat Sheet Calculation Example:

$$R = \frac{\text{Thickness of Material}}{\text{Material Thermal Conductivity}}$$

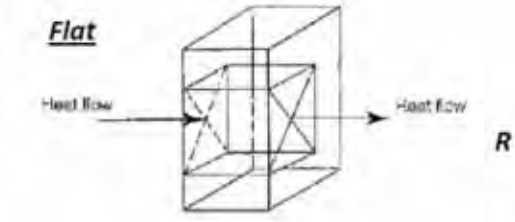
Sheet Insulation Thickness: 2"
Insulation Thermal Conductivity: 0.25 Btu•in/h•ft^2•°F
Resulting "R" Value : R-8.0 *(R-8 equals 8 resistance units)*

(*) It is common knowledge that with flat layer of insulation increasing the "R" value increases the thermal efficiency by the same factor.

The simple relations for flat sheet insulation do not hold true for when looking at cylindrical pipe insulations. For these materials, heat flow is not the simple straight –through heat flow found in flat surface/sheet material, but rather a radial heat flow. The reasoning is based on that fact that the inner radius surface area is much smaller than the outer radius surface area.

These differences in surface area support the need to calculate heat flow must be done using an equivalent thickness. For cylindrical pipe insulation the Cylindrical Pipe Insulation "R" value Calculation detailed above.

Don't compare typical flat sheet insulation "R" values with cylindrical pipe insulation "R" values.

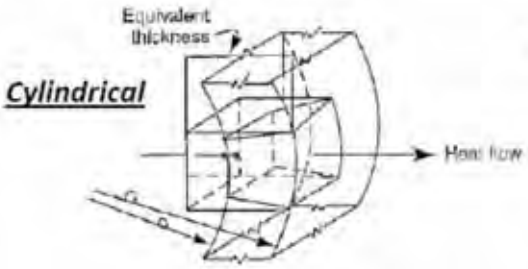


$$R = \frac{\text{Thickness of Flat Sheet Material}}{\text{Material Thermal Conductivity}}$$

Wall Thickness (inches)

	3/8	1/2	3/4	1	1-1/2	2
R-Value	1.6	2.1	3.1	4.2	6	8

Insulation Thermal Conductivity: 0.25 Btu•in/h•ft^2•°F



Cylindrical Pipe Insulation "R" value Calculation:

$$R = \frac{r2\ln(\frac{r2}{r1})}{k}$$

Wall Thickness

Pipe Insulation ID Size	Nom. 3/8	Nom. 1/2	Nom. 3/4	Nom. 1	Nom. 1-1/2
3/8	2.9	3.4	5.7	7.4	—
1/2	2.7	3.3	5.5	7.2	—
5/8	2.5	3.3	5.5	7.1	11.4
3/4	2.4	3.3	5.4	6.9	10.8
7/8	2.3	3.3	5.4	6.9	10.3
1-1/8	2.2	3.2	5.3	7.2	9.6
1-3/8	2.1	3.1	5.1	7.3	9.0
1-5/8	2.4	3.1	4.9	7.2	8.6
1-1/2 IPS	2.3	3.1	4.8	6.9	8.3
2-1/8	2.3	3.1	4.7	6.7	8.1
2 IPS	2.2	3.1	4.6	6.6	7.8
2-5/8	2.2	3.0	4.5	6.4	7.7
2-1/2 IPS	2.2	3.0	4.4	6.3	7.5
3-1/8	2.2	2.9	4.3	6.2	7.4
3 IPS	2.1	2.9	4.3	6.1	7.2
3-5/8	2.1	2.9	4.2	6.0	7.1
4-1/8	2.1	2.8	4.2	5.9	7.0
4 IPS	2.1	2.8	4.1	5.8	6.8
5 IPS	2.1	2.8	4.0	5.6	6.6
6 IPS	2.0	2.7	3.9	5.5	6.4

Insulation Thermal Conductivity 0.25 Btu•in/ft²•°F

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Resetar-Schmidt-Dunahue-EC-6-T. 503.2.8

EC210–09/10
503.2.9

Proponent: Krista Braaksma, representing Washington State Building Code Council

Delete and substitute as follows:

~~**503.2.9 HVAC system completion.** Prior to the issuance of a certificate of occupancy, the design professional shall provide evidence of system completion in accordance with Sections 503.2.9.1 through 503.2.9.3.~~

~~**503.2.9.1 Air system balancing**. Each supply air outlet and zone terminal device shall be equipped with means for air balancing in accordance with the requirements of Chapter 6 of the International Mechanical Code. Discharge dampers are prohibited on constant volume fans and variable volume fans with motors 25hp (18.6kW) and larger.~~

~~**503.2.9.2 Hydronic system balancing.** Individual hydronic heating and cooling coils shall be equipped with means for balancing and pressure test connections.~~

~~**503.2.9.3 Manuals.** The construction documents shall require that an operating and maintenance manual be provided to the building owner by the mechanical contractor. The manual shall include, at least, the following:~~

1. ~~Equipment capacity (input and output) and required maintenance actions.~~
2. ~~Equipment operation and maintenance manuals.~~

3. ~~HVAC system control maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions. Desired or field determined set points shall be permanently recorded on control drawings, at control devices or, for digital control systems, in programming comments.~~
4. ~~A complete written narrative of how each system is intended to operate.~~

503.2.9 Mechanical systems commissioning and completion requirements.

503.2.9.1 System commissioning. Commissioning is a process that verifies and documents that the selected building systems have been designed, installed, and function according to the owner's project requirements and construction documents. Drawing notes shall require commissioning and completion requirements in accordance with this section. Drawing notes may refer to specifications for further requirements. Copies of all documentation shall be given to the owner.

503.2.9.1.1 Commissioning Plan. A commissioning plan shall include as a minimum the following items:

1. A detailed explanation of the original owner's project requirements,
2. A narrative describing the activities that will be accomplished during each phase of commissioning, including guidance on who accomplishes the activities and how they are completed,
3. Equipment and systems to be tested, including the extent of tests,
4. Functions to be tested (for example calibration, economizer control),
5. Conditions under which the test shall be performed (for example winter and summer design conditions, full outside air), and
6. Measurable criteria for acceptable performance.

503.2.9.1.2 Systems Adjusting and Balancing. All HVAC systems shall be balanced in accordance with generally accepted engineering standards. Air and water flow rates shall be measured and adjusted to deliver final flow rates within 10 percent of design rates. Test and Balance activities shall include as a minimum the following items:

1. Air systems balancing: Each supply air outlet and zone terminal device shall be equipped with means for air balancing in accordance with the requirements of Chapter 6 of the *International Mechanical Code*. Discharge dampers are prohibited on constant volume fans and variable volume fans with motors 10 hp (18.6 kW) and larger. Air systems shall be balanced in a manner to first minimize throttling losses then, for fans with system power of greater than 1 hp, fan speed shall be adjusted to meet design flow conditions.

   Exception: Fan with fan motors of 1 hp or less.

2. Hydronic systems balancing: Individual hydronic heating and cooling coils shall be equipped with means for balancing and pressure test connections. Hydronic systems shall be proportionately balanced in a manner to first minimize throttling losses, then the pump impeller shall be trimmed or pump speed shall be adjusted to meet design flow conditions. Each hydronic system shall have either the ability to measure pressure across the pump, or test ports at each side of each pump.

   Exceptions:

   1. Pumps with pump motors of 5 hp or less.
   2. When throttling results in no greater than 5 percent of the nameplate horsepower draw above that required if the impeller were trimmed.

503.2.9.1.3 Functional performance testing.

1. **Equipment Functional Performance Testing** shall demonstrate the correct installation and operation of components, systems, and system-to-system interfacing relationships in accordance with approved plans and specifications. This demonstration is to prove the operation, function, and maintenance serviceability for each of the Commissioned systems. Testing shall include all modes of operation, including:
   1.1. All modes as described in the Sequence of Operation,
   1.2. Redundant or automatic back-up mode,
   1.3. Performance of alarms, and
   1.4. Mode of operation upon a loss of power and restored power.

   Exception: Unitary or packaged HVAC equipment listed in Tables 503.2.3 (1) through (3) that do not require supply air economizers.

2. **Controls functional performance testing.** HVAC control systems shall be tested to document that control devices, components, equipment, and systems are calibrated, adjusted and operate in accordance with approved plans and specifications. Sequences of operation shall be functionally tested to document they operate in accordance with approved plans and specifications.

503.2.9.1.4 Preliminary commissioning report. A preliminary report of commissioning test procedures and results shall be completed and provided to the Owner. The report shall be identified as "Preliminary Commissioning Report" and shall identify:

1. Itemization of deficiencies found during testing required by this section which have not been corrected at the time of report preparation, and the anticipated date of correction.
2. Deferred tests which cannot be performed at the time of report preparation due to climatic conditions.
3. Climatic conditions required for performance of the deferred tests, and the anticipated date of each deferred test.

503.2.9.2 Acceptance: Buildings, or portions thereof, required by this Code to comply with this section shall not be issued a final certificate of occupancy allowing public or owner occupation until such time that the building official has received a letter of transmittal from the building owner that states they have received the Preliminary Commissioning Report as required by Section 503.2.9.1.4. At the request of the building official, a copy of the Preliminary Commissioning Report shall be made available for review.

503.2.9.3 Completion requirements. The construction documents shall require that within 90 days after the date of final certificate of occupancy, the documents described in this section be provided to the building owner.

503.2.9.3.1 Drawings. Construction documents shall include as a minimum the location and performance data on each piece of equipment.

503.2.9.3.2 Manuals. An operating manual and a maintenance manual shall be in accordance with industry-accepted standards and shall include, at a minimum, the following:

1. Submittal data stating equipment size and selected options for each piece of equipment requiring maintenance.
2. Manufacturer's operation manuals and maintenance manuals for each piece of equipment requiring maintenance, except equipment not furnished as part of the project. Required routine maintenance actions shall be clearly identified.
3. Names and addresses of at least one *service agency*.
4. HVAC controls system maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions. Desired or field-determined setpoints shall be permanently recorded on control drawings at control devices or, for digital control systems, in programming comments.
5. A complete narrative of how each system is intended to operate, including suggested setpoints.

503.2.9.3.3 System balancing report. A written report describing the activities and measurements completed in accordance with Section 503.2.9.1.2

503.2.9.3.4 Final commissioning report. A complete report of test procedures and results identified as "Final Commissioning Report" shall include:

1. Results of all Functional Performance Tests.
2. Disposition of all deficiencies found during testing, including details of corrective measures used or proposed.
3. All Functional Performance Test procedures used during the commissioning process including measurable criteria for test acceptance, provided herein for repeatability.

Exception: Deferred tests which cannot be performed at the time of report preparation due to climatic conditions.

Reason: The purpose of this code change proposal is to provide expanded direction on commissioning requirements.

Building commissioning requirements have been in place in Washington since 2000. Also, Title 24 (California's energy code) requires commissioning functional and performance testing. Commissioning is an important means of ensuring systems are installed and function as designed. Far too many buildings contain substantive defects and programming errors that impact the performance and functionality of the building. Commissioning is a means of discovering and correcting these defects. Commissioning also provides documentation of system design intent and operating sequences, and documents that building staff receive accurate operation manuals and drawings.

The cost of commissioning is a small part of the overall project (1-2% of total costs), yet can provide substantial payback in the form of reduce energy usage, better building performance, improved air quality, and higher productivity. A 2004 study by Lawrence Berkeley National Laboratory concluded that commissioning is cost-effective for both new and existing buildings of a variety of uses and sizes, not only in energy savings but also in extended equipment lifetimes and lower maintenance costs. Investigators found that the median payback of building commissioning was 4.8 years, and when non-energy impacts were factored in, the payback was considerably reduced. The average energy cost savings per year was 18 percent.

Bibliography:
Lawrence Berkeley National Laboratory Report Number 56637, The Cost-Effectiveness of Commercial-Buildings Commissioning: A Meta-Analysis of Energy and Non-Energy Impacts in Existing Building and New Construction in the United States, December 2004, http://eetd.lbl.gov/Emills/PUBS/Cx-Costs-Benefits.html

Cost Impact: The code change proposal will increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BRAAKSMA-EC-1-503.2.9

EC211–09/10
503.3.1, Table 503.3.1 (New)

Proponent: Ronald Majette, representing US Department of Energy

1. Revise as follows:

503.3.1 Economizers. Supply air economizers shall be provided on each cooling system in buildings located in climate zones 2B, 3B, 4C, 5A, 5C, 6A, 6B, and 8 having a cooling capacity of at least 54,000 Btu/h ~~as shown in Table 503.3.1(1)~~. Economizers shall be capable of providing 100-percent outdoor air, even if additional mechanical cooling is required to meet the cooling load of the building. Systems shall provide a means to relieve excess outdoor air during economizer operation to prevent over pressurizing the building. The relief air outlet shall be located to avoid recirculation into the building. Where a single room or space is supplied by multiple air systems, the aggregate capacity of those systems shall be used in applying this requirement. The aggregate cooling capacity of cooling systems without economizers shall not exceed 480,000 Btu/h or 20 percent of it air economizer capacity, whichever is greater.

Exceptions:

1. Where the cooling equipment is covered by the minimum efficiency requirements of Table 503.2.3(1) or 503.2.3(2) and meets or exceeds the minimum cooling efficiency requirement (EER) ~~by the percentages shown~~ in Table 503.3.1~~(2).~~
2. Systems with air or evaporatively cooled condensors and which serve spaces with open case refrigeration or that require filtration equipment in order to meet the minimum ventilation requirements of Chapter 4 of the *International Mechanical Code*.

2. Add new table as follows:

TABLE 503.3.1
ALTERNATE COMPLIANCE PATH TO AIRSIDE ECONOMIZERS FOR UNITARY EQUIPMENT

Size Category (Btu/h)	Climate Zones					
	1A, 1B, 2A, 3A, 4A	2B, 3B	6A, 6B, 8	4C, 5A, 5C	3C, 4B, 5B	7
Unitary Equipment with Electric Resistance or no heat covered by table						
≥65,000 and <135,000	Economizer not required	11.2 EER 12.7 IEER	11.2 EER 13.8 IEER	11.2 EER 14.9 IEER	Economizer required	Economizer not required
≥135,000 and <240,000		11.0 EER 12.4 IEER	11.0 EER 13.6 IEER	11.0 EER 14.7 IEER		Economizer required
≥240,000 and <760,000		11.0 EER 11.2 IEER	11.0 EER 12.2 IEER	11.0 EER 13.2 IEER		
≥760,000		9.7 EER 10.9 IEER	9.7 EER 11.9 IEER	9.7 EER 12.8 IEER		
Unitary Equipment with other heat covered by table						
≥65,000 and <135,000	Economizer not required	11.0 EER 12.4 IEER	11.0 EER 13.6 IEER	11.0 EER 14.7 IEER	Economizer required	Economizer not required
≥135,000 and <240,000		10.8 EER 12.2 IEER	10.8 EER 13.3 IEER	10.8 EER 14.4 IEER		Economizer required
≥240,000 and <760,000		9.8 EER 11.0 IEER	9.8 EER 12.0 IEER	9.8 EER 13.0 IEER		
≥760,000		9.5 EER 10.7 IEER	9.5 EER 11.6 IEER	9.5 EER 12.6 IEER		
Unitary and Applied Heat Pumps with electric resistance heat or no heat covered by table						
≥65,000 and <135,000	Economizer not required	11.0 EER 12.4 IEER	11.0 EER 13.6 IEER	11.0 EER 14.7 IEER	Economizer required	Economizer not required
≥135,000 and <240,000		10.6 EER 11.9 IEER	10.6 EER 12.9 IEER	10.6 EER 14.0 IEER		Economizer required
≥240,000		9.5 EER 10.7 IEER	9.5 EER 11.6 IEER	9.5 EER 12.6 IEER		
Unitary and Applied Heat Pumps other heat covered by table						
≥65,000 and <135,000	Economizer not required	10.8 EER 12.2 IEER	10.8 EER 13.3 IEER	10.8 EER 14.4 IEER	Economizer required	Economizer not required
≥135,000 and <240,000		10.4 EER 11.7 IEER	10.4 EER 12.7 IEER	10.4 EER 13.8 IEER		Economizer required
≥240,000		9.3 EER 10.4 IEER	9.3 EER 11.4 IEER	9.3 EER 12.3 IEER		

Reason: For consistency with Standard 90.1. This proposal is based on ongoing analysis efforts within ASHRAE designed to create a Standard 90.1-2010 that is 30% better than Standard 90.1-2004 in response to Federal legislation. Paralleling those efforts and considering that the IECC Chapter 5 is intended to be technically compatible with that standard to facilitate adoption and implementation, DOE is interested in keeping Chapter 5 of the 2012 IECC aligned with ANSI/ASHRAE/IESNA Standard 90.1-2010. Due to the timing of the code development process and ASHRAE standards processes this proposal was submitted in anticipation that by the final action hearings the work to update the standard would be complete.

Table 503.3.1(2) is an option in the current IECC that allows for the elimination of the air economizer requirement for air cooled packaged units covered by ARI 340/360 when incremental higher full load efficiencies are used as defined in Table 503.3.1(2). With the new full load and part load efficiencies that will go into effect in 2010 as approved by addendum g to the 2004 ASHRAE 90.1 and addendum s to the 2007 ASHRAE 90.1 and proposed in other changes to the IECC for the 2012 cycle this table needs to be updated as well.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Majette-EC-13-503.3.1

EC212–09/10
504.5

Proponent: John R. Addario, PE, New York State Department of State – Division of Code Enforcement and Administration

Revise as follows:

504.5 Pipe insulation. For automatic-circulating hot water and heat traced systems, piping shall be insulated with 1 inch (25 mm) of insulation having a conductivity not exceeding 0.27 Btu per inch/h x ft^2 ' °F (1.53 W per 25 mm/m^2 x K). The first 8 feet (2438 mm) of piping in ~~noncirculating~~ non-hot-water-supply temperature maintenance systems served by equipment without integral heat traps shall be insulated with 0.5 inch (12.7 mm) of material having a conductivity not exceeding 0.27 Btu per inch/h x ft^2 ' °F (1.53 W per 25 mm/m^2 x K).

Reason: The intent of this section is to require systems that maintain hot water temperature to be properly insulated. Heat traced systems, like circulating systems, should be required to limit the amount of energy they consume by requiring a minimum amount of insulation. This proposed change includes heat trace systems within the intent of the code. This proposed change also renames the reference from *noncirculating* to *hot water supply temperature maintenance* in order to recognize heat trace systems .

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

Filename: Addario-EC-3-504.5

EC213–09/10
504.5

Proponent: James R. Paschal, Paschal Engineering, representing Aquatherm, Inc.

Revise as follows:

504.5 Pipe insulation. For automatic-circulating hot water systems, piping shall be insulated with 1 inch (25 mm) of insulation having a conductivity not exceeding 0.27 Btu per inch/h x ft^2 x °F (1.53 W per 25 mm/m^2 x K). The first 8 feet (2438 mm) of piping in noncirculating systems served by equipment without integral heat traps shall be insulated with 0.5 inch (12.7 mm) of material having a conductivity not exceeding 0.27 Btu per inch/h x ft^2 x °F (1.53 W per 25 mm/m^2 x K). For non-metallic pipes of at least schedule 80 thickness and having thermal resistance greater than that of steel or copper pipe, reduced insulation thicknesses are permitted if documentation is provided showing that the pipe with the proposed insulation has no more heat gain or loss per foot than steel or copper pipe of the same nominal size with the insulation thickness specified here.

Reason: Plastic pipe with a heavier wall thickness can provide a significant insulating effect, thereby reducing the amount of external insulation necessary to achieve the same thermal performance. The requirements and values in the table assume that the pipe itself does not contribute to the overall thermal performance of the pipe/insulation combination. The addition of this footnote will explicitly allow recognition of this enhanced performance, while meeting the intent of the table by requiring the same or better performance from the pipe/insulation combination. This proposal is also consistent with the recently revised ASHRAE 90.1, *Energy Standard for Buildings Except Low-Rise Residential Buildings*, which recognizes that piping materials with low thermal conductivity and sufficient wall thickness can provide an insulating effect and thereby reduce the overall insulation required to achieve equivalent performance.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Paschal-EC-3-504.5

EC214–09/10
504.5

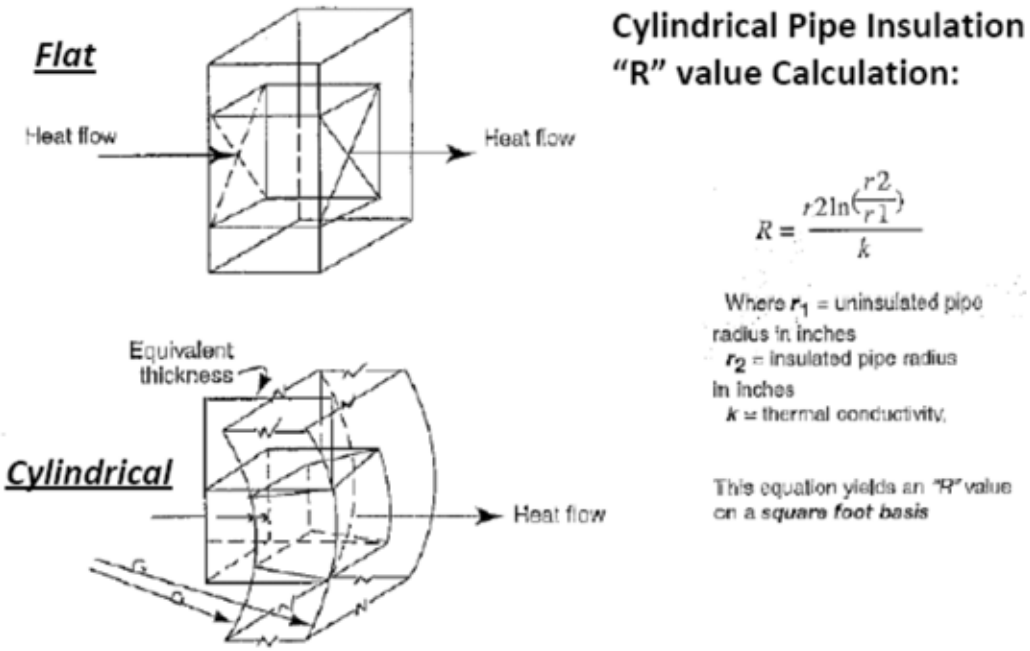
Proponent: Michael Resetar, Armacell LLC; Roger Schmidt, K-Flex USA; Shawn Dunahue, Nomaco Insulation

Revise as follows:

504.5 Pipe insulation. For ~~automatic-circulating~~ hot water delivery systems, piping shall be insulated with ~~1 inch (25 mm)~~ R-6 ~~of~~ insulation having a conductivity not exceeding 0.27 Btu per inch/h× ft2 × °F (1.53 W per 25 mm/m2 × K). ~~The first 8 feet (2438mm) of piping in noncirculating systems served by equipment without integral heat traps shall be insulated with 0.5 inch (12.7mm) of material having a conductivity not exceeding 0.27 Btu per inch/h × ft2 × °F (1.53 W per 25 mm/m2 × K).~~

Reason: Converting wall thickness requirement to an "R" value to be consistent with other insulation requirements within ICC codes and implementing pipe insulation on all hot water lines is a cost effective way to reduce energy consumption and increase water conservation within the structure by maintaining fluid temperature above 105°F longer between uses.

Don't compare typical flat sheet insulation "R" values with cylindrical pipe insulation "R" values.



Cylindrical Pipe Insulation "R" value Calculation:

$$R = \frac{r2\ln(\frac{r2}{r1})}{k}$$

Where r_1 = uninsulated pipe radius in inches
r_2 = insulated pipe radius in inches
k = thermal conductivity.

This equation yields an "R" value on a ***square foot basis***

R" value or thermal resistance is a measure of the ability of a material to retard heat flow. "R" is the numerical reciprocal of "C" (thermal conductance). Thermal resistance is used in combination with numerals to designate thermal resistance values. The higher the "R" value the higher the insulating value. This value is normally calculated on a square foot basis.

Flat Sheet Calculation Example:

$$R = \frac{\text{Thickness of Material}}{\text{Material Thermal Conductivity}}$$

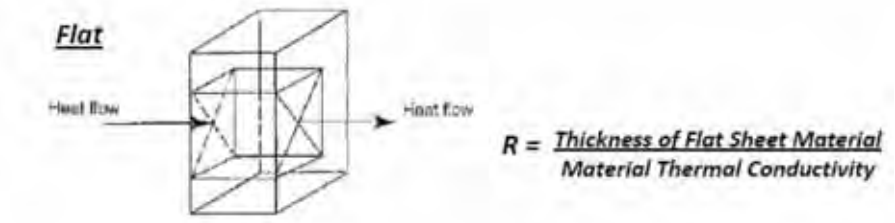
Sheet Insulation Thickness: 2"
Insulation Thermal Conductivity: 0.25 Btu•in/h•ft^2•°F
Resulting "R" Value : R-8.0 *(R-8 equals 8 resistance units)*

(*) It is common knowledge that with flat layer of insulation increasing the "R" value increases the thermal efficiency by the same factor.

The simple relations for flat sheet insulation do not hold true for when looking at cylindrical pipe insulations. For these materials, heat flow is not the simple straight –through heat flow found in flat surface/sheet material, but rather a radial heat flow. The reasoning is based on that fact that the inner radius surface area is much smaller than the outer radius surface area.

These differences in surface area support the need to calculate heat flow must be done using an equivalent thickness. For cylindrical pipe insulation the **Cylindrical Pipe Insulation "R" value Calculation** detailed above.

Don't compare typical flat sheet insulation "R" values with cylindrical pipe insulation "R" values.

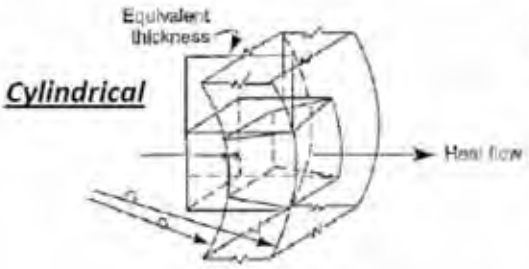


$$R = \frac{\text{Thickness of Flat Sheet Material}}{\text{Material Thermal Conductivity}}$$

Wall Thickness (inches)

	3/8	1/2	3/4	1	1-1/2	2
R-Value	1.5	2.1	3.1	4.2	6	8

Insulation Thermal Conductivity: 0.25 Btu•in/h•ft^2•°F



Cylindrical Pipe Insulation "R" value Calculation:

$$R = \frac{r2\ln(\frac{r2}{r1})}{k}$$

Wall Thickness

Pipe Insulation ID Size	Nom. 3/8	Nom. 1/2	Nom. 3/4	Nom. 1	Nom. 1-1/2
3/8	2.9	3.4	5.7	7.4	—
1/2	2.7	3.3	5.5	7.2	—
5/8	2.5	3.3	5.5	7.1	11.4
3/4	2.4	3.3	5.4	6.9	10.8
7/8	2.3	3.3	5.4	6.9	10.3
1-1/8	2.2	3.2	5.3	7.2	9.6
1-3/8	2.1	3.1	5.1	7.3	9.0
1-5/8	2.4	3.1	4.9	7.2	8.6
1-1/2 IPS	2.3	3.1	4.8	6.9	8.3
2-1/8	2.3	3.1	4.7	6.7	8.1
2 IPS	2.2	3.1	4.6	6.6	7.8
2-5/8	2.2	3.0	4.5	6.4	7.7
2-1/2 IPS	2.2	3.0	4.4	6.3	7.5
3-1/8	2.2	2.9	4.3	6.2	7.4
3 IPS	2.1	2.9	4.3	6.1	7.2
3-5/8	2.1	2.9	4.2	6.0	7.1
4-1/8	2.1	2.8	4.2	5.9	7.0
4 IPS	2.1	2.8	4.1	5.8	6.8
5 IPS	2.1	2.8	4.0	5.6	6.6
6 IPS	2.0	2.7	3.9	5.5	6.4

Insulation Thermal Conductivity 0.25 Btu•in/(h•ft²•°F)

Cost Impact: The material cost implications would be minimal and would be recovered (paid back) after a period of months due to system efficiency gains. Labor associated with the installation would remain constant to that of the current requirements.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Resetar-Schmidt-Dunahue-EC-7-504.5

EC215–09/10
504.5

Proponent: Michael Resetar, Armacell LLC; Roger Schmidt, K-Flex USA; Shawn Dunahue, Nomaco Insulation

Revise as follows:

504.5 Pipe insulation. For automatic-circulating hot water systems, piping shall be insulated with ~~1 inch (25 mm)~~ R-6 ~~of~~ insulation having a conductivity not exceeding 0.27 Btu per inch/h× ft2 × °F (1.53 W per 25 mm/m2 × K). For noncirculating systems**,** the first 8 feet (2438mm) of piping ~~in noncirculating systems~~ served by equipment without integral heat traps shall be insulated with ~~0.5 inch (12.7mm)~~ R-4 ~~of material~~ insulation having a conductivity not exceeding 0.27 Btu per inch/h × ft2 × °F (1.53 W per 25 mm/m2 × K).

Reason: Converting wall thickness requirement to an "R" value to be consistent with other insulation requirements within ICC codes.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Resetar-Schmidt-Dunahue-EC-8-504.5

EC216–09/10
504.7, 504.7.1, 504.7.2, 504.7.3

Proponent: Ronald Majette, representing US Department of Energy

Revise as follows:

504.7 Pools, hot tubs and spas (Mandatory). Pools, hot tubs and spas shall ~~be provided with energy-conserving measures in accordance~~ comply with Sections 504.7.1 through 504.7.3.

504.7.1 ~~Pool h~~Heaters. All ~~pool~~ heaters shall be equipped with a readily *accessible* on-off switch to allow shutting off the heater without adjusting the thermostat setting. ~~Pool h~~ Heaters fired by natural or LP gas shall not have continuously burning pilot lights.

504.7.2 Time switches. Time switches that can automatically turn off and on heaters and pumps according to a preset schedule shall be installed on ~~swimming pool~~ heaters and pumps.

Exceptions:

1. Public health standards require 24-hour pump operation.
2. Pumps are required to operate solar- and waste-heat-recovery ~~pool heating~~ systems.

504.7.3 ~~Pool c~~Covers. Heated pools, hot tubs and spas shall be ~~equipped~~ provided with a vapor-retardant ~~pool~~ cover ~~on or at the water surface~~. Pools, hot tubs and spas capable of being heated to more than 90°F (32°C) shall ~~have a pool~~ be provided with a cover ~~with~~ having a minimum insulation value of R-12.

~~Exception:~~ ~~Pools deriving over 60 percent of the energy for heating from site-recovered energy or solar energy source.~~

Reason: Clarification. The current text does not apply to hot tubs and spas and it should. The text in 504.7.3 has been revised to be applied during inspection prior to approval of the subject pool, hot tub or spa. As currently written, one could interpret the requirements as enforceable after a use permit has been issued. It is not likely code officials could, nor would want to, enforce the cover provisions in a post-occupancy condition as suggested by the current text. The exception for solar or site recovered energy has been eliminated simply because there is no rationale why a pool, hot tub or spa getting 59% of its energy from non-renewables should not be exempt and one getting 61% from renewable should. Also, how would this last provision even be determined in plan review and capable of being readily enforced.

Cost Impact: The proposed change will not increase the cost of construction other than pools that were heated with solar or site recovered energy systems will now require the use of a pool cover.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Majette-EC-16-504.7

EC217–09/10
202 (New), 505.1, 505.2 (New), Tables 505.2(1)-(2) (New), Chapter 6 (New)

Proponent: Ronald Majette, representing US Department of Energy

1. Add new definitions as follows:

GENERAL PURPOSE ELECTRIC MOTOR (SUBTYPE I). Any electric motor that meets the definition of "general purpose" motor as codified by the Department of Energy in 10 CFR 431.

GENERAL PURPOSE ELECTRIC MOTOR (SUBTYPE II). Any electric motor incorporating the design elements of a general purpose electric motor (subtype I) that are configured as:

U-frame motor,
Design C motor,
Close-coupled pump motor,
Footless motor,
Vertical solid shaft normal thrust motor (tested in a horizontal configuration)

8 –pole motor (900 rpm), or
Poly-phase motor with voltage no more than 600 volts (other than 230 or 460 volts).

2. Revise as follows:

505.1 General (Mandatory). This section covers electric motors, lighting system controls, the connection of ballasts, the maximum lighting power for interior applications and minimum acceptable lighting equipment for exterior applications.

Exception: Lighting within dwelling units where 50 percent or more of the permanently installed interior light fixtures are fitted with high-efficacy lamps.

3. Add new text and tables as follows:

505.2 Electric motors. Electric motors manufactured alone or as a component of another piece of equipment shall comply with Table 505.2(1) for *general purpose electric motors (subtype I)* and Table 505.2(2) for *general purpose electric motors (subtype II)*.

Fire pump motors and NEMA Design B, general purpose electric motors with a power rating of more than 200 horsepower, but no more than 500 horsepower shall have a minimum nominal full load efficiency as shown in Table 505.2(2)

TABLE 505.2(1)
MINIMUM NOMINAL FULL LOAD EFFICIENCY FOR 60 HZ NEMA GENERAL PURPOSE ELECTRIC MOTORS (SUBTYPE I) RATED 600

Minimum Nominal Full Load Efficiency (%)								
	Open Drip-Proof Motors				**Totally Enclosed Fan Cooled Motors**			
Number of Poles	2	4	6	8	2	4	6	8
Synchronous Speed (RPM)	3600	1800	1200	900	3600	1800	1200	900
Motor Horsepower								
1.0	NR	82.5	80.0	74.0	75.5	82.5	80.0	74.0
1.5	82.5	84.0	84.0	75.5	82.5	84.0	85.5	77.0
2.0	84.0	84.0	85.5	85.5	84.0	84.0	86.5	82.5
3.0	84.0	86.5	86.5	86.5	85.5	87.5	87.5	84.0
5.0	85.5	87.5	87.5	87.5	87.5	87.5	87.5	85.5
7.5	87.5	88.5	88.5	88.5	88.5	89.5	89.5	85.5
10.0	88.5	89.5	90.2	89.5	89.5	89.5	89.5	88.5
15.0	89.5	91.0	90.2	89.5	90.2	91.0	90.2	88.5
20.0	90.2	91.0	91.0	90.2	90.2	91.0	90.2	89.5
25.0	91.0	91.7	91.7	90.2	91.0	92.4	91.7	89.5
30.0	91.0	92.4	92.4	91.0	91.0	92.4	91.7	91.0
40.0	91.7	93.0	93.0	91.0	91.7	93.0	93.0	91.0
50.0	92.4	93.0	93.0	91.7	92.4	93.0	93.0	91.7
60.0	93.0	93.6	93.6	92.4	93.0	93.6	93.6	91.7
75.0	93.0	94.1	93.6	93.6	93.0	94.1	93.6	93.0
100.0	93.0	94.1	94.1	93.6	93.6	94.5	94.1	93.0
125.0	93.6	94.5	94.1	93.6	94.5	94.5	94.1	93.6
150.0	93.6	95.0	94.5	93.6	94.5	95.0	95.0	93.6

Minimum Nominal Full Load Efficiency (%)								
	Open Drip-Proof Motors				Totally Enclosed Fan Cooled Motors			
200.0	94.5	95.0	94.5	93.6	95.0	95.0	95.0	94.1
250.0	94.5	95.4	95.4	94.5	95.4	95.0	95.0	94.5
300.0	95.0	95.4	95.4	NR[b]	95.4	95.4	95.0	NR
350.0	95.0	95.4	95.4	NR	95.4	95.4	95.0	NR
400.0	95.4	95.4	NR	NR	95.4	95.4	NR	NR
450.0	95.8	95.8	NR	NR	95.4	95.4	NR	NR
500.0	95.8	95.8	NR	NR	95.4	95.8	NR	NR

a. Nominal efficiencies shall be established in accordance with NEMA Standard MG1.
b. NR = no requirement

TABLE 505.2(2)
MINIMUM NOMINAL FULL LOAD EFFICIENCY OF GENERAL PURPOSE ELECTRIC MOTORS (SUBTYPE II AND DESIGN B)[a]

Minimum Nominal Full Load Efficiency (%)								
	Open Drip-Proof Motors				Totally Enclosed Fan Cooled Motors			
Number of Poles	2	4	6	8	2	4	6	8
Synchronous Speed (RPM)	3600	1800	1200	900	3600	1800	1200	900
Motor Horsepower								
1.0	NR	82.5	80.0	74.0	75.5	82.5	80.0	74.0
1.5	82.5	84.0	84.0	75.5	82.5	84.0	85.5	77.0
2.0	84.0	84.0	85.5	85.5	84.0	84.0	86.5	82.5
3.0	84.0	86.5	86.5	86.5	85.5	87.5	87.5	84.0
5.0	85.5	87.5	87.5	87.5	87.5	87.5	87.5	85.5
7.5	87.5	88.5	88.5	88.5	88.5	89.5	89.5	85.5
10.0	88.5	89.5	90.2	89.5	89.5	89.5	89.5	88.5
15.0	89.5	91.0	90.2	89.5	90.2	91.0	90.2	88.5
20.0	90.2	91.0	91.0	90.2	90.2	91.0	90.2	89.5
25.0	91.0	91.7	91.7	90.2	91.0	92.4	91.7	89.5
30.0	91.0	92.4	92.4	91.0	91.0	92.4	91.7	91.0
40.0	91.7	93.0	93.0	91.0	91.7	93.0	93.0	91.0
50.0	92.4	93.0	93.0	91.7	92.4	93.0	93.0	91.7
60.0	93.0	93.6	93.6	92.4	93.0	93.6	93.6	91.7
75.0	93.0	94.1	93.6	93.6	93.0	94.1	93.6	93.0
100.0	93.0	94.1	94.1	93.6	93.6	94.5	94.1	93.0
125.0	93.6	94.5	94.1	93.6	94.5	94.5	94.1	93.6
150.0	93.6	95.0	94.5	93.6	94.5	95.0	95.0	93.6
200.0	94.5	95.0	94.5	93.6	95.0	95.0	95.0	94.1
250.0	94.5	95.4	95.4	94.5	95.4	95.0	95.0	94.5
300.0	95.0	95.4	95.4	NR[b]	95.4	95.4	95.0	NR
350.0	95.0	95.4	95.4	NR	95.4	95.4	95.0	NR

Minimum Nominal Full Load Efficiency (%)								
	Open Drip-Proof Motors				Totally Enclosed Fan Cooled Motors			
400.0	95.4	95.4	NR	NR	95.4	95.4	NR	NR
450.0	95.8	95.8	NR	NR	95.4	95.4	NR	NR
500.0	95.8	95.8	NR	NR	95.4	95.8	NR	NR

a. Efficiencies shall be established in accordance with NEMA Standard MG1.
b. NR = no requirement

4. Add new standard as follows:

NEMA National Electrical Manufacturers Association
1300 North 17th Street, Suite 184
Rosslyn, VA 22209

ANSI/NEMA MG 1-93 Motors and Generators

Reason: This proposal is based on ongoing analysis efforts within ASHRAE designed to create a Standard 90.1-2010 that is 30% better than Standard 90.1-2004 in response to Federal legislation. Paralleling those efforts and considering that the IECC Chapter 5 is intended to be technically compatible with that standard to facilitate adoption and implementation, DOE is interested in keeping Chapter 5 of the 2012 IECC aligned with ANSI/ASHRAE/IESNA Standard 90.1-2010. Due to the timing of the code development process and ASHRAE standards processes this proposal was submitted in anticipation that by the final action hearings the work to update the standard would be complete. Note also that motor efficiency is currently covered in Standard 90.1-07, is not included in the IECC and for consistency should be included.

Section 313 of the Energy Independence and Security Act of 2007 (EISA 2007) mandates that the efficiency of general purpose motors (manufactured or imported) that are rated at 1.0 horsepower and larger be increased for motors manufactured on or after December 19, 2010. In addition, there are new efficiency standards that are required for larger motors that may be used by commercial/ industrial customers (sized greater than 200 horsepower and less than or equal to 500 horsepower). These updated motor efficiency standards have been vetted, analyzed, and agreed to by motor manufacturers.

According to a March 21, 2007 press release by the American Council for an Energy- Efficient Economy (ACEEE) and the National Electrical Manufacturers Association (NEMA), the new motor efficiency standards will create a cumulative national energy savings of 8 quadrillion Btus over 20 years (2010 to 2030), with a net energy cost savings to commercial and industrial consumers of almost $500 million. These clarifying changes to Standard 90.1 will not affect the estimate of these savings.

Adding this clarifying information to the IECC will help designers, end-use customers, and code officials with motor specifications and verifications.

Cost Impact: The code change proposal will not increase the cost of construction as the provisions covered in the proposal are addressed in Federal rules, just as many of the HVAC equipment efficiencies are now in the IECC.

Analysis: A review of the standard(s) proposed for inclusion in the code, ANSI/NEMA MG 1-93, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Majette-EC-22-505-

EC218–09/10
505.1, 505.5.3 (New)

Proponent: Joseph Hill, RA, representing the New York State Department of State

1. Revise as follows:

505.1 General (Mandatory). This section covers lighting system controls, the connection of ballasts, the maximum lighting power for interior applications, electrical energy consumption, and minimum acceptable lighting equipment for exterior applications.

~~**Exception:** Lighting within dwelling units where 50 percent or more of the permanently installed interior light fixtures are fitted with high-efficacy lamps.~~

Exception: Dwelling units are not required to comply with Sections 505.2 through 505.5.2

2. Add new text as follows:

505.5.3 Lighting within dwelling units. (Mandatory). Lighting within dwelling units shall have a minimum of 50 percent of the permanently installed interior light fixtures fitted with *high-efficacy lamps*.

Reason: This dwelling unit exception as existing in the Code is somewhat confusing. For dwelling units, the section essentially mixes design and installation requirements for lighting fixtures. The requirements either;
Drives the owner to *install* 50 percent or more of the interior light fixtures with high-efficacy lamps.
Or Conversely;
Requires the designer to comply with all electrical power and lighting requirements of Section 505.

It would be clearer to the code user to list a requirement for a minimum of 50 percent of the permanently installed interior light fixtures to be fitted *high-efficacy lamps*. This **requirement** is part of Chapter 4 of the Energy Code, and would create consistency with the Residential provisions (Chapter 4) of the Energy Code for dwelling units.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Hill-EC-4-505.1

EC219–09/10
101.4.3, 505.1

Proponent: Ronald Majette, representing US Department of Energy

Revise as follows:

101.4.3 Additions, alterations, renovations or repairs. Additions, alterations, renovations or repairs to an existing building, building system or portion thereof shall conform to the provisions of this code as they relate to new construction without requiring the unaltered portion(s) of the existing building or building system to comply with this code. Additions, alterations, renovations or repairs shall not create an unsafe or hazardous condition or overload existing building systems. An addition shall be deemed to comply with this code if the addition alone complies or if the existing building and addition comply with this code as a single building.

Exception: The following need not comply provided the energy use of the building is not increased:

1. Storm windows installed over existing fenestration.
2. Glass only replacements in an existing sash and frame.
3. Existing ceiling, wall or floor cavities exposed during construction provided that these cavities are filled with insulation.
4. Construction where the existing roof, wall or floor cavity is not exposed.
5. Reroofing for roofs where neither the sheathing nor the insulation is exposed. Roofs without insulation in the cavity and where the sheathing or insulation is exposed during reroofing shall be insulated either above or below the sheathing.
6. Replacement of existing doors that separate *conditioned space* from the exterior shall not require the installation of a vestibule or revolving door, provided, however, that an existing vestibule that separates a *conditioned space* from the exterior shall not be removed,
7. Alterations that replace less than 50 percent of the luminaires in a space, provided that such alterations do not increase the installed interior lighting power.
8. Alterations that replace only the bulb ~~and~~ or ballast within the existing luminaires in a space provided that the *alteration* does not increase the installed interior lighting power.

505.1 General (Mandatory). This section covers lighting system controls, the connection of ballasts, the maximum lighting power for interior applications and minimum acceptable lighting equipment for exterior applications.

Exception: Lighting within dwelling units where 50 percent or more of the permanently installed interior light fixtures are fitted with high-efficacy lamps.

The *alteration* of lighting systems in any building *space* or exterior area shall comply with the lighting power requirements of Section 505 applicable to the space or area being altered and the automatic shutoff requirements of Section 505.2.2.2. Such *alterations* shall include all luminaires that are added, replaced or removed. This requirement shall also be met for *alterations* that involve the replacement of lamps and ballast combinations.

Exception: *Alterations* that involve less than 10 percent of the connected lighting load in a *space* or area and do not increase the installed lighting power.

Reason: For consistency with Standard 90.1. This proposal is based on ongoing analysis efforts within ASHRAE designed to create a Standard 90.1-2010 that is 30% better than Standard 90.1-2004 in response to Federal legislation. Paralleling those efforts and considering that the IECC Chapter 5 is intended to be technically compatible with that standard to facilitate adoption and implementation, DOE is interested in keeping Chapter 5 of the 2012 IECC aligned with ANSI/ASHRAE/IESNA Standard 90.1-2010. Due to the timing of the code development process and ASHRAE standards processes this proposal was submitted in anticipation that by the final action hearings the work to update the standard would be complete.

These changes clarify when controls are required to comply when lighting systems are altered. The current code requires that only controls that are replaced must meet specific requirements for that type of control. The proposed change requires that controls be changed or added to meet the primary lighting control requirement of automatic control when the lighting fixtures in the space are retrofit. This is simpler, makes spaces comply more completely with the code and will save additional energy.

Cost Impact: The proposal will decrease the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Majette-EC-18-505.1

EC220–09/10
202, 505.2.2.1

Proponent: Rick Sugar, Douglas County, CO, representing Colorado Chapter of the International Code Council

1. Revise as follows:

505.2.2.1 Light reduction controls. Each area that is required to have a manual control shall also allow the occupant to reduce the connected lighting load in a reasonably uniform illumination pattern by at least 50 percent. Lighting reduction shall be achieved by one of the following or other *approved* method:

1. Controlling all lamps or luminaires;
2. Dual switching of alternate rows of luminaires, alternate luminaires or alternate lamps;
3. Switching the middle lamp luminaires independently of the outer lamps; or
4. Switching each luminaire or each lamp.

Exceptions:

1. Areas that have only one luminaire.
2. Areas that are controlled by an occupant-sensing device.
3. Corridors, equipment rooms, storerooms, restrooms or public lobbies.
4. *Sleeping unit* (see Section 505.2.3).
5. Spaces that use less than 0.6 watts per square foot (6.5 W/m2).

2. Add new definition as follows:

EQUIPMENT ROOM. A space that contains either electrical equipment, mechanical equipment, machinery, water pumps or hydraulic pumps that are a function of the buildings services.

Reason: All equipment will need to be serviced periodically. Reducing the lighting in these areas is a life safety hazard when working on or around any equipment. Set parameters on what an equipment room is, so the exception is easier to understand and enforce

Cost Impact: This code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Sugar-EC-1-202 - 505.2.2.1

EC221–09/10
504.6

Proponent: Guy Tomberlin, Fairfax County, Virginia, representing himself

Revise as follows:

504.6 Hot water system controls. ~~Automatic~~ Circulating hot water system pumps or heat trace shall be arranged to be ~~conveniently~~ turned off, either automatically or manually, when there is limited hot water demand. ~~system is not in operation.~~ Ready access shall be provided to the operating controls.

Reason: This proposal cleans up flawed language and does not change the intent of the section. Circulating systems are not automatic but the controls that operate recirculating systems can be automatic or manual. The term "conveniently" is not defined in the family of I-codes. The intent is better stated by requiring ready access for the controls. "Ready access" is used throughout the family of I codes with a clear definition that means access which first does not require the removal of a door panel or similar obstruction. The intent of this section is for the controls to be in a location that building maintenance people can easily get to in order to change time clock settings (automatic systems) or simply flip a switch (manual systems). The phrase "when the hot water system is not in operation" is vague and confusing. Is the intention for the circulation pumps or heat trace to operate 24 hours a day unless the water heating system is not making hot water? In other words, when the water heater is turned off? No. The intent is to stop wasting energy consumed by pumps or heat trace when the demand for hot water is limited or non-existent such as occurs during weekends and nights in most buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-EC-504.6

EC222–09/10
505.2.2.2

Proponent: Krista Braaksma, representing Washington State Building Code Council

Revise as follows:

505.2.2.2 Automatic lighting shutoff. Buildings larger than 5,000 square feet (465m^2) shall be equipped with an automatic control device to shut off lighting in normally occupied, non egress related, areas. This automatic control device in these areas shall function on either:

1. A scheduled basis, using time-of-day, with an independent program schedule that controls the interior lighting in areas that do not exceed 25,000 square feet (2323m^2) and are not more than one floor; or
2. An occupant sensor that shall turn lighting off within 30 minutes of an occupant leaving a space; or
3. A signal from another control or alarm system that indicates the area is occupied~~.~~; or
4. Automatic time switches having a minimum 7 day clock and capable of being set for 7 different day types per week and which incorporate an automatic holiday "shut-off" feature, to turn off all loads for at least 24 hours and then resume normally scheduled operations. Automatic time switches shall also have program back-up capabilities, which prevent the loss of program and time settings for at least 10 hours, if power is interrupted.

Automatic time switches shall incorporate an over-ride switching device which:

1. Is readily accessible;
2. Is located so that a person using the device can see the lights or the areas controlled by the switch, or so that the area being illuminated is annunciated;
3. Is manually operated;
4. Allows the lighting to remain on for no more than 2 hours when an over-ride is initiated; and
5. Controls an area not exceeding 5,000 square feet or 5 percent of the building footprint for footprints over 100,000 square feet, whichever is greater.

Reason: The proposal provides a cost effective method of providing lighting control overrides for after-hours work.

Cost Impact: The code change proposal will increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BRAAKSMA-EC-4-505.2.2.2

EC223–09/10
505.2.2.2

Proponent: Randall R. Dahmen, WI Registered PE, WI Licensed Commercial Building Inspector, representing self

Revise as follows:

505.2.2.2 Automatic lighting shutoff. Buildings larger than 5,000 square feet (465m_2) shall be equipped with an automatic control device to shut off lighting in those areas. This automatic control device shall function on either:

1. A scheduled basis, using time-of-day, with an independent program schedule that controls the interior lighting in areas that do not exceed 25,000 square feet (2323 m_2) and are not more than one floor; or
2. An occupant sensor that shall turn lighting off within 30 minutes of an occupant leaving a space; or
3. A signal from another control or alarm system that indicates the area is unoccupied.

Exception: The following shall not require an automatic control device:

1. *Sleeping unit* (see Section 505.2.3).
2. Lighting in spaces where patient care is directly provided.
3. Spaces where an automatic shutoff would endanger occupant safety or security.
4. Lighting intended for continuous operation.

Reason: With rising costs, it is financially inappropriate to require automatic shutoff controls in areas which are used for 24 hour/365 day a year operations. Those spaces which have continuous use have no energy savings or operation savings advantage for installing such controls. Additionally, ASHRAE 90.1 recognizes a similar exception.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAHMEN-EC1-505.2.2.2.DOC

EC224–09/10
505.2.2.3

Proponent: Krista Braaksma, Washington representing Washington State Building Code Council

Revise as follows:

505.2.2.3 Daylight zone control. Daylight zones, as defined by this code, shall be provided with individual controls that control the ~~lights~~ luminaires independent of general area lighting. Contiguous daylight zones adjacent to vertical fenestration are allowed to be controlled by a single controlling device provided that they do not include zones facing more than two adjacent cardinal orientations (i.e., north, east, south, west). Daylight zones under skylights more than 15 feet (4572 mm) from the perimeter shall be controlled separately from daylight zones adjacent to vertical fenestration.

In all areas with skylights, monitors or other fenestration at or above ceiling level and in all areas with windows, all permanent luminaries in the daylighted zone shall be controlled by automatic daylight sensing controls.

Automatic daylight sensing controls shall:

1. Be capable of reducing the light output of the controlled luminaires while maintaining a uniform level of illuminance by one of the following methods:
   1.1. Continuous dimming down to at least 10% of the maximum light output; or
   1.2. Step switching of each lamp in individual luminaires (non-continuous dimming devices shall have adjustable separation [deadband] of on and off points to prevent short cycling) and provide an automatic OFF control. Switching alternate luminaires is not permitted except with single lamp luminaires; or
   1.3. Step dimming by reducing the output of all of the lamps in individual luminaires by at least 50 percent and providing an automatic OFF control.

2. Control only luminaires within the daylit area(s).
3. Incorporate time-delay circuits to prevent cycling of light level changes of less than three minutes.

Any switching devices installed to override the automatic daylighting control shall comply with the criteria in Section 505.2.2.2.

Exception: ~~Daylight spaces enclosed by walls or ceiling height partitions and containing 2 or fewer light fixtures are not required to have a separate switch for general area lighting.~~ The following are exempt from the requirements for automatic daylighting controls in Section 505.2.2.3:

1. Retail spaces adjacent to vertical glazing (retail spaces under overhead glazing are not exempt).
2. Lighting exempted by Section 505.2.2.1, 505.2.2.2, 505.2.2.2.1, or 505.2.2.2.2.
3. Display, exhibition and specialty lighting controlled independently from general area lighting.
4. Small spaces in the daylight zone that are normally unoccupied (such as a storage room with a window, or restrooms) that are controlled by an occupant sensing device:
5. Rooms less than 300 square feet.
6. Conference rooms 300 square feet and larger that have a lighting control system with at least four scene options and an occupancy sensor control.
7. HID lamps with automatic controls that are capable of reducing the power consumption by at least 50%.
8. HID lamps 100 watts or less.

Reason: This proposal provides greater consistency with ASHRAE Standard 90.1 requirements for daylight zone control. It requires automatic controls to reduce energy consumption in daylighted spaces, both under skylights and next to windows.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BRAAKSMA-EC-5-505.2.2.3

EC225–09/10

Tables 505.6.2(1) and 505.2(2)

Proponent: Richard Heinisch, Acuity Brands Lighting, Inc.

Revise table as follows:

TABLE 505.6.2(1)
EXTERIOR LIGHTING ZONES

Lighting Zone	Description
0	Undeveloped areas within national parks, state parks, forest land, rural areas, and other undeveloped areas as defined by the local land use planning authority
1	Developed areas of national parks, state parks, forest land, and rural areas
2	Areas predominantly consisting of residential zoning, neighborhood business districts, light industrial with limited nighttime use and residential mixed use areas
3	All other areas
4	High activity commercial districts in major metropolitan areas as designated by the local land use planning authority

TABLE 505.6.2(2)
INDIVIDUAL LIGHTING POWER ALLOWANCES FOR BUILDING EXTERIORS

		Zone 0	Zone 1	Zone 2	Zone 3	Zone 4
Base Site Allowance (base allowance may be used in tradable or non-tradable surfaces)		No Base Site in Zone 0	500 W	600 W	750 W	1300 W
	Uncovered Parking Areas					
		No Tradable Surface allowances in Zone 0				
	Parking areas and drives		0.04 W/ft^2	0.06 W/ft^2	0.10 W/ft^2	0.13 W/ft^2
	Building Grounds					
Tradable Surfaces (Lighting power densities for uncovered parking areas, building grounds, building entrances and exits, canopies and overhangs and outdoor sales areas may be traded.)	Walkways less than 10 feet wide		0.7 W/linear foot	0.7 W/linear foot	0.8 W/linear foot	1.0 W/linear foot
	Walkways 10 feet wide or greater Plaza areas Special Feature Areas		0.14 W/ft^2	0.14 W/ft^2	0.16 W/ft^2	0.2 W/ft^2
	Stairways		0.75 W/ft^2	1.0 W/ft^2	1.0 W/ft^2	1.0 W/ft^2
	Pedestrian Tunnels		0.15 W/ft^2	0.15 W/ft^2	0.2 W/ft^2	0.3 W/ft^2
	Landscaping		0.04 W/ft^2	0.05 W/ft^2	0.05 W/ft^2	0.05 W/ft^2
	Building Entrances and Exits					
	Main entries		20 W/linear foot of door width	20 W/linear foot of door width	30 W/linear foot of door width	30 W/linear foot of door width
	Other doors		20 W/linear foot of door width	20 W/linear foot of door width	20 W/linear foot of door width	20 W/linear foot of door width
	Entry Canopies		0.25 W/ft^2	0.25 W/ft^2	0.4 W/ft^2	0.4 W/ft^2
	Sales Canopies					
	free standing and attached		0.6 W/ft^2	0.6 W/ft^2	0.8 W/ft^2	1.0 W/ft^2
	Outdoor Sales					
	Open areas (including vehicle sales lots)		0.25 W/ft^2	0.25 W/ft^2	0.5 W/ft^2	0.7 W/ft^2
	Street frontage for vehicle sales lots in addition to "open area" allowance		No allowance	10 W/linear foot	10 W/linear foot	30 W/linear foot

(Remainder of table unchanged)

Reason: This change adds an exterior zone 0 to cover very low light requirement areas. This will help eliminate excessive use of light in areas where none is needed other than for location marking type. Prior to this, the choices for users were zone 1 or 3 which both have higher than needed allowances. The single 60 W luminaire per location allows the use of small HID from higher pole locations (i.e. at parking) and would allow incandescent in locations where cold weather inhibits the use of CFL technology.

Cost Impact: The code change proposal will not increase the cost of construction and will, in fact, decrease costs by keeping designers from over lighting Zone 0 sites.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Heinisch-EC-1-T. 505.6.2(1)-(2)

EC226–09/10
Table 505.6.2(1), 505.6.2(2)

Proponent: Ronald Majette, representing US Department of Energy

Revise as follows:

TABLE 505.6.2(1)
EXTERIOR LIGHTING ZONES

Lighting Zone	Description
0	Undeveloped areas within national parks, state parks, forest land, rural areas, and other undeveloped areas as defined by the authority having jurisdiction
1	Developed areas of national parks, state parks, forest land, and rural areas
2	Areas predominantly consisting of residential zoning, neighborhood business districts, light industrial with limited nighttime use and residential mixed use areas
3	All other areas
4	High activity commercial districts in major metropolitan areas as designated by the local jurisdiction

TABLE 505.6.2(2)
INDIVIDUAL LIGHTING POWER ALLOWANCES FOR BUILDING EXTERIORS

		Zone 0	Zone 1	Zone 2	Zone 3	Zone 4
Base Site Allowance (Base allowance may be used in tradable or nontradable surfaces.)		No Base Site in Zone 0	500 W	600 W	750 W	1300 W
Tradable Surfaces (Lighting power densities for uncovered parking areas, building grounds, building entrances and exits, canopies and overhangs and outdoor sales areas may be traded.)		**Uncovered Parking Areas**				
	Parking areas and drives		0.04 W/ft^2	0.06 W/ft^2	0.10 W/ft^2	0.13 W/ft^2
		Building Grounds				
	Walkways less than 10 feet wide		0.7 W/linear foot	0.7 W/linear foot	0.8 W/linear foot	1.0 W/linear foot
	Walkways 10 feet wide or greater, plaza areas special feature areas	No Tradable Surface Allowances in Zone 0	0.14 W/ft^2	0.14 W/ft^2	0.16 W/ft^2	0.2 W/ft^2
	Stairways		0.75 W/ft^2	1.0 W/ft^2	1.0 W/ft^2	1.0 W/ft^2
	Pedestrian tunnels		0.15 W/ft^2	0.15 W/ft^2	0.2 W/ft^2	0.3 W/ft^2
		Building Entrances and Exits				
	Main entries		20 W/linear foot of door width	20 W/linear foot of door width	30 W/linear foot of door width	30 W/linear foot of door width
	Other doors		20 W/linear foot of door width	20 W/linear foot of door width	20 W/linear foot of door width	20 W/linear foot of door width
	Entry canopies		0.25 W/ft^2	0.25 W/ft^2	0.4 W/ft^2	0.4 W/ft^2
		Sales Canopies				
	Free-standing and attached		0.6 W/ft^2	0.6 W/ft^2	0.8 W/ft^2	1.0 W/ft^2
		Outdoor Sales				
	Open areas (including vehicle sales lots)		0.25 W/ft^2	0.25 W/ft^2	0.5 W/ft^2	0.7 W/ft^2

		Zone 0	Zone 1	Zone 2	Zone 3	Zone 4
	Street frontage for vehicle sales lots in addition to "open area" allowance		No allowance	10 W/linear foot	10 W/linear foot	30 W/linear foot
Nontradable Surfaces (Lighting power density calculations for the following applications can be used only for the specific application and cannot be traded between surfaces or with other exterior lighting. The following allowances are in addition to any allowance otherwise permitted in the "Tradable Surfaces" section of this table.)	Building facades		No allowance	0.1 W/ft2 for each illuminated wall or surface or 2.5 W/linear foot for each illuminated wall or surface length	0.15 W/ft2 for each illuminated wall or surface or 3.75 W/linear foot for each illuminated wall or surface length	0.2 W/ft2 for each illuminated wall or surface or 5.0 W/linear foot for each illuminated wall or surface length
	Automated teller machines and night depositories	A single luminaire of 60 watts or less may be installed for each roadway/parking entry, trail head, and toilet facility, or other locations approved by the authority having jurisdiction	270 W per location plus 90 W per additional ATM per location	270 W per location plus 90 W per additional ATM per location	270 W per location plus 90 W per additional ATM per location	270 W per location plus 90 W per additional ATM per location
	Entrances and gatehouse inspection stations at guarded facilities		0.75 W/ft^2 of covered and uncovered area	0.75 W/ft^2 of covered and uncovered area	0.75 W/ft^2 of covered and uncovered area	0.75 W/ft^2 of covered and uncovered area
	Loading areas for law enforcement, fire, ambulance and other emergency service vehicles		0.5 W/ft^2 of covered and uncovered area	0.5 W/ft^2 of covered and uncovered area	0.5 W/ft^2 of covered and uncovered area	0.5 W/ft^2 of covered and uncovered area
	Drive-up windows/doors		400 W per drive-through	400 W per drive-through	400 W per drive-through	400 W per drive-through
	Parking near 24-hour retail entrances		800 W per main entry	800 W per main entry	800 W per main entry	800 W per main entry

For SI: 1 foot = 304.8 mm, 1 watt per square foot = W/0.0929 m^2.

Reason: For consistency with Standard 90.1. This proposal is based on ongoing analysis efforts within ASHRAE designed to create a Standard 90.1-2010 that is 30% better than Standard 90.1-2004 in response to Federal legislation. Paralleling those efforts and considering that the IECC Chapter 5 is intended to be technically compatible with that standard to facilitate adoption and implementation, DOE is interested in keeping Chapter 5 of the 2012 IECC aligned with ANSI/ASHRAE/IESNA Standard 90.1-2010. Due to the timing of the code development process and ASHRAE standards processes this proposal was submitted in anticipation that by the final action hearings the work to update the standard would be complete.

This change adds an exterior zone 0 to cover very low light requirement areas. This will help eliminate excessive use of light in areas where none is needed other than for location marking type. Prior to this, the choices for users were zone 1 or 3 which both have higher than needed allowances. The single 60 W luminaire per location allows the use of small HID from higher pole locations (i.e. at parking) and would allow incandescent in locations where cold weather inhibits the use of CFL technology.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Majette-EC-23-T. 505.6.2(1)-(2)-REDONE

EC227–09/10

505.5.3 (New), 505.5.3.1 (New), 505.5.3.2 (New), Table 505.5.3 (New)

Proponent: Steve Ferguson, representing The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

Add new text and table as follows:

505.5.3 Alternative Compliance Path: Space-by-Space Method. The Space-by-Space Method as detailed in Section 505.5.3.1 and 505.5.3.2 shall be permitted for calculating lighting power allowance.

505.5.3.1 Space-by-Space Method of Calculating Interior Lighting Power Allowance. Use the following steps to determine the interior lighting power allowance by the Space-by-Space Method:

1. Determine the appropriate building type from Table 505.5.3. For building types not listed, selection of a reasonably equivalent type shall be permitted.
2. For each space enclosed by partitions 80% or greater than ceiling height, determine the gross interior floor area by measuring to the center of the partition wall. Include the floor area of balconies or other projections. Retail spaces do not have to comply with the 80% partition height requirements.
3. Determine the interior lighting power allowance by using the columns designated Space-by-Space Method in Table 505.5.3. Multiply the floor area(s) of the space(s) times the allowed LPD for the space type that most closely represents the proposed use of the space(s). The product is the lighting power allowance for the space(s). For space types not listed, selection of a reasonable equivalent category shall be permitted.
4. The interior lighting power allowance is the sum of lighting power allowances of all spaces. Trade-offs among spaces are permitted provided that the total installed interior lighting power does not exceed the interior lighting power allowance.

505.5.3.2 Additional Interior Lighting Power. When using the Space-by-Space Method, an increase in the *interior lighting power allowance* is allowed for specific lighting functions. Additional power shall be allowed only if the specified lighting is installed and automatically controlled, separately from the general lighting, to be turned off during nonbusiness hours. This additional power shall be used only for the specified *luminaires* and shall not be used for any other purpose.

An increase in the *interior lighting power allowance* is permitted in the following cases:

1. For spaces in which lighting is specified to be installed in addition to the general lighting for the purpose of decorative appearance, such as chandelier-type luminaries or sconces or for highlighting art or exhibits, provided that the additional lighting power shall not exceed 1.0 W/ft^2 of such spaces.
2. For lighting equipment installed in sales areas and specifically designed and directed to highlight merchandise, calculate the additional lighting power in accordance with Section 505.5.2:

TABLE 505.5.3
LIGHTING POWER DENSITIES USING THE SPACE-BY-SPACE METHOD

Common Space Types[a]	*LPD*, W/ft^2	Building-Specific Space Types	*LPD*, W/ft^2
Office—Enclosed	1.1	Gymnasium/Exercise Center	
Office—Open Plan	1.1	Playing Area	1.4
Conference/Meeting/Multipurpose	1.3	Exercise Area	0.9
Classroom/Lecture/Training	1.4	Courthouse/Police Station/Penitentiary	
For Penitentiary	1.3	Courtroom	1.9
Lobby	1.3	Confinement Cells	0.9
For Hotel	1.1	Judges' Chambers	1.3
For Performing Arts Theater	3.3	Fire Stations	
For Motion Picture Theater	1.1	Engine Room	0.8
Audience/Seating Area	0.9	Sleeping Quarters	0.3
For Gymnasium	0.4	Post Office—Sorting Area	1.2
For Exercise Center	0.3	Convention Center—Exhibit Space	1.3

Common Space Types[a]	*LPD*, W/ft^2	Building-Specific Space Types	*LPD*, W/ft^2
For Convention Center	0.7	Library	
For Penitentiary	0.7	Card File and Cataloging	1.1
For Religious Buildings	1.7	Stacks	1.7
For Sports Arena	0.4	Reading Area	1.2
For Performing Arts Theater	2.6	Hospital	
For Motion Picture Theater	1.2	Emergency	2.7
For Transportation	0.5	Recovery	0.8
Atrium—First Three Floors	0.6	Nurses' Station	1.0
Atrium—Each Additional Floor	0.2	Exam/Treatment	1.5
Lounge/Recreation	1.2	Pharmacy	1.2
For Hospital	0.8	Patient Room	0.7
Dining Area	0.9	Operating Room	2.2
For Penitentiary	1.3	Nursery	0.6
For Hotel	1.3	Medical Supply	1.4
For Motel	1.2	Physical Therapy	0.9
For Bar Lounge/Leisure Dining	1.4	Radiology	0.4
For Family Dining	2.1	Laundry—Washing	0.6
Food Preparation	1.2	Automotive—Service/Repair	0.7
Laboratory	1.4	Manufacturing	
Restrooms	0.9	Low Bay (<25 ft Floor to Ceiling Height)	1.2
Dressing/Locker/Fitting Room	0.6	High Bay (25 ft Floor to Ceiling Height)	1.7
Corridor/Transition	0.5	Detailed Manufacturing	2.1
For Hospital	1.0	Equipment Room	1.2
For Manufacturing Facility	0.5	Control Room	0.5
Stairs—Active	0.6	Hotel/Motel Guest Rooms	1.1
Active Storage	0.8	Dormitory—Living Quarters	1.1
For Hospital	0.9	Museum	
Inactive Storage	0.3	General Exhibition	1.0
For Museum	0.8	Restoration	1.7

Common Space Types[a]	*LPD*, W/ft^2	Building-Specific Space Types	*LPD*, W/ft^2
Electrical/Mechanical	1.5	Bank/Office—Banking Activity Area	1.5

Common Space Types[a]	*LPD*, W/ft^2	Building-Specific Space Types	*LPD*, W/ft^2
Workshop	1.9	Religious Buildings	
Sales Area [for accent lighting, see Section 9.6.2(b)]	1.7	Worship Pulpit, Choir	2.4
		Fellowship Hall	0.9
		Retail	
		Sales Area [for accent lighting, see Section 9.6.3(c)]	1.7
		Mall Concourse	1.7
		Sports Arena	
		Ring Sports Area	2.7
		Court Sports Area	2.3
		Indoor Playing Field Area	1.4
		Warehouse	
		Fine Material Storage	1.4
		Medium/Bulky Material Storage	0.9
		Parking Garage—Garage Area	0.2
		Transportation	
		Airport—Concourse	0.6
		Air/Train/Bus—Baggage Area	1.0
		Terminal—Ticket Counter	1.5

a. In cases where both a common space type and a building-specific type are listed, the building specific space type shall apply.

Reason: The Space by Space method for lighting design in ASHRAE/IES Standard 90.1-2007 provide lighting designers more flexibility in designing the lighting systems for a building. It does allow for more innovative design that can save more energy than the current requirements in the IECC. With the approval of EC105 -07/08, lighting designers can no longer use the lighting design criteria of 90.1 if the building project is being designed in accordance with the IECC 2009.This code proposal will provide lighting designers the ability to use the Space by Space method that is currently published in 90.1-2007 when a project is being designed in accordance with the IECC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Ferguson-EC-3-505.6.3

EC228–09/10
505.7

Proponent: Ronald Majette, representing US Department of Energy

Revise as follows:

505.7 Electrical energy consumption. (Mandatory). In buildings having individual dwelling units, provisions shall be made to determine the electrical energy consumed by each tenant by separately metering individual dwelling units. In buildings having a floor area over 10,000 square feet, energy usage shall be monitored and reported separately for the lighting, HVAC, and Plug loads. The energy usage shall be capable of being reported in real time, 15 minute peak demand, hourly, daily, monthly and annual energy consumption and readily accessible to the building occupants.

Reason: For consistency with Standard 90.1. This proposal is based on ongoing analysis efforts within ASHRAE designed to create a Standard 90.1-2010 that is 30% better than Standard 90.1-2004 in response to Federal legislation. Paralleling those efforts and considering that the IECC Chapter 5 is intended to be technically compatible with that standard to facilitate adoption and implementation, DOE is interested in keeping Chapter 5 of the 2012 IECC aligned with ANSI/ASHRAE/IESNA Standard 90.1-2010. Due to the timing of the code development process and ASHRAE standards processes this proposal was submitted in anticipation that by the final action hearings the work to update the standard would be complete.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Majette-EC-24-505.7

EC229–09/10
505.8 (New)

Proponent: Richard Heinisch, representing Acuity Brands Lighting, Inc.

Add new text as follows:

505.8 Submittals. When required by the code official, the following compliance documentation and supplemental information shall be submitted:

1. Specifications for the functionality testing of all lighting products to be included in the construction documents. This may include, as a minimum, a statement of the owner's requirements and a statement documenting how the lighting design satisfies those requirements.
2. Record drawings of the actual installation be provided to the building owner or the designated representative of the building owner. Such record drawings will include, as a minimum, the location and performance data on each piece of lighting equipment.
3. Operating manuals and a maintenance manual are to be provided to the building owner or the designated representative of the building owner. These manuals will include, at a minimum, the following:
    - 3.1. Submittal data stating all selected options for each piece of lighting equipment requiring maintenance.
    - 3.2. Operation manuals and maintenance manuals for each piece of lighting equipment requiring maintenance. Required routine maintenance actions shall be clearly identified including, as a minimum, a recommended relamping program.
    - 3.3. A complete narrative of how each lighting control system is intended to operate including suggested settings.

Reason: To clearly establish the goals and requirements of the lighting system including controls and to ensure that the owner is provided all the information necessary to best use and maintain the lighting systems.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Heinisch-EC-2-505.8

EC230–09/10
506 (New)

Proponent: Steve Ferguson, representing The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

Add new text as follows:

SECTION 506
OTHER EQUIPMENT

506.1 General. This section covers the minimum efficiency of other equipment.

506.2 Dry-type transformer efficiency This section applies to all building power distribution *systems* and only to equipment described below.

506.2.1 New buildings Equipment installed in new buildings shall comply with the requirements of this section as shown in Table 506.2.1

506.2.2 Addition to existing buildings Equipment installed in *additions* to *existing buildings* shall comply with the requirements of this section.

506.2.3 Alterations to existing buildings Alterations to building service equipment or systems shall comply with the requirements of this section applicable to those specific portions of the building and its systems that are being altered.

506.2.3.1 New equipment with alterations. Any new equipment subject to the requirements of this section that is installed in conjunction with the *alterations*, as a direct replacement of existing equipment shall comply with the specific requirements applicable to that equipment.

Exceptions to 506.3.1.2: Compliance shall not be required for the relocation or reuse of existing equipment at the same site.

506.2.4 Low Voltage Dry-Type Distribution Transformers. Low voltage dry-type transformers shall comply with the provisions of the Energy Policy Act of 2005 where applicable, as shown in Table 506.2.4. Transformers that are not included in the scope of the Energy Policy Act of 2005 have no performance requirements in this section, and are listed for ease of reference below as exceptions.

TABLE 506.2.4
MINIMUM NOMINAL EFFICIENCY LEVELS FOR NEMA CLASS I LOW VOLTAGE DRY-TYPE DISTRIBUTION TRANSFORMERS[a]

Single Phase Transformers		Three Phase Transformers	
kVA[ab]	Efficiency (%)[bc]	kVA[ab]	Efficiency (%)[bc]
15	97.7	15	97.0
25	98.0	30	97.5
37.5	98.2	45	97.7
50	98.3	75	98.0
75	98.5	112.5	98.2
100	98.6	150	98.3
167	98.7	225	98.5
250	98.8	300	98.6
333	98.9	500	98.7
		750	98.8
		1000	98.9

a. A low voltage distribution transformer is a transformer that is air-cooled, does not use oil as a coolant, has an input voltage <= 600 Volts, and is rated for operation at a frequency of 60 Hertz.
b. kiloVolt-Amp rating.

c. Nominal efficiencies shall be established in accordance with the NEMA TP-1 2002 test procedure for low voltage dry-type transformers. Class I Low Voltage Dry-Type is a National Electrical Manufacturers Association (NEMA) design class designation.

Exceptions to Table 506.2.4:

Transformers that meet the Energy Policy Act of 2005 exclusions based on NEMA TP-1 definition:

1. Special purpose applications
2. Not likely to be used in general purpose applications
3. Transformers with multiple voltage taps where the highest tap is at least 20 percent more than the lowest tap.

Products meeting these criteria and exempted from 506.3.1 include the following: drive transformer, rectifier transformer, auto-transformer, uninterruptible power system transformer, impedance transformer, regulating transformer, sealed and nonventilating transformer, machine tool transformer, welding transformer, grounding transformer, or testing transformer.

Reason: This addition will save energy and make the IECC consistent with ASHRAE 90.1-2007. Also, it will ensure that IECC complies with the federal Energy Policy Act of 2005, which require the transformer efficiencies shown in the tables.

Transformers are an integral part of the electric distribution system. They are used to lower the voltage of electricity from utility primary circuits to customer secondary circuits. For many commercial buildings, the electricity from the local electric distribution company is provided at 277 Volts (single phase) and 480 Volts (3 phase). However, most, if not all, commercial facilities have a need for electricity to be supplied at 120 Volts (single phase) or 208 Volts (3 phase) to operate certain equipment, such as computers, printers, copiers, kitchen equipment, etc. Low voltage dry-type transformers, which are purchased by the building owner, are used for this purpose.

According to NEMA and DOE statistics, commercial facilities currently use about 11,000,000 low voltage dry-type transformers in their facilities. Annual domestic shipments are 314,000 units per year. There are other types of transformers, such as medium voltage dry-type and liquid-filled, but the medium-voltage units are far less commonly used (about 3,500 shipped per year) and the liquid-filled are predominantly used by electric distribution companies on the "utility side" of the electric meter. For the medium-voltage dry-type and liquid-filled units, the US Department of Energy (DOE) will be deciding on national energy efficiency standards by the fall of 2007.

Under the Energy Policy Act of 2005, new national minimum efficiency standards went into effect for low voltage dry-type transformers manufactured on or after January 1, 2007. The law refers to Table 4-2 of the National Electrical Manufacturers Association (NEMA) publication NEMA TP-1 Guide for Determining Energy Efficiency for Distribution Transformers (2002).

These standards will result in energy savings for commercial buildings. According to an analysis performed by DOE in 2004 and summarized in the July 29, 2004 edition of the Federal Register (Volume 69, No. 145, pages 45376-45417), the standards shown in the proposed Table 8.1, the Department estimated that national efficiency standards for low voltage dry-type transformers would save 4.74 quads of primary energy over 28 years (2007 to 2035). In terms of cumulative electric site energy savings, that is roughly equivalent to 596 Billion kWh over 28 years, or 21.3 Billion kWh per year. The value is lower in the first 10 years (under 15 Billion kWh per year) and higher in the later years (over 27 Billion kWh per year) as more older units are replaced as the years progress.

These savings are based on NEMA test conditions of 35% of nameplate loads. It should be noted that studies have shown that many dry type transformers have typical loads in the 20-30% range, or lower. The lower the % load, the lower the energy savings from higher efficiency transformers (in many cases). To account for current sales of high efficiency dry-type transformers (there are some state mandates in effect) and to account for actual loading patterns, it is safe to assume an annual average savings of 10 Billion kWh.

According to the EEI Statistical Yearbook, in 2004, the commercial sector of the US economy consumed 1,230,425 GigaWatt-hours. This is equal to 1,230,425,000 MegaWatt-hours, or 1,230,425,000,000 kWh (1.23 Trillion kWh, or 1,230 Million kWh). With savings of 10 Billion kWh per year, the national dry-type low voltage transformer energy efficiency standard will save 10/1230 or 0.8% of the electricity used at commercial facilities.

In terms of economics, in 2004, DOE calculated that the mean payback for low voltage dry-type transformers would range, based on the size of the transformer analyzed, from 0.6 to 1.7 years, with mean life cycle cost savings ranging from $1,777 to $6,761 over a 28 year estimated lifetime. It should be noted that the prices of transformers have increased quite dramatically over the past three years (nearly doubling, in some cases), but the mean paybacks should still be less than 4-5 years for most end-use customers.

Adding this information to the next version of ASHRAE 90.1 will help designers, end-use customers, and code officials with transformer specifications and verifications. These standards have been vetted and analyzed and agreed to by transformer manufacturers.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Ferguson-EC-6-506

EC231-09/10
202 (New)

Proponent: John R. Addario, PE, New York State Department of State – Division of Code Enforcement and Administration

Add new definition as follows:

THERMAL BLOCK. Total Building Performance Approach - One or more HVAC zones (not necessarily contiguous) that are modeled as a single entity. HVAC zones in a thermal block must share the same space-type classification, and must be served by the same HVAC system or by the same kind of HVAC system. All of the HVAC zones within the thermal block that are adjacent to an exterior wall must face the same orientation or their orientations must differ by less than 45°.

Reason: This proposed change adds a needed definition for a thermal block as referenced in the Total Building Performance approach. The definition is consistent with ASHRAE 90.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

FILENAME: ADDARIO-EC-2-202

EC232–09/10
Appendix A (New)

Proponent: R. Christopher Mathis and Jonah Butcher, representing MC2 Mathis Consulting Company

Add new Appendix as follows:

APPENDIX A
ALTERNATIVE PRESCRIPTIVE MEASURES FOR ACHIEVING INCREASED LEVELS ENERGY EFFICIENCY BEYOND IECC CODE MINIMUMS

Introduction.

The purpose of Appendix A ("Appendix") to the International Energy Conservation Code (IECC) is to provide jurisdictions with additional prescriptive energy efficiency measures that can be adopted on a voluntary basis in cases where the jurisdiction has an interest in increasing its energy conservation objectives beyond what the IECC provides as minimum code. The Appendix can also serve as a publicly available repository of building energy code "best practices" that provides innovative ways of increasing energy efficiency that have been successfully implemented in other jurisdictions. States and jurisdictions seeking additional energy efficiency options can review these alternative measures and adopt them as desired for their jurisdictions.

The measures in this Appendix provide an incremental, prescriptive improvement in residential and commercial new construction energy efficiency beyond those levels defined in the main body of the IECC.

How to use this Appendix.

The measures in this Appendix modify existing sections of the 2009 IECC or add new sections. The measures are numbered according to section numbering of the 2009 IECC.

Jurisdictions wishing to adopt some or all of these measures can replace selected sections in the 2009 IECC with the corresponding section in this Appendix through their state or local adoption or amendment processes. Instructions are provided to "revise text as follows" or to add new text or tables to incorporate the desired changes.

The alternative prescriptive measures in this Appendix include alternatives to the following sections:

Chapter 1 – ADMINISTRATION
Section 103 Construction Documents. New requirement for design intent documentation.

Chapter 2 – DEFINITIONS
Section 202 General Definitions. New Definitions needed to implement certain new measures.

Chapter 4 – RESIDENTIAL ENERGY EFFICIENCY
Section 402 Building Thermal Envelope. Improved fenestration and insulation requirements.
Section 402.4.1 Building thermal envelope. Including improved air infiltration sealing.
Section 403.6 Equipment sizing. Including certain limits on equipment over sizing.
Section 404.1 Lighting Equipment. Increased levels of high efficiency lighting.

Chapter 5 – COMMERCIAL ENERGY EFFICIENCY
Section 501.1 Scope. Revised Scope.
Section 501.2 Application. Revised Application.
Section 502.1.1 Insulation and fenestration criteria. Removed exception.
Section 502 Building Thermal Envelope. Improved fenestration and insulation requirements.
Section 502.4 Air leakage (Mandatory). Replace air leakage section.
Section 503.2.9 HVAC system completion. Replace with full commissioning requirement.
Section 505.2 Lighting controls (Mandatory). Revise with additional controls requirement.
Section 505.5.2 Interior Lighting Power. Lowered LPD allowances.

New Section 507 - ALTERNATIVE PRESCRIPTIVE COMPLIANCE PACKAGES
New Section APPENDIX X – Design Intent Form.
New Section APPENDIXY – Compliance Certification Form.

Advanced Energy Efficiency Measures Provided for Voluntary Adoption

{Topic: Certifying Design Intent and Compliance with Design Intent}

A103.2 Design Intent Certification. For all projects covered under this code, the registered design professional of record on the project shall provide a certification that key energy performance design intentions were addressed and met. Such design intent certification shall be recorded on Form (X) as shown in Appendix (X) and shall become a component of the construction documents filed with the authority having jurisdiction.

Key elements delivering design intent shall be recorded on Form (Y) as shown in Appendix (Y) and be inspected and verified as built to design by the registered design professional of record, building owner, and code official before certificate of occupancy is granted. Change orders affecting any energy related building components should be attached to this document with an explanation of impacts on energy usage.

A103.2.1 Energy Performance Certifications. The design professional of record shall certify compliance with all of the provisions of this code, including: Compliance with the building envelope, HVAC, lighting, service water heating and whole building performance requirements defined by this code. Such Energy Performance Certifications shall be recorded on Form (Y) as shown in Appendix (Y) and shall be a component of the construction documents filed with the authority having jurisdiction.

{Topic: New Definitions}

Add new text to section 202 GENERAL DEFINITIONS as follows:

FURNACE ELECTRICITY RATIO. The ratio of furnace electricity use to total furnace energy computed as ratio = (3.412*EAE)/(1000*EF + 3.412*EAE), where EAE (average annual auxiliary electrical consumption) and EF (average annual fuel energy consumption) are defined in Appendix N to subpart B of part 430 of title 10 of the Code of Federal Regulations and EF is expressed in millions of Btus per year.

ON-SITE RENEWABLE ENERGY. Includes solar photovoltaic; active solar thermal that employs collection panels, heat transfer mechanical components and a defined heat storage system; wind; small hydro; tidal; wave energy; geothermal (core earth); biomass energy systems; landfill gas and bio-fuel based electrical production, Onsite energy shall be generated on or adjacent to the project site and shall not be delivered to the project through the utility service.

SYSTEM COMMISSIONING. Commissioning is a process that verifies and documents that the selected building systems have been designed, installed, and function according to the owner's project requirements and construction documents.

{Topic: Improved Prescriptive Residential Energy Efficiency Requirements}

Revise and replace Section 401.2 in its entirety with new section A401.2 as follows:

A401.2 Compliance. Projects shall comply with Sections 401, 402.4, 402.5, 402.5, 402.6, 402.7, and (referred to as the mandatory provisions) and Sections 402.1 through 402.3, 403.2.1 and 404.1 (prescriptive);

Replace Table 402.1.1 in its entirety with the following Table A402.1.1:

TABLE A402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION U-FACTORb	SKYLIGHTb U-FACTOR	GLAZED FENESTRATION SHGCb, e	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUEh	FLOOR R-VALUE	BASEMENTc WALL R-VALUE	SLABd R-VALUE & DEPTH	CRAWL SPACEc WALL R-VALUE
1	0.65	0.75	0.25	30	16	3/4	13	0	0	0
2	0.50	0.75	0.25	38	16	4/6	13	10/13	0	0
3	0.35	0.65	0.25	38	19	5/8	19	10/13f	10, 2 ft	5/13
4 except Marine	0.32	0.60	0.35	49	19	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.32	0.60	NR	49	22	13/17	30g	10/13	10, 2 ft	10/13
6	0.30	0.60	NR	60	22	15/19	30g	15/19	10, 4 ft	10/13
7 and 8	0.30	0.60	NR	60	25	19/21	38g	15/19	10, 4 ft	10/13

a. *R*-values are minimums. *U*-factors and SHGCs are maximums. R-19 batts compressed into a nominal 2 × 6 framing cavity such that the *R*-value is reduced by R-1 or more shall be marked with the compressed batt *R*-value in addition to the full thickness *R*-value.
b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
c. "15 / 19" means R-15 continuous insulated sheathing on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulated sheathing on the interior or exterior of the home. "10/13" means R-10 continuous insulated sheathing on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.
d. R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less in Zones 1 through 3 for heated slabs.
e. There are no SHGC requirements in the Marine Zone.
f. Basement wall insulation is not required in warm-humid locations as defined by Figure 301.1 and Table 301.1.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. The second *R*-value applies when more than half the insulation is on the interior of the mass wall.

Replace Table 402.1.3 in its entirety with the following Table A402.1.3:

TABLE A402.1.3
EQUIVALENT U-FACTORS a

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTORb	FLOOR U-FACTOR	BASEMENT WALL U-FACTORd	CRAWL SPACE WALL U-FACTORc
1	0.65	0.75	0.035	0.069	0.197	0.060	0.360	0.477
2	0.50	0.75	0.029	0.056	0.165	0.060	0.059	0.477
3	0.35	0.65	0.029	0.056	0.141	0.046	0.059	0.136
4 except Marine	0.32	0.60	0.024	0.051	0.141	0.046	0.059	0.065
5 and Marine 4	0.32	0.60	0.024	0.051	0.082	0.033	0.059	0.065
6	0.30	0.60	0.020	0.051	0.060	0.033	0.050	0.065
7 and 8	0.30	0.60	0.020	0.047	0.057	0.027	0.050	0.065

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.
b. When more than half the insulation is on the interior, the mass wall *U*-factors shall be a maximum of 0.17 in Zone 1, 0.14 in Zone 2, 0.12 in Zone 3, 0.10 in Zone 4 except Marine, and the same as the frame wall *U*-factor in Marine Zone 4 and Zones 5 through 8.
c. Basement wall *U*-factor of 0.360 in warm-humid locations as defined by Figure 301.1 and Table 301.2.
d. Foundation *U*-factor requirements shown in Table 402.1.3 include wall construction and interior air films but exclude soil conductivity and exterior air films. *U*-factors for determining code compliance in accordance with Section 402.1.4 (total UA alternative) of Section 405 (Simulated Performance Alternative) shall be modified to include soil conductivity and exterior air films.

Replace Section 402.4.1 in its entirety with new section A402.4.1 as follows:

A402.4.1 Building thermal envelope. The building thermal envelope shall be durably sealed to limit infiltration and prevent thermal bypasses. The sealing methods between dissimilar materials shall allow for differential expansion and

contraction. The thermal envelope, including insulation and air barriers, shall be inspected in accordance with Sections 402.4.1.1 through 402.4.1.6.

A402.4.1.1 Walls adjoining exterior walls or unconditioned spaces. Fully insulated wall in substantial contact with air barrier at both interior and exterior, or for Climate Zones 1 thru 3, sealed exterior air barrier aligned with fully supported insulation. The following areas shall meet these requirements: wall behind shower/tub, wall behind fireplace, insulated attic slopes for un-vented attic spaces, attic knee walls, skylight shaft walls, wall adjoining porch roof, staircase walls, double walls.

A402.4.1.2 Floors between conditioned and exterior spaces. An air barrier shall be installed at any exposed insulation edges. Insulation shall be installed to maintain substantial contact w/ sub-floor above and air barrier below. The following areas shall meet these requirements: Insulated floor above un-conditioned and semi-conditioned space.

A402.4.1.3 Shafts. Openings and gaps to unconditioned space shall be fully sealed with an air barrier. The following areas shall meet these requirements: duct, piping and flue shafts and associated penetrations.

A402.4.1.4 Attic and ceiling interface. Attic penetrations and dropped ceilings shall include a full interior air barrier aligned with insulation with any gaps fully sealed. Insulation shall fit snugly in opening and the opening air barrier shall be fully gasketed. The following areas shall meet these requirements: attic access panel, attic drop-down stair, dropped ceiling/soffit, recessed lighting fixtures, whole-house fan.

A402.4.1.5 Common walls between dwelling units. Gap between drywall shaft wall (common wall) and structural framing between units shall be sealed at all exterior boundary conditions.

A402.4.1.6 Gaps and penetrations. Gaps and penetrations in the thermal envelope of the home shall be sealed and insulated. The following areas shall meet these requirements: the perimeters of windows, doors, skylights, and utility penetrations, hose bibs, exterior electrical outlets and light fixtures.

Revise Section 402.4.2 and replace with section A402.4.2 as follows:

A402.4.2 Air sealing and insulation. Building envelope air tightness and insulation installation shall be demonstrated to comply with the requirements of Section 402.4.2.1 and 402.4.2.2.

A402.4.2.1 Air Sealing Testing ~~option~~. Building envelope tightness ~~and insulation installation~~ shall be considered acceptable when tested air leakage is less than five air changes per hour (ACH) when tested with a blower door at a pressure of 33.5 psf (50 Pa). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;
2. Dampers shall be closed, but not sealed, including exhaust, intake, makeup air, backdraft and flue dampers;
   Interior doors shall be open;
3. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
4. Heating and cooling system(s) shall be turned off;
5. HVAC ducts shall not be sealed; and
6. Supply and return registers shall not be sealed.

A402.4.2.2 Insulation inspection. Building envelope insulation installation shall be considered acceptable when the insulation installation items listed in Table 402.4.2, applicable to the method of construction, are field verified. Where required by the *code official*, an *approved* party independent from the installer of the insulation shall inspect the insulation and its installation.

{Topic: IMPROVED EQUIPMENT SIZING REQUIREMENTS}

Revise Section 403.6 and replace with section A403.6 as follows:

A403.6 Equipment sizing. Heating and cooling equipment shall be sized in accordance with Section M1401.3 of the International Residential Code. The maximum oversizing limit for air conditioners and air-source and ground-source

heat pumps is 15% with the following two exceptions: single-speed air-source and ground-source heat pumps in buildings with heating loads that exceed cooling loads have a limit of 25%, and multi-stage heat pumps do not have a strict limit, but shall be sized to allow adequate humidity control in the cooling mode. The maximum oversizing limit for gas, oil or propane heating equipment is 40%.

The following operating conditions shall be used in the sizing calculations and verified where reviewed by the code official:

1. Outdoor temperatures shall be the 99.0% and 1.0% design temperatures as published in the ASHRAE Handbook of Fundamentals for the home's location or most representative city for which design temperature data are available;
2. Indoor temperatures shall be 75 F for cooling and 70 F for heating;
3. Infiltration rate shall be selected as "tight", or the equivalent term. In specifying equipment, the next available manufactured size may be used. In addition, indoor and outdoor coils shall be matched in accordance with ARI Standard 210/240.

{Topic: RESIDENTIAL LIGHTING EQUIPMENT EFFICIENCY}

Revise Section 404.1 and replace with section A404.1 as follows:

SECTION 404
ELECTRICAL POWER AND LIGHTING SYSTEMS

A404.1 Lighting equipment (Prescriptive). A minimum of 80 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps.

{Topic: COMMERCIAL ENERGY EFFICIENCY}

Revise Section 501.1 and replace with section A501.1 as follows:

A501.1 Scope. The requirements contained in this chapter are applicable to commercial buildings, or portions of commercial buildings

Revise Section 501.2 and replace with section A501.2 as follows:

A501.2 Application. The commercial building project shall comply with the requirements in Sections 502 (Building envelope), 503 (Building mechanical systems), 504 (Service water heating), 505 (Lighting), and A507 (Advanced Prescriptive Options) in its entirety.

Compliance with section A507 requires complying with any ONE of the following prescriptive options:

A507.2.1 Efficient Mechanical Equipment
A507.2.2 Reduced Lighting Power Density
A507.2.3 On-Site Supply of Renewable Energy

At the time of plan submittal, the building jurisdiction shall be provided, by the submittal authority, documentation designating the intent to comply with Section A507.2.1, A507.2.2, or A507.2.3 in their entirety.

{Topic: IMPROVED COMMERCIAL BUILDING ENVELOPE MEASURES}

Revise Section 502.1.1 and replace with section A502.1.1 as follows:

A502.1.1 Insulation and fenestration criteria. The *building thermal envelope* shall meet the requirements of Tables 502.2(1) and 502.3 based on the climate *zone* specified in Chapter 3. Commercial buildings or portions of commercial buildings enclosing Group R occupancies shall use the *R*-values from the "Group R" column of Table 502.2(1). Commercial buildings or portions of commercial buildings enclosing occupancies other than Group R shall use the *R*-values from the "All other" column of Table 502.2(1).

Delete Table 502.1.2 in its entirety and replace with the following table A502.1.2 and footnotes:

TABLE A502.1.2
BUILDING ENVELOPE REQUIREMENTS OPAQUE ELEMENT, MAXIMUM U-FACTORS

Climate Zone	1		2		3		4		5		6		7		8	
	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R
Roofs																
Insulation entirely above deck	U - 0.048	U - 0.048	U - 0.048	U - 0.048	U - 0.048	U - 0.048	U - 0.039	U - 0.039	U - 0.039	U - 0.039	U - 0.032	U - 0.032	U - 0.028	U - 0.028	U - 0.028	U - 0.028
Metal buildings (with R-5 thermal blocks)	U - 0.049	U - 0.049	U - 0.049	U - 0.049	U - 0.049	U - 0.049	U - 0.049	U - 0.049	U - 0.049	U - 0.049	U - 0.039	U - 0.039	U - 0.034	U - 0.034	U - 0.034	U - 0.034
Attic and other	U - 0.027	U - 0.027	U - 0.027	U - 0.027	U - 0.027	U - 0.027	U - 0.027	U - 0.027	U - 0.027	U - 0.027	U - 0.021	U - 0.021	U - 0.021	U - 0.021	U - 0.021	U - 0.021
Walls, Above Grade																
Mass	U-0.151	U-0.123	U-0.123	U-0.123	U-0.123	U - 0.104	U - 0.104	U - 0.104	U - 0.090	U - 0.062	U - 0.080	U - 0.062	U - 0.071	U - 0.062	U - 0.052	U - 0.052
Metal buildingc	U-0.093	U-0.093	U-0.093	U - 0.084	U - 0.084	U - 0.084	U - 0.061	U - 0.061	U - 0.061	U - 0.057	U - 0.061	U - 0.057	U - 0.048	U - 0.048	U - 0.048	U - 0.048
Metal framed	U - 0.084	U - 0.084	U - 0.084	U - 0.064	U - 0.064	U - 0.051	U - 0.064	U - 0.051	U - 0.064	U - 0.051	U - 0.064	U - 0.051	U - 0.064	U - 0.051	U - 0.051	U - 0.037
Wood framed and other	U-0.066	U-0.066	U-0.066	U - 0.064	U - 0.064	U - 0.051	U - 0.064	U - 0.051	U - 0.064	U - 0.051	U - 0.051	U - 0.051	U - 0.051	U - 0.051	U - 0.036	U - 0.036
Walls, Below Graded																
Below-grade wall	NR	NR	NR	NR	C - 0.119	C - 0.119	C - 0.119	C - 0.092	C - 0.119	C - 0.092	C - 0.119	C - 0.092	C - 0.092	C - 0.063	C - 0.092	C - 0.063
Floors																
Mass	NR	U-0.123	U-0.123	U-0.123	U - 0.076	U - 0.069	U - 0.076	U - 0.069	U - 0.076	U - 0.069	U - 0.064	U - 0.055	U - 0.055	U - 0.055	U - 0.055	U - 0.055
Joist / Framing	U-0.066	U-0.066	U - 0.033	U - 0.033	U - 0.033	U - 0.033	U - 0.033	U - 0.033	U - 0.033	U - 0.033	U - 0.033	U - 0.033	U - 0.033	U - 0.033	U - 0.033	U - 0.033
Slab-on-Grade Floors																
Unheated slabs	NR	NR	NR	NR	F - 0.54	F - 0.54	F - 0.54	F - 0.54	F - 0.54	F - 0.54	F - 0.54	F - 0.54	F - 0.40	F – 0.40	F - 0.40	F - 0.40
Heated slabs	F - 0.65	F - 0.65	F - 0.65	F - 0.65	F - 0.65	F - 0.65	F - 0.65	F - 0.58	F - 0.58	F - 0.55	F - 0.58	F - 0.55	F - 0.58	F – 0.55	F - 0.58	F - 0.55

a. When heated slabs are placed below-grade, below grade walls must meet the *F*-factor requirements for perimeter insulation according to the heated slab-on-grade construction.

Delete Table 502.2(1) in its entirety and replace with the following table A502.2(1) and footnotes:

TABLE A502.2(1)
BUILDING ENVELOPE REQUIREMENTS – OPAQUE ASSEMBLIES

Climate Zone	1		2		3		4		5		6		7		8	
	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R	All Other	Group R
Roofs																
Insulation entirely above deck	R - 20ci	R-20 ci	R - 20ci	R-20 ci	R - 20ci	R-20 ci	R - 25ci	R-25 ci	R - 25ci	R-25 ci	R - 30ci	R-30 ci	R - 35ci	R-35 ci	R - 35ci	R-35 ci
Metal buildings (with R-5 thermal blocksa)b	R-13 + R-19	R-13 + R-19	R-13 + R-19	R-13 + R-19	R-13 + R-19	R-13 + R-19	R-13 + R-19	R-13 + R-19	R-13 + R-19	R-13 + R-19	R-10 + R-19 + R-6 ci	R-10 + R-19 + R-6 ci	R-10 + R-19 + R-10 ci	R-10 + R-19 + R-10 ci	R-10 + R-19 + R-10	R-10 + R-19 + R-10
Attic and other	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-49	R-49	R-49	R-49	R-49	R-49
Walls, Above Grade																
Mass	R-5.7 ci	R-7.6 ci	R-7.6 ci	R-7.6 ci	R-7.6 ci	R-9,5 ci	R-9,5 ci	R-9.5ci	R-11.5 ci	R-19.5ci	R-13.3 ci	R-19.5ci	R-15.0 ci	R-19.5ci	R-25 ci	R-25 ci
Metal buildingc	R-16	R-16	R-16	R-19	R-19	R-19	R-10 + R-13	R-10 + R-13	R-10 + R-13	R-13 + R-13	R-10 + R-13	R-13 + R-13	R-19 + R-13	R-19 + R-13	R-19 + R-13	R-19 + R-13
Metal framed	R-13 + 3.8 ci	R-13 + 3.8 ci	R-13 + 3.8 ci	R-13 + 7.5 ci	R-13 + 7.5 ci	R- 13 + R-11.4 ci	R-13 + 7.5 ci	R- 13 + R-11.4 ci	R-13 + R-7.5 ci	R- 13 + R-11.4 ci	R-13 + R-7.5 ci	R- 13 + R-11.4 ci	R-13 + R-7.5 ci	R- 13 + R-11.4 ci	R- 13 + R-11.4 ci	R- 13 + R-18.8 ci
Wood framed and other	R-13	R-13	R-13	R-13 + R-3.8ci	R-13 + R-3.8ci	R-13 + R-7.5 ci	R-13 + R-3.8ci	R-13 + R-7.5 ci	R-13 + R-3.8ci	R-13 + R-7.5 ci	R-13 + R 7.5ci	R-13 + R-7.5 ci	R-13 + R-7.5 ci	R-13 + R-7.5 ci	R-13 + R-15.6ci	R-13 + R-15.6ci
Walls, Below Graded																
Below-grade wall	NR	NR	NR	NR	R-7.5 ci	R-7.5 ci	R-7.5 ci	R-10 ci	R-7.5 ci	R-10 ci	R-7.5 ci	R-10 ci	R-10.0 ci	R-15 ci	R-10.0 ci	R-15 ci
Floors																
Mass	NR	R-5ci	R-5ci	R-5ci	R-10 ci	R-11.4 ci	R-10 ci	R-11.4 ci	R-10 ci	R-11.4 ci	12.5 ci	R-15 ci	R-15 ci	R-15.0 ci	R-15 ci	R-15.0 ci
Joist / Framing	R-13	R-13	R-30e	R-30e	R-30e	R-30e	R-30	R-30	R-30	R-30	R-30e	R-30e	R-30e	R-30e	R-30e	R-30e
Slab-on-Grade Floors																
Unheated slabs	NR	NR	NR	NR	R-10 for 24 in.	R-10 for 24 in.	R-10 for 24 in.	R-10 for 24 in.	R-10 for 24 in.	R-10 for 24 in.	R-10 for 24 in.	R-10 for 24 in.	R-15 for 24 in. + R-5ci below	R-15 for ~~48~~ 24 in. + R-5ci below	R-15 for 24 in. + R-5ci below	R-15 for ~~48~~ 24 in. + R-5ci below
Heated slabs	R-10 for 24 in. + R-5ci below	R-10 for 24 in. + R-5ci below	R-10 for 24 in. + R-5ci below	R-10 for 24 in. + R-5ci below	R-10 for 24 in. + R-5ci below	R-10 for 24 in. + R-5ci below	R-10 for 24 in. + R-5ci below	R-15 for 36 in. + R-5ci below	R-15 for 36 in. + R-5ci below	R-20 for 36 in. + R-5ci below	R-15 for 36 in. + R-5ci below	R-20 for 36 in. + R-5ci below	R-20 for 36 in. + R-5ci below	R-20 for 36 in. + R-5ci below	R-20 for 36 in. + R-5ci below	R-20 for 36 in. + R-5ci below
Opaque Doors																
Swinging	U – 0.61	U – 0.61	U – 0.61	U – 0.61	U – 0.61	U – 0.61	U – 0.61	U – 0.61	U – 0.37	U – 0.37	U – 0.37	U – 0.37	U – 0.37	U – 0.37	U – 0.37	U – 0.37
Roll-up or sliding	U - 0.53	U - 0.53	U - 0.53	U - 0.53	U - 0.53	U - 0.53	U - 0.53	U - 0.53	U - 0.53	U - 0.53	U - 0.53	U - 0.53	U - 0.53	U - 0.53	U - 0.53	U - 0.53

For SI: 1 inch = 25.4 mm.
ci = Continuous insulation. NR = No requirement.
a. When using *R*-value compliance method, a thermal spacer block is required, otherwise use the *U*-factor compliance method. [see Tables 502.1.2 and 502.2(2)].
b. Assembly descriptions can be found in Table 502.2(2).
c. R-5.7 ci is allowed to be substituted with concrete block walls complying with ASTM C 90, ungrouted or partially grouted at 32 inches or less on center vertically and 48 inches or less on center horizontally, with ungrouted cores filled with material having a maximum thermal conductivity of 0.44 Btu-in./h-f2 F.
d. When heated slabs are placed below grade, below-grade walls must meet the exterior insulation requirements for perimeter insulation according to the heated slab-on-grade construction.
e. Steel floor joist systems shall to be R-38.

Delete Table 502.2(2) in its entirety and replace with the following table A502.2(2):

TABLE A502.2(2)
BUILDING ENVELOPE REQUIREMENTS–OPAQUE ASSEMBLIES

ROOFS	DESCRIPTION	REFERENCE
R-13 + R-19	Standing seam roof with two fiberglass insulation layers. The first R-value is for faced fiberglass insulation batts draped over purlins. The second R-value is for unfaced fiberglass insulation batts installed parallel to the purlins. A minimum R-3.5 thermal spacer block is placed above the purlin/batt, and the roof deck is secured to the purlins.	ASHRAE/IESNA 90.1 Table A2.3 including Addendum "G"
R-11 + R-19 + R-6ci R-11 + R-19 + R-10ci	The first R-value is for faced fiberglass insulation batts draped over purlins. The second R-value is for unfaced fiberglass insulation batts installed parallel to the purlins. A minimum R-3.5 thermal spacer block is placed above the purlin/batt, and the roof deck is secured to the purlins. The third R-value is for continuous rigid insulation installed between the metal wall panel and steel framing or on the interior of the steel framing.	ASHRAE/IESNA 90.1 Table A2.3 including Addendum "G"
Walls		
R-16 R-19	Single Layer of Mineral Fiber	ASHRAE/IESNA 90.1 Table A2.3 including Addendum "G"
R-10 + R-13 R-19 + R-13	The first rated R-Value of insulation is for insulation compressed between metal wall panels and the steel structure, the second rated R-value of insulation is for insulation installed from the inside, covering the girts.	ASHRAE/IESNA 90.1 Table A2.3 including Addendum "G"

Delete Table 502.3 in its entirety and replace with the following table A502.3 and footnotes:

TABLE A502.3
BUILDING ENVELOPE REQUIREMENTS: FENESTRATION

Climate Zone	1	2	3	4	5	6	7	8
U-Factor								
Vertical Fenestration[a]	0.65	0.65	0.40	0.40	0.40	0.40	0.35	0.35
Entrance Door	0.83	0.83	0.77	0.77	0.77	0.77	0.77	0.77
Skylights [b]	0.75	0.75	0.75	0.60	0.60	0.60	0.60	0.60
SHGC								
Vertical Fenestration[a]	0.25	0.25	0.25	0.30	0.30	0.40	0.40	0.40
Skylights [b]	0.35	0.35	0.35	0.40	0.40	0.40	NR	NR

a. 40% maximum of above-grade wall.
b. 3% Maximum, 5% maximum with automatic day lighting controls which must meet the requirements of Section A502.2.2.4.

Revise Section 502.4 and replace with section A502.4 as follows:

A502.4 Air leakage (Mandatory).

A502.4.1 Air Barriers. The building envelope shall be designed and constructed with a continuous air barrier to control air leakage into, or out of the conditioned space. An air barrier system shall also be provided for interior separations between conditioned space and space designed to maintain temperature or humidity levels which differ from those in the conditioned space by more than 50% of the difference between the conditioned space and design ambient conditions.

The air barrier shall have the following characteristics:

1. It must be continuous, with all joints made airtight.

2. Materials used for the air barrier system shall have an air permeability not to exceed 0.004 cfm/ft2 under a pressure differential of 0.3 in. water (1.57psf) (0.02 L/s.m2 @ 75 Pa) when tested in accordance with ASTM E 2178. Air barrier materials shall be taped or sealed in accordance with the manufacturer's instructions.
3. It shall be capable of withstanding positive and negative combined design wind, fan and stack pressures on the envelope without damage or displacement, and shall transfer the load to the structure. It shall not displace adjacent materials under full load.
4. Air barrier materials shall be maintainable, or, if inaccessible, shall meet the durability requirements for the service life of the envelope assembly.
5. The air barrier material of an envelope assembly shall be joined and sealed in a flexible manner to the air barrier material of adjacent assemblies, allowing for the relative movement of assemblies due to thermal and moisture variations and creep. Connections shall be made between:
   a. Joints around *fenestration* and *door* frames
   b. Junctions between *walls* and foundations, between *walls* at building corners, between *walls* and structural *floors* or *roofs*, and between *walls* and *roof* or *wall* panels
   c. Openings at penetrations of utility services through *roofs*, *walls*, and *floors*
   d. Site-built *fenestration* and *doors*
   e. Building assemblies used as ducts or plenums
   f. Joints, seams, and penetrations of vapor retarders
   g. All other openings in the *building envelope*

A502.4.2 Air Barrier Penetrations. All penetrations of the air barrier and paths of air infiltration/exfiltration shall be made air tight. Openings and penetrations in the building envelope shall be sealed with caulking materials or closed with gasketing systems compatible with the construction materials and location. Joints and seams shall be sealed in the same manner or taped or covered with a moisture vapor-permeable wrapping material. Sealing materials spanning joints between construction materials shall allow for expansion and contraction of the construction materials.

A502.4.3 Fenestration and Doors. Air leakage for *fenestration* and *doors* shall be determined in accordance with NFRC 400 or ASTM E 283 @ 1.57 psf (75 Pa.). Air leakage shall be determined by a laboratory accredited by a nationally recognized accreditation organization, such as the National Fenestration Rating Council, and shall be *labeled* and certified by the *manufacturer*. Air leakage shall not exceed 0.3 cfm/ft2 for glazed swinging entrance doors and for revolving doors and 0.2 cfm/ft2 for all other products under a pressure differential of 0.3 inches of water(1.57 psf).

Exceptions:

a. For garage *doors*, air leakage determined by test at standard test conditions in accordance with ANSI/ DASMA 105 shall be an acceptable alternate for compliance with air leakage requirements.

A502.4.4 Doors and Access Openings to Shafts, Chutes, Stairwells, and Elevator Lobbies: These doors and access openings shall either meet the requirements of 502.4.3 or shall be equipped with weather seals.

Exception: Weatherseals on elevator lobby doors are not required when a smoke control system is installed.

A502.4.5 Loading Dock Weatherseals. Cargo *doors* and loading dock *doors* shall be equipped with weatherseals to restrict *infiltration* when vehicles are parked in the doorway.

A502.4.6 Vestibules. Building entrances that separate *conditioned space* from the exterior shall be protected with an enclosed vestibule, with all *doors* opening into and out of the vestibule equipped with self-closing devices. Vestibules shall be designed so that in passing through the vestibule it is not necessary for the interior and exterior *doors* to open at the same time. Interior and exterior *doors* shall have a minimum distance between them of not less than 7 ft when in the closed position. The exterior envelope of conditioned vestibules shall comply with the requirements for a conditioned space. The interior and exterior envelope of unconditioned vestibules shall comply with the requirements for a semi heated space.

Exceptions:

1. *Building entrances* with revolving *doors*.
2. *Doors* not intended to be used as a *building entrance*.
3. *Doors* opening directly from a *dwelling unit*.

4. *Doors* that open directly from a *space* that is less than 3000 ft2 in area and is separate from the *building entrance*.
5. Doors used primarily to facilitate vehicular movement or material handling and adjacent personnel doors.

A502.4.7 Curtain wall, storefront glazing and commercial entrance doors. Curtain wall, *storefront* glazing and commercial-glazed swinging entrance doors and revolving doors shall be tested for air leakage at 1.57 pounds per square foot (psf) (75 Pa) in accordance with ASTM E 283. For curtain walls and *storefront* glazing, the maximum air leakage rate shall be 0.2 cubic foot per minute per square foot (cfm/ft^2) (3.7 $m^3/h \times m^2$) of fenestration area. For commercial glazed swinging entrance doors and revolving doors, the maximum air leakage rate shall be 1.00 cfm/ft^2 (18.3 $m^3/h \times m^2$) of door area when tested in accordance with ASTM E 283.

A502.4.8 Hot gas bypass limitation. Cooling systems shall not use hot gas bypass or other evaporator pressure control systems unless the system is designed with multiple steps of unloading or continuous capacity modulation. The capacity of the hot gas bypass shall be limited as indicated in Table 502.4.4.

Exception: Unitary packaged systems with cooling capacities not greater than 90,000 Btu/h (26 379 W).

TABLE A502.4.4
MAXIMUM HOT GAS BYPASS CAPACITY

RATED CAPACITY	MAXIMUM HOT GAS BYPASS CAPACITY (% of total capacity)
≤240,000 Btu/h	50%
240,000 Btu/h	25%

For SI: 1 Btu/h = 0.29 watts.

A502.4.9 Outdoor air intakes and exhaust openings. Stair and elevator shaft vents and other outdoor air intakes and exhaust openings integral to the building envelope shall be equipped with not less than a Class I motorized, leakage-rated damper with a maximum leakage rate of 4 cfm per square foot (6.8 L/s · C m2) at 1.0 inch water gauge (w.g.) (1250 Pa) when tested in accordance with AMCA 500D. These air tight, operable dampers shall be installed when the air barrier is penetrated by:

1. Fixed open louvers such as in elevator shafts and machine rooms.
2. Mechanical system components which allow infiltration or exfiltration of air when the systems are inactive, such as atrium smoke exhaust systems, elevator shaft smoke relief openings, and other similar elements.

Such dampers shall be set in the closed position and automatically open upon:

1. The activation of any fire alarm initiating device of the building's fire alarm system;
2. The interruption of power to the damper.

Exception: Gravity (nonmotorized) dampers are permitted to be used in buildings less than three stories in height above grade.

A502.4.10 Recessed lighting. Recessed luminaires installed in the *building thermal envelope* shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and *labeled* as meeting ASTM E 283 when tested at 1.57 psf (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the *conditioned space* to the ceiling cavity. All recessed luminaires shall be sealed with a gasket or caulk between the housing and interior wall or ceiling covering.

{Topic: BUILDING COMMISSIONING REQUIREMENTS}

Revise Section 503.2.9 and replace with section A503.2.9 as follows:

A503.2.9 Mechanical systems commissioning and completion requirements.

A503.2.9.1 System commissioning. Commissioning is a process that verifies and documents that the selected building systems have been designed, installed, and function according to the owner's project requirements and construction documents. Drawing notes shall require commissioning and completion requirements in accordance with

this section. Drawing notes may refer to specifications for further requirements. Copies of all documentation shall be given to the owner.

A503.2.9.1.1 Commissioning plan. A commissioning plan shall include as a minimum the following items:

1. A detailed explanation of the original owner's project requirements,
2. A narrative describing the activities that will be accomplished during each phase of commissioning, including guidance on who accomplishes the activities and how they are completed,
3. Equipment and systems to be tested, including the extent of tests,
4. Functions to be tested (for example calibration, economizer control, etc.),
5. Conditions under which the test shall be performed (for example winter and summer design conditions, full outside air, etc.), and
6. Measurable criteria for acceptable performance.

A503.2.9.1.2 Systems adjusting and balancing. All HVAC systems shall be balanced in accordance with generally accepted engineering standards. Air and water flow rates shall be measured and adjusted to deliver final flow rates within 10% of design rates. Test and balance activities shall include as a minimum the following items:

1. Air systems balancing: Each supply air outlet and zone terminal device shall be equipped with means for air balancing in accordance with the requirements of Chapter 6 of the International Mechanical Code. Discharge dampers are prohibited on constant volume fans and variable volume fans with motors 10 hp (18.6 kW) and larger. Air systems shall be balanced in a manner to first minimize throttling losses then, for fans with system power of greater than 1 hp, fan speed shall be adjusted to meet design flow conditions.

   Exception: Fan with fan motors of 1 hp or less.

2. Hydronic systems balancing: Individual hydronic heating and cooling coils shall be equipped with means for balancing and pressure test connections. Hydronic systems shall be proportionately balanced in a manner to first minimize throttling losses, then the pump impeller shall be trimmed or pump speed shall be adjusted to meet design flow conditions. Each hydronic system shall have either the ability to measure pressure across the pump, or test ports at each side of each pump.

   Exceptions:

   1. Pumps with pump motors of 5 hp or less.
   2. When throttling results in no greater than 5% of the nameplate horsepower draw above that required if the impeller were trimmed.

A503.2.9.1.3 Functional performance testing.

A503.2.9.1.3.1 Equipment functional performance testing. Equipment functional performance testing shall demonstrate the correct installation and operation of components, systems, and system-to-system interfacing relationships in accordance with approved plans and specifications. This demonstration is to prove the operation, function, and maintenance serviceability for each of the Commissioned systems. Testing shall include all modes of operation, including:

1. All modes as described in the Sequence of Operation,
2. Redundant or automatic back-up mode,
3. Performance of alarms, and
4. Mode of operation upon a loss of power and restored power.

   Exception: Unitary or packaged HVAC equipment listed in Tables 503.2.3 (1) through (3) that do not require supply air economizers.

A503.2.9.1.3.2 Controls functional performance testing. HVAC control systems shall be tested to document that control devices, components, equipment, and systems are calibrated, adjusted and operate in accordance with approved plans and specifications. Sequences of operation shall be functionally tested to document they operate in accordance with approved plans and specifications.

A503.2.9.1.3.3 . Testing for Common Rooftop Equipment Problems. Rooftop HVAC equipment will be evaluated to avoid the following common problems:

1. Insufficient duct insulation, or outside conditioned space.
2. Wrong refrigerant charge.
3. Economizer missing or inoperative where required.

A503.2.9.1.4 Preliminary commissioning report. A preliminary report of commissioning test procedures and results shall be completed and provided to the Owner. The report shall be identified as "Preliminary Commissioning Report" and shall identify:

1. Itemization of deficiencies found during testing required by this section which have not been corrected at the time of report preparation and the anticipated date of correction.
2. Deferred tests which cannot be performed at the time of report preparation due to climatic conditions.
3. Climatic conditions required for performance of the deferred tests, and the anticipated date of each deferred test.
4. Planned date of complete compliance.

A503.2.9.2 Acceptance. Buildings, or portions thereof, required by this code to comply with this section shall not be issued a final certificate of occupancy allowing public or owner occupation until such time that the building official has received a letter of transmittal from the building owner that states they have received the Preliminary Commissioning Report as required by Section 503.2.9.1.4. The letter will include certification by the owner of the planned date for bringing all noted deficiencies into compliance (See Section 503.2.9.3.4)

A503.2.9.3 Completion requirements. The construction documents shall require that within 90 days after the date of final certificate of occupancy, the documents described in this section be provided to the building owner.

A503.2.9.3.1 Drawings. Construction documents shall include as a minimum the location and performance data on each piece of equipment.

A503.2.9.3.2 Required Manuals. An operating manual and a maintenance manual shall be in accordance with industry-accepted standards and shall include, at a minimum, the following:

1. Submittal data stating equipment size and selected options for each piece of equipment requiring maintenance.
2. Manufacturer's operation manuals and maintenance manuals for each piece of equipment requiring maintenance, except equipment not furnished as part of the project. Required routine maintenance actions shall be clearly identified.
3. Names and addresses of at least one service agency.
4. HVAC controls system maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions. Desired or field-determined setpoints shall be permanently recorded on control drawings at control devices or, for digital control systems, in programming comments.
5. A complete narrative of how each system is intended to operate, including suggested set points.
6. Names and addresses of designer of record, HVAC designer, contractor, and builder.

A503.2.9.3.3 System balancing report. A written report describing the activities and measurements completed in accordance with Section 503.2.9.1.2

A503.2.9.3.4 Final Commissioning Report. A complete report of test procedures and results identified as "Final Commissioning Report" shall include:

1. Results of all Functional Performance Tests.
2. Disposition of all deficiencies found during testing, including details of corrective measures used or proposed.
3. All Functional Performance Test procedures used during the commissioning process including measurable criteria for test acceptance, provided herein for repeatability.

   Exception: Deferred tests which cannot be performed at the time of report preparation due to climatic conditions.

{Topic: LIGHTING CONTROL REQUIREMENTS}

Revise Section 505.2 and replace with section A505.2 as follows:

A505.2 Lighting controls (Mandatory). Lighting systems shall be provided with controls as required in Sections 505.2.1, 505.2.2, 505.2.3, 505.2.4, and 505.2.5..

A505.2.1 Interior lighting controls. Each area enclosed by walls or floor-to-ceiling partitions shall have at least one manual control for the lighting serving that area. The required controls shall be located within the area served by the controls or be a remote switch that identifies the lights served and indicates their status.

Exceptions:

1. Areas designated as security or emergency areas that must be continuously lighted.
2. Lighting in stairways or corridors that are elements of the means of egress.

A505.2.2 Additional controls. Each area that is required to have a manual control shall have additional controls that meet the requirements of Sections A505.2.2.1 and A505.2.2.2.

A505.2.2.1 Light reduction controls. Each area that is required to have a manual control shall also allow the occupant to reduce the connected lighting load in a reasonably uniform illumination pattern by at least 50 percent. Lighting reduction shall be achieved by one of the following or other *approved* method:

1. Controlling all lamps or luminaires;
2. Dual switching of alternate rows of luminaires, alternate luminaires or alternate lamps;
3. Switching the middle lamp luminaires independently of the outer lamps; or
4. Switching each luminaire or each lamp.

Exceptions:

1. Areas that have only one luminaire.
2. Areas that are controlled by an occupant-sensing device.
3. Corridors, storerooms, restrooms or public lobbies.
4. *Sleeping unit* (see Section 505.2.3).
5. Spaces that use less than 0.6 watts per square foot (6.5 W/m2).

~~A~~**505.2.2.1.1 Daylight Zone Control.** Daylight zones shall be provided with individual controls which control the lights independent of general area lighting. Contiguous daylight zones adjacent to vertical fenestration are allowed to be controlled by a single controlling device provided that they do not include zones facing more than two adjacent cardinal orientations (i.e. north, east, south, west). Daylight zones under skylights more than 15 feet from the perimeter shall be controlled separately from daylight zones adjacent to vertical fenestration.

Exception: Daylight spaces enclosed by walls or ceiling height partitions and containing two or fewer light fixtures are not required to have a separate switch for general area lighting.

A505.2.2.2 Automatic lighting controls. All commercial buildings shall be equipped with automatic control devices to shut off lighting in compliance with one of the following automatic control technologies:

1. Section 505.2.2.2.1 Occupancy Sensors
2. Section 505.2.2.2.2 Time Clock Controls
3. Section 505.2.2.2.3 Automatic Daylighting Controls

Where an automatic time switch control device is installed to comply with Section 505.2.2.2, it shall incorporate an override switching device that:

1. Is readily *accessible*.
2. Is located so that a person using the device can see the lights or the area controlled by that switch, or so that the area being lit is annunciated.
3. Is manually operated.
4. Allows the lighting to remain on for no more than 2 hours when an override is initiated.
5. Controls an area not exceeding 5,000 square feet (465 m2).

Exceptions:

1. In malls and arcades, auditoriums, single-tenant retail spaces, industrial facilities and arenas, where captive-key override is utilized, override time shall be permitted to exceed 2 hours.
2. In malls and arcades, auditoriums, single-tenant retail spaces, industrial facilities and arenas, the area controlled shall not exceed 20,000 square feet (1860 m2).

A505.2.2.2.1 Occupancy sensors Occupancy sensors must be installed in all classrooms, conference/meeting rooms, employee lunch and break rooms, private offices, restrooms, storage rooms and janitorial closets, and other spaces 300 sf. or less enclosed by ceiling height partitions. These automatic control devices shall be installed to automatically turn off lights within 30 minutes of all occupants leaving the space, except spaces with multi-scene control. Areas where automatic daylight controls are installed are not required to have occupancy sensors in addition to the daylight controls, although integrated or dual controls may be implemented for additional energy savings.

A505.2.2.2.2 Time Clock Controls In areas not controlled by occupancy sensors, automatic time switch control devices shall be used. It shall incorporate an override switching device that:

1. Is readily accessible.
2. Is located so that a person using the device can see the lights or the area controlled by that switch, or so that the area being lit is annunciated.
3. Is manually operated.
4. Allows the lighting to remain on for no more than 4 hours when an override is initiated.
5. Controls an area not exceeding 5,000 square feet (465 m2).

Exceptions:

1. In malls and arcades, auditoriums, single-tenant retail spaces, industrial facilities and arenas, where captive-key override is utilized, override time may exceed 2 hours.
2. In malls and arcades, auditoriums, single-tenant retail spaces, industrial facilities and arenas, the area controlled may not exceed 20,000 square feet (1860 m2).

A505.2.2.2.3 Automatic daylighting controls. Automatic controls installed in daylit zones must control lights in the daylit areas separately from the non-daylit areas. Controls for calibration adjustments to the lighting control device shall be readily accessible to authorized personnel. Each daylight control zone shall not exceed 2,500 square feet. Automatic daylighting controls must incorporate an automatic shut-off ability based on time or occupancy in addition to lighting power reduction controls.

Controls will automatically reduce lighting power in response to available daylight by either one of the following methods:

1. **Continuous dimming** using dimming ballasts and daylight-sensing automatic controls that are capable of reducing the power of general lighting in the daylit zone continuously to less than 35% of rated power at maximum light output.

2. **Stepped Dimming** using multi-level switching and daylight-sensing controls that are capable of reducing lighting power automatically. The system should provide at least two control channels per zone and be installed in a manner such that at least one control step shall reduce power of general lighting in the daylit zone by 30% to 50% of rated power and another control step that reduces lighting power by 65% to 100%. Stepped dimming control is not appropriate in continuously occupied areas with ceiling heights of 14 feet or lower

A505.2.5 Additional Control.

1. Display/Accent Lighting—display or accent lighting shall have a separate control device.
2. Case Lighting—lighting in cases used for display purposes shall have a separate control device.
3. Hotel and Motel Guest Room Lighting—hotel and motel guest rooms and guest suites shall have a master control device at the main room entry that controls all permanently installed luminaires and switched receptacles.
4. Task Lighting—supplemental task lighting, including permanently installed undershelf or undercabinet lighting, shall have a control device integral to the luminaires or be controlled by a wall-mounted control device provided the control device is readily accessible and located so that the occupant can see the controlled lighting.

5. Nonvisual Lighting—lighting for nonvisual applications, such as plant growth and food warming, shall have a separate control device.
6. Demonstration Lighting—lighting equipment that is for sale or for demonstrations in lighting education shall have a separate control device.

Exception:

1. a., b. and d. Where LED lighting is used no additional control is required.

{Topic: LIGHTING POWER DENSITY REQUIREMENTS}

Delete Table 505.5.2 in its entirety and replace with the following table A505.5.2 and footnotes:

TABLE A505.5.2
INTERIOR LIGHTING POWER ALLOWANCES
(Underlining omitted for clarity)

LIGHTING POWER DENSITY		
	Whole Building	Space by Space
Building Area Typea	(W/ft2)	
Active Storage		0.8
Atrium – First Three Floors		0.6
Atrium – Each Additional Floor		0.2
Automotive Facility	0.9	
Classroom / Lecture / Training		1.3
Conference / Meeting / Multipurpose		1.1
Corridor / Transition		0.5
Electrical / Mechanical		1.1
Food Preparation		1.2
Inactive Storage		0.2
Lobby		1.1
Restroom		0.8
Stairway		0.6
Convention Center	1.2	
Exhibit Space		1.3
Audience / Seating Area		0.9
Dining: Cafeteria/Fast Food		
Court House	1.2	
Audience / Seating Area		0.9
Courtroom		1.9
Confinement Cells		0.9
Judges Chambers		1.3
Dressing / Locker / Fitting Room		0.6
Dining: Bar / Lounge / Leisure	1.3	
Lounge / Leisure Dining		1.4
Dining: Cafeteria / Fast Food	1.4	
Dining: Family	1.6	
Dining		1.4
Kitchen		1.2
Dormitory	1.0	
Living Quarters		1.1
Bedroom		0.5
Study Hall		1.4
Exercise Center	1.0	
Dressing / Locker / Fitting Room		0.6
Audience / Seating Area		0.3
Exercise Area		0.9
Exercise Area / Gymnasium		0.9
Retail: Supermarket	1.3	
Gymnasium	1.1	
Dressing / Locker / Fitting Room		0.6
Audience / Seating Area		0.4
Playing Area		1.4
Exercise Area		0.9
Healthcare Clinic	1.0	
Corridors w/ patient waiting, exam		1.0
Exam / Treatment		1.0
Emergency		2.7
Public & Staff Lounge		0.9
Hospital / Medical Supplies		1.4

LIGHTING POWER DENSITY		
Hospital – Nursery		0.6
Nurse Station		1.0
Physical Therapy		0.9
Patient Room		0.7
Pharmacy		1.2
Hospital / Radiology		0.4
Operating Room		2.2
Recovery		0.8
Active Storage		0.9
Laundry – Washing		0.6
Hotel	1.0	
Dining Area		1.3
Guest quarters		1.1
Reception / Waiting		2.5
Lobby		1.1
Library	1.3	
Library – Audio Visual		0.7
Stacks		1.7
Card File & Cataloguing		1.1
Reading Area		1.2
Manufacturing Facility	1.3	
Motel	1.0	
Dining Area		1.2
Guest quarters		1.1
Reception / Waiting		2.1
Motion Picture Theater	1.2	
Audience / Seating Area		1.2
Lobby		1.0
Multi-Family	0.7	
Museum	1.1	
Active Storage		0.8
General Exhibition		1.0
Restoration		1.7
Office	0.9	
Enclosed		1.0
Open Plan		1.0
Parking Garage	0.3	
Penitentiary	1.0	
Performing Arts Theater	1.6	
Audience / Seating Area		2.6
Lobby		3.3
Dressing / Locker / Fitting Room		1.1
Police Station	1.0	
Fire Station	0.8	
Fire Station Engine Room		0.8
Sleeping Quarters		0.3
Audience / Seating Area		0.8
Police Station Laboratory		1.4
Post Office / SF	1.1	
Sorting Area		1.2
Lobby		1.0
Religious Buildings	1.3	
Lobby		0.6
Worship / Pulpit / Choir		2.4
Religious Buildings	1.3	
Lobby		0.6
Worship / Pulpit / Choir		2.4
Retail	1.3	
Department Store Sales Area		1.3
Specialty Store Sales Area		1.8
Fine Merchandise Sales Area		2.9
Supermarket Sales Area		1.3
Personal Services Sales Area		1.3
Mass Merchandising Sales Area		1.3
Mall Concourse		1.7
School / University	1.2	
Classroom		1.3
Audience		0.7
Dining		1.1
Office		1.1
Corridor		0.5

LIGHTING POWER DENSITY		
Storage		0.5
Laboratory		1.1
Retail: Specialty	1.6	
Town Hall	1.1	
Transportation	1.0	
Dining Area		2.1
Baggage Area		1.0
Airport – Concourse		0.6
Terminal – Ticket Counter		1.5
Reception / Waiting		0.5
Sports Arena	1.1	
Warehouse	0.6	
Fine Material		1.4
Medium Bulky Material		0.6
Workshop	1.4	

For SI: 1 foot = 304.8 mm, 1 watt per square foot = W/0.0929 m2.

a. The lighting power densities contained in this table include allowances for video-display terminals, decorative lighting and display lighting Additional lighting power is not allowed for these uses. Task lighting is not included in these connected LPD limits.

b. Where lighting equipment is specified to be installed to highlight specific merchandise in addition to lighting equipment specified for general lighting and is switched or dimmed on circuits different from the circuits for general lighting, the smaller of the actual wattage of the lighting equipment installed specifically for merchandise, or additional lighting power as determined below shall be added to the interior lighting power determined in accordance with this line item.

Calculate the additional lighting power as follows:

Additional Interior Lighting Power Allowance = (Retail Area 1 X 0.4W/ft2) + (Retail Area 2 X 0.6 W/ft2) + (Retail Area 3 X 0.9 W/ft2) + (Retail Area 4 X 1.5 W/ft2).

Where:

Retail Area 1 = The floor area for all products not listed in Retail Area 2, 3 or 4.
Retail Area 2 = The floor area used for the sale of vehicles, sporting goods and small electronics.
Retail Area 3 = The floor area used for the sale of furniture, clothing, cosmetics and artwork.
Retail Area 4 = The floor area used for the sale of jewelry, crystal and china.

Exception: Other merchandise categories are permitted to be included in Retail Areas 2 through 4 above, provided that justification documenting the need for additional lighting power based on visual inspection, contrast, or other critical display is *approved* by the authority having jurisdiction.

{Topic: ADDITIONAL REQUIREMENTS}

Add New Section A507 as follows:

SECTION A507
ALTERNATIVE PRESCRIPTIVE COMPLIANCE PACKAGES

A507.1 Requirements. Commercial buildings are required to comply with one of the following sections:

1. A507.2.1 Efficient Mechanical Equipment
2. A507.2.2 Reduced Lighting Power Density
3. A507.2.3 On-Site Supply of Renewable Energy

At the time of plan submittal, the building jurisdiction shall be provided, by the submittal authority, documentation designating the intent to comply with Section A507.2.1, A507.2.2, or A507.2.3 in their entirety.

A507.2.1 Efficient Mechanical Equipment

This mechanical alternative compliance option is intended to allow the builder to meet the requirements of section 507 by choosing to install efficient mechanical equipment. This section in no way replaces requirements in section 503, but is one of several optional compliance packages.

Mechanical equipment choices that fulfill requirements for section A507.2.1 shall comply with the following in addition to the requirements in section 503:

1. Package unitary equipment shall meet the minimum efficiency requirements in Tables A507.2.1(1) and A507.2.1(2)
2. Package Terminal Air Conditioners and Heat Pumps shall meet the minimum efficiency requirements in Table A507.2.1(3)
3. Warm air furnaces and combination warm air furnaces / air conditioning units shall meet the minimum efficiency requirements in Table A507.2.1(4)
4. Boilers shall meet the minimum efficiency requirements in Table A507.2.1(5)
5. Electric chillers shall meet the energy efficiency requirements in Table A507.2.1(6)
6. Absorption chillers shall meet the minimum efficiency requirements in Table A507.2.1(7)

TABLE A507.2.1(1)
UNITARY AIR CONDITIONERS AND CONDENSING UNITS, ELECTRICALLY OPERATED, EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY	SUBCATEGORY OR RATING CONDITION	REQUIRED EFFICIENCY[a]
Air conditioners, Air cooled	< 65,000 Btu/hd	Split system	15.0 SEER 12.5 EER
		Single package	15.0 SEER 12.0 EER
	≥ 65,000 Btuh/h and < 135,000 Btu/h	Split system and single package	12.0 EERb 12.4 IPLVb
	≥ 135,000 Btu/h and < 240,000 Btu/h	Split system and single package	12.0 EERb 12.4 IPLVb
	≥ 240,000 Btu/h and < 760,000 Btu/h	Split system and single package	10.8 EERb 11.0 IPLVb
	≥ 760,000 Btu/h		10.2 EERb 11.0 IPLVb
Air conditioners, Water and evaporatively cooled		Split system and single package	14.0 EER

For SI: 1 British thermal unit per hour = 0.2931 W.
a. IPLVs are only applicable to equipment with capacity modulation.
b. Deduct 0.2 from the required EERs and IPLVs for units with a heating section other than electric resistance heat.

TABLE A507.2.1(2)
UNITARY AND APPLIED HEAT PUMPS, ELECTRICALLY OPERATED, EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY	SUBCATEGORY OR RATING CONDITION	REQUIRED EFFICIENCY[a]
Air cooled (Cooling mode)	< 65,000 Btu/hd	Split system	15.0 SEER 12.5 EER
		Single package	15.0 SEER 12.0 EER
	≥ 65,000 Btu/h and < 135,000 Btu/h	Split system and single package	12.4 EER[b] 11.9 IPLV[b]
	≥135,000 Btu/h and < 240,000 Btu/h	Split system and single package	12.4 EER[b] 11.9 IPLV[b]
	≥ 240,000 Btu/h	Split system and single package	12.4 EER[b] 10.9 IPLV[b]
Water source (Cooling mode)	< 135,000 Btu/h	85°F entering water	14.0 EER
Air cooled (Heating mode)	< 65,000 Btu/hd (Cooling capacity)	Split system	9.0 HSPF
		Single package	8.5 HSPF
	≥ 65,000 Btu/h and < 135,000 Btu/h (Cooling capacity)	47°F db/43°F w[b] outdoor air	3.4 COP
		77°F db/15°F w[b] outdoor air	2.4 COP
	≥ 135,000 Btu/h (Cooling capacity)	47°F db/43°F w[b] outdoor air	3.2 COP
		77°F db/15°F w[b] outdoor air	2.1 COP
Water source (Heating mode)	< 135,000 Btu/h (Cooling capacity)	70°F entering water	4.6 COP

For SI: °C = [(°F) - 32] / 1.8, 1 British thermal unit per hour = 0.2931 W.
db = dry-bulb temperature, °F; wb = wet-bulb temperature, °F
a. IPLVs and Part load rating conditions are only applicable to equipment with capacity modulation.
b. Deduct 0.2 from the required EERs and IPLVs for units with a heating section other than electric resistance heat.

TABLE A507.2.1(3)
PACKAGED TERMINAL AIR CONDITIONERS AND PACKAGED TERMINALHEAT PUMPS

EQUIPMENT TYPE	SIZE CATEGORY	REQUIRED EFFICIENCY[b]
Air conditioners	< 7,000 Btu / h	11.9 EER
& Heat Pumps (Cooling Mode)	7,000 Btu / h and < 10,000 Btu / h	11.3 EER
	10,000 Btu / h and < 13,000 Btu / h	10.7 EER
	> 13,000 Btu / h	9.5 EER

a. Replacement units must be factory labeled as follows: "MANUFACTURED FOR REPLACEMENT APPLICATIONS ONLY: NOT TO BE INSTALLED IN NEW CONSTRUCTION PROJECTS." Replacement efficiencies apply only to units with existing sleeves less than 16 inches (406 mm) high and less than 42 inches (1067 mm) wide.

TABLE A506.2.1(4)
WARM AIR FURNACES AND COMBINATION WARM AIR FURNACES/AIR-CONDITIONING UNITS, WARM AIR DUCT FURNACES AND UNIT HEATERS, EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY (INPUT)	SUBCATEGORY OR RATING CONDITION	REQUIRED EFFICIENCY
Warm air furnaces, gas fired	< 225,000 Btu/h	—	For zones 1 & 2, NR. For zones 3 & 4 90 AFUE or 90 Et For zones 4-8 are 92 AFUE or 92 Et
	≥ 225,000 Btu/h	Maximum capacity	90% Ec note 1
Warm air furnaces, oil fired	< 225,000 Btu/h	—	For zones 1 & 2, NR. For zones 3 to 8 are 85 AFUE or 85 Et
	≥ 225,000 Btu/h	Maximum capacity	85% Et, Note 1
Warm air duct furnaces, gas fired	All capacities	Maximum capacity	*90% Ec*
Warm air unit heaters, gas fired	All capacities	Maximum capacity	*90% Ec*
Warm air unit heaters, oil fired	All capacities	Maximum capacity	*90% Ec*

For SI: 1 British thermal unit per hour = 0.2931 W.

1 Units must also include an IID (intermittent ignition device), have jackets not exceeding 0.75 percent of the input rating, and have either power venting or a flue damper. A vent damper is an acceptable alternative to a flue damper for those furnaces where combustion air is drawn from the conditioned space. Where there two ratings units not covered by the National Appliance Energy Conservation Act of 1987 (NAECA) (3-phase power or cooling capacity greater than or equal to 65,000 Btu/h [19 kW]) shall comply with either rating.

Et = Thermal efficiency.

Ec = Combustion efficiency (100% less flue losses).

Efficient furnace fan: All fossil fuel furnaces in zones 3 to 8 shall have a furnace electricity ratio not greater than 2% and shall include a manufacturer's designation of the furnace electricity ratio.

TABLE A507.2.1(5)
BOILER, EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY	TEST PROCEEDURE	REQUIRED EFFICIENCY
Gas Hot Water	< 300,000 Btu / h	DOE 10 CFR Part 430	90% Et
	> 300,000 Btu / h and > 2.5 mBtu/h	DOE 10 CFR Part 431	89% Et
Gas Steam	< 300,000 Btu / h	DOE 10 CFR Part 430	89% Et
	> 300,000 Btu / h	DOE 10 CFR Part 431	89% Et
Oil	< 300,000 Btu / h	DOE 10 CFR Part 430	90% Et
	> 300,000 Btu / h	DOE 10 CFR Part 431	89% Et

Et = thermal efficiency

* Systems must be designed with lower operating hot water temperatures (<150◦F) and use hot water reset to take advantage of the much higher efficiencies of condensing boilers.

TABLE A507.2.1(5)
CHILLERS - EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	SIZE CATEGORY	REQUIRED EFFICIENCY- CHILLERS		OPTIONAL COMPLIANCE PATH - REQUIRED EFFICIENCY - CHILLERS WITH VSD	
		Full Load (KW /TON)	IPLV (KW /TON)	Full Load (KW /TON)	IPLV (KW /TON)
Air Cooled w/ Condenser	All	1.2	1.0	N/A	N/A
Air Cooled w/o Condenser	All	1.08	1.08	N/A	N/A
Water Cooled, Reciprocating	All	0.840	0.630	N/A	N/A
Water Cooled, Rotary Screw and Scroll	< 90 tons	0.780	0.600	N/A	N/A
	[3]90 tons and < 150 tons	0.730	0.550	N/A	N/A
	[3]150 tons and < 300 tons	0.610	0.510	N/A	N/A
	> 300 tons	0.600	0.490	N/A	N/A
Water Cooled, Centrifugal	< 150 tons	0.610	0.620	0.630	0.400
	[3] 150 tons and < 300 tons	0.590	0.560	0.600	0.400
	300 tons and < 600 tons	0.570	0.510	0.580	0.400
	> 600 tons	0.550	0.510	0.550	0.400

a. Compliance with full load efficiency numbers and IPLV numbers are both required.
b. Only Chillers with Variable Speed Drives(VSD) may use the optional compliance path here for chiller efficiency.

TABLE A507.2.1(6)
ABSORPTION CHILLERS - EFFICIENCY REQUIREMENTS

EQUIPMENT TYPE	REQUIRED EFFICIENCY FULL LOAD COP (IPLV)
Air Cooled, Single Effect	0.60, but only allowed in heat recovery applications
Water Cooled, Single Effect	0.70, But only allowed in heat recovery applications
Double Effect - Direct Fired	1.0 (1.05)
Double Effect - Indirect Fired	1.20

A507.2.2 Reduced Lighting Power Density - Whole Building Lighting Power Density (watts/SF) must comply with table 507.2.2.

TABLE A507.2.2
REDUCED WHOLE-BUILDING
INTERIOR LIGHTING POWER ALLOWANCES

LIGHTING POWER DENSITY	
	Whole Building
Building Type	(W/ft2)
Automotive Facility	0.8
Convention Center	1.1
Court House	1.1
Dining: Bar / Lounge / Leisure	1.2
Dining: Cafeteria / Fast Food	1.3
Dining: Family	1.4
Dormitory	0.9
Exercise Center	0.9
Retail: Supermarket	1.2
Gymnasium	1.0
Healthcare Clinic	0.9
Hotel	0.9
Library	1.2
Manufacturing Facility	1.2
Motel	0.9
Motion Picture Theater	1.1
Multi-Family	0.6
Museum	1.0
Office	0.8
Parking Garage	0.2
Penitentiary	0.9

LIGHTING POWER DENSITY	
Performing Arts Theater	1.4
Police Station	0.9
Fire Station	0.7
Post Office / SF	1.0
Religious Buildings	1.2
Religious Buildings	1.2
Retail	1.2
School / University	1.1
Retail: Specialty	1.4
Town Hall	1.0
Transportation	0.9
Sports Arena	1.0
Warehouse	0.5
Workshop	1.3

A507.2.3 On-site Supply of Renewable Energy

The building or surrounding property shall incorporate an on-site renewable energy system that supplies 3% or more of total building energy loads. On-site power generation using nonrenewable sources does not meet this requirement.

The jurisdiction shall be provided with an energy analysis as described in Section 506 that documents the renewable energy contribution to the building or a calculation demonstrating that the on-site supply of renewable energy

1. Is capable of providing at least 3% of the total energy load of the building, or
2. Provides on-site renewable energy generation with a nominal (peak) rating of 175 BTU's or 0.50 watts per square foot of building.

{Topic: DESIGN INTENT FORMS}

Add new section, Appendix X as follows:

Appendix X. Design Intent Certification Form: Building Energy
Form X:

The {insert Jurisdiction Name here}'s Energy Conservation Code recognizes the essential importance of key building design considerations in meeting the energy performance requirements of this code. In accordance with the provisions of Sections A103.2, signing this form certifies compliance with the design intent objectives of the code.

I, _____, hereby certify that the following are the energy related design intentions for this project:

1. Building Life Expectancy and Planning Cycle
   1. What is the expected lifetime (design goal) of the building? _____ years
   2. What is the life expectancy of the installed components of this building?
      - 2.1. Building envelope (insulation, fenestration, air sealing) _____ years
      - 2.2. HVAC Equipment (furnaces, boilers, air conditioners) _____ years
      - 2.3. . HVAC delivery systems (ducting, piping) _____ years
      - 2.4. Lighting systems _____ years
      - 2.5. Service water heating _____ years

2. Energy Performance Objectives
   1. Using prescribed minimum energy standards for each element of this project _____ (Y/N)
   2. If using higher-than-code levels of energy efficiency for specific elements of this project, identify the specific areas of better-than-code performance used for this project:
      - 2.1. . Building envelope (insulation, fenestration, air sealing) _____ (Y/N)
      - 2.2. . HVAC Equipment (furnaces, boilers, air conditioners) _____ (Y/N)
      - 2.3. . HVAC delivery systems (ducting, piping) _____ (Y/N)
      - 2.4. Lighting systems _____ (Y/N)
      - 2.5. Service water heating _____ (Y/N)

3. Briefly describe those areas of the project where beyond minimum code energy performance is specified. (Attach additional sheets if necessary.)

3. Building Configuration and Design Objectives
   - 3.1. Provide a short narrative explaining how building orientation will affect the energy use in the building and what design features have been tailored to respond to these conditions. (Attach additional sheets if necessary)
   - 3.2. Provide short narrative describing the building HVAC elements to be employed for the building specifically related to energy code compliance or beyond code levels of energy efficiency. (Attach additional sheets if necessary)
   - 3.3. Briefly describe how the following design decisions impacted HVAC Load Sizing:
     1. Building Orientation
     2. Window Area / Window Performance
     3. Opaque Building Envelope Decisions
4. Briefly describe any other building design elements planned for this project intended to meet or exceed the minimum energy efficiency requirements of the code. Attach additional sheets if necessary.)

Designer of Record: Date

Project:

Owner Date

Code Official Date

Add new section, Appendix Y as follows:

Appendix Y. Certification of Energy Code Compliance
Form Y: Summary

The {insert Jurisdiction's Name here}'s Energy Conservation Code recognizes that the building energy performance objectives of a project must be delivered upon completion of the project. In accordance with the provisions of Sections A103.3, signing this form certifies compliance with meeting the energy performance objectives of this project and full compliance with the provisions of the energy efficiency code.

I, _____, hereby certify that this building meets the performance requirements defined by this code:

Certification Checklist:
note: attach additional pages for complex buildings

Envelope Provisions:

	Design Intent		Initial Built as Designed		
Building Component	System	R-Value	Builder / Designer	Owner	Code Official
Roof					
Walls					
Below Grade Walls					
Floors					
Slab on Grade Floors					
Opaque Doors					

Fenestration:

	Design Intent			Initial Built as Designed		
Building Component	System Descriptions	U-value	SHGC	Builder / Designer	Owner	Code Official
Windows						
Skylights						
Doors						

HVAC:

	Design Intent			Initial Built as Designed		
Building Zone Description	System Descriptions	Unit Size	Btu / sqft	Builder / Designer	Owner	Code Official

Service Water Heating:

Design Intent			Initial Built as Designed		
System Descriptions	Unit Size	Btu / sqft	Builder / Designer	Owner	Code Official

Lighting:

	Design Intent			Initial Built as Designed		
Building Zone Description	System Descriptions	Unit Size	Lighting Power/ sqft	Builder / Designer	Owner	Code Official

Designer of Record: Date

Project:

Owner Date

Code Official Date

Reason: The purpose of the new Appendix A ("Appendix") to the International Energy Conservation Code (IECC) is to expand the code's utility to those jurisdictions seeking improved levels of energy efficiency beyond the performance defined by the minimum code.

This proposal provides such jurisdictions with an easy-to-use set of improved, prescriptive energy efficiency measures for residential and commercial buildings to directly substitute for the referenced section of the code.

The Appendix provides innovative ways of increasing energy efficiency that have been successfully demonstrated elsewhere.

The use of Appendices in other ICC codes has set a precedent for this proposal.

While the IECC addresses regional energy efficiency needs using climate zones, the energy landscape has become far more complicated. The new Appendix provides jurisdictions with more choice and flexibility in addressing local energy efficiency needs. This Appendix allows local jurisdictions to set a higher bar for building energy efficiency in response to their local or regionally-specific needs.

Concerns such as local fuel pricing, inflation, utility reliability and local peak power issues may require jurisdictions to seek building energy efficiency levels beyond those defined by the minimum code.

Generic model codes do not necessarily account for the increasingly complex and regionally specific power needs or challenges to local utility reliability. Efficiency gains for new construction can help delay the need for new peaking plant capacity, keeping the price of energy low in addition to delivering simple conservation savings.

The Appendix provides a basic set of improved prescriptive energy performance increases along with three key elements that are essential to ensuring delivered building energy performance:

1. Residential Air Leakage Testing
2. Residential Duct Leakage Testing

3. Commercial Building Commissioning Requirements

The Appendix also provides for improved efficiency options in:

1. Efficient Mechanical Equipment
2. Reduced Lighting Power Densities
3. On-Site Supply of Renewable Energy

These new sections give jurisdictions options to require better equipment, better lighting and on-site generation to meet their efficiency objectives.

Finally, two additional forms are provided as new appendices intended to help jurisdictions ensure compliance with the code provisions adopted. The first certifies that essential elements of energy efficiency and code compliance have been considered up front. This "Design Intent" certification addresses key issues of building life expectancy, energy code objectives, site considerations and other basic energy code compliance topics. The form tells the building official what elements of energy performance were considered during the planning phase. The second form provides the code official with certification that the objectives of the code and the original design intent have been met.

Credible climate change science gives us only about a decade to be well on our way to Greenhouse Gas Reductions. The Architecture 2030 goals call for drastic incremental increases towards carbon neutral buildings in 2030. Targets such as these are being taken seriously by planners, usually on a regional or municipal level. This Appendix enables the IECC to take a similar approach by providing jurisdictions the choice to take advanced steps towards higher efficiency.

The proponent recognizes the difficulty of performing an honest cost benefit analysis for any proposal at this juncture. In fact, we question any cost benefit analysis offered as justification to an IECC proposal. The number of variables and the rate of change in the energy and power landscape make such as task essentially a real-time impossibility. New power generation capacity is being priced at levels that far out-strip historical costs, so prediction based on historical trends is specious at best. Carbon emissions have yet to be given a price tag. Durability and life cycle cost are becoming more important considerations – from building planning to municipal and state energy policy planning. The time-dependent value (TDV) of electricity is becoming a critical component of efficiency policy and planning. While TDV is a common consideration in utility planning, it is (until now) generally ignored in IECC discussions and economic impact statements.

In light of this challenging and rapidly changing utility and power landscape it seems prudent to allow jurisdictions to be able to use the IECC to accomplish their locally-specific objectives for building energy efficiency. This Appendix provides a means to support these objectives within the IECC context (without creating a competing "code" in the public marketplace.)

Cost Impact: The code change proposal will increase the cost of construction locally if adopted by jurisdictions.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Mathis-EC-1-Appendix A

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL EXISTING BUILDING CODE

EXISTING BUILDING CODE COMMITTEE

Jonathan Siu, PE, SE - *Chair*
Principal Engineer/Building Official
City of Seattle, Department of Planning & Development
Seattle, WA

Hal Key, PE – *Vice Chair*
Fire Protection Engineer
Mesa Fire Department
Mesa, AZ

Raymond Andrews, RA
Assistant Director for Code Development
New York State-Department of State
Albany, NY

James Bartl
Director of Code Enforcement
Mecklenburg County Government
Charlotte, NC

Ronald Brendel, PE
Senior Plan Review Engineer/Code Dev. Specialist
City of Saint Louis
Saint Louis, MO

John Catlett, CPCA, CBO, MCP
Director, Office of Building and Fire Code Administration
City of Alexandria Fire Department
Buildling & Fire Adminstration
Alexandria, VA

William Clayton, CBCO
Building Codes Administrator
City of Lakewood
Lakewood, CO

Michael DeVore
Fire Protection Specialist
State Farm Insurance
Bloomington, IL

Matt Dobson
Rep: National Association of Home Builders
Director
Vinyl Siding Institute
Burlington, NC

Jeff Hugo
Manager of Codes
National Fire Sprinkler Association
Essexville, MI

Steven McDaniel, CPCA
Building Official
City of Corning
Corning, NY

Jeri L. S. Morey, AIA
Owner - Architect
Jeri L. S. Morey
Corpus Christi, TX

Marc Sampson
Fire Protection Engineer
Longmont Fire Department
Longmont, CO

Howard Zee, SE
Structural Engineer
City & County of San Francisco Department of Building Inspection
San Francisco, CA

Staff Secretariat:
Beth Tubbs, PE
Senior Staff Engineer
Codes and Standards Development

TENTATIVE ORDER OF DISCUSSION

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL EXISTING BUILDING CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does **not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair.

EB1-09/10
EB2-09/10
EB10-09/10 Part I
EB10-09/10 Part II
EB10-09/10 Part III
EB32-09/10 Part I
EB32-09/10 Part II
EB33-09/10 Part I
EB33-09/10 Part II
EB34-09/10
EB11-09/10 Part I
EB11-09/10 Part II
EB14-09/10 Part I
EB14-09/10 Part II
EB18-09/10
EB26-09/10
EB35-09/10
EB39-09/10
EB23-09/10
EB19-09/10
EB20-09/10
EB27-09/10
EB28-09/10
EB29-09/10
EB30-09/10
EB31-09/10

EB1–09/10
101.5, Chapter 3 (New)

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

Relocate current Section 101.5 to become new Chapter 3 as follows:

CHAPTER 3
COMPLIANCE METHODS

SECTION 301
COMPLIANCE METHODS

~~**101.5**~~ **301.1 General.** ~~**Compliance methods.**~~ The *repair*, *alteration*, *change of occupancy*, *addition* or relocation of all *existing buildings* shall comply with one of the methods listed in Sections ~~101.5.1~~ 301.1.1 through ~~101.5.3~~ 301.1.3 as selected by the applicant. Application of a method shall be the sole basis for assessing the compliance of work performed under a single permit unless otherwise approved by the *code official*. Sections ~~101.5.1~~ 301.1.1 through ~~101.5.3~~ 301.1.3 shall not be applied in combination with each other. Where this code requires consideration of the seismic-force-resisting system of an *existing building* subject to *repair*, *alteration*, *change of occupancy*, *addition* or relocation of *existing buildings*, the seismic evaluation and design shall be based on Section ~~101.5.4~~ 301.1.4 regardless of which compliance method is used.

Exception: Subject to the approval of the *code official*, *alterations* complying with the laws in existence at the time the building or the affected portion of the building was built shall be considered in compliance with the provisions of this code unless the building is undergoing more than a limited structural *alteration* as defined in Section 907.5.3 ~~807.5.3~~. New structural members added as part of the *alteration* shall comply with the *International Building Code*. *Alteration*s of *existing buildings* in *flood hazard areas* shall comply with Section 601.3.

~~**101.5.1**~~ **301.1.1 Prescriptive compliance method.** *Repairs*, *alterations*, *additions* and changes of occupancy complying with Chapter ~~3~~4 of this code in buildings complying with the *International Fire Code* shall be considered in compliance with the provisions of this code.

~~**101.5.2**~~ **301.1.2 Work area compliance method.** *Repairs*, *alterations*, *additions*, changes in occupancy and relocated buildings complying with the applicable requirements of Chapters ~~4~~5 through ~~12~~13 of this code shall be considered in compliance with the provisions of this code.

~~**101.5.3**~~ **301.1.3 Performance compliance method.** *Repairs*, *alterations*, *additions*, changes in occupancy and relocated buildings complying with Chapter ~~13~~14 of this code shall be considered in compliance with the provisions of this code.

~~**101.5.4**~~ **301.1.4 Evaluation and design procedures.** The seismic evaluation and design shall be based on the procedures specified in the *International Building Code*, ASCE 31 or ASCE 41. The procedures contained in Appendix A of this code shall be permitted to be used as specified in Section ~~101.5.4.2~~ 301.1.4.2.

~~**101.5.4.1**~~ **301.1.4.1 Compliance with IBC level seismic forces.** Where compliance with the seismic design provisions of the *International Building Code* is required, the procedures shall be in accordance with one of the following:

1. The *International Building Code* using 100 percent of the prescribed forces. The values of R, Ω_0 and C_d used for analysis in accordance with Chapter 16 of the *International Building Code* shall be those specified for structural systems classified as "Ordinary" in accordance with Table 12.2-1 of ASCE 7, unless it can be demonstrated that the structural system satisfies the proportioning and detailing requirements for systems classified as "Detailed," "Intermediate" or "Special."
2. Compliance with ASCE 41 using both the BSE-1 and BSE-2 earthquake hazard levels and the corresponding performance levels shown in Table ~~101.5.4.1~~ 301.1.4.1.

TABLE ~~101.5.4.1~~ 301.1.4.1
PERFORMANCE CRITERIA FOR IBC LEVEL SEISMIC FORCES OCCUPANCY

OCCUPANCY CATEGORY (Based on IBC Table 1604.5)	PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-1 EARTHQUAKE HAZARD LEVEL	PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-2 EARTHQUAKE HAZARD LEVEL
I	Life safety (LS)	Collapse prevention (CP)
II	Life safety (LS)	Collapse prevention (CP)
III	Note a	Note a
IV	Immediate occupancy (IO)	Life safety (LS)

a. Acceptable criteria for Occupancy Category III shall be taken as 80 percent of the acceptance criteria specified for Occupancy Category IV performance levels.

~~101.5.4.2~~ 301.1.4.2 Compliance with reduced IBC level seismic forces. Where seismic evaluation and design is permitted to meet reduced *International Building Code* seismic force levels, the procedures used shall be in accordance with one of the following:

1. The *International Building Code* using 75 percent of the prescribed forces. Values of R, Ω_0 and C_d used for analysis shall be as specified in Section ~~101.5.4.1~~ 301.1.4.1 of this code.
2. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A as specified in Items 2.1 through 2.5 shall be deemed to comply with this section.
   2.1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A1.
   2.2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Occupancy Category I or II are permitted to be based on the procedures specified in Chapter A2.
   2.3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Chapter A3.
   2.4. Seismic evaluation and design of soft, weak, or open-front wall conditions in multiunit residential buildings of wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Chapter A4.
   2.5. Seismic evaluation and design of concrete buildings and concrete with masonry infill buildings in all occupancy categories are permitted to be based on the procedures specified in Chapter A5.
3. Compliance with ASCE 31 based on the applicable performance level as shown in Table ~~101.5.4.2~~ 301.1.4.2. It shall be permitted to use the BSE-1 earthquake hazard level as defined in ASCE 41 and subject to the limitations in Item 4 below.
4. Compliance with ASCE 41 using the BSE-1 Earthquake Hazard Level and the performance level shown in Table ~~101.5.4.2~~ 301.1.4.2. The design spectral response acceleration parameters S_{XS} and S_{X1} specified in ASCE 41 shall not be taken less than 75 percent of the respective design spectral response acceleration parameters S_{DS} and S_{D1} defined by the *International Building Code*.

TABLE ~~101.5.4.2~~ 301.1.4.2
PERFORMANCE CRITERIA FOR REDUCED IBC LEVEL SEISMIC FORCES OCCUPANCY CATEGORY

OCCUPANCY CATEGORY (Based on IBC Table 1604.5)	PERFORMANCE LEVEL FOR USE WITH ASCE 31	PERFORMANCE LEVEL FOR USE WITH ASCE 41 BSE-1 EARTHQUAKE HAZARD LEVEL
I	Life safety (LS)	Life safety (LS)
II	Life safety (LS)	Life safety (LS)
III	Note a, b	Note a
IV	Immediate occupancy (IO)	Immediate occupancy (IO)

a. Performance levels for Occupancy Category III shall be taken as halfway between the performance levels specified for Occupancy Categories II and IV.
b. For Occupancy Category III, the ASCE 31 screening phase checklists shall be based on the life safety performance level.

(Renumber subsequent chapters)

Reason: The proposed relocation remedies the situation of having technical criteria in the administration chapter. Section 101.5, which includes the basic procedural provisions of the IEBC, as well as specific seismic evaluation and design criteria, does not belong in Chapter 1. Many jurisdictions do not adopt Chapter 1, but instead replace it with local administrative provisions. Having technical provisions in Chapter 1 makes this substitution more complicated and increases the possibility that the technical provisions of current Section 101.5 will be deleted or modified by mistake. The solution to these inconsistencies and potential problems is simply to relocate Section 101.5 in its entirety to a new chapter. (Note that Section 101.5 should not be relocated into either current Chapter 3 or Chapter 4 because the technical criteria in Section 101.5 are meant to apply to all three compliance methods per code change proposal EB1-07/08.)

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Any references to other chapters or sections not in current Section 101.5 (new Chapter 3) will be done editorially if the proposal is approved.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB34-101.5-CHP 3.DOC

EB2–09/10

101.5, Chapter 4, Section 401, 401.1, 101.5.1, 101.5.2, 101.5.3, 101.5.4, 101.5.4.1, Table 101.5.4.1, 101.5.4.2, Table 101.5.4.2, 401.1.1, 401.2, 401.3, Section 402, 402.1, 402.2, 402.3, Section 403, 403.1, 403.2, Section 404, 404.1, 404.2, Section 405, 405.1, 405.2, Section 406, 406.1, 406.2, 407, 407.1, 407.2, 408, 408.1, 408.2, 409, 409.1, 409.2, Chapter 3, 301, 301.1, 301.1.1, 506.2.2.1, 506.2.2.3, 606.2.1, 606.3.1, 807.4.2, 807.4.3, 907.3.1, 1003.3.1, 1003.3.2, 1301.1, 1301.1.1, 1301.2

Proponent: Lawrence Brown, CBO, representing National Association of Home Builders (NAHB)

Change current Chapter 3 (Prescriptive Compliance Method) to Chapter 4, and change current Chapter 4 to Chapter 3, and incorporate current Section 101.5 provisions into the new Chapter 3 as follow:

~~**101.5 Compliance methods.** The *repair*, *alteration*, *change of occupancy*, *addition* or relocation of all *existing buildings* shall comply with one of the methods listed in Sections 101.5.1 through 101.5.3 as selected by the applicant. Application of a method shall be the sole basis for assessing the compliance of work performed under a single permit unless otherwise approved by the *code official*. Sections 101.5.1 through 101.5.3 shall not be applied in combination with each other. Where this code requires consideration of the seismic-force-resisting system of an *existing building* subject to *repair*, *alteration*, *change of occupancy*, *addition* or relocation of *existing buildings*, the seismic evaluation and design shall be based on Section 101.5.4 regardless of which compliance method is used.~~

~~**Exception:** Subject to the approval of the *code official*, *alterations* complying with the laws in existence at the time the building or the affected portion of the building was built shall be considered in compliance with the provisions of this code unless the building is undergoing more than a limited structural *alteration* as defined in Section 807.4.3. New structural members added as part of the *alteration* shall comply with the *International Building Code*. *Alterations* of *existing buildings* in *flood hazard areas* shall comply with Section 601.3.~~

CHAPTER <u>3</u> ~~4~~
CLASSIFICATION OF WORK

SECTION <u>301</u> ~~401~~
GENERAL

<u>301.1</u> ~~401.1~~ <u>Compliance methods</u> ~~Scope~~. The provisions of this chapter~~ shall be used in conjunction with Chapters 5 through 12 and~~ shall apply to the *alteration*, *repair*, *addition* and *change of occupancy* of existing structures, including historic and moved structures~~, as referenced in Section 101.5.2~~. The work performed on an *existing building* shall <u>comply with one of the methods listed in Sections 301.1.1 through 301.1.3</u>~~ be classified in accordance with this chapter~~. <u>Sections 301.1.1 through 301.1.3 shall not be applied in combination with each other. Where this code</u>

requires consideration of the seismic-force-resisting system of an *existing building* subject to *repair*, *alteration*, *change of occupancy*, *addition* or relocation of *existing buildings*, the seismic evaluation and design shall be based on Section 301.1.4 regardless of which compliance method is used.

Exception: Subject to the approval of the *code official*, *alterations* complying with the laws in existence at the time the building or the affected portion of the building was built shall be considered in compliance with the provisions of this code unless the building is undergoing more than a limited structural *alteration* as defined in Section 807.5.3. New structural members added as part of the *alteration* shall comply with the *International Building Code*. *Alterations* of *existing buildings* in *flood hazard areas* shall comply with Section 601.3.

301.1.1 ~~101.5.1~~ Prescriptive compliance method. *Repairs*, *alterations*, *additions* and changes of occupancy complying with Chapter 4~~3~~ of this code in buildings complying with the *International Fire Code* shall be considered in compliance with the provisions of this code.

301.1.2 ~~101.5.2~~ Work area compliance method. *Repairs*, *alterations*, *additions*, changes in occupancy and relocated buildings complying with the applicable requirements of Chapters 5~~4~~ through 12 of this code shall be considered in compliance with the provisions of this code. The work performed on an *existing building* shall be classified in accordance with Sections 302 through 309.

301.1.3 ~~101.5.3~~ Performance compliance method. *Repairs*, *alterations*, *additions*, changes in occupancy and relocated buildings complying with Chapter 13 of this code shall be considered in compliance with the provisions of this code.

301.1.4 ~~101.5.4~~ Evaluation and design procedures. The seismic evaluation and design shall be based on the procedures specified in the *International Building Code*, ASCE 31 or ASCE 41. The procedures contained in Appendix A of this code shall be permitted to be used as specified in Section 301.1.4.2~~101.5.4.2~~.

301.1.4.1 ~~101.5.4.1~~ Compliance with IBC level seismic forces. Where compliance with the seismic design provisions of the *International Building Code* is required, the procedures shall be in accordance with one of the following:

1. The *International Building Code* using 100 percent of the prescribed forces. The values of R, Ω_0 and C_d used for analysis in accordance with Chapter 16 of the *International Building Code* shall be those specified for structural systems classified as "Ordinary" in accordance with Table 12.2-1 of ASCE 7, unless it can be demonstrated that the structural system satisfies the proportioning and detailing requirements for systems classified as "Detailed," "Intermediate" or "Special."
2. Compliance with ASCE 41 using both the BSE-1 and BSE-2 earthquake hazard levels and the corresponding performance levels shown in Table 301.1.4.1 ~~101.5.4.1~~.

TABLE 301.1.4.1 ~~101.5.4.1~~
PERFORMANCE CRITERIA FOR IBC LEVEL SEISMIC FORCES

(No changes to table contents)

301.1.4.2 ~~101.5.4.2~~ Compliance with reduced IBC level seismic forces. Where seismic evaluation and design is permitted to meet reduced *International Building Code* seismic force levels, the procedures used shall be in accordance with one of the following:

1. The *International Building Code* using 75 percent of the prescribed forces. Values of R, Ω_0 and C_d used for analysis shall be as specified in Section 301.1.4.1 ~~101.5.4.1~~ of this code.
2. Structures or portions of structures that comply with the requirements of the applicable chapter in Appendix A as specified in Items 2.1 through 2.5 shall be deemed to comply with this section.
   2.1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A1.
   2.2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Occupancy Category I or II are permitted to be based on the procedures specified in Chapter A2.
   2.3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Chapter A3.

2.4. Seismic evaluation and design of soft, weak, or open-front wall conditions in multiunit residential buildings of wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Chapter A4.

2.5. Seismic evaluation and design of concrete buildings and concrete with masonry infill buildings in all occupancy categories are permitted to be based on the procedures specified in Chapter A5.

3. Compliance with ASCE 31 based on the applicable performance level as shown in Table 301.1.4.2 ~~101.5.4.2~~. It shall be permitted to use the BSE-1 earthquake hazard level as defined in ASCE 41 and subject to the limitations in Item 4 below.
4. Compliance with ASCE41 using the BSE-1 Earthquake Hazard Level and the performance level shown in Table 301.1.4.2~~101.5.4.2~~. The design spectral response acceleration parameters S_{XS} and S_{X1} specified in ASCE 41 shall not be taken less than 75 percent of the respective design spectral response acceleration parameters S_{DS} and S_{D1} defined by the *International Building Code*.

TABLE 301.1.4.2 ~~101.5.4.2~~
PERFORMANCE CRITERIA FOR REDUCED IBC LEVEL SEISMIC FORCES

(No change to table contents)

~~401.1.1 Compliance with other alternatives.~~ ~~*Alterations*, *repairs*, *additions* and changes of occupancy to existing structures shall comply with the provisions of Chapters 4 through 12 or with one of the alternatives provided in Section 101.5.~~

301.2 ~~401.2~~ Work area. The *work area*, as defined in Chapter 2, shall be identified on the construction documents.

301.3 ~~401.3~~ Occupancy and use. When determining the appropriate application of the referenced sections of this code, the occupancy and use of a building shall be determined in accordance with Chapter 3 of the *International Building Code*.

SECTION 302 ~~402~~
REPAIRS

302.1 ~~402.1~~ Scope. *Repairs,* as defined in Chapter 2, include the patching or restoration or replacement of damaged materials, elements, equipment or fixtures for the purpose of maintaining such components in good or sound condition with respect to existing loads or performance requirements.

302.2 ~~402.2~~ Application. *Repairs* shall comply with the provisions of Chapter 5.

302.3 ~~402.3~~ Related work. Work on nondamaged components that is necessary for the required *repair* of damaged components shall be considered part of the *repair* and shall not be subject to the provisions of Chapter 6, 7, 8, 9 or 10.

SECTION 303 ~~403~~
ALTERATION—LEVEL 1

303.1 ~~403.1~~ Scope. Level 1 alterations include the removal and replacement or the covering of existing materials, elements, equipment, or fixtures using new materials, elements, equipment, or fixtures that serve the same purpose.

303.2 ~~403.2~~ Application. Level 1 *alterations* shall comply with the provisions of Chapter 6.

SECTION 304 ~~404~~
ALTERATION—LEVEL 2

304.1 ~~404.1~~ Scope. Level 2 *alterations* include the reconfiguration of space, the *addition* or elimination of any door or window, the reconfiguration or extension of any system, or the installation of any additional equipment.

304.2 ~~404.2~~ Application. Level 2 alterations shall comply with the provisions of Chapter 6 for Level 1 *alterations* as well as the provisions of Chapter 7.

SECTION 305 ~~405~~
ALTERATION—LEVEL 3

305.1 ~~405.1~~ Scope. Level 3 *alterations* apply where the *work area* exceeds 50 percent of the aggregate area of the building.

305.2 ~~405.2~~ Application. Level 3 alterations shall comply with the provisions of Chapters 6 and 7 for Level 1 and 2 *alterations*, respectively, as well as the provisions of Chapter 8.

SECTION 306 ~~406~~
CHANGE OF OCCUPANCY

306.1 ~~406.1~~ Scope. *Change of occupancy* provisions apply where the activity is classified as a *change of occupancy* as defined in Chapter 2.

306.2 ~~406.2~~ Application. Changes of occupancy shall comply with the provisions of Chapter 9.

SECTION 307 ~~407~~
ADDITIONS

307.1 ~~407.1~~ Scope. Provisions for *additions* shall apply where work is classified as an *addition* as defined in Chapter 2.

307.2 ~~407.2~~ Application. *Additions* to existing buildings shall comply with the provisions of Chapter 10.

SECTION 308 ~~408~~
HISTORIC BUILDINGS

308.1 ~~408.1~~ Scope. Historic buildings provisions shall apply to buildings classified as historic as defined in Chapter 2.

308.2 ~~408.2~~ Application. Except as specifically provided for in Chapter 11, historic buildings shall comply with applicable provisions of this code for the type of work being performed.

SECTION 309 ~~409~~
RELOCATED BUILDINGS

309.1 ~~409.1~~ Scope. Relocated buildings provisions shall apply to relocated or moved buildings.

309.2 ~~409.2~~ Application. Relocated buildings shall comply with the provisions of Chapter 12.

CHAPTER 4~~3~~
PRESCRIPTIVE COMPLIANCE METHOD

[B] SECTION 401 ~~301~~
GENERAL

401.1 ~~301.1~~ Scope. The provisions of this chapter shall control the *alteration*, *repair*, *addition* and *change of occupancy* of existing structures, including historic and moved structures as referenced in Section 301.1.1~~101.5.1~~.

Exception: Existing bleachers, grandstands and folding and telescopic seating shall comply with ICC 300-02.

401.1.1 ~~301.1.1~~ Compliance with other methods. Alterations, repairs, *additions* and changes of occupancy to existing structures shall comply with the provisions of this chapter or with one of the methods provided in Section 301.1~~101.5~~

(Renumber remaining Chapter 3 accordingly)

506.2.2.1 Evaluation. The building shall be evaluated by a registered design professional, and the evaluation findings shall be submitted to the *code official*. The evaluation shall establish whether the damaged building, if repaired to its predamaged state, would comply with the provisions of the *International Building Code*, except that the seismic design criteria shall be the reduced level seismic forces specified in Section 301.1.4.2 ~~101.5.4.2~~.

506.2.2.3 Extent of repair for noncompliant buildings. If the evaluation does not establish that the building in its predamage condition complies with the provisions of Section 506.2.2.1, then the building shall be rehabilitated to comply with the provisions of this section. The wind load for the *repair* and rehabilitation shall be those required by the building code in effect at the time of original construction, unless the damage was caused by wind, in which case the wind loads shall be in accordance with the *International Building Code*. The seismic loads for this rehabilitation design shall be those required by the building code in effect at the time of original construction, but not less than the reduced-level seismic forces specified in Section 301.1.4.2 ~~101.5.4.2~~.

606.2.1 Wall anchors for concrete and masonry buildings. Where a permit is issued for reroofing more than 25 percent of the roof area of a building assigned to Seismic Design Category D, E or F with a structural system consisting of concrete or reinforced masonry walls with a flexible roof diaphragm or unreinforced masonry walls with any type of roof diaphragms, the work shall include installation of wall anchors at the roof line to resist the reduced *International Building Code* level seismic forces as specified in Section 301.1.4.2 ~~101.5.4.2~~ of this code and design procedures of Section 301.1.4 ~~101.5.4~~, unless an evaluation demonstrates compliance of existing wall anchorage.

606.3.1 Bracing for unreinforced masonry bearing wall parapets. Where a permit is issued for reroofing for more than 25 percent of the roof area of a building assigned to Seismic Design Category D, E or F that has parapets constructed of unreinforced masonry, the work shall include installation of parapet bracing to resist the reduced *International Building Code* level seismic forces as specified in Section 301.1.4.2 ~~101.5.4.2~~ of this code, unless an evaluation demonstrates compliance of such items.

807.4.2 Substantial structural alteration. Where more than 30 percent of the total floor and roof areas of the building or structure have been or are proposed to be involved in structural *alteration* within a 12-month period, the evaluation and analysis shall demonstrate that the altered building or structure complies with the *International Building Code* for wind loading and with reduced *International Building Code* level seismic forces as specified in Section 301.1.4.2 ~~101.5.4.2~~ for seismic loading. For seismic considerations, the analysis shall be based on one of the procedures specified in Section 301.1.4 ~~101.5.4~~. The areas to be counted toward the 30 percent shall be those areas tributary to the vertical load-carrying components, such as joists, beams, columns, walls and other structural components that have been or will be removed, added or altered, as well as areas such as mezzanines, penthouses, roof structures and in-filled courts and shafts.

807.4.3 Limited structural alteration. Where not more than 30 percent of the total floor and roof areas of the building are involved in structural *alteration* within a 12-month period, the evaluation and analysis shall demonstrate that the altered building or structure complies with the loads applicable at the time of the original construction or of the most recent substantial structural *alteration* as defined by Section 807.4.2. Any existing structural element whose seismic demand-capacity ratio with the *alteration* considered is more than 10 percent greater than its demand-capacity ratio with the *alteration* ignored shall comply with the reduced *International Building Code* level seismic forces as specified in Section 301.1.4.2 ~~101.5.4.2~~.

907.3.1 Compliance with the International Building Code level seismic forces. Where a building or portion thereof is subject to a *change of occupancy* that results in the building being assigned to a higher occupancy category based on Table 1604.5 of the *International Building Code*; or where such *change of occupancy* results in a reclassification of a building to a higher hazard category as shown in Table 912.4; or where a change of a Group M occupancy to a Group A, E, I-1, R-1, R-2 or R-4 occupancy with two-thirds or more of the floors involved in Level 3 *alteration* work, the building shall comply with the requirements for *International Building Code* level seismic forces as specified in Section 301.1.4.1 ~~101.5.4.1~~ for the new occupancy category.

Exceptions:

1. Group Moccupancies being changed to Group A, E, I-1, R-1, R-2 or R-4 occupancies for buildings less than six stories in height and in Seismic Design Category A, B or C.
2. Where approved by the *code official*, specific detailing provisions required for a new structure are not required to be met where it can be shown that an equivalent level of performance and seismic safety is obtained for the applicable occupancy category based on the provision for reduced *International Building Code* level seismic forces as specified in Section 301.1.4.2 ~~101.5.4.2~~.
3. Where the area of the new occupancy with a higher hazard category is less than or equal to 10 percent of the total building floor area and the new occupancy is not classified as Occupancy Category IV. For the purposes of this exception, buildings occupied by two or more occupancies not included in the same occupancy category, shall be subject to the provisions of Section 1604.5.1 of the *International Building Code*. The cumulative effect of the area of occupancy changes shall be considered for the purposes of this exception.
4. Unreinforced masonry bearing wall buildings in Occupancy Category III when assigned to Seismic Design Category A or B shall be allowed to be strengthened to meet the requirements of Appendix Chapter A1 of this code [Guidelines for the Seismic Retrofit of Existing Buildings (GSREB)].

1003.3.1 Vertical addition. Any element of the lateral-force-resisting system of an *existing building* subjected to an increase in vertical or lateral loads from the vertical *addition* shall comply with the *International Building Code* wind provisions and the *International Building Code* level seismic forces specified in Section 301.1.4.1 ~~101.5.4.1~~ of this code.

1003.3.2 Horizontal addition. Where horizontal *additions* are structurally connected to an existing structure, all lateral-force-resisting elements of the existing structure affected by such *addition* shall comply with the *International Building Code* wind provisions and the *International Building Code* level seismic forces specified in Section 301.1.4.1 ~~101.5.4.1~~ of this code.

1301.1 Scope. The provisions of this chapter shall apply to the *alteration, repair, addition* and *change of occupancy* of existing structures, including historic and moved structures, as referenced in Section 301.1.3 ~~101.5.3~~. The provisions of this chapter are intended to maintain or increase the current degree of public safety, health and general welfare in existing buildings while permitting *repair, alteration, addition* and *change of occupancy* without requiring full compliance with the applicable requirements of Chapters 5 through 12 ~~Chapters 4 through 12~~, except where compliance with other provisions of this code is specifically required in this chapter.

1301.1.1 Compliance with other methods. *Alterations, repairs, additions* and *changes of occupancy* to existing structures shall comply with the provisions of this chapter or with one of the methods provided in Section 301.1 ~~101.5~~.

[**B] 1301.2 Applicability.** Structures existing prior to [DATE TO BE INSERTED BY THE JURISDICTION]. Note: it is recommended that this date coincide with the effective date of building codes within the jurisdiction], in which there is work involving additions, alterations or changes of occupancy shall be made to conform to the requirements of this chapter or the provisions of Chapters 5 through 12 ~~Chapters 4 through 12~~. The provisions of Sections 1301.2.1 through 1301.2.5 shall apply to existing occupancies that will continue to be, or are proposed to be, in Groups A, B, E, F, M, R, and S. These provisions shall not apply to buildings with occupancies in Group H or Group I.

Reason: IEBC: This proposal moves (swaps) current Chapter 3 (Prescriptive Compliance Method) to Chapter 4, and moves current Chapter 4 (Classification of Work) to Chapter 3, and expands the general language in current Section 401 (now Section 301) to cover all of the compliance methods. In addition, the appropriate language of Chapter 1, Section 101.5 is moved into the revised Chapter 3. The seismic evaluation and design requirements currently located in IEBC Section 101.5 are also brought over and placed under the expanded and re-titled Section 301.1. Thus, an appropriate location for the technical requirements is created without the need to carve out an additional chapter and renumber the entire code.

Note: The provisions for seismic evaluation and design of existing buildings were relocated last cycle from Chapter 5 to Chapter 1, for the purpose of making them available to all the compliance methods allowed under the IEBC (prescriptive method, work area method, and performance method). This relocation was approved by the IEBC committee (and upheld by the floor in Minneapolis) despite concerns that the administrative chapter is an inappropriate place for technical requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BROWN-EB2-ITEM_#2_IEBC_101-5_MOVED.DOC

EB3–09/10
Chapter 2; IBC Chapter 2

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC STRUCTURAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE COMMITTEE.

PART I – IEBC

Revise definition as follows:

DANGEROUS. Any building, structure or portion thereof that meets any of the conditions described below shall be deemed dangerous:

1. The building or structure has collapsed, has partially collapsed, has moved off its foundation, or lacks the necessary support of the ground ~~necessary to support it~~.
2. There exists a significant risk of collapse, detachment or dislodgement of any portion, member, appurtenance or ornamentation of the building or structure under service loads.

PART II – IBC GENERAL

Revise definition as follows:

DANGEROUS. Any building ~~or~~ , structure or portion thereof that meets any of the conditions described below shall be deemed dangerous:

1. The building or structure has collapsed, has partially collapsed, has moved off its foundation, or lacks the necessary support of the ground ~~necessary to support it~~.
2. There exists a significant risk of collapse, detachment, or dislodgment of any portion, member, appurtenance, or ornamentation of the building or structure under service loads.

Reason: This is an editorial change intended to correct awkward grammar and sentence structure. A coordinating proposal is being submitted for IBC Chapter 34.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB16-CHPT 2-DANGEROUS.DOC

EB4–09/10
Chapter 2; IBC Chapter 2

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC STRUCTURAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE FIRE CODE COMMITTEE.

PART I – IEBC

Revise definition as follows:

SUBSTANTIAL STRUCTURAL DAMAGE. A condition where:

1. In any story, the vertical elements of the lateral force-resisting system have suffered damage such that the lateral load-carrying capacity of the structure in any horizontal direction has been reduced by more than ~~20~~ 33 percent from its pre-damage condition; or
2. The capacity of any vertical gravity load-carrying component, or any group of such components, that supports more than 30 percent of the total area of the structure's floor(s) and roof(s) has been reduced more than 20 percent from its pre-damage condition and the remaining capacity of such affected elements, with respect to all dead and live loads, is less than 75 percent of that required by this code for new buildings of similar structure, purpose and location.

PART II – IBC GENERAL

Revise definition as follows:

SUBSTANTIAL STRUCTURAL DAMAGE. A condition where:

1. In any story, the vertical elements of the lateral force-resisting system have suffered damage such that the lateral load-carrying capacity of the structure in any horizontal direction has been reduced by more than ~~20~~ 33 percent from its pre-damage condition; or
2. The capacity of any vertical gravity load-carrying component, or any group of such components, that supports more than 30 percent of the total area of the structure's floor(s) and roof(s) has been reduced more than 20 percent from its pre-damage condition and the remaining capacity of such affected elements, with respect to all dead and live loads, is less than 75 percent of that required by this code for new buildings of similar structure, purpose and location.

Reason (Part I): In the IEBC, lateral system upgrades are triggered where lateral system damage from any cause is classified as Substantial Structural Damage (SSD). The idea of repair-based upgrade triggers is well within the scope and intent of the code, as long as the triggers are not pulled too easily.

This proposal redefines SSD to help assure reasonable lateral upgrade triggers. While the proposed "33 percent" is no more and no less arbitrary than the current "20 percent" – that is, neither figure is based on theory, or analysis, or historic performance – it is felt that the proposed higher threshold is appropriate. Conceptually, the 33 percent value means that the loss of less than half of one wall line at a single story – potentially a 25 percent capacity reduction in the critical direction – would no longer be enough to trigger a full lateral assessment.

This proposal is made in coordination with a similar proposal for the IBC.

Reason (Part II): In the 2009 IBC, for the first time, lateral system upgrades are triggered where lateral system damage from any cause is classified as Substantial Structural Damage (SSD). Similar triggers have been in the IEBC for several code cycles. The idea of repair-based upgrade triggers is well within the scope and intent of both codes, as long as the triggers are not pulled too easily.

This proposal redefines SSD to help assure reasonable lateral upgrade triggers. While the proposed "33 percent" is no more and no less arbitrary than the current "20 percent" – that is, neither figure is based on theory, or analysis, or historic performance – it is felt that the proposed higher threshold is appropriate. Conceptually, the 33 percent value means that the loss of less than half of one wall line at a single story – potentially a 25 percent capacity reduction in the critical direction – would no longer be enough to trigger a full lateral assessment.

A coordination change is being submitted for IEBC Chapter 2.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB17-CHPT 2-SUB STR DAMAGE.DOC

EB5–09/10

501.1, 1102.1, 1102.4, 1102.5

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

501.1 Scope. Repairs as described in Section 402 shall comply with the requirements of this chapter. Repairs to historic buildings ~~shall~~ need only comply with ~~this chapter, except as modified in~~ Chapter 11.

1102.1 General. Repairs to any portion of an historic building or structure shall be permitted with original or like materials and original methods of construction, subject to the provisions of this chapter. Hazardous materials, such as asbestos and lead-based paint, shall not be used where the code for new construction would not permit their use in buildings of similar occupancy, purpose and location.

~~**1102.4 Chapter 5 compliance.** Historic buildings undergoing repairs shall comply with all of the applicable requirements of Chapter 5, except as specifically permitted in this chapter.~~

~~**1102.5**~~ **1102.4 Replacement.** Replacement of existing or missing features using original materials shall be permitted. Partial replacement for repairs that match the original in configuration, height, and size shall be permitted. ~~Such replacements shall not be required to meet the materials and methods requirements of Section 501.2.~~

~~**Exception:** Replacement glazing in hazardous locations shall comply with the safety glazing requirements of Chapter 24 of the *International Building Code*.~~

Replacement glazing in hazardous locations shall comply with the safety glazing requirements of Chapter 24 of the *International Building Code*.

Exception: Glass block walls, louvered windows, and jalousies repaired with like materials.

Reason: This is an editorial clarification. It will not change the scope or effect of the 2009 provisions. Currently, Chapters 5 and 11 refer to each other in a confusing way with respect to historic buildings. Sections 501.1 and 1102.4 both say that repairs shall be in accordance with Chapter 5 except as modified by Chapter 11, but the exceptions are not clearly stated and are thus difficult to decipher. Further, whenever Chapter 5 is revised, as it has been substantially in the 2006 and 2009 editions, Chapter 11 must be checked to see which of those revisions should apply to historic buildings.

This proposal offers a cleaner approach. It proposes a general exemption for historic buildings in Chapter 5 along with an explicit list of requirements in Chapter 11, without the need for reference back and forth between the chapters. Specifically, the proposal does the following:

- In 501.1, it sends the user to Chapter 11 for historic buildings.
- In 1102.4, it removes the circular reference back to Chapter 5.
- In 1102.5, it corrects (by deletion) the mistaken waiver of section 501.2. This waiver should be referencing 2009 section 502.2 because the provision in question was moved there with the 2009 edition; but the reference in 2009 1102.5 was not properly corrected. If the rest of this proposal is approved, this waiver is no longer needed.
- It restates all the Chapter 5 requirements for historic buildings in Chapter 11.

A study of 2009 Chapters 5 and 11 finds that the only provisions of Chapter 5 not already waived by Chapter 11 for repairs are the following:

- Per 2009 Sections 502.1 and 506.1, dangerous conditions must be eliminated. This requirement is already covered by Sections 1102.2 and 1106.2.
- Per 2009 Section 502.2, hazardous materials shall not be used for repair. This proposal restates the prohibition in Section 1102.1.
- Per 2009 Section 1102.5 and its exception, replacement glazing in hazardous locations must comply with IBC Chapter 24, but 2009 Section 502.3 makes an exception for "glass block walls, louvered windows, and jalousies repaired with like materials." This proposal brings the exception into section 1102.5, stating it in identical terms.

Thus, this proposal captures all the current requirements and exemptions for repairs of historic buildings and presents them more clearly.

Additional background. Examples of how the current provisions lead to confusion over scope and applicability for historic buildings: Section 1102.1 allows repairs with original or like materials and original methods of construction, but Section 502.2 requires materials for new construction, and Section 506.1 requires detailing as for new construction. Section 1102.5 waives Section 501.2 (mistakenly, see above) but does not explicitly mention related provisions in Sections 503 through 508. Section 1102.5 requires glazing in hazardous locations to comply with IBC Chapter 24, but it must do so through an exception to the exception in 502.3. Most significantly, Section 1102.1, regarding repairs, does not explicitly exempt the upgrades required by Section 506, but this is in conflict with the apparent intent of Sections 1102.2 and 1106.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB19-501.1.DOC

EB6–09/10

506.2.2, 506.2.2.1; IBC 3405.2 (IEBC [B] 304.2), 3405.2.1(IEBC [B] 304.2.1)

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC STRUCTURAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE FIRE CODE COMMITTEE.

PART I – IEBC

Revise as follows:

506.2.2 Substantial structural damage to vertical elements of the lateral-force-resisting system. A building that has sustained *substantial structural damage* to the vertical elements of its lateral-force-resisting system shall be evaluated in accordance with Section 506.2.2.1, and either repaired in accordance with Section 506.2.2.2 or repaired and rehabilitated in accordance with Section 506.2.2.3, depending on the results of the evaluation.

Exceptions:

1. Buildings assigned to Seismic Design Category A, B, or C whose substantial structural damage was not caused by earthquake need not be evaluated or rehabilitated for load combinations that include earthquake effects.
2. One- and two-family dwellings need not be evaluated or rehabilitated for load combinations that include earthquake effects.

506.2.2.1 Evaluation. The building shall be evaluated by a registered design professional, and the evaluation findings shall be submitted to the *code official*. The evaluation shall establish whether the damaged building, if repaired to its predamaged state, would comply with the provisions of the *International Building Code* for load combinations that include wind or earthquake effects, except that the seismic design criteria shall be the reduced IBC-level seismic forces specified in Section 101.5.4.2.

PART II – IBC GENERAL

Revise as follows:

3405.2 (IEBC [B] 304.2) Substantial structural damage to vertical elements of the lateral-force-resisting system. A building that has sustained substantial structural damage to the vertical elements of its lateral-force-resisting system shall be evaluated and repaired in accordance with the applicable provisions of Sections 3405.2.1 through 3405.2.3.

Exceptions:

1. Buildings assigned to Seismic Design Category A, B, or C whose substantial structural damage was not caused by earthquake need not be evaluated or rehabilitated for load combinations that include earthquake effects.
2. One- and two-family dwellings need not be evaluated or rehabilitated for load combinations that include earthquake effects.

3405.2.1(IEBC [B] 304.2.1) Evaluation. The building shall be evaluated by a *registered design professional*, and the evaluation findings shall be submitted to the code official. The evaluation shall establish whether the damaged building, if repaired to its pre-damage state, would comply with the provisions of this code for wind and earthquake loads. ~~Evaluation for earthquake loads shall be required if the substantial structural damage was caused by or related to earthquake effects or if the building is in Seismic Design Category C, D, E, or F.~~

Wind loads for this evaluation shall be those prescribed in Section 1609. Earthquake loads for this evaluation, if required, shall be permitted to be 75 percent of those prescribed in Section 1613. Values of R, W_0 and C_d for the existing seismic force-resisting system shall be those specified by this code for an ordinary system unless it is demonstrated that the existing system will provide performance equivalent to that of an intermediate or special system.

Reason (Part I): The purpose of this proposal is to exempt certain combinations of buildings, seismic risk, and damage from triggered seismic upgrades. In general, seismic evaluation and possibly upgrade is triggered when damage to the lateral system, independent of cause, reaches the level defined as Substantial Structural Damage, regardless of occupancy, structure type, or seismic design category. NCSEA acknowledges that this broad applicability might be unnecessary to the general purpose of the code and could discourage or delay certain repairs by imposing the additional costs of seismic upgrade. Therefore, this proposal exempts two classes of buildings from seismic upgrades triggered by substantial structural repairs. Basic repair – that is, restoring the pre-damage condition – will still be required, and this proposal considers such repairs appropriate for the two classes in question:

- Buildings in areas of low or moderate seismicity, where the damage was caused by something other than earthquake. Where earthquakes are rare, it serves no significant public purposes to trigger seismic upgrades following damage caused by fire, collision, wind, etc.
- One- and two-family dwellings, where the public risk is especially low.

In section 506.2.2.1, the proposed language is intended to clarify, not change, the scope of the section.

This proposal is made in coordination with a similar proposal for IBC Chapter 34.

Reason (Part II): The purpose of this proposal is to exempt certain combinations of buildings, seismic risk, and damage from triggered seismic upgrades. In general, seismic evaluation and possibly upgrade is triggered when damage to the lateral system, independent of cause, reaches the level defined as Substantial Structural Damage, regardless of occupancy, structure type, or seismic design category. NCSEA acknowledges that this broad applicability might be unnecessary to the general purpose of the code and could discourage or delay certain repairs by imposing the additional costs of seismic upgrade. Therefore, this proposal exempts two classes of buildings from seismic upgrades triggered by substantial structural repairs. Basic repair – that is, restoring the pre-damage condition – will still be required, and this proposal considers such repairs appropriate for the two classes in question:

- Buildings in areas of low or moderate seismicity, where the damage was caused by something other than earthquake. Where earthquakes are rare, it serves no significant public purposes to trigger seismic upgrades following damage caused by fire, collision, wind, etc.
- One- and two-family dwellings, where the public risk is especially low.

With Exception 1 added to 3405.2, the final sentence of the first paragraph of 3405.2.1 is no longer necessary. The current sentence in 3405.2.1 says seismic evaluation is necessary wherever the damage was caused by earthquake OR the building is in SDC C-F. That is, the current provision exempts buildings in SDC A-B if the damage was not caused by earthquake. Proposed Exception 1 merely adds SDC C to the exempted cases.

A coordinating proposal is being submitted for IEBC Chapter 5.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB24-506.2.2.DOC

EB7–09/10
506.2.2.3

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing self

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

506.2.2.3 Extent of repair for noncompliant buildings. If the evaluation does not establish that the building in its predamage condition complies with the provisions of Section 506.2.2.1, then the building shall be rehabilitated to comply with the provisions of this section. The wind load for the repair and rehabilitation shall be those required by the building code in effect at the time of original construction, unless the damage was caused by wind, in which case the wind loads shall be in accordance with the International Building Code. ~~The seismic loads for this rehabilitation design shall be those required by the building code in effect at the time of original construction, but not less than the reduced-level seismic forces specified in Section 101.5.4.2.~~ If the damage was caused by earthquake and the Instrumental Intensity of the earthquake at the site of the building as determined using data from the United States Geological Survey was VII or greater, the seismic design forces for the repair shall be those required by the building code in effect at the time of original construction. If the damage was not caused by earthquake or if the damage caused by an earthquake with an Instrumental Intensity of less than VII at the site of the building, the seismic design forces for the rehabilitation shall be those required by the building code in effect at the time of original construction, but not less than the reduced-level seismic forces specified in Section 101.5.4.2.

Reason: This change is intended to make seismic upgrades of the lateral force resisting system after a large earthquake logical. Suppose that a large, design-level earthquake (the "big one") occurs in a major city. On the basis even of today's IBC design criteria, it is reasonable to expect that large numbers of buildings will experience significant damage as a result of the earthquake, even to buildings that conform or nearly conform to current code. Yet despite these damaged buildings all performing within the expectation of the current code, the proposed upgrade triggers would require further potentially massive and costly upgrades beyond the repairs already needed, because the proposed upgrade triggers do not permit any consideration of the intensity of the earthquake shaking responsible for the damage. Why would any engineer conclude that a city full of buildings that went through a major earthquake but protected life safety should be seismically upgraded? Why would any community want to mandate those upgrades? Why should the federal government, insurance companies, building owners, or taxpayers pay for those upgrades? Regarding this scenario, in their study of upgrade triggers, SEAONC concluded, "Requirements to upgrade such a large stock of buildings could put an undue economic burden on the private sector and delay regional recovery."

What this proposal does:

This proposal requires seismic upgrades of existing structures if the damage was not the result of earthquake activity or if the damage was caused by earthquake but was disproportionate to the intensity of the earthquake (i.e. significant structural damage when the Instrumental Intensity of the earthquake at the site was less than VII, as measured by the United States Geological Survey).

If an earthquake had a moderate or heavy damage potential at a particular site (Instrumental Intensity of VII or greater) and a structure at that site experienced substantial structural damage, this would not necessarily be unexpected even for a new building and seismic upgrade of the whole building to current code (or close to current code) would generally not be warranted. If, on the other hand, the Instrumental Intensity of say V or VI (very light or light potential damage) and significant structural damage occurred, then the structure may be overly susceptible to earthquake damage and strengthening is arguably prudent.

For copies of articles dealing with the problems with the "substantial structural damage" trigger, please email me at gsearer@wje.com.

Bibliography:

"Evaluation of the Effects of Oakland's Earthquake Damage Repair Ordinance" by Gary R. Searer, Terrence F. Paret, Sigmund A. Freeman, and Una M. Gilmartin, 8th US Conference on Earthquake Engineering, San Francisco, April 2006.

Handbook to the Uniform Building Code: An Illustrative Commentary, International Conference of Building Officials (ICBO), 1998, Whittier, CA.

"Repair of Existing Structures and the International Existing Building Code" by Gary R. Searer and Terrence F. Paret, 8th US Conference on Earthquake Engineering, San Francisco, April 2006.

"Repercussions of the International Existing Building Code on the Repair of Existing Structures" by Terrence F. Paret and Gary R. Searer, ASCE Structures Congress, Forensics Congress, April 2005.

"SEAONC's SFBC Structural Damage Repair Study Group Report and Recommendations" by the Structural Engineers Association of Northern California (SEAONC), April 3, 2008.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SEARER-EB1-506.2.2.3.DOC

EB8–09/10
506.2.3.1; IBC 3405.3.1 (IEBC [B] 304.3.1)

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC STRUCTURAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE FIRE CODE COMMITTEE.

PART I – IEBC

Revise as follows:

506.2.3.1 Lateral force-resisting elements. Regardless of the level of damage to gravity elements of the lateral force- resisting system, if substantial structural damage to gravity load-carrying components was caused primarily by wind or seismic effects, then the building shall be evaluated in accordance with Section 506.2.2.1 and, if noncompliant, rehabilitated in accordance with Section 506.2.2.3.

> **Exception:** One- and two-family dwellings need not be evaluated or rehabilitated for load combinations that include earthquake effects.

PART II – IBC GENERAL

Revise as follows:

3405.3.1 (IEBC [B] 304.3.1) Lateral force-resisting elements. Regardless of the level of damage to vertical elements of the lateral force-resisting system, if substantial structural damage to gravity load-carrying components was caused primarily by wind or earthquake effects, then the building shall be evaluated in accordance with Section 3405.2.1 and, if noncompliant, rehabilitated in accordance with Section 3405.2.3.

> **Exception:** One- and two-family dwellings need not be evaluated or rehabilitated for load combinations that include earthquake effects.

Reason: The purpose of this proposal is to exempt certain buildings from triggered seismic upgrades. In general, seismic evaluation and possibly upgrade is triggered when damage to the lateral system, independent of cause, reaches the level defined as Substantial Structural Damage, regardless of occupancy, structure type, or seismic design category. NCSEA acknowledges that this broad applicability might be unnecessary to the general purpose of the code and could discourage or delay certain repairs by imposing the additional costs of seismic upgrade.

Therefore, this proposal exempts 1- and 2-family dwellings, where the risk to the public of poor earthquake performance is especially low.

Basic repair – that is, restoring the pre-damage condition – will still be required, and this proposal considers such repairs appropriate for the buildings in question.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB30-506.2.3.1.DOC

EB9–09/10
506.2.3.1; IBC 3405.3.1 (IEBC [B] 304.3.1)

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IBC STRUCTURAL CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE FIRE CODE COMMITTEE.

PART I – IEBC

Revise as follows:

506.2.3.1 Lateral force-resisting elements. Regardless of the level of damage to gravity elements of the lateral force- resisting system, if *substantial structural damage* to gravity load-carrying components was caused primarily by wind or seismic effects, then the building shall be evaluated in accordance with Section 506.2.2.1 and, if noncompliant, rehabilitated in accordance with Section 506.2.2.3.

> **Exception:** Buildings assigned to Seismic Design Category A, B, or C whose substantial structural damage was not caused by earthquake need not be evaluated or rehabilitated for load combinations that include earthquake effects.

PART II – IBC GENERAL

Revise as follows:

3405.3.1 (IEBC [B] 304.3.1) Lateral force-resisting elements. Regardless of the level of damage to vertical elements of the lateral force-resisting system, if *substantial structural damage* to gravity load-carrying components was caused primarily by wind or earthquake effects, then the building shall be evaluated in accordance with Section 3405.2.1 and, if noncompliant, rehabilitated in accordance with Section 3405.2.3.

> **Exception:** Buildings assigned to Seismic Design Category A, B, or C whose substantial structural damage was not caused by earthquake need not be evaluated or rehabilitated for load combinations that include earthquake effects.

Reason: The purpose of this proposal is to exempt certain buildings from triggered seismic upgrades. In general, seismic evaluation and possibly upgrade is triggered when damage to the lateral system, independent of cause, reaches the level defined as Substantial Structural Damage, regardless of occupancy, structure type, or seismic design category. NCSEA acknowledges that this broad applicability might be unnecessary to the general purpose of the code and could discourage or delay certain repairs by imposing the additional costs of seismic upgrade. Therefore, this proposal exempts buildings in areas of low or moderate seismicity, where the damage was caused by something other than earthquake. Where earthquakes are rare, it serves no significant public purposes to trigger seismic upgrades following damage caused by fire, collision, wind, etc.

Basic repair – that is, restoring the pre-damage condition – will still be required, and this proposal considers such repairs appropriate for the buildings in question.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB31-506.2.3.1-2.DOC

EB10–09/10

IEBC 605.1, 705.2, 706.1, 805.4 (New), 805.4.1 (New), 912.4.1, 912.4.2, 912.8.2, 1004.1(New), 1005.1, 1103.3, 1105.6; IBC 3411.4, 3411.4.1, 3411.4.2, 3411.5, 3411.6, 3411.8(New), 3411.8.1(New), 3411.9; (IEBC [B] 310.4, 310.4.1, 310.4.2, 310.5, 310.6, 310.8(New), 310.8.1 (New), 310.9), 1007.1 (IFC [B] 1007.1)

Proponent: Gene Boecker, Code Consultants, Inc.

THIS IS A 3 PART CODE CHANGE. ALL 3 PARTS WILL BE HEARD BY THE INTERNATIONAL EXISTING BUILDING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

PART I – IEBC

CHAPTER 5
REPAIRS

SECTION 504
MEANS OF EGRESS

504.1 General. Repairs shall be done in a manner that maintains the level of protection provided for the means of egress.

SECTION 505
ACCESSIBILITY

505.1 General. Repairs shall be done in a manner that maintains the level of accessibility provided.

CHAPTER 6
ALTERATIONS—LEVEL 1

SECTION 604
MEANS OF EGRESS

604.1 General. Repairs shall be done in a manner that maintains the level of protection provided for the means of egress.

SECTION 605
ACCESSIBILITY

605.1 General. A building, facility or element that is altered shall comply with the applicable provisions in Sections 605.1.1 through 605.1.14, Chapter 11 of the International Building Code and ICC A117.1 unless it is technically infeasible. Where compliance with this section is technically infeasible, the alteration shall provide access to the maximum extent that is technically feasible.

A building, facility or element that is constructed or altered to be accessible shall be maintained accessible during occupancy.

Exceptions:

1. The altered element or space is not required to be on an accessible route unless required by Section 605.2.
2. ~~Accessible means of egress required by Chapter 10 of the International Building Code are not required to be provided in existing buildings and facilities.~~ The altered element or space is not required to provide accessible means of egress, unless required by Section 805.4.
3. Type B dwelling or sleeping units required by Section 1107 of the *International Building Code* are not required to be provided in existing buildings and facilities.
4. The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall meet the provisions for Type B dwelling units and shall comply with the applicable provisions in Chapter 11 of the *International Building Code* and ICC A117.1.

605.2 Alterations affecting an area containing a primary function. Where an *alteration* affects the accessibility to, or contains an area of *primary function*, the route to the *primary function* area shall be *accessible*. The accessible route to the primary function area shall include toilet facilities or drinking fountains serving the area of primary function.

Exceptions:

1. The costs of providing the accessible route are not required to exceed 20 percent of the costs of the alterations affecting the area of primary function.
2. This provision does not apply to alterations limited solely to windows, hardware, operating controls, electrical outlets and signs.
3. This provision does not apply to alterations limited solely to mechanical systems, electrical systems, installation or alteration of fire protection systems and abatement of hazardous materials.
4. This provision does not apply to alterations undertaken for the primary purpose of increasing the accessibility of an existing building, facility or element.

CHAPTER 7
ALTERATIONS—LEVEL 2

SECTION 705
MEANS OF EGRESS

705.1 Scope. The requirements of this section shall be limited to work areas that include exits or corridors shared by more than one tenant within the work area in which Level 2 alterations are being performed, and where specified they shall apply throughout the floor on which the work areas are located or otherwise beyond the work area.

705.2 General. The means of egress shall comply with the requirements of this section.

Exceptions:

1. Where the work area and the means of egress serving it complies with NFPA 101.
2. Means of egress conforming to the requirements of the building code under which the building was constructed shall be considered compliant means of egress if, in the opinion of the code official, they do not constitute a distinct hazard to life.
3. The altered element or space is not required to provide accessible means of egress, unless required by Section 805.4.

705.3 Number of exits. The number of exits shall be in accordance with Sections 705.3.1 through 705.3.3.

705.3.1 Minimum number. Every story utilized for human occupancy on which there is a work area that includes exits or corridors shared by more than one tenant within the work area shall be provided with the minimum number of exits based on the occupancy and the occupant load in accordance with the *International Building Code*. In addition, the exits shall comply with Sections 705.3.1.1 and 705.3.1.2.

SECTION 706
ACCESSIBILITY

706.1 General. A building, facility, or element that is altered shall comply with Section 605 and 706.

706.2 Stairs and escalators in existing buildings. In alterations where an escalator or stair is added where none existed previously, an accessible route shall be provided in accordance with Sections 1104.4 and 1104.5 of the *International Building Code*.

706.3 Accessible dwelling units and sleeping units. Where Group I-1, I-2, I-3, R-1, R-2 or R-4 dwelling or sleeping units are being added, the requirements of Section 1107 of the *International Building Code* for accessible units and Chapter 9 of the *International Building Code* for visible alarms apply only to the quantity of spaces being added.

706.4 Type A dwelling or sleeping units. Where more than 20 Group R-2 dwelling or sleeping units are being added, the requirements of Section 1107 of the International Building Code for Type A units and Chapter 9 of the International *Building Code* for visible alarms apply only to the quantity of the spaces being added.

706.5 Type B dwelling or sleeping units. Where four or more Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being added, the requirements of Section 1107 of the *International Building Code* for Type B units and Chapter 9 of the *International Building Code* for visible alarms apply only to the quantity of the spaces being added.

CHAPTER 8
ALTERATIONS—LEVEL 3

SECTION 805
MEANS OF EGRESS

805.1 General. The means of egress shall comply with the requirements of Section 705 except as specifically required in Sections 805.2 and 805.3.

805.2 Means-of-egress lighting. Means of egress from the highest work area floor to the floor of exit discharge shall be provided with artificial lighting within the exit enclosure in accordance with the requirements of the *International Building Code*.

805.3 Exit signs. Means of egress from the highest work area floor to the floor of exit discharge shall be provided with exit signs in accordance with the requirements of the *International Building Code*.

805.4 Accessible means of egress. Additions and buildings or portions thereof undergoing a change of occupancy or alterations shall provide accessible means of egress in accordance with Section 805.4.1 and Section 1007 of the *International Building Code*.

Exceptions:

1. Accessible means of egress is not required in existing buildings where the alterations are less than Level 3.
2. Accessible means of egress is not required in existing building undergoing a change of occupancy where the change or occupancy is in conjunction with alterations that are less than Level 3.

805.4.1 Means of egress through the existing building. Where the accessible means of egress from any portion of a building being altered, undergoing a change of occupancy or addition requires occupants to egress through portions of the existing building, compliance with Section 1007 of the *International Building Code* is required, unless technically infeasible. Where compliance with this provision is *technically infeasible*, the accessible means of egress through the existing building shall provide access to the maximum extent technically feasible.

SECTION 806
ACCESSIBILITY

806.1 General. A building, facility or element that is altered shall comply with Sections 605 and 706.

CHAPTER 9
CHANGE OF OCCUPANCY

SECTION 905
MEANS OF EGRESS

905.1 General. Means of egress in portions of buildings undergoing a change of occupancy classification shall comply with Section 912.

SECTION 906
ACCESSIBILITY

906.1 General. Accessibility in portions of buildings undergoing a change of occupancy classification shall comply with Section 912.8.

SECTION 912
CHANGE OF OCCUPANCY CLASSIFICATION

912.4 Means of egress, general. Hazard categories in regard to life safety and means of egress shall be in accordance with Table 912.4.

TABLE 912.4
MEANS OF EGRESS HAZARD CATEGORIES

RELATIVE HAZARD	OCCUPANCY CLASSIFICATIONS
1 (Highest Hazard)	H
2	I-2, I-3, I-4
3	A, E, I-1, M, R-1, R-2, R-4
4	B, F-1, R-3, S-1
5 (Lowest Hazard)	F-2, S-2, U

912.4.1 Means of egress for change to higher hazard category. When a change of occupancy classification is made to a higher hazard category (lower number) as shown in Table 912.4, the means of egress shall comply with the requirements of Chapter 10 of the *International Building Code*.

Exceptions:

1. Stairways shall be enclosed in compliance with the applicable provisions of Section 803.1.
2. Existing stairways including handrails and guards complying with the requirements of Chapter 8 shall be permitted for continued use subject to approval of the code official.
3. Any stairway replacing an existing stairway within a space where the pitch or slope cannot be reduced because of existing construction shall not be required to comply with the maximum riser height and minimum tread depth requirements.
4. Existing corridor walls constructed of wood lath and plaster in good condition or 1/ 2-inch-thick (12.7 mm) gypsum wallboard shall be permitted. Such walls shall either terminate at the underside of a ceiling of equivalent construction or extend to the underside of the floor or roof next above.
5. Existing corridor doorways, transoms and other corridor openings shall comply with the requirements in Sections 705.5.1, 705.5.2 and 705.5.3.
6. Existing dead-end corridors shall comply with the requirements in Section 705.6.
7. An existing operable window with clear opening area no less than 4 square feet (0.38 m^2) and minimum opening height and width of 22 inches (559 mm) and 20 inches (508 mm), respectively, shall be accepted as an emergency escape and rescue opening.
8. Accessible means of egress is not required for areas undergoing a change of occupancy unless required by Section 805.4.

912.4.2 Means of egress for change of use to equal or lower hazard category. When a change of occupancy classification is made to an equal or lesser hazard category (higher number) as shown in Table 912.4, existing elements of the means of egress shall comply with the requirements of Section 805 for the new occupancy classification. Newly constructed or configured means of egress shall comply with the requirements of Chapter 10 of the *International Building Code*.

Exceptions:

1. Any stairway replacing an existing stairway within a space where the pitch or slope cannot be reduced because of existing construction shall not be required to comply with the maximum riser height and minimum tread depth requirements.
2. Accessible means of egress is not required for areas undergoing a change of occupancy unless required by Section 805.4.

912.4.3 Egress capacity. Egress capacity shall meet or exceed the occupant load as specified in the *International Building Code* for the new occupancy.

912.4.4 Handrails. Existing stairways shall comply with the handrail requirements of Section 705.9 in the area of the change of occupancy classification.

912.4.5 Guards. Existing guards shall comply with the requirements in Section 705.10 in the area of the change of occupancy classification.

912.8 Accessibility. Existing buildings that undergo a change of group or occupancy classification shall comply with this section.

912.8.1 Partial change in occupancy. Where a portion of the building is changed to a new occupancy classification, any alterations shall comply with Sections 605 and 706, as applicable.

912.8.2 Complete change of occupancy. Where an entire building undergoes a change of occupancy, it shall comply with Section 912.8.1 and shall have all of the following accessible features unless technically infeasible. Where compliance with this provision is technically infeasible, provide access to the maximum extent technically feasible.

1. At least one accessible building entrance.
2. At least one accessible route from an accessible building entrance to primary function areas.
3. Signage complying with Section 1110 of the *International Building Code*.
4. Accessible parking, where parking is provided.
5. At least one accessible passenger loading zone, where loading zones are provided.
6. At least one accessible route connecting accessible parking and accessible passenger loading zones to an accessible entrance.

Where it is technically infeasible to comply with the new construction standards for any of these requirements for a change of group or occupancy, the above items shall conform to the requirements to the maximum extent technically feasible.

CHAPTER 10
ADDITIONS

SECTION 1004
MEANS OF EGRESS

1004.1 General. The means of egress shall comply with the requirements of Chapter 10 of the *International Building Code*.

Exception: Accessible means of egress is not required for additions unless required by Section 805.4.

SECTION 1005
ACCESSIBILITY

1005.1 Minimum requirements. Accessibility provisions for new construction shall apply to additions. An addition that affects the accessibility to, or contains an area of, primary function shall comply with the requirements of Sections 605, ~~and~~ 706 and 806, as applicable.

CHAPTER 11
HISTORIC BUILDINGS

SECTION 1103
FIRE SAFETY

1103.1 Scope. Historic buildings undergoing alterations, changes of occupancy, or that are moved shall comply with Section 1103.

1103.2 General. Every historic building that does not conform to the construction requirements specified in this code for the occupancy or use and that constitutes a distinct fire hazard as defined herein shall be provided with an approved automatic fire-extinguishing system as determined appropriate by the code official. However, an automatic fire-extinguishing system shall not be used to substitute for, or act as an alternative to, the required number of exits from any facility.

1103.3 Means of egress. Existing door openings and corridor and stairway widths less than those specified elsewhere in this code may be approved, provided that, in the opinion of the code official, there is sufficient width and height for a person to pass through the opening or traverse the means of egress. When approved by the code official, the front or main exit doors need not swing in the direction of the path of exit travel, provided that other approved means of egress having sufficient capacity to serve the total occupant load are provided.

Exception: Accessible means of egress are not required in historic buildings being altered or undergoing a change of occupancy.

SECTION 1104
ALTERATIONS

1104.1 Accessibility requirements. The provisions of 605 and 706, as applicable, shall apply to buildings and facilities designated as historic structures that undergo alterations, unless technically infeasible. Where compliance with the requirements for accessible routes, entrances or toilet facilities would threaten or destroy the historic significance of the building or facility, as determined by the code official, the alternative requirements of Sections 1104.1.1 through 1104.1.4 for that element shall be permitted.

1104.1.1 Site arrival points. At least one main entrance shall be accessible.

1104.1.2 Multilevel buildings and facilities. An accessible route from an accessible entrance to public spaces on the level of the accessible entrance shall be provided.

1104.1.3 Entrances. At least one main entrance shall be accessible.

Exceptions:

1. If a main entrance cannot be made accessible, an accessible nonpublic entrance that is unlocked while the building is occupied shall be provided; or
2. If a main entrance cannot be made accessible, a locked accessible entrance with a notification system or remote monitoring shall be provided.

1104.1.4 Toilet and bathing facilities. Where toilet rooms are provided, at least one accessible family or assisted-use toilet room complying with Section 1109.2.1 of the *International Building Code* shall be provided.

SECTION 1105
CHANGE OF OCCUPANCY

1105.6 Means of egress. Existing door openings and corridor and stairway widths less than those that would be acceptable for nonhistoric buildings under these provisions shall be approved, provided that, in the opinion of the code official, there is sufficient width and height for a person to pass through the opening or traverse the exit and that the capacity of the exit system is adequate for the occupant load, or where other operational controls to limit occupancy are approved by the code official.

Exception: Accessible means of egress are not required in historic buildings undergoing a change of occupancy.

1105.15 Accessibility requirements. The provisions of Section 912.8 shall apply to buildings and facilities designated as historic structures that undergo a change of occupancy, unless technically infeasible. Where compliance with the requirements for accessible routes, ramps, entrances, or toilet facilities would threaten or destroy the historic significance of the building or facility, as determined by the authority having jurisdiction, the alternative requirements of Sections 1104.1.1 through 1104.1.5 for those elements shall be permitted.

PART II – IBC GENERAL

3411.4 (IEBC [B] 310.4) Change of occupancy. Existing buildings that undergo a change of group or occupancy shall comply with this section. Accessible means of egress shall be provided in accordance with Section 3411.8.

3411.4.1 (IEBC [B] 310.4.1) Partial change in occupancy. Where a portion of the building is changed to a new occupancy classification, any alterations shall comply with Sections 3411.6, 3411.7, ~~and~~ 3411.8 and 3411.9.

3411.4.2 (IEBC [B] 310.4.2) Complete change of occupancy. Where an entire building undergoes a change of occupancy, it shall comply with Section 3411.4.1 and shall have all the following accessible features unless *technically infeasible*. Where compliance with this provision is *technically infeasible*, provide access to the maximum extent technically feasible.

1. At least one accessible building entrance.
2. At least one accessible route from an accessible building entrance to primary function areas.
3. Signage complying with Section 1110.
4. Accessible parking, where parking is provided.
5. At least one accessible passenger loading zone, when loading zones are provided.
6. At least on accessible route connecting accessible parking and accessible passenger loading zones to an accessible entrance.

3411.5 (IEBC [B] 310.5) Additions. Provisions for new construction shall apply to additions. An addition that affects the accessibility to, or contains an area of, a primary function shall comply with the requirements in Section 3411.7 and 3411.8.

3411.6 (IEBC [B] 310.6) Alterations. A building, facility or element that is altered shall comply with the applicable provisions in Section 1007, Chapter 11 of this code and ICC A117.1, unless technically infeasible. Where compliance with this section is technically infeasible, the alteration shall provide access to the maximum extent technically feasible.

Exceptions:

1. The altered element or space is not required to be on an accessible route, unless required by Section 3411.7.
2. Accessible means of egress required by Chapter 10 are not required to be provided in existing buildings and facilities being altered unless required by Section 3411.8.
3. The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall meet the provision for a Type B dwelling unit and shall comply with the applicable provisions in Chapter 11 and ICC A117.1.

3411.7 (IEBC [B] 310.7) Alterations affecting an area containing a primary function. Where an alteration affects the accessibility to, or contains an area of primary function, the route to the primary function area shall be accessible. The accessible route to the primary function area shall include toilet facilities or drinking fountains serving the area of primary function.

Exceptions:

1. The costs of providing the accessible route are not required to exceed 20 percent of the costs of the alterations affecting the area of primary function.
2. This provision does not apply to alterations limited solely to windows, hardware, operating controls, electrical outlets and signs.
3. This provision does not apply to alterations limited solely to mechanical systems, electrical systems, installation or alteration of fire protection systems and abatement of hazardous materials.
4. This provision does not apply to alterations undertaken for the primary purpose of increasing the accessibility of an existing building, facility or element.

3411.8 (IEBC [B] 310.8) Accessible means of egress. Additions and buildings or portions thereof undergoing a change of occupancy or alterations shall provide accessible means of egress in accordance with Sections 1007 and 3411.8.1.

Exceptions:

1. Accessible means of egress is not required in existing buildings where the alterations are less than 50 percent of the aggregate building area.
2. Accessible means of egress is not required in existing building undergoing a change of occupancy where the change or occupancy is in conjunction with alterations that are less than 50 percent of the aggregate building area.

3411.8.1 (IEBC [B] 310.8.1) Means of egress through the existing building. Where the accessible means of egress from any portion of a building being altered, undergoing a change of occupancy or addition requires occupants to egress through portions of the existing building, compliance with Section 1007 is required, unless technically infeasible. Where compliance with this provision is technically infeasible, the accessible means of egress through the existing building shall provide access to the maximum extent technically feasible.

(Renumber subsequent sections)

~~**3411.9**~~ **3411.10 (IEBC [B] ~~310.9~~ 310.10) Historic buildings.** These provisions shall apply to buildings and facilities designated as historic structures that undergo alterations or a change of occupancy, unless *technically infeasible*. Where compliance with the requirements for *accessible* routes, entrances or toilet facilities would threaten or destroy the historic significance of the building or facility, as determined by the applicable governing authority, the alternative requirements of Sections ~~3411.9.1~~ 3411.10.1 through ~~3411.9.4~~ 3411.10.4 for that element shall be permitted.

Exception: Accessible means of egress are not required in historic buildings being altered or undergoing a change of occupancy.

(Renumber subsequent sections)

PART III – IBC MEANS OF EGRESS

Revise as follows:

1007.1 (IFC [B] 1007.1) Accessible means of egress required. Accessible means of egress shall comply with this section. Accessible spaces shall be provided with not less than one accessible means of egress. Where more than one means of egress is required by Section 1015.1 or 1021.1 from any accessible space, each accessible portion of the space shall be served by not less than two accessible means of egress.

Exceptions:

1. Accessible means of egress ~~are not required in alterations to~~ for existing buildings shall be provided as required in Section 3411.8.
2. One accessible means of egress is required from an accessible mezzanine level in accordance with Section 1007.3, 1007.4 or 1007.5.
3. In assembly areas with sloped or stepped aisles, one accessible means of egress is permitted where the common path of travel is accessible and meets the requirements in Section 1028.8.

Reason: The interplay between an existing building and additions or alterations is not well defined. While the text is clear that the addition is required to meet the accessibility provisions it is not clear how the addition will impact the accessibility requirements for the existing building. Similarly, although the statement exists that alterations do not require a retroactive requirement for accessible means of egress, this statement negates the scope of the alteration. Federal Accessibility regulations and common sense dictate that where major changes occur consideration for the accessible means of egress should also occur. Additionally, the simple idea that accessibility should be intentionally denied to a segment of the population does not seem appropriate. The proposal seeks to finesse some of these issues.

It is important to remember that the requirements in the IBC only require a maximum of two accessible means of egress (based on travel distance limitations) as noted in Section 1007.1. And, an elevator can be counted as being one of the accessible means of egress. Thus, it may be easier in some cases to provide an accessible means of egress than one that fully complies with the requirements for new construction.

Some sections shown do not contain changes, but were shown for context and appropriate referencing.

IEBC:

In addition to the items noted above which relate to only Chapter 3, specific direction is provided for each condition as elaborated in the various chapters of the IEBC. Chapter 3 of the IEBC parallels Chapter 34 in the IBC. However, the IEBC also contains provisions that are more in depth than the prescriptive methods described.

The existing language is maintained that requires repairs to not reduce the level of current accessibility; but there is no additional requirement for accessibility in Chapter 5.

605.1, exception #2: Rather than refer to the IBC, specific provisions are being added to the IEBC. The wording is changed to reflect that.

705.2, exception #3: Similar to 605.1, reference to the accessible means of egress is added to allow the code user to understand where the scope of changes will require work in this area. Without this exception, it is unclear whether the reference to making the means of egress comply is intended to include the accessible means of egress as well as other aspects of egress design.

706.1: A reflective reference is added which was lacking. Compliance with another section was mandated but not the section itself.

805.4: The language and intent is the same as noted above for IEBC Section 310.8 and its two exceptions. The exceptions in this case use the language of the IEBC which define the level of work in more definitive terms – using Levels to describe the threshold rather than percentages of work.

805.4.1: This language is replicating that noted above from Section 310.8.1 relative to egress through an existing building.

912.4.1, exception #8: The added exception continues the scoping by including with the Change of Occupancy Chapter a reference back to the main section addressing when accessible means of egress must be provided – 805.4.

912.4.2, exception #2: A new exception is added to this section so that it is clear that whether the change in occupancy is to a higher category or lower category, the requirement to provide accessible means of egress is found in Section 805.4.

912.8.2: This added language does not address accessible means of egress. It addresses the consistent recognition of technical infeasibility. The language informs the code user of this application as it relates to changes in occupancy.

1004.1: Chapter 10 (Additions) does not address means of egress specifically. A reference to compliance with the means of egress provisions in Chapter 10 of the IBC is included. This is consistent with the first sentence in Section 302.1. The added language in inserted before the accessibility section in like manner to other chapters.

1004.1, exception: The exception is consistent with the other changes noted above that refer to Section 805.4 for the thresholds for compliance with the accessible means of egress requirements.

1005.1: Reference is currently provided to the sections relative to accessibility in Chapter 6 and 7 but not 8. The proposal corrects that.

1105.6: Similar to the language in 3411.10 in the IBC, this clearly indicates that accessible means of egress is not required for historic buildings.

IBC/IEBC:

1007.1: The section is changed to indicate that existing building provisions are noted in Chapter 34. This is the proper scoping location for issues dealing with existing buildings – not Chapter 10.

3411.4/310.4: A cross reference is added to direct the code user to the central location for issues relative to existing buildings and accessible means of egress; the proposed 3411.8.

3411.4.2/310.4.2: The paragraph following the text already mentions what happens when the effort is "technically infeasible" but there is no language that states that these items are limited to conditions where technical infeasibility is not a problem. The added language clarifies the intent with respect to technical infeasibility.

3411.5/310.5: A cross reference to the section addressing accessible means of egress is added.

3411.6/310.6: Where accessible means of egress are required, it is necessary to direct the code user to the proper section. The reference to 1007 does that.

3411.6/310.6, exception #2: The exception seems to imply that nothing is required for the existing building relative to accessible means of egress. However, since the addition is impacting the existing building, the egress through the existing building is more similar to an alteration of the existing egress system. The revised text points to the central section addressing what must be done.
3411.8/310.8: A new section is added to specifically address the accessible means of egress. Rather than the blanket statement in Section 1007.1 of the building code, this section will address the scope and extent of work necessary to address accessible means of egress. It directs the code user to Section 1007 for the technical requirements when an accessible means of egress is necessary as well as clearly delineate that when a change of occupancy or alteration occurs, the accessible means of egress must be provided. This is no different than the general requirements in 3404.1/303.1 and 3408.1/307.1 which require alterations and changes in occupancy to meet "new code."
3411.8/310.8, exception #1: Alterations with some magnitude should address accessible means of egress, if the alteration is relatively small then there is reason to limit the requirement. The threshold of 50% of the building area is intended to delineate the difference between IEBC Alterations – Level 2 and Alterations – Level 3
3411.8/310.8, exception #2: Similarly, if the change in occupancy is only to a portion of the building, full compliance with the accessible means of egress is not required. The position should be that if the occupancy is totally changed then the building should be made to comply with the new requirements. For "regular" egress this may mean that the occupant load changes resulting in wider or additional stairways. The least that should be done is to make an effort to provide accessible means of egress.
3411.8.1/310.8.1: If an addition is designed such that the means of egress must enter the existing building then the egress design must meet the requirements for the addition as it passes through the existing building. As this relates to egress design, it includes a continuation of the design in the addition for egress width, corridor protection, panic hardware (as applicable) and similar concerns. The same should be true for the design of the accessible means of egress. If one of the accessible egress paths leads through the existing building, it too needs to meet/continue the level of protection as designed in the addition. The limitation to this is if the effort to make the existing means of egress accessible is "technically infeasible" then work should be done to what is possible. One example of this may be making sure that the slopes along the path in the existing building's corridor are proper even if the width cannot be altered to allow the proper approach to the exit door.
3411.10: The language requires compliance with the accessible means of egress as written with the only defense being the "technically infeasible" option. The exception makes it clear that for historic buildings undergoing major alterations of a change in occupancy an accessible means of egress is not required.

A companion change is being proposed for the IEBC so that the changes here a reflected in that code as well.

While more can always be done if possible, the code identifies the minimums necessary for life safety. The proposed changes identify what is appropriate so that the disabled community has similar levels of life safety to the general public and still sets reasonable thresholds based on the extent of work for the project. The standard of "technical Infeasible" is identified clearly in new sections where it may have been interpreted previously as not applying. The "20% of the cost" criteria identified in 3411.7, exception #1 of the IBC (605.2, exception #1 of the IEBC) relative to alterations affecting the primary function is also maintained.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – IBC MEANS OF EGRESS

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOECKER-E5-1007.1

EB11–09/10

IEBC 605.1, 605.1.10 (New), 706.1, 912.8, 1005.1, 1005.2 (New); IBC 3411.1, 3411.4, 3411.5, 3411.6, 3411.7 (New), 3411.8, 3411.8.9 (IEBC [B] 310.1, 310.4, 310.5, 310.6, 310.7(New), 310.8, 310.8.9)

Proponent: Cheryl Kent, U. S. Department of Housing and Urban Development

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IEBC COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

PART I – IEBC

Revise as follows:

CHAPTER 6
ALTERATIONS—LEVEL 1

SECTION 605
ACCESSIBILITY

605.1 General. A building, facility or element that is altered shall comply with the applicable provisions in Sections 605.1.1through ~~605.1.14~~ 605.1.15,Chapter 11 of the *International Building Code* and ICC A117.1 unless it is *technically infeasible*. Where compliance with this section is *technically infeasible*, the *alteration* shall provide access to the maximum extent that is technically feasible. A building, facility or element that is constructed or altered to be accessible shall be maintained accessible during occupancy.

Exceptions:

1. The altered element or space is not required to be on an accessible route unless required by Section 605.1.10 or 605.2.
2. Accessible means of egress required by Chapter 10 of the *International Building Code* are not required to be provided in existing buildings and facilities.
3. ~~Type B dwelling or sleeping units required by Section 1107 of the *International Building Code* are not required to be provided in existing buildings and facilities.~~
4. The *alteration* to Type A individually owned dwelling units within a Group R-2 occupancy shall meet the provisions for Type B dwelling units and shall comply with the applicable provisions in Chapter 11 of the *International Building Code* and ICC A117.1.

605.1.8 Accessible dwelling or sleeping units. Where Group I-1, I-2, I-3, R-1, R-2 or R-4 dwelling or sleeping units are being altered, the requirements of Section 1107 of the *International Building Code* for accessible units and Chapter 9 of the *International Building Code* for visible alarms apply only to the quantity of the spaces being altered.

605.1.9 Type A dwelling or sleeping units. Where more than 20 Group R-2 dwelling or sleeping units are being altered, the requirements of Section 1107 of the *International Building Code* for Type A units and Chapter 9 of the *International Building Code* for visible alarms apply only to the quantity of the spaces being altered.

605.1.10 Alterations in Group I and R, and in structures, facilities, or elements serving Groups I or R. Where four or more dwelling units or sleeping units intended to be occupied as a residence in Group I-1, I-2, and R occupancies are altered, the unit that is altered shall comply with the applicable provisions of Section 1107 of the *International Building Code* for Type B units. Additionally, where common use structures, facilities, or elements serving Type B units in Groups I-1, I-2, I-3 and R occupancies are altered, the altered structures, facilities, or elements shall comply with Section 1107 of the *International Building Code*.

Exceptions:

1. Structures built for first occupancy before March 13, 1991 are not required to provide Type B units.
2. Type B units are not required to be provided where Type B dwelling units and sleeping units were not required at the time of first occupancy in structures designed and constructed after March 13, 1991.

3. Structures that are not required to provide Type B dwelling units and structures not serving Type B dwelling units in accordance with Section 1107 of the *International Building Code* shall comply with Section 605.1.9 and 605.1.10.
4. Alterations limited to one individually owned dwelling unit or sleeping unit are not required to comply with this section.

(Renumber subsequent sections)

CHAPTER 7
ALTERATIONS—LEVEL 2

SECTION 706
ACCESSIBILITY

706.1 General. A building, facility, or element that is altered shall comply with this section and Section 605.

706.3 Accessible dwelling units and sleeping units. Where Group I-1, I-2, I-3, R-1, R-2 or R-4 dwelling or sleeping units are being added, the requirements of Section 1107 of the International Building Code for accessible units and Chapter 9 of the International Building Code for visible alarms apply only to the quantity of spaces being added.

706.4 Type A dwelling or sleeping units. Where more than 20 Group R-2 dwelling or sleeping units are being added, the requirements of Section 1107 of the International Building Code for Type A units and Chapter 9 of the International Building Code for visible alarms apply only to the quantity of the spaces being added.

706.5 Type B dwelling or sleeping units. Where four or more Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being added, the requirements of Section 1107 of the International Building Code for Type B units and Chapter 9 of the *International Building Code* for visible alarms apply only to the quantity of the spaces being added.

CHAPTER 8
ALTERATIONS—LEVEL 3

SECTION 806
ACCESSIBILITY

806.1 General. A building, facility or element that is altered shall comply with Sections 605 and 706.

CHAPTER 9
CHANGE OF OCCUPANCY

SECTION 906
ACCESSIBILITY

906.1 General. Accessibility in portions of buildings undergoing a *change of occupancy* classification shall comply with Section 912.8.

912.8 Accessibility. Existing buildings that undergo a change of group or occupancy classification shall comply with this section.

Exception: Type B dwelling or sleeping units required by Section 1107 of the *International Building Code* are not required to be provided in existing buildings and facilities undergoing a change of occupancy.

912.8.1 Partial change in occupancy. Where a portion of the building is changed to a new occupancy classification, any alterations shall comply with Sections 605 and 706, as applicable.

912.8.2 Complete change of occupancy. Where an entire building undergoes a change of occupancy, it shall comply with Section 912.8.1 and shall have all of the following accessible features:

1. At least one accessible building entrance.
2. At least one accessible route from an accessible building entrance to primary function areas.

3. Signage complying with Section 1110 of the *International Building Code*.
4. Accessible parking, where parking is provided.
5. At least one accessible passenger loading zone, where loading zones are provided.
6. At least one accessible route connecting accessible parking and accessible passenger loading zones to an accessible entrance.

Where it is technically infeasible to comply with the new construction standards for any of these requirements for a change of group or occupancy, the above items shall conform to the requirements to the maximum extent technically feasible.

CHAPTER 10
ADDITIONS

SECTION 1005
ACCESSIBILITY

1005.1 Minimum requirements. Accessibility provisions for new construction shall apply to additions. An addition that affects the accessibility to, or contains an area of, primary function shall comply with the requirements of this section and Sections 605 and 706, as applicable.

1005.2 Type B dwelling units or sleeping units. Where Group I-1, I-2, or R dwelling units or sleeping units are being added, the requirements of Section 1107 of the *International Building Code* for Type B dwelling units or sleeping units and Section 907 of the *International Building Code* for visible alarms apply only top the quantity of spaces being added.

PART II – IBC GENERAL

Revise as follows:

SECTION 3411 (IEBC [B] 310)
ACCESSIBILITY FOR EXISTING BUILDINGS

3411.1 (IEBC [B] 310.1) Scope. The provisions of Sections 3411.1 through ~~3411.9~~ 3411.10 apply to maintenance, change of occupancy, additions and alterations to existing buildings, including those identified as *historic buildings*.

~~**Exception:** Type B *dwelling* or sleeping units required by Section 1107 of this code are not required to be provided in existing buildings and facilities being altered or undergoing a change of occupancy.~~

3411.4 (IEBC [B] 310.4) Change of occupancy. Existing buildings that undergo a change of group or occupancy shall comply with this section.

Exception: Type B dwelling or sleeping units required by Section 1107 of this code are not required to be provided in existing buildings and facilities undergoing a change of occupancy.

3411.4.1 (IEBC [B] 310.4.1) Partial change in occupancy. Where a portion of the building is changed to a new occupancy classification, any alterations shall comply with Sections 3411.6, ~~3411.7~~ 3411.8 and ~~3411.8~~ 3411.9.

3411.4.2 (IEBC [B] 310.4.2) Complete change of occupancy. Where an entire building undergoes a change of occupancy, it shall comply with Section 3411.4.1 and shall have all of the following accessible features:

1. At least one accessible building entrance.
2. At least one accessible route from an accessible building entrance to primary function areas.
3. Signage complying with Section 1110.
4. Accessible parking, where parking is being provided.
5. At least one accessible passenger loading zone, when loading zones are provided.
6. At least one accessible route connecting accessible parking and accessible passenger loading zones to an accessible entrance.

Where it is technically infeasible to comply with the new construction standards for any of these requirements for a change of group or occupancy, the above items shall conform to the requirements to the maximum extent technically feasible.

3411.5 (IEBC [B] 310.5) Additions. Provisions for new construction shall apply to additions. An addition that affects the accessibility to, or contains an area of, a primary function shall comply with the requirements in Section ~~3411.7~~ 3411.8.

Exception: Where Group I-1, I-2, or R dwelling units or sleeping units are being added, the requirements of Section 1107 for Type B dwelling units or sleeping units and Section 907 for visible alarms shall apply where the quantity of units being added is four or more.

3411.6 (IEBC [B] 310.6) Alterations. A building, facility or element that is altered shall comply with the applicable provisions in Chapter 11 of this code and ICC A117.1, unless technically infeasible. Where compliance with this section is technically infeasible, the alteration shall provide access to the maximum extent technically feasible.

Exceptions:

1. The altered element or space is not required to be on an accessible route, unless required by Section ~~3411.7~~ 3411.8.
2. Accessible means of egress required by Chapter 10 are not required to be provided in existing buildings and facilities.
3. The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall meet the provision for a Type B dwelling unit and shall comply with the applicable provisions in Chapter 11 and ICC A117.1.

3411.7 (IEBC 310.7) Alterations in Group I-1, I-2 and R, and in structures, facilities, or elements serving Groups I or R. Where four or more dwelling units or sleeping units intended to be occupied as a residence in Group I-1, I-2 and R occupancies are altered the altered units shall comply with the applicable provisions of Section 1107 for Type B units. Additionally, where common use structures, facilities, or elements serving Type B units in Groups I-1, I-2 and R occupancies are altered, the altered structures, facilities or element shall comply with Section 1107.

Exceptions:

1. Structures built for first occupancy before March 13, 1991 are not required to provide Type B units.
2. Type B units are not required to be provided where Type B dwelling units and sleeping units were not required at the time of first occupancy in structures designed and constructed after March 13, 1991.
3. Structures that are not required to provide Type B dwelling units and structures not serving Type B dwelling units in accordance with Section 1107 shall comply with Section 3409.6.
4. Alterations limited to one individually owned dwelling unit or sleeping unit are not required to comply with this section.

~~3411.7~~ 3411.8 (IEBC [B] ~~310.7~~ 310.8) Alterations affecting an area containing a primary function. *(No change to text)*

~~3411.8~~ 3411.9 (IEBC [B] ~~310.8~~ 310.9) Scoping for alterations. The provisions of Sections ~~3411.8.1~~ 3411.9.1 through ~~3411.8.12~~ 3411.9.12 shall apply to alterations to existing buildings and facilities.

~~3411.8.7~~ 3411.9.7 (IEBC [B] ~~310.8.7~~ 310.9.7) Accessible dwelling or sleeping units. Where Group I-1, I-2, I-3, R-1, R-2 or R-4 dwelling or sleeping units are being altered or added, the requirements of Section 1107 for Accessible units apply only to the quantity of spaces being altered or added.

~~3411.8.8~~ 3411.9.8 (IEBC [B] ~~310.8.8~~ 310.9.8) Type A dwelling or sleeping units. Where more than 20 Group R-2 dwelling or sleeping units are being added, the requirements of Section 1107 for Type A units apply only to the quantity of the spaces being added.

~~3411.8.9~~ 3411.9.9 (IEBC [B] ~~310.8.9~~ 310.9.9) Type B dwelling or sleeping units. Where four or more Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being altered or added, the requirements Section 1107 for Type B units apply only to the quantity of the spaces being altered or added.

Reason: HUD continues to believe that it is in the public interest to ensure that buildings with 4 or more dwelling units that are covered by the Fair Housing Act's design and construction requirements (that is, were built for first occupancy after March 13, 1991) but were not built in compliance with those requirements, are in fact brought into compliance. However, rather than requiring the entire building to be brought into compliance, HUD is proposing to limit the scope of these proposed changes to only the portions of the building that are being altered. While the changes being proposed may not be sufficient for HUD to recognize Chapter 34 of the IBC and corresponding provisions in the IEBC as being consistent with the

design and construction requirements of the Fair Housing Act, we believe it will at least begin to incorporate Type B dwelling units and their related requirements into buildings that should have been built in compliance with the Fair Housing Act in the first place. It is our intention that the proposal apply only to buildings that were not built in compliance with the requirements of the Fair Housing Act and should have been built in compliance, therefore, this proposal would not apply to buildings built in compliance with those editions of the IBC that HUD has previously recognized as a safe harbor for compliance (i.e., the 2000 IBC as amended by the 2001 Supplement, the 2003 IBC and the 2006 IBC). If the code requires such buildings to come into compliance with the current edition of the code when altered, including accessibility requirements that may have changed from one edition to the next, we believe that is a standard code practice and that it should not be insurmountable with respect to accessibility any more than it is with respect to all other code matters.

Cost Impact: There will be a cost impact on buildings that were NOT built in compliance with the accessibility requirements of the Fair Housing Act, but should have been in compliance with the law, however, the cost impact will be mitigated by making the alterations to bring the building into compliance at the time those elements that are affected are altered, which will be considerably less expensive for owners of such buildings than bringing the building into compliance as a result of litigation.

PART I – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KENT-EB1-605

The following code change (EB12) is withdrawn. The Code Correlation Committee has accepted this proposal as editorial.

EB12–09/10

IEBC 605.1, 605.1.1, 605.1.4, 605.1.14, 605.2, 1104.1, 1105.15; IBC 3402, 3411.2, 3411.3, 3411.6, 3411.7, 3411.8.1, 3411.8.5, 3411.9 (IEBC [B] 202, 310.2, 310.3, 310.6, 310.7, 310.8.1, 310.8.5, 310.9)

Proponent: Maureen Traxler, City of Seattle, WA, Seattle Dept of Planning & Development

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IEBC CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE IEBC CODE COMMITTEE.

PART I – IEBC

SECTION 605
ACCESSIBILITY

605.1 General. A ~~building,~~ facility ~~or element~~ that is altered shall comply with the applicable provisions in Sections 605.1.1 through 605.1.14, Chapter 11 of the *International Building Code* and ICC A117.1 unless it is *technically infeasible*. Where compliance with this section is *technically infeasible*, the *alteration* shall provide access to the maximum extent that is technically feasible.

A ~~building,~~ facility ~~or element~~ that is constructed or altered to be accessible shall be maintained accessible during occupancy.

Exceptions:

1. The altered element or space is not required to be on an accessible route unless required by Section 605.2.
2. Accessible means of egress required by Chapter 10 of the *International Building Code* are not required to be provided in existing ~~buildings and~~ facilities.
3. Type B dwelling or sleeping units required by Section 1107 of the *International Building Code* are not required to be provided in existing ~~buildings and~~ facilities.
4. The *alteration* to Type A individually owned dwelling units within a Group R-2 occupancy shall meet the provisions for Type B dwelling units and shall comply with the applicable provisions in Chapter 11 of the *International Building Code* and ICC A117.1.

605.1.1 Entrances. Where an *alteration* includes alterations to an entrance, and the ~~building or~~ facility has an accessible entrance on an accessible route, the altered entrance is not required to be accessible unless required by Section 605.2. Signs complying with Section 1110 of the *International Building Code* shall be provided.

605.1.4 Ramps. Where steeper slopes than allowed by Section 1010.2 of the *International Building Code* are necessitated by space limitations, the slope of ramps in or providing access to existing ~~buildings or~~ facilities shall comply with Table 605.1.4.

605.1.14 Extent of application. An *alteration* of an existing ~~element, space, or area of a building or~~ facility shall not impose a requirement for greater accessibility than that which would be required for new construction. Alterations shall not reduce or have the effect of reducing accessibility of a ~~building, portion of a building, or~~ facility or portion of a facility.

605.2 Alterations affecting an area containing a primary function. Where an *alteration* affects the accessibility to a, or contains an area of, *primary function*, the route to the *primary function* area shall be accessible. The accessible route to the *primary function* area shall include toilet facilities or drinking fountains serving the area of *primary function*.

Exceptions:

1. The costs of providing the accessible route are not required to exceed 20 percent of the costs of the alterations affecting the area of *primary function*.
2. This provision does not apply to alterations limited solely to windows, hardware, operating controls, electrical outlets and signs.
3. This provision does not apply to alterations limited solely to mechanical systems, electrical systems, installation or *alteration* of fire protection systems and abatement of hazardous materials.
4. This provision does not apply to alterations undertaken for the primary purpose of increasing the accessibility of ~~an *existing* *building*~~, a facility ~~or element~~.

1104.1 Accessibility requirements. The provisions of 605 and 706, as applicable, shall apply to ~~buildings and~~ facilities designated as historic structures that undergo alterations, unless *technically infeasible*. Where compliance with the requirements for accessible routes, entrances or toilet facilities would threaten or destroy the historic significance of the building or facility, as determined by the *code official*, the alternative requirements of Sections 1104.1.1 through 1104.1.4 for that element shall be permitted.

1105.15 Accessibility requirements. The provisions of Section 912.8 shall apply to ~~buildings and~~ facilities designated as historic structures that undergo a *change of occupancy*, unless *technically infeasible*. Where compliance with the requirements for accessible routes, ramps, entrances, or toilet facilities would threaten or destroy the historic significance of the building or facility, as determined by the authority having jurisdiction, the alternative requirements of Sections 1104.1.1 through 1104.1.5 for those elements shall be permitted.

PART II – IBC GENERAL

Revise as follows:

SECTION 3402 (IEBC [B] 202)
DEFINITIONS

TECHNICALLY INFEASIBLE. An *alteration* of a ~~building or a~~ facility that has little likelihood of being accomplished because the existing structural conditions require the removal or *alteration* of a load-bearing member that is an essential part of the structural frame, or because other existing physical or site constraints prohibit modification or addition of elements, spaces or features which are in full and strict compliance with the minimum requirements for new construction and which are necessary to provide accessibility.

3411.2 (IEBC [B] 310.2) Maintenance of facilities. A ~~building,~~ facility ~~or element~~ that is constructed or altered to be *accessible* shall be maintained *accessible* during occupancy.

3411.3 (IEBC [B] 310.3) Extent of application. An *alteration* of an existing ~~element, space or area of a building or~~ facility shall not impose a requirement for greater accessibility than that which would be required for new construction. Alterations shall not reduce or have the effect of reducing accessibility of a ~~building, portion of a building, or~~ facility or portion of a facility.

3411.6 (IEBC [B] 310.6) Alterations. A ~~building,~~ facility ~~or element~~ that is altered shall comply with the applicable provisions in Chapter 11 of this code and ICC A117.1, unless *technically infeasible*. Where compliance with this section is *technically infeasible*, the *alteration* shall provide access to the maximum extent technically feasible.

Exceptions:

1. The altered element or space is not required to be on an *accessible* route, unless required by Section 3411.7.
2. *Accessible means of egress* required by Chapter 10 are not required to be provided in existing ~~buildings and~~ facilities.
3. The *alteration* to Type A individually owned *dwelling* units within a Group R-2 occupancy shall meet the provision for a Type B *dwelling* unit and shall comply with the applicable provisions in Chapter 11 and ICC A117.1.

3411.7 (IEBC [B] 310.7) Alterations affecting an area containing a primary function. Where an *alteration* affects the accessibility to, or contains an area of *primary function*, the route to the *primary function* area shall be *accessible*. The *accessible* route to the *primary function* area shall include toilet facilities or drinking fountains serving the area of *primary function*.

Exceptions:

1. The costs of providing the *accessible* route are not required to exceed 20 percent of the costs of the *alterations* affecting the area of *primary function*.
2. This provision does not apply to *alterations* limited solely to windows, hardware, operating controls, electrical outlets and signs.
3. This provision does not apply to *alterations* limited solely to mechanical systems, electrical systems, installation or *alteration* of fire protection systems and abatement of hazardous materials.
4. This provision does not apply to *alterations* undertaken for the primary purpose of increasing the accessibility of ~~an existing building,~~ a facility ~~or element~~.

3411.8.1 (IEBC [B] 310.8.1) Entrances. *Accessible* entrances shall be provided in accordance with Section 1105.

Exception: Where an *alteration* includes alterations to an entrance, and the ~~building or~~ facility has an *accessible* entrance, the altered entrance is not required to be *accessible*, unless required by Section 3411.7. Signs complying with Section 1110 shall be provided.

3411.8.5 (IEBC [B] 310.8.5) Ramps. Where slopes steeper than allowed by Section 1010.2 are necessitated by space limitations, the slope of ramps in or providing access to existing ~~buildings or~~ facilities shall comply with Table 3411.8.5.

3411.9 (IEBC [B] 310.9) Historic buildings. These provisions shall apply to ~~buildings and~~ facilities designated as historic structures that undergo alterations or a change of occupancy, unless *technically infeasible*. Where compliance with the requirements for *accessible* routes, entrances or toilet facilities would threaten or destroy the historic significance of the ~~building or~~ facility, as determined by the applicable governing authority, the alternative requirements of Sections 3411.9.1 through 3411.9.4 for that element shall be permitted.

Reason: "Facility" is defined in Section 1102 broadly to include "all or any portion of buildings, structures, site improvements, elements and pedestrian or vehicular routes located on a site." In the above code provisions, the mention of buildings, elements, spaces and areas have been removed, as there is no need for the redundancy. There are other portions of Chapter 34 (such as 3412.5.1, 3412.5.2 and the definition of "Primary Function") which refer only to the broader term "facility" and this proposal keeps the use of the term consistent throughout the chapter.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TRAXLER-G8-3411.DOC

The following code change (EB13) is withdrawn. The Code Correlation Committee has accepted this proposal as editorial.

EB13–09/10

IEBC 605.1.10, 1104.1, 1105.15; 3411.8.11, 3411.9 (IEBC [B] 310.8.11, 310.9)

Proponent: Maureen Traxler, City of Seattle, WA, Seattle Dept of Planning & Development

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IEBC CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE IEBC CODE COMMITTEE.

PART I – IEBC

605.1.10 Toilet rooms. Where it is *technically infeasible* to alter existing toilet and bathing ~~facilities~~ rooms to be accessible, an accessible family or assisted-use toilet or bathing ~~facility~~ room constructed in accordance with Section 1109.2.1 of the *International Building Code* is permitted. The family or assisted-use ~~facility~~ toilet or bathing room shall be located on the same floor and in the same area as the existing ~~facilities~~ toilet or bathing rooms.

1104.1 Accessibility requirements. The provisions of 605 and 706, as applicable, shall apply to buildings and facilities designated as historic structures that undergo alterations, unless *technically infeasible*. Where compliance with the requirements for accessible routes, entrances or toilet ~~facilities~~ rooms would threaten or destroy the historic significance of the building or facility, as determined by the *code official*, the alternative requirements of Sections 1104.1.1 through 1104.1.4 for that element shall be permitted.

1105.15 Accessibility requirements. The provisions of Section 912.8 shall apply to buildings and facilities designated as historic structures that undergo a *change of occupancy*, unless *technically infeasible*. Where compliance with the requirements for accessible routes, ramps, entrances, or toilet ~~facilities~~ rooms would threaten or destroy the historic significance of the building or facility, as determined by the authority having jurisdiction, the alternative requirements of Sections 1104.1.1 through 1104.1.5 for those elements shall be permitted.

PART II – IBC GENERAL

Revise as follows:

3411.8.11 (IEBC [B] 310.8.11) Toilet rooms. Where it is *technically infeasible* to alter existing toilet and bathing ~~facilities~~ rooms to be *accessible*, an *accessible* family or assisted-use toilet or bathing ~~facility~~ room constructed in accordance with Section 1109.2.1 is permitted. The family or assisted-use ~~facility~~ toilet or bathing room shall be located on the same floor and in the same area as the existing ~~facilities~~ toilet or bathing rooms.

3411.9 (IEBC [B] 310.9) Historic buildings. These provisions shall apply to buildings and facilities designated as historic structures that undergo alterations or a change of occupancy, unless *technically infeasible*. Where compliance with the requirements for *accessible* routes, entrances or toilet ~~facilities~~ rooms would threaten or destroy the historic significance of the building or facility, as determined by the applicable governing authority, the alternative requirements of Sections 3411.9.1 through 3411.9.4 for that element shall be permitted.

Reason: The use of the term “facility” or “facilities” as used in this section is ambiguous. “Facility” is defined in Section 1102 broadly to include “all or any portion of buildings, structures, site improvements, elements and pedestrian or vehicular routes located on a site.” Replacing the term “facility” or “facilities” with a more meaningful term, such as “room” or “rooms,” removes the ambiguity and is consistent with the terminology used in Section 1109.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TRAXLER-G9-3411.DOC

EB14–09/10

IEBC 605.1, 605.2, 706.1, 806.1, 806.2, 912.8, 912.8.2, 1005.1, 1104.1, 1105.15; IBC 3411.1, 3411.4, 3411.4.2, 3411.6, 3411.7, 3411.8.8, 3411.8.9, 3411.9, 3412.2.5 (IEBC [B] 310.1, 310.4, 310.4.2, 310.6, 310.7, 310.8.8, 310.8.9, 310.9, 1301.2.5)

Proponent: Dominic Marinelli, United Spinal Association

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IEBC COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THIS COMMITTEE.

PART I – IEBC

Revise as follows:

CHAPTER 6
ALTERATIONS—LEVEL 1

SECTION 605
ACCESSIBILITY

605.1 General. A building, facility or element that is altered shall comply with the applicable provisions in Sections 605.1.1 through 605.1.14, Chapter 11 of the International Building Code and ICC A117.1 unless it is technically infeasible. Where compliance with this section is technically infeasible, the alteration shall provide access to the maximum extent that is technically feasible.

A building, facility or element that is constructed or altered to be accessible shall be maintained accessible during occupancy.

Exceptions:

1. The altered element or space is not required to be on an accessible route unless required by Section 605.2.
2. Accessible means of egress required by Chapter 10 of the International Building Code are not required to be provided in existing buildings and facilities.
3. Type B dwelling or sleeping units required by Section 1107 of the International Building Code are not required to be provided in existing buildings and facilities <u>undergoing less than a Level III alteration</u>.
4. The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall meet the provisions for Type B dwelling units and shall comply with the applicable provisions in Chapter 11 of the International Building Code and ICC A117.1.

605.1.8 Accessible dwelling or sleeping units. Where Group I-1, I-2, I-3, R-1, R-2 or R-4 dwelling or sleeping units are being altered, the requirements of Section 1107 of the International Building Code for accessible units and Chapter 9 of the International Building Code for visible alarms apply only to the quantity of the spaces being altered.

605.1.9 Type A dwelling or sleeping units. Where more than 20 Group R-2 dwelling or sleeping units are being altered, the requirements of Section 1107 of the International Building Code for Type A units and Chapter 9 of the International Building Code for visible alarms apply only to the quantity of the spaces being altered.

605.2 Alterations affecting an area containing a primary function. Where an alteration affects the accessibility to a, or contains an area of, primary function, the route to the primary function area shall be accessible. The accessible route to the primary function area shall include toilet facilities or drinking fountains serving the area of primary function.

Exceptions:

1. The costs of providing the accessible route are not required to exceed 20 percent of the costs of the alterations affecting the area of primary function.
2. This provision does not apply to alterations limited solely to windows, hardware, operating controls, electrical outlets and signs.
3. This provision does not apply to alterations limited solely to mechanical systems, electrical systems, installation or alteration of fire protection systems and abatement of hazardous materials.
4. This provision does not apply to alterations undertaken for the primary purpose of increasing the accessibility of an existing building, facility or element.
5. <u>This provision does not apply to altered areas limited to Type B dwelling and sleeping units.</u>

CHAPTER 7
ALTERATIONS—LEVEL 2

SECTION 706
ACCESSIBILITY

706.1 General. A building, facility, or element that is altered shall comply with this section and Section 605.

706.3 Accessible dwelling units and sleeping units. Where Group I-1, I-2, I-3, R-1, R-2 or R-4 dwelling or sleeping units are being added, the requirements of Section 1107 of the International Building Code for accessible units and Chapter 9 of the International Building Code for visible alarms apply only to the quantity of spaces being added.

706.4 Type A dwelling or sleeping units. Where more than 20 Group R-2 dwelling or sleeping units are being added, the requirements of Section 1107 of the International Building Code for Type A units and Chapter 9 of the International Building Code for visible alarms apply only to the quantity of the spaces being added.

706.5 Type B dwelling or sleeping units. Where four or more Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being added, the requirements of Section 1107 of the International Building Code for Type B units and Chapter 9 of the International Building Code for visible alarms apply only to the quantity of the spaces being added.

CHAPTER 8
ALTERATIONS—LEVEL 3

SECTION 806
ACCESSIBILITY

806.1 General. A building, facility or element that is altered shall comply with this section and Sections 605 and 706.

806.2 Type B dwelling or sleeping units. Where four or more Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being altered or added the requirements of Section 1107 of the International Building Code for Type B units and Chapter 9 of the International Building Code for visible alarms apply only to the quantity of the spaces being altered or added.

CHAPTER 9
CHANGE OF OCCUPANCY

912.8 Accessibility. Existing buildings that undergo a change of group or occupancy classification shall comply with this section.

> **Exception:** Type B dwelling or sleeping units required by Section 1107 of the International Building Code are not required to be provided in existing buildings and facilities undergoing a change of occupancy in conjunction with less than a Level III alteration.

912.8.1 Partial change in occupancy. Where a portion of the building is changed to a new occupancy classification, any alterations shall comply with Sections 605, ~~and~~ 706 and 806, as applicable.

912.8.2 Complete change of occupancy. Where an entire building undergoes a change of occupancy, it shall comply with Section 912.8.1 and shall have all of the following accessible features:

1. At least one accessible building entrance.
2. At least one accessible route from an accessible building entrance to primary function areas.
3. Signage complying with Section 1110 of the International Building Code.
4. Accessible parking, where parking is provided.
5. At least one accessible passenger loading zone, where loading zones are provided.
6. At least one accessible route connecting accessible parking and accessible passenger loading zones to an accessible entrance.

Where it is technically infeasible to comply with the new construction standards for any of these requirements for a change of group or occupancy, the above items shall conform to the requirements to the maximum extent technically feasible.

Exception: The accessible features listed in Items 1 through 6 are not required for an accessible route to Type B units.

CHAPTER 10
ADDITIONS

SECTION 1005
ACCESSIBILITY

1005.1 Minimum requirements. Accessibility provisions for new construction shall apply to additions. An addition that affects the accessibility to, or contains an area of, primary function shall comply with the requirements of Sections 605, ~~and~~ 706 and 806, as applicable.

CHAPTER 11
HISTORIC BUILDINGS

SECTION 1104
ALTERATIONS

1104.1 Accessibility requirements. The provisions of 605, ~~and~~ 706 and 806, as applicable, shall apply to buildings and facilities designated as historic structures that undergo alterations, unless *technically infeasible*. Where compliance with the requirements for accessible routes, entrances or toilet facilities would threaten or destroy the historic significance of the building or facility, as determined by the *code official*, the alternative requirements of Sections 1104.1.1 through 1104.1.4 for that element shall be permitted.

Exception: Type B dwelling or sleeping units required by Section 1107 of the *International Building Code* are not required to be provided in historical buildings.

SECTION 1105
CHANGE OF OCCUPANCY

1105.15 Accessibility requirements. The provisions of Section 912.8 shall apply to buildings and facilities designated as historic structures that undergo a *change of occupancy*, unless *technically infeasible*. Where compliance with the requirements for accessible routes, ramps, entrances, or toilet facilities would threaten or destroy the historic significance of the building or facility, as determined by the authority having jurisdiction, the alternative requirements of Sections 1104.1.1 through 1104.1.5 for those elements shall be permitted.

Exception: Type B dwelling or sleeping units required by Section 1107 of the *International Building Code* are not required to be provided in historical buildings.

PART II – IBC GENERAL

Revise as follows:

SECTION 3411 (IEBC [B] 310)
ACCESSIBILITY FOR EXISTING BUILDINGS

3411.1 (IEBC [B] 310.1) Scope. The provisions of Sections 3411.1 through 3411.9 apply to maintenance, change of occupancy, additions and alterations to existing buildings, including those identified as *historic buildings*.

~~**Exception:** Type B *dwelling* or sleeping units required by Section 1107 of this code are not required to be provided in existing buildings and facilities being altered or undergoing a change of occupancy.~~

3411.4 (IEBC [B] 310.4) Change of occupancy. Existing buildings that undergo a change of group or occupancy shall comply with this section.

Exception: Type B dwelling or sleeping units required by Section 1107 of this code are not required to be provided in existing buildings and facilities undergoing a change of occupancy in conjunction with alterations where the work area is 50 percent or less of the aggregate area of the building.

3411.4.1 (IEBC [B] 310.4.1) Partial change in occupancy. Where a portion of the building is changed to a new occupancy classification, any alterations shall comply with Sections 3411.6, 3411.7 and 3411.8.

3411.4.2(IEBC [B] 310.4.2) Complete change of occupancy. Where an entire building undergoes a change of occupancy, it shall comply with Section 3411.4.1 and shall have all of the following accessible features:

1. At least one accessible building entrance.
2. At least one accessible route from an accessible building entrance to primary function areas.
3. Signage complying with Section 1110.
4. Accessible parking, where parking is being provided.
5. At least one accessible passenger loading zone, when loading zones are provided.
6. At least one accessible route connecting accessible parking and accessible passenger loading zones to an accessible entrance.

Where it is technically infeasible to comply with the new construction standards for any of these requirements for a change of group or occupancy, the above items shall conform to the requirements to the maximum extent technically feasible.

Exception: The accessible features listed in Items 1 through 6 are not required for an accessible route to Type B units.

3411.5 (IEBC [B] 310.5) Additions. Provisions for new construction shall apply to additions. An addition that affects the accessibility to, or contains an area of, a primary function shall comply with the requirements in Section 3411.7.

3411.6 (IEBC [B] 310.6) Alterations. A building, facility or element that is altered shall comply with the applicable provisions in Chapter 11 of this code and ICC A117.1, unless technically infeasible. Where compliance with this section is technically infeasible, the alteration shall provide access to the maximum extent technically feasible.

Exceptions:

1. The altered element or space is not required to be on an accessible route, unless required by Section 3411.7.
2. Accessible means of egress required by Chapter 10 are not required to be provided in existing buildings and facilities.
3. The alteration to Type A individually owned dwelling units within a Group R-2 occupancy shall meet the provision for a Type B dwelling unit and shall comply with the applicable provisions in Chapter 11 and ICC A117.1.
4. Type B dwelling or sleeping units required by Section 1107 of this code are not required to be provided in existing buildings and facilities undergoing a change of occupancy in conjunction with alterations where the work area is 50 percent or less of the aggregate area of the building.

3411.7 (IEBC [B] 310.7) Alterations affecting an area containing a primary function. Where an alteration affects the accessibility to, or contains an area of primary function, the route to the primary function area shall be accessible. The accessible route to the primary function area shall include toilet facilities or drinking fountains serving the area of primary function.

Exceptions:

1. The costs of providing the accessible route are not required to exceed 20 percent of the costs of the alterations affecting the area of primary function.
2. This provision does not apply to alterations limited solely to windows, hardware, operating controls, electrical outlets and signs.
3. This provision does not apply to alterations limited solely to mechanical systems, electrical systems, installation or alteration of fire protection systems and abatement of hazardous materials.
4. This provision does not apply to alterations undertaken for the primary purpose of increasing the accessibility of an existing building, facility or element.
5. This provision does not apply to altered areas limited to Type B dwelling and sleeping units.

3411.8 (IEBC [B] 310.8) Scoping for alterations. The provisions of Sections 3411.8.1 through 3411.8.12 shall apply to alterations to existing buildings and facilities.

3411.8.7 (IEBC [B] 310.8.7) Accessible dwelling or sleeping units. Where Group I-1, I-2, I-3, R-1, R-2 or R-4 dwelling or sleeping units are being altered or added, the requirements of Section 1107 for Accessible units apply only to the quantity of spaces being altered or added.

3411.8.8 (IEBC [B] 310.8.8) Type A dwelling or sleeping units. Where more than 20 Group R-2 dwelling or sleeping units are being altered or added, the requirements of Section 1107 for Type A units apply only to the quantity of the spaces being altered or added.

3411.8.9 (IEBC [B] 310.8.9) Type B dwelling or sleeping units. Where four or more Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being added, the requirements Section 1107 for Type B units apply only to the quantity of the spaces being added. Where Group I-1, I-2, R-1, R-2, R-3 or R-4 dwelling or sleeping units are being altered and where the work area is greater than 50 percent of the aggregate area of the building, the requirements Section 1107 for Type B units apply only to the quantity of the spaces being altered.

3411.9 (IEBC [B] 310.9) Historic buildings. These provisions shall apply to buildings and facilities designated as historic structures that undergo alterations or a change of occupancy, unless technically infeasible. Where compliance with the requirements for accessible routes, entrances or toilet facilities would threaten or destroy the historic significance of the building or facility, as determined by the applicable governing authority, the alternative requirements of Sections 3411.9.1 through 3411.9.4 for that element shall be permitted.

> **Exception:** Type B dwelling or sleeping units required by Section 1107 of the International *Building Code* are not required to be provided in historical buildings.

SECTION 3412 (IEBC [B] CHAPTER 13)
COMPLIANCE ALTERNATIVES

3412.2.5 (IEBC [B] 1301.2.5) Accessibility requirements. All portions of the buildings proposed for *change of occupancy* shall conform to the accessibility provisions of Section 3411 (IEBC 308).

Reason: The intent of this proposal is to take a small step towards increasing the availability of housing with minimum accessibility requirements. With the fastest grouping group in the United States being people over 65 years old, there is a definite need. The last U.S. Census information indicated that 41% of people of 65 have some level of disability.

Type of units covered under the Fair Housing Act include apartments, condominiums, dormitories, fraternities, sororities, convents, monasteries, assisted living facilities, nursing homes, group homes, etc. The Fair Housing Act is applicable to building first occupied after March 1991. While the department of Housing and Urban Development has been active in enforcement of these regulations, there are a lot of existing buildings that were constructed since 1991 that did not comply with this federal law. The legacy building codes first started requiring Type B units in apartments and condominiums in 1996/1997. With code changes that added congregate living facilities and Institutional facilities, the IBC requirements for Type B units was declared a 'safe harbor' document by HUD in 2002. Reasonably, buildings in jurisdictions that have adopted 2003 or 2006 IBC meet FHA. United Spinal's concern is the buildings that were built before that.

There are a considerable number of existing buildings that should have complied with FHA and did not. When a major alteration is being performed, there is a prime opportunity to have those buildings move towards compliance. This will not only be a benefit for people that need that housing to live in, but will also help the building owners lessen or avoid complaints filed under FHA. Also, this is the most cost effective opportunity to make these revisions.

What this proposal is asking for, is that when buildings are undergoing a Level 3 alteration, or a change of occupancy that includes a Level 3 alteration, that whatever elements are altered, those elements are brought up to meet Type B requirements. If the element is not part of the alteration, it is not required to be altered. This is consistent with current building code philosophy for alterations. There are still the allowances for technically infeasible. The exceptions for non-elevator buildings, site limitations and flood zones currently indicated in Section 1107.7 are still applicable under *Extent of Application* (IBC 3409.3, IEBC 310.3, 605.1.14). Historical buildings, by their reference back to general provisions could be affected, therefore a general exception for Type B units is proposed for historical buildings.

In addition, when the area being altered is for Type B units, there is an exception for the additional route requirements currently in IBC Sections 3411.4.2 and 3411.7 and IEBC Section 310.4.2, 310.7, 605.2 and 912.8.2. United Spinal hopes that this address the concerns of site impracticality brought up during the last hearings by the Building Owners Managers Association, the National Association of Home Builders and the National Multi-Housing Council. This also reinforces the intent that this provision is not meant to require elevators when alterations are performed on upper floors in non-elevator buildings (see exceptions in Section 1107.7). These areas would have been exempted if built new under FHA and IBC, and should continue to be exempted.

The intent is that the same requirements for housing in existing buildings are included in IBC and IEBC. The wording is slightly different because IBC does not include a definition for Level 3 alterations. The terminology used – "work areas exceeds 50 percent of the aggregate area of the building" - can be found in IEBC 405.1. Some sections included in this proposal are not revised, but are included for context.

Cost Impact: The code change proposal will increase the cost of construction

PART I – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MARINELLI-EB1-605.2.DOC

EB15–09/10
606.2.1, 807.4.4 (New)

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

1. Delete without substitution:

~~**606.2.1 Wall anchors for concrete and masonry buildings.** Where a permit is issued for reroofing more than 25 percent of the roof area of a building assigned to Seismic Design Category D, E, or F with a structural system consisting of concrete or reinforced masonry walls with a flexible roof diaphragm or unreinforced masonry walls with any type of roof diaphragms, the work shall include installation of wall anchors at the roof line to resist the reduced *International Building Code* level seismic forces as specified in Section 101.5.4.2 of this code and design procedures of Section 101.5.4, unless an evaluation demonstrates compliance of existing wall anchorage.~~

2. Add new text as follows:

807.4.4 Wall anchors for concrete and masonry buildings. For any building assigned to Seismic Design Category D, E, or F with a structural system consisting of concrete or reinforced masonry walls with a flexible roof diaphragm or unreinforced masonry walls with any type of roof diaphragm, the alteration work shall include installation of wall anchors at the roof line to resist the reduced IBC-level seismic forces, unless an evaluation demonstrates compliance of existing wall anchorage.

Reason: This proposal relocates a triggered structural improvement from Chapter 6 to Chapter 8 where it is more appropriate. In current 606.2.1, reroofing certain buildings triggers the installation of roof-to-wall anchors. While reroofing is Alteration Level 1 work, the installation of anchors is a disproportionate requirement largely unrelated to the re-roofing. Wall-o-roof anchors are most often installed from underneath the framing members, so the re-roofing does not make the anchor installation more convenient or cost-effective. In some cases, the current trigger could result in disproportionate additional costs, discouraging the rather simple but important act of maintaining the roof. This proposal therefore moves the triggered installation of roof-to-wall anchors to Chapter 8 where it makes more sense as a building improvement commensurate with Level 3 Alterations. Because Level 3 Alterations already involve substantial work, the "25% roof area" trigger, which is appropriate to Level 1 Alterations, is removed when the provision is moved to proposed Section 807.4.4.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB25-606.2.1.DOC

EB16–09/10
606.3.2

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

606.3.2 Roof diaphragms resisting wind loads in high-wind regions. Where roofing materials are removed from more than 50 percent of the roof diaphragm or section of a building located where the basic wind speed is greater than 90 mph or in a special wind region, as defined in Section 1609 of the *International Building Code*, roof diaphragms, connections of the roof diaphragm to roof framing members, and roof-to-wall connections ~~that are part of the main wind-force resisting system~~ shall be evaluated for the wind loads specified in the *International Building Code*, including wind uplift. If the diaphragms and connections in their current condition do not comply with those wind provisions~~,~~ they shall be replaced or strengthened in accordance with the loads specified in the *International Building Code*.

Reason: This proposal is an editorial clarification. The current provision, modified for the 2009 code, inadvertently suggests that all connections that might participate in resisting any wind loads would be subject to evaluation and possible upgrade. This proposal clarifies which connections are in the intended scope and reduces confusion further by deleting the ambiguous term "main wind force resisting system".

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB26-606.3.2.DOC

EB17–09/10
606.3.2

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

606.3.2 Roof diaphragms resisting wind loads in high-wind regions. Where roofing materials are removed from more than 50 percent of the roof diaphragm or section of a building located where the basic wind speed is greater than 90 mph or in a special wind region, as defined in Section 1609 of the *International Building Code*, roof diaphragms and connections that are part of the main wind-force resisting system shall be evaluated for the wind loads specified in the *International Building Code*, including wind uplift. If the diaphragms and connections in their current condition ~~do not comply with those wind provisions,~~ are not capable of resisting at least 75% of those wind loads, they shall be replaced or strengthened in accordance with the loads specified in the *International Building Code*.

Reason: This proposal makes a reasonable allowance for "reduced" wind loads for certain triggered upgrades. Justifications and precedents include:

- For the work triggered by Section 606.3.2, the major deficiencies – lack of basic load path elements or load path continuity – will still be caught if reduced wind loads are used.
- Seismic evaluations typically use reduced loads, in part to avoid triggering upgrades to marginally overstressed elements. Wind provisions should reasonably do the same.
- The seismic 75% factor is partly based on a reasonable "grandfathering" approach. Many existing buildings were designed with a (now obsolete) 1/3 overstress allowance for wind loads. Current ASCE 7 load combinations for strength design no longer make the same allowance, so even well-designed existing buildings would unreasonably be caught by a trigger that requires 100% of current loads.
- FEMA (Disaster Assistance Policy 9527.4, available online) has stated a position that lateral force levels for new construction are generally considered unreasonable when applied to triggered repairs.
- New designs are expected to remain elastic under 100% of current wind loads. A structure that can resist at least 75% of these loads can still reasonably be expected to perform acceptably, given the differences between minimum yield and expected ultimate strengths and due to the generally conservative nature of new design.
- ASCE 7 requires a load factor of 1.6 for wind loads. Even at 75%, the effective load factor is still greater than 1.0.

- Though not based on any quantified theory, observed performance, or a "grandfathering" strategy, the proposed 75% value is consistent with the factor used to reduce seismic loads.
- The 75% value does not reach as low as past codes did when identifying dangerous conditions; buildings were deemed dangerous only if they could not resist 50% or 67% of design wind loads.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB27-606.3.2-2.DOC

EB18–09/10
607.1

Proponent: Lorraine Ross, Intech Consulting Inc., representing Polyiso Insulation Manufacturers Association (PIMA)

Revise as follows:

607.1 Minimum requirements. Level 1 alterations to existing buildings or structures are permitted without requiring the entire building or structure to comply with the energy requirements of the *International Energy Conservation Code* or *International Residential Code*. The alterations shall conform to the energy requirements of the *International Energy Conservation Code* or *International Residential Code* as they relate to new construction only.

Exception: Where Level 1 alterations involve addition or replacement of the roof covering, the roof assembly shall meet the energy requirements of the *International Energy Conservation Code, Chapter 5* for new construction.

Reason: A rapidly accelerating awareness of the energy and environmental challenges facing us today has spurred enhanced energy efficiency standards, stricter codes and emerging technologies in new construction. As a result, there is confidence that buildings constructed over the coming years will consume less and less energy. Unfortunately, these activities rarely impact the energy consumption levels of the more than 70 billion square feet of existing commercial building floor space in this country.

This code change proposal addresses the need to upgrade existing roofs to meet the new construction requirements of the International Energy Conservation Code, Chapter 5 for Commercial Buildings. This action is one of the most practical and economically feasible opportunities for improving the energy efficiency in existing buildings: Roof replacement of low-slope roofed buildings, i.e. replacement of waterproofing membrane. It is commonly known that a typical building requires three roof replacements during its lifetime or roughly one replacement every twenty years. Thus, routine roof replacement facilitates implementation of the long-proven energy efficiency measure of added levels of insulation.

Representing eighteen percent of all U.S. annual energy use at 91 kBtu/ft^2 based on floor area, existing commercial buildings play an important role in the challenge to achieve substantial reductions in consumption of energy and impact on the environment. A key lies in the fact that the vast majority of building stock will require roof replacement over the next fifteen to twenty five years providing a practical opportunity to improve the thermal performance of buildings. From the research conducted and the results presented in this report, the following conclusions have been established:

- One and one half billion square feet of existing floor area is a viable annual potential for installation of low-slope energy efficient roofing systems. Clearer and more stringent energy code language as well as increased enforcement specific to re-roofing projects could enhance this potential.
- After ten years, fifteen billion square feet or greater than 20 percent of today's existing floor area will be saving 6.5 percent of total site energy consumption or 118 billion Btu and 266 billion Btu of source energy annually. It is presumed that during this period, a portion of non-retrofitted buildings will be demolished, further contributing to the relative impact of energy efficient roofing systems in lowering the energy intensity level of buildings. Lastly, from a life cycle perspective, the total embodied energy involved in the insulation is recovered in the first year of its use through the energy saved.
- The economic impact includes a cumulative savings of $12.2 billion and annual savings of $2.4 billion which, of course, continues throughout the lifetime of the insulation. The total capital required (installed cost of additional insulation) over this ten year period is approximately $23 billion. Please note that the economic impact in this study is limited to the site utility costs and the installed costs of the insulation. There are other potential economic benefits associated with reductions in energy generation and use as well as reduction in emissions and other environmental impacts that are beyond the scope of this research.
- Energy savings realized with energy efficient roof systems vary significantly between climate zones and vary dramatically between building types. Of the ten building types studied, seven exhibit substantial savings in all climate zones with schools reaping the greatest benefits.
- With respect to GWP, this practical means of thermal performance improvement prevents nearly 0.2 percent of the total building stock emissions in the first year alone. The compounding impact provides a GWP emissions prevention benefit of greater than 100 million metric tons CO_2-equiv. after ten years. Again, comparing this to the life cycle emissions involved in the additional insulation shows that the net zero emissions period is roughly one year.

Reference:
Phelan, J., Pavlovich, G., Ma E., Energy and Environmental Impact Reduction Opportunities for Existing Buildings with Low-Slope Roofs April 2009

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROSS-EB3-607.1.DOC

EB19–09/10
704.2.2

Proponent: Daniel E. Nichols, PE, New York State Dept. of State, Div. of Code Enforcement and Administration

Revise as follows:

704.2.2 Groups A, B, E, F-1, H, I, M, R-1, R-2, R-4, S-1 and S-2. In buildings with occupancies in Groups A, B, E, F-1, H, I, M, R-1, R-2, R-4, S-1 and S-2, work areas that have exits or corridors shared by more than one tenant or that have exits or corridors serving an occupant load greater than 30 shall be provided with automatic sprinkler protection where all of the following conditions occur:

1. The *work area* is required to be provided with automatic sprinkler protection in accordance with the *International Building Code* as applicable to new construction; and
2. The *work area* exceeds 50 percent of the floor area; ~~and~~
3. ~~The building has sufficient municipal water supply for design of a fire sprinkler system available to the floor without installation of a new fire pump.~~

Exceptions:

1. Work areas in Group R occupancies three stories or less in height.
2. If the building does not have sufficient municipal water supply for design of a fire sprinkler system available to the floor without installation of a new fire pump, work areas shall be protected by an automatic smoke detection system throughout all occupiable spaces other than sleeping units or individual dwelling units that activates the occupant notification system in accordance with Sections 907.4, 907.5, and 907.6 of the *International Building Code*.

Reason: Currently, the IEBC allows buildings in areas that do not have a municipal water system or have a municipal system with low pressure to be exempt from automatic sprinkler requirements. This is a all-in or all-out type of protection, with no mitigating measures taken if the fire sprinkler is exempted.

This code change provides two important features to mitigate, but not replace, the effectiveness of automatic sprinklers based on current tradeoffs in the IEBC. The first mitigation is to provide notification to occupants of a fire event, which would be provided with a sprinkler system (IBC 907.5 #2). The second mitigation would be to contact the fire department with monitoring (Section 907.6.5) and providing automatic notification.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NICHOLS-EB1-704.2.2.DOC

EB20–09/10
704.4, 704.4.1, 704.4.1.1 through 704.4.1.7, 704.4.2, 704.4.3

Proponent: Daniel E. Nichols, PE, New York State Dept. of State, Div. of Code Enforcement and Administration

1. Revise as follows:

704.4 Fire alarm and detection. An approved fire alarm system shall be installed in accordance with Sections 704.4.1 through 704.4.3. ~~Where automatic sprinkler protection is provided in accordance with Section 704.2 and is connected to the building fire alarm system, automatic heat detection shall not be required.~~

~~An approved automatic fire detection system shall be installed in accordance with the provisions of this code and NFPA 72. Devices, combinations of devices, appliances, and equipment shall be approved. The automatic fire detectors shall be smoke detectors, except that an approved alternative type of detector shall be installed in spaces such as boiler rooms, where products of combustion are present during normal operation in sufficient quantity to actuate a smoke detector.~~

704.4.1 Occupancy requirements. A fire alarm system shall be installed in work areas in accordance with Section~~s~~ ~~704.4.1.1 through 704.4.1.7~~ 907 of the *International Building Code* for new buildings. Existing alarm-notification appliances shall be automatically activated throughout the building. Where the building is not equipped with a fire alarm system, alarm-notification appliances within the work area shall be provided and automatically activated.

Exceptions~~:~~

~~1.~~ Occupancies with an existing, previously approved fire alarm system.
~~2. Where selective notification is permitted, alarm-notification appliances shall be automatically activated in the areas selected.~~

2. Delete without substitution:

~~**704.4.1.1 Group E.**~~
~~**704.4.1.2 Group I-1.**~~
~~**704.4.1.3 Group I-2.**~~
~~**704.4.1.4 Group I-3.**~~
~~**704.4.1.5 Group R-1.**~~
~~**704.4.1.6 Group R-2.**~~
~~**704.4.1.7 Group R-4.**~~

3. Revise as follows:

704.4.2 Supplemental fire alarm system requirements. Where the work area on any floor exceeds 50 percent of that floor area, Section 704.4.1 shall apply throughout the floor.

Exception: Alarm-initiating and notification appliances shall not be required to be installed in tenant spaces outside of the work area.

704.4.3 Smoke alarms. Individual sleeping units and individual dwelling units in any work area in Group R-1, R-2, R-3, R-4, and I-1 occupancies shall be provided with smoke alarms in accordance with the *International Fire Code*.

~~**Exception:** Interconnection of smoke alarms outside of the rehabilitation work area shall not be required.~~

Reason: This code section fixes a technical flaw between the International Fire Code and the International Existing Building Code. Currently, the International Existing Building Code allows for the retroactive requirements of the International Fire Code to be limited by isolating such requirements to work areas only. The structure of the International Fire Code is that the retroactive requirements applies to all buildings, not those being worked on. However, the IEBC does just that, and actually lowers the level of building fire protection than if the building was just enforced to the level of the IFC.

As an example, IFC Section 4603.6.1 requires a majority of existing Group E occupancies to be provided with a fire alarm system. IEBC Section 704.4.1.1 limits the requirement to just the work area within a Group E even though more construction work is being done in the latter condition.

The code change changes the reference to the new construction requirements for fire alarm requirements. To do so, the occupancy requirements have been directed to the IBC for new construction, a more appropriate requirement for fire alarm coverage. By referencing the new construction requirements, it adds other occupancies to the Alterations-Level 2 section, including Group A occupancies.

The remainder of the code change is mostly editorial. First, most of Section 704.4 is being removed to align with the new layout of Section 907, as approved in the 2007 supplement. Second, exception #2 of Section 704.4.1 was removed since IBC Section 907 already sets requirements for selective notification. Third, the exception of Section 704.4.3 has been removed since the retroactive smoke alarm requirements of the IFC already have requirements dealing with interconnect in existing buildings. Section 704.4.2 is shown for informational purposes only.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NICHOLS-EB2-704.4.DOC

EB21–09/10
707.5, 807.4, 807.4.3

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

707.5 Existing structural elements resisting lateral loads. Alterations affecting the demands or capacities of existing elements of the lateral-load-resisting system shall be evaluated using the wind provisions of the *International Building Code* and the reduced *International Building Code* level seismic forces. Any existing lateral load-resisting

structural elements whose demand-capacity ratio with the alteration considered is more than 10 percent greater than its demand-capacity ratio with the alteration ignored shall be brought into compliance with those wind and seismic provisions. ~~comply with structural requirements specified in Section 807.4. For the purposes of calculating demand-capacity ratio, the demand shall consider applicable load combinations with the design lateral loads or forces in accordance with Section 1609 and 1613 of the *International Building Code*.~~ For the purposes of this section, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacity shall account for the cumulative effects of additions and alterations since the original construction.

807.4 Existing structural elements resisting lateral loads ~~Structural alterations~~. All ~~structural~~ existing elements of the lateral-force-resisting system ~~in buildings undergoing Level 3 structural alterations or buildings undergoing Level 2 alterations as triggered by Section 707.5~~ shall comply with this section.

Exceptions:

1. Buildings of Group R occupancy with no more than five dwelling or sleeping units used solely for residential purposes that are altered based on the conventional light-frame construction methods of the *International Building Code* or in compliance with the provisions of the *International Residential Code*.
2. Where such *alterations* involve only the lowest story of a building and the *change of occupancy* provisions of Chapter 9 do not apply, only the lateral-force-resisting components in and below that story need comply with this section.

807.4.3 Limited structural alteration. Where ~~not more than 30 percent of the total floor and roof areas of the building or structure have been or are proposed to be involved in substantial structural alteration with a 12-month period~~, the work does not involve a substantial structural alteration, the existing elements of the lateral-load resisting system shall comply with Section 707.5. ~~the evaluation and analysis shall demonstrate that the altered building or structure complies with the loads applicable at the time of the original construction or of the most recent substantial structural alteration as defined in Section 807.4.2. Any existing structural elements whose seismic demand-capacity ratio with the alteration considered is more than 10 percent greater than its demand-capacity ratio with the alteration ignored shall comply with reduced *International Building Code* level seismic forces as specified in Section 101.5.4.2.~~

Reason: This proposal is primarily editorial to clarify the cross-referencing that covers Level 2 and Level 3 alterations. The wind and seismic requirements for Level 2 alterations and Level 3 limited structural alterations are essentially the same: any elements made worse by more than 10% shall be improved, but global seismic upgrades are not triggered.

However, rather than having Level 2 alterations reference the provisions of Level 3 alterations (which are split into two classes, substantial and limited), this proposal moves the relevant wind and seismic requirements into the Level 2 provisions, in Section 707.5.

There is one substantive change to Section 707.5, but it is actually a correction: The current provision refers to IBC Section 1613 for seismic loads. This is inconsistent with IEBC provisions for Level 3 alterations and other circumstances, so the typical "reduced IBC level seismic forces" are proposed instead.

In 807.4.3, the current wind and seismic provisions can now be made by a simple reference to Section 707.5. Also, rather than repeating the criteria for a substantial structural alteration, simplified text is proposed.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB20-707.5.DOC

EB22–09/10
707.5

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

707.5 Existing structural elements resisting lateral loads. Any existing lateral load-resisting structural elements whose demand-capacity ratio with the alteration considered is more than 10 percent greater than its demand-capacity ratio with the alteration ignored shall comply with structural requirements specified in Section 807.4. In addition, the alteration shall not create a structural irregularity prohibited by ASCE 7 unless the entire structure complies with Section 101.5.4.2. For the purposes of calculating demand-capacity ratio, the demand shall consider applicable load

combinations with the design lateral loads or forces in accordance with Section 1609 and 1613 of the *International Building Code.* For the purposes of this section, comparisons of demand-capacity ratios and calculation of design lateral loads, forces and capacity shall account for the cumulative effects of additions and alterations since the original construction.

Reason: Consistent with the IEBC philosophy to "do no harm," this proposal adds a provision that prohibits the creation of structural irregularities already prohibited for new buildings per ASCE 7. The creation of a new structural irregularity might not cause element demand-capacity ratios to increase by more than 10 percent, but those irregularities should still be avoided. (Existing irregularities need not be eliminated entirely; it is felt that they would rarely be made worse without pulling the current 10% DCR increase trigger.)

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB21-707.5-2.DOC

EB23–09/10
710.2 (New)

Proponent: Tom Neltner, National Center for Healthy Housing, representing National Center for Healthy Housing and Alliance for Healthy Homes

Add new text as follows:

710.2 Water heating facilities. Water heating facilities shall be properly installed, maintained and capable of providing an adequate amount of water to be drawn at every required sink, lavatory, bathtub, shower and laundry facility at a temperature of not less than 110°F (43°C).A combustion water heater shall not be located in any bathroom, toilet room, bedroom or other occupied room normally kept closed, unless adequate combustion air and exhaust ventilation are provided. An approved combination temperature and pressure-relief valve and relief valve discharge pipe shall be properly installed and maintained on water heaters. In dwelling units, the temperature of the water at the spout in a bathtub or shower shall not exceed 120°F (49°C).

Reason: The current code does not set a maximum water temperature for bathtubs and showers. However, the American Society of Sanitary Engineering recommends a maximum mixed water temperature setting of 120ºF (49ºC). This code change makes the IEBC consistent with the ASSE recommendations and the requirements of the *International Residential Code* and the *International Plumbing Code.*

According to the Consumer Products Safety Commission, "Each year, approximately 3,800 injuries and 34 deaths occur in the home due to scalding from excessively hot tap water. The majority of these injuries involve the elderly and children under the age of five. The U.S. Consumer Product Safety Commission (CPSC) urges all users to lower their water heaters to 120 degrees Fahrenheit. In addition to preventing injuries, this decrease in temperature will conserve energy and save money.

CPSC goes on to state "Most adults will suffer third-degree burns if exposed to 150 degree water for two seconds. Burns will also occur with a six-second exposure to 140 degree water or with a thirty second exposure to 130 degree water. Even if the temperature is 120 degrees, a five minute exposure could result in third-degree burns." See *www.cpsc.gov/CPSCPUB/PUBS/5098.pdf.*

In addition, in December 2007, the National Center for Healthy Housing (NCHH) and the U.S. Centers for Disease Control and Prevention (CDC) convened an Expert Panel consistent with National Institute of Health guidelines to assess the effectiveness of various interventions to make homes healthier and safer. NCHH and CDC published the report of the experts in January 2009. See www.nchh.org/LinkClick.aspx?fileticket=2lvaEDNBIdU%3d&tabid=229 for the full report.

The Expert Panel reviewed the peer-reviewed research on the issue of maximum safe water temperature. The experts found two significant studies.

- 80% of children hospitalized for scald burns lived in homes with unsafe bathtub water temperatures of 130°F or higher (Feldman K, Schaller R, Feldman J, McMillon M. 1978. Tap water scald burns in children. Pediatrics 62: 1–7.)
- Five years after a 1983 Washington State law required new water heaters to be pre-set at 120°F at the factory, 77% of homes tested had safe tap water temperatures and there was a reduction in the frequency, morbidity and mortality of tap water burn injuries in children (Erdmann TC, Feldman KW, Rivara FP, Heimbach DM, Wall HA. 1991. Tap Water Burn Prevention—The Effect of Legislation. Pediatrics 88(3): 572–577.)

Setting the water heater at 120°F raises questions about *legionnaires* disease. The ASSE approved water mixers provide the safety without raising the threat of *legionnaires* disease

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NELTNER-EB1-710.2.DOC

EB24–09/10
807.4.2

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

807.4.2 Substantial structural alteration. Where more than 30 percent of the total floor and roof areas of the building or structure have been or are proposed to be involved in structural alteration within a ~~12-month~~ five-year period, the evaluation and analysis shall demonstrate that the altered building or structure complies with the *International Building Code* for wind loading and with reduced *International Building Code* level seismic forces as specified in Section 101.5.4.2 for seismic loading. For seismic considerations, the analysis shall be based on one of the procedures specified in Section 101.5.4. The areas to be counted toward the 30 percent shall be those areas tributary to the vertical load-carrying components, such as joists, beams, columns, walls and other structural components that have been or will be removed, added or altered, as well as areas such as mezzanines, penthouses, roof structures and in-filled courts and shafts.

Reason: Current Section 807.4.2 requires alterations within a 12-month period to be counted together for purposes of determining whether the project is big enough to trigger a seismic upgrade. This proposal reduces the possibility that the provisions will be gamed to avoid the trigger. Currently, for example, by phasing alteration work over 3 years, it is possible that a cumulative 89 percent of the floor and roof area could be altered in a nonconforming building, skirting the intended upgrade trigger. This proposal changes the time period from 12 months to five years, a period that (in our judgment) is appropriate to the nature of seismic upgrade. It is long enough to discourage the most blatant gaming but not so long that it prevents multiple distinct alterations or becomes an administrative record-keeping burden for building departments.

The proposal continues to allow unlimited nonstructural alteration without triggering upgrades.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB28-807.4.2.DOC

EB25–09/10
807.4.4 (New)

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

807.4.4 Bracing for unreinforced masonry parapets. Parapets constructed of unreinforced masonry in buildings assigned to Seismic Design Category D, E, or F shall have bracing installed as needed to resist the reduced *International Building Code* level seismic forces, unless an evaluation demonstrates compliance of such items.

Reason: Level 3 alteration requirements include those of Level 1 and Level 2, but the parapet trigger for Level 1 alteration (in 606.3.1) is based on reroofing. Thus, under the current provision, a substantial Level 3 alteration could go forward, but the simple life-saving measure of parapet bracing would not be triggered unless the project happened to include reroofing.

This proposal corrects this gap between the definitions of Alteration Levels. The proposed new section 807.4.4 (with the essential wording borrowed from 606.3.1) would require parapet bracing for the most hazardous cases regardless of whether the intended work involves reroofing.

Cost Impact: Mild cost increase, but only for Level 3 alterations in buildings with unreinforced masonry parapets assigned to SDC D-F.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB29-807.4.4.DOC

EB26–09/10
808.1

Proponent: Lorraine Ross, Intech Consulting Inc., representing Polyiso Insulation Manufacturers Association (PIMA)

Revise as follows:

808.1 Minimum requirements. Level 3 alterations to existing buildings or structures are permitted without requiring the entire building or structure to comply with the energy requirements of the *International Energy Conservation Code* or *InternationalResidential Code*. The alterations shall conform to the energy requirements of the *International Energy Conservation Code* or *International Residential Code* as they relate to new construction only.

Exception: Where Level 3 alterations involve addition or replacement of the roof covering, the roof assembly shall meet the energy requirements of the *International Energy Conservation Code, Chapter 5* for new construction.

Reason: A rapidly accelerating awareness of the energy and environmental challenges facing us today has spurred enhanced energy efficiency standards, stricter codes and emerging technologies in new construction. As a result, there is confidence that buildings constructed over the coming years will consume less and less energy. Unfortunately, these activities rarely impact the energy consumption levels of the more than 70 billion square feet of existing commercial building floor space in this country.

This code change proposal addresses the need to upgrade existing roofs to meet the new construction requirements of the International Energy Conservation Code, Chapter 5 for Commercial Buildings. This action is one of the most practical and economically feasible opportunities for improving the energy efficiency in existing buildings: Roof replacement of low-slope roofed buildings, i.e. replacement of waterproofing membrane. It is commonly known that a typical building requires three roof replacements during its lifetime or roughly one replacement every twenty years. Thus, routine roof replacement facilitates implementation of the long-proven energy efficiency measure of added levels of insulation.

Representing eighteen percent of all U.S. annual energy use at 91 kBtu/ft^2 based on floor area, existing commercial buildings play an important role in the challenge to achieve substantial reductions in consumption of energy and impact on the environment. A key lies in the fact that the vast majority of building stock will require roof replacement over the next fifteen to twenty five years providing a practical opportunity to improve the thermal performance of buildings. From the research conducted and the results presented in this report, the following conclusions have been established:

- One and one half billion square feet of existing floor area is a viable annual potential for installation of low-slope energy efficient roofing systems. Clearer and more stringent energy code language as well as increased enforcement specific to re-roofing projects could enhance this potential.
- After ten years, fifteen billion square feet or greater than 20 percent of today's existing floor area will be saving 6.5 percent of total site energy consumption or 118 billion Btu and 266 billion Btu of source energy annually. It is presumed that during this period, a portion of non-retrofitted buildings will be demolished, further contributing to the relative impact of energy efficient roofing systems in lowering the energy intensity level of buildings. Lastly, from a life cycle perspective, the total embodied energy involved in the insulation is recovered in the first year of its use through the energy saved.
- The economic impact includes a cumulative savings of $12.2 billion and annual savings of $2.4 billion which, of course, continues throughout the lifetime of the insulation. The total capital required (installed cost of additional insulation) over this ten year period is approximately $23 billion. Please note that the economic impact in this study is limited to the site utility costs and the installed costs of the insulation. There are other potential economic benefits associated with reductions in energy generation and use as well as reduction in emissions and other environmental impacts that are beyond the scope of this research.
- Energy savings realized with energy efficient roof systems vary significantly between climate zones and vary dramatically between building types. Of the ten building types studied, seven exhibit substantial savings in all climate zones with schools reaping the greatest benefits.
- With respect to GWP, this practical means of thermal performance improvement prevents nearly 0.2 percent of the total building stock emissions in the first year alone. The compounding impact provides a GWP emissions prevention benefit of greater than 100 million metric tons CO_2-equiv. after ten years. Again, comparing this to the life cycle emissions involved in the additional insulation shows that the net zero emissions period is roughly one year.

Reference:
Phelan, J., Pavlovich, G., Ma E., Energy and Environmental Impact Reduction Opportunities for Existing Buildings with Low-Slope Roofs April 2009

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROSS-EB2-808.1.DOC

EB27–09/10
902.1

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Revise as follows:

902.1 Compliance with the building code. Where the character or use of an existing building or part of an existing building is changed to one of the following special use or occupancy categories as defined in the *International Building Code*, the building shall comply with all of the applicable requirements of the *International Building Code*:

1. Covered mall buildings.
2. Atriums.
3. Motor vehicle-related occupancies.
4. Aircraft-related occupancies.
5. Motion picture projection rooms.
6. Stages and platforms.
7. Special amusement buildings.
8. Incidental use areas.
9. Hazardous materials.
10. Ambulatory health care facilities.

Reason: As a result of Item G23 07/08, which was approved as modified, the IBC now contains specific requirements for Ambulatory health care facilities. In an ambulatory health care facility, patients are incapacitated for various lengths of time. This creates a situation where the patients may, or may not, be able to accomplish self-preservation and self-evacuation. Patients are placed at a higher risk in these facilities.

The proposal provides a method for the code officials to mitigate the increased risk when an ambulatory health care facility is constructed in an existing building.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-EB1-902.1.DOC

EB28–09/10
909.1

Proponent: Jeffrey N. Gentile, PE, Upper Darby Township, representing Pennsylvania Association of Building Code Officials, Inc.

Revise as follows:

909.1 Mechanical requirements. Where the occupancy of an *existing building* or part of an *existing building* is changed such that the new occupancy is subject to different kitchen exhaust requirements or to increased mechanical ventilation requirements in accordance with the *International Mechanical Code*, the new occupancy shall comply with the intent of the respective *International Mechanical Code* provisions.

Exception: Changes in occupancy between office and retail store as defined in Table 403.3 of the *International Mechanical Code* for spaces under 3000 square feet are not required to increase mechanical ventilation rates.

Reason: Many tenant spaces, especially those in malls and strip centers, alternate between B and M uses. For example, a craft store may become a hair salon then later a florist shop. For small establishments, the additional restroom and ventilation requirements are burdensome – often requiring the replacement of HVAC systems. These requirements are necessary in some spaces, including specialty shops as listed in IMC table 403.3, so the exception does not just list B & M occupancy types.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GENTILE-EB1-912.4.2.DOC

EB29–09/10
912.2.1

Proponent: Randall R. Dahmen, WI Registered PE, WI Licensed Commercial Building Inspector

Revise as follows:

912.2.1 Fire sprinkler system. Where a change in occupancy classification occurs that requires an automatic fire sprinkler system to be provided based on the new occupancy in accordance with Chapter 9 of the *International Building Code*, such system shall be provided throughout the fire area where the *change of occupancy* occurs.

Reason: The intent of the *International Building Code* requirements addressing the need for automatic sprinkler system installation as based on occupancy is to address each occupancies "fire area". This intent is not conveyed in the current *International Existing Building Code* wording. This proposed change is meant to clarify the intent of the IEBC requirement, as based on the current wording of the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAHMEN-EB1-912.2.1.DOC

EB30–09/10
912.4.2

Proponent: Jeffrey N. Gentile, PE, Upper Darby Township, representing Pennsylvania Association of Building Code Officials, Inc.

Revise as follows:

912.4.2 Means of egress for change of use to equal or lower hazard category. When a change of occupancy classification is made to an equal or lesser hazard category (higher number) as shown in Table 912.4, existing elements of the means of egress shall comply with the requirements of Section 805 for the new occupancy classification. When the occupant load of a building or space exceeds the provided egress capacity, then the occupant load for the building shall be determined by dividing the egress width(s) in the building by the applicable number(s) found in Section 1005.1 of the *International Building Code*. This altered occupant load is required to be clearly posted. Newly constructed or configured means of egress shall comply with the requirements of Chapter 10 of the *International Building Code*.

> **Exception:** Any stairway replacing an existing stairway within a space where the pitch or slope cannot be reduced because of existing construction shall not be required to comply with the maximum riser height and minimum tread depth requirements.

Reason: It does not make sense that the code would allow a building to be non-conformant in one of the most important life safety areas of the building code just because it is existing. The change increases the egress safety by setting a reasonable occupancy load requirement while not requiring any alterations to the building.

.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GENTILE-EB1-912.4.2.DOC

EB31–09/10
912.5.1

Proponents: Joseph A. McGrath, PE, RA, representing New York State Dep. of State, Division of Code Enforcement and Administration

Revise as follows:

912.5.1 Height and area change to higher hazard category. When a change of occupancy classification is made to a higher hazard category as shown in Table 912.5, heights and areas of buildings and structures shall comply with the requirements of Chapter 5 of the *International Building Code* for the new occupancy classification.

Exception: In other than Groups H, F-1 and S-1, in lieu of fire walls, use of fire barriers and horizontal assemblies having a fire-resistance rating of not less than that specified in Table 706.4 of the *International Building Code*, constructed in accordance with Sections 707 and 712 of the *International Building Code*, shall be permitted to meet the area limitations required for the new occupancy in buildings protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 of the *International Fire Code*. The maximum allowable area between fire barriers, horizontal assemblies or any combination thereof shall not exceed the tabular area specified in Table 503 of the *International Building Code* without any area increase allowed for an automatic sprinkler system in accordance with Section 506 of the *International Building Code*. Where horizontal assemblies are used to limit the maximum allowable area, the required fire-resistance rating of the horizontal assemblies shall be permitted to be reduced by 1-hour provided the height and number of stories increases allowed by Section 504.2 for an automatic sprinkler system are not used for the building.

Reason: This proposal is a follow-up to code change EB33-06/07 that was approved as modified by Public Comment #1 submitted by the Alliance for Fire and Smoke Containment and Control (AFSCC) at the ICC Final Action Hearings in Rochester, New York in May, 2007. The reason for the original EB33 proposal is the need to reuse existing mill buildings that are sprinklered and the fact that the original code requirement for fire walls is not financially or physically practicable. This proposal will provide an additional measure of safety to the current requirements of this section.

At the 2007 hearings the AFSCC proposed that if fire barriers were used in lieu of fire walls, a significant reduction in allowable building and fire areas should occur. We agree, so this proposal reduces the allowable building area by allowing fire fighting access (open space) credits but not sprinklering credits. An example, to use the most probable application of this proposal, would be a Type IIIB construction mill building being converted from an F-1 (moderate hazard) occupancy to an R-2 (residential) occupancy. This change in occupancy would be considered a change to a higher hazard.

Under the proposed change, the mill building described above would be allowed to have a floor area of 28,000 square feet and a total maximum floor area for all stories of 84,000 square feet between fire barriers with a maximum 75% increase allowed for open space. Present requirements for a new building would allow 60,000 square feet for a single floor area and 180,000 square feet of total floor area with the additional increase allowed for an automatic sprinkler system.

The logic behind not allowing area increases for sprinklering is because under the circumstances of the substitution of fire barriers for fire walls in these buildings, the required sprinklers should not be given extra credit.

The concept of allowing horizontal assemblies to be used to subdivide the building presumes that the fire would be contained within the six sided box formed by the fire barrier walls and horizontal assemblies and/or exterior walls and roof which is limited to the area prescribed in this proposed code change. Thus, the volume of the building separated from the rest of the building by the required fire-resistance rated construction would be comparable.

The logic behind allowing a 1-hour reduction in the required fire-resistance rating for the horizontal assemblies is based on the fact that the automatic sprinkler system provided would not be used for a height increase both in number of stories and in total feet (1 story and 20 feet), yet the building will still be compartmented with fire-resistive horizontal assemblies having, in most cases, a minimum fire-resistance rating of 2-hours and, in some cases, as low as 1-hour but only 1 hour less than what would otherwise be required by Table 705.4 by this exception for the fire barriers. Thus, the sprinkler credit that would otherwise be given for the increase in height currently allowed by Chapter 5 of the International Building Code would be used for the reduction of 1-hour in the required fire- resistance rating of the horizontal assembly. We believe this provides a reasonable equivalent level of fire and life safety protection for existing buildings being converted under this exception as modified by this code change proposal.

Cost Impact: The code change proposal will result in added costs to construction if the building is over a specific size as to require more fire barriers than the present requirements. However, the cost and practicality of converting existing buildings is still greatly improved from the requirements in the 2003 IEBC.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCGRATH-EB1-912.5.1.DOC

EB32–09/10
IEBC 912.8, 912.8.1, 912.8.2; IBC 3411.4, 3411.4.1, 3411.4.2 (IEBC [B] 310.4, 310.4.1, 310.4.2)

Proponent: Maureen Traxler, City of Seattle, WA, Seattle Dept of Planning & Development

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE FIRE CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE FIRE CODE COMMITTEE.

PART I – IEBC

Revise as follows:

912.8 Accessibility. ~~Existing buildings that undergo a change of group or occupancy shall comply with this section.~~

~~912.8.1 Partial change in occupancy.~~ Where ~~a~~ all or any portion of ~~the~~ a building is changed to a new occupancy classification, any alterations shall comply with Sections 605 and 706, as applicable.

~~912.8.2 Complete change of occupancy.~~ ~~Where an entire building undergoes a change of occupancy, it shall comply with Section 3411.4.1 and shall have all of the following accessible features:~~

1. ~~At least one accessible building entrance.~~
2. ~~At least one accessible route from an accessible building entrance to primary function areas.~~
3. ~~Signage complying with Section 1110.~~
4. ~~Accessible parking, where parking is being provided.~~
5. ~~At least one accessible passenger loading zone, when loading zones are provided.~~
6. ~~At least one accessible route connecting accessible parking and accessible passenger loading zones to an accessible entrance.~~

~~Where it is technically infeasible to comply with the new construction standards for any of these requirements for a change of group or occupancy, the above items shall conform to the requirements to the maximum extent technically feasible.~~

PART II – IBC GENERAL

Revise as follows:

3411.4 (IEBC [B] 310.4) Change of occupancy. ~~Existing buildings that undergo a change of group or occupancy shall comply with this section.~~

~~3411.4.1 (IEBC [B] 310.4.1) Partial change in occupancy.~~ Where ~~a~~ all or any portion of ~~the~~ a building is changed to a new occupancy classification, any alterations shall comply with Sections 3411.6, 3411.7 and 3411.8.

~~3411.4.2 (IEBC [B] 310.4.2) Complete change of occupancy.~~ ~~Where an entire building undergoes a change of occupancy, it shall comply with Section 3411.4.1 and shall have all of the following accessible features:~~

1. ~~At least one accessible building entrance.~~
2. ~~At least one accessible route from an accessible building entrance to primary function areas.~~
3. ~~Signage complying with Section 1110.~~
4. ~~Accessible parking, where parking is being provided.~~
5. ~~At least one accessible passenger loading zone, when loading zones are provided.~~
6. ~~At least one accessible route connecting accessible parking and accessible passenger loading zones to an accessible entrance.~~

~~Where it is technically infeasible to comply with the new construction standards for any of these requirements for a change of group or occupancy, the above items shall conform to the requirements to the maximum extent technically feasible.~~

Reason: When buildings are altered, required improvements in accessibility are limited to 20% of the cost of the alterations according to exception 1 to IBC Section 3411.7 and exception 1 to IEBC Section 605.2. According to the Access Board website [http://www.access-board.gov/ada%2Daba/adaag.cfm#a202], "Department of Justice ADA regulations state, 'Alterations made to provide an accessible path of travel to the altered area will be deemed disproportionate to the overall alteration when the cost exceeds 20% of the cost of the alteration to the primary function area.' (28 CFR 36.403 (f)(1)). See also Department of Transportation ADA regulations, which use similar concepts in the context of public sector transportation facilities (49 CFR 37.43 (e)(1))."

Changes of occupancy shouldn't be required to do more than alterations. Many changes of occupancy are accomplished with little or no construction work—a space may be refurnished and transformed from a Group M retail store to a Group B office. Any construction work that is done would be required to comply with IBC Section 3411.7 (IEBC Section 605.2), and would be subject to the 20% limitation.

The list of priority accessible features has been deleted because it is not necessary for correlation with the ADAAG, and because such a prescriptive requirement does not allow the flexibility to spend money improving the accessible route where it makes the most sense. It is our understanding that while the list was originally proposed for adoption in the new ADAAG, ultimately, it was decided to allow that flexibility, and the list does not appear in the updated ADAAG.

We think the proposal presented above is the most comprehensive and cleanest way to address our issues. However, if the Committee decides that keeping the priority list is a necessity, we would be open to a modification of the proposal that would retain all the existing language that is shown as being struck through in IBC Sections 3411.4, 3411.4.1, and 3411.4.2, but instead, just inserts an exception just after the list in Section 3411.4.2 as follows:

3411.4.2 Complete change of occupancy. Where an entire building undergoes a change of occupancy, it shall comply with Section 3411.4.1 and shall have all of the following *accessible* features:

1. At least one *accessible* building entrance.
2. At least one *accessible* route from an *accessible* building entrance to *primary function* areas.
3. Signage complying with Section 1110.
4. Accessible parking, where parking is being provided.
5. At least one *accessible* passenger loading zone, when loading zones are provided.
6. At least one *accessible* route connecting *accessible* parking and *accessible* passenger loading zones to an *accessible* entrance.

Exception: The costs of providing an *accessible* route or *accessible* features are not required to exceed 20 percent of the costs of the *alterations* affecting the area of *primary function*.

Where it is *technically infeasible* to comply with the new construction standards for any of these requirements for a change of group or occupancy, the above items shall conform to the requirements to the maximum extent technically feasible.

The corresponding changes would have to be made to IEBC Section 912.8 if this alternative is chosen (i.e., retain struck-through text in 912.8, 912.8.1, and 912.8.2, and add the new exception to 912.8.2). This would still address the issue capping the required costs of accessibility upgrades, without affecting the priority list.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TRAXLER-G11-3411.4.2

EB33–09/10

IEBC 912.8.2; IBC 3411.4.2 (IEBC [B] 310.4.2)

Proponent: Norman B. Clark, CBO, City of Caldwell, Department of Building Safety, representing self and the Idaho Association of Building Officials

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IEBC CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE FIRE CODE COMMITTEE.

PART I – IEBC

Revise as follows:

912.8 Accessibility. Existing buildings that undergo a change of group or occupancy classification shall comply with this section.

912.8.1 Partial change in occupancy. Where a portion of the building is changed to a new occupancy classification, any alterations shall comply with Sections 605 and 706, as applicable.

912.8.2 Complete change of occupancy. Where an entire building undergoes a *change of occupancy*, it shall comply with Section 912.8.1 and shall have all of the following accessible features:

1. At least one accessible building entrance.
2. At least one accessible route from an accessible building entrance to *primary function* areas.
3. Signage complying with Section 1110 of the *International Building Code*.
4. Accessible parking, where parking is provided.
5. At least one accessible passenger loading zone, where loading zones are provided.
6. At least one accessible route connecting *accessible* parking and accessible passenger loading zones to an accessible entrance.
7. At least one accessible toilet room for men and women or an accessible family assisted use toilet room complying with Section 1109.2 of the *International Building Code*.

Where it is *technically infeasible* to comply with the new construction standards for any of these requirements for a change of group or occupancy, the above items shall conform to the requirements to the maximum extent technically feasible.

PART II – IBC GENERAL

Revise as follows:

3411.4 (IEBC [B] 310.4) Change of occupancy. Existing buildings that undergo a change of group or occupancy shall comply with this section.

3411.4.1 (IEBC [B] 310.4.1) Partial change in occupancy. Where a portion of the building is changed to a new occupancy classification, any alterations shall comply with Sections 3411.6, 3411.7 and 3411.8.

3411.4.2 (IEBC [B] 310.4.2) Complete change of occupancy. Where an entire building undergoes a change of occupancy, it shall comply with Section 3411.4.1 and shall have all of the following *accessible* features:

1. At least one *accessible* building entrance.
2. At least one *accessible* route from an accessible building entrance to *primary function* areas.
3. Signage complying with Section 1110.
4. Accessible parking, where parking is being provided.
5. At least one *accessible* passenger loading zone, when loading zones are provided.
6. At least one *accessible* route connecting *accessible* parking and *accessible* passenger loading zones to an accessible entrance.
7. At least one accessible toilet room for men and women or an accessible family assisted use toilet room complying with Section 1109.2.

Where it is *technically infeasible* to comply with the new construction standards for any of these requirements for a change of group or occupancy, the above items shall conform to the requirements to the maximum extent technically feasible.

Reason: The intent of this proposal is to clarify the requirements for accessible toilet rooms, or a unisex (family assisted use) toilet room in a change of occupancy. For example: converting a single family dwelling to commercial use. Section 3411.4 addresses the six basic requirements for accessibility in a change of occupancy, but does not include toilet rooms. Section 3411.8.11 permits a family assisted use toilet room when it is technically infeasible to alter existing toilet rooms. This is under the scope for 'alterations' according to some ICC staff. Some look at it differently. This is the problem, wide open interpretation. There are ways to interpret the requirement through Section 3411.1, though many, including some ICC technical support staff, and architects interpret 'alterations' to be separate, as between Section 3411.1 and 3411.8. This is an example of interpretation from extreme opposite ends. This new wording under Section 3411.4 will clarify and eliminate, or extremely minimize the opportunity for misinterpretation. It has been argued that if you are not altering any part of a toilet room in a change of occupancy, then there wouldn't be any requirements to bring the toilet room(s) up to current accessibility standards, nor would there be the requirements for one family assisted use toilet room. This is simply not true, and this needs to be simplified. This proposal will not change the code requirements, only simplify the interpretation.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CLARK-G1-3411.4.2

EB34–09/10
912.8.2

Proponent: Lawrence Brown, CBO, National Association of Home Builders (NAHB)

Revise as follows:

912.8.2 Complete change of occupancy. Where an entire building undergoes a *change of occupancy*, it shall comply with Section 912.8.1 and shall have all of the following accessible features:

1. At least one accessible building entrance.
2. At least one accessible route from an accessible building entrance to *primary function* areas.
3. Signage complying with Section 1110 of the *International Building Code*.
4. Accessible parking, where parking is provided.
5. At least one accessible passenger loading zone, where loading zones are provided.
6. At least one accessible route connecting accessible parking and accessible passenger loading zones to an accessible entrance.

Where it is *technically infeasible* to comply with the new construction standards for any of these requirements for a change of group or occupancy, the above items shall conform to the requirements to the maximum extent technically feasible.

Exception: Type B dwelling or sleeping units required by Section 1107 of the *International Building Code* are not required to be provided in existing buildings and facilities.

Reason: The purpose of this Proposal is to reinstate this Exception that was deleted during the 2007-08 Code Development Cycle. The deletion of the Exception is contrary to the U.S. Federal Law Fair Housing Act accessibility requirements. The Federal Fair Housing Act does not require existing buildings that are converted to residential use to comply with the Fair Housing Act accessibility requirements. The IBC does not require existing buildings with a change of occupancy to residential use to contain Type B units. In fact, with the deletion of this Exception caused an inconsistency between the IBC and the IEBC. Section 3411.1 of the IBC states:

> **3409.1 Scope.** The provisions of Sections 3411.1 through 3411.9 apply to maintenance, change of occupancy, additions and alterations to existing buildings, including those identified as historic buildings.
>
> **Exception:** Type B dwelling or sleeping units required by Section 1107 are not required to be provided in existing buildings and facilities.

Federal Law for the implementing the accessibility requirements of the Fair Housing Act only apply to new buildings as described in the HUD Fair Housing Act Design Manual as follows: *"The Fair Housing Act does not require any renovations to existing buildings. Its design requirements apply to new construction only – to covered multifamily dwellings that are built for first occupancy after March 13, 1991. First occupancy is defined as "a building that has never before been used for any purpose."*

As the Federal law states, any existing building that is converted to residential use, no matter when it was constructed, is NOT required to comply with the Fair Housing Act. It also needs to be understood that the I-Codes contain provisions The I-Codes should not contain requirements that are contrary to Federal public law.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BROWN-EB1-912.8.2.DOC

EB35–09/10
1006 (New)

Proponent: Lorraine Ross, Intech Consulting Inc., representing Polyiso Insulation Manufacturers Association (PIMA)

Add new section as follows:

SECTION 1006
ENERGY CONSERVATION

1006.1 Minimum requirements. Additions to existing buildings shall conform to the energy requirements of the *International Energy Conservation Code* or *International Residential Code* as they relate to new construction.

(Renumber subsequent sections)

Reason: Although Section 1001.1 Scope states, **"**An *addition* to a building or structure shall comply with the *International Codes* as adopted for new construction without requiring the *existing building* or structure to comply with any requirements of those codes or of these provisions, except as required by this chapter. Where an *addition* impacts the *existing building* or structure, that portion shall comply with this code," there is no clear direction on Energy Conservation.

This code change proposal inserts a new section entitled, Energy Conservation, which clarifies that additions must meet the *International Energy Conservation Code* for new construction.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROSS-EB1-1006.DOC

EB36–09/10
1101.2

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

1101.2 Report. A historic building undergoing repair, alteration, or change of occupancy shall be investigated and evaluated. If it is intended that the building meet the requirements of this chapter, a written report shall be prepared and filed with the code official by a registered design professional when such a report is necessary in the opinion of the code official. Such report shall be in accordance with Chapter 1 and shall identify each required safety feature that is in compliance with this chapter and where compliance with other chapters of these provisions would be damaging to the contributing historic features. For buildings assigned to Seismic Design Category D, E, or F, a structural evaluation describing, at a minimum, the vertical and horizontal elements of the lateral force resisting system and any strengths or weaknesses therein ~~a complete load path and other earthquake-resistant features~~ shall be prepared. Additionally, the report shall describe each feature that is not in compliance with these provisions and shall demonstrate how the intent of these provisions is complied with in providing an equivalent level of safety.

Reason: This is an editorial proposal. The current provision requires the engineer to describe a complete load path whether one is present or not. Further, the term "earthquake resistant features" is vague. This proposal clarifies that the provision's intent is to require some description of the designed or *de facto* lateral system and to identify its salient features. The proposed language should be clearer, more enforceable, and more effective at producing a useful report.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB22-1101.2.DOC

EB37–09/10
1102.2, 1106.2

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Delete and substitute as follows:

~~**1102.2 Dangerous buildings.** When an historic building is determined to be dangerous, no work shall be required except as necessary to correct identified unsafe conditions.~~

1102.2 Unsafe conditions. Conditions determined by the code official to be unsafe shall be remedied. No work shall be required beyond what is required to remedy the unsafe conditions.

~~**1106.2 Unsafe structural elements.** Where the code official determines that a component or a portion of a building or structure is dangerous as defined in this code and is in need of repair, strengthening, or replacement by provisions of this code, only that specific component or portion shall be required to be repaired, strengthened, or replaced.~~

1106.2 Dangerous conditions. Conditions determined by the code official to be dangerous shall be remedied. No work shall be required beyond what is required to remedy the dangerous condition.

Reason: This proposal is editorial. It makes the use of defined terms more consistent, while preserving the intent of the Chapter. Sections 1102.2 and 1106.2 currently use the terms "dangerous" and "unsafe" interchangeably, but the definitions in Chapter 2 are not the same.

In Section1102.2, the proposal understands that the intent of the current provision is to address unsafe conditions (as defined in Chapter 2) without triggering additional work. The proposed language is clearer and uses "unsafe" in place of "dangerous."

In Section 1106.2, which is in the Structural portion of the Chapter, the proposal deletes unnecessary language and uses the structural term "dangerous" in place of "unsafe."

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB23-1102.2.DOC

EB38–09/10
1202.3, 1202.4

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

1202.3 Wind loads. Buildings shall comply with *International Building Code* or *International Residential Code* wind provisions as applicable.

Exceptions:

1. Detached one- and two-family dwellings and Group U occupancies where wind loads at the new location are not higher than those at the previous location.
2. Structural elements whose stress is not increased by more than ~~5~~ 10 percent.

1202.4 Seismic loads. Buildings shall comply with *International Building Code* or *International Residential Code* seismic provisions at the new location as applicable.

Exceptions:

1. Structures in Seismic Design Categories A and B and detached one- and two-family dwellings in Seismic Design Categories A, B, and C where the seismic loads at the new location are not higher than those at the previous location.
2. Structural elements whose stress is not increased by more than ~~5~~ 10 percent.

Reason: This proposal makes the wind and seismic upgrade triggers in Chapter 12 consistent with those already in Sections 302.4, 303.4, 707.5, 807.4.3, and 1003.3. Over the last several code cycles, all the lateral triggers have been increased from 5% to 10%, and Chapter 12 should be consistent.

The proposal also corrects the misspelling of the word "structural" in the exception to Section 1202.4.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB18-1202.3.DOC

EB39–09/10
1202.8 (New)

Proponent: Randall R. Dahmen, WI Registered PE, WI Licensed Commercial Building Inspector

Add new text as follows:

1202.8 Building envelope. A relocated or moved building shall comply with the *International Energy Conservation Code* for building envelope requirements when the building is relocated or moved to a different climate zone.

Reason: In order to create efficient building energy performance, this code change requires those buildings that change regions of climate where there are more restrictive building envelope requirements, to meet the more restrictive performance criteria of the IECC for the new location Buildings are many times relocated or moved from regions of the country which are typically warm, and which require minimal insulation at the time of original construction, to regions that are extremely cold, whose minimum requirements for building insulation are significantly greater. Similarly, buildings that are relocated or moved from a cold climate to a warm climate may find that they may need to make changes to the existing glazing in order to comply with the Solar Heat Gain Coefficient (SHGC) requirements.

At present, there are no rules requiring that the relocated building install additional insulation to the building envelope assemblies. This seems inappropriate, since the original design was intended for the original building location, not the proposed relocation.

It is the opinion of this author that this proposal is an extension of the snow load requirements already addressed under IEBC 1202.5. Clearly it has been established that when a building changes locations, it needs to be modified so as to appropriately accommodate the climatic conditions of the new site. This is a continuation of that thought process.

Cost Impact: Minimal. Exact costs would be dependent on the significance in the change in climate for the moved or relocated building.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAHMEN-EB2-1202.8.DOC

EB40–09/10
A102.2

Proponent: Peter Somers, Magnusson Klemencic Associates, National Council of Structural Engineers Associations/Code Advisory Committee/Existing Buildings Subcommittee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

A102.2 Essential and hazardous facilities. The provisions of this chapter shall not apply to the strengthening of buildings ~~or structures~~ in Occupancy ~~Category~~ Categories III ~~when assigned to Seismic Design Category C, D, or E~~ or ~~buildings or structures in Occupancy Category~~ IV. Such buildings ~~or structures~~ shall be strengthened to meet the requirements of the *International Building Code* for new buildings of the same occupancy category or other such criteria approved by the code official. ~~that have been established by the jurisdiction.~~

Reason: It does not make any sense to allow the seismic risk reduction procedures of Appendix Chapter A1 to be used for Occupancy III buildings assigned to Seismic Design Category B, but not Seismic Design Categories C-E. The enhanced seismic performance objectives for Occupancy Category III buildings apply relatively uniformly across all seismic design categories in the IBC and ASCE 7-05. In particular, Occupancy Category III buildings in all seismic design categories are designed using a seismic Importance Factor equal to 1.25, making them stronger than Occupancy Category II buildings. The provisions of A1 do not have any reference to an importance factor (which is equal to 1.0 for Occupancy Category II buildings), and so they really should not assumed to be applicable to Occupancy Category III buildings, regardless of seismic design category.

Furthermore, the scoping of Chapter A1 in IEBC Section 101.5.4.2 excludes Occupancy Category III (and IV), so this proposal makes the appendix chapter consistent with its use as permitted in Section 101.5.4.2.

The change at the end of Section A102.2 is editorial for consistency with code terminology.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SOMERS-EB2-A102.2.DOC

EB41–09/10
A103

Proponent: Peter Somers, Magnusson Klemencic Associates, National Council of Structural Engineers Associations/Code Advisory Committee/Existing Buildings Subcommittee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

1. Delete definitions without substitution:

SECTION A103
DEFINITIONS

~~**BUILDING CODE**. The code current adopted by the jurisdiction~~

~~**INTERNATIONAL BUILDING CODE.** The 2009 *International Building Code* (IBC)~~

2. Add new definition as follows:

FLEXIBLE DIAPHRAGM. A diaphragm of wood or untopped metal deck construction.

3. Revise definition as follows:

RIGID DIAPHRAGM. A diaphragm of ~~reinforced~~ concrete construction ~~supported by concrete beams and columns or by structural steel beams and columns.~~

Reason: The definitions for Building Code and International Building Code are unnecessary and are not included in the other appendix chapters.

The definition for flexible diaphragm is added since it is required for Section A111.1, which determines where the Special Procedure can be used.

The proposed revision to the definition rigid diaphragm is essentially editorial since a diaphragm's rigidity has no relationship to the type of framing system that supports the floors and roof, and older concrete diaphragms might not be "reinforced" based on current code definitions, yet would still be considered rigid based on stiffness.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SOMERS-EB3-A103.DOC

EB42–09/10
A110.2

Proponent: Peter Somers, Magnusson Klemencic Associates, National Council of Structural Engineers Associations/Code Advisory Committee/Existing Buildings Subcommittee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

A110.2 Lateral forces on elements of structures. Parts and portions of a structure not covered in Sections A110.3 shall be analyzed and designed per the current building code, using force levels defined in Section A110.1.

Exceptions:

1. Unreinforced masonry walls for which height-to-thickness ratios do not exceed ratios set forth in Table A1-B need not be analyzed for out-of-plane loading. Unreinforced masonry walls that exceed the allowable *h/t* ratios of Table A1-B shall be braced according to Section A113.5.
2. Parapets complying with Section A113.6 need not be analyzed for out-of-plane loading.
3. Walls in buildings with flexible diaphragms shall be anchored to floor and roof diaphragms in accordance with Section A113.1.

Reason: The proposed change provides appropriate wall anchorage forces for buildings with rigid diaphragms. The wall anchorage force currently specified in Section A113.1.3 ($0.9S_{DS}$) is similar to the IBC wall anchorage force for new masonry construction with flexible diaphragms ($0.8S_{DS}$ per ASCE 7-05 section 12.11.2.1), but is more than twice the IBC wall anchorage force for new construction with rigid diaphragms ($0.4S_{DS}$ per ASCE 7-05 section 12.11.2).

Therefore, this proposal maintains the current Chapter A1 provisions for wall anchorage with flexible diaphragms and points the use back to the IBC for wall anchorage with rigid diaphragms (by making the exception only apply to flexible diaphragms). The wall anchorage requirements for flexible diaphragms were based on the ABK research in the 1980s, but that program did not cover buildings with rigid diaphragms, so it is appropriate to refer to the building code for wall anchorage forces consistent with other parts of this section.

Cost Impact: The code change proposal could lead to a significant reduction in cost to masonry wall anchorage in buildings with rigid diaphragm.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SOMERS-EB1-A110.2.DOC

EB43–09/10
A301.2

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

A301.2 Scope. The provisions of this chapter apply to residential buildings of light-frame wood construction ~~assigned to Seismic Design Category C, D or E of the *International Building Code*~~ containing one or more of the structural weaknesses specified in Section A303.

Exception: The provisions of this chapter do not apply to the buildings, or elements thereof, listed below. These buildings or elements require analysis by an engineer or architect in accordance with Section A301.3 to determine appropriate strengthening:

1. Group R-1, R-2 or R-4 occupancies with more than four dwelling units.
2. Buildings with a lateral-force-resisting system using poles or columns embedded in the ground.
3. Cripple walls that exceed 4 feet (1219 mm) in height.
4. Buildings exceeding three stories in height and any three-story building with cripple wall studs exceeding 14 inches (356 mm) in height.
5. Buildings where the building official determines that conditions exist that are beyond the scope of the prescriptive requirements of this chapter.
6. Buildings or portions thereof constructed on concrete slabs on grade.

The details and prescriptive provisions herein are not intended to be the only acceptable strengthening methods permitted. Alternative details and methods may be used when approved by the building official. Approval of alternatives shall be based on test data showing that the method or material used is at least equivalent in terms of strength, deflection and capacity to that provided by the prescriptive methods and materials.

The provisions of this chapter may be used to strengthen historic structures, provided they are not in conflict with other related provisions and requirements that may apply.

Reason: This proposal clarifies the intent of the first paragraph of this section. The balance of the section, not shown, remains unchanged by this proposal.

Appendix Chapter A3 originated as stand-alone provisions in various jurisdictions in California. In those conditions, it was appropriate to include scoping provisions to indicate that retrofit was only required or advised in areas of higher seismic risk. However, with their use in the IEBC, the provisions are either used to satisfy triggered upgrades via IEBC Section 101.5.4.2 or used for a voluntary seismic upgrade (allowed under IEBC Section 707.6). For both reasons, the scoping of the appendix chapter should not restrict their use to certain seismic design categories. The sections of the IEBC where seismic upgrade triggers occur (see Sections 502.2.2, 707.5, or 807.4) do not distinguish between seismic design categories, so neither should the appendix chapter. The intent of this proposal is to permit this chapter's use at the option of the registered design professional regardless of seismic design category.

With the proposed modification, Appendix Chapter A3 could be used in all seismic design categories, although the following should be noted:

- Structures assigned to SDC A are exempt from most seismic provisions per ASCE 7-05 Section 11.7,
- Dwellings in low seismic design categories are exempt from all seismic provisions per IBC Section 1613.1, and
- Residential buildings would not be assigned to Seismic Design Category F.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB6- A301.2.-3.DOC

EB44–09/10
A301.2

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

A301.2 Scope. The provisions of this chapter apply to residential buildings of light-frame wood construction assigned to Seismic Design Category C, D or E of the *International Building Code* containing one or more of the structural weaknesses specified in Section A303.

Exception: The provisions of this chapter do not apply to the buildings, or elements thereof, listed below. These buildings or elements require analysis by an engineer or architect in accordance with Section A301.3 to determine appropriate strengthening:

1. Group R-1, R-2 or R-4 occupancies with more than four dwelling units.
2. Buildings with a lateral-force-resisting system using poles or columns embedded in the ground.
3. Cripple walls that exceed 4 feet (1219 mm) in height.
4. Buildings exceeding three stories in height and any three-story building with cripple wall studs exceeding 14 inches (356 mm) in height.
5. Buildings where the building official determines that conditions exist that are beyond the scope of the prescriptive requirements of this chapter.
6. Buildings or portions thereof constructed on concrete slabs on grade.

The details and prescriptive provisions herein are not intended to be the only acceptable strengthening methods permitted. Alternative details and methods may be used when approved by the building official. Approval of alternatives shall be based on test data showing that the method or material used is at least equivalent in terms of strength, deflection and capacity to that provided by the prescriptive methods and materials.

~~The provisions of this chapter may be used to strengthen historic structures, provided they are not in conflict with other related provisions and requirements that may apply.~~

Reason: This sentence is unnecessary and confusing. First, it might conflict with more general provisions for historic buildings in IEBC chapter 11. Also, it seems to suggest that all the other scope limitations of A301.2 – post supports, brick footings, etc., as well as archaic existing materials or details – may be waived for any historic building. That was not the intent of the sentence. Rather, the intent was to allow the use of this chapter unless historic codes restrict certain work, but such a statement is not needed. Further, as noted in the Chapter A3 commentary, historic houses sometimes have post supports or other conditions that would make this chapter difficult to apply, and those conditions call for consultation with the building department, which is at odds with this single sentence in A301.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB5- A301.2-2.DOC

EB45–09/10
A301.2, A301.3, A304.1.1

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

A301.2 Scope. The provisions of this chapter apply to residential buildings of light-frame wood construction assigned to Seismic Design Category C, D or E of the *International Building Code* containing one or more of the structural weaknesses specified in Section A303.

Exception: The provisions of this chapter do not apply to the buildings, or elements thereof, listed below. These buildings or elements require analysis by an engineer or architect in accordance with Section A301.3 to determine appropriate strengthening:

1. Group R-1, R-2 or R-4 occupancies with more than four dwelling units.
2. Buildings with a lateral-force-resisting system using poles or columns embedded in the ground.
3. Cripple walls that exceed 4 feet (1219 mm) in height.
4. Buildings exceeding three stories in height and any three-story building with cripple wall studs exceeding 14 inches (356 mm) in height.
5. Buildings where the building official determines that conditions exist that are beyond the scope of the prescriptive requirements of this chapter.
6. Buildings or portions thereof constructed on concrete slabs on grade.

~~The details and prescriptive provisions herein are not intended to be the only acceptable strengthening methods permitted. Alternative details and methods may be used when approved by the building official. Approval of alternatives shall be based on test data showing that the method or material used is at least equivalent in terms of strength, deflection and capacity to that provided by the prescriptive methods and materials.~~

The provisions of this chapter may be used to strengthen historic structures, provided they are not in conflict with other related provisions and requirements that may apply.

A301.3 Alternative design procedures. The details and prescriptive provisions herein are not intended to be the only acceptable strengthening methods permitted. Alternative details and methods may be used where designed by a registered design professional and approved by the code official. Approval of alternatives shall be based on a demonstration that the method or material used is at least equivalent in terms of strength, deflection and capacity to that provided by the prescriptive methods and materials.

Where ~~When~~ analysis by a registered design professional ~~an engineer or architect~~ is required ~~in accordance with Section A301.2,~~ such analysis shall be in accordance with all requirements of the building code, except that the seismic forces ~~base shear~~ may be taken as 75 percent of those ~~the horizontal forces~~ specified in the building code.

A304.1.1 Scope. The structural weaknesses noted in Section A303 shall be strengthened in accordance with the requirements of this section. Strengthening work may include both new construction and alteration of existing construction. Except as provided herein, all strengthening work and materials shall comply with the applicable provisions of the building code. ~~Alternative methods of strengthening may be used provided such systems are designed by an engineer or architect and are approved by the building official.~~

Reason: This proposal is mostly editorial. It relocates three sentences from current section A301.2 to section A301.3 and makes coordinating revisions. These three sentences are clearly about alternative methods. They belong in A301.3, so this proposal moves them there, and edits them slightly for consistent terminology. The portion of current A301.2 not shown is to remain unchanged by this proposal.

Once these sentences are relocated to A301.3, the current reference to A301.2 (in A301.3) is no longer needed. The other changes shown in A301.3 are editorial, for consistent terminology. In A304.1.1, the final sentence duplicates the relocated provision above and is proposed for deletion.

There is one substantive change: In the last of the three relocated sentences, the current call for "test data" is proposed for revision. The I-codes typically allow alternatives, and test data are not always required. Reasonable alternatives can also be justified on the basis of engineering analysis, proprietary data, conventional methods, or other consensus documents derived from test data but not necessarily based on that data directly. Approval of the code official is still required, and the key issues are identified in the rest of the sentence, which remains unchanged.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB4-A301.2.DOC

EB46–09/10
A303

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

SECTION A303
STRUCTURAL WEAKNESSES

For the purpose of this chapter, structural weaknesses shall be as specified below.

1. Sill plates or floor framing that are supported directly on the ground without a foundation system that conforms to the building code ~~an approved foundation system~~.
2. A perimeter foundation system that is constructed only of wood posts supported on isolated pad footings.
3. Perimeter foundation systems that are not continuous.

   Exceptions:

   1. Existing single-story exterior walls not exceeding 10 feet (3048 mm) in length, forming an extension of floor area beyond the line of an existing continuous perimeter foundation.
   2. Porches, storage rooms and similar spaces not containing fuel-burning appliances.

4. A perimeter foundation system that is constructed of unreinforced masonry or stone.
5. Sill plates that are not connected to the foundation or that are connected with less than what is required by the building code.

   Exception: When approved by the building official, connections of a sill plate to the foundation made with other than sill bolts may be accepted if the capacity of the connection is equivalent to that required by the building code.

6. Cripple walls that are not braced in accordance with the requirements of Section A304.4 and Table A3-A, or cripple walls not braced with diagonal sheathing or wood structural panels in accordance with the building code.

Reason: This proposal makes the provision more consistent and enforceable. The intent of this section is to identify non-conforming conditions expected to lead to deficient performance. The conditions should be objectively defined, as they are for all but item 1. This proposal therefore modifies item 1 to make it consistent with the rest of the section.

Approval of alternate conditions remains a possibility under section A301.3 but “approval” is not the subject of section A303.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB3-A303.DOC

EB47–09/10

A304.1.3, A304.1.4, Figure A3-8, Figure A3-8A(New), Figure A3-8B(New), Figure A3-8C(New), Figure A3-9,

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

1. Revise as follows:

A304.1.3 Floor joists not parallel to foundations. Floor joists framed perpendicular or at an angle to perimeter foundations shall be restrained either by an existing nominal 2-inch-wide (51 mm) continuous rim joist or by a nominal 2-inch-wide (51 mm) full-depth block~~ing~~ between alternate joists in one-and two-story buildings, and between each joist in three-story buildings. Existing blocking for multistory buildings must occur at each joist space above a braced cripple wall panel.

Existing connections at the top and bottom edges of an existing rim joist or blocking need not be verified in one-story buildings. In multistory buildings, the existing top edge connection need not be verified; however, the bottom edge connection to either the foundation sill plate or the top plate of a cripple wall shall be verified. The minimum existing bottom edge connection shall consist of 8d toenails spaced 6 inches (152mm) apart for a continuous rim joist, or three 8d toenails per block. When this minimum bottom edge-connection is not present or cannot be verified, a supplemental connection installed as shown in ~~Figure A3-8~~ Figure A3-8A or A3-8C shall be provided.

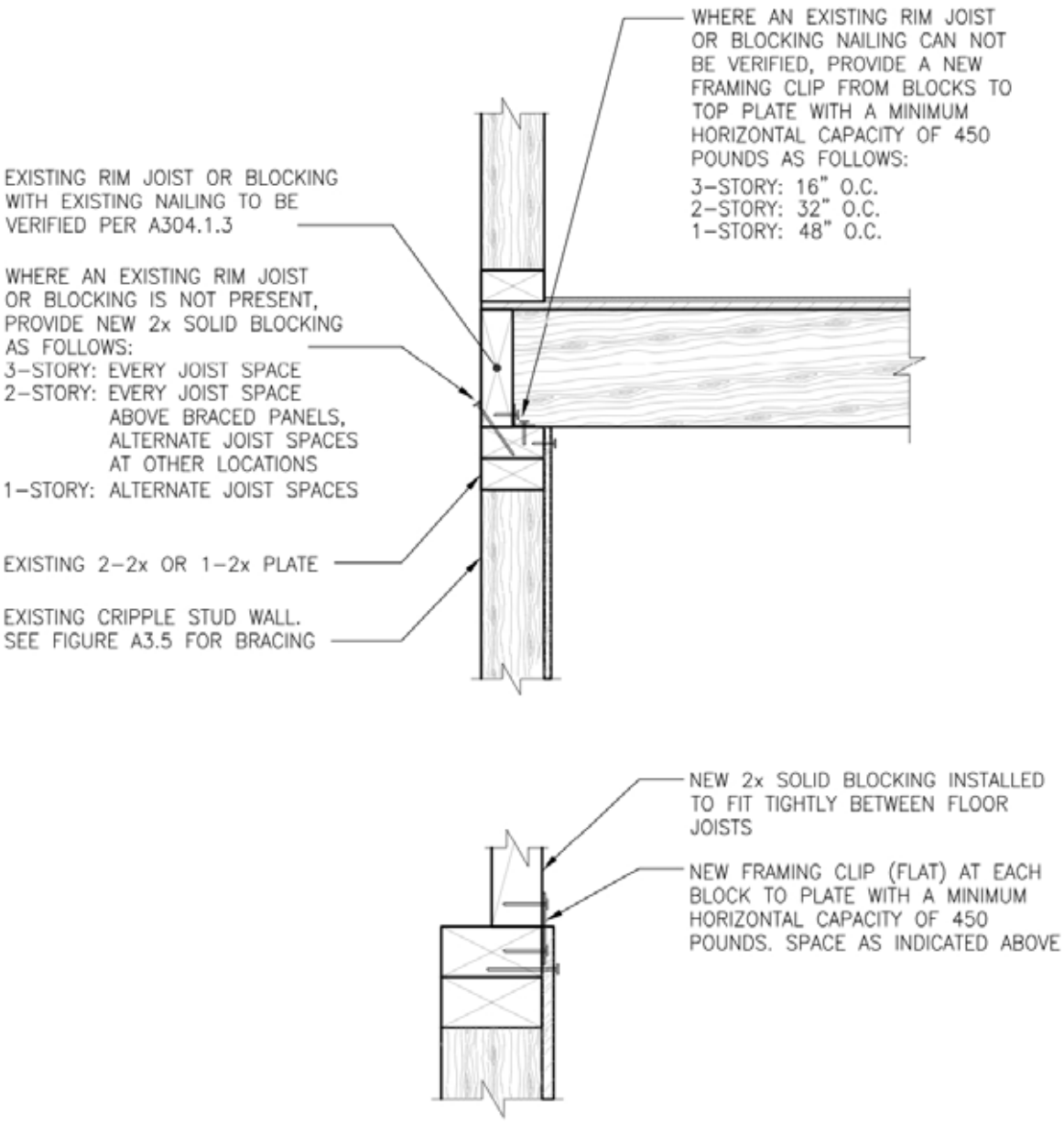
Where an existing continuous rim joist or the minimum existing blocking does not occur, new ¾-inch or 23/32"(19 mm) wood structural panel blocking installed tightly between floor joists and nailed as shown in Figure ~~A3-8~~ A3-9 shall be provided at the inside face of the cripple wall. In lieu of ~~3/4-inch (19 mm)~~ wood structural panel blocking, tight fitting, full-depth 2-inch (51 mm) blocking may be used. New blocking may be omitted where it will interfere with vents or plumbing that penetrates the wall.

A304.1.4 Floor joists parallel to foundations. Where existing floor joists are parallel to the perimeter foundations, the end joist shall be located over the foundation and, except for required ventilation openings, shall be continuous and in continuous contact with the foundation sill plate or the top plate of the cripple wall. Existing connections at the top and bottom edges of the end joist need not be verified in one-story buildings. In multistory buildings, the existing top edge connection of the end joist need not be verified; however, the bottom edge connection to either the foundation sill plate or the top plate of a cripple wall shall be verified. The minimum bottom edge connection shall be 8d toenails spaced 6 inches (152 mm) apart. If this minimum bottom edge connection is not present or cannot be verified, a supplemental connection installed as shown in Figure ~~A3-9~~ A3-8B, A3-8C, or A3-9 shall be provided.

2. Delete current figures and substitute as follows:

~~**FIGURE A3-8—ALTERNATE BLOCKING WHERE RIM JOIST OR BLOCKING HAS BEEN OMITTED**~~

~~**FIGURE A3-9—CONNECTION OF CRIPPLE WALL TO FLOOR SHEATHING WHEN FLOOR FRAMING IS PARALLEL TO WALL**~~



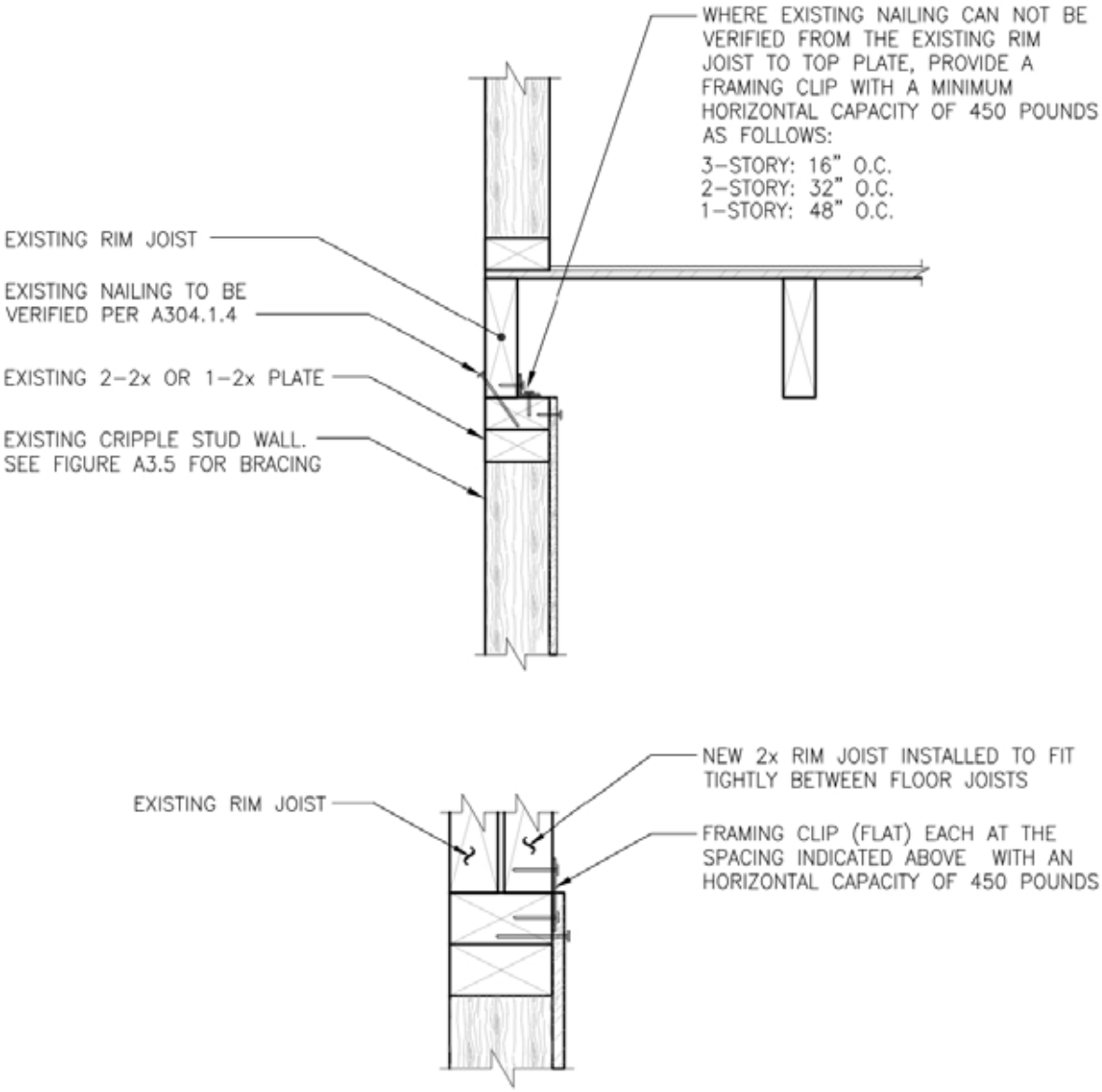
ALTERNATE DETAIL FOR
FLUSH CONDITION

FOR SI: 1 INCH = 25.4mm, 1 POUND = 4.4N.

NOTES:

1. SEE MANUFACTURING INSTRUCTIONS FOR NAIL SIZES ASSOCIATED WITH METAL FRAMING CLIPS.

FIGURE A3-8A – TYPICAL FLOOR TO CRIPPLE WALL CONNECTION (FLOOR JOISTS NOT PARALLEL TO FOUNDATIONS)



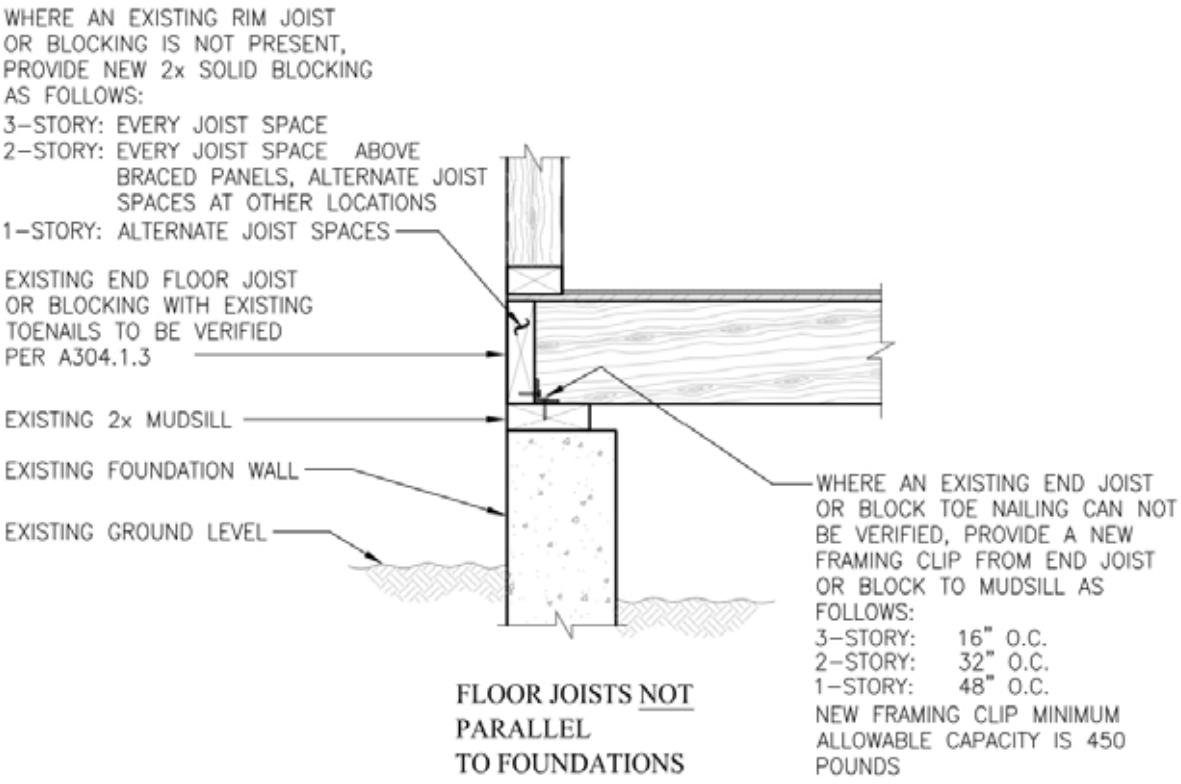
ALTERNATE CONNECTION
FOR FLUSH CONNECTION

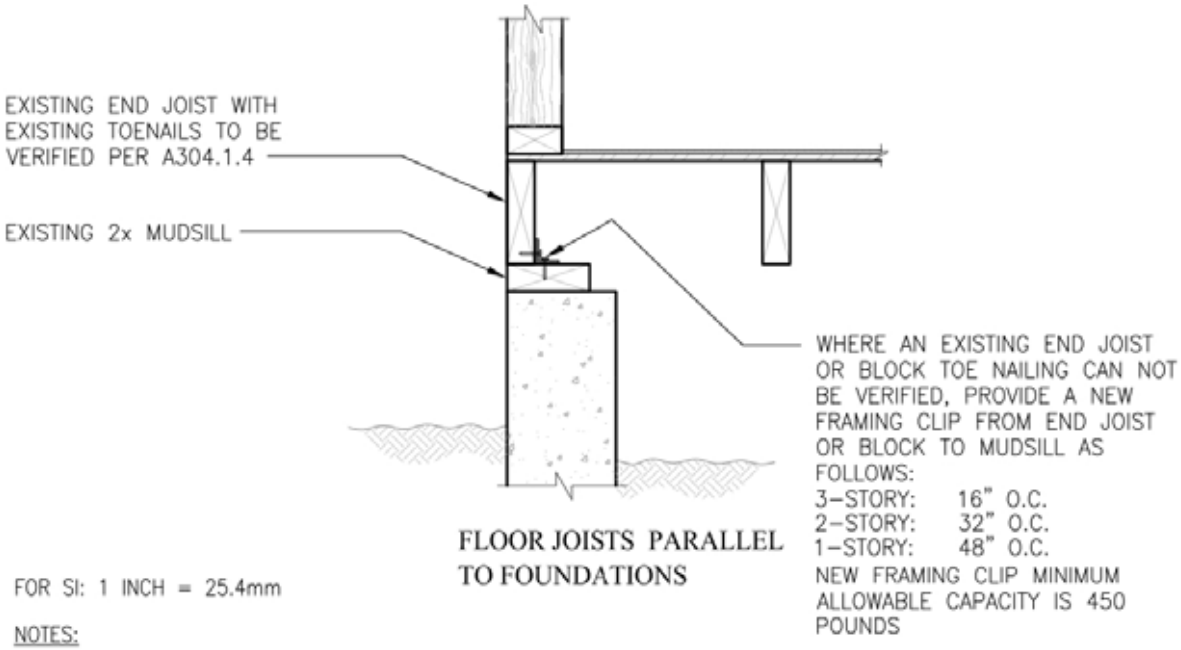
FOR SI: 1 INCH = 25.4mm, 1 POUND = 4.4N.

NOTES:

1. SEE MANUFACTURING INSTRUCTIONS FOR NAIL SIZES ASSOCIATED WITH METAL FRAMING CLIPS.

FIGURE A3-8B – TYPICAL FLOOR TO CRIPPLE WALL CONNECTION (FLOOR JOISTS PARALLEL TO FOUNDATIONS)



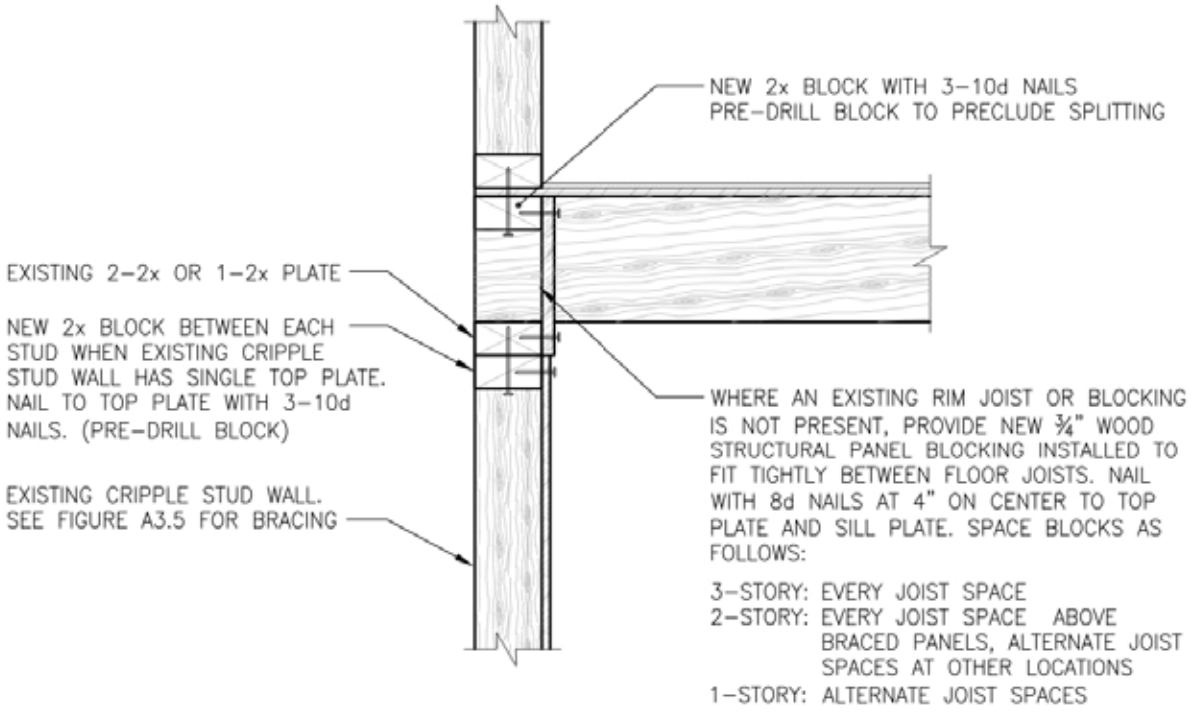


FOR SI: 1 INCH = 25.4mm

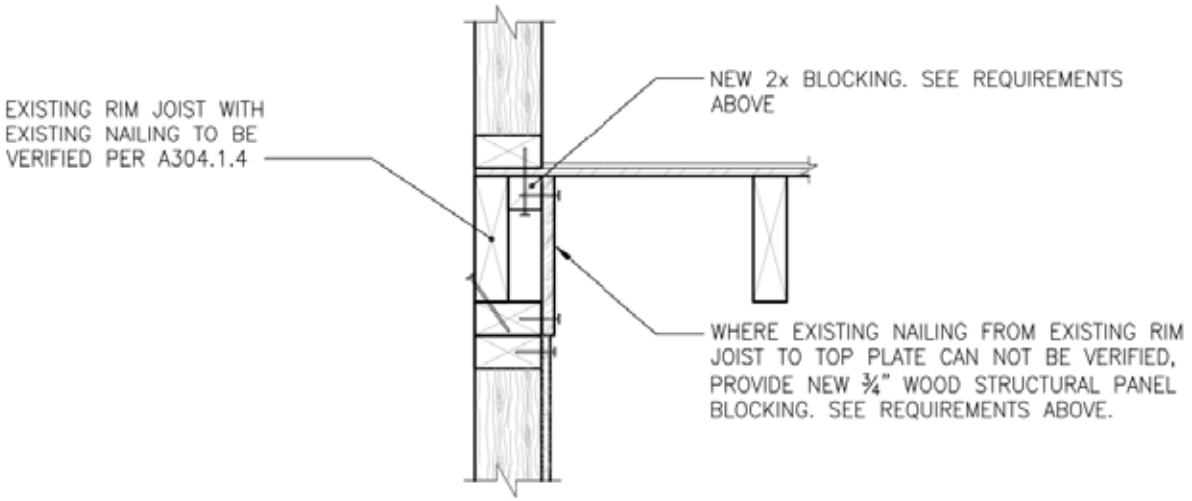
NOTES:

1. SEE SECTION A304.3 FOR SILL PLATE ANCHORAGE.
2. SEE MANUFACTURING INSTRUCTIONS FOR NAIL SIZES ASSOCIATED WITH METAL FRAMING CLIPS.

FIGURE A3–8C – TYPICAL FLOOR TO MUDSILL CONNECTIONS



FLOOR JOISTS NOT PARALLEL TO FOUNDATION



FLOOR JOISTS PARALLEL TO FOUNDATION

FOR SI: 1 INCH = 25.4mm, 1 POUND = 4.4N.

NOTES: SEE SECTION A304.4 FOR CRIPPLE WALL BRACING.

FIGURE A3–9 – ALTERNATE FLOOR FRAMING TO CRIPPLE WALL CONNECTION

Reason: This proposal updates and replaces Figures A3-8 and A3-9, and makes corresponding revisions to the text. In the last paragraph of A304.1.3, ¾" plywood is also referenced as 23/32" as this is more common at lumber yards.

The 2009 figures proposed for replacement or modification are rarely used, as they have been found to be impractical or of limited capacity. 2009 Figures A3-8 and A3-9 attempted to address the floor-to-cripple wall attachment with a plywood gusset concept for both parallel and non-parallel floor framing conditions. However, the approach was both uneconomical and of limited capacity due to a poor connection between the top of the gusset and the floor diaphragm. In 2009 figure A3-8 there is no attachment between the top of the plywood gusset and the floor diaphragm. The detail thus relies for shear transfer on compression of a plywood gusset with an unsupported top. 2009 Figure A3-9 indicates an attachment to the floor diaphragm, but this attachment would be made with shot nails or wood screws into the existing flooring, which is not recommended.

The proposed figures illustrate preferred approaches for creating a load path between the existing floor structure and either the top of the cripple wall (Figures A3-8A and A3-8B) or the sill plate (Figure A3-8C). These new Figures systematically address the four most common conditions found in houses eligible for Chapter A3 with reliable and cost effective details. Similar to portions of 2009 Figure A3-8, these new details utilize readily available and well-documented metal fasteners.

Proposed Figure A3-9 is a modification of 2009 Figure A3-8 with the upper portion of 2009 Figure A3-9 retained as an alternative for cases where the plywood gusset approach might be suitable. The 2009 details have been modified to provide a simpler and more reliable attachment to the floor diaphragm that does not risk damage to the interior flooring.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB14-A304.1.3.DOC

EB48–09/10
A304.2.2

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

A304.2.2 Evaluation of existing foundations ~~Foundation evaluation by an engineer or architect~~. Partial perimeter foundations or unreinforced masonry foundations shall be evaluated by a registered design professional ~~an engineer or architect~~ for the force levels specified ~~noted~~ in Section A301.3. Test reports or other substantiating data to determine existing foundation material strengths shall be submitted to the code official ~~for review~~. Where ~~When~~ approved by the code ~~building~~ official, these existing foundation systems may be strengthened in accordance with the recommendations included with the evaluation in lieu of being replaced.

Exception: In lieu of testing existing foundations to determine material strengths, and where ~~when~~ approved by the code ~~building~~ official, a new nonperimeter foundation system designed for the forces specified ~~noted~~ in Section A301.3 may be used to resist ~~all exterior~~ lateral forces from perimeter walls. A registered design professional shall confirm the ability of the existing diaphragm to transfer seismic forces to the new nonperimeter foundations.

Reason: This proposal is primarily editorial, for clarity and consistency of terminology. The exception allows interior foundation walls to resist lateral forces coming from the perimeter of the building. The design professional responsible for the new non-perimeter foundation should also check the diaphragm as part of this offset load path.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB9- A304.2.2.DOC

EB49–09/10
A304.2.3 through A304.2.6, A304.2.6 (New), Appendix A

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

1. Revise as follows:

A304.2.3 Details for new perimeter foundations. All new perimeter foundations shall be continuous and constructed according to ~~one of the details shown in~~ either Figure A3-1 or A3-2. All new construction materials shall comply with the requirements of building code. Where approved by the code official, the existing clearance between existing floor joists or girders and existing grade below the floor need not comply with the building code.

Exception~~s~~:

1. ~~When approved by the building official, the existing clearance between existing floor joists or girders and existing grade below the floor need not comply with the building code.~~
2. ~~2.~~ Where designed by a registered design professional and ~~When~~ approved by the code ~~building~~ official, ~~and when designed by an engineer or architect,~~ partial perimeter foundations may be used in lieu of a continuous perimeter foundation.

A304.2.4 New concrete foundations ~~Required compressive strength~~. New concrete foundations shall have a minimum compressive strength of 2,500 pounds per square inch (17.24 MPa) at 28 days.

A304.2.5 New hollow-unit masonry foundations. New hollow-unit masonry foundations shall be solidly grouted. The grout shall have minimum compressive strength of 2,000 pounds per square inch (13.79 MPa). Mortar shall be Type M or S~~, and grout and masonry units shall comply with the building code~~.

~~**A304.2.6 Reinforcing steel**. Reinforcing steel shall comply with the requirements of the building code.~~

A304.2.6 New sill plates. Where new sill plates are used in conjunction with new foundations, they shall be minimum 2x nominal thickness and shall be preservative-treated wood or foundation grade redwood marked or branded by an approved agency. Nails in contact with preservative-treated wood shall be hot-dip galvanized. Metal framing anchors in contact with preservative-treated wood shall be galvanized in accordance with ASTM A153 with a G185 coating.

2. Add standard to Appendix A referenced standards:

ASTM

A153/A153M-05	Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

Reason: This proposal addresses a series of provisions all related to new foundation elements. It proposes a number of editorial revisions for clarity and consistency of terminology, as well as a few substantive improvements, as follows:

In A304.2.3, a general reference to the building code is proposed so that subsequent sections (A304.2.5 and A304.2.6) don't each need to refer to the building code. The final sentence of the section is merely relocated from Exception 1. Since the referenced details have no provisions for minimum under-floor clearances, this allowance for code official discretion is not actually an Exception. This is an editorial change. Exception 2 is edited for consistent terminology.

A304.2.4 is merely re-titled for consistency.

A304.2.5 is clarified by the addition of a minimum grout strength consistent with the code for new construction, a reflection of standard practice that improves these prescriptive provisions.

Current A304.2.6 is proposed for deletion. References here to the building code are unnecessary if a general requirement is added per A304.2.3.

A new section (proposed A304.2.6) addresses sill plates on new foundations. The construction of new footings will likely require a new sill plate. The proposal makes requirements for this new member and connectors.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: ASTM A153/A153M-05 is currently referenced in the IBC.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB10- A304.2.3.DOC

EB50–09/10
A304.3.1, A304.3.2, A304.3.3, A304.5, A302

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

A304.3.1 Existing perimeter foundations. Where ~~When~~ the building has an existing continuous perimeter foundation, all perimeter wall sill plates shall be anchored ~~bolted~~ to the foundation with adhesive ~~chemical~~ anchors or expansion anchors ~~bolts~~ in accordance with Table A3-A.

Anchors ~~or bolts~~ shall be installed in accordance with Figure A3-3, with the plate washer installed between the nut and the sill plate. The nut shall be tightened to a snug-tight condition after curing is complete for adhesive ~~chemical~~ anchors and after expansion wedge engagement for expansion ~~bolts~~ anchors. All anchors shall be installed in accordance with manufacturer's recommendations. ~~The installation of nuts on all bolts shall be subject to verification by the building official.~~ Where existing conditions prevent anchor ~~or bolt~~ installations through the sill plate, this connection may be made in accordance with Figure A3-4A, A3-4B, or A3-4C. The spacing of these alternate connections shall comply with the maximum spacing requirements of Table A3-A. Expansion anchors ~~bolts~~ shall not be used where ~~when~~ the installation causes surface cracking of the foundation wall at the locations of the bolt.

A304.3.2 Placement of ~~chemical~~ anchors ~~and expansion bolts~~. ~~Chemical anchors or expansion bolts~~ Anchors shall be placed within 12 inches (305 mm), but not less than 9 inches (229mm), from the ends of sill plates and shall be placed in the center of the stud space closest to the required spacing. New sill plates may be installed in pieces ~~when~~ where necessary because of existing conditions. For lengths of sill plate greater than 12 feet (3658mm), anchors or bolts shall be spaced along the sill plate as specified ~~noted~~ in Table A3-A. For other lengths of sill plate, ~~see~~ anchor placement shall be in accordance with Table A3-B. ~~For lengths of sill plate less than 30 inches (762mm), a minimum of one anchor or bolt shall be installed.~~

Exception: Where physical obstructions such as fireplaces, plumbing or heating ducts interfere with the placement of an anchor ~~or bolt~~, the anchor ~~or bolt~~ shall be placed as close to the obstruction as possible, but not less than 9 inches (229 mm) from the end of the plate. Center-to-center spacing of the anchors ~~or bolts~~ shall be reduced as necessary to provide the minimum total number of anchors required based on the full length of the wall. Center-to-center spacing shall not be less than 12 inches (305mm).

A304.3.3 New perimeter foundations. Sill plates for new perimeter foundations shall be ~~bolted as required by~~ anchored in accordance with Table A3-A and as shown in Figure A3-1 or A3-2.

A304.5 Quality control. All work shall be subject to inspection by the ~~building~~ code official including, but not limited to:

1. Placement and installation of new ~~chemical anchors or expansion bolts~~ adhesive or expansion anchors installed in existing foundations. Special inspection is not required for ~~chemical~~ adhesive anchors installed in existing foundations regulated by the prescriptive provisions of this chapter.
2. Installation and nailing of new cripple wall bracing.
3. Any work may be subject to special inspection when required by the ~~building~~ code official in accordance with the building code.

ADHESIVE ~~CHEMICAL~~ ANCHOR. An assembly consisting of a threaded rod, washer, nut, and chemical adhesive approved by the code building official for installation in existing concrete or masonry.

EXPANSION ~~BOLT~~ ANCHOR. ~~A single assembly approved by the building official for installation in existing concrete or masonry. For the purpose of this chapter, expansion bolts shall contain a base designed to expand when properly set, wedging the bolt in the pre-drilled hole. Assembly shall also include appropriate washer and nut.~~ An approved post-installed anchor, inserted into a pre-drilled hole in existing concrete or masonry, that transfers loads to or from the concrete or masonry by direct bearing or friction or both.

Reason: This proposal is primarily editorial. It renames and revises the definitions of the two anchor types for consistency with definitions now used in ACI 318 Appendix D and other ICC-ES resources. It also makes editorial revisions as needed to reflect the revised terminology.

In A304.3.1, the proposal adds a reference to manufacturer's recommendations, which is standard practice, especially for expansion anchors, which are typically proprietary. Verification by the code official is adequately covered in A304.5, so that sentence is proposed for deletion to avoid duplication.

In A304.3.2, the sentence about "lengths of sill plate less than 30 inches" duplicates a requirement already in Table A3-B, referenced in the previous sentence. It is proposed for deletion to avoid duplication.

Other minor revisions are editorial, for the sake of consistent terminology.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB2-A302.DOC

EB51–09/10
A304.4.1, A304.4.1.1

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

A304.4.1 General. Exterior cripple walls not exceeding 4 feet (1219 mm) in height shall ~~use~~ be permitted to be specified by the prescriptive bracing method in Section A304.4 ~~below~~. Cripple walls over 4 feet (1219mm) in height require analysis by a registered design professional ~~an engineer or architect~~ in accordance with Section A301.3.

A304.4.1.1 Sheathing installation requirements. Wood structural panel sheathing shall not be less than 15/32-inch (12 mm) thick and shall be installed in accordance with Figure A3-5 or A3-6. All individual pieces of wood structural panels shall be nailed with 8d common nails spaced 4 inches (102 mm) on center at all edges and 12 inches (305 mm) on center at each intermediate support with not less than two nails for each stud. Nails shall be driven so that their heads are flush with the surface of the sheathing and shall penetrate the supporting member a minimum of 1 1/2 inches (38 mm). When a nail fractures the surface, it shall be left in place and not counted as part of the required nailing. A new 8d nail shall be located within 2 inches (51 mm) of the discounted nail and be hand-driven flush with the sheathing surface. ~~All horizontal~~ Where the installation involves horizontal joints, those joints ~~must~~ shall occur over nominal 2-inch by 4-inch (51 mm by 102 mm) blocking installed with the nominal 4-inch (102 mm) dimension against the face of the plywood.

Vertical joints at adjoining pieces of wood structural panels shall be centered on ~~existing~~ studs such that there is a minimum 1/8 inch (3.2 mm) between the panels, and such that the nails are placed a minimum of ½ inch (12.7 mm) from the edges of the existing stud. Where such edge distances cannot be maintained because of the width of the existing stud, a new stud shall be added adjacent to the existing studs and connected in accordance with Figure A3-7.

Reason: This proposal is editorial, for improved clarity and consistent code language.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB7- A304.4.1.DOC

EB52–09/10
A304.5.1 (New)

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Add new text as follows:

A304.5.1 Nails. All nails specified in this chapter shall be common wire nails of the following diameters and lengths: 8d nails shall be 0.131" x 2 ½". 10d nails shall be 0.148" x 3". 12d nails shall be 0.148" x 3 ¼". 16d nails shall be 0.162" x 3 ½". Nails used to attach metal framing connectors directly to wood members need only be 1 ½" long.

Reason: This proposal adds needed specificity. The chapter makes many references to nails but does not always indicate "Common Wire Nails". Many different types of nails are also sold at lumber supply yards and hardware stores, so choosing the appropriate type of nail may be confusing. Furthermore, the substitution of inadequate nails is commonplace where gage and length are not specified. This proposal clarifies what is required

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB11- A304.5.1.DOC

EB53–09/10
A304.6

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Delete without substitution:

~~**A304.6 Phasing of the strengthening work.** When approved by the building official, the strengthening work contained in this chapter may be completed in phases. The strengthening work in any phase shall be performed on two parallel sides of the structure at the same time.~~

Reason: The proposal removes an unnecessary and possibly costly provision. First, work may always be phased or sequenced at the discretion of the code official. The current provision is intended to assure that the greatest seismic risks are reduced before other work is performed. But the probability that a significant earthquake occurs during the project is extremely low, even if the work is phased. Since this chapter is triggered by other provisions in the body of the IEBC, the seismic improvements it requires will already be part of the project scope and would not inadvertently be delayed or left incomplete. By requiring a specific sequence of work, the provision could unnecessarily restrict an owner from completing work in the least disruptive or expensive way. Finally, single-family residences do not always have parallel sides, making it difficult to implement the original requirement.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB8- A304.6.DOC

EB54–09/10
Figures A31- through A3-7

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Delete figures and substitute as follows:

~~**FIGURE A3-1—NEW REINFORCED CONCRETE FOUNDATION SYSTEM**~~
~~**FIGURE A3-2—NEW HOLLOW-MASONRY UNIT FOUNDATION WALL**~~
~~**FIGURE A3-3—SILL PLATE BOLTING TO EXISTING FOUNDATION**~~
~~**FIGURE A3-4A—SILL PLATE BOLTING IN EXISTING FOUNDATION—ALTERNATE**~~
~~**FIGURE A3-4B—SILL PLATE BOLTING TO EXISTING FOUNDATION WITHOUT CRIPPLE WALL AND FRAMING PARALLEL TO THE FOUNDATION WALL**~~
~~**FIGURE A3-4C—SILL PLATE BOLTING IN EXISTING FOUNDATION—ALTERNATE**~~
~~**FIGURE A3-5—CRIPPLE WALL BRACING WITH WOOD STRUCTURAL PANEL ON EXTERIOR FACE OF CRIPPLE STUDS**~~
~~**FIGURE A3-6—CRIPPLE WALL BRACING WITH WOOD STRUCTURAL PANEL ON INTERIOR FACE OF CRIPPLE STUDS**~~
~~**FIGURE A3-7—PARTIAL CRIPPLE STUD WALL ELEVATION**~~

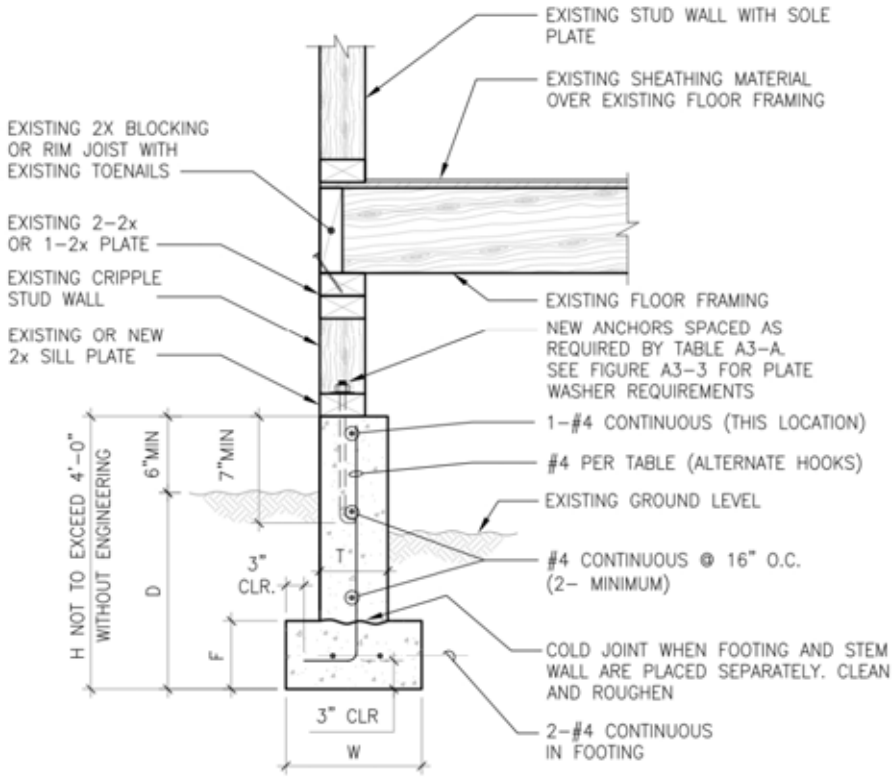
For 2009 Figure A3-1, substitute proposed Figure A3-1

MINIMUM FOUNDATION DIMENSIONS						MINIMUM FOUNDATION REINFORCING	
NUMBER OF STORIES	W	F	D[A, B, C]	T	H	VERTICAL REINFORCING	
						SINGLE–POUR WALL AND FOOTING	FOOTING PLACED SEPARATE FROM WALL
1	12 INCHES (305mm)	6 INCHES (152mm)	12 INCHES (305mm)	6 INCHES (152mm)	≤24 INCHES (610mm)	#4 @ 48" (1219mm) ON CENTER	#4 @ 32" (813mm) ON CENTER
2	15 INCHES (381mm)	7 INCHES (178mm)	18 INCHES (457mm)	8 INCHES (203mm)	≥36 INCHES (914mm)	#4 @ 48" (1219mm) ON CENTER	#4 @ 32" (813mm) ON CENTER
3	18 INCHES (457mm)	8 INCHES (203mm)	24 INCHES (610mm)	10 INCHES (254mm)	≥36 INCHES (914mm)	#4 @ 48" (1219mm) ON CENTER	#4 @ 18" (457mm) ON CENTER

A. WHERE FROST CONDITIONS OCCUR, THE MINIMUM DEPTH SHALL EXTEND BELOW THE FROST LINE.

B. THE GROUND SURFACE ALONG THE INTERIOR SIDE OF THE FOUNDATION MAY BE EXCAVATED TO THE ELEVATION OF THE TOP OF THE FOOTING.

C. WHEN EXPANSIVE SOIL IS ENCOUNTERED, THE FOUNDATION DEPTH AND REINFORCEMENT SHALL BE AS DIRECTED BY THE BUILDING OFFICIAL.



FOR SI: 1 INCH = 25.4mm, 1 FOOT = 304.8mm

FIGURE A3–1 – NEW REINFORCED CONCRETE FOUNDATION SYSTEM

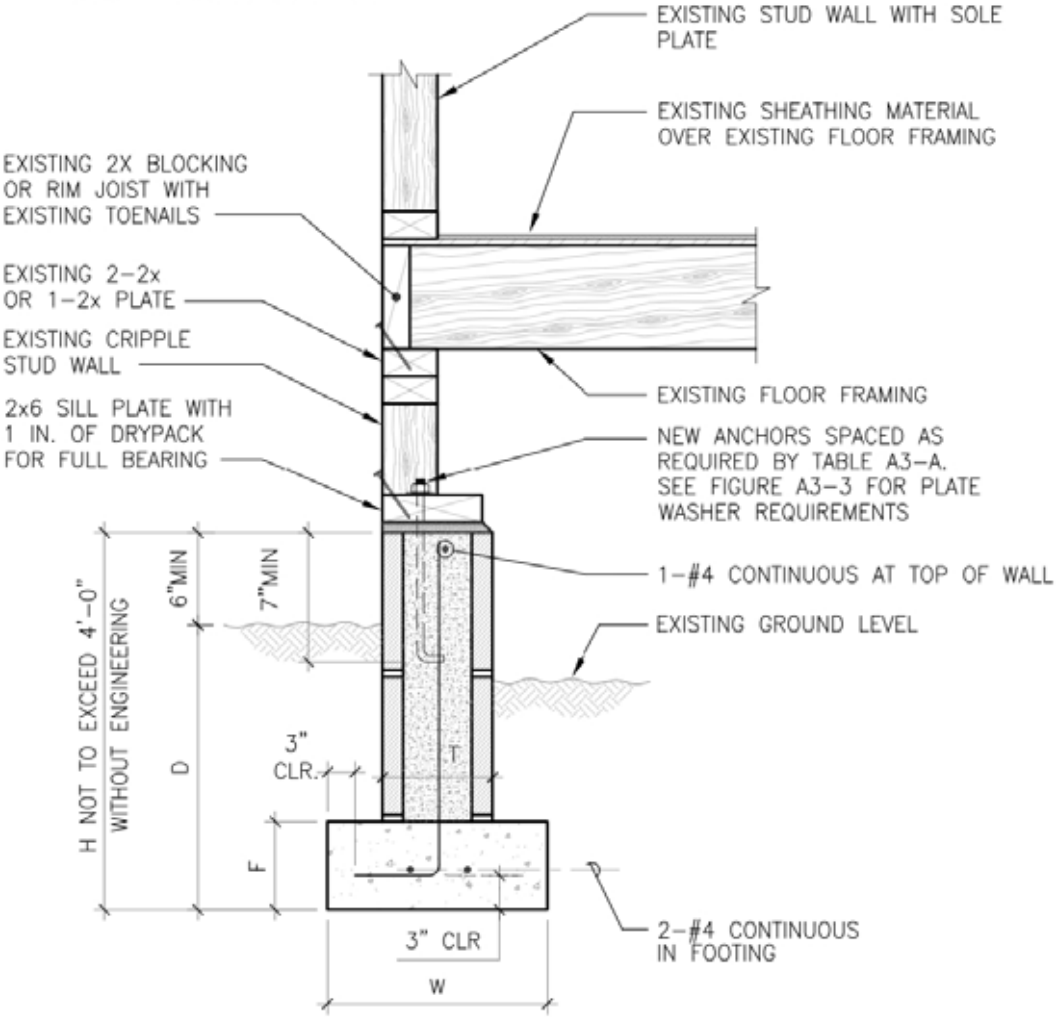
For 2009 Figure A3-2, substitute proposed Figure A3-2

	MINIMUM FOUNDATION DIMENSIONS					MINIMUM FOUNDATION REINFORCING	
NUMBER OF STORIES	W	F	D[A, B, C]	T	H	VERTICAL REINFORCING	HORIZONTAL REINFORCING
1	12 INCHES (305mm)	6 INCHES (152mm)	12 INCHES (305mm)	6 INCHES (152mm)	≤24 INCHES (610mm)	#4 @ 24" (610mm) ON CENTER	#4 CONTINUOUS AT TOP OF STEM WALL
2	15 INCHES (381mm)	7 INCHES (178mm)	18 INCHES (457mm)	8 INCHES (203mm)	≥24 INCHES (610mm)	#4 @ 24" (610mm) ON CENTER	#4 @ 16" (406mm) ON CENTER
3	18 INCHES (457mm)	8 INCHES (203mm)	24 INCHES (610mm)	10 INCHES (254mm)	≥36 INCHES (914mm)	#4 @ 24" (610mm) ON CENTER	#4 @ 16" (406mm) ON CENTER

A. WHERE FROST CONDITIONS OCCUR, THE MINIMUM DEPTH SHALL EXTEND BELOW THE FROST LINE.

B. THE GROUND SURFACE ALONG THE INTERIOR SIDE OF THE FOUDATION MAY BE EXCAVATED TO THE ELEVATION OF THE TOP OF THE FOOTING.

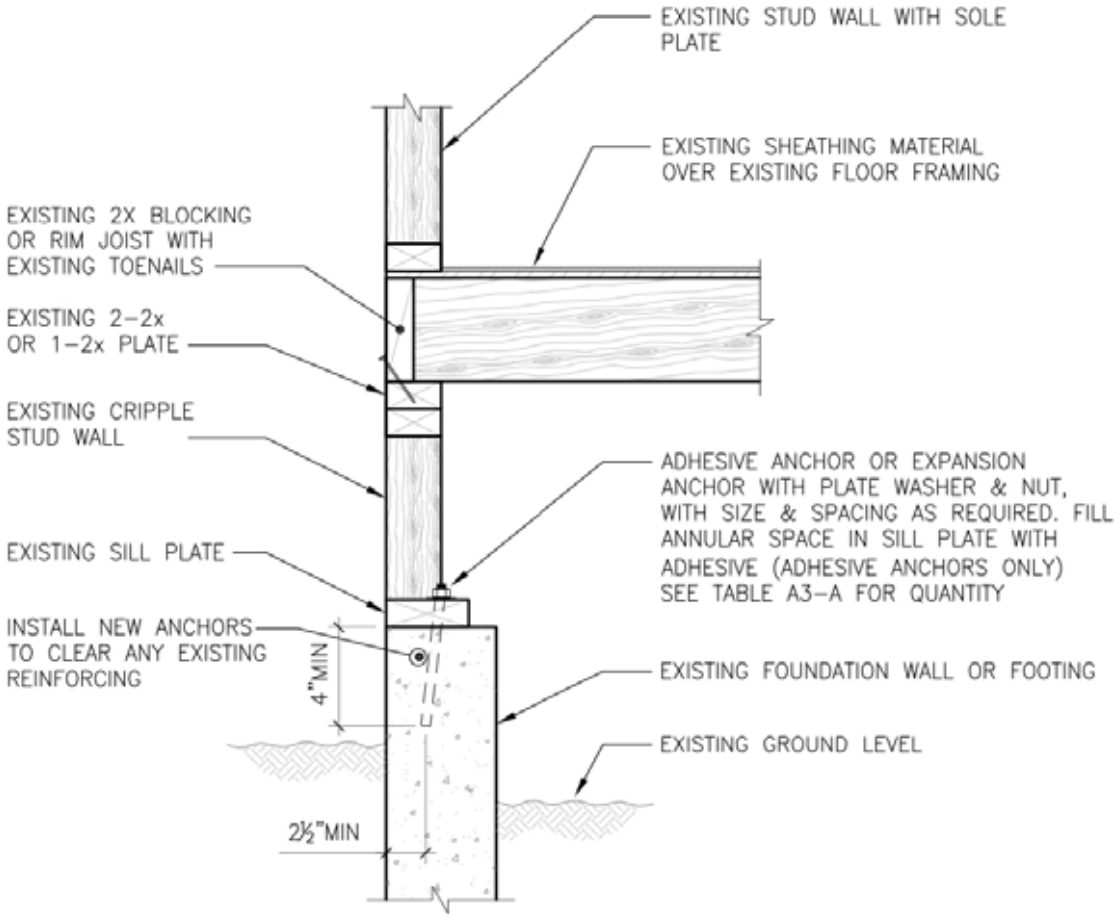
C. WHEN EXPANSIVE SOIL IS ENCOUNTERED, THE FOUNDATION DEPTH AND REINFORCEMENT SHALL BE AS DIRECTED BY THE BUILDING OFFICIAL.



FOR SI: 1 INCH = 25.4mm, 1 FOOT = 304.8mm

FIGURE A3–2 – NEW CONCRETE MASONRY FOUNDATION

For 2009 Figure A3-3, substitute proposed Figure A3-3



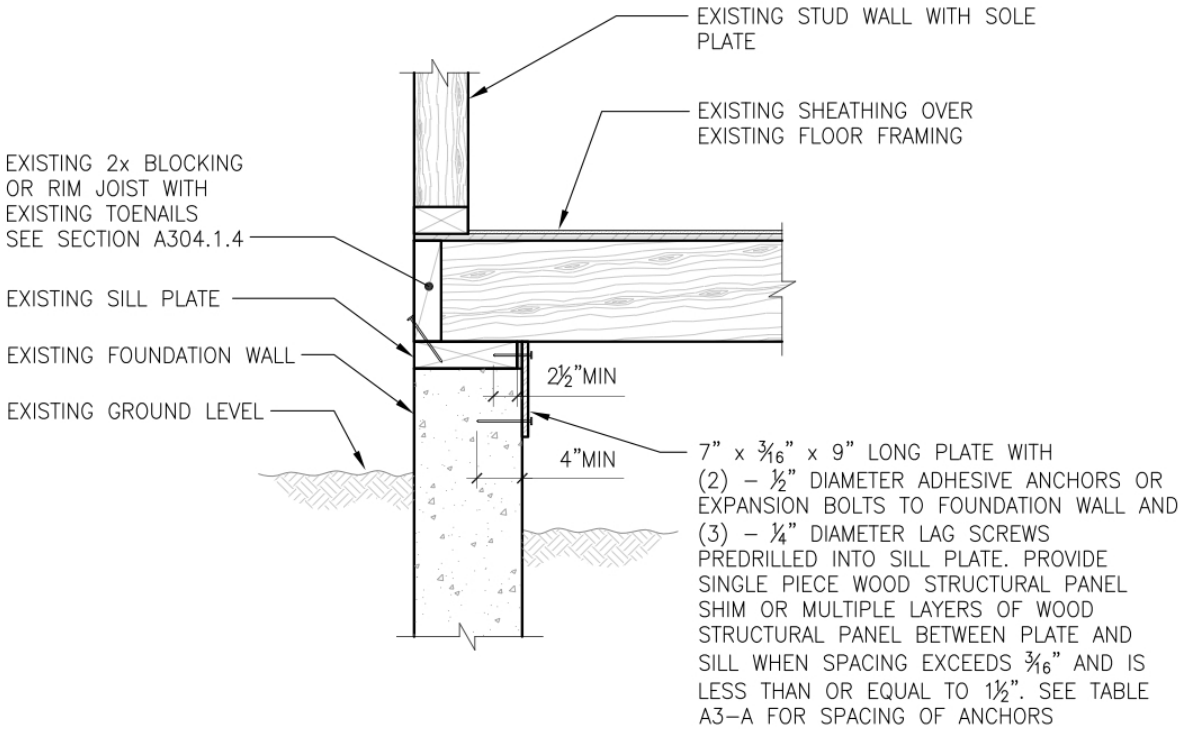
FOR SI: 1 INCH = 25.4mm

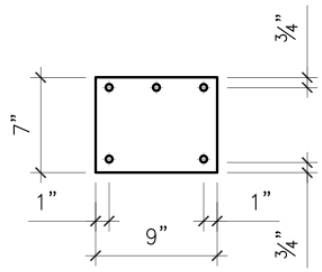
NOTES:

1. PLATE WASHERS SHALL COMPLY WITH THE FOLLOWING:
   ½ IN. ANCHOR OR BOLT – 3" x 3" x ¼"
   ⅝ IN. ANCHOR OR BOLT – 3" x 3" x ¼""
2. SEE FIGURE A3–5 OR A3–6 FOR CRIPPLE WALL BRACING

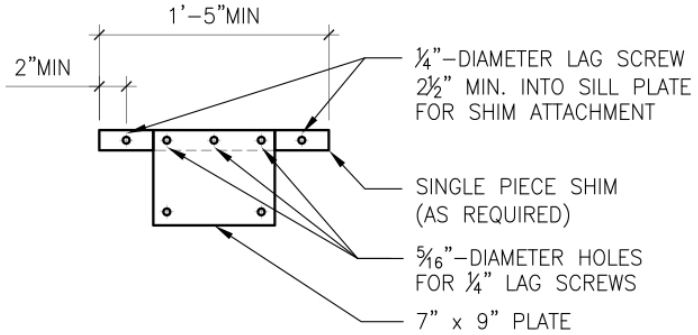
FIGURE A3–3 – SILL PLATE BOLTING TO EXISTING FOUNDATION

For 2009 Figure A3-34 substitute proposed Figure A3-4A





HOLE DIAMETER SHALL NOT EXCEED CONNECTOR DIAMETER BY MORE THAN 1/16"



CONNECTION WHEN SHIM SPACE EXCEEDS ¾" IN WIDTH UP TO 1½"

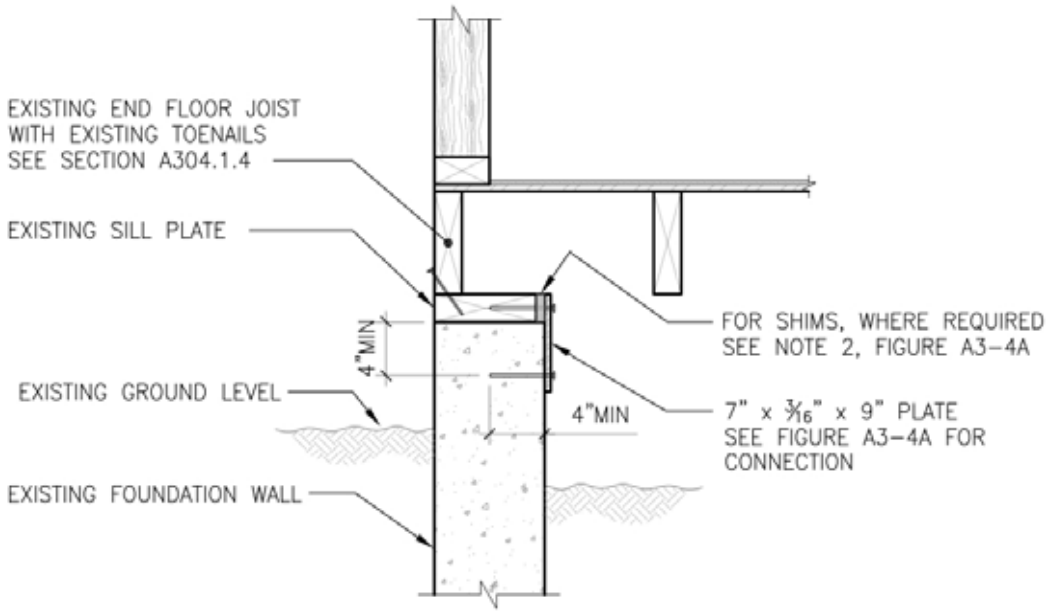
FOR SI: 1 INCH = 25.4mm, 1 FOOT = 304.8

NOTES:

1. IF SHIM SPACE EXCEEDS 1½", ALTERNATE DETAILS WILL BE REQUIRED.
2. WHERE REQUIRED, SINGLE PIECE SHIM SHALL BE FOUNDATION GRADE REDWOOD OR PRESERVATIVE – TREATED WOOD. IF PRESERVATIVE TREATED WOOD IS USED, IT SHALL BE ISOLATED FROM THE FOUNDATION SYSTEM WITH A MOISTURE BARRIER.

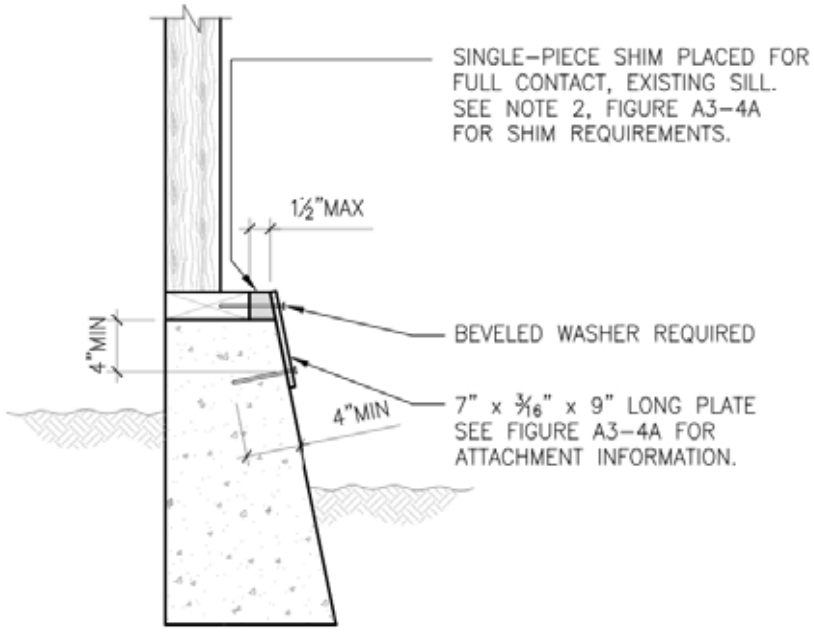
FIGURE A3–4A – ALTERNATE SILL PLATE BOLTING IN EXISTING FOUNDATION WITHOUT CRIPPLE WALLS AND FLOOR FRAMING NOT PARALLEL TO FOUNDATIONS

For 2009 Figure A3-4B & 4C, substitute proposed Figure A3-4B & 4C



FOR SI: 1 INCH = 25.4mm

FIGURE A3–4B – ALTERNATE SILL PLATE ANCHOR TO EXISTING FOUNDATION WITHOUT CRIPPLE WALL AND FLOOR FRAMING PARALLEL TO FOUNDATIONS

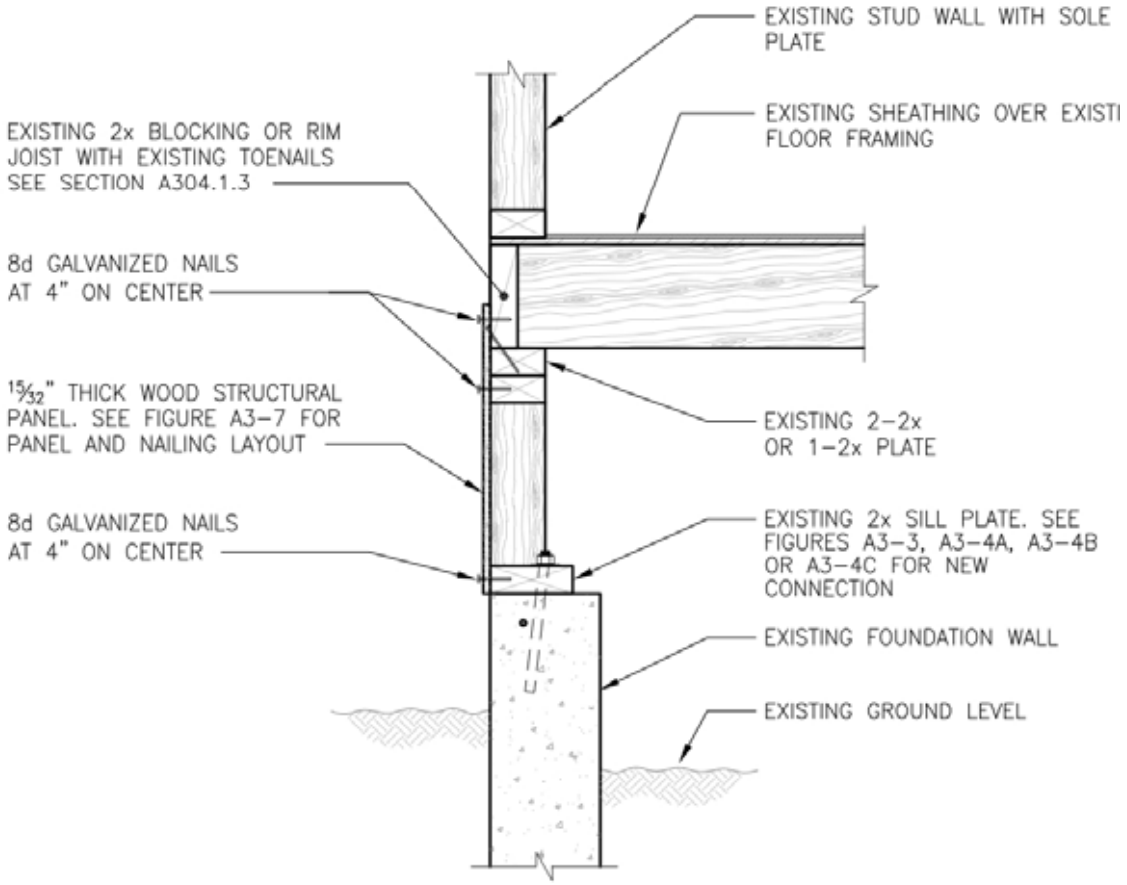


ALTERNATE CONNECTION
FOR BATTERED FOOTING

FOR SI: 1 INCH = 25.4mm

FIGURE A3–4C – SILL PLATE ANCHORING TO EXISTING FOUNDATI(ALTERNTATE

For 2009 Figure A3-5, substitute proposed Figure A3-5

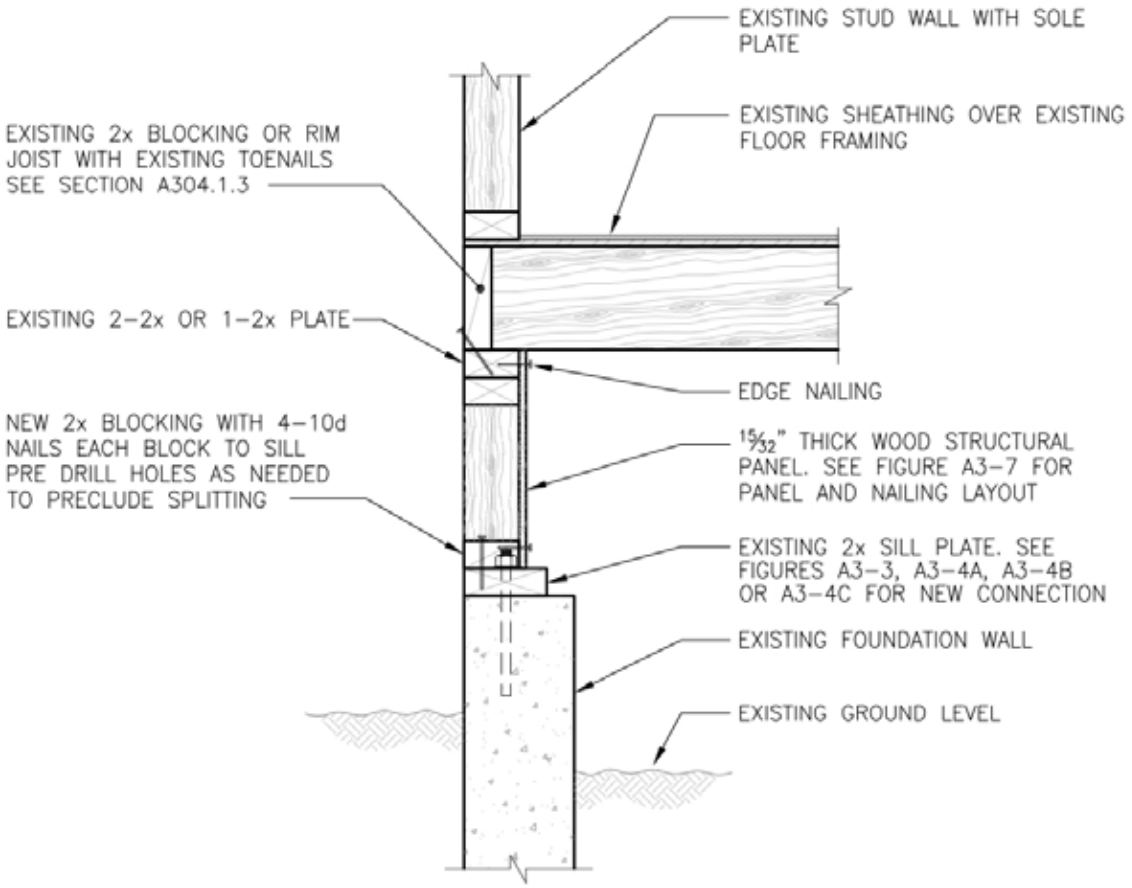


FOR SI: 1 INCH = 25.4mm

NOTES: SEE FIGURE A3-3 FOR SILL PLATE ANCHORING

FIGURE A3-5 – CRIPPLE WALL BRACING WITH NEW WOOD STRUC PANEL ON EXTERIOR FACE OF CRIPPLE STUDS

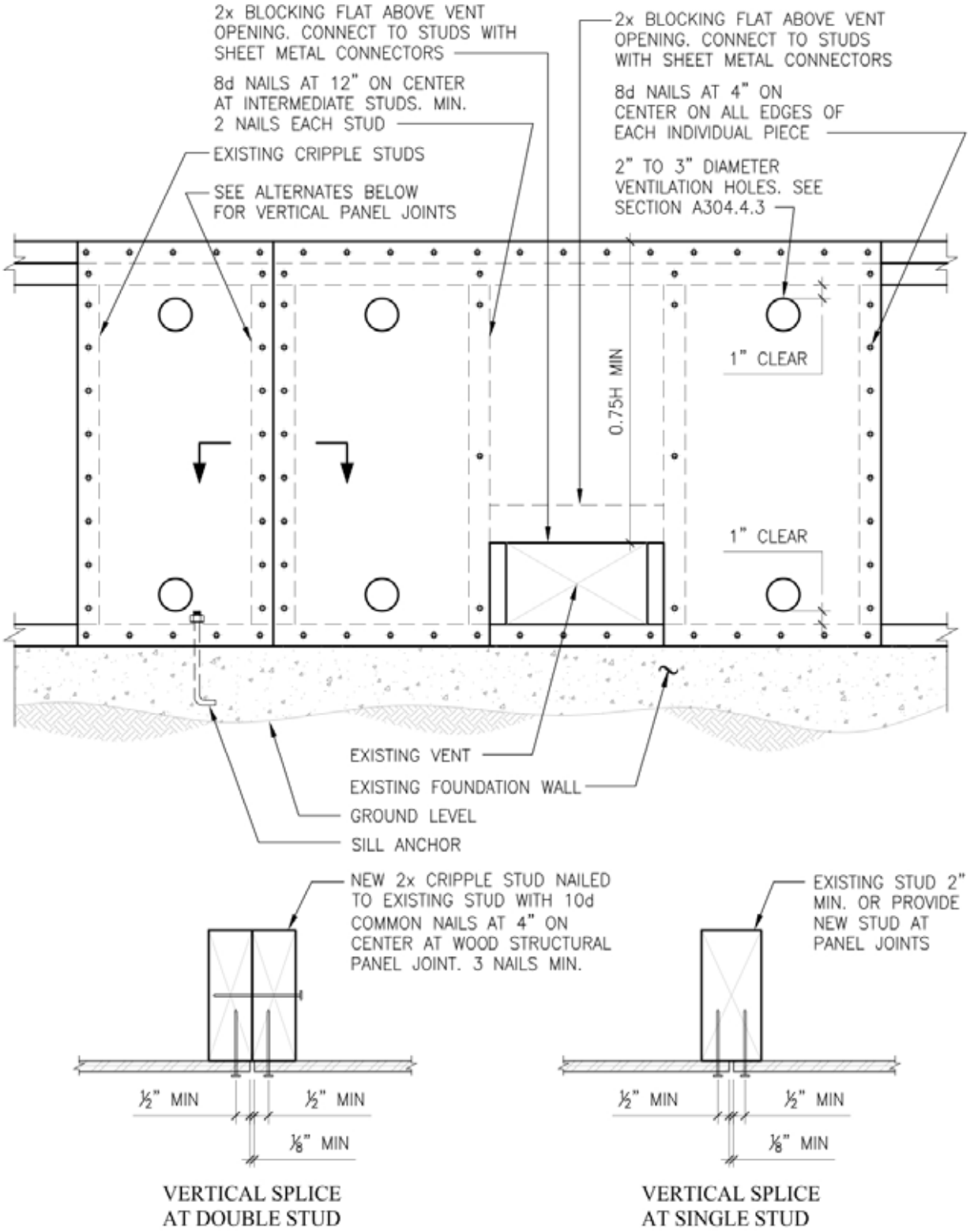
For 2009 Figure A3-6, substitute proposed Figure A3-6



FOR SI: 1 INCH = 25.4mm

FIGURE A3–6 – CRIPPLE WALL BRACING WITH WOOD STRUCTURAL PANEL ON INTERIOR FACE OF CRIPPLE STUDS

For 2009 Figure A3-7, substitute proposed Figure A3-7



FOR SI: 1 INCH = 25.4mm

FIGURE A3–7 – PARTIAL CRIPPLE STUD WALL ELEVATION

Reason: This proposal updates Figures A3-1 through A3-7 to improve their clarity, consistency, usability, and enforceability, and to better coordinate them with the text. The major edits to each Figure, along with explanations of the few minor substantive proposals are as follows:

Proposed revision to Figure A3-1 does the following:

- Deletes nails shown at floor sill plate, as they are not required and do not apply to any work required by the sections that reference this Figure, A304.2.3 and A304.3.3.
- Corrects table to add vertical reinforcing requirements for foundations supporting one story. The 2009 table has column heading text in the wrong row and mistakenly omits data for 1-story houses.
- Requires 2 #4 continuous bars for the lower footing section in lieu of 1-#4 continuous, as well as horizontal reinforcing at 16 inches on center. This is standard practice and is more appropriate for a prescriptive detail, especially when the footing is 18" wide, to help account for expansive or otherwise marginal soil not explicitly addressed by the prescriptive retrofit design.
- Requires 3" clear dimension to the edge of the footing to ensure code compliance for footings cast against the earth.
- Adds a note clarifying sill plate may be new or existing when foundation is replaced.
- Adds a note to "clean and roughen" the footing, standard practice for foundations made with two pours.
- Corrects leader for reference to "H"
- Calls out #4 vertical bars to clarify the intent of the table. Calls for alternating hooks which is a good standard practice.
- Other editorial clarifications, including consistent terminology for "floor framing," "sill plate, "sole plate" (the horizontal plate above the floor line), and "anchors".

Proposed revision to Figure A3-2 does the following:

- Deletes nails shown at floor sill plate, as they are not required and do not apply to any work required by the sections that reference this Figure, A304.2.3 and A304.3.3.
- Corrects typo. Sill plate call-out should read "2x6".
- Corrects graphical inconsistency for depth of embedment and height above grade.
- Requires 2 #4 continuous bar for the lower footing section in lieu of 1-#4 continuous. This is standard practice and is more appropriate especially when footing is 18" wide.
- Other editorial clarifications, including consistent terminology for "code official," "floor framing," "sill plate, "sole plate" (the horizontal plate above the floor line), and "anchors".

Proposed revision to Figure A3-3 does the following:

- Deletes nails shown at floor sill plate, as they are not required and do not apply to any work required by the section that references this Figure, A304.3.1.
- Clarifies that filling oversized holes with adhesive is required only for adhesive anchors, not expansion anchors.
- Changes washer requirement and size to match current code requirements.
- Requires that new anchors be installed clear of existing reinforcing.
- Other editorial clarifications, including consistent terminology for "floor framing," "sill plate, "sole plate" (the horizontal plate above the floor line), and "anchors".

Proposed revision to Figure A3-4A does the following:

- Deletes nails shown at floor sill plate, as they are not required and do not apply to any work required by the section that references this Figure, A304.3.1.
- Adds notes regarding shims. Typical hardware (Simpson, for example) limits shim thickness to 1-1/2".
- Revises plate detail to indicate that 1/4" screws are used from the shim to the sill. Extends the leader from the 5/16" diameter holes to the center-top hole in the metal plate. Changes reference to "lag screws" in the 5/16" call out to "lag holes" since the upper in the metal plate must be 5/16" to accept a ¼" lag screw
- Adds note to isolate wood shim from the foundation with moisture barrier.
- Revises title.
- Other editorial clarifications, including consistent terminology for "floor framing," "sill plate, "sole plate" (the horizontal plate above the floor line), and "anchors".

Proposed revision to Figure A3-4B does the following:

- Deletes nails shown at floor sill plate, as they are not required and do not apply to any work required by the section that references this Figure.
- References shim requirements on Figure A3-4A.
- Revises title.

Proposed revision to Figure A3-4C does the following:

- Indicates 1½" maximum dimension for shim.
- Adds note that shim should be pressure treated or redwood as it is in contact with the ground.
- Adds note for shim to be foundation grade redwood or to be isolated from the foundation with a moisture barrier.

Proposed revision to Figure A3-5 does the following:

- Deletes nails shown at floor sill plate, as they are not required and do not apply to any work required by the section that references this Figure.
- Adds references to other Figures.
- Other editorial clarifications, including consistent terminology for "floor framing," "sill plate, "sole plate" (the horizontal plate above the floor line), and "anchors".

Proposed revision to Figure A3-6 does the following:

- Deletes nails shown at floor sill plate, as they are not required and do not apply to any work required by the section that references this Figure.
- Adds note to caution against splitting the block and to recommend pre-drilling.
- Other editorial clarifications, including consistent terminology for "floor framing," "sill plate, "sole plate" (the horizontal plate above the floor line), and "anchors".

Proposed revision to Figure A3-7 does the following:

- "Vertical splice at double stud": Changes face nail of studs to 10d @ 4" on center. 16d nails are 3 ½" thus potentially penetrating ½" past double 2x4's. 10d nails at reduced spacing will lead to less chance of splitting but give even greater capacity.
- "Vertical splice at single stud": Deletes ½" requirement for nail to edge of stud, as this is not required for new construction.
- Clarifies the requirement for stud thickness at vertical panel joints.
- Other editorial revisions, including corrections to leader lines and more accurately displayed field nail spacing.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB15-FIG A31-A37.DOC

EB55–09/10
A401.2

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing National Council of Structural Engineers Association (NCSEA) Existing Buildings Subcommittee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

A401.2 Scope. The provisions of this chapter shall apply to all existing Occupancy Group R-1 and R-2 buildings of wood construction or portions thereof where the structure has a soft, weak, or open-front wall line, and there exists one or more stories above. ~~:~~

~~1. The ground floor portion of the wood-frame structure contains parking or other similar open floor space, which causes soft, weak or open-front wall lines as defined in this chapter, and there exists one or more stories above.,or~~

~~2. The walls of any story or basement of wood construction are laterally braced with nonconforming structural materials as defined in this chapter, a soft or weak wall line exists as defined in this chapter and there exist two or more stories above.~~

~~3 The structure is assigned to Seismic Design Category C, D or E.~~

Reason: This proposal clarifies the scope by removing inapplicable and unnecessary language. Of the three conditions in the current provision, only Condition 1 is appropriate for a clear and limited scope. The proposed wording of Condition 1 removes the reference to parking and open floor space, as well as the requirement that the open floor space be on the ground floor. While these are common conditions, they are not the only ones to which this chapter is meant to apply. The descriptors proposed for removal are better suited for commentary.

Current Condition 2 recognizes the possibility of a weak or soft story condition without an open front wall line, but with the revision to Condition 1, it is no longer necessary, as soft and weak conditions are already covered.

Current Condition 3 indicates the original intent of this chapter to apply to voluntary retrofits in areas of relatively high seismicity. While the provisions were not written originally for SWOF buildings in areas of lower seismicity, they may be used for those buildings. Further, the limitation to SDC C-E no longer applies now that this chapter is referenced from the body of the IEBC as an option for buildings in any seismic design category.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SEARER-EB8-A401.2.DOC

EB56–09/10
A402

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise definition as follows:

A402
DEFINITIONS

EXPANSION ANCHOR. ~~An approved mechanical fastener placed in hardened concrete that is designed to expand in a self-drilled or pre-drilled hole of a specified size and engage the sides of the hole in one or more locations to develop shear and/or tension resistance to applied loads without grout, adhesive, or drypack.~~ An approved post-installed anchor, inserted into a pre-drilled hole in existing concrete or masonry, that transfers loads to or from the concrete or masonry by direct bearing or friction or both.

Reason: This proposal is editorial. The proposed definition is consistent with that now used in ACI 318 Appendix D and other ICC-ES resources.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB12- A402-EXPANSION ANCHOR.DOC

EB57–09/10
A403.1

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing National Council of Structural Engineers Association (NCSEA) Existing Buildings Subcommittee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

A403.1 General. ~~Buildings within the scope of this chapter shall be analyzed, designed, and constructed in conformance with the building code, except as modified in this chapter.~~ All modifications required by the provisions in this chapter shall be designed in accordance with the International Building Code provisions for new construction, except as modified by this chapter.

Exception: Buildings for which the prescriptive measures provided in Section A405 apply and are used.

No alteration of the existing lateral-force-resisting system or vertical-load-carrying system shall reduce the strength or stiffness of the existing structure, unless the altered structure would remain in conformance with the building code and this chapter. ~~When~~ Where any portion of a building within the scope of this chapter is constructed on or into a slope steeper than one unit vertical in three units horizontal, the lateral-force-resisting system at and below the base level diaphragm shall be analyzed for the effects of concentrated lateral forces at the base caused by this hillside condition.

Reason: This proposal clarifies the intent of the section. The current wording of the first paragraph suggests improperly that whole buildings must be brought to conformance with the code for new construction, when the actual intent, as clearly stated within the chapter, is to address only the critical parts of an eligible building.

Only the modifications required by this chapter, principally the added structural elements, must be designed in accordance with IBC. (It's important to say "IBC provisions for new construction" so as not to require IBC Chapter 34, to which this IEBC Appendix Chapter is an alternate.) Existing elements are addressed in the second paragraph, which the proposal would modify to conform with the general philosophy of the IEBC regarding alterations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SEARER-EB9-A403.1.DOC

EB58–09/10
A403.2

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing National Council of Structural Engineers Association (NCSEA) Existing Buildings Subcommittee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

A403.2 Scope of analysis. This chapter requires the alteration, repair, replacement or addition of structural elements and their connections to meet the strength and stiffness requirements herein. The lateral-load-path analysis shall include the resisting elements and connections from the wood diaphragm immediately above any soft, weak or open-front wall lines to the foundation soil interface or to the uppermost story of a podium structure comprised of steel, masonry, or concrete structural systems that supports the upper, wood-framed structure. ~~floor or roof of a Type I structure below.~~ Stories above the uppermost story with a soft, weak, or open-front wall line shall be considered in the analysis but need not be modified. The lateral-load-path analysis for added structural elements shall also include evaluation of the allowable soil-bearing and lateral pressures in accordance with the building code.

Exception: When an open-front, weak or soft wall line exists because of parking at the ground floor of a two-story building and the parking area is less than 20 percent of the ground floor area, then only the wall lines in the open, weak or soft directions of the enclosed parking area need comply with the provisions of this chapter.

Reason: This proposal is editorial. The current reference to "Type 1" is unclear and somewhat illogical, since it uses a fire rating to define a type of structural system. To avoid potential confusion, the proposal replaces "Type I" with a slightly longer but clearer description using structural terms to indicate the intent of the provision (as explained in the ICC commentary). The proposed addition to the next to last sentence is a similar clarification with no substantive effect.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SEARER-EB10-A403.2.DOC

EB59–09/10
A403.1, A403.2

Proponent: David Bonowitz, SE, National Council of Structural Engineers Associations, Code Advisory Committee, Existing Buildings Subcommittee (NCSEA EBS)

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

A403.1 General. Buildings within the scope of this chapter shall be analyzed, designed and constructed in conformance with the building code, except as modified in this chapter.

Exception: Buildings for which the prescriptive measures provided in Section A405 apply and are used.

No alteration of the existing lateral-force-resisting system or vertical-load-carrying system shall reduce the strength or stiffness of the existing structure. ~~When any portion of a building within the scope of this chapter is constructed on or into a slope steeper than one unit vertical in three units horizontal, the lateral-force-resisting system at and below the base level diaphragm shall be analyzed for the effects of concentrated lateral forces at the base caused by this hillside condition.~~

A403.2 Scope of analysis. This chapter requires the alteration, repair, replacement or addition of structural elements and their connections to meet the strength and stiffness requirements herein. The lateral-load-path analysis shall include the resisting elements and connections from the wood diaphragm immediately above any soft, weak or open-front wall lines to the foundation soil interface or to the uppermost floor or roof of a Type I structure below. Stories

above the uppermost story with a soft, weak, or open-front wall line need not be modified. The lateral-load-path analysis for added structural elements shall also include evaluation of the allowable soil-bearing and lateral pressures in accordance with the building code. Where any portion of a building within the scope of this chapter is constructed on or into a slope steeper than one unit vertical in three units horizontal, the lateral-force-resisting system at and below the base level diaphragm shall be analyzed for the effects of concentrated lateral forces at the base caused by this hillside condition.

Reason: This proposal is editorial. It simply moves the last sentence of current A403.1, which is about scope of analysis, to the end of A403.2, where it more properly belongs.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BONOWITZ-EB13-A403.1.DOC

EB60–09/10
A403.3, A403.4, A403.5

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing National Council of Structural Engineers Association (NCSEA) Existing Buildings Subcommittee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

1. Revise as follows:

A403.3 Design base shear and design parameters. The design base shear in a given direction shall be permitted to be 75 percent of the value required for similar new construction in accordance with the building code. The value of R used in the design of the strengthening of any story shall not exceed the lowest value of R used in the same direction at any story above. The system overstrength factor, Ω_0, and the deflection amplification factor, C_d, shall not be less than the largest respective value corresponding to the R factor being used in the direction under consideration.

Exceptions:

1. For structures assigned to Seismic Design Category A or B, values of R, Ω_0, and C_d shall be permitted to be based on the seismic force-resisting system being used to achieve the required strengthening.
2. For structures assigned to Seismic Design Category C or D, values of R, Ω_0, and C_d shall be permitted to be based on the seismic force-resisting system being used to achieve the required strengthening, provided that when the strengthening is complete, the strengthened structure will not have an extreme weak story irregularity defined as Type 5b in ASCE 7 Table 12.3-2.
3. For structures assigned to Seismic Design Category E, values of R, Ω_0, and C_d shall be permitted to be based on the seismic force-resisting system being used to achieve the required strengthening, provided that when the strengthening is complete, the strengthened structure will not have an extreme soft story, a weak story, or an extreme weak story irregularity defined, respectively, as Types 1b, 5a, and 5b in ASCE 7 Table 12.3-2.

2. Delete without substitution:

~~**A403.4 Vertical distribution of forces.** The total seismic force shall be distributed over the height of the structure as for new construction in accordance with the building code. Distribution of force by story weight shall be permitted for two-story buildings. The value of R used in the design of any story shall be less than or equal to the value of R used in the given direction for the story above.~~

~~**A403.5 Weak story limitation.** Every weak story shall be strengthened to the lesser of:~~

1. ~~Ω_o times the story shear prescribed by Sections A403.3 and A403.4.~~
2. ~~In two-story buildings up to 30 feet (9144 mm) in height, 65 percent of the strength of the story above. In all other buildings, 80 percent of the strength of the story above.~~

(Renumber subsequent sections)

Reason: This proposal makes editorial clarifications and allows alternative design requirements that respond to implementation problems experienced by practitioners.

The principal editorial revision is that the limits on R values are moved from A403.4, where they are currently out of place, to A403.3.

The substantive changes address the following problem: The limits on R values (in current A403.4 and proposed A403.3), while based on rational limits for combined systems used in new construction, have had the effect of forcing an R value of 2.0 on the design of systems added for strengthening (due to the fact that the nonconforming gypsum and stucco materials on the upper floors would in effect mandate the use of an R of 2 for the lowest floor), thus requiring larger new members and longer new walls than is often necessary to achieve the risk reduction objective of this chapter. The larger and longer elements are likely also to bring additional expense, discouraging retrofit, and leading to constructability problems fitting the new elements into the existing building without affecting parking, exits, utility connections, etc.

Thus, the question is how to allow a more practical design (and R value) suited to the risk reduction retrofit of existing buildings, where new systems are typically used to supplement old ones, as opposed to new construction, where all new systems must and should comply completely with the building code. The right solution should acknowledge that no single R value can be stipulated for the design of strengthening elements, that Chapter A4 is intended as a prescriptive and somewhat simplified alternative to ASCE 41, and that the principal goal of retrofitting SWOF buildings is to eliminate their SWOF deficiency.

This proposal attempts to satisfy these constraints by allowing two options for the engineer:

- Use the low R value as a default. This maintains the requirement of the 2009 edition.
- Use a higher R value appropriate to the retrofit system as long as the designer demonstrates that critical irregularities will in fact be removed. The critical irregularities differ by Seismic Design Category as they do for new buildings. (One difference: In this proposal, SDC C is grouped with SDC D, as opposed to SDC A and B, in recognition that Chapter A4 was originally developed for voluntary work in SDC C through E, that SDC C requires some minimum story strength as contemplated by current section A403.5, and that some irregularities allowed in new SDC C buildings are inappropriate in existing buildings where other protective provisions for new construction might not be met.)

In addition, current section A403.5 is deleted because the options in proposed A403.3 will now result in adequate minimum story strengths in SDC C through E.

Finally, the last sentence of current section A403.4 is deleted because its scope is replaced by A403.3. The first part of current A403.4 is not needed because Section 12.14 of ASCE 7 already permits distribution of force by story weight. Furthermore, in any structure where the first story is the weak story, any requirement regarding vertical distribution of force is essentially superfluous, since the design force for the weak story is the same no matter what the vertical distribution is assumed to be.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SEARER-EB11-A403.3.DOC

EB61–09/10
A403.6, A403.6.1

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing National Council of Structural Engineers Association (NCSEA) Existing Buildings Subcommittee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

A403.6 Story drift limitations. The calculated story drift for each retrofitted story shall not exceed the allowable deformation compatible with all vertical-load-resisting elements and 0.025 times the story height. The calculated story drift shall not be reduced by the effects of horizontal diaphragm stiffness but shall be increased when these effects produce rotation. Drift calculations shall be in accordance with the building code.

A403.6.1 Pole structures. The effects of rotation and soil stiffness shall be included in the calculated story drift ~~when~~ where lateral loads are resisted by vertical elements whose required depth of embedment is determined by pole formulas. The coefficient of subgrade reaction used in deflection calculations shall be based on a geotechnical investigation conducted in accordance with the building code ~~provided from an approved geotechnical report~~ or based on other methods approved by the code official ~~methods~~.

Reason: Editorial proposal to separate current A403.6 into two parts for clarity. The first part, regarding interstory drift in the structure overall, remains unchanged. The second part, regarding deflection criteria for pole structures, is separated into a subsection for clarity. The proposal also clarifies text related to the geotechnical report requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SEARER-EB12-A403.6.DOC

EB62–09/10
A403.8.1, A402

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing National Council of Structural Engineers Association (NCSEA) Existing Buildings Subcommittee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Delete without substitution:

~~**A403.8.1 Cripple walls.** Cripple walls braced with nonconforming structural materials shall be braced in accordance with this chapter. When a single top plate exists in the cripple wall, all end joints in the top plate shall be tied. Ties shall be connected to each end of the discontinuous top plate and shall be equal to one of the following:~~

1. ~~Three-inch by 6-inch (76 mm by 152 mm), 18-gage galvanized steel, nailed with six 8d common nails at each end.~~
2. ~~One and one-fourth-inch by 12-inch (32 mm by 305 mm), 18-gage galvanized steel, nailed with six 16d common nails at each end.~~
3. ~~Two-inch by 4-inch by 12-inch (51 mm by 102 mm by 305 mm) wood blocking, nailed with six 16d common nails at each end.~~

~~**CRIPPLE WALL**. A wood-frame stud wall extending from the top of the foundation wall to the underside of the lowest floor framing.~~

Reason: This provision does not belong in this chapter. Section A403.11.1 already precludes the use of gypsum or cement plaster to provide resistance in a soft or weak story or in a story with an open front wall line. Requiring that cripple walls be braced as required by this chapter doesn't make sense, because this chapter does not cover bracing of walls (Bracing of walls is covered in the conventional framing provisions of the IBC).

If an engineer decides to discount or ignore a cripple wall with non-conforming materials, he or she should not have to worry about addressing a discontinuous top plate in the wall, since the wall is nonstructural in terms of the design. If an engineer decides to add structural wood sheathing to the wall, then this chapter already requires that the wall be designed in accordance with the IBC (subject to reduced forces); the new wood structural panel design would be governed by Section 403.11.2; and the discontinuous top plate would be addressed by the engineer as necessary from an engineering perspective.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SEARER-EB14-A402 CRIPPLE WALLS.DOC

EB63–09/10
A403.11.2.1

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing National Council of Structural Engineers Association (NCSEA) Existing Buildings Subcommittee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

A403.11.2.1 Drift limit. Wood structural panel shear walls shall meet the story drift limitation of Section A403.6. Conformance to the story drift limitation shall be determined by approved testing or calculation~~, not by the use of an aspect ratio. Calculated deflection shall be determined according to *International Building Code* Equation 23-1 and shall be increased by 25 percent. Contribution to the shear wall deflection from the anchor or tie-down slippage shall also be included. The slippage contribution shall include the vertical elongation of the connector metal components, the vertical slippage of the connectors to framing members, localized crushing of wood due to bearing loads and shrinkage of the wood elements because of changes in moisture content as a result of aging. The total vertical slippage shall be multiplied by the shear panel aspect ratio and added to the total horizontal deflection~~. Individual shear panels shall be permitted to exceed the maximum aspect ratio, provided the allowable story drift and allowable shear capacities are not exceeded.

Reason: The deletion in the first sentence regarding "aspect ratio" is proposed because this section already requires story drift calculation; thus a specific prohibition against the use of aspect ratio is unnecessary. The balance of the deletion is proposed because the requirements for calculating story drift should be no more stringent for existing wood-framed buildings than they are for new buildings. The requirements being deleted were part of the original Los Angeles soft/weak story strengthening ordinance and were developed in the mid-1990s when the building code didn't require much in the way of deflection calculation for wood-frame construction. Now that the IBC has requirements for calculating deflection, these requirements are superfluous, in some cases conflict with IBC requirements, and are no longer required.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SEARER-EB16-A403.11.2.1.DOC

EB64–09/10
A403.11.2.3, A403.11.3

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing National Council of Structural Engineers Association (NCSEA) Existing Buildings Subcommittee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Delete without substitution:

~~**A403.11.2.3 Wood species of framing members.** Allowable shear values for wood structural panels shall consider the species of the framing members. When the allowable shear values are based on Douglas fir-larch framing members, and framing members are constructed of other species of lumber, the allowable shear values shall be multiplied by the following factors: 0.82 for species with specific gravities greater than or equal to 0.42 but less than 0.49, and 0.65 for species with specific gravities less than 0.42. Redwood shall use 0.65 and hem fir shall use 0.82, unless otherwise approved.~~

~~**A403.11.3 Substitution for 3-inch (76mm) nominal width framing members.** Two 2-inch (51mm) nominal width framing members shall be permitted in lieu of any required 3-inch (76mm) nominal width framing member when the existing and new framing members are of equal dimensions, when they are connected as required to transfer the in-plane shear between them, and when the sheathing fasteners are equally divided between them.~~

(Renumber subsequent sections)

Reason: With respect to Section A403.11.2.3, this section is unnecessary as it is contained in footnote a of IBC Table 2306.4.1. Since the user has to go to that section to find shear wall design values, there is no need to repeat the modifications for framing species here.

With respect to Section A403.11.3, this section is also unnecessary as it is contained in footnote i of IBC Table 2306.4.1 which references IBC Section 2306.1. Since the user has to go to that section to find shear wall design values, there is no need to repeat the allowable substitution here.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SEARER-EB17-A403.11.2.3.DOC

EB65–09/10
A403.11.4.1, A402

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing National Council of Structural Engineers Association (NCSEA) Existing Buildings Subcommittee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

1. Revise as follows:

A403.11.4.1 Expansion anchors in tension. Expansion anchors that provide tension strength by friction resistance shall not be used to connect hold-down devices to existing concrete or masonry elements. ~~Expansion anchors that provide tension strength by bearing (commonly referenced as "undercut" anchors) shall be permitted.~~

2. Delete definition without substitution:

~~**EXPANSION ANCHOR.** An approved mechanical fastener placed in hardened concrete that is designed to expand in a self-drilled or pre-drilled hole of a specified size and engage the sides of the hole in one or more locations to develop shear and/or tension resistance to applied loads without grout, adhesive, or drypack.~~

Reason: This proposal eliminates redundancy and potential confusion. Expansion anchors and undercut anchors are now defined separately in ACI Appendix Chapter D, which governs the design of these anchors. In addition, the second sentence of the current provision is essentially commentary to the first sentence. By focusing on a single type of non-friction anchor, the second sentence also introduces confusion by suggesting (improperly) that other anchor types would not be allowed.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SEARER-EB18-A403.11.4.1.DOC

EB66–09/10

Chapter A4, A403.11.4.2, A405.1.1, A405.2.1, A406.1, A406.3.3, A406.3.4, A406.3.5, A406.3.6

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing National Council of Structural Engineers Association (NCSEA) Existing Buildings Subcommittee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

CHAPTER A4
EARTHQUAKE ~~HAZARD~~ RISK REDUCTION IN ~~EXISTING~~ WOOD-FRAME RESIDENTIAL BUILDINGS WITH SOFT, WEAK OR OPEN FRONT WALLS

A403.11.4.2 Required depth of embedment. The required depth of embedment or edge distance for the anchor used in the hold-down connector shall be provided in the concrete or masonry below any plain concrete slab unless satisfactory evidence is submitted to the ~~building~~ code official that shows that the concrete slab and footings are of monolithic construction.

A405.1.1 Additional conditions. To qualify for these prescriptive measures, the following additional conditions need to be satisfied by the retrofitted structure:

1. Diaphragm aspect ratio L/W is less than 0.67, where W is the diaphragm dimension parallel to the soft, weak or open-front wall line and L is the distance in the ~~orthogoal~~ orthogonal direction between that wall line and the rear wall of the ground floor open area.
2. Minimum length of side shear walls = 20 feet (6096 mm).
3. Minimum length of rear shear wall = ~~three-fourth of rear wall.~~ three-fourths of the total rear wall length.
4. No plan or vertical irregularities other than a soft, weak or open-front wall line.
5. Roofing weight less than or equal to 5 pounds per square foot (240 N/m^2).
6. Aspect ratio of the full second floor diaphragm meets the requirements of the building code for new construction.

A405.2.1 Anchor ~~bolt~~ size and spacing. The anchor ~~bolt~~ size and spacing shall be a minimum of ¾ inch (19 mm) in diameter at 32 inches (813 mm) on center. Where existing ~~bolts~~ anchors are inadequate, supplemental or alternative approved connectors, such as new steel plates bolted to the side of the foundation and nailed to the sill, shall be used. ~~may be used, such as an approved connector.~~

A406.1 New materials. New materials shall meet the requirements of the *International Building Code*, except where allowed by this chapter. ~~All materials approved by the building code, including their appropriate allowable stresses and limiting aspect ratios, shall be permitted to meet the requirements of this chapter.~~

A406.3.3 Existing wood framing. Wood framing is permitted to use the design stresses specified in the building code under which the building was constructed or other stress criteria approved by the ~~building~~ code official.

A406.3.4 Existing structural steel. All existing structural steel shall be permitted to be assumed to comply with ASTM ~~use the allowable stresses for Grade~~ A36. Existing pipe or tube columns shall be assumed to be of minimum wall thickness unless verified by testing or exposure.

A406.3.5 ~~Strength of~~ Existing concrete. All existing concrete footings shall be permitted to be assumed to be plain concrete with a compressive strength of 2,000 pounds per square inch (13.8 MPa). Existing concrete compressive strength taken greater than 2,000 pounds per square inch (13.8 MPa) shall be verified by testing, record drawings or department records.

A406.3.6 Existing sill plate anchorage. The analysis of existing cast-in-place ~~anchor bolts~~ anchors shall be permitted to assume proper anchor embedment for purposes of evaluating ~~use the allowable service loads for bolts with proper embedment when used for~~ shear resistance to lateral loads.

Reason: These are all editorial clarifications or edits for consistency and clarity.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SEARER-EB5-A403.11.4.3.DOC

EB67–09/10
A403.11.4.3

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing National Council of Structural Engineers Association (NCSEA) Existing Buildings Subcommittee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Delete without substitution:

~~**A403.11.4.3 Required preload of bolted hold-down connectors.** Bolted hold-down connectors shall be preloaded to reduce slippage of the connector. Preloading shall consist of tightening the nut on the tension anchor after the placement but before the tightening of the shear bolts in the panel boundary flange member. The tension anchor shall be tightened until the shear bolts are in firm contact with the edge of the hole nearest the direction of the tension anchor. Hold-down connectors with self-jigging bolt standoffs shall be installed in a manner to permit preloading.~~

Reason: This section of Appendix A4 is not standard practice in wood construction, and is not explicitly required in new construction. It is also potentially at odds with installation instructions for proprietary hold-down hardware. As a matter of construction quality assurance, it is better suited to commentary.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SEARER-EB4-A403.11.4.3.DOC

EB68–09/10
A402

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing National Council of Structural Engineers Association (NCSEA) Existing Buildings Subcommittee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Delete without substitution:

~~**SECTION A404**~~
~~**PHASED CONSTRUCTION**~~

~~The work specified in this chapter shall be permitted to be done in the following phases. Work shall start with Phase 1 unless otherwise approved by the building official. When the building does not contain the conditions associated with the given phase, the work shall proceed to the next phase.~~

~~**Phase 1 Work.** The first phase shall include all work in the lowest story with a soft, weak or open-front wall line and all foundation work.~~

~~**Phase 2 Work.** The second phase shall include wood-framed walls in any story with two or more stories above that are laterally braced with nonconforming structural materials.~~

~~**Phase 3 Work.** The third and final phase shall include all required work not performed in Phase 1 or Phase 2.~~

(Renumber subsequent sections)

Reason: The proposal removes an unnecessary and possibly costly provision. First, work may always be phased or sequenced at the discretion of the code official. The current provision is intended to assure that the greatest seismic risks are reduced before other work is performed. But the probability that a significant earthquake occurs during the project is extremely low, even if the work is phased. Since this chapter is triggered by other provisions in the body of the IEBC, the seismic improvements it requires will already be part of the project scope and would not inadvertently be delayed or left incomplete. Finally, by requiring a specific sequence of work, the provision could unnecessarily restrict an owner from completing work in the least disruptive or expensive way.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SEARER-EB7-A404.DOC

EB69–09/10
A406.3, A406.3.1, Table A4-A

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing National Council of Structural Engineers Association (NCSEA) Existing Buildings Subcommittee

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

1. Revise as follows:

A406.3 Existing materials. ~~All existing materials shall be in sound condition and constructed in general conformance to the building code before they are permitted to be used to resist the lateral loads prescribed in this chapter.~~ The physical condition, strengths, and stiffnesses of existing building materials shall be taken into account in any analysis required by this chapter. The verification of existing materials conditions and their conformance to these requirements shall be made by physical observation ~~reports~~, material testing or record drawings as determined by the design professional ~~structural designer~~ ~~and as approved by~~ subject to the approval of the code ~~building~~ official.

2. Delete without substitution:

~~**A406.3.1 Horizontal wood diaphragms.** Allowable shear values for existing horizontal wood diaphragms that require analysis under Section A403.10 are permitted to be taken from TableA4-A. The values in Table A4-A shall be used for allowable stress design. Design forces based on strength design shall be reduced to allowable stress levels before comparison with the limiting values in the table.~~

(Renumber subsequent sections)

TABLE A4-A
ALLOWABLE VALUES FOR EXISTING MATERIALS

Existing Materials or Configurations of Materials[a]	Allowable Values x 14.594 for N/m
1. Horizontal diaphragms[b]	
1.1. Roofs with straight sheathing and roofing applied directly to the sheathing	100 lbs. per ft. for seismic shear
1.2. Roofs with diagonal sheathing and roofing applied directly to the sheathing	250 lbs. per ft. for seismic shear
1.3. Floors with straight tongue-and-groove sheathing	100 lbs. per ft. for seismic shear
1.4. Floors with straight sheathing and finished wood flooring with board edges offset or perpendicular	500 lbs. per ft. for seismic shear
1.5. Floors with diagonal sheathing and finished wood flooring	600 lbs. per ft. for seismic shear
2. Crosswalls[b,c]	Per side:
2.1. Plaster on wood or metal lath	200 lbs. per ft. for seismic shear
2.2. Plaster on gypsum lath	175 lbs. per ft. for seismic shear
2.3. Gypsum wallboard unblocked edges	75 lbs. per ft. for seismic shear
2.4. Gypsum wallboard, blocked edges	125 lbs. per ft. for seismic shear
3. Existing footings, wood framing, structural steel and reinforced steel	
3.1. Plain concrete footings	f'c = 1,500 psi (10.3 MPa) unless otherwise shown by tests[d]
3.2. Douglas fir wood	Allowable stress same as D.F. No. 1[d]
3.3. Reinforcing steel	fs = 18,000 psi (124 MPa) maximum[d]
3.4. Structural steel	fs = 20,000 (138 MPa) maximum[d]

For SI: 1 foot = 304.8 mm

a. Material must be sound and in good condition.

b. A one-third increase in allowable stress is not allowed.

c. Shear values of these materials may be combined, except the total combined value shall not exceed 300 pounds per foot.

d. Stresses given may be increased for combinations of loads as specified in the building code.

Reason: This proposal clarifies the intent of the provision, removes unenforceable language, and removes obsolete material values from Table A4-A.

The current first sentence in A406.3 lends itself to an improper interpretation that would impose an unreasonable mandate on a project. The proposal replaces it with a reasonable requirement for engineering judgment and accountability by the design professional.

The proposal also deletes subsection A403.6.1, which is obsolete and incomplete at best, misleading at worst. Table A4-A, derived from Chapter A1 (by dividing by a factor to obtain allowable values), continues to use terms ("crosswall") and concepts appropriate to the unreinforced masonry structures covered in Chapter A1 but not appropriate to the wood-frame structures addressed by Chapter A4. Table A4-A lacks stiffnesses for each material, thus limiting its value in the context of Chapter A4. And since the table is referenced only in A406.3.1, which deals only with horizontal wood diaphragms, most of the values in the table are not linked to the chapter's provisions for sheathed walls, footings, etc.

Table A4-A is also in conflict with other portions of Chapter A4 and with current design practices. For example, Table A4-A states that the maximum structural steel allowable stress is only 20,000 psi; however, Section A406.3.4 allows the significantly higher allowable stresses of Grade A36 steel. Similarly, Table A4-A states that existing concrete must be assumed to have an f'c of 1,500 psi, yet Section A406.3.5 states that an f'c of 2,000 psi may be used. Finally, Table A4-A states that reinforcing steel shall be assumed to have an allowable stress of 18,000 psi; however, allowable stress design of concrete has not been in common use for decades.

When Chapter A4 was first developed, strengths and stiffnesses for nonconforming materials were not widely published. Now, relevant values are provided in a number of national standards and guidance documents, including ANSI/AF&PA SDPWS-2005 (Special Design Provisions for Wind and Seismic), ASCE-31, and ASCE-41. Thus, deletion of Table A4-A does not leave the practicing engineer without guidance.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: SEARER-EB13-A406.3.DOC

EB70–09/10
A406.3.2.1, A406.3.2.2

Proponent: Gary R. Searer, Wiss, Janney, Elstner Associates, Inc., representing self

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Revise as follows:

A406.3.2.1 Existing nails Allowable nail slip values. The use of box nails and unseasoned lumber are permitted to be assumed. When the required drift calculations of Section A403.11.2.1 rely on the slip design values for common nails or surfaced dry lumber, their use in construction shall be verified by exposure. The design value of the box nails shall be assumed to be similar to that of common nails having the same diameter. Verification of surfaced dry lumber shall be by identification conforming to the building code.

A406.3.2.2 Existing plywood ~~panel construction~~. When verification of the existing plywood ~~materials~~ is by use of record drawings alone, ~~the panel construction for~~ plywood shall be assumed to be of three plies. ~~The plywood modulus "G" shall be assumed equal to 50,000 pounds per square inch (345 MPa).~~

Reason: These are all clarifications intended to streamline these two sections of code and to preclude conflicts between other sections of code.

The presence of box nails and unseasoned lumber are always permitted to be assumed since this is a conservative assumption; there's no reason to state this.

A406.3.2.1 currently only deals with drift calculations, but the presence of box or common nails affects the strength as well; therefore any reference to drift and slip values is stricken, and the term "design values" is used.

The sentence stating that design value of box nails shall be assumed similar to that of common nails of the same diameter is not in complete agreement with AF&PA (since head size and length also play a role) and is unnecessary.

The first three changes to A406.3.2.2 are editorial. The fourth change (deletion of the last sentence) is to address the fact that shear modulus depends on the thickness of the plywood and is in conflict with AF&PA values. In addition, AF&PA now provides apparent shear stiffness, G_a, values, which are more helpful and easy to use than straight modulus, G, values; requiring "G" be used is potentially confusing to the engineer and the building official.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SEARER-EB3-A406.3.2.1.DOC

EB71–09/10
Appendix C (New)

Proponent: T. Eric Stafford, PE, Institute for Business and Home Safety

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Add a new appendix as follows:

APPENDIX C: GUIDELINES FOR WIND RETROFIT OF EXISTING BUILDINGS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

CHAPTER C1
ROOF DECK FASTENING FOR HIGH WIND AREAS

SECTION C101
GENERAL

C101.1 Intent and purpose. The provisions of this chapter provide prescriptive methods for selected structural retrofitting of existing buildings. Compliance with these provisions will not always meet the requirements for new construction in the *International Building Code* or the *International Residential Code*. The provisions of this chapter are intended to provide methods for strengthening existing buildings to increase resistance to wind loads.

C101.2 Scope. The provisions of this chapter are a prescriptive alternative for one- and two-family dwellings to achieve compliance with Section 606.3 of the *International Existing Building Code*.

SECTION C102
ROOF DECK ATTACHMENT FOR WOOD ROOFS

C102.1 Roof decking attachment for one- and two-family dwellings. For one- and two-family dwellings, fastening shall be in accordance with section C102.1.1 or C102.1.2 as appropriate for the existing construction. The diameter of 8d nails shall be a minimum of 0.131 inches and the length shall be a minimum of 2-1/4 inches to qualify for the provisions of this section for existing nails regardless of head shape or head diameter.

C102.1.1 Sawn lumber or wood plank roofs. Roof decking consisting of sawn lumber or wood planks up to 12" wide and secured with at least two nails (minimum size 8d) to each roof framing member it crosses shall be deemed to be sufficiently connected. Sawn lumber or wood plank decking secured with smaller fasteners than 8d nails or with fewer than two nails (minimum size 8d) to each framing member it crosses shall be deemed sufficiently connected if fasteners are added such that two clipped head, round head, or ring shank nails (minimum size 8d) are in place on each framing member the nail crosses.

C102.1.2 Wood structural panel roofs. For roof decking consisting of wood structural panels, fasteners and spacings required in Table C102.1.2 are deemed to comply with the requirements of Section 606.3 of the *International Existing Building Code*.

Supplemental fasteners as required by Table C102.1.2 shall be 8d ring shank nails with round heads and the following minimum dimensions:

1. 0.113-inch nominal shank diameter
2. Ring diameter a minimum of 0.012-inch greater than shank diameter
3. 16 to 20 rings per inch
4. A minimum 0.280-inch full round head diameter
5. Ring shank to extend a minimum of 1 ½" from the tip of the nail.
6. Minimum 2-1/4 inch nail length

TABLE C102.1.2
SUPPLEMENT FASTENERS AT PANEL EDGES AND INTERMEDIATE FRAMING

Existing fasteners	Existing fastener spacing (edge or intermediate supports)	Wind speed 110 mph or less supplemental fastening shall be no greater than	Wind speed greater than 110 mph supplemental fastening for interior zone[c] locations and edge zones not covered by column to right shall be no greater than	Edge zone[d] for wind speed greater than 120 mph and Exposure C, or Wind speed greater than 140 mph and Exposure B
Staples or 6d	Any	6" o.c.[b]	6" o.c.[b]	4" o.c[b] at panel edges and 4" o.c.[b] at intermediate supports.
8d clipped head or round head smooth shank	6" o.c. or less	None necessary	None necessary along edges of panels but 6" o.c.[b] at intermediate supports of panel	4" o.c[a] at panel edges and 4" o.c.[a] at intermediate supports.
8d clipped head or round head ring shank	6" o.c. or less	None necessary	None necessary	4" o.c[a] at panel edges and 4" o.c.[a] at intermediate supports.
8d clipped head or round head smooth shank	Greater than 6" o.c.	6" o.c.[a]	6" o.c.[a] along panel edges and 6" o.c.[b] at intermediate supports of panel	4" o.c[a] at panel edges and 4" o.c.[a] at intermediate supports.
8d clipped head or round head ring shank	Greater than 6" o.c.	6" o.c.[a]	6" o.c.[a]	4" o.c[a] at panel edges and 4" o.c.[a] at intermediate supports.

a. Maximum spacing determined based on existing fasteners and supplemental fasteners.
b. Maximum spacing determined based on supplemental fasteners only.
c. Interior zone = sheathing that is not located within 4 feet of the perimeter edge of the roof or within 4 feet of each side of a ridge
d. Edge zone = sheathing that is located within 4 feet of the perimeter edge of the roof and within 4 feet of each side of a ridge

Reason: The intent of this proposal is to provide a prescriptive solution for compliance with Section 606.3. This proposal, along with a similar proposal, is requesting the creation of a new set of Appendix chapters that are intended to provide guidance for retrofitting existing structures to strengthen their resistance to wind forces. These new proposed chapters are similar in scope to Appendix A which addresses seismic retrofits for existing buildings. We anticipate that, over time, additional retrofit methods will be provided in this Appendix chapter. These retrofits are voluntary, and as such may or may not meet the requirements of new construction. However, these voluntary measures will serve to better protect the public and reduce damage from high wind events.

Section 606.3 requires the roof deck to be evaluated and remedial action when insufficient or deteriorated connections are found. However, it gives little guidance on making the required determination or providing the required corrections. Ordinarily one would to turn to the requirements for new construction. However, blindly applying the same fastening requirements where fasteners already exist could potentially compromise performance because of damage to roof panels or framing members. The assumption is that there is an optimum spacing of existing and new fasteners that is a function of the number and type of existing connectors.

Adding fasteners where fasteners already exist is different than installing fasteners in new construction because of the greater potential for damaging sheathing or framing members. To date the code only addresses nailing schedules for new installations without providing any guidance for retrofit nailing. The goal is that by the addition of additional fastener strengths will at least approach current fastening requirements in order to approach the same performance level. This code modification provides the guidance that is needed when adding fasteners where fasteners already exist.

The nail spacings shown in Table C102.1.2 are derived from research conducted in the 1990's at Clemson University tempered by the requirements for roof sheathing attachment for high winds in the Wood Frame Construction Manual and SSTD 10-99. Smaller diameter fasteners such as staples damage framing members less than larger diameter fasteners and they provide significantly lower uplift resistance. Consequently, in these situations supplemental fasteners can be installed at typical new construction spacing without concern for splitting the structural members.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: STAFFORD-EB1-APP C.DOC

EB72–09/10
Appendix C (New)

Proponent: T. Eric Stafford, PE, Institute for Business and Home Safety

THIS PROPOSAL IS ON THE AGENDA OF THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IBC STRUCTURAL CODE DEVELOPMENT COMMITTEE.

Add a new appendix as follows:

APPENDIX C
GUIDELINES FOR WIND RETROFIT OF EXISTING BUILDINGS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

CHAPTER C1
GABLE END RETROFIT FOR HIGH WIND AREAS

SECTION C101
GENERAL

C101.1 Intent and purpose. The provisions of this chapter provide prescriptive methods for selected structural retrofitting of existing buildings. Compliance with these provisions will not always meet the requirements for new construction in the *International Building Code* or the *International Residential Code*. The provisions of this chapter are intended to provide methods for strengthening existing buildings to increase the building's resistance to wind loads.

C101.2 Scope. The following prescriptive methods are intended for applications where the gable end wall framing is provided by a wood gable end wall truss or a conventionally framed rafter system. The retrofits are appropriate for wall studs oriented with the wide face parallel to or perpendicular to the gable end surface. Gable ends to be strengthened shall be permitted to be retrofitted using methods prescribed by this chapter.

SECTION C102
DEFINITIONS

ANCHOR BLOCK. A piece of lumber secured to horizontal braces and filling the gap between existing framing members for the purpose of restraining horizontal braces from movement perpendicular to the framing members.

COMPRESSION BLOCK. A piece of lumber used to restrain in the compression mode (force directed towards the interior of the attic) an existing or retrofit stud. It is attached to a horizontal brace and bears directly against the existing or retrofit stud.

CONVENTIONALLY FRAMED GABLE END. A gable end framed with studs whose faces are perpendicular to the gable end wall.

HORIZONTAL BRACE. A piece of lumber used to restrain both compression and tension loads applied by a retrofit stud. It is typically installed horizontally on the top of attic floor framing members (truss bottom chords or ceiling joists) or on the bottom of pitched roof framing members (truss top chord or rafters).

HURRICANE TIES. Manufactured metal connectors designed to provide uplift and lateral restraint for roof framing members.

NAIL PLATE. A manufactured metal plate made of galvanized steel with factory punched holes for fasteners. A nail plate may have the geometry of a strap.

RETROFIT. The voluntary process of strengthening or improving buildings or structures, or individual components of buildings or structures for the purpose of making existing conditions better serve the purpose for which they were originally intended or the purpose that current building codes intend.

RETROFIT STUD. A lumber member used to structurally supplement an existing gable end wall stud.

RIGHT ANGLE BRACKET. A galvanized metal right angle bracket listed by the manufacturer for the material into which they will be attached, masonry (concrete or CMU) or wood.

STUD-TO-PLATE CONNECTOR. A manufactured metal connector designed to connect studs to plates.

TRUSS GABLE END. An engineered factory made truss or site built truss that incorporates factory installed or field installed vertical studs with their faces parallel to the plane of the truss

SECTION C103
MATERIALS OF CONSTRUCTION

C103.1 Existing materials. All existing wood materials that will be part of the retrofit work (trusses, rafters, ceiling joists, top plates, wall studs, etc.) shall be in sound condition and free from defects or damage that substantially reduces the load-carrying capacity of the member. Any wood materials found to be damaged or deteriorated shall be strengthened or replaced with new materials to provide a net dimension of sound wood equivalent to its undamaged original dimensions.

C103.2 New materials. All new materials shall comply with the requirements of the *International Building Code* or the *International Residential Code* as applicable.

C103.3. Material specifications for retrofits. Materials for retrofitting gable end walls shall comply with Sections C103.3.1 through C103.6

C103.3.1 Anchor blocks, compression blocks, and horizontal braces. Anchor blocks, compression blocks, and horizontal braces shall be lumber nominally 2 inch by at least 4 inch wide.

C103.3.2 Nail plate. Nail plates shall be of minimum 20 gauge thickness.

C103.3.3 Retrofit stud. Retrofit studs shall be made of nominal 2-inch lumber.

C103.3.4 Right angle bracket. Right angle brackets shall have a minimum capacity of 350 for uplift and lateral load conditions.

C103.3.5 Stud-to-plate connector. Stud-to-plate connectors shall have a minimum capacity of 500 pounds for uplift.

C103.3.6 Truss gable end. Gable end trusses shall be spaced no greater than 24-iches on center.

C103.4 Metal plate connectors, straps and anchors. Metal plate connectors, plates, straps and anchors shall be a product approved for connecting wood-to-wood or wood-to-concrete as appropriate. Straps and nail plates shall be manufactured from galvanized steel with a minimum thickness of 20 gauge. Nail plates shall have holes sized for a minimum of 8d nails.

C103.5 Twists in straps. Straps shall be permitted to be twisted or bent where they transition between framing members or connection points. Straps shall be bent only once at a given location though it is permissible that they be bent or twisted at multiple locations along their length.

C103.6 Fasteners. Fasteners shall meet the requirements of Sections C103.6.1 and Section C103.6.2, and shall be permitted to be screws or nails meeting the minimum length requirement shown in figures and specified in tables. Fastener spacing shall meet the requirements of Section C103.6.3.

C103.6.1 Screws. Screws shall be a minimum #8 size with head diameters no less than 0.28 inches. Screw lengths shall be no less than indicated in the Figures and in Tables. Permissible screws include deck screws and wood screws. Screws shall have at least 1 inch of thread. Fine threaded screws or drywall screws shall not be permitted. Screws shall be chosen with the appropriate diameter such that the shank adjacent to the head fits through the hole in the strap.

C103.6.2 Nails. Unless otherwise indicated in the provisions or drawings, where fastener lengths are indicated in Figures and Tables. as 1-¼ inches, 8d common nails with shank diameter 0.131 inches and head diameters no less than 0.28 inches shall be permitted. Unless otherwise indicated in the provisions or drawings, where fasteners lengths are indicated in Figures and Tables. as 3 inches, 10d common nails with shank diameter of 0.148 inches and head diameters no less than 0.28 inches shall be permitted.

C103.6.3 General fastener spacing. Fastener spacing for shear connections of lumber-to-lumber shall meet the requirements shown in Figure C103.6.3 and the following conditions.

C103.6.3.1 General fastener spacing. Fastener spacing shall meet the following conditions except as provided for in Section C103.6.3.3

The distance between fasteners and the edge of lumber that is less than 3-1/2 inches deep in the direction of the fastener length shall be a minimum of 3/4 inches.

1. The distance between fasteners and the edge of lumber that is more than 2 inches thick in the direction of the fastener length shall be a minimum of ½ inches.
2. The distance between a fastener and the end of lumber shall be a minimum of 2-½ inches.
3. The distance between fasteners parallel to the grain (center-to-center) shall be a minimum of 2-1/2 inches.
4. The distance between fasteners perpendicular to the grain (center-to-center) in lumber that is less than 3-1/2 inches deep in the direction of the fastener length shall be 1 inch.
5. The distance between fasteners perpendicular to the grain (center-to-center) in lumber that is more than 2 inches thick in the direction of the fastener length shall be ½ inch.

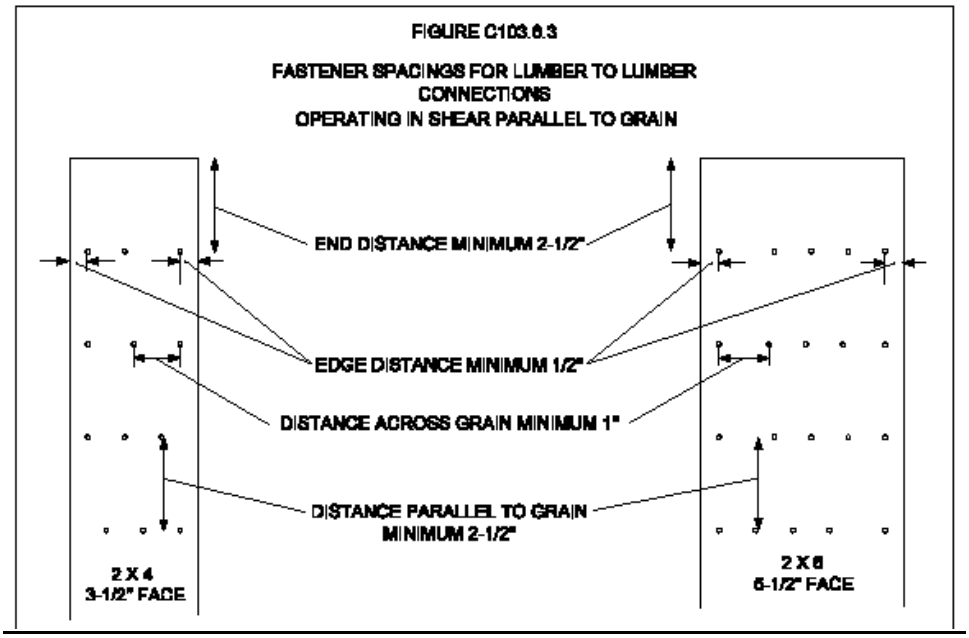
C103.6.3.2 Wood-to-wood connections of two members each 2 inch or less thick. Wood-to-wood connections fastener spacing shall meet the following conditions.

1. The distance between fasteners parallel to grain (center-to-center) shall be a minimum of 2-1/2 inches.
2. The distance between fasteners across grain (center-to-center) shall be a minimum of 1 inch.
3. For wood-to-wood connections of lumber at right angles, fasteners shall be spaced a minimum of 2-1/2 inches parallel to the grain and 1 inch perpendicular to the grain in any direction.

C103.6.3.3 Metal connectors to wood connections. Metal connectors to wood connections shall meet the following conditions.

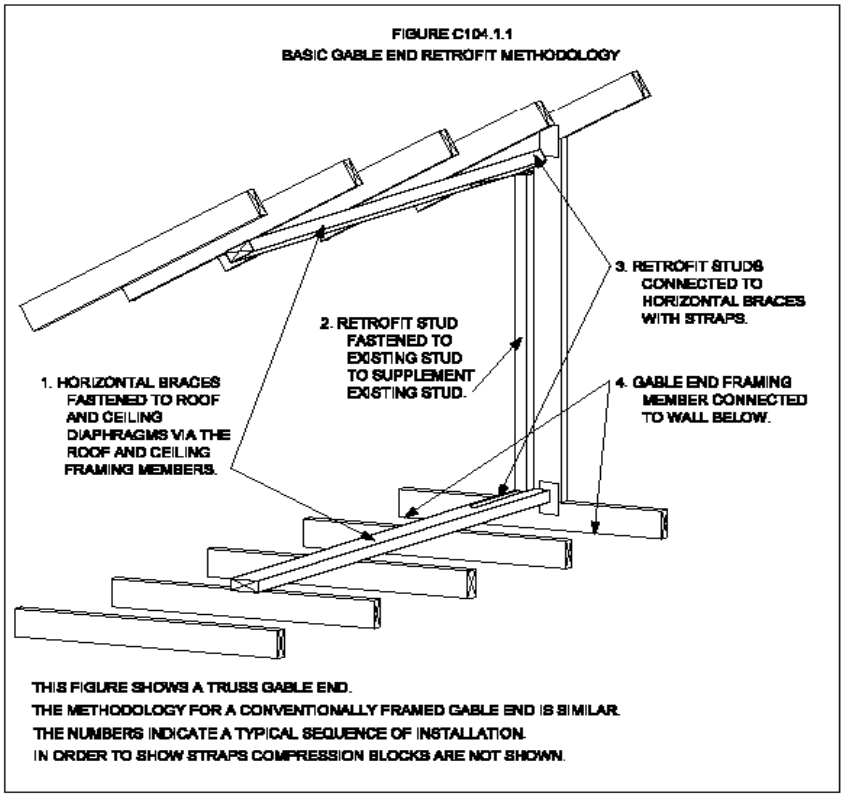
1. Fastener spacing to edge or ends of lumber shall be as dictated by the prefabricated holes in the connectors and the connectors shall be installed in accordance with the manufacturer.
2. Fasteners in 1-1/4 inch wide metal straps that are installed on the 1-1/2 inch broad face of lumber shall be a minimum 1/4 inches from either edge of the lumber. Consistent with Section C103.6.3.1 fasteners shall be allowed to be spaced according to the fastener holes fabricated into the strap.
3. Fasteners in metal nail plates shall be spaced a minimum of ½ inches across wood grain and a minimum of 1-1/2 inches parallel to wood grain.

SECTION C104
RETROFITTING GABLE END WALLS TO ENHANCE WIND RESISTANCE



SECTION C104
RETROFITTING GABLE END WALLS TO ENHANCE WIND RESISTANCE

C104.1 General. These prescriptive methods of retrofitting are intended to increase the resistance of existing gable end construction for out-of-plane wind loads resulting from high wind events. The ceiling diaphragm shall be comprised of minimum ½ inch thick drywall, minimum nominal 3/8 inch thick wood structural panels, or plaster. An overview isometric drawing of one kind of gable end retrofit to improve wind resistance is shown in Figure C104.1.1.



C104.2 Horizontal braces. Horizontal braces shall be installed approximately perpendicular to the roof and ceiling framing members at the location of each existing gable end stud greater than 3 feet in length. Unless it is adjacent to an omitted horizontal brace location, horizontal braces shall be minimum 2x4 dimensional lumber as defined in Section C103.3. A single horizontal brace is required at the top and bottom of each gable end stud for Retrofit Configuration A, B, or C and two horizontal braces are required for Retrofit Configuration D. Maximum heights of gable end wall studs and associated retrofit studs for each Retrofit Configuration shall not exceed the values listed in Table C104.2. Horizontal braces shall be oriented with their broad faces across the roof or ceiling framing members, be fastened to a minimum of three framing members, and extend at least 6 feet measured perpendicularly from the gable end plus 2-1/2 inches beyond the last top chord or bottom chord member (rafter or ceiling joist) from the gable end as shown in Figure C104.2(1), Figure C104.2(2), Figure C104.2(3), and Figure C104.2(4).

TABLE C104.2

STUD LENGTH LIMITATIONS BASED ON EXPOSURE AND DESIGN WIND SPEED

Exposure Category	**Maximum 3-Sec Gust** Basic Wind Speed [a]	**Maximum Height of Gable End Retrofit Stud [b]**			
C	110	8'-0"	11'-3"	14'-9"	16'-0"
C	120	7'-6"	10'-6"	13'-6"	16'-0"
C	130	7'-0"	10'-0"	12'-3"	16'-0"
C	140	7'-0"	10'-0"	12'-3"	16'-0"
C	150	6'-6"	8"-9"	11'-0"	16'-0"
B	110	8'-0"	12'-3"	16'-0"	N/R [c.]
B	120	8'-0"	11'-3"	14'-9"	16'-0"
B	130	8'-0"	11'-3"	14'-9"	16'-0"
B	140	7'-6"	10'-6"	13'-6"	16'-0"
B	150	7'-0"	10'-0"	12'-3"	16'-0"
	Retrofit Configuration -->	A	B	C	D

For SI: 1 Inch = 25.4mm, 1 Foot = 304.8mm

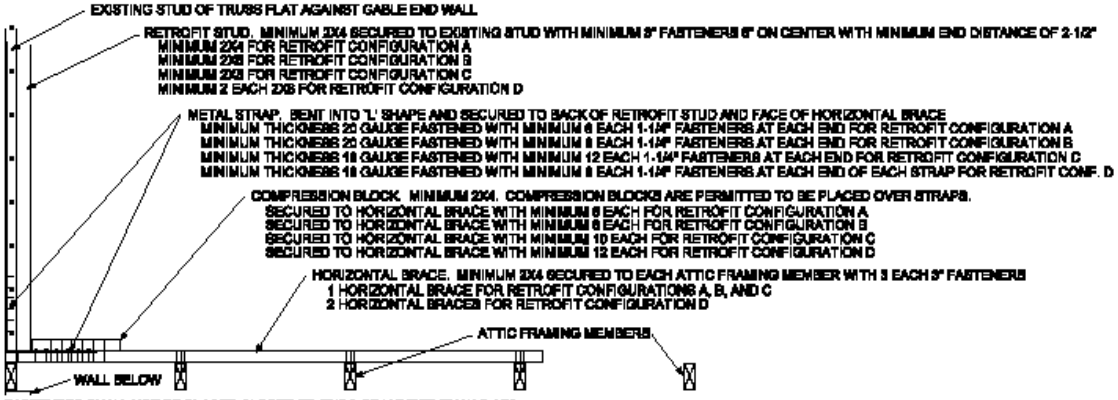
a. Interpolation between given wind speeds not permitted.

b. Existing gable end studs less than or equal to 3'-0" in height shall not require retrofitting.

c. N/R = Not Required. Configuration C is acceptable to 16'-0" maximum height.

FIGURE C104.2 (1)
TRUSS FRAMED GABLE END "L-BENT STRAP

ELEVATION VIEW



FASTENERS SHALL NOT BE PLACED CLOSER TO ENDS OF LUMBER THAN 2-1/2".

FASTENERS SHALL NOT BE PLACED CLOSER TO EDGES OF LUMBER THAN 1/2" EXCEPT WHERE STRAPS DICTATE OTHERWISE.

THE NUMBER OF FASTENERS SHOWN IS NOT NECESSARILY THE NUMBER REQUIRED.

PLAN VIEWS

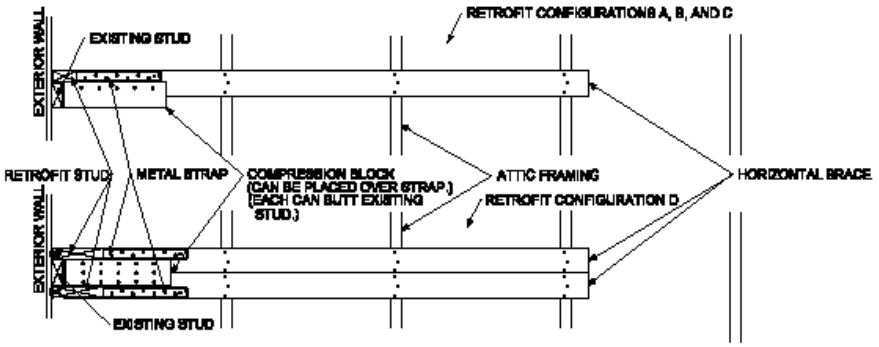
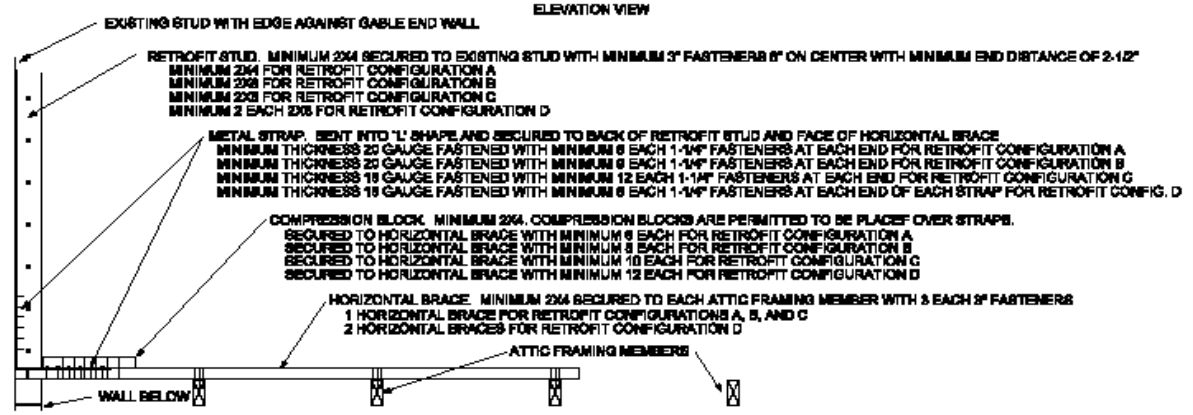


FIGURE C104.2 (2)
CONVENTIONALLY FRAMED GABLE END. L-BENT STRAP
ELEVATION VIEW



FASTENERS SHALL NOT BE PLACED CLOSER TO ENDS OF LUMBER THAN 2-1/2".
FASTENERS SHALL NOT BE PLACED CLOSER TO EDGES OF LUMBER THAN 1/2" EXCEPT WHERE STRAPS DICTATE OTHERWISE.
THE NUMBER OF FASTENERS SHOWN IS NOT NECESSARILY THE NUMBER REQUIRED.

PLAN VIEWS
RETROFIT CONFIGURATIONS A, B, AND C

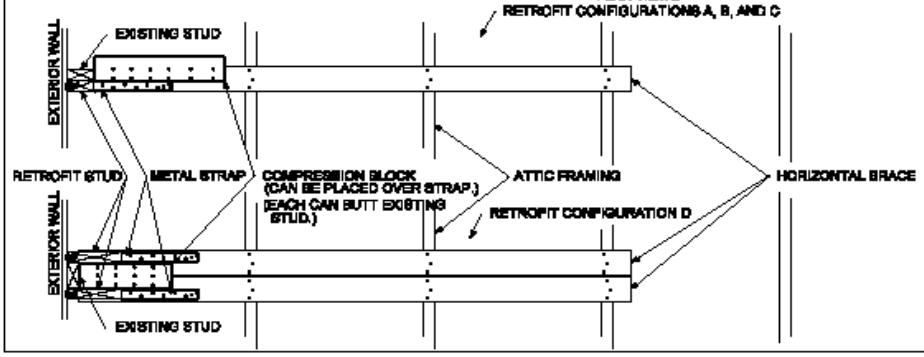
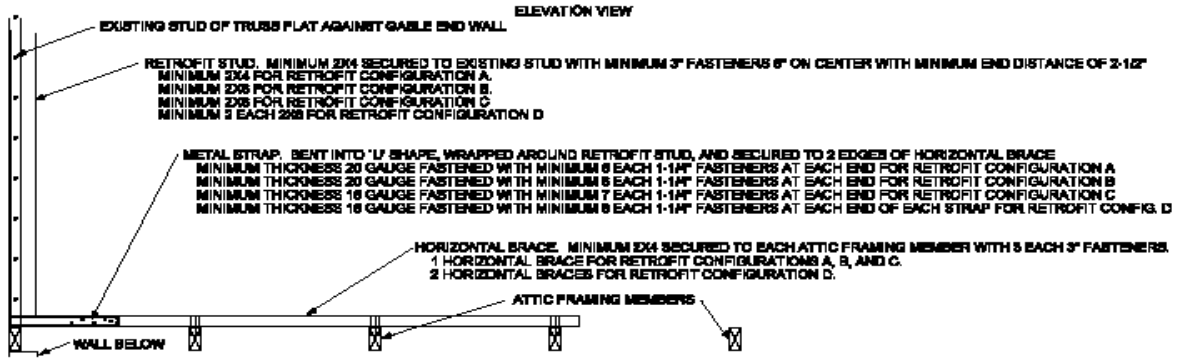


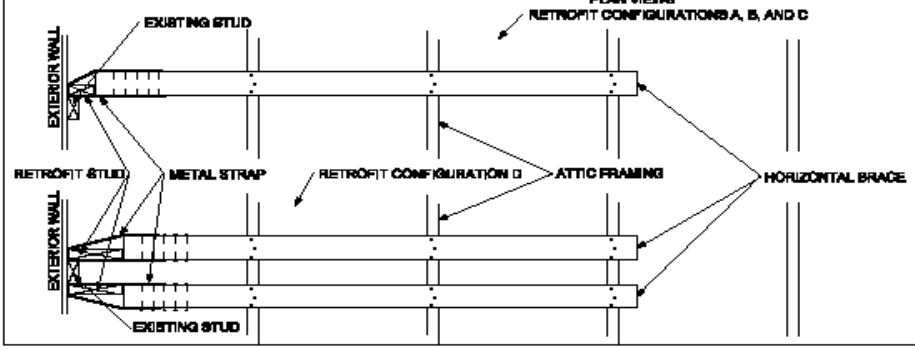
FIGURE C104.2 (3)
TRUSS FRAMED GABLE END. U-BENT STRAP

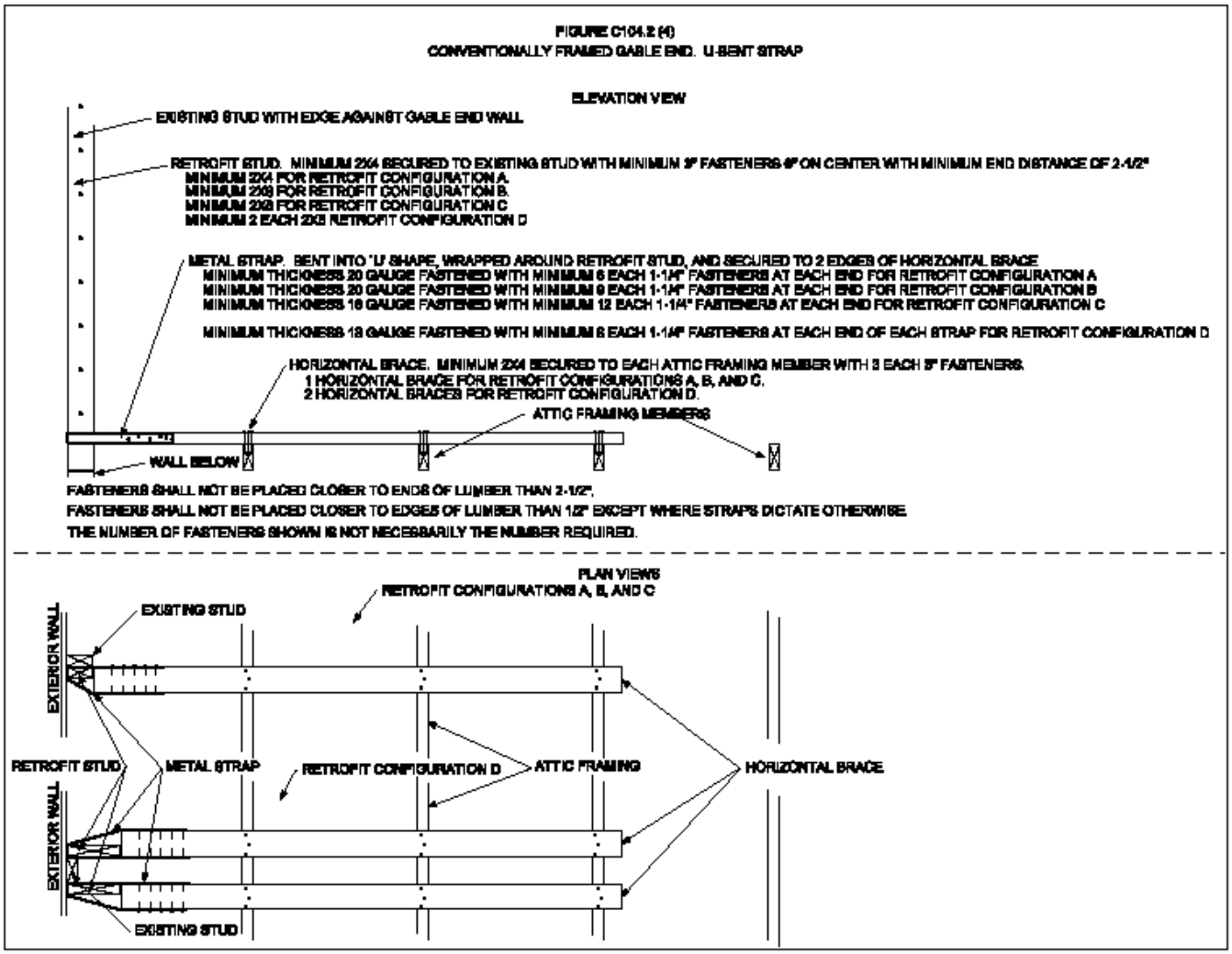
ELEVATION VIEW



FASTENERS SHALL NOT BE PLACED CLOSER TO ENDS OF LUMBER THAN 2-1/2".
FASTENERS SHALL NOT BE PLACED CLOSER TO EDGES OF LUMBER THAN 1/2" EXCEPT WHERE STRAPS DICTATE OTHERWISE.
THE NUMBER OF FASTENERS SHOWN IS NOT NECESSARILY THE NUMBER REQUIRED.

PLAN VIEWS
RETROFIT CONFIGURATIONS A, B, AND C





C104.2.1 Existing gable end studs. If the spacing of existing vertical gable end studs in conventionally framed or the truss gable ends is greater than 24 inches, a new stud and corresponding horizontal braces shall be installed such that the maximum spacing between existing and added studs shall be no greater than 24 inches. Additional gable end wall studs shall not be required at locations where their length would be 3 feet or less. Each end of each required new stud shall be attached to the existing roof framing members (truss top chord or rafter and truss bottom chord or ceiling joist) using a minimum of two 3 inch toenail fasteners (#8 wood screws or 10d nails) and a metal connector with minimum uplift capacity of 175 pounds, or nail plates with a minimum of four 1-1/4 inch long fasteners (#8 wood screws or 8d nails).

C104.2.2 Main method of installation. Each horizontal brace shall be fastened to each existing roof or ceiling member that it crosses using three 3-inch long fasteners (#8 wood screws or 10d nails) as indicated in Figure C104.2(1) and Figure C104.2(3) for trusses and Figure C104.2(2) and Figure C104.2(4) for conventionally framed gable end walls. Alternative methods for providing horizontal bracing of the gable end studs as provided in Sections C104.2.3 through C104.2.9 shall be allowed in lieu of this primary installation method.

C104.2.3 Omitted horizontal brace. Where impediments, other permanently attached obstacles or conditions exist that prevent installation in accordance with Section C104.2.2 horizontal braces may be omitted for height limitations corresponding to Retrofit Configurations A and B as defined in Table C104.2 provided installation is as indicated in Figure C104.2.3 and provided all of the following conditions are met. This method is not allowed for Retrofit Configurations C or D.

1. There shall be at least two horizontal braces on each side of an omitted horizontal brace or at least one horizontal brace if it is the end horizontal brace. Omitted horizontal braces must be separated by at least two horizontal braces even if that location is comprised of two retrofit studs and two horizontal braces.

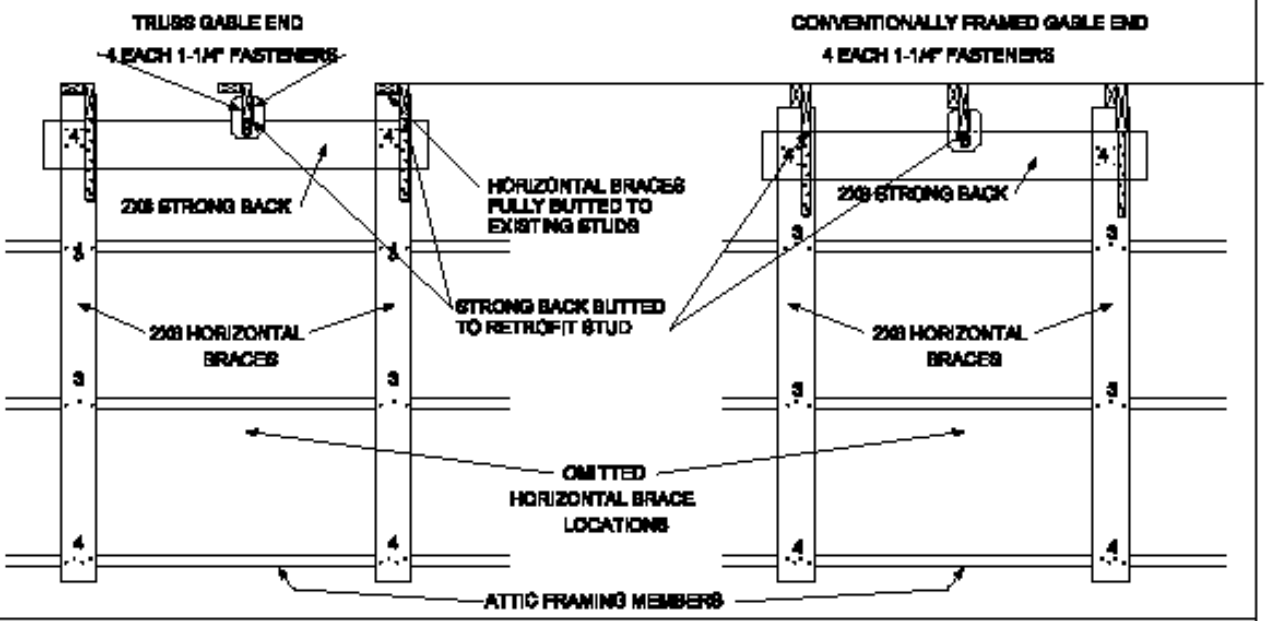
2. Horizontal braces adjacent to the omitted horizontal brace shall be 2x6 lumber, shall butt against the existing studs, and shall be fastened to each existing roof or ceiling member that it crosses using three 3-inch long fasteners (#8 wood screws or 10d nails). For Retrofit Configuration B, 4 fasteners shall be required on at least one of the connections between the horizontal brace and the existing roof and ceiling framing members. Fasteners shall be spaced a minimum of ¾" from the edges of the horizontal braces and a minimum of 1-3/4" from adjacent fasteners.
3. Where the existing studs on each side of an omitted horizontal brace have their broad face perpendicular to the gable end wall, the retrofit studs at those locations and the retrofit stud at the omitted horizontal brace locations shall be sized such that they protrude a minimum of 3-1/2 inches beyond the interior edge of the existing studs for both Retrofit Configurations A and B. The edges of the three retrofit studs facing towards the interior of the attic shall be aligned such that they are the same distance from the gable end wall.
4, Retrofit studs shall be fastened to existing studs in accordance with Section C104.3.
5. Retrofit studs adjacent to the omitted horizontal brace shall be fastened to the horizontal brace using straps in accordance with Table C104.4.1 consistent with the size of the retrofit stud. The method applicable to Table C104.4.2 is not allowed.
6. A strong back made of minimum of 2x8 lumber shall be placed parallel to the gable end and shall be located on and span between horizontal braces on the two sides of the omitted horizontal brace and shall extend beyond each horizontal braces by a minimum of 2-1/2 inches. The strong back shall be butted to the three retrofit studs. The strong back shall be attached to each of the horizontal braces on which it rests with 5 3 inch long fasteners (#8 screws or 8d nails). Those fasteners shall be spaced a minimum of 3/4 inch from any edge of lumber and shall be spaced a minimum of 2-1/2 inch from each other. Additional compression blocks shall not be required at locations where a strong back butts against a retrofit stud.
7. The retrofit stud at the location of the omitted horizontal braces shall be fastened to the strong back using a connector with minimum uplift capacity of 800 pounds and installed such that this capacity is oriented in the direction perpendicular to the gable end wall.
8. The use of shortened horizontal braces using the alternative method of Section C104.2.5 is not allowable for horizontal braces adjacent to the omitted horizontal braces.
9. Horizontal braces shall be permitted to be interrupted in accordance with Section C104.2.8.

FIGURE C104.2.3
OMITTED HORIZONTAL BRACE

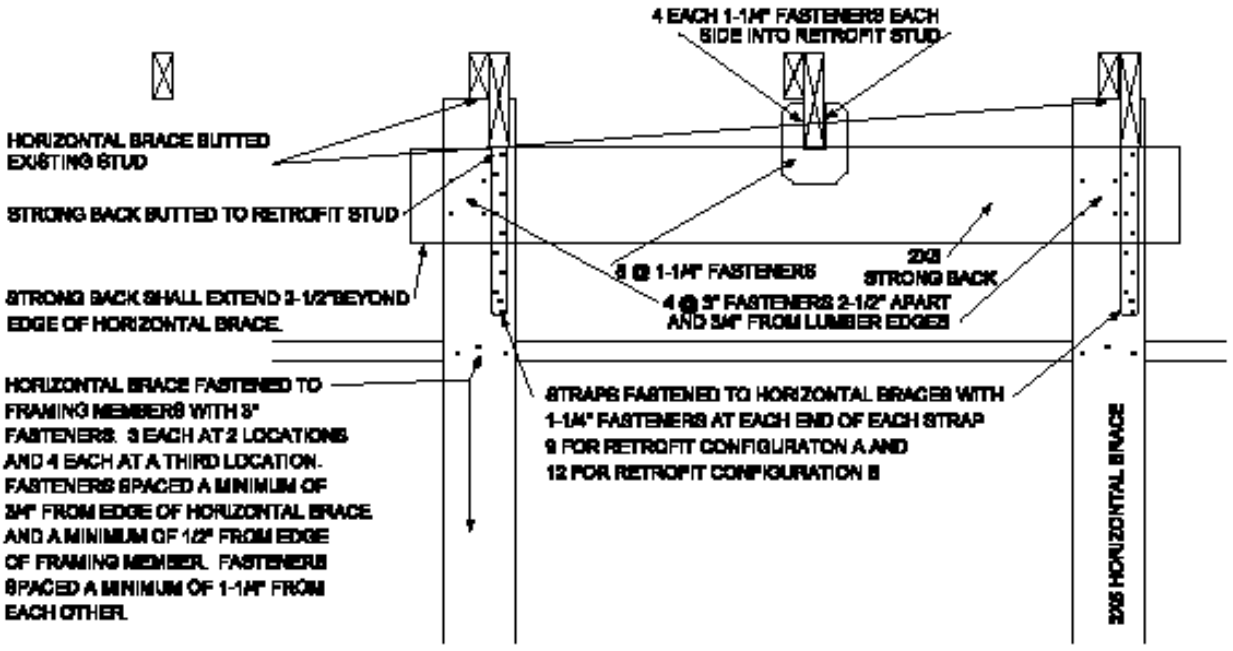
OVERVIEW

PLAN VIEWS
RETROFIT CONFIGURATION A AND B ONLY
NOT ALLOWED FOR RETROFIT CONFIGURATION C OR D

UNIDENTIFIED NUMBERS INDICATE THE NUMBER OF FASTENERS



DETAILS OF CONVENTIONALLY FRAMED GABLE



C104.2.4 Omitted horizontal brace and retrofit stud. Where impediments, other permanently attached obstacles or conditions exist that prevent installation in accordance with Section C104.2.2 or Section C104.2.3 by not permitting installation of horizontal braces, then retrofit studs and horizontal brace shall be permitted to be omitted from those locations by installation of ladder assemblies for Retrofit Configurations A and B as defined in Table C104.2 provided all of the following conditions are met**.** This method is not allowed for Retrofit Configurations C or D.

1. No more than two ladder assemblies are permitted on a single gable end.
2. There shall be at least two retrofit studs and horizontal brace assemblies on either side of the locations where the retrofit studs and horizontal bracing members are omitted (no two ladder braces bearing on a single retrofit stud).
3. Where the existing studs on each side of an omitted horizontal brace have their broad face parallel to the gable end wall the retrofit studs at those locations and the retrofit stud at the omitted horizontal brace locations shall be 2x6 lumber for Retrofit Configuration A and 2x8 lumber for Retrofit Configuration B.
4, Horizontal braces adjacent to the omitted horizontal brace shall be 2x6 lumber and be fastened to each existing roof or ceiling member crossed using three 3-inch long fasteners (#8 wood screws or 10d nails) as indicated in Figure C104.2(1) and Figure C104.2(3) for trusses and Figure C104.2(2) and Figure C104.2(4) for conventionally framed gable end wall. For Retrofit Configuration B, 4 fasteners shall be required on at least one of the connections between the horizontal brace and the existing roof and ceiling framing members.
5. Ladder rungs /shall be provided across the location of the omitted retrofit studs as indicated in Figure C104.2.4(1) for trusses and Figure C104.2.4(2) for conventionally framed gable end walls.
6. Ladder rungs shall be made of at a minimum 2x4 lumber oriented with their broad face horizontal and spaced a maximum of 16-inches on center vertically.
7. Where ladder rungs cross structural members such as the existing stud at the omitted retrofit stud location or gable end vent framing they shall be connected to each other with a metal connector with a minimum capacity of 175 pounds in the direction perpendicular to the gable end wall.
8. Notching of the ladder rungs shall not be permitted unless the net depth of the framing member is a minimum of 3-1/2 inches.

C104.2.5 Short horizontal brace. Where impediments, other permanently attached obstacles or conditions exist that prevent installation in accordance with Sections C104.2.2, C104.2.3, or C104.2.4 by not permitting extension of horizontal braces across the existing framing members such that they can be fastened to a minimum of three framing members and extend at least 6-feet from the gable end wall plus 2-1/2 inches beyond the last roof or ceiling framing member, the horizontal braces may be shortened provided installation is as indicated in Figure C104.2.5 and provided that all of the following conditions are met.

1. The horizontal brace shall be installed across a minimum of two framing spaces, extend a minimum of 4-feet from the gable end wall plus 2-1/2 inches beyond the last roof or ceiling framing member, and be fastened to each existing framing member with three 3-inch long fasteners (#8 wood screws or 10d nails),
2. An anchor block shall be fastened to the side of the horizontal brace in the second framing space from the gable end wall as shown in Figure C104.2.5. The anchor block lumber shall have a minimum edge thickness of 1-1/2 inches and the depth shall be as a minimum the depth of the existing roof or ceiling framing member. Six 3-inch long fasteners (#8 wood screws or 10d nails) shall be used to fasten the anchor block to the side of the horizontal brace.
3. The anchor block shall extend into the space between the roof or ceiling framing members a minimum of one-half the depth of the existing framing members at the location where the anchor block is installed. The anchor block shall be installed tightly between the existing framing members such that the gap at either end shall not exceed $^{1}/_{8}$ inch.
4. The use of omitted horizontal braces using the method of Section C104.2.3 adjacent to a short horizontal brace as defined in this section is not permitted.

C104.2.6 Installation of horizontal braces onto webs or vertical members of trusses. Where existing conditions preclude installation of horizontal braces on truss top or bottom chords they shall be permitted to be installed on truss webs or vertical members of trusses provided all of the following conditions are met.

1. Horizontal braces shall be installed as close to the top or bottom chords as practical without altering the truss or any of its components and not more than three times the depth of the truss member to which it would ordinarily be attached.
2. A racking block, comprised of an anchor block meeting the definition of anchor block of Section C102 or comprised of minimum 15/32 inch plywood or 7/16 inch OSB, shall be fastened to the horizontal brace in the second framing space from the gable end wall. The racking block shall extend towards the diaphragm (roof or ceiling as appropriate) so that the edge of the racking block closest to the diaphragm is within ½ the depth of

the existing framing member from the diaphragm surface. They shall be attached to horizontal braces using six fasteners (#8 wood screws or 10d nails) of sufficient length to provide 1-1/2 inches of penetration into the horizontal brace.

3. Racking blocks can be fastened to any face or edge of horizontal braces between each web or truss vertical posts to which a horizontal brace is attached. Racking blocks can be on alternate sides of horizontal braces. Racking blocks shall be installed tightly between the lumber of truss members or truss plates such that the gap at either end shall be a maximum of 1/8 inch.

C104.2.7 Alternative method of installation of horizontal braces at truss ridges. Where impediments such as truss plates or access for installation of fasteners limits or restricts installation of horizontal braces near the peak of the roof, ridge ties may be added to provide support for the required horizontal brace. The top of added ridge tie members shall be installed a maximum of 16-inches below the existing ridge line or 4 inches below impediments. The added ridge tie members shall be installed across a minimum of three bays, but no less than 6-feet from the gable end wall plus 2-1/2 inches beyond the last roof or ceiling framing member to permit fastening of the horizontal brace. A minimum of a 2x4 member shall be used for each ridge tie and fastening shall consist of two 3-inch long wood screws, four 3 inch long 10d nails or two 3-1/2 inch long 16d nails driven through and clinched at each top chord or web member intersected by the ridge tie as illustrated in Figure C104.2.7.

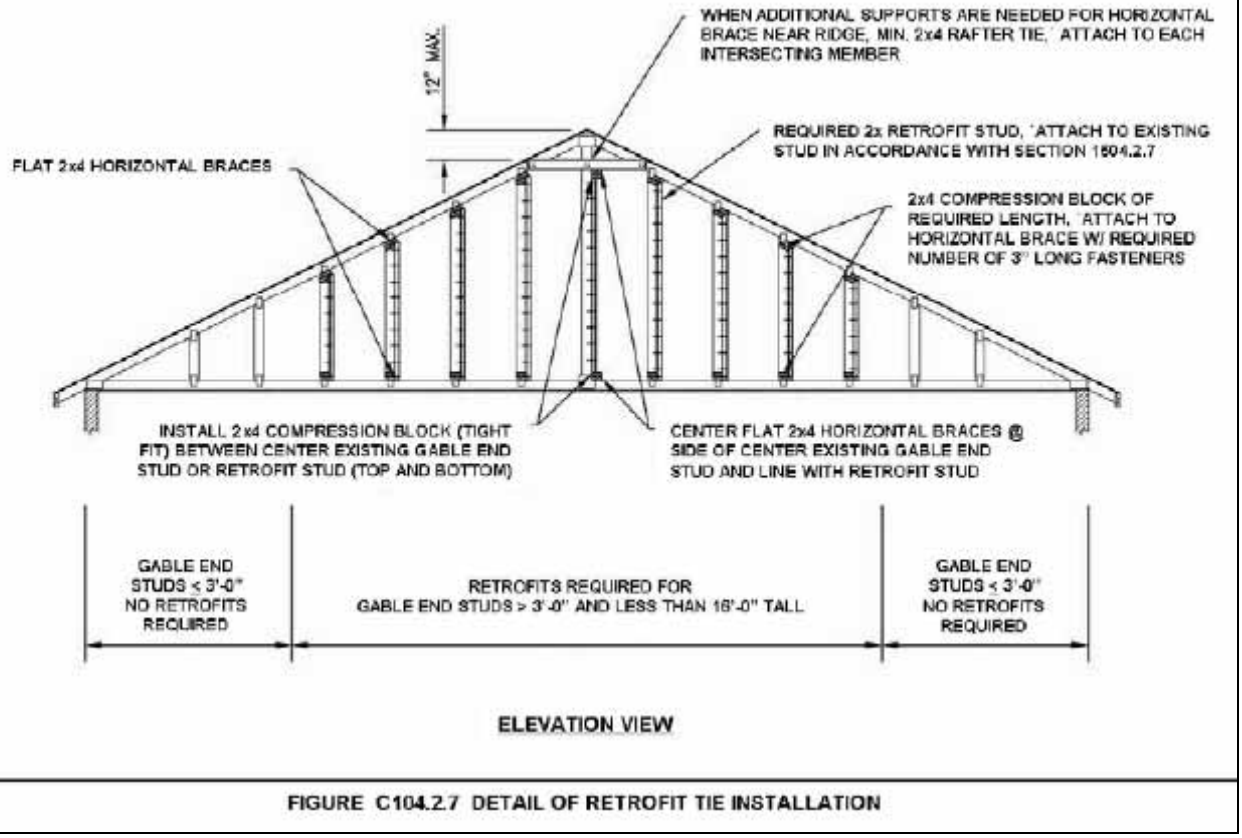


FIGURE C104.2.7 DETAIL OF RETROFIT TIE INSTALLATION

C104.2.8 Interrupted horizontal braces. Where impediments, other permanently attached obstacles or conditions exist that prevent installation of horizontal braces in accordance with Section C104.2.2 by preventing the installation of a single continuous horizontal braces then horizontal braces shall be permitted to be interrupted using the methods shown in Figure C104.2.8(1), Figure C104.2.8(2), and Figure C104.2.8(3). For interruptions that occur in the attic framing space closest to the gable end, nine 3 inch fasteners shall be used to connect each section of the interrupted horizontal braces. For interruptions that occur in the second attic space from the gable end, six 3 inch fasteners shall be used to connect each section of the interrupted horizontal braces. For interruptions that occur in the attic framing space farthest from the gable end, three 3 inch fasteners shall be used to connect each section of the interrupted horizontal braces. Horizontal braces shall be continued far enough to allow connections to three existing roof framing members as shown in Figure C104.2.8(1), Figure C104.2.8(2), or Figure C104.2.8(3). Fasteners shall be spaced in accordance with Section C103.6.3. Lumber members used to form horizontal braces shall be the same width and depth as required for an un-interrupted member.

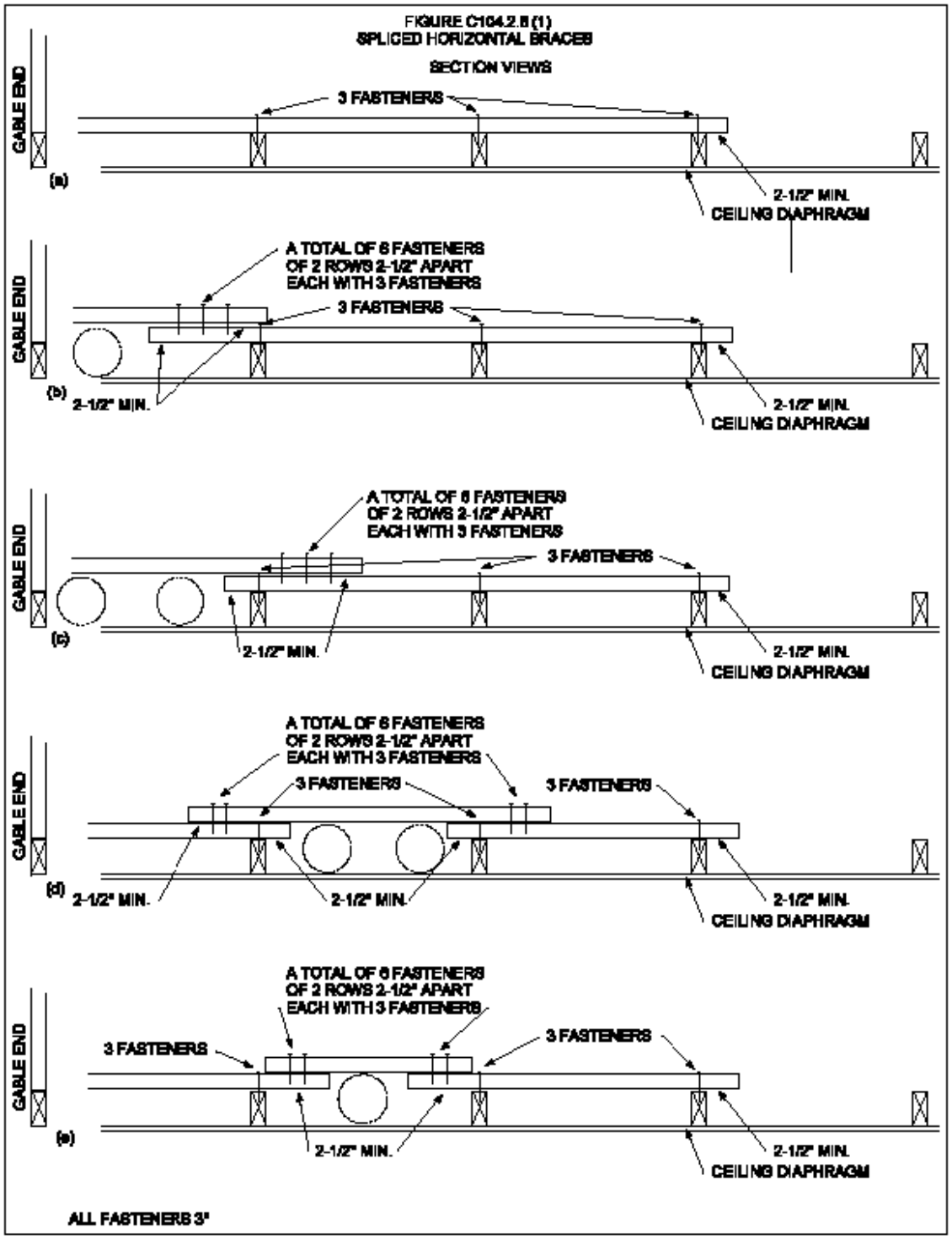


FIGURE C104.2.5 (1)
SPLICED HORIZONTAL BRACES
SECTION VIEWS
GABLE END
3 FASTENERS
(a)
2-1/2" MIN.
CEILING DIAPHRAGM
A TOTAL OF 6 FASTENERS
OF 2 ROWS 2-1/2" APART
EACH WITH 3 FASTENERS
3 FASTENERS
(b)
2-1/2" MIN.
2-1/2" MIN.
CEILING DIAPHRAGM
A TOTAL OF 6 FASTENERS
OF 2 ROWS 2-1/2" APART
EACH WITH 3 FASTENERS
3 FASTENERS
(c)
2-1/2" MIN.
2-1/2" MIN.
CEILING DIAPHRAGM
A TOTAL OF 6 FASTENERS
OF 2 ROWS 2-1/2" APART
EACH WITH 3 FASTENERS
3 FASTENERS
3 FASTENERS
(d)
2-1/2" MIN.
2-1/2" MIN.
2-1/2" MIN.
CEILING DIAPHRAGM
A TOTAL OF 6 FASTENERS
OF 2 ROWS 2-1/2" APART
EACH WITH 3 FASTENERS
3 FASTENERS
3 FASTENERS
(e)
2-1/2" MIN.
2-1/2" MIN.
CEILING DIAPHRAGM
ALL FASTENERS 3"

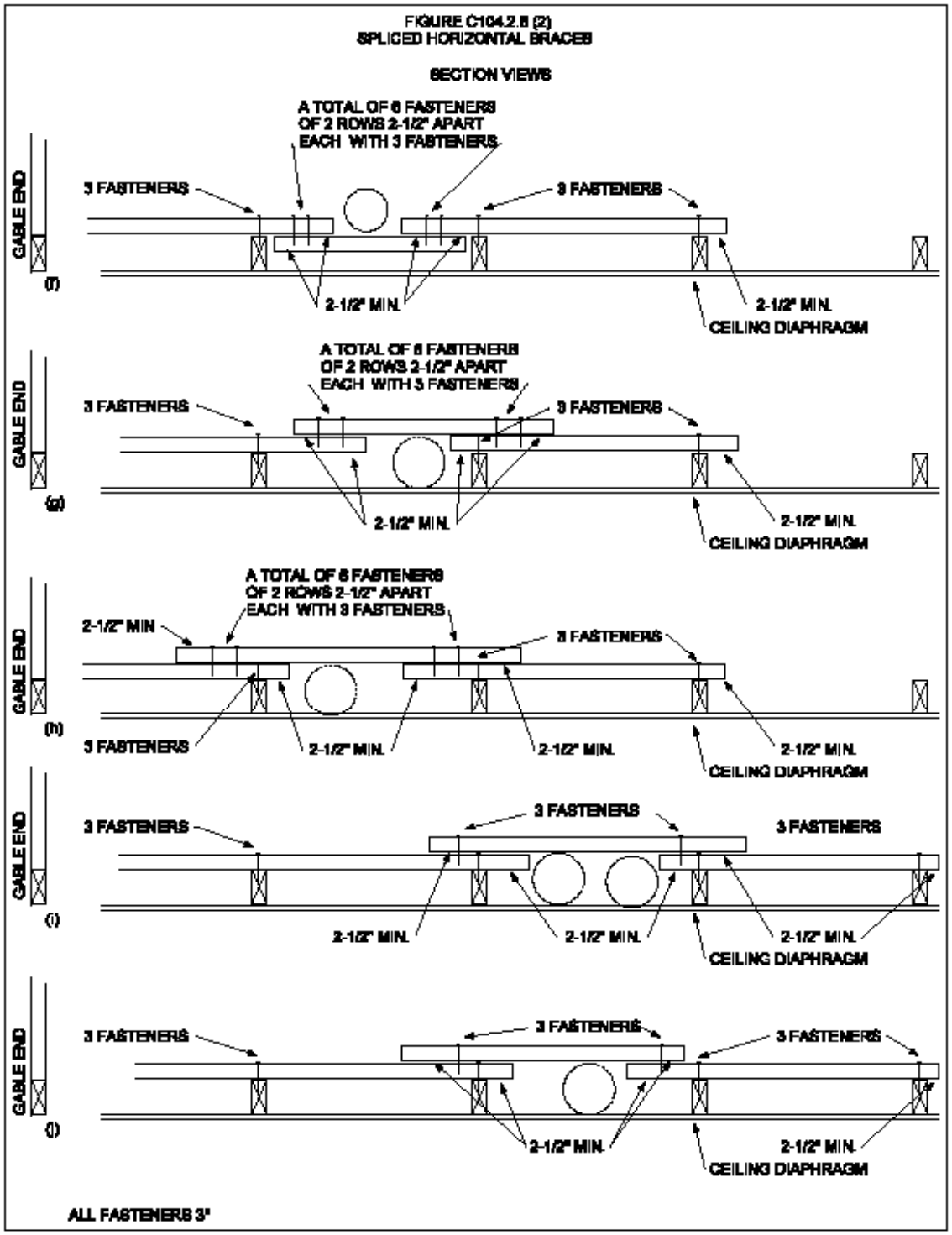
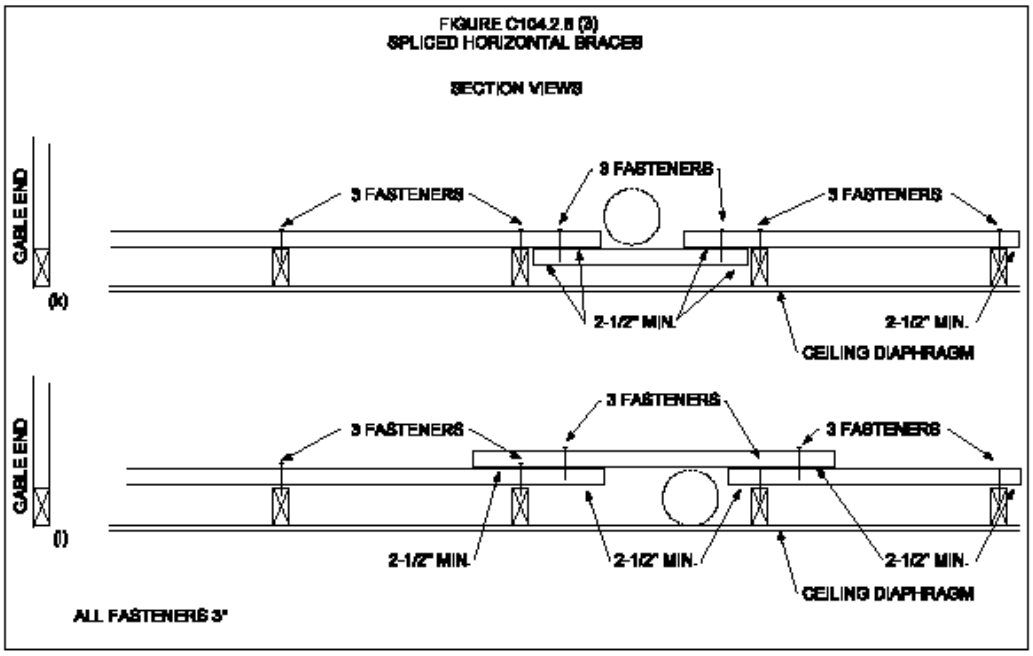


FIGURE C104.2.6 (2)
SPLICED HORIZONTAL BRACES
SECTION VIEWS
A TOTAL OF 6 FASTENERS OF 2 ROWS 2-1/2" APART EACH WITH 3 FASTENERS
3 FASTENERS
3 FASTENERS
GABLE END
(f)
2-1/2" MIN.
2-1/2" MIN.
CEILING DIAPHRAGM
A TOTAL OF 6 FASTENERS OF 2 ROWS 2-1/2" APART EACH WITH 3 FASTENERS
3 FASTENERS
3 FASTENERS
GABLE END
(g)
2-1/2" MIN.
2-1/2" MIN.
CEILING DIAPHRAGM
A TOTAL OF 6 FASTENERS OF 2 ROWS 2-1/2" APART EACH WITH 3 FASTENERS
2-1/2" MIN
3 FASTENERS
GABLE END
(h)
3 FASTENERS
2-1/2" MIN.
2-1/2" MIN.
2-1/2" MIN.
CEILING DIAPHRAGM
3 FASTENERS
3 FASTENERS
3 FASTENERS
GABLE END
(i)
2-1/2" MIN.
2-1/2" MIN.
2-1/2" MIN.
CEILING DIAPHRAGM
3 FASTENERS
3 FASTENERS
3 FASTENERS
GABLE END
(j)
2-1/2" MIN.
2-1/2" MIN.
CEILING DIAPHRAGM
ALL FASTENERS 3"

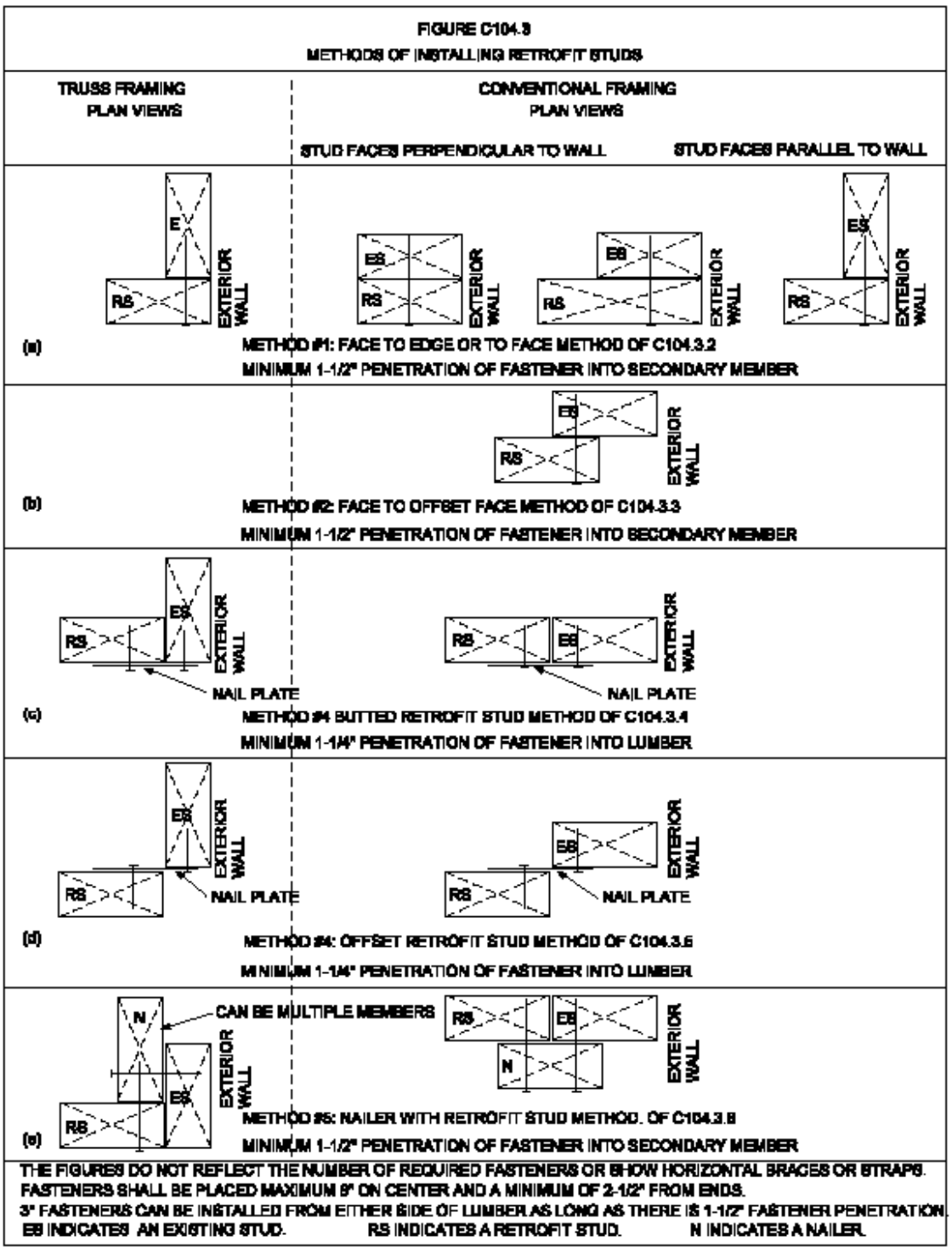


C104.2.9 Piggyback trusses. Piggyback trusses (trusses composed of two members one above the other) shall be permitted to be retrofitted if either of the following cases is true. 1. The existing studs in both the upper truss and the lower truss to which wall sheathing, panel siding, or other wall facade are attached are sufficiently in line that retrofit studs can be installed and connections made between the two with retrofit stud(s). 2. The same as condition 1 except the studs in the upper truss are not sufficiently in line with ones below and the existing studs in the upper truss are 3 feet or shorter. For condition 1 both the lower stud and the upper stud shall be retrofitted using the methods of Section C104.2. For condition two the retrofit stud shall be connected to the lower studs using the methods of Section C104.2 and be continuous from the bottom horizontal brace to the top horizontal brace. No connection is required between the retrofit stud and the upper stud. In both conditions the bottom chord of the piggy back truss section shall be fastened to each retrofit stud using a connector with minimum axial capacity of 175 pounds.

C104.3 Retrofit studs. Retrofit studs shall be installed in accordance with Section C104.3.1 and using one of the five methods of Sections C104.3.2, through C104.3.6 and as shown in Figure C104.3. For the Retrofit Configuration derived from Table C104.2 the size of retrofit studs shall be as indicated in Table C104.4.1 or Table C104.4.2. Retrofit studs shall extend from the top of the lower horizontal brace to the bottom of the upper horizontal brace except that a maximum gap of 1/8 inch is allowed at the bottom and ½ inch at the top. Where wall sheathing, panel siding, or other wall façade is fastened to gable end studs not manufactured into a truss, i.e. are field installed, retrofit studs shall be applied to those field installed studs in accordance with Section C104.2.1.

FIGURE C104.3

METHODS OF INSTALLING RETROFIT STUDS



THE FIGURES DO NOT REFLECT THE NUMBER OF REQUIRED FASTENERS OR SHOW HORIZONTAL BRACES OR STRAPS.
FASTENERS SHALL BE PLACED MAXIMUM 9" ON CENTER AND A MINIMUM OF 2-1/2" FROM ENDS.
3" FASTENERS CAN BE INSTALLED FROM EITHER SIDE OF LUMBER AS LONG AS THERE IS 1-1/2" FASTENER PENETRATION.
EB INDICATES AN EXISTING STUD. RS INDICATES A RETROFIT STUD. N INDICATES A NAILER.

C104.3.1 Fastening. Where nail plates are not used, retrofit studs shall be attached to existing studs using 3 inch fasteners at a maximum of 6 inches on center but no closer than 2-1/2 inches on center with fasteners no closer than 2-1/2 inches to the ends of members.

C104.3.2 Method #1: Face to edge or to face method. Retrofit studs shall be installed immediately adjacent to existing (Section C104.2) gable end wall studs as indicated in Figure C104.3(a). The retrofit studs shall overlap the edge or side of the existing stud by a minimum of 1-1/4 inches. Fasteners shall be installed as specified in Section C104.3.1.

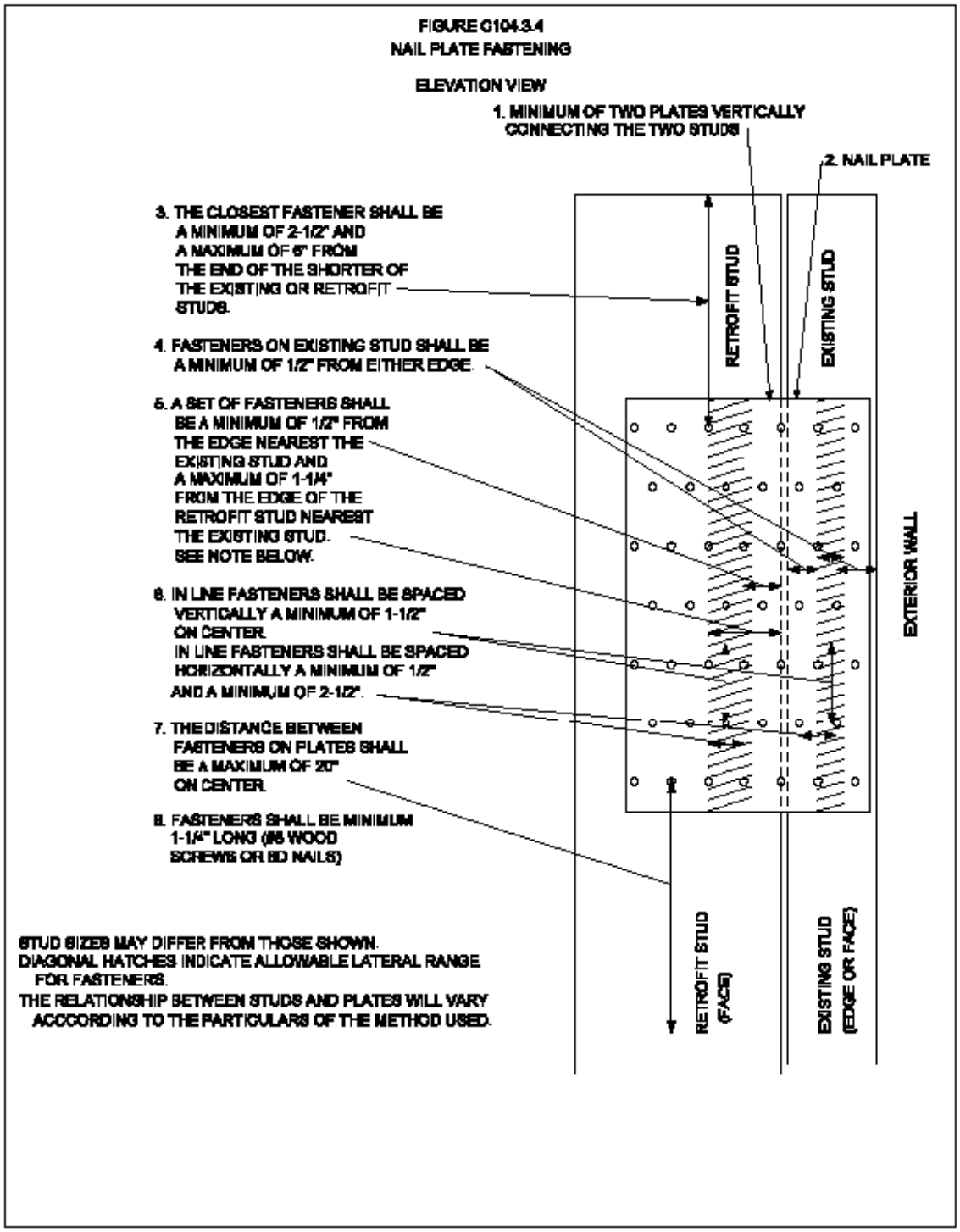
C104.3.3 Method #2: Face to face offset method. Retrofit studs shall be installed against the face of existing studs as indicated in Figure C104.3(b) such that the faces overlap a minimum of 1-1/2 inch and the edge distance to fasteners is no less than ¾ inch. Fasteners shall be installed as specified in Section C104.3.1.

C104.3.4 Method #3: Butted retrofit stud method. Provided that all of the following fastening conditions are met retrofit studs shall be permitted to be butted by their edge or face to existing studs with the addition of nail plates as indicated in Figure C104.3(c) and Figure C104.3.4.

1. The 1-1/2 inch edge of retrofit studs shall be installed against the 1-1/2 inch or the broad face of existing studs.
2. A minimum of two nail plates shall be used.
3. Fasteners used to secure nail plates to studs shall be a minimum 1-1/4 inch long (#8 wood screws or 8d nails).
4. Fasteners placed in nail plates shall be a minimum of 2-1/2 inches along the length of lumber. A fastener shall be placed in nail plates a maximum of 6 inches from the ends of the shorter stud.
5. Fasteners shall be placed a minimum of a ½ inch from the edges of the studs. Fasteners shall be placed a maximum of 1-1/2 inches from the abutting vertical edges of existing studs and retrofit studs.
6. There shall be at least 3 fasteners through nail plates into all existing and retrofit studs to which it is attached.
7. Where there are 3 fasteners through nail plates onto a single existing or retrofit stud then nail plates shall be spaced a maximum of 15 inches on center.
8. Where there are more than 3 fasteners though nail plates onto a single existing or retrofit stud then nail plates shall be spaced a maximum of 20 inches on center.
9. In line fasteners used to secure nail plates shall be spaced vertically a minimum of 1-1/2 inches on center. Staggered fasteners used to secure nail plates shall be spaced horizontally a minimum of ½ inches.

FIGURE C104.3.4
NAIL PLATE FASTENING

ELEVATION VIEW



C104.3.5 Method #4: Offset retrofit stud method. Where retrofit studs are placed as indicated in Figure C104.3(d) retrofit studs shall be permitted to be offset from existing studs by use of nail plates such that the vertical corner of a retrofit stud shall be placed at the vertical corner of an existing stud as indicated in Figure C104.3(d) and Figure C104.3.4 provided the fastening conditions of Section C104.3.4 are met.

C104.3.6 Method #5: Nailer with retrofit stud method. Retrofit studs and existing studs shall be permitted to be connected using non-continuous 2x4 nailers as indicated in Figure C104.3(e) provided the following conditions are met.

1. Both the existing stud and the retrofit stud shall be butted to nailers and both shall be fastened to the nailer with 3 inch long fasteners (#8 wood screws or 8d nails). Fasteners connecting each stud to the nailer shall be spaced 6 inches on center.
2. Fasteners into nailers from any direction shall be offset vertically by a minimum of 2-1/2 inches.
3. Fasteners into nailers shall be a minimum of 2-1/2 inches but not more than 6 inches from the end of the shorter of the existing stud and retrofit stud to which they are fastened.

C104.3.7 Reduced depth of retrofit studs. Retrofit studs may be reduced in depth by notching, tapering, or other methods at any number of locations along their length provided that all of the following conditions are met.

1. The retrofit stud to be reduced in depth shall be sized such that the remaining minimum depth of the member at the location of the notch (including cross cut kerfs) shall not be less than that required by Table C104.4.1 or Table C104.4.2.
2. The retrofit stud reduced in depth shall not be spliced within 12 inches of the location of notches. Splice members shall not be notched.
3. The vertical extent of notches shall not exceed 12 inches as measured at the depth of location of reduced depth.
4. A retrofit stud member reduced in depth shall be fastened to the side of the existing gable end wall studs in accordance with Section C104.3.1. Two additional 3 inch fasteners (#8 wood screws or 10d nails) shall be installed on each side of notches in addition to those required by Section C104.3.1.

C104.3.8 Retrofit stud splices. Retrofit studs greater than 8 feet in height may be field spliced in accordance with Figure C104.3.8.

C104.4 Connection between horizontal braces and retrofit studs. Connections between horizontal braces and retrofit studs shall comply with Section C104.4.1 or Section C104.4.2. Each retrofit stud shall be connected to the top and bottom horizontal brace members with a minimum of a 20 gauge 1-1/4 inch wide flat or coil metal strap with pre-punched holes for fasteners. Straps shall be fastened with 1-1/4 inch long fasteners (#8 wood screws or 8d nails) with the number of fasteners as indicated on Table C104.4.1 and Table C104.4.2. Fasteners shall be no closer to the end of lumber than 2-1/2 inches.

C104.4.1 L-bent strap method. Retrofit studs shall be connected to horizontal braces or to strong backs in accordance with Figure C104.2(1), Figure C104.2(2), or Figure C104.2.3, and shall comply with the following conditions.

1. A strap shall be applied to the edges of a retrofit stud nearest the gable end wall and to the face of horizontal braces using at each end of the strap the number of fasteners specified in Table C104.4.1. Straps shall be long enough so that each strap extends sufficient distance onto the vertical face of the retrofit stud that the fastener closest to the ends of the studs is a minimum of 2-1/2 inches from the end of the stud. Straps shall be allowed to be twisted to accommodate the transition between the tops of retrofit studs and horizontal bracings following roof pitches.
2. Compression blocks shall be installed on the horizontal braces directly against either the existing vertical gable end wall stud or the retrofit stud. Figure C104.2(1) (trusses) and Figure C104.2(2) (conventionally framed) show the installation of the compression block against the existing vertical gable end wall stud with the strap from the retrofit stud running beside the compression block. Compression blocks shall be allowed to be placed over straps. Compression blocks shall be fastened to the horizontal braces with at least the minimum number of 3 inch long fasteners (#8 wood screws or 10d nails) specified in Table C104.4.1. End and edge distances for fasteners shall be in accordance with Section C103.6.3.

TABLE C104.4.1
ELEMENT SIZING AND SPACING FOR L-BENT RETROFIT METHOD

	Retrofit Config.	Retrofit Config.	Retrofit Config.	Retrofit Config.
Retrofit Elements	A	B	C	D
Minimum size and number of Horizontal Braces	2x4	2x4	2x4	2 each 2x4
Minimum size and number of Retrofit Studs	2x4	2x6	2x8	2 each 2x8
Minimum number of fasteners connecting each end of straps to Retrofit Studs or to Horizontal Braces	6	9	12	8 on each strap
#8 screws or 10d nails 1-1/4" long				
Minimum number of fasteners to connect	6	8	10	12
Compression Blocks to Horizontal Braces				
#8 screws or 10d nails 3" long				

For SI: 1 Inch = 25.4mm, 1 Foot = 304.8mm

C104.4.2 U-bent strap method. Retrofit studs shall be connected to horizontal braces in accordance with Figure C104.2(3) or Figure C104.2(4), shall be limited to Retrofit Configurations A and B (Table C104.2), and shall comply with the following conditions.

1. Straps shall be of sufficient length to meet the requirements for the number of fasteners in accordance with Table C104.4.2 and to meet the end distance requirements of Section C103.6.3 shall be shaped around retrofit studs and fastened to the edges of horizontal braces. Straps shall wrap the back edge of the retrofit stud snuggly with a maximum gap of ¼ inches. Rounded bends of straps shall be allowed. One fastener shall be installed that connects each strap to the side of the associated retrofit stud.
2. The horizontal brace shall butt snugly against the retrofit stud with a maximum gap of ¼ inches.
3. Straps shall be allowed to be twisted to accommodate the transition between the tops of retrofit studs and horizontal braces that follow the roof pitch.

TABLE C104.4.2
ELEMENT SIZING AND SPACING FOR U-BENT RETROFIT METHOD

	Retrofit Config.	Retrofit Config.	Retrofit Config.	Retrofit Config.
Retrofit Elements	A	B	C	D
Minimum size and number of Horizontal Braces	2x4	2x4	2x4	2 each 2x4
Minimum size and number of Retrofit Studs	2x4	2x6	2x8	2 each 2x8
Minimum number of fasteners connecting Straps To each edge of Horizontal Braces	6	7	7	6 on side of each strap
#8 screws or 10d nails 1-1/4" long				

For SI: 1 Inch = 25.4mm, 1 Foot = 304.8mm

C104.5 Connection of gable end wall to wall below. The bottom chords or bottom members of wood framed gable end walls shall be attached to the wall below using one of the methods prescribed in Sections C104.5.1 or C104.5.2. The particular method chosen shall correspond to the framing system and type of wall construction encountered.

C104.5.1 Truss gable end wall. The bottom chords of the gable end wall in a truss gable shall be attached to the wall below using right angle brackets. A minimum of two fasteners shall be installed into the bottom chord. The right angle brackets shall be installed throughout the portion of the gable end where the gable end wall height is greater than 3 feet at the spacing specified in Table C104.5.1. Connection to the wall below shall be by one of the methods listed below:

1, For a wood frame wall below, a minimum of two fasteners shall be installed. The fasteners shall be of the same diameter and style specified by the bracket manufacturer and sufficient length to extend through the double top plate of the wall below.

2. For a concrete or masonry wall below without a sill plate, the type and number of fasteners into the wall shall be consistent with the bracket manufacturer's specifications for fasteners installed in concrete or masonry.

3. For a concrete or masonry wall below with a 2x sill plate, the fasteners into the wall below shall be of the diameter and style specified by the bracket manufacturer for concrete or masonry connections; but, long enough to pass through the wood sill plate and provide the required embedment into the concrete or masonry below. Alternatively, the bracket can be anchored to the sill plate using 4 each 1-1/2 inch long fasteners of the same type as specified by the bracket manufacturer for wood connections, provided that the sill plate is anchored to the wall on each side of the bracket by a 1/4-inch diameter masonry screw with a 2-3/4 inches of embedment into the concrete or masonry wall. A ¼ inch washer shall be placed under the heads of the masonry screws.

TABLE C104.5.1
SPACING OF RIGHT ANGLE BRACKETS

Exposure Category	Maximum 3-Sec. Gust Wind Speed – V Mph	Spacing of Right Angle Brackets [a.]
C	110	38-inches
C	120	32-inches
C	130	28-inches
C	140	24-inches
C	150	20-inches
B	110	48-inches
B	120	40-inches
B	130	36-inches
B	140	30-inches
B	150	26-inches

a. See Section C102 for definition of right angle bracket.

C104.5.2 Conventionally framed gable end wall. Each stud in a conventionally framed gable end wall, throughout the length of the gable end wall where the wall height is greater than 3 feet, shall be attached to the bottom or sill plate using a stud to plate connector with minimum uplift capacity of 175 pounds. The bottom or sill plate shall then be connected to the wall below using one of the methods listed below:

1. For a wood frame wall below, the sill or bottom plate shall be connected to the top plate of the wall below using ¼ inch diameter lag bolt fasteners of sufficient length to penetrate the bottom plate of the upper gable end wall and extend through the bottom top plate of the wall below. A washer sized for the diameter of the lag bolt shall be placed under the head of each lag bolt. The fasteners shall be installed at the spacing indicated in Table C104.5.2.

2. For a concrete or masonry wall below, the sill or bottom plate shall be connected to the concrete or masonry wall below using ¼ inch diameter concrete or masonry screws of sufficient length to provide 2-3/4 inches of embedment into the top of the concrete or masonry wall. A washer sized for the diameter of the lag bolt shall be placed under the head of each lag bolt. The fasteners shall be installed at the spacing indicated in Table C104.5.2.

TABLE C104.5.2
SPACING OF LAG OR MASONRY SCREWS USED TO
CONNECT SILL PLATE OF GABLE END WALL TO TOP OF THE WALL BELOW

Exposure Category	Maximum 3-Sec. Gust Wind Speed - V mph	Spacing of Lag Screws or Masonry Screws
C	110	19-inches
C	120	16-inches
C	130	14-inches
C	140	14-inches
C	150	10-inches
B	110	24-inches
B	120	20-inches
B	130	18-inches
B	140	15-inches
B	150	13-inches

Reason: This proposal, along with a similar proposal, is requesting the creation of a new set of Appendix chapters that are intended to provide guidance for retrofitting existing structures to strengthen their resistance to wind forces. These new proposed chapters are similar in scope to Appendix A which addresses seismic retrofits for existing buildings. We anticipate that, over time, additional retrofit methods will be provided in this Appendix chapter. These retrofits are voluntary, and as such may or may not meet the requirements of new construction. However, these voluntary measures will serve to better protect the public and reduce damage from high wind events.

The purpose of the proposed addition is to provide prescriptive means for retrofitting gable ends to resist high winds. This code addition will facilitate the retrofitting of gable ends without requiring site specific engineering for common applications, thus removing some of the obstacles that might impede this important retrofit in hurricane prone regions.

Reason for adding provisions for retrofitting gable ends

Gable end failures are one of the most common types of structural failures observed in hurricanes. They have been documented in most major hurricanes and in many weaker hurricanes.

The proposed code addition is intended to be a prescriptive approach to reduce retrofitting costs, facilitate retrofitting, minimize the need for engineering, and facilitate code review and inspection. The addition will provide standardized off the shelf methods that can be readily approved and easily inspected by building department personnel. Building departments can thus become creditable third party resources for authenticating retrofitting just as they do for other structural issues of buildings.

It should be recognized that almost no attempt to retrofit will actually weaken or compromise a building or subject surrounding buildings to risk, on the contrary all will benefit. The retrofitting is voluntary.

Reason for adding retrofit measures to the code

Because most America's buildings located in hurricane prone regions were not built to today's building codes standards, there is significant value added to the code if the retrofitting of buildings could be facilitated by the provision of prescriptive means. This would inherently reduce the cost of retrofitting. The need for structural retrofitting has been highlighted in the recent spate of hurricanes and the insurance crises that has developed in the coastal high wind areas of a number of states because of older buildings that do not meet current building code structural requirements. Clearly, it is in the public's health, welfare, and safety to facilitate retrofitting. Given the importance of retrofitting to the public, retrofitting of buildings should be encouraged and facilitated by removing as many impediments as possible. The code can actually facilitate and encourage retrofitting by providing prescriptive means. Such methods should encourage, facilitate, and reduce the cost of improving America's building stock.

Reason for location in code

The preferred approach is to add an appendix chapter that deals specifically with retrofitting of a voluntary nature. The advantage of this approach is that it easily allows for additional retrofit measures to be added without confusing code users by gable end retrofit being in the repair section and then changing its location to a separate chapter in a subsequent edition when more retrofit measures are added. Further by grouping retrofit measures into a separate chapter users will find them and perhaps even use the chapter as a catalog of potential retrofit measures. Additionally, grouping voluntary measures into a separate chapter, a chapter separate from mandatory measures, will make code administration less prone to confusion.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: STAFFORD-EB2-APP C-2.DOC

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL FIRE CODE

FIRE CODE COMMITTEE

John Mueller – *Chair*
Rep: National Association of State Fire Marshals
Deputy State Fire Administrator
NY State Office of Fire Prevention & Control
Albany, NY

Robert Geislinger – *Vice Chair*
Fire Marshal
South Metro Fire Rescue Authority
Centennial, CO

Frank Castelvecchi, III, PE
Senior Plans Review Engineer
County of Henrico, Building Inspections
Henrico, VA

Larry Christy
Fire Marshal
Butler Township
Butler, PA

Rolland Crawford
Principal
The Crawford Specialty Group
Loma Linda, CA

Sean DeCrane
Battalion Chief
Cleveland Fire Department
Cleveland, OH

Gordon Earhart, PE, RN, CSP, CBO
Fire Protection Engineer
Fire Dynamics- Henderson Engineers Inc.
Lenexa, KS

Rick Helsinger, CBO
Chief Building Official
City of Fairfield
Fairfield, OH

Tonya Hoover
Rep: California Fire Chiefs Association
Fire Prevention Officers-Northern
Assistant State Fire Marshal
CALFIRE - Office of the State Fire Marshal
Sacramento, CA

Angeline Leitner, EIT
Fire Protection Engineer
City of Saint Paul Department of Safety and Inspections
Saint Paul, MN

Michael Love
Rep: International Association of Fire Chiefs
Division Chief
Montgomery County Fire and Rescue Service
Rockville, MD

Joe McElvaney, Jr.
Fire Protection Engineer
City of Phoenix
Phoenix, AZ

Peter Merrill
Rep: National Association of Home Builders
President & CEO, Construction Dispute Resolution
Construction Dispute Resolution Services, LLC
Santa Fe, NM

Richard Soltis, Jr.
Fire Sub Code Official
Lawrence Township
2207 Lawrence Road
Lawrence, NJ 08648
609/844-7024609/844-0282
rsoltis@lawrencetwp.com

Mark Steven Wassom, PE
Rep: National Association of State Fire Marshals
Fire Protection Engineer/Fire Prevention Section
State of Colorado - Division of Fire Safety
Centennial, CO

Staff Secretariat:
Bill Rehr
Senior Technical Staff
International Code Council

TENTATIVE ORDER OF DISCUSSION

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL FIRE CODE AND INTERNATIONAL WILDLAND-URBAN INTERFACE CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does **not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair.

WILDLAND-URBAN
WUIC1-09/10
WUIC2-09/10
WUIC3-09/10
WUIC4-09/10
WUIC5-09/10

FIRE CODE
F1-09/10
  ADM34-09/10
  ADM35-09/10
F2-09/10
F3-09/10
F4-09/10
F5-09/10
F6-09/10
F7-09/10
  RB9-09/10, Part II
F8-09/10
  F30-09/10
  F238-09/10
F9-09/10
F10-09/10
F11-09/10
F12-09/10
F13-09/10
F14-09/10
F15-09/10
F16-09/10
F17-09/10
F18-09/10
F19-09/10
F20-09/10, Part I
F20-09/10, Part II
  F40-09/10
F21-09/10
F22-09/10
F23-09/10
F24-09/10
F25-09/10
F26-09/10
F27-09/10
F28-09/10
F29-09/10
F31-09/10
F32-09/10
  F33-09/10
F34-09/10
F35-09/10
F36-09/10
F37-09/10
F38-09/10
F39-09/10
F41-09/10
F42-09/10
F43-09/10
F44-09/10
F45-09/10
F46-09/10
F47-09/10
F48-09/10
F49-09/10
F50-09/10
F51-09/10
F52-09/10
F53-09/10
F54-09/10
F55-09/10
F56-09/10
F57-09/10
F58-09/10
F59-09/10
F60-09/10
F61-09/10
F62-09/10
F64-09/10
F65-09/10
F66-09/10
F67-09/10
F68-09/10
F69-09/10
F70-09/10
F71-09/10
F72-09/10
F73-09/10
F74-09/10
F75-09/10
F76-09/10
F77-09/10
F78-09/10
F79-09/10
F80-09/10
F81-09/10
F82-09/10
F83-09/10
F84-09/10
F85-09/10
F86-09/10
F87-09/10
  F89-09/10
  F90-09/10
  F96-09/10
  F97-09/10
F88-09/10
F91-09/10
F92-09/10
F93/09/10
F94-09/10
F95-09/10
F98-09/10
F99-09/10
F100-09/10
F101-09/10
F102-09/10
F103-09/10
F104-09/10
F105-09/10
F106-09/10
F107-09/10
F108-09/10, Part I
F109-09/10
F110-09/10
F111-09/10
F112-09/10, Part I
F113-09/10
F114-09/10, Part I
F114-09/10, Part II
F114-09/10, Part III
F115-09/10, Part I
F116-09/10, Part I
F117-09/10
F118-09/10
F119-09/10
F120-09/10, Part I
F120-09/10, Part II
F121-09/10
F122-09/10
F123-09/10
F124-09/10
F125-09/10
F126-09/10
F127-09/10
F128-09/10
F129-09/10
F130-09/10
F131-09/10
F132-09/10, Part I
F133-09/10
F134-09/10
F135-09/10
F136-09/10
F137-09/10

F138-09/10
F139-09/10
F140-09/10
F141-09/10
F142-09/10
F143-09/10
F144-09/10
F145-09/10
F146-09/10
F63-09/10
G72-09/10
F147-09/10
G70-09/10
G71-09/10
F148-09/10, Part I
F148-09/10, Part II
F149-09/10
F150-09/10
F151-09/10
F152-09/10
F153-09/10
F154-09/10
F155-09/10
F156-09/10
F157-09/10
F158-09/10
F159-09/10
F160-09/10
F161-09/10, Part I
F161-09/10, Part II
F162-09/10, Part I
F162-09/10, Part II
F163-09/10
F164-09/10
F165-09/10
F166-09/10
F167-09/10
F168-09/10
F169-09/10
F170-09/10
F171-09/10
F172-09/10
F173-09/10
F174-09/10
F175-09/10
F176-09/10
F177-09/10
F178-09/10
F179-09/10
F180-09/10
F181-09/10
F182-09/10
F183-09/10
F184-09/10
F185-09/10
F186-09/10
F187-09/10
F188-09/10
G73-09/10
G74-09/10
F189-09/10
F190-09/10
F191-09/10
F192-09/10
M32-09/10
F193-09/10, Part I
F193-09/10, Part II
F194-09/10
M33-09/10
F195-09/10
F196-09/10
F197-09/10
F198-09/10
F199-09/10
F200-09/10
F201-09/10
F202-09/10
F203-09/10
F204-09/10
F205-09/10
F206-09/10
F207-09/10
F208-09/10
F209-09/10
F210-09/10
F211-09/10
F212-09/10
F213-09/10
F214-09/10
F215-09/10
F216-09/10
F217-09/10
F218-09/10
F219-09/10
F220-09/10
F221-09/10
F222-09/10
F223-09/10
F224-09/10
F225-09/10
F226-09/10
F227-09/10
F228-09/10
F229-09/10
F230-09/10
F231-09/10
F232-09/10
F233-09/10
F234-09/10
F235-09/10
F236-09/10, Part I
F236-09/10, Part II
F237-09/10

F1–09/10
All Chapters

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Create "Parts" in the IFC and renumber Chapters as follows:

Part I – Administrative
Chapter 1 Scope and Administration
Chapter 2 Definitions

Part II – General Safety Provisions
Chapter 3 General Requirements
Chapter 4 Emergency Planning and Preparedness

Part III – Building and Equipment Design Features
Chapter 5 Fire Service Features
Chapter 6 Building Services and Systems
Chapter 7 Fire-Resistance-Rated Construction
Chapter 8 Interior Finish, Decorative Materials and Furnishings
Chapter 9 Fire Protection Systems
Chapter 10 Means Of Egress
Chapter ~~46~~ 11 Construction Requirements for Existing Buildings
Chapters 12 through 19 *(reserved)*

Part IV – Special Occupancies and Operations
Chapter ~~11~~ 20 Aviation Facilities
Chapter ~~12~~ 21 Dry Cleaning
Chapter ~~13~~ 22 Combustible Dust-Producing Operations
Chapter ~~22~~ 23 Motor Fuel-Dispensing Facilities and Repair Garages
Chapter ~~15~~ 24 Flammable Finishes
Chapter ~~16~~ 25 Fruit and Crop Ripening
Chapter ~~17~~ 26 Fumigation and Thermal Insecticidal Fogging
Chapter ~~18~~ 27 Semiconductor Fabrication Facilities
Chapter ~~19~~ 28 Lumber Yards and Woodworking Facilities
Chapter ~~20~~ 29 Manufacture of Organic Coatings
Chapter ~~21~~ 30 Industrial Ovens
Chapter ~~24~~ 31 Tents and Other Membrane Structures
Chapter ~~23~~ 32 High-Piled Combustible Storage
Chapter ~~14~~ 33 Fire Safety during Construction and Demolition
Chapter ~~25~~ 34 Tire Rebuilding and Tire Storage
Chapter ~~26~~ 35 Welding and Other Hot Work
Chapter ~~45~~ 36 Marinas
Chapters 37 through 49 *(reserved)*

Part V – Hazardous Materials
Chapter ~~27~~ 50 Hazardous Materials—General Provisions
Chapter ~~28~~ 51 Aerosols
Chapter ~~29~~ 52 Combustible Fibers
Chapter ~~30~~ 53 Compressed Gases
Chapter ~~31~~ 54 Corrosive Materials
Chapter ~~32~~ 55 Cryogenic Fluids
Chapter ~~33~~ 56 Explosives and Fireworks
Chapter ~~34~~ 57 Flammable and Combustible Liquids
Chapter ~~35~~ 58 Flammable Gases and Flammable Cryogenic Fluids
Chapter ~~36~~ 59 Flammable Solids
Chapter ~~37~~ 60 Highly Toxic and Toxic Materials
Chapter ~~38~~ 61 Liquefied Petroleum Gases
Chapter ~~39~~ 62 Organic Peroxides
Chapter ~~40~~ 63 Oxidizers, Oxidizing Gases and Oxidizing Cryogenic Fluids

Chapter ~~41~~ 64 Pyrophoric Materials
Chapter ~~42~~ 65 Pyroxylin (Cellulose Nitrate) Plastics
Chapter ~~43~~ 66 Unstable (Reactive) Materials
Chapter ~~44~~ 67 Water-Reactive Solids and Liquids
Chapters 68 through 79 *(reserved)*

Part VI – Referenced Standards
Chapter ~~47~~ 80 Referenced Standards

Part VII – Appendices
Appendix A Board of Appeals
Appendix B Fire-Flow Requirements for Buildings
Appendix C Fire Hydrant Locations and Distribution
Appendix D Fire Apparatus Access Roads
Appendix E Hazard Categories
Appendix F Hazard Ranking
Appendix G Cryogenic Fluids—Weight and Volume Equivalents
Appendix H Hazardous Materials Management Plan (HMMP) and Hazardous Materials Inventory Statement (HMIS) Instructions
Appendix I Fire Protection Systems – Noncompliant Conditions
Appendix J Emergency Responder Radio Coverage
Index

Reason: In the most recent code change cycle, two new chapters were added to the IFC. One Chapter addressed Marinas and the other contained Construction Requirements for Existing Buildings. Since there was no other location to place these chapters they, were added at the end of the code as Chapters 45 and 46.

Starting with original publication of the IFC in 2000, the hazardous materials provisions have been in the back portion of the code book. But now we have also included a chapter on marinas and a chapter on existing buildings. Neither of these chapters contain subject matter that is consistent with, or appropriately placed with, the concept of hazardous materials.

Therefore, this proposal will reorganize the IFC into 7 Parts. Each Part contains a subject matter and holds the chapters that logically fit under the heading of each Part. It is also foreseeable that additional chapters could be added in the future as regulation for new processes or operations are developed. Therefore, the proposal is designed to accommodate these future chapters by providing reserved (unused) chapters in several Parts. This will allow new chapters to be included into the appropriate Part as they are developed and approved.

Several concepts were used as the foundation to establish the Chapter numbers and locations as follows:

1. Chapters 1-Administration and 2-Definitions are the same subject matter in all of the ICC Codes, so they remain as 1 and 2
2. Chapters 7-Fire-Resistance-Rated Construction, 8-Interior Finish, Decorative Materials and Furnishings, 9-Fire Protection Systems, and 10-Means of Egress are the same subject matter in the IBC. These Chapters remain as 7, 8, 9, and 10 to maintain consistency with the IBC.
3. Chapter 46-Construction Requirements for Existing Buildings has been moved to Chapter 11 in Part III – Building and Equipment Design Features
4. Chapter 24-Tents and Other Membrane Structures has been moved to Chapter 31 in Part IV-Special Occupancies and Operations. This provides consistency with the IBC which has membrane structures in Chapter 31.
5. Chapter 14-Fire Safety during Construction and Demolition has been moved to Chapter 33 in Part IV-Special Occupancies and Operations. This provides consistency with the IBC which has Chapter 33-Safeguards during Construction.
6. Chapter 45-Marinas has been moved to Chapter 36 in Part IV-Special Occupancies and Operations.
7. Part V-Hazardous Materials contains all of the hazardous material regulations.

This is a different approach to the code format than the other ICC Codes utilize. But in the case of the IFC, it has been proven that there is a need to be able to expand and add new chapters that are specific to a subject matter. This proposal will allow for long-term use of the IFC by allowing the addition of new chapters, yet provide future ability to maintain chapter numbering so that the code use will know that Egress is Chapter 10, Flammable Finishes is Chapter 24, Hazardous Materials – General Provisions is Chapter 50.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F24-ALL CHAPTERS.DOC

F2–09/10
202 (New)

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Add new definition as follows:

SECTION 202
GENERAL DEFINITIONS

FIRE HAZARD. Any thing or act which increases or could cause an increase of the hazard or threat of fire to a greater degree than that customarily recognized as normal by persons in the public service regularly engaged in preventing, suppressing or extinguishing fire or any thing or act which could obstruct, delay, hinder or interfere with the operation of the fire department or the safety of occupants in the event of fire.

Reason: The definition of "Fire Hazard" is not currently found in the IFC. The term is used 31 times in the IFC and is found in the following Chapters: 1, 2, 3, 4, 6, 9, 10, 19, 20, 21, 23, 24, 26, 33, 34 and Appendix E. However, the term is not defined in the code. The inclusion of this definition will further clarify the intent of an otherwise ambiguous term.

A similar proposal was discussed in the last code change cycle. Comments were received and have been addressed as follows:

1. "Why not use the standard Webster definition?" – the Webster Dictionary does not define "Fire Hazard"
2. "Is it better to leave as an undefined term." – The definition of "Fire Hazard" is not currently found in the IFC. The term appears in the IFC 31 times. The term is commonly used in the IFC, so it must have some intended value. For a situation to be a fire hazard it must either increase the potential of ignition, or increase the intensity of fire once it does ignite, or obstruct/hinder fire department operations, or obstruct/hinder occupant egress.
3. "What is difference of fire risk and fire hazard?" – Fire risk occurs in all locations and all situations of work, business, and just plain life. The level of fire risk varies in all situations. However when something occurs to raise or affect the normally expected level of fire risk, the potential of ignition increases and this situation then becomes classified as a fire hazard. As specified in the definition, if the situation creates an increase in the potential for fire (fire risk), it is a fire hazard.
4. "This definition would create a conflict with IFC 906.3." – This is incorrect, the words "fire hazard" are used in this section, however, they do not stand alone. The words are used as part of the term "Class A Fire Hazards". To state that the defined term "fire hazard" must be used in defining "Class A Fire Hazard" is incorrect, and is out of context. This is not the same term. The term "Class A Fire Hazard" is a specific and defined term dealing with Class A materials. This makes as little sense as assuming that Chapter 15 Flammable Finishes only applies to flammable liquids. In case you are wondering…Chapter 15 includes flammable liquids, along with combustible liquids and combustible powders, etc.

The definition of "fire hazard", although a somewhat objective definition, is needed to be able to point back to some code reference when the term is used in the code in those 31 locations.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F1-202 FIRE HAZARD.DOC

F3–09/10
304.3.2

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

Revise as follows:

304.3.2 Capacity exceeding 5.33 cubic feet. Containers with a capacity exceeding 5.33 cubic feet (40 gallons) (0.15 m^3) shall be provided with lids. Containers and lids shall be constructed of noncombustible materials or of combustible materials with a peak rate of heat release not exceeding 300 kW/m^2 when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation.

Exception: Wastebaskets ~~in Group I-3 occupancies shall~~ complying with Section 808.~~1~~.

Reason: This proposal makes the exception more generic and avoids the need for corrections as a function of what may change in Chapter 8. In fact, the 2009 code already has requirements for all "Wastebaskets and linen containers in Group I-2 and I-3 occupancies" in Section 808.1 and not just for wastebaskets in Group I-3 occupancies. The proposal does not introduce any new requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-F7-304.3.2.DOC

F4–09/10
307.1.1

Proponent: A. Keith Brown, North Metro Fire Rescue District, representing Fire Marshal's Association of Colorado

Revise as follows:

307.1.1 Prohibited open burning. *Open burning* shall be prohibited ~~that is offensive or objectionable because of smoke emissions or~~ when atmospheric conditions or local circumstances make such fires hazardous ~~shall be prohibited~~.

Reason: The purpose of the proposed code change is to limit the reasons for prohibiting open burning to circumstances that constitute a fire hazard.

The phrase "offensive or objectionable" in the existing code language is unreasonably subjective, making the prohibition of open burning due to smoke emissions unenforceable. The 2009 IFC does not provide a definition for "offensive or objectionable." Also, there is not a referenced standard that provides a method for measuring or otherwise determining when smoke emissions are "offensive or objectionable." In the absence of such guidance, the legal requirement for consistency of enforcement is unattainable.

Fundamentally and historically, the IFC has regulated fire hazards and not air quality due to smoke from fires. Experience strongly suggests that the present wording encourages citizens to request intervention by the fire code official to resolve neighborhood disputes regarding smoke emissions from many forms of outdoor fires that citizens correctly or incorrectly believe to be "open burning" (e.g., recreational fires, bonfires, charcoal burners, etc.); such situations should be civil matters rather than unlawful acts subject to the penalties prescribed in IFC Section 109.

The proposed wording empowers the fire code official to prohibit open burning when such fires would, in fact, be hazardous due to measurable environmental factors such as weather (e.g., wind, temperature, relative humidity) and/or fuel characteristics (e.g., fuel moisture content).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BROWN-F3- 307.1.1.DOC

F5–09/10
307.1.1, 307.3

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Revise as follows:

307.1.1 Prohibited open burning. *Open burning* that is offensive or objectionable because of smoke emissions or when atmospheric conditions or local circumstances make such fires hazardous shall be prohibited.

> **Exception:** Prescribed burning for the purpose of reducing the impact of wildland fire when authorized by the *fire code official*.

307.3 Extinguishment authority. ~~The~~ When open burning creates or adds to a hazardous or objectionable situation, or a required permit for *open burning* has not been obtained, the *fire code official* is authorized to order the extinguishment of the open burning operation ~~by the permit holder, another person responsible or the fire department of *open burning* that creates or adds to a hazardous or objectionable situation~~.

Reason: Section 307.1.1 is revised to allow for prescribed burning that is conducted in an effort to minimize the fuel load in wildland and interface areas. Prescribed burning is a common practice and is done with great planning and forethought. The ability for a fire agency to utilize prescribed burning operations in a season when the fire can be controlled, reduces the personnel and resources needed to control a wildland fire when it occurs, and increases the probability that fewer structures and lives are lost to wildland fire.

The current wording of Section 307.3 has a final phrase that states "or the fire department of open burning that creates or adds to a hazardous or objectionable object". This portion of the section is flawed in that either the requirement or intent is missing for this sentence to make sense. This proposal will revise Section 307.3 to simply say that the fire department can order the extinguishment of the fire.

IFC Section 109.2.2 already states "who" must comply with the order. Section 109.2.2 reads as follows:

> **109.2.2 Compliance with orders and notices.** A notice of violation issued or served as provided by this code shall be complied with by the owner, operator, occupant or other person responsible for the condition or violation to which the notice of violation pertains.

By eliminating the statement that the fire department can extinguish the fire, removes the owner's ability to say "put it out yourself" rather than complying with the order. The intent of the section is to have the owner comply, and not have the fire department handle an open burning fire which is not an emergency. The revision in Section 307.3 will allow the fire department to order that the fire be extinguished, and Section 109.2.2 specifies who must comply. This will clarify the application of this section.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F2-307.3.DOC

F6–09/10
315

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee and Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Revise as follows:

SECTION 315
~~MISCELLANEOUS COMBUSTIBLE MATERIALS~~ GENERAL STORAGE

315.1 General. Storage~~, use and handling of miscellaneous combustible materials~~ shall be in accordance with this section.

315.2 Permit required. A permit for miscellaneous combustible storage shall be ~~obtained in accordance with~~ required as set forth in Section 105.6.

~~315.2~~ 315.3 Storage in buildings. Storage of ~~combustible~~ materials in buildings shall be orderly and stacks shall be stable. Storage of combustible materials shall be separated from heaters or heating devices by distance or shielding so that ignition cannot occur.

(Renumber subsequent sections)

Reason: This proposal will modify this section covering storage in buildings in several different ways.

This proposal is intended to clarify that this section contains requirements which apply to storage in general, not just storage of combustible materials. Specifically, Section 315.2.1 requires that a separation be maintained between the top of storage and ceilings or sprinklers. This requirement applies to all storage, whether combustible or not, and providing a clearance from sprinklers and ceilings is critical whether the materials are combustible or not.

The first sentence of Section 315.1 is revised to delete the reference to "use and handling". As stated in the title of the section, this section applies to "storage". Sections 315.1 and 315.2 deal with storage and there are no requirements for use or handling.

The second sentence of Section 315.1 is separated and creates a new Section 315.2 dealing with permits. This follows standard format throughout the rest of the IFC. The new Section 315.2 is also revised to specify that a permit is required only for storage of combustible materials. Even though this section regulates storage of both combustible and noncombustible materials, only combustible materials are required to obtain a permit when the storage exceeds 2500 cubic feet. The quantity limit is specified in the permit requirements in Section 105.6.29.

Section 315.2 is renumbered to 315.3 and revised to specify that the first sentence applies to ALL storage, and the second sentence applies to combustible storage. This will then state that all storage, whether combustible or not, is regulated and should be orderly. This means that the stored materials, whether combustible or not, are orderly, and that the stacks of stored materials need to be stable. These requirements allow for aisles being maintained, and the reduction of injury or blocking of exit during a seismic event or even when materials are hit with a hose stream during fire operations.

Hazards specific to 'combustible' materials have been more clearly identified. The second sentence in 315.3 is revised to specify that only combustible materials need to be separated from ignition sources. It is not necessary to separate non-combustible materials from ignition sources because there is no hazard.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F3-315.DOC

F7–09/10
316.4 (New)

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Add new text as follows:

316.4 Obstructions on roofs. Installing or maintaining wires, cables, ropes, aerial antennas, or other suspended obstructions installed or maintained on the roofs of buildings having a roof slope of less than 30 degrees, shall be located to provide a vertical clearance of not less than 7 feet (2133 mm) between the roof surface and such obstruction.

Exception: Obstructions shall be permitted to be installed less than 7 feet (2133 mm) high provided they are protected in a manner to prevent injury to firefighters working on the roof.

(Renumber subsequent sections)

Reason: This proposal will increase for firefighter safety when performing fire suppression related duties on a rooftop, and will also protect maintenance workers as they are working on a rooftop.

Obstructions below 7 feet from the roof surface may be difficult or impossible to see at night or when obscured by smoke conditions. Many accidents have occurred where an obstruction was not seen and was run into by someone on the roof. In these instances, people have been injured, strangled, entangled, and fallen from rooftops.

This proposal does not prohibit the installation of these items, but it requires that they are identified or protected. For example, protection may be as simple as placing a white 2" diameter plastic pipe around the guy wire used to secure an antenna. Or be constructing an obstruction below the guy wire so that walking under the wire is not possible.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F4-316.4.DOC

F8–09/10

316.0 (New), 905.3.8 (IBC [F] 905.3.8) (New)

Proponent: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Add new text as follows:

SECTION 316.0
ROOF GARDENS AND LANDSCAPED ROOFS

316.1 General. Rooftop gardens and landscaped roofs shall be installed and maintained in accordance with this code and Sections 1505.0 and 1507.16 of the *International Building Code*.

316.2 Rooftop garden or landscaped roof size. Rooftop garden or landscaped roof areas shall not exceed 15,625 ft2 (1,450 m^2) in size for any single area with a maximum dimension of 125 ft (39 m) in length or width. A minimum 3 ft (0.9 m) wide clearance shall be provided between adjacent rooftop garden or landscaped roof areas.

316.3 Rooftop structure and equipment clearance. A minimum 3 ft (0.9 m) wide clearance shall be provided between the rooftop garden or landscaped roof and rooftop structures, including but not limited to mechanical and machine rooms, penthouses, skylights, roof vents, solar panels, antenna supports, and building service equipment.

316.4 Vegetation. Vegetation shall be maintained as described in Sections 316.4.1 and 316.4.2

316.4.1 Irrigation. Supplemental irrigation shall be provided as necessary to maintain levels of hydration necessary to keep green roof plants alive and to keep dry foliage to a minimum.

316.4.2 Dead foliage. Dead foliage and biomass shall be removed immediately.

905.3.8 (IBC [F] 905.3.8) Roof gardens and landscaped roofs. Buildings or structures with roof gardens or landscaped roofs that are equipped with a standpipe shall extend the standpipe to the roof level on which the roof garden or landscaped roof is located.

Reason: As rooftop gardens and landscaped roofs gain in acceptance and popularity reasonable requirements need to be added to the codes to address the fuel load that these additions can add to a building or structure.

New Section 316.0 is proposed to be added to the International Fire Code to manage the size of any one area utilized for these improvements, provide for a reasonable 3 foot clearance to structures and equipment that require access for maintenance and fire response purposes and to control fire exposure. A requirement that means for hydration be provided and that dead foliage and biomass be removed immediately.

A new section is proposed for the construction of buildings that have fire standpipe systems for the standpipe to be extended to the roof if a rooftop garden or landscape is proposed.

Cost Impact: These requirements will increase the cost of construction for those buildings where a roof garden or landscaped roof is proposed to be installed on the roof.

Analysis: Code Change S10-09/10 appears on the hearing order of the IBC-Fire Safety Committee and proposes revisions to IBC Table 1505.1 and Section 1507.16 on this topic. Code change F238-09/10 proposes similar requirements.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F9-316.0.DOC

F9–09/10
318 (New)

Proponent: Daniel E. Nichols, PE, New York State Department of State, Div. of Code Enforcement and Administration

Add new section as follows:

SECTION 318
VEGETATION ON ROOFS

318.1 Maintenance of vegetation. Vegetation placed upon buildings shall be maintained to prevent the accumulation of weeds, grass, vines, trees, or other growth that is capable of being ignited. All vegetation that poses a fire hazard to the building or exposure structures shall be removed from the building.

318.2 Maintenance plan. The fire code official is authorized to require a maintenance plan for vegetation placed on roofs due to the size of a roof garden, materials used, or when a fire hazard may exist to the building or exposures due to the lack of maintenance.

318.3 Maintenance equipment. Fueled equipment stored on roofs and used for the care and maintenance of vegetation on roofs shall be stored in accordance with Section 313.

Reason: A separate section is being proposed to address the placement of vegetation on roofs. It was originally considered to be a sub-section of Section 304, but vegetation on roofs does not fit within the title and is outside the scope of the Section.

Roof gardens (Green roofs) are an increasing condition and the benefits of having them are gaining popularity in protecting our environment. High-profile roof gardens, such as those seen in the Chicago area, have been thoroughly designed and are well maintained; thus seeing the benefit to our environment and energy use reduction. However, some are turning to the 'do-it-yourself' style of making a roof garden and placing vegetation on roofs for more of a feel good or aesthetic reason rather than the original purpose. The latter type of roof garden placement places a great fire risk for buildings and exposure buildings due to the possible lack of maintenance in the future. In essence, an unmaintained roof garden in similar to a brush fire being conducted on top of a building rather than on the ground. This creates an increased exposure hazard as roof covering rating requirements are based on flying embers, not falling ones.

Section 318.1 sets a basic level of maintenance, similar to that found in Section 304 for the maintenance of vegetation in and around a building. Section 318.2 gives the fire code official the ability to request a maintenance plan of the vegetation, which is beneficial to determine if the roof garden will be maintained or is just a bunch of vegetation placed on the roof. The maintenance plan is also beneficial to determine what happens to a building that goes vacant or when the building owner does not keep up with the maintenance. Section 318.3 sends the code user to 313 for appropriate storage of fueling equipment.

Due to the relatively new topic of green roofs and the increased popularity of them, it is appropriate to set basic guidelines to maintain them rather than wait for an incident.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NICHOLS-F6-318.DOC

F10–09/10
401.6 (New)

Proponent: Michael Jacoby, Seven Valleys, PA, representing self

Add new text as follows:

401.6 Geographical locational Information. A site's geographical location being the site's latitude / longitude coordinates centered on the structure, recorded in decimal for accuracy shall be entered as part of a site's official locational records, in plans and documents.

(Renumber subsequent sections)

Reason: By having accurate geographical locational information which is essential for emergency planning and preparedness to protect those within your communities that have families or loved ones with special needs and by using latitude and longitude coordinates centered on a facility at the time of construction that over time this will eliminate the continuing locational problems being found within mapping databases combined with confusion that you may encounter when Out-Of-Area-Assistance is required for emergencies.

Simply put… State Highway Numbers, Road Names and Postal Delivery Addresses even a community for industrial park may change its name but a site's set of latitude and longitude coordinates will always stay constant.

In other words if you've ever driven to a wrong location when using address numbers and road names etc. especially when every second counts you should immediately understand why this proposed change is so important.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: JACOBY-F1-401.6.DOC

F11–09/10
403.2.1

Proponent: Amber Anderson/Stuart Tom, Cosumnes CSD Fire Department, representing California Fire Chief's Association

Revise as follows:

403.2.1 Contents. The public safety plan, where required by Section 403.2, shall address such items as emergency vehicle ingress and egress, fire protection, emergency egress or escape routes, emergency medical services, public assembly areas and the directing of both attendees and vehicles (including the parking of vehicles), vendor and food concession distribution, and the need for the presence of law enforcement, and fire and emergency medical services personnel at the event.

Reason: This code sections intent is clear with regards to additional public safety requirements that may be necessary as determined by the fire code official when certain conditions warrant. The additional proposed language for this section merely adds the ability of the fire code official to require emergency egress or escape plans to the other identified elements within the section. Including the proposed language to the existing code section will ensure that emergency egress or escape plans are included with the other requirements that the fire code official may deem necessary.

Cost Impact: The code change proposal will increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ANDERSON-TOM-F2-403.2.1.DOC

F12–09/10
404.3.2

Proponent: Gregory J. Cahanin, Cahanin Fire & Code Consulting, representing the Michael Minger Foundation

Revise as follows:

404.3.2 Fire safety plans. Fire safety plans shall include the following:

1. The procedure for reporting a fire or other emergency.
2. The life safety strategy and procedures for notifying, relocating or evacuating occupants, including occupants who need assistance. Emphasis shall be given to identifying individuals with mobility and cognitive disabilities and integrating their special needs into fire safety plans.
3. Site plans indicating the following:
   - 3.1. The occupancy assembly point.
   - 3.2. The locations of fire hydrants.
   - 3.3. The normal routes of fire department vehicle access.
4. Floor plans identifying the locations of the following:
   - 4.1. Exits.
   - 4.2. Primary evacuation routes.
   - 4.3. Secondary evacuation routes.
   - 4.4. Accessible egress routes.
   - 4.5. Areas of refuge.
   - 4.6. Exterior areas for assisted rescue.
   - 4.7. Manual fire alarm boxes.
   - 4.8. Portable fire extinguishers.
   - 4.9. Occupant-use hose stations.
   - 4.10. Fire alarm annunciators and controls.
5. A list of major fire hazards associated with the normal use and occupancy of the premises, including maintenance and housekeeping procedures.

6. Identification and assignment of personnel responsible for maintenance of systems and equipment installed to prevent or control fires.
7. Identification and assignment of personnel responsible for maintenance, housekeeping and controlling fuel hazard sources.

Reason: Provisions for individuals with mobility disabilities are well established in the physical environment requirements of the IBC's Accessibility chapter. Once the building is constructed with the accessibility features the maintenance codes need to have requirements in place that recognize that movement of these individuals in an emergency has to be defined, planned, and communicated. We are also at a point of recognizing that individuals with cognitive disabilities may need additional education or notice of what to do in fire emergencies. This simple addition to the IFC (and the IPMC coordination if approved here) will prompt property owners and operators to consider the sometimes unique needs of the occupants in their buildings in an emergency. This simple requirement begins the dialog between occupants and building operators to help insure that when an emergency occurs everyone will have the opportunity to move safely to the outside. Proper egress planning lessens the burden of emergency personnel in providing rescue services while the suppression effort is ongoing.

The submittal of this proposal and several others with the ICC is part of the work of the Michael H. Minger Foundation, as a result of a Department of Homeland Security Fire Prevention and Safety Grant to study how colleges and universities respond to and provide for students with physical and learning disabilities in a fire event. The study identified model practices being used by campuses regarding fire safety, housing and evacuation policies and procedures. The proposed changes to the IPMC lay the foundation for uniform fire safety planning in the campus environment in a nationally recognized document while also establishing a clear base for egress planning and performance in all types of occupancies.

The Michael H. Minger Foundation was established in 2005. The purpose of the Foundation is to improve fire safety standards and enhance fire safety systems on college and university campuses and to educate parents and students and raise awareness of the reality and risk of campus fires. This non-profit organization was founded to honor the life of Michael H. Minger, an outstanding young man, who lost his life in a college dormitory fire. The Michael Minger Act in Kentucky established a requirement for fire sprinklers in college housing. A governor's task force focusing on campus safety in Kentucky was lead by Gail Minger, the director of the Michael H. Minger Foundation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CAHANIN-F2-404.3.2

F13–09/10
404.6 (New)

Proponent: Gregory J. Cahanin, Cahanin Fire & Code Consulting, representing the Michael Minger Foundation

Add new text as follows:

404.6 Posting of evacuation plan. A posted evacuation plan consisting of a floor plan layout indicating the available evacuation routes with identification of key emergency components, such as areas of rescue assistance, shall be provided near the main entry to the floor or building where access by the general public occurs in Group A-3, B and R-2 occupancies .

Reason: Within ANSI A17.1 for elevators there is now a requirement for 'in case of fire use stairs' placards to be posted at elevator call buttons and this proposal is a better detailed extension of that requirement document in that the posted plan will clearly define where the stairs and areas of rescue assistance are located. A companion proposal for a new 404.5.1 requires posting of egress paths from dorm rooms and this new section is an extension into public area notice.

The information provided on the plan will communicate the available means of egress to the occupants. It is also recognized that there is no specific form of education being provided to the general population related to the provisions being provided for accessibility in buildings. The evacuation plan can begin the educational process by identifying building provisions for egress in a public area.

The submittal of this proposal and several others with the ICC is part of the work of the Michael H. Minger Foundation, as a result of a Department of Homeland Security Fire Prevention and Safety Grant to study how colleges and universities respond to and provide for students with physical and learning disabilities in a fire event. The study identified model practices being used by campuses regarding fire safety, housing and evacuation policies and procedures. The proposed changes to the IPMC lay the foundation for uniform fire safety planning in the campus environment in a nationally recognized document while also establishing a clear base for egress planning and performance in all types of occupancies.

The Michael H. Minger Foundation was established in 2005. The purpose of the Foundation is to improve fire safety standards and enhance fire safety systems on college and university campuses and to educate parents and students and raise awareness of the reality and risk of campus fires. This non-profit organization was founded to honor the life of Michael H. Minger, an outstanding young man, who lost his life in a college dormitory fire. The Michael Minger Act in Kentucky established a requirement for fire sprinklers in college housing. A governor's task force focusing on campus safety in Kentucky was lead by Gail Minger, the director of the Michael H. Minger Foundation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CAHANIN-F1-404.6.DOC

F14–09/10
408.4 through 408.4.4 (New), Chapter 47, Appendix K (New)

Proponent: William Winslow, CIH, CFI, CMI, Winslow Partnership, representing self

1. Add new text as follows:

408.4 Group H occupancies and outdoor areas with hazardous materials. Group H occupancies and outdoor areas with hazardous materials shall comply with Sections 408.4.1 through 408.4.4 when such occupancies or facilities are required by 40CFR, Section 68.130 to have a Risk Management Plan (RMP). See Appendix K for further information on chemicals and threshold quantities that require a RMP.

408.4.1 Emergency response plan. An emergency response plan describing procedures for mitigating an unintentional chemical release shall be prepared prior to occupancy. A copy of the plan shall be maintained on-site, and upon request, a copy of the plan shall be provided to the fire code official for approval.

408.4.2 Training. Employees who are designated as emergency responders shall be trained to perform duties assigned in the Emergency Response Plan. Training criteria shall be provided in the Emergency Response Plan.

408.4.3 Equipment. Equipment and supplies specified in the Emergency Response Plan for use in the event of an unintentional chemical release shall be maintained on-site or shall be available for delivery to the site as specified in the plan.

408.4.4 Emergency drill. When required by the fire code official, an annual drill shall be conducted to practice the Emergency Response Plan. The fire code official shall be notified of the date and time of a scheduled drill not less than sixty days prior to the event. When an emergency drill identifies deficiencies in the Emergency Response Plan, the plan shall be updated to correct noted deficiencies.

2. Add new standard to Chapter 47 as follows:

EPA

40 CFR, Part 68 Subparts F and G – 2000	Chemical Accident Prevention Provisions - Regulated Substances for Accidental Release Prevention and Risk Management Plan

3. Add new Appendix K as follows:

(Underlining in the body of the substances tables omitted for clarity)

APPENDIX K
HAZARDOUS MATERIALS AND THRESHOLD QUANTITIES FOR EMERGENCY RESPONSE PLANNING

This appendix is for informational purposes and is not intended for adoption.

SECTION K101
GENERAL

K101.1 Scope. The *International Fire Code*, Section 408.4 establishes requirements for Group H-1, H-2, H-3 and H-4 occupancies and outdoor facilities to have an emergency response plan when threshold quantities for certain chemicals are exceeded. Section 408.4 intends for the emergency response planning requirements, including the list of applicable chemicals and threshold quantities, to:

1. Remain consistent with the U.S. Environmental Protection Agency's (EPA) Risk Management Plan (RMP) filing thresholds specified in Title 40, Section 68.130 of the Code of Federal Regulations, and
2. Remain consistent with the regulations for facilities requiring a RMP, as specified in Section 112(r) of the Clean Air Act.

Table K101(1) and Table K101(2) provide EPA's threshold quantities for regulated chemicals as of January 1, 2009. This information is provided as a reference for application of Section 408.4, but because the list of applicable chemicals and quantities under Federal law may change over time, it is recommended that the source Federal documents be consulted for the most up-to-date information when applying the code.

TABLE K101(1)
LIST OF REGULATED TOXIC SUBSTANCES AND THRESHOLD QUANTITIES FOR ACCIDENTAL RELEASE PREVENTION
(Source: 40CFR, Part 68, Sec. 68.130; Revised as of July 1, 2000)

(The font for the 2 tables was left as submitted due to technical difficulties in formatting)

Chemical name	CAS No.	Threshold quantity (lbs)
Acrolein [2-Propenal].....	107-02-8	5,000
Acrylonitrile [2-Propenenitrile].	107-13-1	20,000
Acrylyl chloride [2-Propenoyl chloride].	814-68-6	5,000
Allyl alcohol [2-Propen-l-ol]..	107-18-61	15,000
Allylamine [2-Propen-l-amine]..	107-11-9	10,000
Ammonia (anhydrous).....	7664-41-7	10,000
Ammonia (conc 20% or greater)..	7664-41-7	20,000
Arsenous trichloride.....	7784-34-1	15,000
Arsine.....	7784-42-1	1,000
Boron trichloride [Borane, trichloro-].	10294-34-5	5,000
Boron trifluoride [Borane, trifluoro-].	7637-07-2	5,000
Boron trifluoride compound with methyl ether (1:1) [Boron, trifluoro [oxybis [metane]]-, T-4-.	353-42-4	15,000
Bromine.....	7726-95-6	10,000
Carbon disulfide.....	75-15-0	20,000
Chlorine.....	7782-50-5	2,500
Chlorine dioxide [Chlorine oxide (ClO2)].	10049-04-4	1,000
Chloroform [Methane, trichloro-].	67-66-3	20,000
Chloromethyl ether [Methane, oxybis[chloro-].	542-88-1	1,000
Chloromethyl methyl ether [Methane, chloromethoxy-].	107-30-2	5,000
Crotonaldehyde [2-Butenal].....	4170-30-3	20,000
Crotonaldehyde, (E)- [2-Butenal, (E)-].	123-73-9	20,000
Cyanogen chloride.....	506-77-4	10,000
Cyclohexylamine [Cyclohexanamine].	108-91-8	15,000
Diborane.....	19287-45-7	2,500
Dimethyldichlorosilane [Silane, dichlorodimethyl-].	75-78-5	5,000
1,1-Dimethylhydrazine [Hydrazine, 1,1-dimethyl-].	57-14-7	15,000
Epichlorohydrin [Oxirane, (chloromethyl)-].	106-89-8	20,000
Ethylenediamine [1,2-Ethanediamine].	107-15-3	20,000
Ethyleneimine [Aziridine].....	151-56-4	10,000
Ethylene oxide [Oxirane].....	75-21-8	10,000
Fluorine.....	7782-41-4	1,000
Formaldehyde (solution).....	50-00-0	15,000
Furan.....	110-00-9	5,000
Hydrazine.....	302-01-2	15,000

Hydrochloric acid (conc 37% or greater).	7647-01-0	15,000
Hydrocyanic acid.....	74-90-8	2,500
Hydrogen chloride (anhydrous) [Hydrochloric acid].	7647-01-0	5,000
Hydrogen fluoride/Hydrofluoric acid (conc 50% or greater) [Hydrofluoric acid].	7664-39-3	1,000
Hydrogen selenide.....	7783-07-5	500
Hydrogen sulfide.....	7783-06-4	10,000
Iron, pentacarbonyl- [Iron carbonyl (Fe(CO)5), (TB-5-11)-].	13463-40-6	2,500
Isobutyronitrile [Propanenitrile, 2-methyl-].	78-82-0	20,000
Isopropyl chloroformate [Carbonochloridic acid, 1-methylethyl ester].	108-23-6	15,000
Methacrylonitrile [2-Propenenitrile, 2-methyl-].	126-98-7	10,000
Methyl chloride [Methane, chloro-].	74-87-3	10,000
Methyl chloroformate [Carbonochloridic acid, methylester].	79-22-1	5,000
Methyl hydrazine [Hydrazine, methyl-].	60-34-4	15,000
Methyl isocyanate [Methane, isocyanato-].	624-83-9	10,000
Methyl mercaptan [Methanethiol]	74-93-1	10,000
Methyl thiocyanate [Thiocyanic acid, methyl ester].	556-64-9	20,000
Methyltrichlorosilane [Silane, trichloromethyl-].	75-79-6	5,000
Nickel carbonyl.....	13463-39-3	1,000
Nitric acid (conc 80% or greater).	7697-37-2	15,000
Nitric oxide [Nitrogen oxide (NO)].	10102-43-9	10,000
Oleum (Fuming Sulfuric acid) [Sulfuric acid, mixture with sulfur trioxide] \1\.	8014-95-7	10,000
Peracetic acid [Ethaneperoxoic acid].	79-21-0	10,000
Perchloromethylmercaptan [Methanesulfenyl chloride, trichloro-].	594-42-3	10,000
Phosgene [Carbonic dichloride].	75-44-5	500
Phosphine.....	7803-51-2	5,000
Phosphorus oxychloride [Phosphoryl chloride].	10025-87-3	5,000
Phosphorus trichloride [Phosphorous trichloride].	7719-12-2	15,000
Piperidine.....	110-89-4	15,000
Propionitrile [Propanenitrile].	107-12-0	10,000
Propyl chloroformate [Carbonochloridic acid, propylester].	109-61-5	15,000
Propyleneimine [Aziridine, 2-methyl-].	75-55-8	10,000
Propylene oxide [Oxirane, methyl-].	75-56-9	10,000

Sulfur dioxide (anhydrous).....	7446-09-5	5,000
Sulfur tetrafluoride [Sulfur fluoride (SF4), (T-4)-].	7783-60-0	2,500
Sulfur trioxide.....	7446-11-9	10,000
Tetramethyllead [Plumbane, tetramethyl-].	75-74-1	10,000
Tetranitromethane [Methane, tetranitro-].	509-14-8	10,000
Titanium tetrachloride [Titanium chloride (TiCl4) (T-4)-].	7550-45-0	2,500
Toluene 2,4-diisocyanate [Benzene, 2,4-diisocyanato-1-methyl-] \1\.	584-84-9	10,000
Toluene 2,6-diisocyanate [Benzene, 1,3-diisocyanato-2-methyl-] \1\.	91-08-7	10,000
Toluene diisocyanate (unspecified isomer) [Benzene, 1,3-diisocyanatomethyl-] \1\.	26471-62-5	10,000
Trimethylchlorosilane [Silane, chlorotrimethyl-].	75-77-4	10,000
Vinyl acetate monomer [Acetic acid ethenyl ester].	108-05-4	15,000

TABLE K101(2)

FLAMMABLE SUBSTANCES AND THRESHOLD QUANTITIES FOR ACCIDENTAL RELEASE PREVENTION[1]

(Source: 40CFR, Part 68, Sec. 68.130; Revised as of July 1, 2000)

Chemical name	CAS No.	Threshold quantity (lbs)
Acetaldehyde.....	75-07-0	10,000
Acetylene [Ethyne].....	74-86-2	10,000
Bromotrifluorethylene [Ethene, bromotrifluoro-].	598-73-2	10,000
1,3-Butadiene.....	106-99-0	10,000
Butane.....	106-97-8	10,000
1-Butene.....	106-98-9	10,000
2-Butene.....	107-01-7	10,000
Butene.....	25167-67-3	10,000
2-Butene-cis.....	590-18-1	10,000
2-Butene-trans [2-Butene, (E)].	624-64-6	10,000
Carbon oxysulfide [Carbon oxide sulfide (COS)].	463-58-1	10,000
Chlorine monoxide [Chlorine oxide].	7791-21-1	10,000
2-Chloropropylene [1-Propene, 2-chloro-].	557-98-2	10,000
1-Chloropropylene [1-Propene, 1-chloro-].	590-21-6	10,000
Cyanogen [Ethanedinitrile].....	460-19-5	10,000
Cyclopropane.....	75-19-4	10,000
Dichlorosilane [Silane, dichloro-].	4109-96-0	10,000
Difluoroethane [Ethane, 1,1-difluoro-].	75-37-6	10,000
Dimethylamine [Methanamine, N-methyl-].	124-40-3	10,000

2,2-Dimethylpropane [Propane, 2,2-dimethyl-].	463-82-1	10,000
Ethane.....	74-84-0	10,000
Ethyl acetylene [1-Butyne].....	107-00-6	10,000
Ethylamine [Ethanamine].....	75-04-7	10,000
Ethyl chloride [Ethane, chloro-].	75-00-3	10,000
Ethylene [Ethene].....	74-85-1	10,000
Ethyl ether [Ethane, 1,1'-oxybis-].	60-29-7	10,000
Ethyl mercaptan [Ethanethiol]..	75-08-1	10,000
Ethyl nitrite [Nitrous acid, ethyl ester].	109-95-5	10,000
Hydrogen.....	1333-74-0	10,000
Isobutane [Propane, 2-methyl]..	75-28-5	10,000
Isopentane [Butane, 2-methyl-].	78-78-4	10,000
Isoprene [1,3-Butadinene, 2-methyl-].	78-79-5	10,000
Isopropylamine [2-Propanamine].	75-31-0	10,000
Isopropyl chloride [Propane, 2-chloro-].	75-29-6	10,000
Methane.....	74-82-8	10,000
Methylamine [Methanamine].....	74-89-5	10,000
3-Methyl-1-butene.....	563-45-1	10,000
2-Methyl-1-butene.....	563-46-2	10,000
Methyl ether [Methane, oxybis-]	115-10-6	10,000
Methyl formate [Formic acid, methyl ester].	107-31-3	10,000
2-Methylpropene [1-Propene, 2-methyl-].	115-11-7	10,000
1,3-Pentadinene.....	504-60-9	10,000
Pentane.....	109-66-0	10,000
1-Pentene.....	109-67-1	10,000
2-Pentene, (E)-.....	646-04-8	10,000
2-Pentene, (Z)-.....	627-20-3	10,000
Propadiene [1,2-Propadiene]....	463-49-0	10,000
Propane.....	74-98-6	10,000
Propylene [1-Propene].....	115-07-1	10,000
Propyne [1-Propyne].....	74-99-7	10,000
Silane.....	7803-62-5	10,000
Tetrafluoroethylene [Ethene, tetrafluoro-].	116-14-3	10,000
Tetramethylsilane [Silane, tetramethyl-].	75-76-3	10,000
Trichlorosilane [Silane, trichloro-].	10025-78-2	10,000
Trifluorochloroethylene [Ethene, chlorotrifluoro-].	79-38-9	10,000
Trimethylamine [Methanamine, N,N-dimethyl-].	75-50-3	10,000
Vinyl acetylene [1-Buten-3-yne]	689-97-4	10,000
Vinyl chloride [Ethene, chloro-].	75-01-4	10,000
Vinyl ethyl ether [Ethene, ethoxy-].	109-92-2	10,000
Vinyl fluoride [Ethene, fluoro-].	75-02-5	10,000
Vinylidene chloride [Ethene, 1,1-dichloro-].	75-35-4	10,000
Vinylidene fluoride [Ethene, 1,1-difluoro-].	75-38-7	10,000

Vinyl methyl ether [Ethene, methoxy-].	107-25-5	10,000

[1]A flammable substance when used as a fuel or held for sale as a fuel at a retail facility is excluded from all provisions of 40CFR, Part 68.

Reason: Dalton, Georgia, April 11, 2006 - A final report issued by the U.S. Chemical Safety and Hazard Investigation Board (CSB) concluded inadequate emergency planning by the facility, city, and county contributed to the severity of a runaway chemical reaction and toxic vapor cloud release at MFG Chemical Inc. One problem is that emergency plans required under CCA 112(r) and other federal regulations do not have to be approved by the FCO and do not require periodic drills. This code change will allow the FCO to require emergency planning, training, and drills that meet the needs of the fire department for facilities with hazardous materials that exceed the threshold quantity for risk management planning found in CCA 112(r). It will also ensure that the FCO has the authority to require the plan be written and implemented before a new facility begins operation. The provision for approval by the FCO is in agreement with NFPA 600, which applies to any organized, private, industrial group of employees having fire-fighting response duties, such as emergency brigades, emergency response teams, fire teams, and plant emergency organizations. Section 1.3.2 of NFPA 600 states, " The authority having jurisdiction shall be permitted to examine and approve organization, operations, training". The 60 day notification of an upcoming drill will provide the time necessary for the fire department to include the drill in its training schedule.

Cost Impact: The code change proposal should not increase cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, 40 CFR, Part 68 Subparts F and G – 2000, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:				
Committee:	AS	AM	D	
Assembly:	ASF	AMF	DF	

ICCFILENAME: WINSLOW-F3-408.4 (NEW)-REVISED.DOC

F15–09/10
408.7.5 (New)

Proponent: Robert E. Ellison, Jr., Detention and Correctional Inspector for the South Carolina Department of Corrections, representing self

Add new text as follows:

408.7.5 Other occupancies. Buildings or portions of buildings in Group I-3 occupancies where security operations necessitate the locking of required means of egress shall be permitted to be classified as a different occupancy. Occupancies classified as other than Group I-3 shall meet the applicable requirements of this code for that occupancy provided provisions are made for the release of occupants at all times.

Means of egress from detention and correctional occupancies that traverse other use areas shall, as a minimum, conform to requirements for detention and correctional occupancies.

> **Exception:** It shall be permissible to exit through a horizontal exit into other contiguous occupancies that do not conform to detention and correctional occupancy egress provisions but that do comply with requirements set forth in the appropriate occupancy, as long as the occupancy is not a Group H use.

Reason: To allow existing correctional facilities the same latitude in providing necessary security measures in portions of existing buildings, and separate buildings on an correctional complex (that are classified as other than I-3 occupancy) as the International Building Code does for newly constructed buildings. To be consistent with current International Building Code text and commentary that permits this application in new buildings. Current provisions of the International Fire Code do not address this issue for existing buildings.

Many existing occupancies (constructed prior to the extensive code changes for I-3 occupancies that included IBC 408.2) are still in use. Many of these existing I-3 facilities have attached occupancies or separate buildings that are designated as other than I-3 occupancy, in which there is a necessity of locking of exit doors for security purposes. The change would allow these existing occupancies the ability to secure exit doors for security purposes (if provisions for unlocking and exiting are adhered to), as provided for in the IBC for new construction..

Additional documentation: (Excerpt from IBC 2006 Commentary)

IBC 408.2

♦ In accordance with the provisions of Section 508.3, portions of an occupancy in Group I-3 may be classified as a separate occupancy and meet the provisions of the code for that occupancy. Since the area may be used by the residents, however, a need may exist for the other occupancy to also contain security provisions, such as the locking of egress doors. This section specifically permits such a condition as long as arrangements have been made for release of the occupants within these areas at any time they are occupied. Acceptable methods include having either staff operated locks or remote release of the locks, similar to that which is provided in the housing areas.

Although it is indicated that the section applies to portions of occupancies in Group 1-3, consideration should be given to allow the necessary security to be provided in separate buildings that are part of a detention or correctional facility. Applications of this section should be restricted to the buildings that must be secure because they are occupied by residents, and arrangements for quick release of the locks must be provided at all times the building is occupied. If residents are to be permitted into an area or building without staff supervision, the residents should be able to initiate their own evacuation.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The future maintenance of the technical content of proposed IFC Section 408.7.5 will be the responsibility of the IBC-General Code Development Committee. The need for and suitability of having the new section appear in the IFC is a matter to be determined by the IFC Code Development Committee.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ELLISON-F1-408.7.5 NEW.DOC

F16–09/10
503.2.2.1 (New)

Proponent: Carl D. Wren, Fire Department, City of Austin, TX, representing self

Add new text as follows:

503.2.2.1 Decrease in width. The fire code official shall have the authority to approve a decrease in the minimum access width. In evaluating reduced access widths, the fire code official shall consider traffic safety issues, maximum building heights, fixed fire suppression systems, the degree of street interconnections, and the adequacy of turning radii. When necessary to demonstrate compliance, the fire code official may require technical assistance provided by traffic safety professionals as well as fire safety professionals in accordance with Section 104.7.2.

Reason: For a number of years the fire service has been exploring strategic partnerships for reducing the overall risk to our communities from a variety of hazards rather than restricting its efforts to simply reducing deaths and injuries from fire related emergencies. This effort is evident in the objectives of the National Fire Academy Course "Strategies for Community Risk Reduction" and its predecessor course "Strategic Analysis of Community Risk Reduction" as well as in the NFPA "Risk Watch" program. With this general idea of overall risk to the community and a specific consideration of the potential for reducing traffic injuries and fatalities in mind, it may often be advantageous to plan for traffic calming during the site plan or subdivision design phases of a project and for the fire code official to be able to choose to accept a design with narrower but significantly interconnected streets over the potential for the jurisdiction to attempt the installation of traffic calming measures as an afterthought, or over the use of cul-de-sacs or other dead-ends with forced turnaround situations.

While the issue of environmental quality is not a goal or objective directly attributed to the fire code, environmental improvements have been a by-product of code development issues such as handling and storing hazardous materials. The EPA has also weighed in on the issue of authority to consider alternate roadway designs and has cited at least two (2) potential benefits of giving fire officials the clear authority to consider and potentially to approve narrower streets in some circumstances. First, representatives of the EPA have noted their position that interconnected narrower streets support more pedestrian friendly cities or neighborhoods and can therefore result in reduced vehicle miles traveled and an attendant reduction in carbon emissions. Second, they have noted that they support this approach as a way to give opportunity to consider and possibly use low-impact development (LID) techniques or green infrastructure for storm water treatment. They believe this will reduce the quantity and improve the quality of storm water runoff.

Finally, this proposal simply clarifies and makes explicit what the proponent considers to be a currently implied authority under IFC sections 104.8, 104.9 and 503.1.2. It affords an opportunity to give developers credit for reduced fire risks due to fire sprinkler protection and acknowledges that there is a potential for major reductions in traffic casualties for well thought out narrow street configurations. Further information on the potential impact of street widths on traffic related injuries can be obtained through a 1997 study by Peter Swift et al that is currently being peer reviewed.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WREN-F1-503.2.2.1.DOC

F17–09/10
504.3.1, 502.1

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Add new text as follows:

503.4.1. Traffic calming devices. Traffic calming devices are prohibited unless approved by the *fire code official*.

502.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

TRAFFIC CALMING DEVICES. Traffic calming devices are design elements of fire apparatus access roads such as street alignment, installation of barriers, and other physical measures intended to reduce traffic and cut-through volumes, and slow vehicle speeds.

Reason: Many communities are facing increased traffic volumes. Both new and existing streets are experiencing higher vehicular volumes and speeds as drivers attempt to find "short cuts" to ease their commutes. Designers, planning departments and traffic departments are increasingly turning to traffic calming measures to preserve the quality and enjoyment of life for their citizens.

A key interest of all emergency services is to provide timely response to emergencies. Traffic calming devices can unduly delay and result in damage to emergency apparatus. This proposed language will allow fire officials to restrict traffic calming devices to those that will minimize these problems.

Standard emergency medical service response times are based on 4-6 minutes. This time frame is based on the fact that brain damage resulting from cardiac arrest typically occurs within 4-6 minutes. Delaying, or extending, these response times in any fashion places the public at greater risk.

Traffic officials and fire officials both have the responsibility to ensure that public interests are properly considered in their decision-making process. Both sets of officials have detailed regulations to provide for those interests.

This proposal requires approval of traffic calming measures by the fire code official. What it doesn't do is detail how that approval is to be made within various jurisdictions. Each jurisdiction has their own traffic pattern emergency response challenges. The purpose of this proposal is to ensure that the fire department is part of this decision-making process. This proposal requires approval of traffic calming measures in private fire access roads and public roads.

Many traffic calming designs include various road configurations that delay, or even restrict, fire apparatus access. Such items may include "round-abouts", speed humps, narrowing of streets, winding roads rather than straight roads, etc. All of these items slow the response time of any emergency response vehicle whether it be law enforcement, medical services, or fire.

The definition for traffic calming is based on the definition provided by the Institute of Transportation Engineers.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F5-504.3.1.DOC

F18–09/10
505.1 (IBC [F] 501.2)

Proponent: Amber Anderson and Stuart Tom, representing California Fire Chief's Association

1. Revise as follows:

505.1 Address Identification. New and existing buildings shall have *approved* address numbers, building numbers or *approved* building identification placed in a position that is plainly legible and visible from the street or road fronting the property. These numbers shall contrast with their background. When required by the Fire Code Official, address numbers shall be provided in additional *approved* locations to facilitate emergency response. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall be a minimum of 4 inches (101.6 mm) high with a minimum stroke width of 0.5 inch (12.7 mm). Where access is by means of a private road and the building cannot be viewed from the *public way*, a monument, pole or other sign or means shall be used to identify the structure. Address numbers shall be maintained.

2. Revise IBC as follows:

[F] 501.2 Address identification. New and existing buildings shall be provided with *approved* address numbers or letters. Each character shall be a minimum 4 inches (102 mm) high and a minimum of 0.5 inch (12.7 mm) wide. They shall be installed on a contrasting background and be plainly visible from the street or road fronting the property. When required by the building official, address numbers shall be provided in additional *approved* locations to facilitate emergency response. Where access is by means of a private road and the building address cannot be viewed from the *public way*, a monument, pole or other *approved* sign or means shall be used to identify the structure. Address numbers shall be maintained.

Reason: The added code language provides the Fire Code Official and Building Official with the authority to require additional address locations for facilities, campuses, strip malls, business parks, residences and other properties where identification of buildings is essential to emergency responders. The additional requirements proposed by the added language will assist various emergency responders in identifying specific addresses when an emergency response from locations other than the primary access point is required.

Cost Impact: The code change proposal will increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ANDERSON-TOM-F3-505.1~G1-501.2.doc

F19–09/10
506.1, 506.1.2 (New), Chapter 47

Proponent: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

1. Revise as follows:

506.1 Where required. Where access to or within a structure or an area is restricted because of secured openings or where immediate access is necessary for life-saving or fire-fighting purposes, the fire code official is authorized to require a key box to be installed in an approved location. The key box shall be of an approved type listed in accordance with UL 1037 and shall contain keys to gain necessary access as required by the fire code official.

506.1.2 Non-standardized fire service elevator keys. Key boxes provided for non-standardized fire service elevator keys shall comply with Section 506.1 and items 1 through 6 of this section.

1. The key box shall be compatible with an existing rapid entry key box system in use in the jurisdiction and approved by the fire code official.
2. The front cover shall be permanently labeled with the words "Fire Department Use Only – Elevator keys."
3. The key box shall be mounted at each elevator bank at the lobby nearest to the lowest level of fire department access.
4. The key box shall be mounted 5'6" above the finished floor to the right side of the elevator bank.
5. Contents of the key box are limited to fire service elevator keys. Additional elevator access tools, keys and information pertinent to emergency planning or elevator access shall be permitted when authorized by the fire code official.
6. In buildings with two or more elevator banks, a single key box shall be permitted to be used when such elevator banks are separated by not more than 30 feet. Additional key boxes shall be provided for each individual elevator or elevator bank separated by more than 30 feet.

   Exception: A single key box shall be permitted to be located adjacent to a fire command center or the non-standard fire service elevator key to be secured in a key box used for other purposes and located in accordance with Section 506.1 when approved by the Fire Chief.

2. Add new standard to Chapter 47 as follows:

UL

ANSI/UL 1037-99	Standard for Antitheft Alarms and Devices.

Reason: This proposal is a companion to a proposal calling for the standardization of fire service elevator keys to provide for rapid access to fire service access elevators and elevators with Phase I or Phase II emergency recall operation. That proposal includes a provision to allow placement of a non-standard fire service elevator key in a key box if there is a practical difficulty in providing a standardized key.

This proposal sets outs standards for the key boxes intended to be used for the elevator key and provides for compatibility with existing rapid entry systems; labeling of the key box; height and location of the key box(s); use of the key box for other items; and an exception to use a key box installed near a fire command center or for other purposes.

The proposal also provides for a level of security for the key box. The fire code currently provides the fire code official with the authority to require a key box within which will be keys that will provide access to secured facilities and/or locations at those facilities. There is an obligation to make sure the key box required by (or approved by) the fire code official is secure to prevent the key box from becoming a security threat.

This proposal addresses this issue of security by requiring an approved key box to be listed in accordance with UL standard 1037, The Standard for Antitheft alarms and devices. The major key box manufacturers have their rapid entry devices listed under this standard.

In preparing this proposal, statewide regulations requiring standardized fire service elevator keys (or Master Elevator Keys) from Florida, Louisiana and New Jersey were reviewed. Since some states and local jurisdictions have already begun to address this issue with the adoption of regulations and other states and jurisdictions are considering this topic it is beneficial to building owners and code officials to have a standard set of requirements contained within the model codes.

Cost Impact: The code change proposal will increase the cost of new construction.

Analysis: A review of the standard proposed for inclusion in the code, ANSI/UL 1037-99, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F13-506.DOC

F20–09/10
506.3 (New); IBC 3003.3 (New)

Proponent: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE FIRE CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE FIRE CODE COMMITTEE.

PART I – IFC

Revise section title and add new text as follows:

SECTION 506
KEY BOXES AND FIRE SERVICE ELEVATOR KEYS

506.3 Standardized fire service elevator keys. All buildings with elevators equipped with Phase I Emergency Recall, Phase II emergency in-car operation, or a Fire Service Access Elevator shall be equipped to operate with a standardized fire service elevator key approved by the fire code official.

Exception: Where there is a practical difficulty to providing a standardized key the owner shall place the building's non-standardized fire service elevator keys in a key box installed in accordance with Section 506.1.

506.3.1 Requirements for standardized fire service elevator keys. Standardized fire service elevator keys shall comply with all of the following:

1. All fire service elevator keys within the jurisdiction shall be uniform and specific for the jurisdiction. Keys shall be cut to a uniform key code.
2. Fire service elevator keys shall be a patent protected design to prevent unauthorized duplication.
3. Fire service elevator keys shall be factory restricted by the manufacturer to prevent the unauthorized distribution of key blanks. No uncut key blanks shall be permitted to leave the factory
4. Fire service elevator keys subject to these rules shall be engraved with the words "DO NOT DUPLICATE".

506.3.2 Access to standardized fire service keys. Access to standardized fire service elevator keys shall be restricted to the following:

1. Elevator owners or their authorized agents;
2. Elevator contractors.
3. Elevator Inspectors of the jurisdiction.
4. Fire code officials of the jurisdiction.
5. The fire department and other emergency response agencies designated by the fire code official.

506.3.3 Duplication or distribution of keys. No person may duplicate a standardized fire service elevator key or issue, give, or sell a duplicated key unless in accordance with this code.

506.3.4 Responsibility to provide keys. The building owner shall provide up to three (3) standardized fire service elevator keys where required by the fire code official, upon installation of a standardized fire service key switch or switches in the building.

PART II – IBC GENERAL

Add new text as follows:

3003.3 Standardized fire service elevator keys. All elevators shall be equipped to operate with a standardized fire service elevator key in accordance with the *International Fire Code*.

Reason: When fire departments and other public agencies respond to emergencies the ability to quickly access the location of the emergency can be the deciding factor of a successful response. Elevators are increasingly being relied upon for emergency operations and their importance has been highlight by recent additions to the International Building Code requiring the installation of fire service access elevators and providing requirements for the installation of occupant evacuation elevators.

One of the difficulties the fire service and other emergency response agencies have when accessing facilities and attempting to use elevators is the increasing number of non-standardized keys which may not be available at the time of response. Even when emergency responders are provided the necessary keys in case of response, the correct key may have to be identified from a large collection of keys for any one building. In larger jurisdictions the sheer number of keys makes the possession of the keys unwieldy for the emergency responders.

The purpose Part1 of this proposal is to provide for a standardized fire service elevator key to reduce the number of keys necessary for accessing elevators in an emergency. As drafted this section will only apply to those buildings that have elevators with Phase I or Phase II emergency service or to those buildings with a fire service access elevator.

The proposal also provides for a level of security for the standardized key. Access to the key that can take control of an elevator is an existing area of vulnerability for buildings and one that was not addressed in the past with simple key designs being utilized. Since this proposal will create a standardized key, it also includes rules for the safeguarding of that key.

Part 2 of this proposal is included to simply place a pointer in the International Building Code should the International Fire Code Committee approve Part 1 of this proposal.

Because the International Codes are written to enable jurisdictions to adopt the codes at the State, Local or Regional levels the proposal follows that format and designated the “fire code official” as the regulating official. However, it is expected, and preferred, that a State level agency designate a standardized key for all jurisdictions to provide for a statewide standardized key.

In preparing this proposal, statewide regulations requiring standardized fire service elevator keys (or Master Elevator Keys) from Florida, Louisiana and New Jersey were reviewed. Since some states and local jurisdictions have already begun to address this issue with the adoption of regulations and other states and jurisdictions are considering this topic it is beneficial to building owners and code officials to have a standard set of requirements contained within the model codes.

Cost Impact: The code change proposal will not increase the cost of new construction.

Analysis: Similar requirements are proposed in code change proposal F40-09/10.

PART I – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F5-506.3.DOC

F21–09/10
507.5.1.1 (New)

Proponent: Daniel E. Nichols, PE, New York State Department of State, Div. of Code Enforcement and Administration

Add new text as follows:

507.5.1.1 Hydrant for standpipe systems. Buildings equipped with a standpipe system installed in accordance with Section 905 shall have a fire hydrant within 100 feet of the fire department connections.

Exception: The distance shall be permitted to be greater than 100 feet when approved by the fire code official.

Reason: NFPA 14 Section 6.4.5.4 requires that a fire hydrant be placed within 100 feet from a fire department connection, unless otherwise approved by the AHJ (6.4.5.4.1). However, this section is generally missed as the site work and site approval is based on the fire apparatus access road and fire department water supply requirements in IFC Chapter 5. By placing this requirement in Section 507, the code user is better directed to this requirement during the site design and not an afterthought as it usually happens during the building permit plan review.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NICHOLS-F3-507.5.1.1.DOC

F22–09/10
508.1.2 (IBC [F] 911.1.2)

Proponent: Lee Kranz, City of Bellevue, WA, representing The Washington Association of Building Officials (WABO), Technical Code Development Committee

Revise as follows:

508.1.2 (IBC [F] 911.1.2) Separation. The fire command center shall be separated from the remainder of the building by not less than a ~~1-hour~~ 2-hour *fire barrier* constructed in accordance with Section 707 of the International Building Code or *horizontal* assembly constructed in accordance with Section 712 of the International Building Code, or both.

Reason: Section 909.20.6.1 was changed in the 2009 IBC to require not less than 2-hour fire protection for smoke-proof enclosure pressurization fan power wiring and control wiring. Since this wiring is required to extend into the fire command room the rating of the room should be at least equal to the rating of the wiring serving it. If the fire command room is not equal to the fire-resistance rating of the wiring serving it is not possible to comply with Section 909.20.6.1 as the panel and switch gear within the panel does not permit installation of a 2 hour rated assembly to protect it.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: KRANZ-F1-911.1.2~RENAMED 508.1.2.doc

F23–09/10
508.1.5 (IBC [F] 911.1.5)

Proponent: Joe McElvaney, Phoenix, AZ, representing self

Revise as follows:

508.1.5 (IBC [F] 911.1.5) Required features. The *fire command center* shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system control unit.
2. The fire department communications system.
3. Fire detection and alarm system annunciator.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. ~~Status indicators and controls for air distribution systems~~.
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking *stairway* doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, *means of egress*, *fire protection systems*, fire-fighting equipment and fire department access, and the location of *fire walls*, *fire barriers*, *fire partitions*, *smoke barriers* and smoke partitions.
13. Work table.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. Elevator fire recall switch in accordance with ASME A17.1.
17. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.

Reason: The IFC and IBC have smoke and fire dampers, smoke detection for the air distribution systems, automatic fire sprinkler system throughout. All these reduce and/or limit the travel of smoke. Today energy management system /computers that are used on air distribution system, turn on or off air distribution system items (i.e. fans, damper) If some that do not have knowledge of the air distribution system and start to turn on/off fan or open/close damper one can cause major damage to the air handling units and duct. If the goal of this item is to be used after a fire (to move smoke form one area to another area and to limit damage) then this can be done with energy management system with the help of the building engineer. Additional panel is not need. If the building has a smoke control system then a panel with be still require by item 6 of this section

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: MCELVANEY-F1-508.1.5.DOC

F24–09/10
508.1.5 (IBC [F] 911.1.5)

Proponent: Joe McElvaney, Phoenix, AZ, representing self

Revise as follows:

508.1.5 (IBC [F] 911.1.5) Required features. The *fire command center* shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system control unit.
2. The fire department communications system.
3. Fire detection and alarm system annunciator.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air distribution systems.
6. The fire-fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking *stairway* doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. ~~Fire pump status indicators.~~
12. Schematic building plans indicating the typical floor plan and detailing the building core, *means of egress*, *fire protection systems*, fire-fighting equipment and fire department access, and the location of *fire walls*, *fire barriers*, *fire partitions*, *smoke barriers* and smoke partitions.
13. Work table.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. Elevator fire recall switch in accordance with ASME A17.1.
17. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.

Reason: The current IFC and NFPA 20 do not have a list of items that shall have their status indicated. NFPA 72 does have a section that lists items that should be monitored where required by another code. If an alarm system is installed and the fire pump is monitored per NFPA 72 via the fire alarm panel, there is no need to have another panel on the wall that has the fire pump status. The fire alarm system can do all of this. Also, Section 508 does not tell us what type of fire pump status we need to have monitored.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCELVANEY-F2-508.1.5-2.DOC

F25–09/10
508.1.5 (IBC [F] 911.1.5)

Proponent: Gary Lewis, Chair, ICC Ad Hoc Committee on Terrorism-Resistant Buildings

Revise as follows:

508.1.5 (IBC [F] 911.1.5) Required features. The fire command center shall comply with NFPA 72 and shall contain the following features.

1. The emergency voice/alarm communication system unit.
2. The fire department communications system.
3. Fire-detection and alarm system annunciator system.
4. Annunciator visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air handling systems.
6. The fire-fighters control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking stairway doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.

11. Fire pump status indicators.
12. Schematic building plans, including a Building Information Card approved by the fire department, which shall provide building statistics including address, height, width and type of construction; stairway access, designation, floors served, pressurization, standpipe availability; elevators bank designation, car numbers, and floors served; ventilation details, including HVAC zones, location of mechanical equipment rooms, and offsite emergency phone numbers; utilities, fuel oil tank locations, gas service locations, electrical service locations; fire protection systems details, including standpipe locations, valve locations, pump room locations; hazardous materials and locations; and, contact phone numbers for building engineers, managers and fire safety directors. The Building Information Card shall also indicate ~~indicating~~ the typical floor plan and detailing the building core, means of egress, fire protection systems, elevator locations, firefighting equipment and fire department access and the location fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions.
13. Work table.
14. Generator supervision devices, manual start and transfer features.
15. Public address system, where specifically required by other sections of this code.
16. Elevator fire recall switch in accordance with ASME A17.1.
17. Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.

Reason: This proposal is a revised follow-up to a similar proposal defeated last cycle. It is part of a package of submittals generated by the ICC's Ad Hoc Committee on Terrorism-Resistant Buildings. The proposal seeks to slightly modify and revise an existing provision of the IBC and a parallel provision in the IFC related to fire command centers in high-rise buildings.

The scope of the proposal has been reduced to simply codifying Item #12 of the list of required fire department support features in the center. There is a need to provide complete, yet concise information to the responding fire service to assist in assessment and management of the rescue and fire fighting efforts.

The Final Report on the Collapse of the World Trade Center contained 30 key recommendations compiled by the National Institute of Standards and Technology designed to address the building vulnerabilities learned in that tragedy. Three of those thirty recommendations (Items #15, 23 and 24) embrace increasing situational awareness and emergency communications of first responders in large-scale emergencies. In fact, the command center was recently doubled in size, and now also contains additional elevator control switching, a relatively new enhancement.

The proposed Building Information Card in #12, as utilized by the NYFD, puts critical response information in a user-friendly format and medium. A simulation of the Building Information Card used in New York City follows:

Bibliography: National Institute of Standards & Technology, Final Report of the National Construction safety Team on the Collapses of the World Trade Center Towers. United States Government Printing Office: Washington, D.C. September 2005.

Cost Impact: The Ad Hoc Committee anticipates no additional cost to construction resulting from this proposal as the bulk of this information must already be provided based on the current code.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LEWIS-F1-508.1.5.DOC

F26–09/10
509.1.1 (New)

Proponents: Amber Anderson/Stuart Tom, Cosumnes CSD Fire Department, representing California Fire Chief's Association

Add new text follows:

509.1.1 Utility identification. When required by the fire code official, gas shut off valves, electric meters, service switches and other utility equipment shall be clearly and legibly marked to identify the unit or space that it serves. Identification shall be made in an approved manner, readily visible and shall be maintained.

Reason: The current code does not require the identification of utilities at multi-unit/multi-building properties. The added code language provides the Fire Code Official authority to require utility identification for services serving multi-unit/multi-building properties including facilities, campuses, strip malls, business parks and residential properties where identification of utilities is essential to emergency responders.

Cost Impact: The code change proposal will increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ANDERSON-TOM-F4- 509.1.1.DOC

F27–09/10
510, 502.1, Appendix J, 105.7.12 (New)

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

1. Revise as follows:

SECTION 510
EMERGENCY RESPONDER RADIO COVERAGE

510.1 Emergency responder radio coverage in new buildings. All new buildings shall have *approved* radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where *approved* by the *building code official* and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained in lieu of an *approved* radio coverage system.
2. Where it is determined by the *fire code official* that the radio coverage system is not needed.

~~510.3~~ **510.2 Emergency responder radio coverage in existing buildings**. Existing buildings that do not have *approved* radio coverage for emergency responders within the building shall be equipped with such coverage according to one of the following:

1. Whenever existing wired communication system cannot be repaired or is being replaced, or where not *approved* in accordance with Section 510.1 Exception 1.
2. Within a time frame established by the adopting authority.

~~J101.2~~ **510.3 Permit required.** A construction permit ~~is required~~ for installation of or modification to emergency responder radio coverage systems and related equipment is required as specified in Section 105.7.12. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

510.4 Technical requirements. Systems, components, and equipment required to provide emergency responder radio coverage system shall comply with Sections 511.4.1 through 511.4.2.5.

~~510.2~~ **510.4.1 Radio signal strength.** The building shall be considered to have acceptable emergency responder radio coverage when signal strength measurements in 95 percent of all areas on each floor of the building meet the signal strength requirements in Sections ~~510.2.1~~ 510.4.1.1 and ~~510.2.2~~ 510.4.1.2.

~~510.2.1~~ **510.4.1.1 Minimum signal strength into the building**. A minimum signal strength of -95 dBm shall be receivable within the building.

~~510.2.2~~ **510.4.1.2 Minimum signal strength out of the building**. A minimum signal strength of -100 dBm shall be received by the agency's radio system when transmitted from within the building.

~~J103.1~~ **510.4.2 System design.** The emergency responder radio coverage system shall be designed in accordance with Sections ~~510.3.2.1~~ 510.4.2.1 through ~~510.3.2.5~~ 510.4.2.5.

~~J103.1.1~~ **510.4.2.1 Amplification systems allowed.** Buildings and structures which cannot support the required level of radio coverage shall be equipped with a radiating cable system, a distributed antenna system with Federal Communications Commission (FCC)-certified signal boosters, or other system approved by the *fire code official* in order to achieve the required adequate radio coverage.

~~J103.1.2~~ **510.4.2.2 Technical criteria.** The *fire code official* shall maintain a document providing the specific technical information and requirements for the emergency responder radio coverage system. This document shall contain, but not be limited to, the various frequencies required, the location of radio sites, effective radiated power of radio sites, and other supporting technical information.

~~J103.1.3~~ **510.4.2.3 Secondary power.** Emergency responder radio coverage systems shall be provided with an *approved* secondary source of power. The secondary power supply shall be capable of operating the emergency responder radio coverage system for a period of at least 12 hours. When primary power is lost, the power supply to the emergency responder radio coverage system shall automatically transfer to the secondary power supply.

~~J103.1.4~~ **510.4.2.4 Signal booster requirements.** If used, signal boosters shall meet the following requirements:

1. All signal booster components shall be contained in a NEMA4-type water proof cabinet.
2. Battery systems used for the emergency power source shall be contained in a NEMA4-type water proof cabinet.
3. The ~~system shall include automatic alarming of malfunctions of the~~ signal booster system and battery system~~. Any resulting trouble alarm shall be automatically transmitted to an approved central station or proprietary supervising station as defined in NFPA 72~~ shall be electrically supervised and monitored by a supervisory service, or when approved by the *fire code official*, shall sound an audible signal at a constantly attended location.
4. Equipment shall have FCC Certification prior to installation.

~~J103.1.5~~ **510.4.2.5 Additional frequencies and change of frequencies.** The emergency responder radio coverage system shall be capable of modification or expansion in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC.

~~J103.2~~ **510.5 Installation requirements.** The installation of the public safety radio coverage system shall be in accordance with Sections ~~J103.2.1~~ 510.5.1 through ~~J103.2.5~~ 510.5.5.

~~J103.2.1~~ **510.5.1 Approval prior to installation**. No amplification system capable of operating on frequencies licensed to any public safety agency by the FCC shall be installed without prior coordination and approval of the *fire code official*.

~~J103.2.3~~ **510.5.3 Minimum qualifications of personnel.** The minimum qualifications of the system designer and lead installation personnel shall include:

1. A Valid FCC issued General Radio Operators License, and
2. Certification of in-building system training issued by a nationally recognized organization, school or a certificate issued by the manufacturer of the equipment being installed.

The agency may waive these requirements upon successful demonstration of adequate skills and experience satisfactory to the *fire code official*.

~~J103.2.4~~ **510.5.4 Acceptance test procedure**. When an emergency responder radio coverage system is required, and upon completion of installation, the building *owner* shall have the radio system tested to ensure that two-way coverage on each floor of the building is a minimum of 90 percent. The test procedure shall be conducted as follows:

1. Each floor of the building shall be divided into a grid of 20 approximately equal areas.
2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's radio communications system.
3. A maximum of two nonadjacent areas will be allowed to fail the test.
4. In the event that three of the areas fail the test, in order to be more statistically accurate, the floor may be divided into 40 equal areas. A maximum of four nonadjacent areas will be allowed to fail the test. If the system fails the 40-area test, the system shall be altered to meet the 90 percent coverage requirement.
5. A test location approximately in the center of each grid area will be selected for the test, then the radio will be enabled to verify two-way communications to and from the outside of the building through the public agency's radio communications system. Once the test location has been selected, that location shall represent the entire area. If the test fails in the selected test location, that grid area shall fail, and prospecting for a better spot within the grid area will not be allowed.
6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building owner so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building owner will be required to rerun the acceptance test to reestablish the gain values.
7. As part of the installation a spectrum analyzer or other suitable test equipment shall be utilized to insure spurious oscillations are not being generated by the subject signal booster. This test will be conducted at time of installation and subsequent annual inspections.

~~J103.2.5~~ 510.5.5 **FCC compliance.** The emergency responder radio coverage system installation and components shall also comply with all applicable federal regulations, including but not limited to, FCC 47 CFR 90.219.

~~J103.3~~ 510.6 **Maintenance.** The emergency responder radio coverage system shall be maintained operational at all times in accordance with Sections ~~510.5.1~~ 510.6.1 through ~~510.5.3~~ 510.6.3.

~~**J103.3.1 Maintenance.** The public radio coverage system shall be maintained operational at all times.~~

~~**J103.3.2 Permit required.** A construction permit, as required by Section 105.7.5 of the *International Fire* Code, shall be obtained prior to the modification or alteration of the emergency responder radio coverage system.~~

~~J103.3.3~~ 510.6.1 **Testing and proof of compliance**. The emergency responder radio coverage system shall be inspected and tested annually or whenever structural changes occur including additions or remodels that could materially change the original field performance tests. Testing shall consist of the following:

1. In-building coverage test as described in Section ~~J103.2.4~~ 510.5.4.
2. Signal boosters shall be tested to ensure that the gain is the same as it was upon initial installation and acceptance.
3. Backup batteries and power supplies shall be tested under load of a period of one hour to verify that they will properly operate during an actual power outage. If within the one hour test period the battery exhibits symptoms of failure, the test shall be extended for additional one hour periods until the integrity of the battery can be determined.
4. All other active components shall be checked to verify operation within the manufacturer's specifications.
5. At the conclusion of the testing a report which shall verify compliance with Section ~~J103.3.4~~ 510.5.4 be submitted to the *fire code official*.

~~J103.3.4~~ 510.6.2 **Additional frequencies.** The building *owner* shall modify or expand the emergency responder radio coverage system at their expense in the event frequency changes are required by the FCC or additional frequencies are made available by the FCC. Prior approval of a public safety radio coverage system on previous frequencies does not exempt this section.

~~J103.3.5~~ 510.6.3 **Field testing.** Agency personnel shall have the right to enter onto the property at any reasonable time to conduct field-testing to verify the required level of radio coverage.

~~**J102.1 Definitions.** For the purpose of this appendix, certain terms are defined as follows:~~

502.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

AGENCY. Any emergency responder department within the jurisdiction that utilizes radio frequencies for communication. This could include, but not be limited to, various public safety agencies such as fire department, emergency medical services and law enforcement.

2. Add new text as follows:

105.7.12 Radio coverage system. A construction permit is required for installation of or modification to emergency responder radio coverage systems and related equipment. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

(Renumber subsequent sections)

3. Delete Appendix J without substitution:

~~APPENDIX J~~
~~EMERGENCY RESPONDER RADIO COVERAGE~~

Reason: This proposal takes the requirements for emergency responder radio coverage made last code cycle and finishes the process. Appendix J was included in the 2009 edition and contains the installation and testing criteria for the emergency responder radio coverage system. In this proposal, the entire appendix is relocated into the code. This action is the result of a request by the Code Development Committee last cycle and can be seen in their Reason Statement in Report on Hearings.

As the appendix is relocated into the code, some minor clarifications occurred. The following revisions are made:

1. 510.1 – the term "new" is included to clarify the difference between Section 510.1 (new construction) and 510.2 (existing construction)

2. 510.3 – this section has been relocated and includes three sections from the appendix which dealt with permits. Sections J101.2, J103.2.2 and J103.3.2 all referenced permits. This revision will provide a single section which covers permits for these systems.
3. 105.7.12 – this permit requirement is added to Chapter 1. Since the appendix is deleted, the permit requirement also needs to be located within the code. This is editorial.
4. 510.4.2.4 – Item 3 is revised to correlate with the new wording used in other sections of the code when referencing monitoring of systems. 510.6 – The two sections from the Appendix J103.3 and J103.3.1 have been combined into one section for simplicity.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F33-510.DOC

F28–09/10

510.1, 510.3, 510.4 (New), 510.5 (New), 502.1; Appendix J103.2.3, J103.2.4

Proponent: A. Keith Brown, North Metro Fire Rescue District, representing Fire Marshal's Association of Colorado

1. Revise as follows:

510.1 Emergency responder radio coverage in buildings. All buildings shall have *approved* radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. Buildings and structures which cannot support the required level of radio coverage shall be equipped with a radiating cable system, a distributed antenna system with FCC certified signal boosters, or other system *approved* by the fire code official in order to achieve the required radio coverage. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where *approved* by the building official and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained in lieu of an *approved* radio coverage system.
2. ~~Where it is determined by the *fire code official* that the radio coverage system is not needed.~~ One- and two-family dwellings.

510.3 Emergency responder radio coverage in existing buildings. Existing buildings that do not have approved radio coverage for emergency responders within the building shall be equipped with such coverage according to one of the following:

1. Wherever existing wired communication system cannot be repaired or is being replaced, or where not a*pproved* in accordance with Section 510.1, Exception 1.
2. Within a time frame established by the adopting authority.

Exception: One- and two-family dwellings.

2. Add new text as follows:

510.4 Inspection, testing and maintenance. Emergency responder radio communication systems shall be maintained in an operative condition at all times, and shall be replaced or repaired where defective or degraded.

510.4.1 Testing and proof of compliance. The emergency responder radio coverage system shall be inspected and tested annually or whenever structural changes occur including additions, alterations, or remodels that could materially change the original field performance tests. At the conclusion of the testing, a report verifying compliance with Sections 510.4.2 and 510.4.3, as applicable, shall be submitted to the *fire code official*.

510.4.2 Annual tests. Within one year of issuance of the certificate of occupancy, and annually thereafter, the building owner of any building for which an emergency responder communication radio system is installed shall test all active components of the system, including, but not limited to, amplifiers, power supplies, supervisory signals and backup batteries. Amplifiers shall be tested to ensure that the gain is the same as it was upon initial installation and acceptance. Backup batteries and power supplies shall be tested under load for a period of one hour to verify that they will properly operate during an actual power outage. If within the one hour test period, in the opinion of the testing technician, the battery exhibits symptoms of failure, the test shall be extended for additional one hour periods until the

testing technician confirms the integrity of the battery. All other active components shall be checked to determine that they are operating within the manufacturer's specifications for the intended purpose. If the communications appear to have degraded or if the tests fail to demonstrate adequate system performance, the owner of the building or structure is required to remedy the problem and restore the system in a manner consistent with the original approval criteria.

510.4.3 Five year tests. In addition to the annual test, the building owner shall perform a radio coverage test a minimum of once every five years to ensure that the radio system continues to meet the requirements of the original acceptance test. The procedure set forth in 510.4.2 shall apply to such tests.

510.4.4 Field testing by emergency response agencies. Emergency response agencies are authorized to conduct annual tests on all systems. If communications appear to have degraded or if the tests fail to demonstrate adequate system performance the owner of the building or structure shall remedy the problem and restore the system in a manner consistent with the original approval criteria.

510.4.5 Degradation due to building, additions, remodels or alterations. If the degradation to the system is due to building additions, remodels or alterations, the owner of the building or structure shall remedy the problem and restore the system in a manner consistent with the original approval criteria in order to obtain a final inspection for occupancy.

510.4.6 Degradation due to system failure. Any system degradation or failure not related to the performance of the owner's on site system shall be the responsibility of the appropriate emergency service agency.

510.4.7 Qualifications of testing personnel. All annual and five year tests shall be conducted, documented, and signed by a person in possession of a current FCC license, or a current technician certification issued by the Associated Public Safety Communications Officials - International or the Personal Communications Industry Association. All test records shall be retained on the inspected premises by the building owner and a copy submitted to the *fire code official*.

510.5 Additional frequencies. The building owner shall modify or expand the emergency responder radio coverage system, at no expense to the emergency response agency, in the event frequency changes are required by the FCC, additional frequencies are made available by the FCC, or frequency changes are initiated by the emergency response agency. Prior approval of a public safety radio coverage system on previous frequencies does not exempt this section.

3. Revise as follows:

502.1 ~~J102.1~~ Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

EMERGENCY RESPONSE AGENCY. Any of various public safety agencies such as fire departments, emergency medical services and law enforcement ~~emergency responder department~~ within the jurisdiction that utilizes radio frequencies for communication. ~~This could include, but not be limited to, various public safety agencies such as fire department, emergency medical services and law enforcement~~.

510.2.2 Minimum signal strength out of the building. A minimum signal strength of -100 dBm shall be received by the emergency response agency's radio system when transmitted from within the building.

J103.2.3 Minimum qualifications of personnel. The minimum qualifications of the system designer and lead installation personnel shall include:

1. A valid FCC-issued General Radio Operators License, and
2. Certification of in-building system training issued by a nationally recognized organization or school or a certificate issued by the manufacturer of the equipment being installed.

The emergency response agency may waive these requirements upon successful demonstration of adequate skills and experience satisfactory to the *fire code official*.

J103.2.4 Acceptance test procedure. When an emergency responder radio coverage system is required, and upon completion of installation, the building *owner* shall have the radio system tested to ensure that two-way coverage on each floor of the building is a minimum of 90 percent. The test procedure shall be conducted as follows:

1. Each floor of the building shall be divided into a grid of 20 approximately equal areas.

2. The test shall be conducted using a calibrated portable radio of the latest brand and model used by the emergency response agency talking through the emergency response agency's radio communications system.
3. A maximum of two nonadjacent areas shall be allowed to fail the test.
4. In the event that three of the areas fail the test, in order to be more statistically accurate, the floor may be divided into 40 equal areas. A maximum of four nonadjacent areas shall be allowed to fail the test. If the system fails the 40-area test, the system shall be altered to meet the 90-percent coverage requirement.
5. A test location approximately in the center of each grid area shall be selected for the test, then the radio shall be enabled to verify two-way communications to and from the outside of the building through the ~~public~~ emergency response agency's radio communications system. Once the test location has been selected, that location shall represent the entire area. If the test fails in the selected test location, that grid area shall fail, and prospecting for a better spot within the grid area shall not be allowed.
6. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building owner so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building owner shall be required to rerun the acceptance test to reestablish the gain values.
7. As part of the installation a spectrum analyzer or other suitable test equipment shall be utilized to insure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at time of installation and subsequent annual inspections.

4. Delete without substitution:

~~J103.1.1 Amplification systems allowed.~~
~~J103.3 Maintenance.~~

Reason: The purposes of the proposed code change are:
Item 1:

1. Clarify that Section 510.1 does not require the addition of a radio-coverage system where approved radio coverage exists;
2. Delete the existing Section 510.1 Exception 2 that allows a vital requirement to be eliminated for any arbitrary and capricious reason and without providing an equivalent level of safety for emergency responders;
3. Except one- and two-family dwellings from all requirements of Section 510;
4. Ensure the continuing operability of radio coverage systems, where required, even in the event of frequency changes;
5. Establish documentation requirements for inspection and testing of radio coverage systems.

The existing, charging language of Section 510.1 implies, or could easily be construed to require, that some sort of public-safety radio-amplification system is required in all new buildings regardless of existing signal strengths, especially when Exception 1 (referencing an in-building communication system) is considered. The proposed language, which inserts Section J103.1.1, makes clear that Section 510.1 applies only to buildings and structures that do not already support the required level of radio coverage. Where acceptable emergency responder radio coverage is lacking, the new language (again from J103.1.1) identifies the allowable amplification systems that may be used to achieve required radio coverage.

The existing Exception 2 of Section 510.1 may be unique in the IFC in that no criteria or logical nexus is stated or implied to provide a reasonable basis for eliminating radio coverage for emergency responders, a fire service feature vital to firefighter safety. If Exception 2 was intended to mean that a radio coverage system is not needed when a building is shown to support acceptable radio coverage without such a system, then the language used is, at best, imprecise and, at worst, outrageously broad so as to violate the long-established principles of equivalent effectiveness elucidated in IFC Sections 104.8 and 104.9

The proposed exceptions to Section 510.1 and 510.3 for one- and two-family dwellings constructed under the IBC (e.g., where the IRC is not adopted) are intended simply to clarify that radio coverage systems will not be required in such buildings, thus preventing potential overzealous application of Section 510. Note that the proposed language references "dwellings," the definition of which (IFC Chapter 2) explicitly excludes townhouses as well as condominium/apartment buildings containing more than two dwelling units. Thus, even though each condominium in a Group R-2 high rise may itself be a single dwelling unit, the proposed exceptions for one- and two-family dwellings would not preclude requiring a radio-coverage system in said high rise. Because IFC Section 105.7 does not presently require a permit for the installation or modification of emergency responder radio coverage systems, dwellings constructed pursuant to the IRC are not impacted by the proposed change, per IFC Section 102.5 Item 1.

Item 2: The proposed Section 510.4 provides requirements for on-going maintenance and recurring testing of installed radio-coverage systems, similar to inspection, testing, and maintenance requirements for other systems (see IFC Sections 901.6, 604.3, 2703.2.6, et al.). Section 510 in the 2009 IFC lacks any such explicit requirements. Absent local adoption of Appendix J, assurance of dependable radio coverage necessary for the safety of emergency responders would appear to rest wholly on the general provisions of IFC Sections 106 and 107, which sections prescribe neither the frequency of testing (see Section 107.2) nor the qualifications of personnel competent to execute the highly technical testing of radio-amplification systems.

Section 510.5, as proposed, both mandates that radio coverage systems be upgraded as needed to accommodate frequency changes and makes such upgrades the responsibility of the building owner. The proposed language stems from Section J103.3.4.

Item 3: The purpose of this portion of the proposed code change is to define and clarify in the body of the code a foundational term used within the context of IFC Section 510 and Appendix J - Emergency Responder Radio Coverage. The proposed text stems from the definition contained in IFC Section J102.1.

Item 4: The content of the noted appendix sections was moved into Section 510. Deletion of those appendix sections eliminates the potential for conflicts between Section 510 and Appendix J.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BROWN-F2- 510.1~REVISED.DOC

F29–09/10
510.1

Proponent: Ronald Marts, Telecordia, Qwest Communications, AT&T

Revise as follows:

510.1 Emergency responder radio coverage in buildings. All buildings shall have *approved* radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. This section shall not require improvement of the existing public safety communication systems.

Exceptions:

1. Where *approved* by the building official and the *fire code official*, a wired communication system in accordance with Section 907.2.13.2 shall be permitted to be installed or maintained in lieu of an *approved* radio coverage system.
2. Where it is determined by the *fire code official* that the radio coverage system is not needed.
3. In telecommunications buildings, where emergency responder radio coverage is required and such systems, components or equipment required may have a negative impact of radio frequency interference (RFI) on local, regional and/or national telecommunications functions of the facility, it shall be permitted to provide a function switch for the activation of the internal emergency responder radio system. The location of the function switch shall be approved by the fire code official.

Reason: This specific activation of the facilities internal emergency responder radio system will limit potential inference with the vital telecommunications operations of the facility to 24/7 exposure to these signals. The potential for interference with the operations of the telecommunications facility operations is unique to each space and operation of the facility and places in direct risk emergency services, national security and defense, and other critical telecommunications functions of the facility.

To date, studies have suggested that RFI from these transmitters may affect telecommunications equipment and thus telecommunications service.

Cost Impact: The code change proposal will have a small impact on construction cost

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MARTS-F1-510.1.DOC

F30–09/10
511 (New)

Proponents: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Add new section as follows:

SECTION 511
SOLAR PHOTOVOLTAIC INSTALLATIONS

511.1 General. The installation of solar photovoltaic installations shall comply with Table 601 and Chapter 16 of the *International Building Code*. The installation shall also comply with Sections 511.2 through 511.11 and NFPA 70.

511.2 Circuit marking. To facilitate identifying energized electrical lines that connect the solar panels to the inverter, to prevent these conduits from being cut when venting for smoke removal, markings shall be provided to give emergency responders appropriate warning that a solar electric system is present.

511.3 Materials. The materials used for marking shall be reflective, weather resistant and suitable for the environment.

511.4 Main service disconnect. For residential occupancies, the marking shall be placed within the main service disconnect. If the main service disconnect is operable with the service panel closed, then the marking shall be placed on the outside cover. For commercial occupancies, the marking shall be placed adjacent to the main service disconnect in a location clearly visible from the location where the lever is operated.

511.4.1. Marking content and format. The marking shall contain the words "CAUTION: SOLAR ELECTRIC CONNECTED" in capital letters a minimum of 3/8 inches in height with white letters on a red background.

511.5 DC conduit, raceways, enclosures, cable assemblies, and junction boxes. Marking shall be provided on all interior and exterior dc conduit, raceways, enclosures, cable assemblies, and junction boxes to alert the fire service to their presence. The marking shall be placed every 10 feet or fraction thereof, at turns and above and below penetrations, and on all dc combiner and junction boxes.

511.5.1 Marking content and format. The marking shall contain the words "CAUTION: SOLAR ELECTRIC CONNECTED" in capital letters a minimum of 3/8 inches in height with white letters on a red background.

511.5.2 Locations of DC conductors. Conduit, wiring systems, and raceways for photovoltaic circuits shall be located as close as possible to the ridge or hip or valley and from the hip or valley as directly as possible to an outside wall to reduce trip hazards and maximize ventilation opportunities. Conduit runs between sub arrays and to DC combiner boxes shall be installed in a manner that minimizes total amount of conduit on the roof by taking the shortest path from the array to the DC combiner box. The DC combiner boxes shall be located such that conduit runs are minimized in the pathways between arrays.

511.6 Power disconnects. A power disconnect shall be located within 3 feet of the photovoltaic array to provide for de-energizing the DC circuit(s) from the array to the inverter. The disconnect shall be label with reflective lettering.

511.7 Access, pathways for smoke ventilation. Roof access and spacing requirements shall be observed in order to ensure access to the roof; provide pathways to specific areas of the roof; provide for smoke ventilation operations; and to provide emergency egress from the roof.

511.8 Roof access points. Roof access points shall be defined as an area that does not place ground ladders over openings such as windows or doors, and are located at strong points of building construction in locations where the access point does not conflict with overhead obstructions such as tree limbs, wires, or signs.

511.9. Residential systems-One- and two-family residential dwellings. Access shall be provided in accordance with Sections 511.9.1 through 511.9.3

511.9.1 Residential buildings with hip roof layouts. Panels shall be located in a manner that provides one (1) three-foot (3') wide clear access pathway from the eave to the ridge on each roof slope where panels are located. The access pathway shall be located at a structurally strong location on the building such as along a underlying bearing wall.

511.9.2 Residential buildings with a single ridge. Panels shall be located in a manner that provides two (2) three-foot (3') wide access pathways from the eave to the ridge on each roof slope where panels are located.

511.9.3 Hips and Valleys: Panels shall be located no closer than one and one half (1.5) feet to a hip or a valley if panels are to be placed on both sides of a hip or valley. If the panels are to be located on only one side of a hip or valley that is of equal length then the panels shall be permitted to be placed directly adjacent to the hip or valley.

511.9.4 Ventilation. Panels shall be located no higher than three feet (3) below the ridge.

> **Exception:** The fire department is authorized to allow panels to be located two (2) feet below the ridge if a product or method acceptable to the fire department has been provided for ventilation.

511.10 All other occupancies. Access shall be provided in accordance with Sections 511.10.1 through 511.10.3

511.10.1 Access. There shall be a minimum six (6) foot wide clear perimeter around the edges of the roof.

> **Exception:** If either axis of the building is 250 feet or less, there shall be a minimum four feet (4') wide clear perimeter around the edges of the roof.

511.10.2 Pathways. The solar installation shall be designed to provide designated pathways. The pathways shall meet the following requirements:

1. The pathway shall be over structural members
2. The center line axis pathways shall be provided in both axis of the roof. Center line axis pathways shall run on structural members or over the next closest structural member nearest to the center lines of the roof
3. Shall be straight line not less than 4 feet clear to skylights and/or ventilation hatches

4. Shall be straight line not less than 4 feet clear to roof standpipes
5. Shall provide not less than 4 feet clear around roof access hatch with at least one not less than 4 feet clear pathway to parapet or roof edge

511.10.3 Ventilation. The solar installation shall be designed to meet the following requirements.

1. Arrays shall be no greater than 150 by 150 feet in distance in either axis
2. Ventilation options between array sections shall be either a pathway 8 feet or greater in width; a 4 feet or greater in width pathway and bordering on existing roof skylights or ventilation hatches; or a 4 feet or greater in width pathway and bordering 4' x 8' "venting cutouts" every 20 feet on alternating sides of the pathway

511.11 Ground mounted photovoltaic arrays. Ground mounted photovoltaic arrays shall comply with Sections 511.1 through 511.6 and this section. Setback requirements do not apply to ground-mounted, free standing photovoltaic arrays. A clear brush area of 10' is required for ground mounted photovoltaic arrays.

Reason: Photovoltaic arrays are increasing in popularity as an alternative energy source. These arrays, which cannot be shut down and retain electrical charges present unique hazards to firefighters operating on roofs with arrays or nearby circuits.

This proposal is intended to provide general requirements to allow for increased safety of firefighters working around and near the arrays.

These provisions were created from a "DRAFT SOLAR PHOTOVOLTAIC INSTALLATION GUIDELINE " prepared by the CAL FIRE, Office of the State Fire Marshal, local California fire departments, and the solar photovoltaic industry.

Cost Impact: The code change proposal will increase the cost of Photovoltaic installations.

Analysis: Code change proposal F238-09/10 proposes similar requirements.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F20-511.DOC

F31–09/10
602.1 [IBC [F] 2702.1 (New)]

Proponent: John England, MCO, England Enterprises Inc., representing the Cities of Beaufort and Hardeeville, SC

1. Add new definitions as follows:

602.1 Definitions. The following words and terms shall, for the purposes of this chapter, and as used elsewhere in the code, have the meanings shown herein.

EMERGENCY POWER. Electrical power provided by an automatic backup system that will energize within 10 seconds.

STANDBY POWER. Electrical power provided by an automatic backup system that will energize within 60 seconds.

2. Add new text as follows:

IBC [F] SECTION 2702
DEFINITIONS

IBC [F] 2702.1 Definitions. The following words and terms shall, for the purposes of this chapter, and as used elsewhere in this code, have the meanings shown herein.

IBC [F] EMERGENCY POWER. Electrical power provided by an automatic backup system that will energize within 10 seconds.

IBC [F] STANDBY POWER. Electrical power provided by an automatic backup system that will energize within 60 seconds.

(Renumber subsequent sections)

Reason: Many people do not understand these simple definitions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

F32–09/10
603.3.2

Proponent: John Levey, Oilheat Associates, representing the National Oilheat Research Alliance

Revise as follows:

603.3.2 Fuel oil storage inside buildings. Fuel oil storage inside buildings shall comply with Sections 603.3.2.1 through 603.3.2.5 or Chapter 34.

> **Exception:** The storage of fuel oil used for space or water heating inside buildings in quantities exceeding 660 gallons (2498 L) shall comply with NFPA 31.

Reason: In 603.3.1 the current code refers to NFPA-31 for storage exceeding 660 gallons.

Our proposal is to use similar language in 603.3.2 for tanks that are used for space/water heating only.

Limiting the inside storage to 660 gallons will leave a large numbers of building owners with significantly less on-site storage than is acceptable. While average annual consumption of fuel oil is just under 1,000 gallons, many larger homes consume well over 2,000 gallons per year.

It is a common practice in many areas for two and three level buildings to have a separate oil furnace and tank for each floor.

The proposed change is intended to address the need for larger inside storage capacities than currently permitted, without the additional financial and logistical burdens involved with the installation of protected tanks.

"Protected" tanks (double wall, insulated tanks) are not practical for inside fuel oil storage in most locations due to size and weight constraints. A 3000 gallon "protected" tank weighs 1,874 pounds and is 52" in diameter. A typical 330 gallon tank weighs 320 pounds and is 27" wide. Installers must lift and move these tanks as access to machinery and elevators to move them is unlikely.

"Protected" tanks typically require an investment that is approximately ten times the investment for unprotected tanks. We believe this will discourage the proactive replacement of aging tanks and lead to additional releases of product and the resulting environmental consequences.

In jurisdictions that previously followed NFPA 31, four (4) 330 tanks have been allowed for a number of years. The replacement of these tanks will require that the storage capacity be downsized, providing a disincentive to proactive replacement.

Properly installed standard UL listed fuel oil storage tanks (UL 80 and UL 2258), installed in accordance with NFPA-31 have a well established safety record, merely changing the storage capacity for fuel oil should not cause additional fire hazards.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LEVEY-F1-603.3.1.DOC

F33–09/10
604.2.19 (New) [IBC [F] 2702.2.21 (New)]

Proponent: James Harper, City of Omaha, representing Nebraska Code Officials Association

Add new text as follows:

604.2.19 (IBC [F] 2702.2.21) Exhaust fans in shaft enclosures. Standby power shall be provided to exhaust fans installed in shaft enclosures in accordance with the *International Mechanical Code* and Section 716.5.3 of the *International Building Code*.

Reason: Section 504.8 of the IMC requires that an exhaust fan installed in a shaft enclosure in lieu of dampers be connected to standby power, however such requirement is not captured in Chapter 27 of the IBC. In addition, Exception 2 of Section 716.5.3 provides a similar exception where an exhaust fan is provided in lieu of dampers. (Sec. 716.5.3 of the IBC is repeated as Section 607.5.5 of the IMC.) It is essential that such fans be connected to standby power. Standby and emergency power requirements are also referenced in IBC Chapter 27 which provides a single convenient location in the code for determining standby and emergency power requirements. The requirements in the IMC should appear in IBC Chapter 27.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HARPER-G1-2702.2.21~RENAMED-F1-604.2.19.doc

F34–09/10
604.5 (New)

Proponent: Manny Muniz, California Deputy State Fire Marshal (Ret.), representing self

Add new text as follows:

604.5 Periodic testing of battery unit means of egress illumination. Required means of egress illumination utilizing battery-operated unit equipment in accordance with Section 1006.3 shall be periodically tested in accordance with Section 604.5.1, 604.5.2 or 604.5.3, as applicable.

604.5.1 Non-computer-based/non-self-testing/non-self-diagnosing battery operated unit equipment. Non-computer-based/non-self-testing/non-self-diagnosing battery operated unit equipment shall be functionally tested at 30-day intervals for not less than 30 seconds and annually for not less than 90 minutes. Throughout the duration of such tests, the equipment shall be fully operational.

604.5.1.1 Written records. A written record shall be maintained by the owner in accordance with Section 604.3.2 of functional tests.

604.5.2 Self-testing/self-diagnostic battery-operated unit equipment. Self-testing/self-diagnostic battery-operated unit equipment shall be visually inspected, automatically perform a minimum 30 second operational test and a diagnostic routine not less than once every 30 days. Failures shall be indicated by a status indicator. A full functional test shall be conducted annually for not less than 90 minutes. Throughout the duration of such tests, the equipment shall be fully operational.

604.5.2.1 Written records. A written record shall be maintained by the owner in accordance with Section 604.3.2 of visual inspections and operational tests.

604.5.3 Computer-based, self-testing/self-diagnostic battery-operated unit equipment. Computer-based, self-testing/self-diagnostic battery-operated unit equipment shall automatically perform a minimum 30 second operational test and a diagnostic routine not less than once every 30 days. The equipment shall also perform automatically a minimum 90 minute annual function test. Throughout the duration of such tests, the equipment shall be fully operational.

604.5.2.2 Test records. The computer-based, self-testing/self-diagnostic system shall have the capability to provide documentation of the tests and failures upon request of the fire code official.

(Renumber subsequent section)

Reason: IFC Section 107.1 requires that any device, equipment or system required for compliance with the provisions of the code, shall be continuously maintained in accordance with the code and applicable referenced standards. Section 604.3 requires that emergency and standby power systems be maintained in accordance with NFPA 110 and 111. The IFC does not, however, contain maintenance and testing requirements for means of egress illumination that is provided by battery-operated unit equipment as allowed by Section 1006.3. Both NFPA 110 and 111 specifically exclude such equipment from their scopes.

This proposal seeks to fill the void in the IFC by providing periodic testing requirements for the three types of battery operated unit equipment found in the field, i.e., non-computer-based/non-self-testing/non-self-diagnosing, self-testing/self-diagnostic and computer-based, self-testing/self-diagnostic . Similar provisions have been in NFPA 101 since the 2003 edition.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: Similar requirements are proposed in code change proposal F35-09/10.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MUNIZ-F1-604.5

F35–09/10
604.5 (New)

Proponent: Daniel E. Nichols, PE, New York State Dept. of State, Div. of Code Enforcement and Administration

Add new text as follows:

604.5 Emergency lighting equipment. Emergency lighting shall be inspected and tested in accordance with Section 604.5.1 through 604.5.2.1.

604.5.1 Activation test. An activation test of the emergency lighting equipment shall be completed monthly. The activation test shall ensure the emergency lighting activates automatically upon normal electrical disconnect and stays sufficiently illuminated for a minimum of 30 seconds.

604.5.1.1 Activation test record. Records shall be maintained on the premises for a minimum of 3 years and submitted to the fire code official upon request. The record shall include the location of the emergency lighting tested, whether the unit passed or failed, the date of the test, and the person completing the test.

604.5.2 Power test. For battery powered emergency lighting, a power test of the emergency lighting equipment shall be completed annually. The power test shall operate the emergency lighting for a minimum of 90 minutes and shall remain sufficiently illuminated for the duration of the test.

604.5.2.1 Power test record. Records shall be maintained on the premises for a minimum of 3 years and submitted to the fire code official upon request. The record shall include the location of the emergency lighting tested, whether the unit passed or failed, the date of the test, and the person completing the test.

~~**604.5**~~ **604.6 Supervision of maintenance and testing.** Routine maintenance, inspection and operational testing shall be overseen by a properly instructed individual.

Reason: IBC 1006.3 permits the use of unit equipment as sufficient to provide means of egress illumination. However, NFPA 111 Section 1.1.4.1 Item 4 specifically exempts unit equipment from being covered by the maintenance standard (NFPA 110 does not apply). This provides a gap in the IFC for maintaining the most common type of emergency lighting in smaller buildings, self-contained unit lighting.

The requirements found herein are based on a combination of current State of New York provisions for maintaining lighting equipment and NFPA 101Section 7.9.3. Records retention requirements are similar to the requirements for fire protection system maintenance records in IFC Section 901.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Similar requirements are proposed in code change proposal F34-09/10.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NICHOLS-F2-604.5 NEW.DOC

F36–09/10
605.1

Proponent: Philip M. Chandler, representing New York State Department of State, Office of Fire Protection & Control

Revise as follows:

605.1 Abatement of electrical hazards. ~~Identified electrical hazards shall be abated. Identified hazardous electrical conditions in permanent wiring shall be brought to the attention of the responsible code official.~~ Where it is found that the electrical system in a structure constitutes a hazard to the occupants or the structure by reason of inadequate service, improper fusing, insufficient receptacle and lighting outlets, improper wiring or installation, deterioration or damage, or for similar reasons, the fire code official shall require the defects to be corrected to eliminate the hazard. Electrical wiring, devices, appliances and other equipment that is modified or damaged and constitutes an electrical shock or fire hazard shall not be used.

Reason: The proposed revision will make this section consistent with the requirements of the *International Property Maintenance* Code (IPMC), Section 604.3. The new language clearly identifies important electrical hazards that create a risk of fire and eliminates much ambiguity found in the old language.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CHANDLER-F1-605.1.DOC

F37–09/10
605.1.1 (New)

Proponent: Philip M. Chandler, representing New York State Department of State, Office of Fire Protection & Control

Add new text as follows:

605.1.1 Electrical inspection. In accordance with the provisions of Section 104.7.2, the fire code official is authorized to require an inspection and report on the safety of a structure's electrical system, wiring, devices, appliances and equipment. The inspection and report shall be prepared by a qualified engineer, specialist, laboratory or fire safety specialty organization acceptable to the fire code official.

Reason: The fire code official may have reason to believe that the electrical safety of a structure is compromised, yet lack the highly technical knowledge or specialized skills to make a final determination. Inasmuch as the risk of shock or hazard of fire are very real consequences of defective electrical systems and equipment, this authorization of the fire code official to obtain technical assistance is warranted.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CHANDLER-F2-605.1.1.DOC

F38–09/10
605.10, 605.10.1, 605.10.2 (All new)

Proponents: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Add new text as follows:

605.10 Abandoned or unused wiring. Installed supply circuits and interconnecting cables that are no longer in use shall be maintained in accordance with this code and NFPA 70, or removed.

605.10.1 Abandoned wiring. Installed supply circuits and interconnecting cables that are not terminated at devices or equipment and have not been tagged for future use shall be considered abandoned.

605.10.1.1 Identification tags. Tags intended to identify supply circuits and interconnecting cable for future use shall have the following information.

1. The date the circuit or cable was tagged as intended for future use.
2. The expected date of the future use.
3. A description of what the intended future use is.

605.10.2 Removal. Accessible portions of abandoned supply circuits and interconnecting cables, including wiring tagged for future use that has not been utilized within one year of tagging, shall be removed.

(Renumber subsequent section)

Reason: A growing problem in existing buildings is the accumulation of abandoned or unused wiring. This sometimes hidden hazard provides increased fuel loads and entanglement hazards for firefighters. Though provisions for maintaining or removing such wiring are contained within NFPA 70, it is the fire code official who is responsible for maintenance inspections and the code official most likely to encounter this hazard.

This proposal takes the requirements found in the electrical code and places them directly within the fire code for direct application by the fire code official. The proposal also puts a one year limit on wiring that has been tagged for future use to eliminate a loophole in current requirements. This will increase the ability of the fire service to reduce unnecessary fuel loads and to eliminate a distinct hazard to firefighters.

Following are excerpts from the electrical code as background.

372.13 Discontinued Outlets.
When an outlet is abandoned, discontinued, or removed, the sections of circuit conductors supplying the outlet shall be removed from the raceway. No splices or reinsulated conductors, such as would be the case of abandoned outlets on loop wiring, shall be allowed in raceways.

374.7 Discontinued Outlets.
When an outlet is abandoned, discontinued, or removed, the sections of circuit conductors supplying the outlet shall be removed from the raceway. No splices or reinsulated conductors, such as would be the case with abandoned outlets on loop wiring, shall be allowed in raceways.

390.7 Discontinued Outlets.
When an outlet is abandoned, discontinued, or removed, the sections of circuit conductors supplying the outlet shall be removed from the raceway. No splices or reinsulated conductors, such as would be the case with abandoned outlets on loop wiring, shall be allowed in raceways.

640.2 Definitions.
For purposes of this article, the following definitions apply.

Abandoned Audio Distribution Cable. Installed audio distribution cable that is not terminated at equipment and not identified for future use with a tag.

(C) Abandoned Audio Distribution Cables. The accessible portion of abandoned audio distribution cables shall be removed.

645.2 Definition.
Abandoned Supply Circuits and Interconnecting Cables. Installed supply circuits and interconnecting cables that are not terminated at equipment and not identified for future use by a tag.

645.5 Supply Circuits and Interconnecting Cables.

(F) Abandoned Supply Circuits and Interconnecting Cables. The accessible portion of abandoned supply circuits and interconnecting cables shall be removed unless contained in a metal raceway.

(G) Installed Supply Circuits and Interconnecting Cables Identified for Future Use.
- *(1) Supply circuits and interconnecting cables identified for future use shall be marked with a tag of sufficient durability to withstand the environment involved.*
- *(2) Supply circuit tags and interconnecting cable tags shall have the following information:*
  - *a. Date identified for future use*
  - *b. Date of intended use*
  - *c. Information relating to the intended future use*

725.2 Definitions.
Abandoned Class 2, Class 3, and PLTC Cable. Installed Class 2, Class 3, and PLTC cable that is not terminated at equipment and not identified for future use with a tag.

725.25 Abandoned Cables.
The accessible portion of abandoned Class 2, Class 3, and PLTC cables shall be removed. Where cables are identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.

760.2 Definitions.
Abandoned Fire Alarm Cable. Installed fire alarm cable that is not terminated at equipment other than a connector and not identified for future use with a tag.

760.3 Other Articles.
Circuits and equipment shall comply with 760.3(A) through (G). Only those sections of Article 300 referenced in this article shall apply to fire alarm systems.
- *(A) Spread of Fire or Products of Combustion. Section 300.21. The accessible portion of abandoned fire alarm cables shall be removed.*

760.25 Abandoned Cables.
The accessible portion of abandoned fire alarm cables shall be removed. Where cables are identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.

770.2 Definitions.
See Article 100. For purposes of this article, the following additional definitions apply.
Abandoned Optical Fiber Cable. Installed optical fiber cable that is not terminated at equipment other than a connector and not identified for future use with a tag.

770.25 Abandoned Cables.
The accessible portion of abandoned optical fiber cables shall be removed. Where cables are identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.

800.2 Definitions.
See Article 100. For the purposes of this article, the following additional definitions apply.
Abandoned Communications Cable. Installed communications cable that is not terminated at both ends at a connector or other equipment and not identified for future use with a tag.

800.25 Abandoned Cables.
The accessible portion of abandoned communications cables shall be removed. Where cables are identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.

820.2 Definitions.
See Article 100. For the purposes of this article, the following additional definitions apply.
Abandoned Coaxial Cable. Installed coaxial cable that is not terminated at equipment other than a coaxial connector and not identified for future use with a tag.

FPN: See Article 100 for a definition of Equipment.

820.25 Abandoned Cables.
The accessible portion of abandoned coaxial cables shall be removed. Where cables are identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.

830.2 Definitions.
See Article 100. For purposes of this article, the following additional definitions apply.
Abandoned Network-Powered Broadband Communications Cable. Installed network-powered broadband communications cable that is not terminated at equipment other than a connector and not identified for future use with a tag.

830.25 Abandoned Cables.
The accessible portion of abandoned network-powered broadband cables shall be removed. Where cables are identified for future use with a tag, the tag shall be of sufficient durability to withstand the environment involved.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F6-605.10.DOC

F39–09/10
606.9, 606.9.1; IMC [F] 1106.5, [F] 1106.5.1

Proponent: Jeffrey M. Shapiro, P.E., International Code Consultants representing International Institute of Ammonia Refrigeration

1. Revise as follows:

606.9 Remote controls. Where flammable refrigerants are used and compliance with Section 1106 of the *International Mechanical Code* is required, remote control of the mechanical equipment and appliances located in the machinery room as required by Sections 606.9.1 and 606.9.2 shall be provided at an approved location immediately outside the machinery room and adjacent to its principal entrance.

606.9.1 Refrigeration system emergency shutoff. A clearly identified switch of the break-glass type or with an approved tamper resistant cover shall provide off-only control of refrigerant compressors, refrigerant pumps, and normally closed, automatic refrigerant valves located in the machinery room. Additionally, this equipment shall be automatically shut off whenever the refrigerant vapor concentration in the machinery room exceeds the vapor detector's upper detection limit or 25 percent of the LEL, whichever is lower.

~~**Exception:** In machinery rooms where only nonflammable refrigerants are used, only compressors are required to be stopped by vapor detection or the cut-off switch.~~

2. Revise IMC as follows:

[F] 1106.5 Remote controls. Remote control of the mechanical equipment and appliances located in the machinery room shall comply with Sections 1106.5.1 and 1106.5.2 ~~be provided as required by Section 606.9 of the *International Fire Code*~~.

[F] 1106.5.1 Refrigeration system emergency shutoff. A clearly identified switch of the break-glass type or with an approved tamper resistant cover shall provide off-only control of refrigerant compressors, refrigerant pumps, and normally closed, automatic refrigerant valves located in the machinery room. Additionally, this equipment shall be automatically shut off whenever the refrigerant vapor concentration in the machinery room exceeds the vapor detector's upper detection limit or 25 percent of the LEL, whichever is lower.

~~**Exception:** In machinery rooms where only nonflammable refrigerants are used, only compressors are required to be stopped by vapor detection or the cut-off switch.~~

Reason: The recommended revisions eliminate a conflict among the IMC, the IFC and ASHRAE 15, which is the nationally recognized standard governing refrigeration safety. The problem originates with IMC 1106.5. The exception to IMC 1106.5.1 affects nonflammable refrigerants, but because nonflammable refrigerants are excluded from Section 1106.5 as a whole [IMC Section 1106.1 states that 1106 only applies when triggered by IMC 1104.2, and the last sentence of 1104.2 only triggers 1106 when dealing with flammable refrigerants (classified as A2, A3, B2 and B3)], the exception is meaningless.

The IMC's current structure of applying Section 1106 and the remote shutoff control requirements only to flammable refrigerants is consistent with ASHRAE 15, Section 8.12. On the other hand, IFC 606.9 misses this limitation, but compensates by providing the exception to 606.9.1, which partially exempts nonflammable refrigerants. The most effective fix to all of this is to maintain the current correlation between the IMC and ASHRAE 15 and to modify the IFC to agree by placing the flammability constraint in 606.9 rather than in an exception.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: In order to maintain proper correlation of the IFC and IMC on the same subject, the changes made to IFC 606.9.1 by code change F52-06/07 should also have been applied to IMC [F] 1106.5.1 in the 2009 edition, however they were not. The ICC Code Correlation Committee (CCC), at its August 6, 2009 meeting, approved the needed revision to IMC Section [F] 1106.5.1 to read as IFC 606.9.1 in the 2012 edition. The text of Section [F] 1106.5.1, as approved by the CCC, not the current text of the 2009 IMC, is shown in Item 2 of this proposal for clarity.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SHAPIRO-F3-606.9

F40–09/10
607.4

Proponent: Richard P. Rogozinski, New York State Office of Fire Prevention and Control

Revise as follows:

607.4 Elevator keys. Keys for the elevator car doors and firefighter service keys shall be kept in an approved location for immediate use by the fire department. Existing firefighter service elevator key switches shall be operable by a standard key as defined in section 2.27.8 of ASME A17.1-2007.

Reason: To reduce time spent by emergency response personnel looking for the right key to operate an elevator.

Example: At the Governor Nelson A Rockefeller Empire State Plaza in Albany, NY, there were no less than 4 fire service keys to operate the elevators on fire service in this large office complex before one key was chosen to operate all cars regardless of the elevator company.

2.27.8 Switch Keys:

The key switches required by 2.27.2 through 2.27.5 for all elevators in a building shall be operable by the same key. The keys shall be Group 3 Security (Group 3 covers access or operation of equipment by firefighters and emergency personnel). There shall be a key for each switch provided.

These keys shall be kept on the premises in a location readily accessible to firefighters and emergency personnel, but not where they are available to the public. This key shall be of a tubular, 7 pin, style 137 construction and shall have a bitting code of 6143521. The key shall be coded "FEO-K1." The possession of the "FEO-K1" key shall be limited to elevator personnel, emergency personnel, and elevator equipment manufacturers.

Where provided, a lock box, including its lock and other components, shall conform to the requirements of UL 1037.

Cost Impact: The code change proposal will have a cost to retro-fit the key switches.

Analysis: Similar requirements are proposed in code change proposal F20-09/10.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROGOZINSKI-F1-607.3.DOC

F41–09/10
608.5.2

Proponent: Stephen McCluer, APC by Schneider Electric, representing IEEE Stationary Battery Committee

Revise as follows:

608.5.2 Recombinant battery neutralization. For VRLA or other types of ~~sealed~~ batteries with immobilized electrolyte, the method and material shall be capable of neutralizing a spill of 3.0 percent of the capacity of the largest cell or block in the room to a pH between 5.0 and 9.0.

Exception: Lithium-ion and lithium metal polymer batteries shall not require neutralization.

Reason: In Section 608.5.2, delete the reference to "sealed" batteries. This term is widely misused to include valve-regulated cells which, by definition, cannot be totally sealed for escape of gas because they have a pressure relief valve, although they *are* sealed to prevent the escape of electrolyte.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCCLUER-F1-608.5.1

F42–09/10
608.6.1

Proponent: Stephen McCluer /APC by Schneider Electric /representing IEEE Stationary Battery Committee

Revise as follows:

608.6.1 Room ventilation. Ventilation shall be provided in accordance with the *International Mechanical Code* and the following:

1. For flooded lead-acid, flooded Ni-Cad and VRLA batteries, the ventilation system shall be designed to limit the maximum concentration of hydrogen to 1.0 percent of the total volume of the room; or
2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot (1 ft_3/min/ft_2) [0.0051 m_3/s × m_2] of floor area of the room.

   Exception: Lithium-Ion and Lithium Metal Polymer batteries shall not require additional ventilation beyond what would normally be required for human occupancy of the space per the *International Mechanical Code*.

Reason: The implication of the existing text is that Li-Ion and LMP batteries do not require any ventilation. This is not correct. LI-Ion and LMP batteries do require some ventilation, but they do not require additional ventilation beyond what is required by the IMC per 608.6.1.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCCLUER-F5- 608.6.1.DOC

F43–09/10
608.6.1, 608.6.2; IMC [F] 502.4, [F] 502.5, [F] 502.5.2

Proponent: Jonathan C. Siu, City of Seattle, WA, Seattle Department of Planning & Development

1. Revise the IFC as follows:

608.6.1 Room ventilation. Ventilation shall be provided in accordance with the *International Mechanical Code* and the following:

1. For flooded lead-acid, flooded Ni-Cad and VRLA batteries, the ventilation system shall be designed to limit the maximum concentration of hydrogen to 1.0 percent of the total volume of the room; and ~~or~~
2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot (1 ft3/min/ft2) [0.0051 m3/s × m2] of floor area of the room.

   Exception: Lithium-ion and lithium metal polymer batteries shall not require ventilation.

608.6.2 Cabinet ventilation. When VRLA batteries are installed inside a cabinet, the cabinet shall be *approved* for use in occupied spaces and shall be mechanically or naturally vented ~~by one of~~ in accordance with the following ~~methods~~:

1. The cabinet ventilation shall limit the maximum concentration of hydrogen to 1 percent of the total volume of the cabinet during the worst-case event of simultaneous “boost” charging of all the batteries in the cabinet; and ~~or~~
2. When calculations are not available to substantiate the ventilation rate, continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot [1 ft3/min/ft2 or 0.0051 m3/(s _m2)] of floor area covered by the cabinet. The room in which the cabinet is installed shall also be ventilated as required in Section 608.6.1.

2. Revise the IMC as follows:

[F] 502.4 Stationary storage battery systems. Stationary storage battery systems, as regulated by Section 608 of the *International Fire Code*, shall be provided with ventilation in accordance with this chapter and Sections 502.4.1 and ~~or~~ 502.4.2.

Exception: Lithium-ion batteries shall not require ventilation.

[F] 502.5 Valve-regulated lead-acid batteries in cabinets. Valve-regulated lead-acid (VRLA) batteries installed in cabinets, as regulated by Section 608.6.2 of the *International Fire Code*, shall be provided with ventilation in accordance with Sections 502.5.1 and ~~or~~ 502.5.2.

[F] 502.5.2 Ventilation rate in cabinets. Continuous cabinet ventilation shall be provided at a rate of not less than 1 cubic foot per minute per square foot (cfm/ft2) [0.00508 m3/(s ● m2)] of the floor area covered by the cabinet. The room in which the cabinet is installed shall also be ventilated as required by Sections 502.4.1 and ~~or~~ 502.4.2.

Reason: Where lead-acid batteries are stored within an enclosed space, production of hydrogen is a concern. In order to maintain the hydrogen level below the lower flammable limit (LFL), the ventilation system shall be designed such that the concentration of hydrogen is limited by Section 608.6.1(1) and 608.6.2(1) (IMC Section 502.4.1) and a minimum continuous ventilation rate is provided in accordance with Sections 608.6.1(2) and 608.6.2(2) (IMC Section 502.4.2). This proposal modifies the code language so that the criteria of both sections are to be met, rather than that of one or the other.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SIU-F3-608.6.1-608.6.2

F44–09/10
610 (New); 601.1

Proponent: Bob Eugene/Underwriters Laboratories Inc/Underwriters Laboratories Inc

1. Add new section as follows:

SECTION 610
COMMERCIAL KITCHEN COOKING OIL
STORAGE TANK SYSTEMS

610.1 General. Storage of cooking oil (grease) in commercial cooking operations shall comply with Chapter 34. Systems used to store cooking oils in larger than 60 gallon (227 L) aboveground tanks shall also comply with Sections 610.2 through 610.5. For purposes of this section, cooking oil shall be classified as a Class IIIB liquid unless otherwise determined by testing.

610.2 Storage tanks. Cooking oil storage tanks shall be listed in accordance with UL 142 or UL 80, and shall be installed in accordance with Section 3404 and the tank manufacturer's instructions.

610.3 System components. Cooking oil storage system components, including but not limited to piping, connections, fittings, valves, tubing, and other related components used for the transfer of cooking oil from the cooking appliance to the storage tank, and from the storage tank to the discharge point, shall be installed in accordance with Section 3403.6.

610.4 Tank venting. Normal and emergency venting for cooking oil storage tanks shall terminate outside the building as specified in Sections 3404.2.7.3 and 3404.2.7.4.

610.5 Electrical equipment. Electrical equipment used for the operation and heating of the cooking grease storage system shall be listed and comply with NFPA 70.

2. Revise as follows:

601.1 Scope. The provisions of this chapter shall apply to the installation, operation and maintenance of fuel-fired appliances and heating systems, emergency and standby power systems, electrical systems and equipment, mechanical refrigeration systems, elevator recall, stationary storage battery systems and commercial kitchen ~~hoods~~ equipment.

3. Add new referenced standards to Chapter 47 as follows:

UL

80-07	Standard for Steel Tanks for Oil-Burner Fuels and Other Combustible Liquids
142-06	Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids

Reason: There is a large market for collecting and recycling used cooking oil (grease) from commercial cooking operations. This is sometimes done using a system designed to store the used cooking oil on-site in an aboveground tank. These systems typically include features to assist in pumping the grease from the cooking appliance to the storage tank, and to pump the grease from the storage tank to a recovery truck. Some systems include heating elements that assist in keeping the grease in a form that is easily pumped to the truck.

This arrangement could create a problem if the system is not properly designed and installed. Without these new requirements, many installations of this product may not be installed with the safety features needed to protect employees and the public.

Last cycle a similar proposal was disapproved because, among other reasons, it would have required tank venting requirements to be applied to 55 gallon drums and smaller containers of used cooking oil. In this proposal, section 610.2 to 610.5 requirements only kick in for tanks larger than 60 gallons, which is consistent with the container size limitations specified in 3404.3.

This proposal accomplishes the following:

~~1.~~1. Clarifies that the storage of cooking oils (commonly Class IIIB combustible liquids) in any containers shall comply with Chapter 34 requirements.

~~2.~~2. Establishes requirements for cooking oil storage tank systems, including those that heat the stored liquid.

~~3.~~3. Revises the scope of 601.1 to cover these systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, UL 142-06, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009. UL 80 is currently referenced in the IRC.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-F2-610 sub only

F45–09/10
610 (New), 601.1

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

1. Add new text as follows:

SECTION 610
EMERGENCY SHOWER AND EYE WASH STATION

610.1 Emergency shower and eye wash station required. In areas of Group I-2 and Ambulatory Health Care Facilities where chemicals are used that could necessitate the immediate flushing with water after an exposure, an emergency shower and eye wash station shall be installed and maintained in accordance with Section 411 of the *International Plumbing Code*.

2. Revise as follows:

601.1 Scope. The provisions of this chapter shall apply to the installation, operation and maintenance of fuel-fired appliances and heating systems, emergency and standby power systems, electrical systems and equipment, mechanical refrigeration systems, elevator recall, stationary storage battery systems, ~~and~~ commercial kitchen hoods, and emergency shower and eye wash stations.

Reason: This proposal will require the installation of an emergency shower and eye wash in Group I-2 occupancies and Ambulatory Surgical Centers. The eye wash and shower will be required in areas of the facility where hazardous chemicals are being used. IPC Section 411 currently has design criteria and requirements for emergency shower and eye wash stations when they are installed.

This equipment will allow for immediate treatment of chemical burns and exposures which will increase the safety of employees and occupants.

Currently, many health care facilities are constructed under the IBC and IFC. The owner can receive a Certificate of Occupancy for the new facility and then apply for approval and licensing through Federal Centers for Medicare and Medicaid Services (CMS). This requirement is in the Federal CMS regulations and must be complied with before any license is approved. By including this provision in the International Codes, the emergency shower and eye wash will be provided during construction and design under the I-Codes and eliminate frustration, delay and additional expense when the owner applies for licensing through Federal CMS. This proposal will correlate the IBC and IFC with Federal CMS Regulations for these facilities.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F7-610 NEW.DOC

F46–09/10
703.2

Proponent: John Woestman, The Kellen Company, representing the Door Safety Council (DSC)

Revise as follows:

703.2 Opening protectives. Opening protectives shall be maintained in an operative condition in accordance with NFPA 80. Where required by the fire code official, the application of field applied labels associated with the maintenance of opening protectives shall follow the requirements of the *approved* third-party certification organization accredited for *listing* the opening protective. Fire doors and *smoke barrier* doors shall not be blocked or obstructed or otherwise made inoperable. Fusible links shall be replaced promptly whenever fused or damaged. Fire door assemblies shall not be modified.

Reason: This code proposal addresses the very real issue of maintaining labeled opening protectives by requiring field applied labels to follow the requirements of the third-party certification organization which is accredited for listing the specific opening protective. Ongoing maintenance is now an IFC requirement, and this code change provides an enforceable method of allowing maintenance of labeled protectives.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: WOESTMAN-F3-1030.2-2.DOC

F47–09/10
Table 803.3

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Revise table as follows:

TABLE 803.3
INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY[k]

	Sprinklered[l]			Nonsprinklered		
Group	Exit enclosures and exit passageways[a,b]	Corridors	Rooms and enclosed spaces[c]	Exit enclosures and exit passageways[a,b]	Corridors	Rooms and enclosed spaces[c]
B, E, M, R-1, ~~R-4~~	B	C	C	A	B	C
R-4	B	C	C	A	B	B

(Portions of table and footnotes not shown remain unchanged)

Reason: Table 803.3 in the IFC governs wall and ceiling finish in existing buildings. Table 803.3 in the IBC governs wall and ceiling finish for new buildings.

Code change F116 07-08 amended IBC Table 803.3 to require interior finishes in new Group R-4 buildings to have a minimum of Class B flame-spread rating for wall coverings in "rooms and enclosed spaces".

Code Change F116 07-08 created an inconsistency between the 2009 IBC and 2009 IFC. The requirements for R-4 nonsprinklered buildings are no longer consistent in the IFC and the IBC. The IBC will require a Class B flame-spread rating, but then once the building is built and occupied, the IFC reduces the flame-spread rating to Class C for maintenance requirements of the same building and also for any new wall coverings installed after the Certificate of Occupancy is obtained.

This proposal will correlate the maintenance requirements in the IFC with the construction requirements in the IBC. The flame spread rating for interior finish in Group R-4 will be required to be Class B, the same as is required in the IBC. With this proposed change, the IFC will require that the flame-spread rating be maintained to the same level of the original required flame-spread rating.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: LARIVIERE-F30-TABLE 803.3.DOC

F48–09/10
803.5.1

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

Revise as follows:

803.5.1 Textile wall or ceiling coverings. Textile wall or ceiling coverings shall comply with one of the following:

1. The wall or ceiling covering shall have a class A flame spread index in accordance with ASTM E 84 or UL 723 and be protected by automatic sprinklers installed in accordance with Section 903.3.1.1 or 903.3.1.2,
2. The wall covering shall meet the criteria of Sections 803.5.1.1 or 803.5.1.2 when tested in the manner intended for use in accordance with NFPA 265 using the product mounting system, including adhesive, of actual use, or
3. The wall or ceiling covering shall meet the criteria of Sections 803.1.2.1 when tested in accordance with NFPA 286 using the product mounting system, including adhesive, of actual use.

Reason: The text of Section 803.5 does not make it clear that textile ceiling coverings, just like textile wall coverings, are only permitted to be installed when tested in accordance with ASTM E 84 if the compartment is fully protected by sprinklers. The reason for this is the same reason that the requirement exists for textile wall coverings: it has long been known that the ASTM E 84 (Steiner tunnel) test can produce misleading results when applied to thin materials such as textile wall coverings. The new text also needs to make it clear that NFPA 265 is inappropriate for testing ceiling coverings since the burner flame does not reach the ceiling. This proposal is simple clarification.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-F4-803.5.1.DOC

F49–09/10
803.5.2 (New)

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

Add new text as follows:

803.5.2 Newly introduced textile wall and ceiling coverings. Newly introduced textile wall and ceiling coverings shall comply with one of the following:

1. The wall or ceiling covering shall have a class A flame spread index in accordance with ASTM E 84 or UL 723 and be protected by automatic sprinklers installed in accordance with Section 903.3.1.1 or 903.3.1.2. Test specimen preparation and mounting shall be in accordance with ASTM E 2404.
2. The wall covering shall meet the criteria of Section 803.5.1.2 when tested in the manner intended for use in accordance with NFPA 265 using the product mounting system (including adhesive) of actual use, or
3. The wall or ceiling covering shall meet the criteria of Sections 803.1.2.1 when tested in accordance with NFPA 286 using the product mounting system (including adhesive) of actual use.

Reason: The correct specimen preparation and mounting method for textile, paper and vinyl wall and ceiling coverings tested in accordance with ASTM E 84 (Steiner tunnel) test is ASTM E 2404. At the last cycle there was concern about the application of this requirement retroactively to existing textile wall and ceiling coverings, potentially tested before the development of ASTM E 2404. Therefore, this new text clarifies that the change applies only to newly introduced textile wall and ceiling coverings.
The new subsections address the requirements for wall and ceiling coverings, as appropriate:

1. They point out again that textile ceiling coverings, just like textile wall coverings, are only permitted to be installed when tested in accordance with ASTM E 84 if the compartment is fully protected by sprinklers. The reason for this is the same reason that the requirement exists for textile wall coverings. The reason is that it has long been known that the ASTM E 84 (Steiner tunnel) test can produce misleading results when applied to thin materials such as wall coverings.
2. The new text also makes it clear that NFPA 265 is inappropriate for testing ceiling coverings since the burner flame does not reach the ceiling.
3. The new text eliminates reference to Method A of NFPA 265 for newly introduced textile wall coverings, since this method has been eliminated from the body of the standard. Method A applies only to materials tested in the past (i.e. existing materials).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-F14-803.5.2.DOC

F50–09/10
803.6.1, 803.6.2

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

Revise as follows:

803.6.1 General. Expanded vinyl wall or ceiling coverings shall comply with the requirements of Section 803.1.2 using the product mounting system (including adhesive) of actual use. Expanded vinyl wall or ceiling coverings complying with Section 803.1.2 shall not be required to comply with Section 803.1.1.

803.6.2 Compliance alternative. Expanded vinyl wall or ceiling coverings shall be allowed to comply with ~~the requirements for textile wall or ceiling coverings in Section 803.5. When tested in accordance with ASTM E 84 or UL 723, test specimen preparation shall be in accordance with ASTM E 2404~~ one of the following:

1. The wall or ceiling covering shall have a class A flame spread index in accordance with ASTM E 84 or UL 723 and be protected by automatic sprinklers installed in accordance with Section 903.3.1.1 or 903.3.1.2. Test specimen preparation and mounting shall be in accordance with ASTM E 2404.
2. The wall covering shall meet the criteria of Section 803.5.1.2 when tested in the manner intended for use in accordance with NFPA 265 using the product mounting system (including adhesive) of actual use.
3. The wall or ceiling covering shall meet the criteria of Sections 803.1.2.1 when tested in accordance with NFPA 286 using the product mounting system (including adhesive) of actual use.

Reason: Instead of sending code users to another section, it is best simply to state the requirements for expanded vinyl wall or ceiling covering materials directly. The correct specimen preparation and mounting method for textile, paper and vinyl wall and ceiling coverings tested in accordance with ASTM E 84 (Steiner tunnel) test is ASTM E 2404. The revised text addresses the requirements for wall and ceiling coverings, as appropriate:

1. They point out again that expanded vinyl wall and ceiling coverings are only permitted to be installed when tested in accordance with ASTM E 84 if the compartment is fully protected by sprinklers.
2. The new text also makes it clear that NFPA 265 is inappropriate for testing ceiling coverings since the burner flame does not reach the ceiling.
3. The new text eliminates reference to Method A of NFPA 265, which has been eliminated from the body of the standard. Method A applies only to materials tested in the past.
4. The text also clarifies that testing to NFPA 286 needs to use the correct product mounting system, including adhesive.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-F1-803.6.1.DOC

F51–09/10
804.3 (New), Chapter 47

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

1. Add new text as follows:

804.3 Interior floor finish Newly introduced interior floor finish and floor covering materials shall comply with Sections 804.3.1 through 804.3.3.

Exception: Floor finishes and coverings of a traditional type, such as wood, vinyl, linoleum or terrazzo, and resilient floor covering materials that are not comprised of fibers.

804.3.1 Classification. Interior floor finish and floor covering materials required by Section 804.3.3 to be of Class I or II materials shall be classified in accordance with NFPA 253. The classification referred to herein corresponds to the classifications determined by NFPA 253 as follows: Class I, 0.45 watts/cm^2 or greater; Class II, 0.22 watts/cm^2 or greater.

804.3.2 Testing and identification. Interior floor finish and floor covering materials shall be tested by an approved agency in accordance with NFPA 253 and identified by a hang tag or other suitable method so as to identify the manufacturer or supplier and style, and shall indicate the interior floor finish or floor covering classification according to Section 804.3.1. Carpet-type floor coverings shall be tested as proposed for use, including underlayment. Test reports confirming the information provided in the manufacturer's product identification shall be furnished to the building official upon request.

804.3.3 Interior floor finish requirements. Interior floor covering materials shall comply with Sections 804.3.3.1 and 804.3.3.2 and interior floor finish materials shall comply with Section 804.3.4.2.

804.3.3.1 Pill test. In all occupancies, interior floor covering materials shall comply with the requirements of the DOC FF-1 Apill test@ (CPSC 16 CFR, Part 1630) or of ASTM D 2859.

804.3.3.2 Minimum critical radiant flux. In all occupancies, interior floor finish and floor covering materials in exit enclosures, exit passageways, corridors and rooms or spaces not separated from corridors by full-height partitions extending from the floor to the underside of the ceiling shall withstand a minimum critical radiant flux. The minimum critical radiant flux shall not be less than Class I in Groups I-1, I-2 and I-3 and not less than Class II in Groups A, B, E, H, I- 4, M, R-1, R-2 and S.

> **Exception:** Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, Class II materials are permitted in any area where Class I materials are required and materials complying with DOC FF-1 A pill test@ (CPSC 16 CFR, Part 1630) or with ASTM D 2859 are permitted in any area where Class II materials are required.

(Renumber subsequent section)

2. Add new standard to Chapter 47 as follows:

ASTM D 2859 (2006) Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials

Reason: Somehow, requirements for interior floor finish are missing in the IFC, while such requirements exist in the IBC as well as in the Life Safety Code and the Uniform Fire Code. In this proposal the wording has been taken from the IBC, with four changes. The key change is that this section applies only to "newly introduced" interior floor finish materials, in view of the fact that the IFC is for existing buildings. The other changes are as shown below:

1. The "pill test" is applied to all newly introduced carpets and carpet-like floor finish materials, in view of the fact that the federal government, through CPSC, regulates all carpets and rugs based on 16 CFR 1630 since the 1970s.
2. In the IBC there is confusion because section 804.4 states that "interior floor finish and floor covering materials in exit enclosures, exit passageways, corridors and rooms or spaces not separated from corridors by full-height partitions extending from the floor to the underside of the ceiling shall withstand a minimum critical radiant flux" and then section 804.4.1 states that "interior floor finish and floor covering materials in exit enclosures, exit passageways and corridors shall not be ...". This leaves undefined what minimum critical radiant flux is required for "interior floor finish and floor covering materials in rooms or spaces not separated from corridors by full-height partitions extending from the floor to the underside of the ceiling". Since section 804.2 only distinguishes two classes for NFPA 253, the logical conclusion is that the words are missing and that these rooms or spaces have to meet the same requirements as the corridors from which they are not separated. A proposal has been submitted to the IBC to make this correction.
3. ASTM D 2859, which is equivalent to 16 CFR 1630 and is used extensively outside of the US, while 16 CFR 1630 is only a federal mandate, is added as an alternate. In fact, ASTM D 2859 is the standard that complies with the ICC policy on referenced standards. A proposal has been submitted to the IBC to allow ASTM D 2859 as an alternate test method to 16 CFR 1630.

The fire hazard of newly introduced floor coverings (which basically means carpets only) is the same in new buildings and in existing buildings. Therefore the IFC should be consistent with the IBC.

An alternate approach: If the addition of ASTM D 2859 is not desired by the committee, please use the following text:

804.3 Interior floor finish.

804.3.1 General. Newly introduced interior floor finish and floor covering materials shall comply with Sections 804.3.2 through 804.3.4.

> **Exception:** Floor finishes and coverings of a traditional type, such as wood, vinyl, linoleum or terrazzo, and resilient floor covering materials that are not comprised of fibers.

804.3.2 Classification. Interior floor finish and floor covering materials required by Section 804.3.4 to be of Class I or II materials shall be classified in accordance with NFPA 253. The classification referred to herein corresponds to the classifications determined by NFPA 253 as follows: Class I, 0.45 watts/cm^2 or greater; Class II, 0.22 watts/cm^2 or greater.

804.3.3 Testing and identification. Interior floor finish and floor covering materials shall be tested by an approved agency in accordance with NFPA 253 and identified by a hang tag or other suitable method so as to identify the manufacturer or supplier and style, and shall indicate the interior floor finish or floor covering classification according to Section 804.3.2. Carpet-type floor coverings shall be tested as proposed for use, including underlayment. Test reports confirming the information provided in the manufacturer=s product identification shall be furnished to the building official upon request.

804.3.4 Interior Floor Finish Requirements.

804.3.4.1 Pill test. In all occupancies, newly introduced floor covering materials shall comply with the requirements of the DOC FF-1 Apill test@ (CPSC 16 CFR, Part 1630).

804.3.4.2 Minimum critical radiant flux. In all occupancies, newly introduced interior floor finish and floor covering materials in exit enclosures, exit passageways, corridors and rooms or spaces not separated from corridors by full-height partitions extending from the floor to the underside of the ceiling shall withstand a minimum critical radiant flux. The minimum critical radiant flux shall not be less than Class I in Groups I-1, I-2 and I-3 and not less than Class II in Groups A, B, E, H, I- 4, M, R-1, R-2 and S.

Exception: Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, Class II materials are permitted in any area where Class I materials are required and materials complying with DOC FF-1 "pill test" (CPSC 16 CFR, Part 1630) are permitted in any area where Class II materials are required.

(Renumber subsequent section)

Cost Impact: The cost of carpets that meet Class I or Class II in accordance with NFPA 253 is higher than the cost of carpets that are not classified.

Analysis: A review of the standard(s) proposed for inclusion in the code, ASTM D 2859-2006, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

CPSC 16 CFR, Part 1630 is already referenced in the IBC and NFPA 253 is already referenced in the IFC.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-F10-804.3.DOC

F52–09/10
805.1 (New)

Proponent: Marcelo M. Hirschler, GBH International

Add new text as follows:

805.1 Ignition by cigarettes. Upholstered furniture newly introduced into occupancies regulated by this code shall comply with 805.1.1. Mattresses newly introduced into occupancies regulated by this code shall comply with 805.1.2.

805.1.1 Upholstered furniture. Newly introduced upholstered furniture shall be shown to resist ignition by cigarettes as determined by tests conducted in accordance with one of the following:

1. Mocked-up composites of the upholstered furniture shall have a char length not exceeding 1.5 inches (38 mm) when tested in accordance with NFPA 261.
2. The components of the upholstered furniture shall meet the requirements for Class I when tested in accordance with NFPA 260.

805.1.2 Mattresses. Newly introduced mattresses shall be shown to resist ignition by cigarettes as determined by tests conducted in accordance with DOC 16 CFR Part 1632 and shall have a char length not exceeding 2 inches (51 mm).

(Renumber subsequent sections)

Reason: Mattresses in the United States have been required to meet 16 CFR 1632 by the Consumer Product Safety Commission since the 1970s. There are no new mattresses sold legally in the US that are not compliant with 16 CFR 1632. As an example, the web site by ISPA (International Sleep Products Association)

(http://www.sleepproducts.org/Content/NavigationMenu/Advocacy_Issues/ISPA_Position_Papers/Flammability_Position_Paper.htm) states as follows: "ISPA Position: ISPA supports the national flammability standards for mattresses codified at 16 C.F.R. Parts 1632 and 1633 promulgated by the U.S. Consumer Product Safety Commission (CPSC) [linked text]. Part 1632 requires that mattresses resist a smoldering cigarette ignition, which has been in place since the mid-1970s. Part 1633, which will become effective July 1, 2007, requires that mattresses resist an open-flame ignition. ISPA also seeks a national standard that addresses the flammability of bedclothes (top-of-the-bed products such as pillows, comforters and mattress pads), given that these are usually the first items ignited in a bedroom fire. Background: The mattress industry takes its product stewardship responsibilities seriously. For over 30 years, the mattress industry has actively supported regulatory efforts to develop flammability standards, public education initiatives and basic scientific research targeted at reducing residential fire casualties and property loss. In the early 1970s, we participated in the development of 16 C.F.R. Part 1632."

There is no mandatory federal flammability regulation for upholstered furniture in the US. However basically, manufacturers of both residential and contract upholstered furniture support the need for their products to meet cigarette ignition resistance requirements.

Residential upholstered furniture: the UFAC (Upholstered Furniture Action Council) web site (www.ufac.org) states: "The Upholstered Furniture Action Council was founded in 1978 to make upholstered furniture more resistant to ignition from smoldering cigarettes which are the leading cause of upholstery fires in the home. Household fires from smoldering ignition have been reduced substantially since its inception. According to the latest figures there has been a 79.3% decline in the number of upholstered furniture fires from cigarette ignition." The web site also states: "Background: In 1970, federal government agencies proposed mandatory safety standards to reduce the potential fire hazards posed by the cigarette ignition of mattresses, carpeting and upholstered furniture. Mandatory standards were imposed for mattresses and carpeting. When the Consumer Product Safety Commission, (CPSC) began looking at upholstered furniture, UFAC was formed to allow upholstered furniture manufacturers the opportunity to work with CPSC in a meaningful way to design safety standards which are effective, cost effective and workable from a manufacturing standpoint. The only logical course of action for the furniture industry was to create a voluntary program that would develop a better safety record for the industry, at a lower cost, than the proposed government regulations." UFAC administers the program that is responsible for the golden hangtags that are found on residential upholstered furniture and indicate that the furniture has passed the UFAC test. The UFAC web site lists the manufacturers (http://www.ufac.org/mfglist.htm) and the retailers (http://www.ufac.org/retailerslist.htm) that comply with their test. UFAC represents the major manufacturers of residential upholstered furniture. Their web site indicates that the UFAC test is identical to NFPA 260 (http://www.ufac.org/method11.htm).

Institutional upholstered furniture: The Business & Institutional Home Furnishings Alliance (BIFMA) was the developer of the standard test that became NFPA 261 (originally known as the BIFMA test). Contract or institutional upholstered furniture now meets either NFPA 260 (UFAC test) or NFPA 261 and is resistant to cigarette ignition resistance. BIFMA is listed in the UFAC web site as a UFAC supporting organization.

Therefore, all newly introduced mattresses and upholstered furniture should be required to meet the appropriate smoldering ignition resistance tests.

Cost Impact: The code change proposal will not increase the cost of construction, as this is normal use.

Analysis: Standards NFPA 260 and 261 and DOC 16 CFR Part 1632 are currently referenced in the IFC.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-F17-805.1.DOC

F53–09/10
805.4

Proponent: William Freer, Fire Protection Specialist, NYS Office of Fire Prevention and Control

Revise as follows:

805.4 Group R-2 college and university dormitories. The requirements of Sections 805.4.1 through 805.4.2.3 shall apply to college and university dormitories classified in Group R-2 including decks, porches and balconies.

Reason: The purpose of this code addition is to clarify that the requirements for upholstered furniture in R-2 college and university also applies to decks, porches and balconies. The current code does not specifically state that the code is applicable to decks, porches and balconies. In March of 2009 the city of Pittsburgh, PA banned couches from porches citing them as a fire hazard. Similar laws and ordinances have been enacted in Lincoln NE, Ames IA, Boulder CO, and East Lansing MI. The Village of Brockport in New York experienced a fire about 10 years ago where a cigarette was dropped on an old sofa that sat on an open wooden porch, and several hours later the whole front of the house was ablaze trapping several persons on the second floor. Since their local law banning couches from porches was instituted in 1999 there have been no such fires in the Village of Brockport. This code change will not be as restrictive as the laws and ordinances that have banned couches from porches but will require the same level of protection as afforded inside the structure.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FREER-F1-805.4.DOC

F54–09/10
805.5 (New)

Proponent: Carl Ogburn, Chestnut Ridge Foam

Add new text as follows:

805.5 Group A-2 occupancies intended for food or drink consumption. The requirements of Sections 805.5.1 through 805.5.1.3 shall apply to Group A-2 occupancies intended for food or drink consumption.

805.5.1 Upholstered furniture. Newly introduced upholstered furniture shall meet the requirements of Sections 805.5.1.1 through 805.5.1.3

805.5.1.1 Ignition by cigarettes. Newly introduced upholstered furniture shall be shown to resist ignition by cigarettes as determined by tests conducted in accordance with one of the following:

1. Mocked-up composites of the upholstered furniture shall have a char length not exceeding $1^1/_2$ inches (38 mm) when tested in accordance with NFPA 261, or
2. The components of the upholstered furniture shall meet the requirements for Class I when tested in accordance with NFPA 260.

805.5.1.2 Heat release rate. Newly introduced upholstered furniture shall have limited rates of heat release when tested in accordance with ASTM E 1537 or California Technical Bulletin 133, as follows:

1. The peak rate of heat release for the single upholstered furniture item shall not exceed 80 kW.

   Exception: Upholstered furniture in rooms or spaces protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1.

2. The total energy released by the single upholstered furniture item during the first 10 minutes of the test shall not exceed 25 MJ.

   Exception: Upholstered furniture in rooms or spaces protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1.

805.5.1.3 Identification. Upholstered furniture shall bear the label of an approved agency, confirming compliance with the requirements of Sections 805.5.1.1 and 805.5.1.2.

Reason: CA TB 133, which is referenced in the IFC, is a standard issued by the California Bureau of Home Furnishings and Thermal Insulation (CBHF) and is equivalent to ASTM E 1537, with the pass/fail criteria contained in the proposal. This proposal would make the same requirements for bars and night clubs than is now used for some other occupancies, such as Groups I-1, I-2, I-3 and R-2. Experience shows that if a bar or night club is not sprinklered the potential for big fires is large. Approval of this proposal would ensure that furniture is not the cause of a big fire with many fatalities.

Cost Impact: CA TB 133 furniture is more expensive than standard furniture.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: OGBURN-F2-805.5-2.DOC

F55–09/10
805.5 (New)

Proponent: Carl Ogburn, Chestnut Ridge Foam

Add new text as follows:

805.5 Group E Occupancies other than day care facilities. The requirements of Sections 805.5.1 through 805.5.1.3 shall apply to Group E occupancies other than Group E day care facilities.

805.5.1 Upholstered furniture. Newly introduced upholstered furniture shall meet the requirements of Sections 805.5.1.1 through 805.5.1.3

805.5.1.1 Ignition by cigarettes. Newly introduced upholstered furniture shall be shown to resist ignition by cigarettes as determined by tests conducted in accordance with one of the following:

1. Mocked-up composites of the upholstered furniture shall have a char length not exceeding $1^1/_2$ inches (38 mm) when tested in accordance with NFPA 261; or
2. The components of the upholstered furniture shall meet the requirements for Class I when tested in accordance with NFPA 260.

805.5.1.2 Heat release rate. Newly introduced upholstered furniture shall have limited rates of heat release when tested in accordance with ASTM E 1537 or California Technical Bulletin 133, as follows:

1. The peak rate of heat release for the single upholstered furniture item shall not exceed 80 kW.

   Exception: Upholstered furniture in rooms or spaces protected by an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1.

2. The total energy released by the single upholstered furniture item during the first 10 minutes of the test shall not exceed 25 MJ.

   Exception: Upholstered furniture in rooms or spaces protected by an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1.

805.5.1.3 Identification. Upholstered furniture shall bear the label of an *approved* agency, confirming compliance with the requirements of Sections 805.5.1.1 and 805.5.1.2.

Reason: CA TB 133, which is referenced in the IFC, is a standard issued by the California Bureau of Home Furnishings and Thermal Insulation (CBHF) and is equivalent to ASTM E 1537, with the pass/fail criteria contained in the proposal. This proposal would make the same requirements for educational establishments (other than day care occupancies) than is now used for some other occupancies, such as Groups I-1, I-2, I-3 and R-2. Educational facilities are ones where so many young people are potentially exposed and vulnerable. Approval of this proposal would ensure that furniture is not the cause of a big fire with many fatalities.

Cost Impact: CA TB 133 furniture is more expensive than standard furniture.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: OGBURN-F1-805.5.DOC

F56–09/10
806.2, Chapter 47

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

1. Revise as follows:

806.2 Artificial vegetation. Artificial decorative vegetation shall meet the flame propagation performance criteria of NFPA 701. Meeting the flame propagation performance criteria of NFPA 701 shall be documented and certified by the manufacturer in an approved manner. Alternately, the artificial decorative vegetation item shall be tested in accordance with NFPA 289, using the 20 kW ignition source, and shall have a maximum heat release rate of 100 kW.

2. Add new standard to Chapter 47 as follows:

NFPA

289-2009 Standard Method of Fire Test for Individual Fuel Packages

Reason: The NFPA Technical Committee on Fire Tests recently developed a furniture calorimeter heat release fire test specifically for this type of product. NFPA 289 is a very versatile fire test and uses a propane gas burner as the ignition source. The 20 kW gas burner ignition source in NFPA 289 was specifically designed with the intent of being a substitute for UL 1975 and would be suitable as an ignition source for Christmas trees.
The National Institute of Standards and Technology website has the following statements: The National Fire Protection Association (NFPA) reports that there is an estimated annual average of 210 home structure fires that begin with Christmas trees. Based on data from 2002 through 2005, these fires caused an average of 24 civilian deaths, 27 civilian injuries, and $13.3 million in direct property damage per year. The NFPA analysis also shows that although the number of Christmas tree fires is low, these fires represent a higher level of hazard. On average, 1 of every 9 Christmas tree fires resulted in a fatality compared to an average of one death per 75 non-confined home structure fires overall. Further, 49 % of Christmas tree fires spread beyond the room of origin. The fires that spread beyond the room of origin caused 94 % of the associated fatalities. The percentage of trees involved in structure fires represent an extremely small portion of the total number of natural Christmas trees sold, which is estimated at 30 million trees, in the United States each year. The moisture content of each tree can play a dominant role in determining the fire hazard each tree represents. Properly maintaining a cut Christmas tree is important to retaining a high moisture content in the needles of the tree to limit accidental ignition and prevent rapid flame spread. A tree which has dry needles can readily ignite with a flaming source and generate heat release rates that are capable of causing flashover in residential scale rooms. See more information and videos at http://fire.nist.gov/tree_fire.htm .

The above statistics addressed home structure fires and natural Christmas trees, which are required by the IFC to be kept moist and fresh at all times. However, the IFC fire safety requirements for artificial vegetation, including Christmas trees, are based on testing to NFPA 701 only.
At one time UL had developed UL Subject 411, *Outline of Investigation for Artificial Christmas Trees*, now withdrawn, which used 1 lb of shredded newspaper distributed around the Christmas tree, and required the ensuing fire to meet the following three criteria: (1) To have flames that do not extend more than 3 ft (0.9 m) above the tree, (2) To have no significant lateral flame spread away from the area affected by the ignition source and (3) To have no flaming droplets that continue flaming after reaching the floor. UL 411 was withdrawn because no jurisdiction adopted it and no manufacturer was willing to have their product listed to that UL requirement.
When a natural Christmas tree is allowed to dry out it will typically generate more than 1 MW heat release. Similarly, some artificial trees have been shown to reach similar values. The Uniform Fire Code, contains recommendations (in the non mandatory Annex) for this type of fire performance by artificial vegetation and Christmas trees.

This proposal does not recommend the deletion of the use of NFPA 701 but simply offers an alternate option.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, NFPA 289-2009, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-F5-806.2.DOC

F57–09/10
807.1 (IBC [F] 806.1)

Proponent: Douglas H. Evans, PE, FSFPE, Clark County, NV, representing the Department of Development Services – Building Division

Revise as follows:

807.1 (IBC [F] 806.1) General requirements. In occupancies in Groups A, E, I and R-1 and dormitories in Group R-2, curtains, draperies, hangings and other decorative materials suspended from walls or ceilings shall meet the flame propagation performance criteria of NFPA 701 in accordance with Section 806.2 or be noncombustible.

Exceptions:

1. Curtains, draperies, hangings and other decorative materials suspended from walls of *sleeping units* and *dwelling units* in dormitories in Group R-2 protected by an *approved automatic sprinkler system* installed in accordance with Section 903.3.1 and such materials are limited to not more than 50 percent of the aggregate area of walls.
2. Decorative materials, including, but not limited to, photographs and paintings in dormitories in Group R-2 where such materials are of limited quantities such that a hazard of fire development or spread is not present.

In Groups I-1 and I-2, combustible decorative materials shall meet the flame propagation criteria of NFPA 701 unless the decorative materials, including, but not limited to, photographs and paintings, are of such limited quantities that a hazard of fire development or spread is not present. In Group I-3, combustible decorative materials are prohibited.

Fixed or movable walls and partitions, paneling, wall pads and crash pads, applied structurally or for decoration, acoustical correction, surface insulation or other purposes, shall be considered interior finish if they cover 10 percent or more of the wall or of the ceiling area, and shall not be considered decorative materials or furnishings.

In Group B and M occupancies, fabric partitions suspended from the ceiling and not supported by the floor shall meet the flame propagation performance criteria in accordance with Section 807.2 and NFPA 701 or shall be noncombustible. <u>In other than Group B and M occupancies, fabric partitions shall be in accordance with the type of construction required for the building.</u>

Reason: The purpose of this revision is to clarify intent. Designers frequently want to use draperies as room dividers. Cp 6 intends room dividers to be considered interior non-bearing partitions. There are also two instances in 806 where fabric partitions are specifically allowed in Group B and M occupancies, which indicate that fabric partitions are not intended for all occupancy uses. As a partition, there is rarely any disagreement on the type of construction required by code. In addition, NFPA 701 uses a Bunsen burner as the ignition source and if a larger ignition source can be expected, the hazard may be far in excess of what Section 807 expects.

Cost Impact: As clarification of intent, this code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EVANS-F3-807.1.DOC

F58–09/10
807.4.2.1, 808.2, Chapter 47; IBC 402.11, 402.12.1, 402.16.5, Chapter 35

Proponent: Marcelo M. Hirschler, GBH International

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE FIRE CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE FIRE CODE COMMITTEE.

PART I – IFC

1. Revise as follows:

807.4.2 Group A. The requirements in Sections 807.4.2.1 through 807.4.2.3 shall apply to occupancies in Group A.

807.4.2.1 Foam plastics. Exposed foam plastic materials and unprotected materials containing foam plastic used for decorative purposes, or stage scenery or exhibit booths shall have a maximum heat release rate of 100kW when tested in accordance with UL 1975, or when tested in accordance with NFPA 289 using the 20 kW ignition source.

Exceptions:

1. Individual foam plastic items or items containing foam plastic where the foam plastic does not exceed 1 pound (0.45 kg) in weight.
2. Cellular or foam plastic shall be allowed for trim in accordance with Section 804.2.

808.2 Signs. Foam plastic signs that are not affixed to interior building surfaces shall have a maximum heat release rate of 150 kW when tested in accordance with UL 1975, or when tested in accordance with NFPA 289 using the 20 kW ignition source.

Exception: Where the aggregate area of foam plastic signs is less than 10 percent of the floor area or wall area of the room or space in which the signs are located, whichever is less, subject to the approval of the fire code official.

2. Add new standard to Chapter 47 as follows:

NFPA

289–2009	Fire Test for Individual Fuel Packages

PART II – IBC GENERAL

1. Revise as follows:

402.11 Kiosks. Kiosks and similar structures (temporary or permanent) shall meet the following requirements:

1. Combustible kiosks or other structures shall not be located within the mall unless constructed of any of the following materials:
   1.1. Fire-retardant-treated wood complying with Section 2303.2.
   1.2. Foam plastics having a maximum heat release rate not greater than 100kW (105 Btu/h) when tested in accordance with the exhibit booth protocol in UL 1975 or when tested in accordance with NFPA 289 using the 20 kW ignition source.
   1.3. Aluminum composite material (ACM) having a flame spread index of not more than 25 and a smoke-developed index of not more than 450 when tested as an assembly in the maximum thickness intended for use in accordance with ASTM E 84 or UL 723.
2. Kiosks or similar structures located within the mall shall be provided with *approved* fire suppression detection devices.
3. The minimum horizontal separation between kiosks or groupings thereof and other structures within the mall shall be 20 feet (6096 mm).
4. Each kiosk or similar structure or groupings thereof shall have a maximum area of 300 square feet (28 m^2).

402.12.1 Materials. Children's playground structures shall be constructed of noncombustible materials or of combustible materials that comply with the following:

1. Fire-retardant-treated wood.
2. Light-transmitting plastics complying with Section 2606.
3. Foam plastics (including the pipe foam used in soft-contained play equipment structures) having a maximum heat-release rate not greater than 100 kW when tested in accordance with UL 1975 or when tested in accordance with NFPA 289 using the 20 kW ignition source.
4. Aluminum composite material (ACM) meeting the requirements of Class A interior finish in accordance with Chapter 8 when tested as an assembly in the maximum thickness intended for use.
5. Textiles and films complying with the flame propagation performance criteria contained in NFPA 701.
6. Plastic materials used to construct rigid components of soft-contained play equipment structures (such as tubes, windows, panels, junction boxes, pipes, slides and decks) exhibiting a peak rate of heat release not exceeding 400 kW/m^2 when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation at a thickness of 6 mm.
7. Ball pool balls, used in soft-contained play equipment structures, having a maximum heat release rate not greater than 100 kW when tested in accordance with UL 1975 or when tested in accordance with NFPA 289 using the 20 kW ignition source. The minimum specimen test size shall be 36 inches by 36 inches (914 mm by 914 mm) by an average of 21 inches (533 mm) deep, and the balls shall be held in a box constructed of galvanized steel poultry netting wire mesh.

8. Foam plastics shall be covered by a fabric, coating or film meeting the flame propagation performance criteria of NFPA 701.
9. The floor covering placed under the children's playground structure shall exhibit a Class I interior floor finish classification, as described in Section 804, when tested in accordance with NFPA 253.

402.16.5 Foam plastics. Foam plastics used in signs shall have flame-retardant characteristics such that the sign has a maximum heat-release rate of 150 kilowatts when tested in accordance with UL 1975 or when tested in accordance with NFPA 289 using the 20 kW ignition source, and the foam plastics shall have the physical characteristics specified in this section. Foam plastics used in signs installed in accordance with Section 402.14 shall not be required to comply with the flame spread and smoke-developed indexes specified in Section 2603.3.

2. Add new standard to Chapter 35 as follows:

NFPA

289 – 2009	Fire Test for Individual Fuel Packages

Reason: UL 1975 was developed in the 1970s and uses a 340 g wood crib as the ignition source. More modern technology, using a propane gas burner, has recently been developed by the NFPA Technical Committee on Fire Tests, specifically for this type of product. NFPA 289 is more versatile than UL 1975 and is also likely to offer lower variability. The 20 kW gas burner ignition source in NFPA 289 was specifically designed with the intent of being a substitute for UL 1975. This proposal does not recommend the deletion of the use of UL 1975 but simply offers a more modern alternate option.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, NFPA 289-2009, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-F15-807.4.2.1-COMBINED WITH F6.DOC

F59–09/10
808.1

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

Revise as follows:

808.1 Wastebaskets and linen containers in Group I-1, I-2 and I-3 occupancies. Wastebaskets, linen containers and other waste containers, including their lids, located in Group I-1, I-2 and I-3 occupancies shall be constructed of noncombustible materials or of materials that meet a peak rate of heat release not exceeding 300 kW/m^2 when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation. Metal wastebaskets and other metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be *listed* in accordance with UL 1315 and shall be provided with a noncombustible lid. Portable containers exceeding 32 gallons (121 L) shall be stored in an area classified as a waste and linen collection room and constructed in accordance with Table 508.2 of the *International Building Code*.

Reason: The wastebaskets and linen containers in I-1 occupancies should meet the same requirements as those for I-2 and I-3. Most residents in these facilities have little mobility or capability of escaping a large fire. As explained in earlier cycles, most nonmetallic waste containers are manufactured from polyethylene which has a fuel value over double that of newsprint and a very high heat release in a fire. These wastebaskets and linen containers hold combustible waste (much of which is paper) and linen while having very combustible walls. This change will extend the use of more fire safe material to the I-1 occupancies. Most manufacturers of such containers can use alternate materials.

Cost Impact: The code change proposal will increase the cost of the wastebaskets and linen containers used in I-1 occupancies.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-F12-808.1.DOC

F60–09/10
808.2 (New)

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

Add new text as follows:

808.2 Waste containers with a capacity of 20 gallons or more in Group R-2 college and university dormitories. Waste containers, including their lids, located in Group R-2 college and university dormitories and with a capacity of 20 gallons (75.7 L) or more shall be constructed of noncombustible materials or of materials that meet a peak rate of heat release not exceeding 300 kW/m^2 when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m^2 in the horizontal orientation. Metal wastebaskets and other metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be *listed* in accordance with UL 1315 and shall be provided with a noncombustible lid. Portable containers exceeding 32 gallons (121 L) shall be stored in an area classified as a waste and linen collection room and constructed in accordance with Table 508.2 of the *International Building Code*.

(Renumber subsequent sections)

Reason: The large waste containers in college and university dormitories should comply with the same requirements as any waste container in Group I-2 and I-3 occupancies. As explained in earlier cycles, most nonmetallic waste containers are manufactured from polyethylene which has a fuel value over double that of newsprint and a very high heat release in a fire. These waste containers hold combustible waste (much of which is paper) while having very combustible walls. This change will extend the use of more fire safe material to the larger waste containers in dormitories. Most manufacturers of such containers can use alternate materials.

Cost Impact: The code change proposal will increase the cost of the waste containers used in dormitories.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-F13-808.2.DOC

F61–09/10
808.3 (New)

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

Add new text as follows:

808.3 Combustible lockers. Where lockers constructed of combustible materials are used, the lockers shall be considered interior finish and shall comply with Section 803.

> **Exception:** Lockers constructed entirely of wood and noncombustible materials shall be permitted to be used wherever interior finish materials are required to meet a Class C classification in accordance with 803.1.1.

Reason: Traditionally lockers, in schools (high schools, middle schools, universities), clubs, swimming pools and gymnasiums, were constructed of steel. In recent years, the use of lockers constructed of combustible materials has become prevalent. These lockers typically line an entire wall (for example a corridor in a school) and are not regulated by the fire code. Lockers are not usually considered interior finish. The only other materials regulated by the IFC at present are: interior trim, upholstered furniture, decorations, decorative vegetation, wastebaskets, linen containers and signs. Lockers do not fall into any of those categories.

Combustible lockers can present a significant fire load and, if ignited, are likely to spread fire the same way that interior finish materials spread fire. They should be considered interior finish materials and regulated like all other interior finish materials for any occupancy.

The following wording comes from an advertisement for “Rust Free Plastic Lockers”. “Our waterproof plastic lockers are convenient for many types of locations, from boat decks to pool areas. Along with their rustproof quality, they are durable for many years of use. Available as single or multiple tiered units, our plastic lockers are ideal for any area near water or humidity whether a spa, pool, shower or beach area. Plastic lockers withstand the humidity and corrosiveness of water and pool areas and last much longer than traditional metal lockers. Wet swimsuits and towels, or even sweaty clothing will never rust, corrode delaminate or crack our 100% plastic foot lockers or stand-up plastic locker solutions!” The lockers by this particular manufacturer are constructed of 3/8 inch thick solid plastic bodies and heavy duty ½ inch thick doors. Typically the “solid plastic” used is either high density polyethylene or polypropylene.

In some “high-end” environments, such as country clubs, plastic lockers are not found. Instead, lockers are made with “the highest quality materials and meticulous attention to detail. Locker sides, top and bottom are made of ¾ inch industrial grade particleboard with stain and impact resistant white melamine finish inside and out. Locker back is the same particleboard in a ½ inch thickness. All exposed edges are finished with matching edge banding. These club lockers include number plates and heavy duty keyed cam locks for security. Wooden Lockers feature highly durable ¾ inch solid wood raised panels. Wood locker surfaces are finished with 1 coat of sealer and 2 coats of lacquer for maximum durability. Laminate Lockers feature high pressure laminate doors.”

One manufacturer advertises 100% polypropylene lockers, which “will not rust, corrode, fade, or require repainting, Our plastic lockers will save you money from having to replace rusty metal lockers or warped wood and wood laminated lockers in a few short years.” This manufacturer also states that the 100% polypropylene lockers last “ten times longer than metal lockers” and last “longer than wood lockers, or plastic laminated lockers in humid environments such as in tropical climates, and where there are locker rooms near showers, saunas, pools or in facilities which require frequent sanitation. Wood lockers, in a humid environment will warp. Plastic-laminated lockers are simply particle board covered with a laminate sheet. Moisture will seep into connector and hinge screw holes in the locker and eventually will soften the particle board.” This manufacturer states that plastic lockers are impervious to moisture and will not fade, warp, or delaminate.

In other proposals I have already discussed the fire performance of polyethylene and polypropylene.

Wood interior finish corresponds typically to Class C interior finish, which is usually allowed other than in corridors and exits. Therefore, lockers made exclusively out of wood should be allowed anywhere that Class C interior finish is allowed without additional testing. If there is some doubt as to whether the material is wood or a plastic resembling wood, it would be up to the manufacturer to demonstrate that the lockers are made of wood in order to use the exception.

Cost Impact: The code change proposal will increase costs, since the fire performance of combustible lockers is not regulated at present.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-F9-808.3.DOC

F62–09/10
901.4.5 (New) [IBC [F] 901.2.1 (New)]

Proponent: Jeff Hugo, CBO, National Fire Sprinkler Association

Add new text as follows:

901.4.5 (IBC [F] 901.2.1) Pump and riser room size. Fire pump and/or fire sprinkler system riser rooms shall be designed with adequate space for all equipment necessary for the installation as defined by the manufacturer with sufficient working room around the stationary equipment. Clearances around equipment to elements of permanent construction, including other installed equipment and appliances, shall be sufficient to allow inspection, service, repair or replacement without removing such elements of permanent construction or disabling the function of a required fire-resistance-rated assembly. Fire pump and fire sprinkler riser rooms shall be provided with a door(s) and unobstructed passageway large enough to allow removal of the largest piece of equipment.

Reason: Fire pump and fire sprinkler riser rooms require routine maintenance, repairs, and possible replacement, adequate working clearances is needed. Typically one could assume that a 36" work space in front of the piece of equipment would be adequate, but the design sizes and layout of these rooms is limitless, and thus should rely on the manufacturer to lay out specific guidelines for their equipment. This new section will relieve the workforce responsible for maintaining such equipment, provide adequate room for fire fighters, and finally giving designers and building officials some direction in this area.

The NFSA as an industry representative is constantly hearing this plea from its members throughout the country. Rooms designed or built too small, have no or little space to maneuver equipment and other unnecessary impairments to the flow of normal repair are the most common complaints. Such delays can cause more expense and in some cases personal injury, causing more expense to the building owner. OS&Y valves and backflow preventers can weigh several hundred pounds and could be several feet long, fire pump control cabinets fall into the same category. Insight to the size, weight, layout, along with the manufacturer's recommended working space can aid the designer in accomplishing this task on paper prior to the construction of the room.

This new section will also mandate such equipment to fit through the doors along with an adequate path out of the structure so that interior walls and finishes do not need to be removed and replaced after several years. Similar language can be found in the IMC, IPC, and the National Electrical Code for installed equipment and appliances.

The 07/08 IFC Code Change Committee supported this change but requested that the change be inserted in the general section of 901 Combination standpipes/sprinkler risers are common in many structures.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HUGO-F2-901.2.1.DOC

F63–09/10
901.6, Table 901.6.1, Chapter 47

Proponent: Amber Anderson/Stuart Tom, Cosumnes CSD Fire Department, representing California Fire Chief's Association

1. Revise as follows:

901.6 Inspection, testing and maintenance. Fire detection, alarm, and extinguishing systems, mechanical smoke exhaust systems and smoke and heat vents shall be maintained in an operative condition at all times, and shall be replaced or repaired where defective. Nonrequired *fire protection systems* and equipment shall be inspected, tested and maintained or removed.

TABLE 901.6.1
FIRE PROTECTION SYSTEM MAINTENANCE STANDARDS

SYSTEM	STANDARD
Portable fire extinguishers	NFPA 10
Carbon Dioxide fire-extinguishing systems	NFPA 12
Halon 1301 fire-extinguishing systems	NFPA 12A
Dry-chemical extinguishing systems	NFPA 17
Wet-chemical extinguishing systems	NFPA 17A
Water based fire protection systems	NFPA 25
Fire alarm systems	NFPA 72
Mechanical smoke exhaust systems	NFPA 204
Smoke and heat vents	NFPA 204
Water-mist systems	NFPA 750
Clean-agent extinguishing systems	NFPA 2001

2. Add new standard to Chapter 47 as follows:

NFPA

204-2007 Standard for Smoke and Heat Venting

Reason: The purpose of the revision is to clarify to which standard smoke and heat vents and mechanical smoke exhaust systems should be maintained. NFPA 204 would be a new referenced standard in the IFC.

Smoke and heat vents and mechanical smoke exhaust systems are fire protection systems often required by the IFC. Fire protection systems must be maintained as indicated in IFC Section 901.4, IFC 901.4.1, 902.1 (definition of fire protection systems), and 901.6.1. However what is not clear is the standard to which to maintain such systems. IFC Section 901.4 requires maintenance to be in accordance with the original installation standard for that system. The original installation standard for smoke and heat vents would be found in IFC Section 910.3.1, UL 793 titled *Automatically Operated Roof Vents for Smoke and Heat*. UL 793, Section 18.1 indicates that the installation of the system must be in accordance with NFPA 204. However, UL 793 does not address maintenance of the system.

The next requirement for maintenance is found in IFC Section 901.4.1 which states maintenance as required by the IFC. Since the installation standard is NFPA 204 it makes sense that the maintenance standard should also be NFPA 204 as the IFC does not provide maintenance provisions for such systems.

Although NFPA 204 would be a new referenced standard in the IFC it is not a new referenced standard in practice. By modifying the table the user is provided clarity and easy reference for enforcement provision system maintenance.

A companion proposal (submitted separately by Justin Beal representing City of Fresno Fire Department) has also been submitted to include new language within IFC Section 910:

> **910.5 Maintenance.** Smoke and heat vents and mechanical smoke exhaust systems shall be maintained in an operative condition in accordance with NFPA 204. Fusible links shall be promptly replaced whenever fused, damaged or painted. Smoke and heat vents and mechanical smoke exhaust systems shall not be modified, unless approved by the fire code official.

This new section would maintain consistent formatting in the IFC as already established for the other systems listed in IFC Table 901.6.1. For example, companion code sections already in the IFC for portable fire extinguishers is 906.2; for carbon dioxide fire extinguishing systems is 904.8; for Halon 1301 fire extinguishing systems is 904.9; dry-chemical extinguishing systems 904.6; wet-chemical extinguishing systems 904.5; water based fire protection 903.5; fire alarm systems 907.9; and clean agent extinguishing systems 904.10.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard NFPA 204-2007 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria. The companion code change proposal mentioned in the proponent's reason statement is F146-09/10.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ANDERSON-TOM-F5- 901.6.DOC

F64–09/10

901.9 (New)

Proponent: Rick Sheets, Fire Committee Chair, Brinks Home Security, representing National Burglar and Fire Alarm Association

Add new text as follows:

901.9 Discontinuation or change of service. Notice shall be made to the fire code official whenever contracted alarm services for monitoring or testing or inspection of an existing fire alarm system are terminated for any reason, or a change in alarm monitoring provider or other service provider is made. Notice shall be made in writing, to the fire code official by the building owner and where required, by the alarm service provider being terminated.

Reason: It is, and should always remain, the responsibility of the commercial property owner to maintain their building(s) to code. The code prohibits the "removal of or tampering with equipment" and "appurtenances", and in 901.4 of this code states that "fire protection systems shall be maintained in accordance with the original installation standards for that system", yet no such language is provided for non-tangible services. Any contracted services for remote station monitoring and the required testing of equipment in place at the time of acceptance, could be cancelled after the Acceptance Test without notifying the code official. This is of concern for many reasons:

1. The alarm service provider of record may be replaced with non-licensed, non-registered, non-qualified and non-approved personnel or methods.
2. Due to non-payment of fees by the property owner, the alarm service provider may have stopped (or will soon stop) monitoring, repairing and testing of the fire alarm system.
3. If an alarm service provider no longer provides monitoring, repairing or testing services due to non-payment they cannot be seen by the code official as being at fault.

Since by code, the building owner is responsible for keeping their building and fire alarm system in proper working condition, part of that responsibility lies in the fact that they are paying their bills to their alarm service provider. In any other circumstance nonpayment is merely a contract dispute between customer and provider. However, since the service being provided is mandated by code (monitoring and testing) the service provider gets caught in the middle of a complex situation. The addition of this rule will provide the proper notifications to be made before discontinuance of required services.

While the impairment coordinator should be the one to inform the fire official of these types of changes, they may be reluctant to do so because they'd be admitting that these services have been stopped as a cost cutting measure. Allowing the alarm service provider to also notify the fire code official of imminent cessation of service provides a cross-check to ensure the proper continuation of services present at the time of acceptance remain in effect. If another service provider has been procured by the building owner this notification allows the fire code official an opportunity to make sure any required licenses and permits are in place.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SHEETS-F6-901.8.2.DOC

F65–09/10
903.1.2 (New) [IBC [F] 903.1.2 (New)]

Proponent: Lee Kranz, City of Bellevue, WA, representing The Washington Association of Building Officials (WABO), Technical Code Development Committee

Add new text as follows:

903.1.2 (IBC [F] 903.1.2) Fire walls. For the purposes of this section, each portion of a building separated by one or more fire walls complying with Section 706 of the *International Building Code* shall be considered to be a separate building.

Reason: This code change clarifies that fire walls may be used to create separate buildings for sprinkler protection requirements found in IBC, Section 903. This change is necessary to remind readers of the basic code principle that fire walls create separate buildings, even for sprinkler purposes, and ensures that the code is applied consistently throughout. The definition of "Fire Area", found in IBC Section 702 includes fire walls as an element to define the boundaries of the fire area.

IBC Sections 503.1 and 706.1 clearly indicate that portions of buildings separated by one or more fire walls shall be considered separate buildings. Section 903 contains language that appears to conflict with the fire wall provisions because there is no specific reference to fire walls creating separate buildings for sprinkler protection requirements. One example of an ambiguity may be found in Section 903.2.7 where currently, it is not clear if a fire wall creates separate buildings for sprinkler system scoping requirements. This issue is resolved by adding the proposed language.

In a mixed-use building containing an occupancy required to be provided with an approved automatic sprinkler system, a fire wall, installed per Section 706, is permitted to eliminate the need to provide sprinkler protection throughout the entire building, thereby limiting the installation to the applicable occupancy.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KRANZ-F2-903.1.2.DOC

F66–09/10
903.2 (IBC [F] 903.2)

Proponent: David S. Collins, FAIA, The Preview Group, Inc., representing The American Institute of Architects

Revise as follows:

903.2 (IBC [F] 903.2) Where required. *Approved automatic sprinkler systems* in new buildings and structures shall be provided in the locations described in Sections 903.2.1 through 903.2.12.

Exceptions:

1. Spaces or areas in telecommunications buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided those spaces or areas are equipped throughout with an automatic smoke detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour *fire barriers* constructed in accordance with Section 707 of the *International Building Code* or not less than 2-hour *horizontal assemblies* constructed in accordance with Section 712 of the *International Building Code*, or both
2. Where fire areas exceed the limits in Sections 903.2.1 through 903.2.9, fire barriers constructed in accordance with Section 707 of the *International Building Code* or horizontal assemblies constructed in accordance with Section 712, or both, shall be permitted to create smaller fire areas, in accordance with

Section 706.3.9 of the *International Building Code*, that would not be required to be protected by an approved automatic sprinkler system. This exception shall not apply where other provisions of this code would otherwise require the installation of an approved automatic sprinkler system.

Reason: There is a lack of clear direction as to how the thresholds in 903.2 are to be applied where a fire area is created by construction of fire barriers as allowed in Assembly and other occupancies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COLLINS-F1-903.2.DOC

F67–09/10
903.2.1.2 (IBC [F] 903.2.1.2)

Proponent: Kelly P. Reynolds representing Chick-Fila-A and McDonald's Corporation

Revise as follows:

903.2.1.2 (IBC [F] 903.2.1.2) Group A-2. An automatic sprinkler system shall be provided for Group A-2 occupancies where one of the following conditions exists:

1. The fire area exceeds 5,000 square feet (464 m^2);
2. The fire area has an occupant load of ~~100~~ 150 or more;
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.

Reason: The three legacy codes (BOCA, ICBO & SBCCI) did not classify restaurants as A-2 (assembly) use groups, until the 2000 edition of the IBC (International Building Code). Even then, fire sprinklers were not required until the building was more than 5,000 sq. ft. or had an occupancy load of more than 300 persons. This same requirement appeared in the Life Safely Code **(**NFPA No. 101).
The sprinkler threshold dramatically changed to more than I00 persons in the 2006 IBC and 2006 IFC (International Fire Code).

Historically, the 300 person fire sprinkler threshold was based on tragic night club fires such as the Cocoanut Grove in Boston in 1942 that killed 492 persons and the Beverly fire in Kentucky in 1977 claimed 150 lives that were both over crowded beyond their legal capacity.

In 2003, The Station Nightclub fire in Rhode Island took 100 lives. It was over crowded by more than 200 persons. Through an apparent over-reaction, the code made a dramatic change of the fire sprinkler threshold for A-2 Use Groups from 300 persons down to 100 persons.

The intent of this code change proposal is to change that threshold to a more reasonable 150 persons to accommodate quick-serve restaurants. A quick-serve restaurant is "defended in place" and does not have the same conditions that these three infamous fire tragedies had. They do not have overcrowding, loud noise (music), and low lighting levels.

No alcohol or potential reaction/judgment impairing consumption's occur in quick-service restaurants, unlike nightclubs or full-service restaurants. Furthermore, they are "easy to navigate" and "well lit". The grease-laden cooking equipment is the only area of real concern and that is protected throughout by pre-engineered, self contained, approved fire suppression systems.

The 150 person threshold for fire sprinklers is more reasonable than the current 100 persons for these types of operations. Furthermore, there are no recorded fire deaths in any such type of quick-serve operations based on N FPA Fire Statistics .

Cost Impact: The code change proposal will reduce cost for A-2 uses under 150 people.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: REYNOLDS-F1-903.2.1.2

F68–09/10
903.2.2 (IBC [F] 903.2.2)

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Revise as follows:

903.2.2 (IBC [F] 903.2.2) Group B Ambulatory health care facilities. An *automatic sprinkler system* shall be installed throughout ~~all *fire areas*~~ the entire floor containing a Group B ambulatory health care facility ~~occupancy~~ and all floors between the ambulatory health care facility and the *level of exit discharge* serving such a facility, including the *level of exit discharge* serving such a facility when either of the following conditions exist at any time:

1. Four or more care recipients are incapable of self preservation.
2. One or more care recipients that are incapable of self preservation are located at other than the *level of exit discharge* serving such a~~n~~ facility ~~occupancy~~.

Reason: The current language would allow Ambulatory Surgical Centers to be placed in a high-rise structure, but would only require that the surgical center is to be sprinklered. In a fire, occupants would have to exit through spaces that lack sprinkler protection. If sprinklers are required to protect occupants in ambulatory surgical centers, it is illogical to expect them to evacuate through unprotected spaces.

Automatic sprinkler systems are required in Ambulatory Health Care Facilities because the patients could be incapable of self-preservation. When assistance is necessary for evacuation, the evacuation time increases. The current code will require sprinklers within the Ambulatory Health Care Facility, so when the employees start to evacuate the patients they are in a protected, sprinklered, environment. But as they leave the Ambulatory Health Care Facility and continue to the exit, they would be leaving the sprinklered area. This is contrary to the reasoning to provide fire sprinklers in the first place. The patients in these facilities will take longer to evacuate, and will need assistance to evacuate.

Therefore, this proposal will require that when an Ambulatory Health Care Facility is located in a multi-story building, that the entire floor is protected with fire sprinklers and every floor between that level and the level of exit discharge will also be protected with fire sprinklers. This will provide a safe route for evacuation of patients to the exterior of the building.

The term "occupancy" is deleted after "ambulatory health care facility" because it is not needed and becomes redundant when it is referred to as a "facility occupancy."

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F8-903.2.2.DOC

F69–09/10

903.2.4 (IBC [F] 903.2.4), 903.2.7 (IBC [F] 903.2.7), 903.2.9 (IBC [F] 903.2.9)

Proponent: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Revise as follows:

903.2.4 (IBC [F] 903.2.4) Group F-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group F-1 occupancy where one of the following conditions exists:

1. Where a Group F-1 fire area exceeds 12,000 square feet (1115 m^2);
2. Where a Group F-1 fire area is located more than three stories above grade plane; or
3. Where the combined area of all Group F-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2).
4. Where a Group F-1 occupancy is used for the manufacture of upholstered furniture or mattresses.

903.2.7 (IBC [F] 903.2.7) **Group M.** An automatic sprinkler system shall be provided throughout buildings containing a Group M occupancy where one of the following conditions exists:

1. Where a Group M fire area exceeds 12,000 square feet (1115 m^2);
2. Where a Group M fire area is located more than three stories above grade plane; or
3. Where the combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2). ; or
4. Where a Group M occupancy is used for the display and sale of upholstered furniture or mattresses.

903.2.9 (IBC [F] 903.2.9) Group S-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group S-1 occupancy where one of the following conditions exists:

1. A Group S-1 fire area exceeds 12,000 square feet (1115 m^2);
2. A Group S-1 fire area is located more than three stories above grade plane; or
3. The combined area of all Group S-1 fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2).
4. A Group S-1 fire area used for the storage of commercial trucks or buses where the fire area exceeds 5,000 square feet (464 m^2).
5. A Group S-1 occupancy is used for the storage of upholstered furniture or mattresses.

Reason: Last cycle the upholster furniture industry submitted a proposal to require the installation of automatic sprinkler systems in mercantile occupancies that contain upholstered furniture regardless of the size of the occupancy. The committee agreed and accepted the proposal. The hazard presented by the upholstered furniture in the mercantile occupancy is greater in an F-1 occupancy where the furniture is being manufactured and in an S-1 occupancy where the fuel load contribution of the upholstered furniture is greater than in the mercantile group. For this reason both the F-1 and S-1 involving upholstered furniture should be protected with an automatic sprinkler system regardless of the size of the occupancy.

Mattresses has been added to the F-1, M and S-1 Groups requiring the automatic sprinkler systems because the polyfoam that presents the hazard in the upholstered furniture presents the same hazard in the mattresses and should have similar protection levels.

Cost Impact: The code change proposal will increase the cost of construction for occupancies containing this hazard.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F17-903.2.4.DOC

F70–09/10
903.2.6 (IBC [F] 903.2.6)

Proponent: Roland J. Huggins, PE, American Fire Sprinkler Association, representing self

Revise as follows:

903.2.6 Group I. An *automatic sprinkler system* shall be provided throughout buildings with a Group I *fire area*.

Exception: An *automatic sprinkler system* installed in accordance with Section 903.3.1.2 or 903.3.1.3 shall be allowed in Group I-1 facilities <u>provided that:</u>

1. <u>A hydraulic design information sign is located on the system riser</u>
2. <u>Exception 1 of Section 903.4 is not applied</u>
3. <u>Systems installed in accordance with Section 903.3.1.3 shall be maintained in accordance with the requirements of Section 903.3.1.2</u>.

Reason: This exception provides a very cost efficient system but an institutional facility is still a commercial facility and warrants a higher level of assurance that the system will work. An NFPA 13D system does not require any identification for the design basis of the system so others working on the system after installation need this information. Granted, building plans are supposed to be maintained, but often aren't and a system riser sign is often the only guidance available. Section 903.4 requires the system to be monitored so in case of fire the fire department is automatically notified. Exception #1 excludes systems in one-and two-family dwellings. Since Section 903.3.1.3 explicitly links NFPA 13D systems and one- and two-family dwellings, it is interpreted that Exception #1 applies to all 13D systems. Clarification is needed. As a final item, if the intent of the ICC is that these facilities be maintained to ensure adequate operation, guidance must be provided. Simply referencing Section 903.5 will not work since it references IFC which references NFPA 25. NFPA 13D systems are outside the scope of NFPA 25. The only maintenance and testing performed on an NFPA 13D system is provided by the homeowner.

Cost Impact: The code change proposal will have minimal impact on the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HUGGINS-F1-903.2.5.DOC

F71–09/10
903.2.7 (IBC [F] 903.2.7)

Proponent: Michael E. Dell'Orfano, South Metro Fire Rescue Authority, representing Fire Marshal's Association of Colorado

Revise as follows:

903.2.7 (IBC [F] 903.2.7) Group M. An *automatic sprinkler system* shall be provided throughout buildings containing a Group M occupancy where one of the following conditions exists:

1. A Group M *fire area* exceeds 12,000 square feet (1115 m^2).
2. A Group M *fire area* is located more than three stories above grade plane.
3. The combined area of all Group M *fire areas* on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2).
4. A Group M ~~occupancy is~~ <u>fire area</u> used for the display and sale of upholstered furniture <u>where the fire area exceeds 7,250 square feet (673 m^2)</u>.

Reason: When F135-07/08 was approved, a zero-square-foot sprinkler threshold was established for Group M's displaying and selling upholstered furniture. However, the code development committee recommended that a more reasonable threshold be established for the sprinkler requirement. In order to create that higher threshold, we have considered other upholstered furniture sprinkler requirements found in the IFC and recommend that the new threshold should be:

1. Greater than 0 square feet: Under the 2009 IFC, very small "boutique" stores will have to protect their buildings with sprinklers when they are only displaying a few loveseats, children's bedroom sets, etc. Most occupancies other than merchantile don't have to be sprinklered even though they may contain more upholstered furniture than these small stores.

2. Greater than 2,500 square feet: Even buildings with high-piled storage of upholstered furniture usually don't have to be protected with sprinklers until they reach this threshold.
3. Less than 12,000 square feet: All Group M fire areas already have to be sprinklered at this threshold.

The proposed threshold of 7,250 square feet was chosen through a simple method of selecting the half-way point between 2,500 and 12,000 square feet while considering the above criteria. Also, changing "occupancy" to "fire area" follows the existing format for Group M sprinkler requirements and avoids having to measure the actual area of furniture displays (which may change over time).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DELL'ORFANO-F1-903.2.7.DOC

F72–09/10
903.2.7 (IBC [F] 903.2.7)

Proponent: Ken Brouillette, City of Puyallup, Washington

Revise as follows:

903.2.7 (IBC [F] 903.2.7) Group M. An automatic sprinkler system shall be provided throughout buildings containing a Group M occupancy where one of the following conditions exists:

1. A Group M fire area exceeds 12,000 square feet (1115 m^2).
2. A Group M fire area is located more than three stories above grade plane.
3. The combined area of all Group M fire areas on all floors, including mezzanines, exceeds 24,000 square feet (2230 m^2).
4. ~~A Group M occupancy is used for the display and sale of upholstered furniture.~~

Reason: This addition to the 2009 code has caused an extreme hardship for business owners and an enforcement nightmare for AHJ's. One piece of furniture would create the requirement to retrofit an existing building. High hazard commodities in Chapter 23 of the IFC do not require an automatic fire sprinkler system until 501 feet of storage is required. A clear threshold is necessary for enforcement of this section.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BROUILLETTE-F1-903.2.7.DOC

F73–09/10
903.2.11 (IBC [F] 903.2.11)

Proponent: Donald R. Monahan, PE, Walker Parking Consultants, representing the National Parking Association and the Automated & Mechanical Parking Association

Revise as follows:

903.2.11 (IBC [F] 903.2.11) Specific building areas and hazards. In all occupancies an *automatic sprinkler system* shall be installed for building design or hazards in the locations set forth in Sections 903.2.11.1 through 903.2.11.6.

Exceptions:

1. Groups R-3 and U.
2. Open parking garages

Reason: This section requires fire sprinklers in stories and basements of all occupancies without exterior wall openings meeting a minimum dimension of 30 inches totaling 20 square feet in each 50 linear feet on at least one side for fire department access. Open parking garages typically meet the opening requirements, however, there are many open parking garages that have been constructed with architectural mesh covering the exterior of the garage. The mesh has adequate openness to meet the definition of an open parking garage in 406.3 with natural ventilation, however, the mesh does not provide the openings required in this section for fire department access. Because of the many open parking garage projects that have been constructed with architectural mesh and without fire sprinklers, it appears fire departments are satisfied with firefighter access via the stairways. Further, there are not interior partitions, as with most other building types, that would restrict access to any area within the garage. Fire sprinklers should not be required in open parking structures because of their non-combustible structure design, the nature and limited amount of combustible content, alternate open egress routes, easy access via stairways for firefighting, and ample openings to allow dissipation of smoke and combustion gases. Open parking structures are recognized as a low hazard to life and property from fire. The risk of fire spread and personal injury in an open parking structure fire is extremely low.

Representative Projects:

Wynn Hotel/Casino Parking Structure Las Vegas, NV	Arizona State University PS Tempe, AZ	Reservoir Woods PS Waltham, MA	High/Alma South PS Palo Alto, CA
Bellagio Parking Structure Las Vegas, NV	Harrisburg International Airport PS Harrisburg, PA	GTECH Center PS Providence, RI	Community Hospital North Indianapolis, IN
Convention Center PS Austin, TX			

Sources: http://www.bankerwire.com/portfolio_detail.php?portID=21
http://www.cambridgeparkade.com/case_study.asp?id=0

References:
Analysis of Garage Fires, Publication 2006-01-0791, SAE International, Warrendale, PA, April 2006.
Structure and Vehicle Fires in General Vehicle Parking Garages, National Fire Protection Association, Quincy, MA, January 2006.

Cost Impact: Significant cost savings not to install automatic fire sprinklers in open parking garages.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MONAHAN-F1-903.2.11.DOC

F74–09/10
903.2.11 (IBC [F] 903.2.11)

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Revise as follows:

903.2.11 (IBC [F] 903.2.11) Specific buildings areas and hazards. In all occupancies other than Group U, an *automatic sprinkler system* shall be installed for building design or hazards in the locations set forth in Sections 903.2.11.1 through 903.2.11.6.

~~Exception:~~ ~~Group R-3 and Group U.~~

Reason: This proposal provides correlation with IFC Section 903.2.8 which requires that all Group R occupancies be equipped with fire sprinklers. Currently, Section 903.2.8 requires fire sprinklers in all Group R occupancies, but then Section 903.2.11 lists R-3 as an exception. This creates confusion and misapplication.

This proposal will provide consistency between the two sections.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F9-903.2.11.DOC

F75–09/10
903.2.11.1 (IBC [F] 903.2.11.1)

Proponents: Tom Lariviere, Chairman, Joint Fire Service Review Committee; Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Revise as follows:

903.2.11.1 (IBC [F] 903.2.11.1) Stories without openings. An *automatic sprinkler system* shall be installed throughout all stories, including *basements*, of all buildings where the floor area exceeds 1,500 square feet (139.4 m^2) and where there is not provided at least one of the following types of *exterior wall* openings:

1. Openings below grade that lead directly to ground level by an exterior stairway complying with Section 1009 or an outside ramp complying with Section 1010. Openings shall be located in each 50 linear feet (15 240 mm), or fraction thereof, of *exterior wall* in the story on at least one side. The required openings shall be distributed such that the lineal distance between adjacent openings does not exceed 50 feet (15 240 mm).

2. Openings entirely above the adjoining ground level totaling at least 20 square feet (1.86 m^2) in each 50 linear feet (15 240 mm), or fraction thereof, of *exterior wall* in the story on at least one side. The required openings shall be distributed such that the lineal distance between adjacent openings does not exceed 50 feet (15 240 mm). The height of the bottom of the clear opening shall not exceed 44 inches (1118 mm) measured from the floor.

Reason: The purpose of the openings under Section 903.2.11.1 are for firefighting operations. To effectuate firefighting operations the openings need to be accessible and usable. Therefore this proposal specifies that the maximum sill height of 44" above the floor must be provided. This height is consistent with the height provided for Emergency Escape and Rescue windows in Section 1029.3.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F10-SHUMAN-F2-903.2.11.1.DOC

F76–09/10
903.2.11.1.3 (IBC [F] 903.2.11.1.3)

Proponents: Tom Lariviere, Chairman, Joint Fire Service Review Committee; Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Revise as follows:

903.2.11.1.3 (IBC [F] 903.2.11.1.3) Basements. Where any portion of a *basement* is located more than 75 feet (22 860 mm) from openings required by Section 903.2.11.1, or where walls, partitions or other obstructions are installed that restrict the application of water from hose streams, the *basement* shall be equipped throughout with an *approved automatic sprinkler system*.

Reason: The purpose of the openings under Section 903.2.11.1 are for firefighting operations.

The firefighting purpose of these openings is to provide the ability to confine the fire in the basement from the exterior of the building. A basement fire can be especially dangerous to enter under fire conditions. Firefighters must be able to apply hose stream water from the exterior of the structure through these openings provided. This is particularly important in basements (below grade floors) since entry through a stairway would require firefighters to travel down into the heat and smoke that is trying to escape up and out the stairway.

When obstructions such as walls or partitions are installed in the basement, the ability to apply hose streams through these openings and reach the basement area is reduced or eliminated. The configuration and clear-opening requirements become useless when an interior wall or other obstruction is placed inside the basement. In that case, it is reasonable to require automatic fire sprinklers to provide adequate protection in the basement. This proposal requires that in the case of obstructions, the basement shall be provided with an approved automatic sprinkler system.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F11-SHUMAN-F3-903.2.11.1.3.DOC

F77–09/10
903.2.11.2 (IBC [F] 903.2.11.2)

Proponent: Edward L. Repic, Architectural Refuse Solutions, LLC, representing self

Revise as follows:

903.2.11.2 Rubbish and linen chutes. An *automatic sprinkler system* shall be installed at the top of rubbish and linen chutes and in their terminal rooms. Chutes ~~extending through three or more floors~~ shall have additional sprinkler heads installed ~~within such chutes~~ at alternate floors and at the lowest intake. When a rubbish chute extends through a building more than one floor below the lowest intake the extension shall have sprinklers installed on the exterior of the chute at alternate floors beginning with the second level below the last intake and ending with the floor above the discharge. Chute sprinklers shall be accessible for servicing. A dry–pipe automatic sprinkler system shall be required for exterior chute extensions unless otherwise approved.

Note Regarding Reason: This submittal is part of four such proposals submitted as independent documents with the intent of adequately addressing Rubbish Chutes (which can include "recycling" chutes that simply redirect parts of the rubbish waste stream to locations other than a landfill) and Linen (or Laundry) Chutes. These proposals individually address Life Safety, Sprinkler Placement, Accessibility in new and existing facilities, and actual Chute Construction and a related component to Rubbish Chutes: Compactors (codes generally address the shaft enclosure but ignore the actual chute being enclosed or the compactor it is feeding).

Reason: Rubbish and linen chutes, typically 24" in diameter can convey a fire up a building through smoke compartments at every level due to the chimney effect generated by this large diameter feature extending from the lowest floors of the building to a point 3' to 6' above the roof, depending upon local requirements. A rubbish chute shaft enclosure usually terminates at the floor level above the discharge level. The rubbish room at the base of the chute is required to be rated the same as the chute enclosure shaft. That means, for all practical purposes, that a chute enclosure shaft, unlike any other shaft in construction, contains combustibles within the shaft enclosure: In this case, the rubbish that is collected at the base of the chute. We believe that a fire should be given the least possible opportunity to spread. The additionally recommended sprinkler heads allow one less floor to be exposed to fire when the alternate count leaves the bottom intake unprotected by a sprinkler head.

It is important to note, too, that the odorous muck and mung that builds up on the inside of a rubbish chute ... which includes cooking fats and oils ... is flammable. We have literally scraped this buildup off the inside of a chute, ignited it with a lighter, and watched it burn like a candle.

The addition of sprinkler heads on chutes that extend several stories below the lowest intake protects against the buildup igniting several floors below the lowest chute sprinkler level without control. This is particularly important when you consider that the buildup of steam pressure can be significant once the first sprinkler head is activated. That pressure can contribute to spreading the fire beyond the chute in the event that the pressure is sufficient to blow a poorly maintained intake door open, thereby exposing theretofore uninvolved floor(s) to the spread of fire

Cost Impact: The code change proposal will not increase construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: REPIC-F1-903.2.11.2.DOC

F78–09/10
903.3.1 (IBC [F] 903.3.1)

Proponent: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Revise as follows:

903.3.1 (IBC [F] 903.3.1) Standards. Sprinkler systems shall be designed and installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3 and Chapters 23 and 34 of this code, as applicable.

Reason: Both chapters 23 and 34 of the *International Fire Code* have extensive design requirements for automatic sprinklers systems that need to be applied. This added language is to serve as a pointer to those two chapters to provide needed direction to designers and code officials.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F16-903.3.1.DOC

F79–09/10
903.3.1.1, 903.3.1.2 (New) [IBC [F] 903.3.1.1, [F] 903.3.1.2 (New)]

Proponent: Marshall Klein, PE, Marshall A. Klein & Associates Inc., representing National Multi Housing Council (NMHC)

1. Revise as follows:

[F] 903.3.1.1 (IBC [F] 903.3.1.1) NFPA 13 sprinkler systems. Where the provisions of this code require that a building or portion thereof be equipped throughout with an automatic sprinkler system in accordance with this section, sprinklers shall be installed throughout in accordance with NFPA 13 except as provided in Sections 903.3.1.1 and 903.3.1.2.

2. Add new text as follows:

903.3.1.2 (IBC [F] 903.3.1.2) Bathrooms. In Group R occupancies, other than Group R residential care facilities, sprinklers shall not be required in bathrooms that do not exceed 55 square feet in area and are located within individual dwelling units or sleeping units.

Reason: In the 1976 edition of the Life Safety Code, to encourage sprinklers in apartment buildings, NFPA 101 Section 11-3.8.3.4.1 Exception permitted bathrooms that did not exceed 55 sq. ft within individual dwelling units to omit sprinklers when the apartment building was sprinklered in accordance with NFPA 13. In the 1991 edition of NFPA 13, this exception was added to that Code (Section 4-4.1.7.7.1) with the understanding that the NFPA 101 codes's next edition in 1994 could then delete the exception since it was placed in the sprinkler code. In the 1994 edition of NFPA 101, the sprinkler exception was removed from Section 18-3.5 Exception because NFPA 13 picked it up.

The history of apartment unit bathroom fires is minuscule. Even according to the latest NFPA Home Structure Fire Report, January 2009, Table 9B, "Reported Apartment Structure Fires by Area of Origin 2003-2006 Annual Averages", out of 113,000 fires/year, only 1600 (1%) are in bathrooms. In comparison, according to the NFPA US Hotel & Motel Structure Fire Report, March 2008, Table 8, "Structure Fires in Hotels & Motels by Area of Origin 2002-2005 Annual Averages", out of 3900 fires/year, only 130 (3%) are in "Lavatory, bathroom, locker room or check room". The upshot is that bathroom fires in apartments, hotels or motels are not a major fire problem in sprinklered or non-sprinklered buildings and that is why the past NFPA Codes and the Model Building Codes (including the I Codes) have exempted small bathrooms from sprinklers in order to encourage these residential occupancies to be sprinklered for life safety/fire protection.

However, now in the 2009 edition of NFPA 13, that will be referenced in the 2012 I Codes, Section 8.15.8.1.1 has been revised to permit omission of sprinklers ***only*** in bathrooms in hotel/motel dwelling units. The code proposal to the 2009 NFPA 13 was first rejected by the NFPA 13 Committee during its ROP period (Code Proposal 13-202 Log #79) with the Committee Statement for rejection as "No technical data was provided supporting this change". But during the ROC period, a public comment (Comment 13-141 Log #235) was submitted by the National Fire Sprinkler Association (NFSA), and the NFPA 13 Committee accepted the Comment based not on any technical data supporting the change, but on the following substantiation:

"Substantiation for NFPA 13 Public Comment 13-141: As a rule, the traditional bathroom has changed in fire loading. Storage of combustibles in these rooms is now very common and the use of high wattage electrical devices has gained widespread acceptance. From unattended curling irons and candles to exhaust fans with exposed heating elements, there are many new sources for potential fires in today's bathrooms. The exception to this new trend would generally be the bathroom in a hotel or motel room that maintains a minimal combustible loading due to the transient nature of the occupancy. As the original submitter pointed out, the Committee has recognized this when discussing closets in these occupancies. Therefore, the sprinklers in smaller bathrooms in hotels and motels should still be permitted to be omitted. This comment created by the NFSA Engineering and Standards Committee."

Out of the 25 voting members of the NFPA 13 Committee, the 2 members that voted to reject the change and their comments were:
BAHADORI, H. (representing Hughes Associates): "This will remove the exception for all apartments and condominium buildings. No substantiation has been provided to justify this."
KEEPING, L.(representing Canadian Automatic Sprinkler Association): "I do not believe that this material should have been accepted. Prior to the 1991 edition of NFPA 13, sprinklers were only allowed to be omitted from the washrooms in hotels, but for that edition, the allowance was opened up to all dwelling units as long as they were no larger than 55 sq. ft. and enclosed within a 15 minute thermal barrier. At that time adequate technical substantiation was offered to validate the change. Since that time, no adverse fire losses have been brought to the Committee's attention that would support this backward step. Further the conditions inside the bathrooms of today are no different from those that were found in 1991, so the current submitter's substantiation is not convincing."

If apartment bathrooms are so hazardous to the occupants' safety, wouldn't one think that in the past 33 years the fire data would have reflected this major deficiency created by the NFPA 101 Subcommittee on Residential Occupancies back in 1976? Why is the multi-family industry, that has been one of the biggest supporters of residential sprinkler systems for the past 20 years, and has the ***best*** sprinkler performance records of **all** occupancy groups (From 2005 NFPA Fire Data On Sprinkler Reliability: 98% operational reliability x 98% effectiveness of sprinklers = 96% performance reliability for apartments) being singled out to provide additional sprinklers where there is no fire problem?

In summary, since the NFPA 13 Committee removed this apartment bathroom sprinkler exception from its sprinkler standard without any adequate reason that such an exception has been, or will be, a life safety/fire protection problem, it is only reasonable for the I Codes to place the exception back into its Codes to continue to encourage sprinkler installations in new, as well as existing, buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KLEIN-F2-903.1.1.1

F80–09/10
903.3.1.1.1 (IBC [F] 903.3.1.1.1)

Proponent: Dave Frable, U.S. General Services Administration

Revise as follows:

903.3.1.1.1 (IBC [F] 903.3.1.1.1) Exempt locations. Automatic sprinklers shall not be required in the following rooms or areas where such rooms or areas are protected with an approved automatic fire detection system in accordance with Section 907.2 that will respond to visible or invisible particles of combustion. Sprinklers shall not be omitted from any room merely because it is damp, of fire-resistance rated construction or contains electrical equipment.

1. Any room where the application of water, or flame and water, constitutes a serious life or fire hazard.
2. Any room or space where sprinklers are considered undesirable because of the nature of the contents, when approved by the fire code official.
3. Generator and transformer rooms separated from the remainder of the building by walls and floor/ceiling or roof/ceiling assemblies having a fire-resistance rating of not less than 2 hours.
4. Rooms or areas that are of noncombustible construction with wholly noncombustible contents.
5. Fire service access elevators machine rooms and machinery spaces.
6. Machine rooms and machinery spaces associated with occupant evacuation elevators designed in accordance with Section 3008 of the *International Building Code*.

Reason: The intent of this code change is to permit automatic sprinkler protection to be exempt in machine rooms and machinery spaces for occupant evacuation elevators. The proposal also provides consistency with the current requirements in Section 3008.6.1 of the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FRABLE-F3-903.3.1.1.1.DOC

F81–09/10
903.3.1.1.2 (New) [IBC [F] 903.3.1.1.2 (New)]

Proponent: Jeff Hugo, CBO, National Fire Sprinkler Association

Add new text as follows:

903.3.1.1.2 (IBC [F] 903.3.1.1.2) Sprinkler omissions Automatic sprinklers shall not be required to be installed in locations where NFPA 13 permits sprinklers to be omitted. The building shall still be considered equipped throughout.

Reason: The IBC requires that buildings using sprinklers for height/area increases and trade-offs (exceptions) to be sprinklered throughout. NFPA 13 also requires that the structure be sprinklered throughout (Section 8.1.1), unless specifically exempted by the standard. These areas that do not require sprinklers are commonly found in Chapter 8 of NFPA 13, and with these excepted areas, the building is still considered by the standard to be sprinklered throughout, which would comply with the requirements of the IBC.

One of the most common misinterpretations seen are canopies, exterior roofs and porte-cocheres being considered as a part of the main portion of the structure and therefore are being required to be sprinklered. The 2007 NFPA 13 clearly defines when sprinklers are required under the exterior roofs, canopies and porte-cocheres.

NFPA 13 (Section 8.15.7) is very specific on the sprinklering requirements in these appendages. All canopies, exterior roofs and porte-cocheres over 4' in width are required to be sprinklered unless:

- The canopy, roof, or porte-cochere is constructed with non-combustible, limited combustible, or fire retardant treated wood. (all fire retardant treated wood shall comply with NFPA 703)
- The underside (ceiling/eaves) of the canopy, roof, and porte-cochere of combustible construction provided the exposed finish material on the roof, canopy, or porte-cochere is non-combustible, limited combustible, or fire retardant treated wood, and the combustible concealed spaces (attic) is sprinklered, unless:
- The combustible concealed space is filled entirely with noncombustible insulation, or
- Ceilings that are noncombustible or limited combustible connected directly to joists with joist spaces not - exceeding 160 cubic feet, or
- If concealed spaces do not exceed 55 square feet in area.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HUGO-F3-903.3.1.1.2.DOC

F82–09/10
903.3.1.2.1 (New) [IBC [F] 903.3.1.2.1 (New)]

Proponent: Jeff Hugo, CBO, National Fire Sprinkler Association

Add new text as follows:

903.3.1.2.1 (IBC [F] 903.3.1.2.1) Sprinkler omissions Automatic sprinklers shall not be required to be installed in locations where NFPA 13R permits sprinklers to be omitted, except as specified by Section 903.3.1.2.2. The building shall still be considered equipped throughout.

(Renumber subsequent section)

Reason: The IBC requires that buildings using sprinklers for height increases and trade-offs (exceptions) to be sprinklered throughout. NFPA 13R also requires that the structure be sprinklered throughout, unless specifically exempted or not mentioned by the standard.

One of the most common misinterpretations seen are canopies, exterior roofs and porte-cocheres being considered as a part of the main portion of the structure and therefore are being required to be sprinklered. The 2007 NFPA 13 clearly defines when sprinklers are required under the exterior roofs, canopies and porte-cocheres.

This change would not affect balcony and deck requirement already in place in the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HUGO-F4-903.3.1.2.1.DOC

F83–09/10
903.3.5.2 (IBC [F] 903.3.5.2)

Proponent: Phillip A. Brown, American Fire Sprinkler Association

Revise as follows:

903.3.5.2 (IBC [F] 903.3.5.2) Secondary water supply. ~~A~~ An automatic secondary on-site water supply equal to the hydraulically calculated sprinkler demand, including the hose stream requirement, shall be provided for high-rise buildings in Seismic Design Category C, D, E or F as determined by the *International Building Code*. An additional fire pump is not required. The secondary water supply shall have a duration of not less than 30 minutes as determined by the occupancy hazard classification in accordance with NFPA 13.

Exception: Existing buildings.

Reason: A statement needs to be added to this section clarifying that the secondary water supply must be automatic and cannot be from a source that has to be manually activated. The Commentary clarification that an additional fire pump is not required should also be brought forward into this section.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BROWNP-F1-903.3.5.2.DOC

F84–09/10
903.4 (IBC [F] 903.4)

Proponent: Roland J. Huggins, PE, American Fire Sprinkler Association, representing self

Revise as follows:

903.4 (IBC [F] 903.4) Sprinkler system supervision and alarms. All valves controlling the water supply for *automatic sprinkler systems*, pumps, tanks, water levels and temperatures, critical air pressures and water-flow switches on all sprinkler systems shall be electrically supervised by a *listed* fire alarm control unit.

Exceptions:

1. *Automatic sprinkler systems* protecting ~~one- and two-family *dwellings*~~ installed in accordance with NFPA 13D.
2. Limited area systems serving fewer than 20 sprinklers.
3. *Automatic sprinkler systems* installed in accordance with NFPA 13R where a common supply main is used to supply both domestic water and the *automatic sprinkler system*, and a separate shutoff valve for the *automatic sprinkler system* is not provided.
4. Jockey pump control valves that are sealed or locked in the open position.
5. Control valves to commercial kitchen hoods, paint spray booths or dip tanks that are sealed or locked in the open position.
6. Valves controlling the fuel supply to fire pump engines that are sealed or locked in the open position.
7. Trim valves to pressure switches in dry, preaction and deluge sprinkler systems that are sealed or locked in the open position.

Reason: This requirement should be predicated upon the type of installed system instead of naming the facility it is installed in. This change also avoids the lack of coordination for changes to other sections, such as the addition of townhouses to Section 903.3.1.3 last cycle. This format follows that used Section 903.4, exception 3.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HUGGINS-F2-903.4.DOC

F85–09/10
903.4.2 (IBC [F] 903.4.2)

Proponent: Michael Perrino, Code Consultants, Inc.

Revise as follows:

903.4.2 (IBC [F] 903.4.2) Alarms. An *approved* audible devices , located on the exterior of the building in an approved location, shall be connected to every each automatic sprinkler system. Such sprinkler water-flow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Alarm devices shall be provided on the exterior of the building in an *approved* location. Where a fire alarm system is installed, actuation of the *automatic sprinkler system* shall actuate the building fire alarm system.

Reason: Current language can be misinterpreted to require audible devices throughout a building. This language makes it clear from the beginning of the section that the audible devices required by this section are only required on the exterior of a building.

Cost Impact: The code change proposal will decrease the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PERRINO-F1-903.4.2.DOC

F86–09/10
903.4.2 (IBC [F] 903.4.2)

Proponent: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Revise as follows:

903.4.2 Alarms. *Approved* audible audio and visual devices shall be connected to every *automatic sprinkler system*. Such sprinkler water-flow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Alarm devices shall be provided on the exterior of the building in an *approved* location. Where a fire alarm system is installed, actuation of the *automatic sprinkler system* shall actuate the building fire alarm system.

Reason: This would aid the fire service in their response to alarms by providing an outside horn strobe device. In areas with a large number of buildings that sound waves can bounce off of it is sometimes difficult to readily locate where the original sound is emanating from. Combining a visual device with the audible device will assist in quicker location identification.

An additional advantage would be that the fire code official could then require this device to be placed above the fire department connection as the "approved location" and this could then aid responding apparatus in locating the FDC especially at night or if the fire department connection is obstructed for any reason.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F12-903.4.2.DOC

F87–09/10
904.1.1 (New) [IBC [F] 904.1.1 (New)]

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Add new text as follows:

904.1.1 (IBC [F] 904.1.1) Certification of service personnel for fire extinguishing equipment. Service personnel providing or conducting maintenance on *automatic fire extinguishing systems*, other than *automatic sprinkler systems*, shall possess a valid Certificate issued by an *approved* third party certification organization, an *approved* governmental agency, or other *approved* organization for the type of system and work performed.

Reason: This proposal will allow the code official to specify a minimum level of qualifications for servicing fire extinguishing systems. Ensuring technicians are qualified will enable communities to stay in compliance with the latest code regulations for fire extinguishing systems.

This proposal allows several options for the code official. The code official could choose to accept certification from a third party organization, a governmental agency, or any other organization. Formal certification for automatic fire extinguishing system technicians provides a mechanism for the technicians to demonstrate their knowledge of codes, standards, and related practices. The code official only needs to ascertain that the service technician has the proper certification.

Third party certification programs must meet a minimum acceptable standard that ensures a proper examination preparation. Certification programs provide a mechanism for fire code officials to use to evaluate individuals for the necessary knowledge. Certification programs from third party certification agencies should comply with Regulations and National Standards, such as:

- Uniform Guidelines on Employee Selection Procedures
- US Equal Employment Opportunity Commission (EEOC)
- Standards for Educational & Psychological Testing
- National Council on Measurement in Education (NCME)
- American Educational Research Association (AERA)
- American Psychological Association (APA)

Certification by governmental agency quite often is a certificate issued by a state agency. Similar to third party certifications, governmental certification must be specific to the type of work to be performed.

Certification by other organizations could consist of manufacturer training and certification programs. These certifications typically are only valid for the products from the specific manufacturer.

The code official has the option to determine which certification methods are acceptable, or even if multiple certifications are necessary. Requiring certified technicians helps protect public safety and promotes professionalism and expertise and helps ensure the competency of those individuals involved in the service industry.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F12-904.1.1.DOC

F88–09/10
904.3.2 (IBC [F] 904.3.2)

Proponent: Jim Tidwell, Tidwell Code Consulting, representing Fire Equipment Manufacturers Association

Revise as follows:

904.3.2 (IBC [F] 904.3.2) Actuation. Automatic fire-extinguishing systems shall be automatically activated and provided with a manual means of activation in accordance with Section 904.11.1. Where more than one hazard could be simultaneously involved in fire due to their proximity, all hazards shall be protected by a single system designed to protect all hazards that could become involved.

Exception: Multiple systems may be installed if they are designed to operate simultaneously.

Reason: To clarify that all hazards must be appropriately protected. Allowing separate systems with differing activation mechanisms presents a significant potential for fire propagation beyond the capability of the fire protection systems. A likely scenario would be that a fire occurs in one area, and spreads to an adjacent hazard before the fire protection system activates; then, after the system has exhausted all of its supply of chemical, the adjacent fire reignites the original hazard, which is no longer protected. This requirement is consistent with NFPA 17 and 17-A. This change is for clarification only.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TIDWELL-F1-904.3.2.DOC

F89–09/10
904.5.1 (New)

Proponent: Mark Conroy, Brooks Equipment Company

Add new text as follows:

904.5.1 Technician qualifications. A service technician who performs maintenance on a wet-chemical extinguishing system shall comply with the qualification requirements of NFPA 17A.

(Renumber subsequent sections)

Reason: NFPA 17A requires certification of technicians that perform maintenance on wet chemical extinguishing systems in section 7.3. It is therefore reasonable and appropriate to reference NFPA 17A for qualification requirements for service technicians performing maintenance of these systems.

Some states have licensing programs that include a qualification test. This code change proposal allows these programs to continue, but mandates technician certification where licensing is not required.

Where licensing programs have not been developed, fire code officials are the best suited to determine appropriateness of testing programs based on test content and competitive pricing that is considered fair and reasonable at the local level.

Standardized test programs are the basis for certification. The tests are based on information available in the public domain and as a minimum include questions on the industry standard, NFPA 17A, Standard for Wet Chemical Extinguishing Systems. Where states do not have licensing programs with qualification tests, these certification programs can be used to fulfill this code change proposal for qualification of personnel servicing wet chemical extinguishing systems.

This code change proposal allows the fire code official to make the final determination of suitability based on testing programs that set a benchmark that is considered achievable, affordable, and reasonable.

Cost Impact: The cost of certification could be as high as $180 per technician. Some programs mandate periodic payments to maintain a certificate. The cost of certification could be passed along to the building owner in the form of higher fees for installing and servicing these systems. Therefore, this code change proposal could potentially increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CONROY-F2-904.5.1

F90–09/10
904.6.1 (New)

Proponent: Mark Conroy, Brooks Equipment Company

Add new text as follows:

904.6.1 Technician qualifications. A service technician who performs maintenance on a dry extinguishing system shall comply with the qualification requirements of NFPA 17.

(Renumber subsequent sections)

Reason: NFPA 17 (2009) requires certification of technicians that perform maintenance on dry chemical extinguishing systems in section 11.1. It is therefore reasonable and appropriate to reference NFPA 17 for qualification requirements for service technicians performing maintenance of these systems.

Some states have licensing programs that include a qualification test. This code change proposal allows these programs to continue, but mandates technician certification where licensing is not required.

Where licensing programs have not been developed, fire code officials are the best suited to determine appropriateness of testing programs based on test content and competitive pricing that is considered fair and reasonable at the local level.

Standardized test programs are the basis for certification. The tests are based on information available in the public domain and as a minimum include questions on the industry standard, NFPA 17, Standard for Dry Chemical Extinguishing Systems. Where states do not have licensing programs with qualification tests, these certification programs can be used to fulfill this code change proposal for qualification of personnel servicing dry chemical extinguishing systems.

This code change proposal allows the fire code official to make the final determination of suitability based on testing programs that set a benchmark that is considered achievable, affordable, and reasonable.

Cost Impact: The code change proposal could potentially increase the cost of construction. The cost of certification could be as high as $180 per technician. Some programs mandate periodic payments to maintain a certificate. The cost of certification could be passed along to the building owner in the form of higher fees for installing and servicing these systems.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CONROY-F3-904.6.1 (NEW)

F91–09/10
905.3.2 (IBC [F] 905.3.2)

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Delete without substitution:

~~**905.3.2 (IBC [F] 905.3.2) Group A.** Class I automatic wet standpipes shall be provided in nonsprinklered Group A buildings having an *occupant load* exceeding 1,000 *persons*.~~

~~**Exceptions:**~~

~~1. Open-air-seating spaces without enclosed spaces.~~
~~2. Class I automatic dry and semiautomatic dry standpipes or manual wet standpipes are allowed in buildings where the highest floor surface used for human occupancy is 75 feet (22 860 mm) or less above the lowest level of fire department vehicle access.~~

(Renumber subsequent sections)

Reason: The current code language requires that a standpipe system be installed in new Group A occupancies with an occupant load over 1,000 and that are not sprinklered. Groups A-1, A-3 and A-4 require sprinklers at an occupant load of 300; Group A-2 requires sprinklers at an occupant load of 100. Which leaves Group A-5 with no occupant load requirement, but it would be exempted based on Exception 1 of Section 905.3.2.

Therefore, a Group A occupancy with an occupant load over 1,000 persons is not permitted to be unsprinklered. As a result, this requirement will never be applicable.

Therefore, this section is proposed to be deleted.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F13-905.3.2.DOC

F92–09/10
905.3.6 (IBC [F] 905.3.6), 1107.5

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Revise as follows:

905.3.6 (IBC [F] 905.3.6) Helistops and heliports. Buildings with a *helistop* or *heliport* ~~that are equipped with a standpipe shall extend the~~ shall be provided with a Class I or III standpipe system extended to the roof level on which the *helistop* or *heliport* is located in accordance with Section 1107.5.

1107.5 Standpipe systems. ~~Where a~~ A building with a rooftop *helistop* or *heliport* ~~is equipped~~ shall be provided with a Class I or III standpipe system~~, the system shall be~~ extended to the roof level on which the helistop or heliport is located. All portions of the *helistop* and *heliport* area shall be within 150 feet (45 720 mm) of a $2^1/_2$-inch (63.5 mm) outlet on ~~a Class I or III~~ the standpipe system.

Reason: Currently, Section 905.3.6 and 1107.5 require a standpipe connection to serve a heliport IF the building has a standpipe system. The hazard is not related to the existence of the standpipe system. The hazard is the existence of the helistop or heliport.

A heliport is a distinct hazard that will involve flammable fuels. In the event of an emergency, rapid deployment of hand hose lines will be necessary to attack a resulting fire, effectuate rescue and to protect exposures and the remainder of the building. This proposal will specify that when a helistop or heliport is provided on a rooftop location, then a standpipe system is required.

The requirement will be for a standpipe system throughout the building, not just a connection at the roof level. This is critical in firefighting operations because many times the connection below the rooftop level may be needed just to gain access onto the roof. If the only connection is on the roof, it is of no use if the firefighters cannot get to it.

Additionally, a heliport includes fueling operations. It is entirely possible for a spill to not only affect the rooftop, but also floors below as the liquid fuel spreads. The standpipe system will again be utilized in these situations.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F14-905.3.6.DOC

F93–09/10
905.4 (IBC [F] 905.4)

Proponent: Marshall Klein, PE, Marshall A. Klein & Associates Inc.

Revise as follows:

905.4 (IBC [F] 905.4) Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required *stairway*, a hose connection shall be provided for each floor level above or below grade. Hose connections shall be located at an intermediate floor level landing between floors, unless otherwise *approved* by the *fire code official*.
2. On each side of the wall adjacent to the *exit* opening of a horizontal *exit*.

   Exception: Where floor areas adjacent to a horizontal *exit* are reachable from *exit stairway* hose connections by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the horizontal *exit*.

3. In every *exit* passageway, at the entrance from the exit passageway to other areas of a building.

   Exception: Where floor areas adjacent to an exit passageway are reachable from *exit stairway* hose connections by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the exit passageway to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an *exit* passageway or *exit corridor* to the mall.
5. Where the roof has a slope less than four units vertical in 12 units horizontal (33.3-percent slope), ~~each standpipe shall be provided with~~ a hose connection shall be located to serve ~~either on~~ the roof or at the highest landing of a stairway with stair access to the roof provided in accordance with Section 1009.13. ~~An additional hose connection shall be provided at the top of the most hydraulically remote standpipe for testing purposes.~~
6. Where the most remote portion of a nonsprinklered floor or story is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or story is more than 200 feet (60 960 mm) from a hose connection, the *fire code official* is authorized to require that additional hose connections be provided in *approved* locations.

Reason: Back during the 1999 ICC Code Cycle, Code Proposal F370-99 (which is now the existing wording in IBC/IFC Section 905.4) was approved as submitted to correlate the standpipe hose connection locations with NFPA 14.

The 2012 I Codes will reference the 2010 edition of NFPA 14 under IBC/IFC Section 905.2 This code proposal is correlating IBC/IFC hose connection requirements with the latest revisions for the location of hose connection in the 2010 edition of NFPA 14 Section 7.3.2.

The existing wording of the first sentence in Item #5 requires a hose connection at every roof location (where the roof has less than a 1 in 4 slope) above all stairways, whether or not such stairways actually have access to the roof. Since IBC/IFC Section 1009.13 does not require all stairways to have access to the roof, if additional hose connections are then placed on the roof from stairways that do not extend to the roof, such hose connections are not only a large initial expense, but also a long term maintenance expense (freezing issues). These additional roof hose connections are really not needed from a system testing or fire-fighting purpose. For fighting a roof fire, fire fighters would only hook up to a hose connection from a "protected enclosure" and enter the fire area on the roof with a charged hose line, not first go onto the roof that is on fire and then hook up to an unprotected roof hose connection. For flow/pressure standpipe testing purposes you only need one hose connection.

The ROP and ROC stages of the 2010 edition of NFPA 14 have been completed and NFPA 14 Committee Code Proposals 14-53 and 14-55 were accepted without any public comments submitted on them. Therefore, the code revisions to IBC/IFC Section 905.4(5) in this code proposal will correlate with NFPA 14.

The NFPA 14 Committee Code Proposal 14-53 added to A.7.3.2 the following sentence: "Only one standpipe is necessary to serve the roof, it is not the intent to extend each standpipe to the roof level." The substantiation by the NFPA 14 Committee was: "Clarifies the requirement for standpipes on building roofs." Therefore, the first sentence in Section 905.4(5) has been revised to correlate with NFPA 14 hose connection requirement for serving the roof.

The NFPA 14 Committee Code Proposal 14-55 deleted NFPA 14 Section 7.3.2.2 which read: "7.3.2.2 An additional 2½ in. (65 mm) hose connection shall be provided at the hydraulically most remote portion of the system to facilitate testing." The substantiation by the NFPA 14 Committee to delete this section was: "It is not the intent of the committee to require the second hose valve for testing. The topmost outlet and the outlet on the next floor below can be used for testing purposes. This better reflects the calculation requirement in Chapter 7." Therefore, the section sentence in Section 905.4(5) has been deleted to correlate with NFPA 14's deletion of this additional hose connection that is not needed to properly test the standpipe system.

The addition of the reference to IBC/IFC Section 1009.13, "Stairway to roof", in Section 905.4(5) is for user friendliness and correlation purposes with a related section of the Codes

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KLEIN-F3-905.4

F94–09/10
906.1 (IBC [F] 906.1)

Proponent: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Revise as follows:

906.1 (IBC [F] 906.1) Where required. Portable fire extinguishers shall be installed in the following locations.

1. In new and existing Group A, B, E, F, H, I , M, R-1, R-2, R-4 and S occupancies.

   ~~**Exception:** In new and existing Group A, B and E occupancies equipped throughout with quick response sprinklers, portable fire extinguishers shall be required only in locations specified in Items 2 through 6.~~

2. Within 30 feet (9144 mm) of commercial cooking equipment.
3. In areas where flammable or *combustible liquids* are stored, used or dispensed.
4. On each floor of structures under construction, except Group R-3 occupancies, in accordance with Section 1415.1.
5. Where required by the sections indicated in Table 906.1.
6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the *fire code official*.

Reason: Fire extinguishers have historically been the first line of defense for small, controllable fires. They are intended to be used for fires of limited size and easily controlled. If a fire is discovered in its early stages the most effective means of protecting life and preventing property loss is to sound an alarm and then to control and/or extinguish the incipient stage fire with a portable fire extinguisher. To simply wait for the fire to grow to size large enough for a sprinkler head to activate is contrary to lessons and guidance from the fire service and fire protection professionals. Since fire extinguishers provide a first line of defense vs. sprinklers, it remains unclear as to the justification for this exception .In that light, the Exception 1 to Section 906.1 should be deleted.

This exception was not in the original draft of the International Fire Code and it did not exist in any of the legacy fire codes. It currently does not exist in NFPA 1 Uniform Fire Code, NFPA 10 Standard for Portable Fire Extinguishers or NFPA 5000 Building Construction and Safety Code. It first appeared in the Final Draft of the 2000 editions of the IFC/IBC. Since the first publication of the International Fire Code, some fire service and fire protection professionals have expressed concern over the inclusion of an exception.

As a result a number of states have deleted the exception upon adoption of the IFC/IBC.

- 12 States plus Washington D.C. and New York City have Deleted Line 1 Exception.
- 2 States have amended Section 906.1 and the exception to require more extinguishers
- 2 States use both NFPA 1 and the IFC with more stringent code applicable.
- 17 additional States have adopted NFPA 1 as their fire code instead of the IFC.

A total of 33 State jurisdictions and an unknown number of local jurisdictions have chosen to delete the exception in favor of providing the ability to control a fire at its earliest stages.

There are other issues with this exception that have arisen since states have now been adopting the IFC and enforcing it within their state. Some examples are:

- The exception is not being interpreted correctly and as a result is not being limited to occupancies with “QUICK RESPONSE” sprinklers installed. Instead, it is being applied in all cases where “REGULAR” sprinklers are installed.
- When an occupancy is being renovated and the sprinkler system is updated, presently installed extinguishers are being removed, lessening the level of protection available.
- Fire code officials do not all see hazard areas the same and as a result Section 906.1, Item 6 is not consistently applied jurisdiction to jurisdiction.
- Some officials are exempting all extinguishers from being required thereby placing the occupants in danger at the time of a fire.

An added detriment is that if a building is occupied without fire extinguishers the ability of the building owner to properly and effectively place fire extinguishers is negatively impacted by the practical difficulty of installing fire extinguisher cabinets. Walls may not be thick enough for recessing the cabinets to keep the fire extinguishers from being obstructions to travel or from being hit and damaged themselves. If the walls and partitions can handle the recessed cabinets, design drawings and permits may be required to modify the walls and partitions.

This proposal will eliminate the exception and provide for the proper placement of an important firefighting tool.

Cost Impact: The code change proposal will cause a cost increase in new construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F8-906.1.DOC

F95–09/10
906.1 (IBC [F] 906.1)

Proponent: Steven Orlowski, National Association of Home Builders

Revise as follows:

906.1 (IBC [F] 906.1) Where required. Portable fire extinguishers shall be installed in the following locations.

1. In new and existing Group A, B, E, F, H, I, M, R-1, R-2, R-4, and S Occupancies.

   Exception: In new and existing Group A, B, ~~and~~ E and R-2 occupancies equipped with quick response sprinklers, portable fire extinguishers shall be required only in locations specified in Items 2 through 6.

2. Within 30 feet (9144 mm) of commercial cooking equipment.
3. In areas where flammable or *combustible liquids* are stored, used, or dispensed.
4. On each floor of structures under construction, except R-3 occupancies, in accordance with Section 1415.1.
5. Where required by the sections indicated in Table 906.1.
6. Special-hazard areas, including but not limited to, laboratories, computer rooms and generator rooms where required by the *fire code official*.

Reason: Both the International Building Code and the International Fire Code specifically require that all new R occupancies, which are considered light hazard according to NFPA 13, are equipped with quick-response or residential type automatic sprinklers. In addition, NFPA 13 permits some R occupancies to install an automatic suppression system in accordance to NFPA 13 R, when the structure does not exceed 4 stories in height. The purpose for requiring the quick response heads in group A, B, E and R-2 occupancies is to lower the operating temperature for the suppression system to react during the incipient stage of a fire emergency. This provides additional time for the occupants to evacuate the structure and achieve the overall desire for the occupant to evacuate the structure rather than fight the fire and put themselves at unnecessary risk.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ORLOWSKI-F1-906.1.DOC

F96–09/10
906.3 (New) [IBC [F] 906.3 (New)]

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Add new text as follows:

906.3 (IBC [F] 906.3) Certification of service personnel. Service personnel providing or conducting maintenance shall possess a valid Certificate issued by an *approved* third party certification organization, an *approved* governmental agency, or other *approved* organizations for the type of work performed.

(Renumber subsequent sections)

Reason: This proposal will allow the code official to specify a minimum level of qualifications for servicing portable fire extinguishers. Ensuring technicians are qualified will enable communities to stay in compliance with the latest code regulations for portable fire extinguishers.

This proposal allows several options for the code official. The code official could choose to accept certification from a third party organization, a governmental agency, or any other organization. Formal certification for portable fire extinguisher technicians provides a mechanism for the technicians to demonstrate their knowledge of codes, standards, and related practices. The code official only needs to ascertain that the service technician has the proper certification.

Third party certification programs must meet a minimum acceptable standard that ensures a proper examination preparation. Certification programs provide a mechanism for fire code officials to use to evaluate individuals for the necessary knowledge. Certification programs from third party certification agencies should comply with Regulations and National Standards, such as:

- Uniform Guidelines on Employee Selection Procedures
- US Equal Employment Opportunity Commission (EEOC)
- Standards for Educational & Psychological Testing
- National Council on Measurement in Education (NCME)
- American Educational Research Association (AERA)
- American Psychological Association (APA)

Certification by governmental agency quite often is a certificate issued by a state agency. Similar to third party certifications, governmental certification must be specific to the type of work to be performed.

Certification by other organizations could consist of manufacturer training and certification programs. These certifications typically are only valid for the products from the specific manufacturer.

The code official has the option to determine which certification methods are acceptable, or even if multiple certifications are necessary. Requiring certified technicians helps protect public safety and promotes professionalism and expertise and helps ensure the competency of those individuals involved in the service industry.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F15-906.3.DOC

F97–09/10
906.3 (New) [IBC [F] 906.3 (New)]

Proponent: Mark Conroy, Brooks Equipment Company

Add new text follows:

906.3 (IBC [F] 906.3) Technician qualifications. A service technician who performs maintenance and recharging of portable fire extinguishers shall comply with the technician qualification requirements of NFPA 10.

(Renumber subsequent sections)

Reason: NFPA 10 requires certification of technicians in section 7.1.2. It is therefore reasonable and appropriate to reference NFPA 10 for qualification requirements for service technicians performing maintenance and recharging of fire extinguishers.

Some states have licensing programs that include a qualification test. This code change proposal allows these programs to continue, but mandates technician certification where licensing is not required.

Where licensing programs have not been developed, fire code officials are the best suited to determine appropriateness of testing programs based on test content and competitive pricing that is considered fair and reasonable at the local level.

Standardized test programs are the basis for certification. The tests are based on information available in the public domain and as a minimum include questions on the industry standard, NFPA 10, Standard on Portable Fire Extinguishers. Where states do not have licensing programs with qualification tests, these certification programs can be used to fulfill this code change proposal for qualification of personnel servicing fire extinguishers.

This code change proposal allows the fire code official to make the final determination of suitability based on testing programs that set a benchmark that is considered achievable, affordable, and reasonable.

Cost Impact: The cost of certification could be as high as $180 per technician. Some programs mandate periodic payments to maintain a certificate. The cost of certification could be passed along to the building owner in the form of higher fees for installing and servicing extinguishers. Therefore, this code change proposal could potentially increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CONROY-F1-906.3 (NEW)

F98–09/10
907.1.1 (IBC [F] 907.1.1)

Proponent: Rick Sheets, Fire Committee Chair, Brinks Home Security, representing National Burglar and Fire Alarm Association

Revise as follows:

907.1.1 (IBC [F] 907.1.1) Construction documents. *Construction documents* for fire alarm systems shall be of sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that it will conform to the provisions of this code, the *International Building Code,* and relevant laws, ordinances, rules and regulations~~, as determined by the *fire code official*~~.

Reason: Rules and regulations are determined by law, not by an individual. This wording suggests that this is something that is intended to be "interpreted".

Administrative wording in chapter one states the duties and responsibilities of the code official, making this additional vague and incomplete language unnecessary.

IFC Section 106.4 *specifically* prohibits inspectors from dismissing provisions of adopted codes or ordinances.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SHEETS-F14-907.1.1-PRIMARY.DOC

F99–09/10
907.1.1 (New) [IBC [F] 907.1.1 (New)]

Proponent: Rick Sheets, Fire Committee Chair, Brinks Home Security, representing National Burglar and Fire Alarm Association

Add new text as follows:

907.1.1 (IBC [F] 907.1.1) Non-required systems. Non-required systems shall be permitted to be installed and maintained in accordance with the applicable provisions of Sections 907.1 and 907.3 through 907.9.

(Renumber subsequent sections)

Reason: The problem is that due to misapplication or misinterpretation of these rules, often times voluntary non-required protection is being discouraged. If the code is satisfied with no protection for a particular Use Group, then only applicable requirements should be enforced for non-required systems that a building owner chooses to have installed. The person paying for the *extra* protection should be the person setting the level of protection. The extra protection must be installed properly but to be compatible with NFPA 72, 2007 5.5.2.3 "Non-Required Coverage", the amount or level of additional protection must be left up to the building owner.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Note that if this code change proposal should be approved the IBC would reference Section 907.8 instead of 907.9.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SHEETS-F4-907.1.1-B.DOC

F100–09/10
907.2.1 (IBC [F] 907.2.1)

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

907.2.1 (IBC [F] 907.2.1) Group A. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group A occupancies ~~having an~~ where the occupant load ~~of~~ due to the assembly occupancy is 300 or more. Group A occupancies not separated from one another in accordance with Section 707.3.9 of the *International Building Code* shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

> **Exception:** Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

Reason: Section 508 of the IBC already addresses the extent of application for conditions where there are differing occupancy groups. The revised language recognizes that and makes reference back to that section of the code. There has been a question about how to apply the 300 occupants. If the 300 occupants are all in a single room, it is clear. However, it is not clear how the people in different parts of the building are combined to reach the threshold of 300.

For example: There are 150 assembly occupants in a small restaurant and another 200 occupants in another small restaurant in the same building, it is not clear from the code whether those people should be added together or not; and, if not, under what conditions. If the two restaurants are at opposite ends of a small strip retail center or on different floors of a small downtown building, the code will now be clear that the two areas must be separated using the mixed occupancy provisions if there are other occupancies between the two or by a fire barrier if the two restaurants adjoin one another.

The exception is unaffected by the proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOECKER-F3-907.2.1.DOC

F101–09/10

907.2.1 (IBC [F] 907.2.1), 907.2.2(IBC [F] 907.2.2), 907.2.3 (IBC [F] 907.2.3), 907.2.4 (IBC [F] 907.2.4), 907.2.7(IBC [F] 907.2.7), 907.2.9.1 (IBC [F] 907.2.9.1)

Proponent: Jeremy N. Mohler, CET, Rocky Mountain Consulting Engineers, Inc., representing self

Revise as follows:

907.2.1 (IBC [F] 907.2.1) Group A. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group A occupancies having an occupant load of 300 or more. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

~~**Exception:** Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.~~

907.2.2 (IBC [F] 907.2.2) Group B. A manual fire alarm system shall be installed in Group B occupancies where one of the following conditions exists:

1. The combined Group B occupant load of all floors is 500 or more.
2. The Group B occupant load is more than 100 persons above or below the lowest level of exit discharge.
3. The Group Bfire area contains a Group B ambulatory health care facility.

~~**Exception:** Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.~~

907.2.3 (IBC [F] 907.2.3) Group E.A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group E occupancies. When automatic sprinkler systems or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system.

Exceptions:

1. A manual fire alarm system is not required in Group E occupancies with an occupant load of less than 50.
2. Manual fire alarm boxes are not required in Group E occupancies where all of the following apply:
   - 2.1. Interior corridors are protected by smoke detectors.
   - 2.2. Auditoriums, cafeterias, gymnasiums and similar areas are protected by heat detectors or other approved detection devices.
   - 2.3. Shops and laboratories involving dusts or vapors are protected by heat detectors or other approved detection devices.
   - 2.4. The capability to activate the evacuation signal from a central point is provided.
   - 2.5. In buildings where normally occupied spaces are provided with a two-way communication system between such spaces and a constantly attended receiving station from where a general evacuation alarm can be sounded, except in locations specifically designated by the fire code official.
3. ~~Manual fire alarm boxes shall not be required in Group E occupancies where the building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1, the notification appliances will activate on sprinkler water flow and manual activation is provided from a normally occupied location.~~

907.2.4 (IBC [F] 907.2.4) Group F. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group F occupancies where both of the following conditions exist:

1. The Group F occupancy is two or more stories in height; and
2. The Group F occupancy has a combined occupant load of 500 or more above or below the lowest level of exit discharge.

~~**Exception:** Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.~~

907.2.7 (IBC [F] 907.2.7) Group M. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group M occupancies where one of the following conditions exists:

1. The combined Group M occupant load of all floors is 500 or more persons.
2. The Group M occupant load is more than 100 persons above or below the lowest level of exit discharge.

Exceptions:

1. A manual fire alarm system is not required in covered mall buildings complying with Section 402 of the *International Building Code*.
2. ~~Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will automatically activate throughout the notification zones upon sprinkler water flow.~~

907.2.9.1 (IBC [F] 907.2.9.1) Manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group R-2 occupancies where:

1. Any dwelling unit or sleeping unit is located three or more stories above the lowest level of exit discharge;
2. Any dwelling unit or sleeping unit is located more than one story below the highest level of exit discharge of exits serving the dwelling unit or sleeping unit; or
3. The building contains more than 16 dwelling units or sleeping units.

Exceptions:

1. A fire alarm system is not required in buildings not more than two stories in height where all dwelling units or sleeping units and contiguous attic and crawl spaces are separated from each other and public or common areas by at least 1-hour fire partitions and each dwelling unit or sleeping unit has an exit directly to a public way, exit court or yard.
2. ~~Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2 and the occupant notification appliances will automatically activate throughout the notification zones upon a sprinkler water flow.~~
3. ~~3.~~ 2. A fire alarm system is not required in buildings that do not have interior corridors serving dwelling units and are protected by an approved automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that dwelling units either have a means of egress door opening directly to an exterior exit access that leads directly to the exits or are served by open-ended corridors designed in accordance with Section 1026.6, Exception 4.

Reason: In these code sections a simple manual system is to be installed. These exceptions remove all human interface with the fire alarm system, and put the entire operation of the alarm system on a single, simple monitor module which monitors the water flow of the sprinkler system. Sprinkler systems are designed to be a fire suppression system, and not a fire extinguishing system which will allow for the accumulation of smoke throughout the building. If there is to be a voltage surge, a loose connection, conductors pulled from the monitor module for any reason, or if the fire originates within the sprinkler riser room demolishing the monitor module activating the fire alarm system, then the system would never alarm and occupants would not be notified of a life safety issue within the building. Most sprinkler heads are set to release at 150 degrees F or higher. A smoldering fire may not reach this temperature for minutes or, in some cases, hours but will produce a lot of smoke. In this case, human discovery of the fire will most likely precede the activation of a sprinkler head. Manual fire alarm pull stations have always been required and placed at most exits. People may stay within a burning building searching for a manual pull station to activate the fire alarm system, which may result in smoke inhalation and death of that person.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MOHLER-F1-907.2.1

F102–09/10
907.2.1.1 (IBC [F] 907.2.1.1)

Proponent: Gene Boecker, Code Consultants, Inc., representing self

Revise as follows:

907.2.1.1 (IBC [F] 907.2.1.1) System initiation in Group A occupancies with an occupant load of 1,000 or more. Activation of the fire alarm in Group A occupancies ~~with an~~ where the occupant load ~~of~~ due to the assembly occupancy is 1,000 or more shall initiate a signal using an emergency voice/alarm communications system in accordance with Section 907.6.2.2. Group A occupancies not separated from one another in accordance with Section 707.3.9 of the *International Building* Code shall be considered as a single occupancy for the purposes of applying this section.

Exception: Where *approved*, the prerecorded announcement is allowed to be manually deactivated for a period of time, not to exceed 3 minutes, for the sole purpose of allowing a live voice announcement from an *approved*, constantly attended location.

Reason: Section 508 of the IBC already addresses the extent of application for conditions where there are differing occupancy groups. The revised language recognizes that and makes reference back to that section of the code. There has been a question about how to apply the 1,000 occupants. If the 1,000 occupants are all in a single room, it is clear. However, it is not clear how the people in different parts of the building are combined to reach the threshold of 1,000.

For example: There are 250 assembly occupants in a small restaurant at one end of a hotel and sports bar with an occupant load of 120 in a separate location. At the other end of the hotel is a conference center with an occupant load of 700. It is not clear from the code whether those people should be added together or not; and, if not, under what conditions. The code will now be clear that the areas must be separated using the mixed occupancy provisions if there are other occupancies between them or by a fire barrier if the areas adjoin one another.

The exception is unaffected by the proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOECKER-F2-907.2.1.1.DOC

F103–09/10
907.2.1.1 (IBC [F] 907.2.1.1), 907.6.2.2.5 (New) [IBC [F] 907.5.2.2.5 (New)]

Proponent: Ed Roether, Populous (Formerly HOK Sport Venue Event), representing self

Revise as follows:

907.2.1.1 (IBC [F] 907.2.1.1) System initiation in Group A occupancies with an occupant load of 1,000 or more. Activation of the fire alarm in Group A occupancies with an *occupant load* of 1,000 or more shall initiate a signal using an emergency voice/alarm communications system in accordance with 907.6.2.2.

Exceptions:

1. Where approved, the prerecorded announcement is allowed to be manually deactivated for a period of time, not to exceed 3 minutes, for the sole purpose of allowing a live voice announcement from an approved, constantly attended location.
2. A public address system shall be permitted to serve as the emergency voice/alarm communication system when in compliance with Section 907.6.2.2.5.

907.6.2.2.5 (IBC [F] 907.5.2.2.5) Public address system. In Group A occupancies a public address system that is audible above the expected ambient noise level shall be permitted to serve as the emergency voice/alarm communication system. Prerecorded or live emergency voice announcements shall be from an approved location constantly attended by personnel trained to respond to an emergency.

Reason: Large assembly occupancies with large volume spaces, a large number of occupants and elevated sound levels present significant challenges in providing effective occupant notification by standard means in accordance with the NFPA 72, National Fire Alarm Code. This proposal provides an alternate approach to the NFPA 72 emergency voice alarm and communications system provisions for these unique occupancies while still maintaining those features that assure effective occupant notification in an emergency. Essentially, all recently constructed stadiums, arenas and grandstands have provided voice/alarm communication by their public address system since it provides the most effective occupant notification with intelligibility and audibility facets. These occupancies demand the routine operation of highly reliant, acoustically capable, and sufficiently

audible public address systems that can be relied upon to effect occupant evacuation, relocation, or both. NFPA 101 has historically allowed alternative occupant notification systems for these large seating areas that incorporate the public address system as conceptually comparable to a system in compliance with NFPA 72 so that a reliable and effective occupant notification system is provided.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROETHER-F1-907.2.1.1.DOC

F104–09/10
907.2.1.1 (New) [IBC [F] 907.2.1.1 (New)]

Proponent: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Add new text as follows:

907.2.1.1 (IBC [F] 907.2.1.1) Group A-2. Where a Group A-2 occupancy is required to be equipped with an automatic sprinkler system by this code or the *International Building Code*, the sprinkler system water flow switch(es) shall be connected to an automatic fire alarm system.

(Renumber subsequent sections)

Reason: The reason for this proposal is to link a fire alarm requirement with the language requiring a sprinkler system in section 903.2.1.2 for group A-2 occupancies. In a facility with a required sprinkler system, a fire alarm panel is required by section 903.4.1of the fire code to electronically monitor the sprinkler system signals. Adding this requirement for an automatic fire alarm system in an A-2 occupancy would only require the installation of audible/visual devices throughout the facility since the exception for 907.2.1 does not require manual fire alarm boxes. This would provide early warning to those occupants in the building to ensure prompt evacuation in the event of fire sprinkler system activation.

Cost Impact: The code change proposal will increase the cost of construction of Group A-2 occupancies required to have suppression systems.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F7-907.2.1.DOC

F105–09/10
907.2.1.2 (New), 907.6.2.2.4 (New) [IBC [F] 907.2.1.2 (New), [F] 907.5.2.2.4 (New)]

Proponent: Ed Roether, Populous (Formerly HOK Sport Venue Event), representing self

Add new text as follows:

907.2.1.2 (IBC [F] 907.2.1.2) Emergency voice/alarm communication captions. Stadiums, arenas and grandstands required to caption audible public announcements shall be in accordance with Section 907.6.2.2.4.

907.6.2.2.4 (IBC [F] 907.5.2.2.4) Emergency voice/alarm communication captions. Where stadiums, arenas and grandstands are required to caption audible public announcements in accordance with Section 1108.2.7.2 of the *International Building Code*, the emergency/voice alarm communication system shall also be captioned. Prerecorded or live emergency captions shall be from an *approved* location constantly attended by personnel trained to respond to an emergency, The caption displays shall be permitted to serve as the visual notification appliances for the assembly seating area.

(Renumber subsequent section)

Reason: Large assembly occupancies with large volume spaces present significant challenges in providing effective occupant notification by standard means in accordance with NFPA 72. Captioning emergency safety information that is announced over the PA system was ruled as needed for equivalent communication with persons having a hearing impairment in a court decision over civil rights under the Americans with Disabilities Act (ADA) at Fed Ex Field, dated September 30, 2008. It was also proposed as a requirement in the Proposed Rule by the Department of Justice, dated June 17, 2008, to establish new design guidelines for the ADA. This proposal provides effective emergency communication for those with hearing impairments in the large volume spaces while still maintaining a fully compliant NFPA 72 system elsewhere. Another code change proposal establishes a simple threshold of 15,000 seats for where captioning would be required since some facilities would not have the ability to adequately caption and the current requirement in Section 1108.2.7.2 has no threshold. Currently, any grandstand with a public address system requires equivalent text and in a little league ballpark the seating would meet the definition of a grandstand and there will likely be a microphone with a loud speaker that would address the public. A stadium requires a certain amount of sophistication before captioning can be readily possible. This proposal in tandem with the other code change proposal would apply to only those stadiums, arenas and grandstands that would have adequate infrastructure to caption announcements.

This proposal provides an alternate approach to the NFPA 72, National Fire Alarm Code, emergency voice/alarm and communications system provisions for these unique occupancies while still maintaining those features that assure effective occupant notification in an emergency by appropriately trained personnel. Caption displays installed in large volume spaces, such as stadiums, arenas and grandstands, which are not listed as visible notification appliances for fire alarm systems, provide effective visual notification since the notification objective is reasonably achieved. It is the intent of this proposal to permit the omission of visible notification appliances in the seating area provided that the adjacent areas have visible notification in accordance with NFPA 72. NFPA 101 has historically allowed alternative occupant notification systems for these large seating areas that incorporate the public address system and, by changes in 2009 NFPA 101, the electronic displays or message boards as conceptually comparable to a system in compliance with NFPA 72 so that a reliable and effective occupant notification system is provided.

Finally, this proposal allows the use of either pre-recorded or real-time captions of audible announcements. It should be noted that the microphone required in the fire command center in case the fire department needs to over-ride the emergency notification system to make "live" safety and emergency announcements raises challenges when trying to caption those announcements. Providing a stenographer on-site for a potential emergency at any point in time may be difficult and providing a stenographer off-site requires further interface between a system in compliance with NFPA 72 and one that is not. So, there are some technical challenges with captioning emergency announcements that need further consideration in the building's fire safety and evacuation plans.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROETHER-F2-907.2.1.2.DOC

F106–09/10
907.2.2.1 (IBC [F] 907.2.2.1)

Proponent: Rick Sheets, Fire Committee Chair, Brinks Home Security, representing National Burglar and Fire Alarm Association

Revise as follows:

907.2.2.1 (IBC [F]907.2.2.1) Group B ambulatory health care facilities. *Fire areas* containing Group B ambulatory health care facilities shall be provided with an electronically supervised automatic smoke detection system installed within the ambulatory health care facility and in public use areas outside of tenant spaces, including public *corridors* and elevator lobbies.

~~**Exception:** Buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 provided the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.~~

Reason: Delete Exception.

Another new occupancy has been defined under the "B" Business category, called "Ambulatory Health Care Facilities". (304.1) These facilities are defined as buildings or portions of buildings providing medical, surgical, psychiatric or nursing care less than 24 hours a day to persons incapable of self-preservation (i.e. 'put under' for minor surgery etc.). These occupancies, covered in 907.2.2.1, need an automatic smoke detection system installed in the Ambulatory Health Care Facility plus in their public use areas, corridors and elevator lobbies including all the public areas on other floors outside the AHCF area, ...except if the building is sprinkled and its activation causes the (required) occupant notification appliances to activate.

The problem with allowing this exception is that by code, heat detectors (which is what a sprinkler head is) are not, and never have been, permitted to replace smoke detectors for protection of life. Heat detectors are not life-safety devices in any code or standard because they do not provide the early warning needed for the safe evacuation of occupants. Sprinklers have a great reputation for saving lives only when used along with early detection provided by smoke detectors.

Cost Impact: The code change proposal will increase the cost of construction $.30 per square foot.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SHEETS-F1-907.2.2.1.DOC

F107–09/10
907.2.3 (IBC [F] 907.2.3)

Proponent: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Revise as follows:

907.2.3 (IBC [F] 907.2.3) Group E. A manual fire alarm system that ~~activates~~ initiates the occupant notification signal utilizing an emergency voice/alarm communication system meeting the requirements of Section 907.6.2.2 and installed in accordance with Section 907.6 shall be installed in Group E occupancies. When automatic sprinkler systems or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system.

Exceptions:

1. A manual fire alarm system is not required in Group E occupancies with an occupant load of ~~less than 50~~ 30 or less.
2. Manual fire alarm boxes are not required in Group E occupancies where all of the following apply:
   2.1. Interior corridors are protected by smoke detectors.
   2.2. Auditoriums, cafeterias, gymnasiums and similar areas are protected by heat detectors or other approved detection devices.
   2.3. Shops and laboratories involving dusts or vapors are protected by heat detectors or other approved detection devices.
   ~~2.4. The capability to activate the evacuation signal from a central point is provided.~~
   ~~2.5. In buildings where normally occupied spaces are provided with a two-way communication system between such spaces and a constantly attended receiving station from where a general evacuation alarm can be sounded, except in locations specifically designated by the fire code official.~~
3. Manual fire alarm boxes shall not be required in Group E occupancies where the building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1, the ~~notification appliances~~ emergency voice/alarm communication system will activate on sprinkler waterflow and manual activation is provided from a normally occupied location.

Reason: Group E occupancies mix a high concentration of children with fuel loads on a daily basis. As budgets shrink, so do the number of adult supervisors. Our children are in schools because they are required to be there. We owe them a duty to ensure they are safe from the risk of fire while in school. We simply cannot wait for a catastrophe to protect children while at school.

Unfortunately the world of elementary, secondary and higher education learning has gone through tremendous changes in security measures undertaken, both operationally and hardware installations, due to the threat of violent acts committed against students and staff. Where we had educational facilities with highly effective fire drill evacuation procedures and actions during system activation, we now have written plans and training in place to ignore the activation of the fire alarm system if a "lockdown" has been declared because the activation of the fire alarm system may be a diversion to bring staff and students out into the open to serve as victims.

This is not a possible situation. This is a very real situation that occurs throughout the country in response to the acts of violence that have occurred at educational facilities. Though the exact procedure may vary site to site, the main premise of a "lockdown" is to gather staff and students into classrooms and offices and to lock the doors, preventing intruders from getting into the room and preventing staff and students from leaving the rooms until an all clear is announced. The staff and students are trained to ignore a fire alarm activation during a lockdown until they are ordered to evacuate after someone in authority, (could be a Principal or could be a Police Commander), makes a determination that the fire threat is real and that they must evacuate to survive the fire.

Once the students and staff ignore the fire alarm, there needs to be a reliable method of communicating the message that now is the time to evacuate. PA systems that do not meet appropriate standards of care for installation or maintenance related to reliability at the time of a fire emergency do not satisfy that need. To address this issue this proposal would require the installation of a emergency voice/alarm communications system installed in accordance with the code and referenced standards. Recognizing that there is a related increase in the cost of construction Section 907.5.2.2 allows that system to be used for other announcements to eliminate the need for a public address system for that purpose.

Section 907.2.3, Exception one has been modified to correlate the occupant load triggers, Items 2.4 and 2.5 would be redundant since the emergency voice/alarm communications system would meet those two requirements and Exception 3 was modified to correlate with the new language in 907.2.3.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F2-907.2.3.DOC

F108 –09/10

907.2.6.1.1(IBC [F] 907.2.6.1.1), 907.2.8.3 (IBC [F] 907.2.8.3), 907.2.9.2 (IBC [F] 907.2.9.2), 907.2.10.3 (IBC [F] 907.2.10.3), 907.2.11 (IBC [F] 907.2.11), 907.2.11.1 (IBC [F] 907.2.11.1), 907.2.11.2 (IBC [F] 907.2.11.2), 907.2.11.3(IBC [F] 907.2.11.3), 907.2.11.4 (IBC [F] 907.2.11.4), 902.1 (IBC [F] 902.1); IRC R314.1, R314.2, R314.3, R314.4, R202, Chapter 44

Proponent: Roger Evans, Park City Municipal Corporation, representing Utah Chapter of ICC

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IFC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IFC

Revise as follows:

907.2.6.1.1 (IBC [F] 907.2.6.1.1) Smoke alarms and smoke detectors. Single- and multiple-station smoke alarms or smoke detectors shall be installed in accordance with Section 907.2.11.
907.2.8.3 (IBC [F] 907.2.8.3) Smoke alarms and smoke detectors. Single- and multiple-station smoke alarms or smoke detectors shall be installed in accordance with Section 907.2.11.

907.2.9.2 (IBC [F] 907.2.9.2) Smoke alarms and smoke detectors. Single- and multiple-station smoke alarms or smoke detectors shall be installed in accordance with Section 907.2.11.

907.2.10.3 (IBC [F] 907.2.10.3) Smoke alarms and smoke detectors. Single- and multiple-station smoke alarms or smoke detectors shall be installed in accordance with Section 907.2.11.

907.2.11 (IBC [F] 907.2.11) Single- and multiple-station smoke alarms and smoke detectors. Listed single- and multiple-station smoke alarms complying with ANSI/UL 217 or smoke detectors complying with ANSI/UL 268 shall be installed in accordance with Sections 907.2.11.1 through 907.2.11.4 and NFPA 72.

907.2.11.1 (IBC [F] 907.2.11.1) Group R-1. Single- or multiple-station smoke alarms or smoke detectors shall be installed in all of the following locations in Group R-1:

1. In sleeping areas.
2. In every room in the path of the means of egress from the sleeping area to the door leading from the sleeping unit.
3. In each story within the sleeping unit, including basements. For sleeping units with split levels and without an intervening door between the adjacent levels, a smoke alarm or smoke detector installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

907.2.11.2 (IBC [F] 907.2.11.2) Groups R-2, R-3, R-4 and I-1. Single or multiple-station smoke alarms or smoke detectors shall be installed and maintained in Groups R-2, R-3, R-4 and I-1 regardless of occupant load at all of the following locations:

1. On the ceiling or wall outside of each separate sleeping area in the immediate vicinity of bedrooms.
2. In each room used for sleeping purposes.

   Exception: Single- or multiple-station smoke alarms in Group I-1 shall not be required where smoke detectors are provided in the sleeping rooms as part of an automatic smoke detection system.

3. In each story within a dwelling unit, including basements but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

907.2.11.3 (IBC [F] 907.2.11.3) Interconnection. Where more than one smoke alarm or smoke detector is required to be installed within an individual dwelling unit or sleeping unit in Group R-1, R-2, R-3 or R-4, the smoke alarms shall be interconnected in such a manner that the activation of one will activate all of the alarms in the individual unit and the activation of a smoke detector shall activate the fire alarm audible notification devices throughout the individual dwelling unit. ~~The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.~~ The required fire alarm signal shall be clearly audible in all sleeping rooms, having a sound level of at least 15 db above average ambient sound level or 5 db above the maximum sound level, or a sound level at least 75 db at the pillow.

907.2.11.4 (IBC [F] 907.2.11.4) Power source. ~~In new construction, required smoke alarms shall receive their primary power from the building wiring where such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms with integral strobes that are not equipped with battery back-up shall be connected to an emergency electrical system. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.~~ Required smoke alarms or smoke detectors shall receive their power by one of the following means:

1. Listed smoke alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source with secondary power backup and without a disconnecting switch other than those required for overcurrent protection. Listed smoke alarms that are battery-powered shall not be permitted in new construction.

2. Listed smoke detectors shall receive their power from the approved control panel. The approved control panel shall receive its primary power from the building wiring when such wiring is served from a commercial source and the primary power source shall not include a disconnecting switch other than those required for overcurrent protection. The control panel shall be equipped with rechargeable batteries for secondary power backup.
3. Listed low-power radio frequency (wireless) smoke detectors shall be permitted to be battery powered when the battery is electrically supervised and shall be capable of sending an alarm signal to the approved control panel for a minimum of 7 days after sending the initial battery depletion signal.

   Exception: Smoke alarms are not required to be equipped with battery backup where they are connected to an emergency electrical system.

902.1(IBC [F] 902.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

SMOKE DETECTOR. A listed device intended to be connected to an approved smoke detection system for the purpose of sensing visible or invisible particles of combustion and alerting occupants by a distinct and audible signal.

PART II – IRC BUILDING/ENERGY

1. Revise IRC as follows:

R314.1 Smoke detection and notification. All smoke alarms and smoke detectors shall be listed in accordance with ANSI/UL 217 and ANSI/UL 268 respectively and shall be installed in accordance with the provisions of this code and the household fire warning equipment provisions of NFPA 72.

R314.2 Smoke detection systems. Household fire alarm systems ~~installed in accordance with NFPA 72 that include smoke alarms, or a combination of smoke detector and audible notification device installed as required by this section for smoke alarms, shall be permitted. The household fire alarm system shall provide the same level of smoke detection and alarm as required by this section for smoke alarms.~~ , including smoke alarms or a combination of smoke detectors and audible notification devices, shall be installed in accordance with NFPA 72 and as required by Sections R314.3 and R314.4. Where a household fire warning system is installed using a combination of smoke detector(s) and audible notification device(s), it shall become a permanent fixture of the occupancy and owned by the homeowner. The system shall be monitored by an approved supervising station and be maintained in accordance with NFPA 72.

~~Exception:~~ ~~Where smoke alarms are provided meeting the requirements of Section~~ R314.4~~.~~

R314.3 Location. Smoke alarms or smoke detectors shall be installed in the following locations:

1. In each sleeping room.
2. Outside each separate sleeping area in the immediate vicinity of the bedrooms.
3. On each additional story of the dwelling, including basements and habitable attics but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm or smoke detector installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

~~Exception~~ **R314.3.1 Interconnection**. ~~When~~ Where more than one smoke alarm is required to be installed within an individual dwelling unit the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual unit and the activation of a smoke detector shall activate the fire alarm audible notification devices throughout the individual dwelling unit. The required fire alarm signal shall be clearly audible in all sleeping rooms, having a sound level of at least 15 db above average ambient sound level or 5 db above the maximum sound level, or a sound level at least 75 db at the pillow.

Exception: The interconnection of smoke alarms or smoke detectors in existing areas shall not be required where work requiring a permit does not result in the removal of interior finishes exposing the structure which could provide access for wiring or in dwellings without attics, crawl spaces or basements.

~~R314.3.1~~ R314.3.2 Alterations, repairs and additions. When alterations, repairs or additions requiring a permit occur, or when one or more sleeping rooms are added or created in existing dwellings, the individual dwelling unit shall be equipped with smoke alarms or smoke detectors located as required for new dwellings.

Exceptions:

1. Work involving the exterior surfaces of dwellings, such as the replacement of roofing or siding, or the addition or replacement of windows or doors, or the addition of a porch or deck, are exempt from the requirements of this section.
2. Installation, alteration or repairs of plumbing or mechanical systems are exempt from the requirements of this section.
3. Smoke alarms that receive their primary power from the building wiring when such wiring is served from a commercial source or smoke detectors that receive their primary power from an approved panel shall not be required to be hard-wired in existing dwellings where work requiring a permit does not result in the removal of interior finishes exposing the structure which could provide access for wiring or in dwellings without attics, crawl spaces or basements.

R314.4 Power source. ~~Smoke alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection. Smoke alarms shall be interconnected.~~ Required smoke alarms or smoke detectors shall receive their power by one of the following means:

1. Listed smoke alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source with secondary power backup and without a disconnecting switch other than those required for overcurrent protection. Listed smoke alarms that are battery-powered shall not be permitted in new construction.
2. Listed smoke detectors shall receive their power from the approved control panel. The approved control panel shall receive its primary power from the building wiring when such wiring is served from a commercial source and the primary power source shall not include a disconnecting switch other than those required for overcurrent protection. The control panel shall be equipped with rechargeable batteries for secondary power backup.
3. Listed low-power radio frequency (wireless) smoke detectors shall be permitted to be battery powered when the battery is electrically supervised and shall be capable of sending an alarm signal to the approved control panel for a minimum of 7 days after sending the initial battery depletion signal.

Exceptions~~:~~:

~~1.~~ Smoke alarms shall be permitted to be battery operated when installed in buildings without commercial power.

~~2. Interconnection and hard-wiring of smoke alarms in existing areas shall not be required where the alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for hard-wiring and interconnection without the removal of interior finishes.~~

2. Add new definition to Section R202 as follows:

SMOKE DETECTOR. A device intended to be connected to an approved smoke detection system for the purpose of sensing visible or invisible particles of combustion and alerting occupants by a distinct and audible signal.

3. Add new standard to Chapter 44 as follows:

ANSI/UL 268-06 Smoke Detectors for Fire Alarm Signaling Systems

Reason: As read in context the language in the 2009 IFC relating to the interconnection of smoke alarms and smoke alarm power requirements in the 2009 edition of the IRC and IFC does not call out system-connected smoke detectors. This has caused some local authorities to disallow the installation of ANSI/UL 268 system-connected smoke detectors. The performance and reliability of fire alarm systems using ANSI/UL 268 smoke detectors are extremely high if they are installed and maintained in accordance with National Fire Protection Association (NFPA) 72.

The proposed code will remove all ambiguity relating to the installation of smoke detectors and will ensure that both smoke alarms and smoke detectors may be permitted for installation.

Cost Impact: There will be no cost impact because the proposed change is not mandating the installation of smoke detectors over smoke alarms. The decision as to which type of device to install will be up the system designer and/or building owner.

Analysis: UL 217-06 is currently referenced in both the IFC and the IRC. UL 268-06 is currently referenced in the IFC and if this code change is approved UL 268 will be added to the IRC Chapter 44 as a referenced standard.

PART I – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EVANSR-907-F2.DOC

F109–09/10

907.2.9 (IBC [F] 907.2.9), 907.2.9.3 (New) [IBC [F] 907.2.9.3 (New)]

Proponent: William Freer, Fire Protection Specialist, NYS Office of Fire Prevention and Control

1. Revise as follows:

907.2.9 (IBC [F] 907.2.9) Group R-2. Fire alarm systems and smoke alarms shall be installed in Group R-2 occupancies as required in Section 907.2.9.1 ~~and 907.2.9.2~~ through 907.2.9.3.

907.2.9.3 ([F] 907.2.9.3) Group R-2 college and university buildings. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.6 shall be installed in Group R-2 college and university buildings in the following locations:

1. Common spaces outside of dwelling units and sleeping units
2. Laundry rooms, mechanical equipment rooms, and storage rooms
3. All interior corridors serving sleeping units or dwelling units.

Required smoke alarms in dwelling units and sleeping units in Group R-2 college and university buildings shall be interconnected with the fire alarm system in accordance with NFPA 72.

Exception: An automatic smoke detection system is not required in buildings that do not have interior corridors serving sleeping units or dwelling units and where each sleeping unit or dwelling unit either have a *means of egress* door opening directly to an exterior *exit access* that leads directly to an *exit* or a *means of egress* door opening directly to an exit.

Reason: This code change would add new requirements to the code. The current code only requires single and multiple station smoke alarms in new R-2 student housing. Single and multiple station smoke alarms are not required to be connected to a building fire alarm which would evacuate the building in event of a fire or smoke condition. They are also not required to be in all areas of the building which have been shown to be frequent areas of ignition. In a study completed by the New York State Governor's Task Force on Campus Fire Safety it was cited that 43% of fires in college dormitories are located in dorm rooms or kitchens, leaving the other 57% to be located in areas that would not require smoke detection under the current code. The study also showed that there were approximately 300 fires on college campus over a 3 year period while only 160 and were reported to the Fire Department. The Center for Campus Fire Safety reports 99 deaths have been "reported" in fires in student housing since 2000. An NFPA study on student housing showed 3,300 structural fires in Dormitories, Fraternities, Sororities and Barracks between 2002-2005. Since 1980 there has been an increase of 3% in reported fires in dormitory type occupancies, while there has been a 52% decrease in overall reported structural fires. New York State has required Fire Alarm and detection system in new dormitories since 2003 and has not had any deaths reported in these buildings since that change.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FREER-F2-907.2.9.DOC

F110–09/10
907.2.9.2 (New) [IBC [F] 907.2.9.2 (New)]

Proponent: Ken Kraus, Los Angeles Fire Department

Add new text as follows:

907.2.9.2 (IBC [F] 907.2.9.2) Automatic smoke detection system. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.6 shall be installed through out all interior corridors serving 10 or more dwelling units.

> **Exception:** An automatic smoke detection system is not required in buildings that do not have interior *corridors* serving *dwelling units* and where each *dwelling unit* has a *means of egress* door opening directly to an *exit* or to an exterior *exit access* that leads directly to an *exit*.

Reason: Automatic fire alarm systems are currently required, with exception, within interior corridors in R-1 Occupancies, e.g., Hotels and Motels. While Apartment buildings represent, in some respects, hazards similar to those found in R-1 Occupancies, they represent distinct and extenuating conditions that warrant similar protectives. Specifically:

Non transient occupants in R-2 Occupancies utilize cooking appliances to a much greater extent than R-1 Occupants.
R-2 occupants disable smoke alarms since low voltage and false alarms represent a continual nuisance.
R-2 occupants are much more likely to prop open required fire protection assemblies (for ventilation) than occupants in hotels and motels.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KRAUS-F1-907.2.9.2.DOC

F111–09/10
907.2.10.2 (IBC [F] 907.2.10.2)

Proponent: Rick Sheets, Fire Committee Chair, Brinks Home Security, representing National Burglar and Fire Alarm Association

Revise as follows:

907.2.10.2 (IBC [F] 907.2.10.2) Automatic smoke detection system. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.6 shall be installed in corridors, waiting areas open to corridors and habitable spaces other than sleeping units and kitchens.

Exceptions:

1. ~~Smoke detection in habitable spaces is not required where the facility is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.~~
2. An automatic smoke detection system is not required in buildings that do not have interior corridors serving sleeping units and where each sleeping unit has a means of egress door opening directly to an exit or to an exterior exit access that leads directly to an exit.

Reason: Exception #1 should be deleted.

Background: A new R-4 occupancy has been defined under the "B" Business category, called "Ambulatory Health Care Facilities". (AHCF, 304.1) These facilities provide medical, surgical, psychiatric or nursing care less than 24 hours a day to persons incapable of self-preservation (i.e. 'put under' for minor surgery etc.). These occupancies, covered in 907.2.2.1, need an automatic smoke detection system installed in the Ambulatory Health Care Facility area, plus in their public use areas, corridors and elevator lobbies for all the public areas located outside the AHCF area. While we see the need for a new occupancy type, we cannot see where sprinklers are permitted to replace required smoke detection.

Problem:

First, it seems that this exception doesn't simply allow smoke detection to be omitted; it seems to allow the "smoke detection" to be omitted from an "automatic smoke detection system." Doesn't this mean that virtually no system will be installed, since the manual boxes required by 907.2.10.1 are also allowed to be omitted in sprinklered buildings? Isn't this pushing the sprinkler reliance a little too far?

Secondly, sprinkler heads are essentially fixed-temperature heat detectors. Smoke detectors required in other parts of the ICC codes only permit heat detectors to be used where the environment is not suitable for the use of smoke detectors. It is not reasonable to expect the occupants and staff of these facilities to wait until a smoldering/small fire generates enough heat to activate a sprinkler head, when the environment allows early warning to be used. Section 907.2.10.1 indicates there won't even be manual pull boxes at the exits, even if the fire is soon discovered by an occupant. We are also confident most fire departments would rather be informed of smoke rather than told that a sprinkler system is currently trying to control a fire.

The fire alarm and detection community has watched as manual pull boxes are permitted to be omitted, but this is the first time automatic smoke detection is permitted to be omitted. Please stop this dangerous trend and provide the early warning needed for the safe evacuation of these occupants. Sprinkler are not perfect and they do have a great reputation for saving lives, but they provide the best chances for survival when used along with the early warning provided by smoke detectors.

Cost Impact: This code change proposal would increase the cost by $0.15 to $0.30 per square foot.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SHEETS-F2-907.2.10.2.DOC

F112–09/10
907.2.11 (IBC [F] 907.2.11); IRC R314.1

Proponents: Joseph Fleming, Deputy Chief, Boston Fire Department, representing The Boston, MA Fire Department; Sean DeCrane, Cleveland Fire Department representing the Cleveland, OH Fire Department and the International Association of Fire Fighters

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IFC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IFC

Revise as follows:

907.2.11 (IBC [F] 907.2.11) Single and multiple-station smoke alarms. *Listed* single- and multiple-station photoelectric smoke alarms complying with UL 217 shall be installed in accordance Sections 907.2.11.1 through 907.2.11.4 and NFPA 72.

PART II – IRC BUILDING/ENERGY

Revise as follows:

R314.1 Smoke detection and notification. All smoke alarms installed to meet the requirements of this code shall be the photoelectric type and shall be listed in accordance with UL 217 and installed in accordance with the provisions of this code and the household fire warning equipment provisions of NFPA 72.

Reason: (**Fleming)** According to the United States Fire Administration (http://www.usfa.dhs.gov/downloads/pdf/tfrs/v5i1.pdf) 37% of fire fatalities occur with operational smoke alarms and another 21% occur with disabled alarms. The use of photoelectric alarms, as opposed to alarms using ionization technology could reduce both by ½. This would reduce fire deaths in the U.S. by approximately 25% which translates into over 750 lives saved each year. The following information supports this estimated benefit.

1. There are some fires were smoke alarms/detectors cannot provide a benefit: arson fires in egress paths, victims intimate with flaming fires, explosions, etc. In addition, it is unlikely that smoke alarms/detectors provide the critical warning to occupants who are awake. As a consequence, when discussing smoke alarms, we should focus our attention on the types of fires where the smoke alarm can provide a crucial benefit to occupants not on all the types of fires that occur. The vast majority of fires where a smoke alarm/detector can help occupants are smoldering fires started when the victim is asleep.

    - *Smoke detectors should be able to save at least 60% and possibly 75% of sleeping victims, but only 13% of victims who were awake.* (McGuire, J., Ruscoe, B., The Value of a Fire Detectors in the Home, Fire Study No. 9, National Research Council of Canada, Division of Building Research, Ottawa, Ont., Canada, December, 1962.)
    - *"Delayed discovery, typically associated with fires that occur at night when everyone is asleep, also tends to be a characteristic of the smoldering fire caused by discarded smoking material. These smoldering fires are the leading causes of US fire fatalities and detectors are ideally designed to deal with them.* ("A Decade of Detectors", Fire Journal 09/85, John Hall - NFPA.)

2. In flaming fires the ionization alarm/detector is faster than the photoelectric by 30-50 seconds. This extra time is virtually irrelevant to alert occupants. For example, in the recent smoke alarm testing involving flaming cooking fires (http://smokealarm.nist.gov/pdf_files/SmokeDetectors_Q&As_Feb2008.pdf), which is the most common type of flaming fire, although the photo was 30-50 seconds slower than the ionization it still provided on average over 10 minutes warning. It has often been said that in a fire "seconds count." However it is hard to imagine a scenario were the extra seconds provided by the ionization in the most common type of flaming fires makes a difference for life safety, when the photoelectric is already providing on average over 10 minutes of Available Safe Egress Time. As a consequence, although photoelectric alarms/detectors respond later in flaming fires this is a quantitative as opposed to a qualitative advantage. Here are some quotes from researchers.

    - *The advantage of ionization smoke detectors during flaming fires is only about a 15-20 second earlier warning. This margin will only be decisive for the loss of human life in extraordinary circumstances. In general the difference between the alarm times for the optical and the ionization detectors are reduced when the detection is made from an adjacent room. (*Meland, Oysten, and Lonuik, Lars, "Detection of Smoke - Full Scale Tests with Flaming and Smouldering Fires, "Fire Safety Science," - Proceedings of the Third International Symposium, July, 1991,)

- *Under the conditions of ignition from flames, the ionization chamber type detector exhibited a greater sensitivity to the smoke produced than the photoelectric system. However, the rate of generation of smoke was so great that the extra time given by the ionization chamber as a result may be of little practical use. (*R., (Riley, K., and Rogers, S., "A Study of the Operation and Effectiveness of Fire Detectors Installed in the Bedrooms and Corridors of Residential Institutions", Fire Research Station, Fire Research Current Paper 26/78, Borehamwood, England, April 1978.)

3. In smoldering fires the photoelectric is faster than the ionization by 30 minutes or more. This extra time is critical for sleeping occupants. If the ionization was consistently providing adequate warning, it would not matter that it was slower than the photoelectric. Unfortunately it doesn't. According to NIST's testimony to the Boston City Council), *"ionization alarms may not always alarm even when a room is filled with smoke from a smoldering fire."* In addition, according to data collected by NIST Report during smoldering fires the ionization smoke alarm often provided less than 1-2 minutes of Available Safe Egress Time. (1-2 minutes is the minimum time needed for sleeping occupants to escape.) In fact the ionization, in many cases, was providing negative available safe egress time. (http://smokealarm.nist.gov/pdf_files/StatementfortheRecordWG1finalsmokealarmstatement.pdf

   This finding has been noted by many other researchers.
   - *Ionization chamber type detectors, in the room of origin and the corridor, did not, in the smoldering fire tests, provide adequate warning that the escape route was impassable or that conditions in the room were potentially hazardous to life. (*R., Riley, K., and Rogers, etc.)
   - *"This test will show that most photoelectric detectors, operated by battery will detect smoke at about 1.5-3% smoke, which is good. The test will show that the photoelectric detectors operated by household current will activate between 2 and 4 %, which is still good. But, the test also will show that many ionization detectors will not activate until the smoke obscuration reaches 10-20 and sometimes 25%. … Therefore, because of the present state of the art in detecting smoke, the Subcommittee on Smoke Detectors can take no other course but to recommend the installation of photoelectric detectors."* ("Residential Smoke Alarm Report - Prepared by Special Automatic Detection Committee of the International Association of Fire Chiefs," The International Fire Chief, September 1980.)
   - The tests i.e. the CALCHIEFS Tests, being commented upon in the previous quote were conducted by the Los Angeles Fire Dept. They concluded that photoelectrics were the preferred smoke alarm for all hallways and bedrooms. ("An Evaluation of Fire Detectors for Residential Placement," Los Angeles City Fire Dept., Fire Prevention Bureau – Research Unit, August 1981.)
   - *"Photoelectric detectors sighted in the hallway are more effective for detecting smoldering smoke than ionization detectors, providing adequate escape time for most conditions of size and location of the smoke sources. Ionization detectors sited in the hallway generally provide inadequate escape times unless smoke movement into the hallway is slowed down by narrow door openings, causing a slower loss of visibility, or unless they are sited close to the smoke source." (* P.F. Johnson and S. K. Brown, "Smoke Detection of Smoldering Fires in a Typical Melbourne Dwelling," *Fire Technology,* Vol. 22, No. 4, 1986, pp. 295-340.)
   - *"The ionization detectors detected smoke from a smoldering fire much later than optical (photoelectric) detectors. When the particular conditions during the fire development are taken into consideration there are reasons to indicate that this detection principle would not provide adequate safety during this type of fire".* (Meland, Oysten, and Lonuik, Lars, "Detection of Smoke - Full Scale Tests with Flaming and Smouldering Fires, "Fire Safety Science," - Proceedings of the Third International Symposium, July, 1991, pp. 975-984.)

4. In addition to being inadequate at providing adequate warning in smoldering fires, several researchers have identified that the ionization smoke alarm is far more susceptible to disablement due to nuisance alarms than is the photoelectric. Here are some quotes from the recent NIST Smoke Alarm Report. http://smokealarm.nist.gov/

   Additionally a separate study of nuisance alarm sources was conducted because this was identified as an important issue in a prior study by the U.S. Consumer Product Safety Commission. It was observed that ionization alarms had a propensity to alarm when exposed to nuisance aerosols produced in the early stages of some cooking activities, prior to noticeable smoke production. This phenomenon could be particularly vexing to homeowners who experience such nuisance alarms. … While one third of the smoke detectors did not work on the initial test, half of these were made operational by restoring power. Homeowners interviewed revealed that most of these were intentionally disconnected due to nuisance alarms, mostly from cooking.

   For the Toasting Scenario the ionization located near the kitchen responded in about 130-150 seconds. The photoelectric responded in 225-300. In fact according to NIST, *"Photoelectric alarm thresholds were met only after item started to char and produce visible smoke."* So although both responded, it is much more likely that the ionization will repeatedly respond to most normal toasting and be more likely to be disabled..

   Here are some recent quotes by other researchers on nuisance alarms.
   - *"Homes with ionization alarms had more than 8 times the rate of false alarms as those with photoelectric. In small rural residences, photoelectric smoke alarms have lower rates of false alarms and disconnections." (*Perkins, M., "Ionization and photoelectric smoke alarms in rural Alaskan homes," Western Journal of Medicine, 2000;173:89-92 (Contact: Alaska Injury Prevention Center, Anchorage, AK.))
   - *"We favor photoelectric detectors to reduce rates of nuisance alarms from cooking and to provide optimal protection from cigarette related fires." (*Kuklinski, D., Berger, L., Weaver, J., "Smoke detector Nuisance Alarms: A Field Study in a Native American Community," NFPA Journal; Sept/Oct. 1995.)
   - *"On direct observation at first follow-up, ionization study alarms were more likely to be non-functional, 20% ionization vs. 5% photoelectric, with the most common reason being a disconnected or absent battery." (*Mueller, B., et al, "Randomized controlled trial of ionization and photoelectric smoke alarm functionality," Injury Prevention, 2008; 14:80-86.)

   Even smoke alarm manufacturers are aware of the benefits of photoelectric technology. (They just do a very poor job of communicating this to consumers.)
   - *"The optical smoke alarm therefore is less likely to react to the results of cooking and this makes it far more suitable for installation near kitchens or in confined spaces such as bed sits. The slight price differential between the two types of alarms can be balanced out by the elimination of false alarms being triggered by nearby kitchens and bathrooms."* "Domestic smoke alarms – a guide for specifiers," Bendall, D. (BFK Brands Europe), Fire Prevention 281 July/August 1995.

- *"Never install ionization smoke alarms in areas where cooking fumes, open fires and products of combustion are present. Where these conditions occur and a smoke alarm must be installed, a photoelectric alarm is the best option."* http://www.kidde.com.au/utcfs/kid/How+Smoke+Alarms+Work.html

5. Combination alarms/detectors have the potential to provide the quickest response to both smoldering and flaming fires but due to the excessive nuisance alarms from the ionization part of the alarm/detector, they should not be allowed near kitchens and bathrooms. In addition, the minor advantage that ionization or combination have over photoelectric in flaming fires is marginal and probably not critical.

   To quote a study (Mueller et al) cited earlier, *"An alarm containing both technologies is more expensive; it may also be more likely rendered non-functional if either technology causes frequent nuisance alarms. Our results suggest that installing photoelectric alarms on main floors of homes similar to those in our study may increase the proportion of functioning alarms and therefore provided longer term protection,"*

   Other items to consider:
   - I am not aware of any "wireless alarms" that come as combination (photo/ion).
   - Both ion and photo are sold with 10 year batteries. Are Combination (ion/photo)?
   - Combination CO/Smoke come with CO/Ion or CO/Photo. Is there a Combo Smoke Alarm/CO?
   - Why require dual in sprinkled occupancies when, according to the USFA, the only type of fire that can kill someone is a smoldering fire? "*Even though fire sprinklers are effective life safety devices you still need smoke alarms. Some fires can begin as smoldering fires that produce smoke and gases but don't generate enough heat to activate the sprinklers. Smoke alarms are needed to provide warning for these situations."* (http://www.usfa.dhs.gov/citizens/all_citizens/home_fire_prev/manufactured/sprinklers-mh.shtm)

6. I would like to mention that based on this research the Australasian Fire Authorities Council has recommended the use of photoelectric smoke alarms as opposed to ionization or combination.

   http://www.afac.com.au/__data/assets/pdf_file/0020/3674/AFACSmokeAlarmposition1June2006.pdf

7. Precedents for this action.

   a. Since 1998 the Massachusetts State Building Code has mandated photoelectric smoke alarm within 20 feet of a kitchen or bathroom due to the propensity of ionization smoke alarms to experience nuisance alarms.
   b. Since 2002 **NFPA 72 (the National Fire Alarm Code)** has only allowed ionization smoke alarms near kitchens if they were equipped with a silence button. The NFPA 72 committee has finally recognized the advantage that photoelectric smoke alarms have in regards to nuisance alarms. However I take exception to their assumption that a "hush button" neutralizes the ionizations propensity for nuisance alarms. No study has shown these to be effective at reducing disablement of ionization alarms. http://www.nfpa.org/assets/files/PDF/ROP/72-A2009-ROC.pdf (Page 72-249)
   c. **New Vermont Law** – Photoelectric-only type of smoke alarms are required to be installed in the vicinity of any bedrooms and on each level of a dwelling, for all new dwellings and dwellings that are sold or transferred, beginning January 1, 2009. http://www.dps.state.vt.us/fire/heating/photoelectric.html
   d. **Massachusetts has voted to Change the State Fire Code** so that as of January 1, 2010, smoke alarms with only ionization technology will not be allowed to meet the code. http://www.realtown.com/massachusettsrealestate/blog/massachusetts-smoke-detector-laws-changing
   e. **The 7th Edition of the Massachusetts State Building Code** was updated so that as of January 1, 2008 smoke alarms with only ionization technology will not be allowed to meet the code. http://www.ludlow.ma.us/building/permit_applications/life-safety-systems-app.pdf

Bibliography – In addition to references cited above, the following will be provided to the committee.

1. Fleming, J., *"Photoelectric vs. Ionization Detectors - A Review of the Literature,"* NFPRF Fire Suppression and Detection Research Symposium, Orlando, FL, 2/98.
2. Fleming, J., *"Photoelectric vs. Ionization Detectors - A Review of the Literature, Revisited,"* (NFPRF Fire Suppression and Detection Research Symposium, Orlando, FL, 01/05. This presentation included analyses of: 1) 30 years of smoke detector studies, 2) the National Institute of Standards Smoke Detector Project, 3) statistic regarding the effectiveness of smoke detectors, ands 4) the effectiveness of Underwriter's Labs Smoke Detector Approval Standard, UL217.)
3. Fleming, J., *"Smoke Detectors and the Investigation of Fatal Fires,"* Published in May 2000 issue of "Fire & Arson Investigator", the official magazine of International Association of Arson Investigators. (Also published on Interfire.org, an Arson Resource Website – posted 02/01.)

Reason: (DeCrane) I do not want to get into me too testimony, even during the reason statement, and my colleague Joseph Fleming from the Boston Fire Department has written an extensive Reason Statement. This will make it difficult to go in depth referencing various reports as Chief Fleming has provided the technical substantiation for this code change.

As a representative of the International Association of Fire Fighters (IAFF), I represent the professional fire fighters of North America. At the IAFF's most recent convention, the Union representatives of over 280,000 professional fire fighters across the United States and Canada, with representatives from the United Kingdom, Australia and New Zealand, voted unanimously to support he requirement of photoelectric smoke detectors.

The representatives, of those who respond to difficult fire scenes involving thousands of fatalities, have determined it is time to move forward with the requirement of photoelectric smoke detectors. Countless times our members have responded to residential fires and removed victims who had disabled their detectors due to nuisance alarms. Tragically many of these families forgot to replace the batteries or reinstall the hard wire detector when they were finished cooking. Unfortunately in many incidents these occupants, or a loved one, ended up paying the ultimate price for their forgetfulness, or some may argue, the lack of the detector industry addressing the problem.

On behalf of the nation's professional fire fighters we request your support for this code change.

Cost Impact: (Fleming) The code change proposal will not increase construction costs in any meaningful manner. The cost difference between ionization and photoelectric is minimal, particularly when one considers the benefit.

Cost Impact: (DeCrane) The code change proposal will minimally increase construction costs.

PART I – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FLEMING-DECRANE-F1-907.2.11

F113–09/10
907.2.11.2 (IBC [F] 907.2.11.2)

Proponent: Rick Sheets, Fire Committee Chair, Brinks Home Security, representing National Burglar and Fire Alarm Association

Revise as follows:

907.2.11.2 (IBC [F] 907.2.11.1) Groups R-2, R-3, R-4 and I-1. Single- or multiple-station smoke alarms shall be installed and maintained in Groups R-2, R-3, R-4 and I-1 regardless of *occupant load* at all of the following locations:

1. On the ceiling or wall outside of each separate sleeping area in the immediate vicinity of bedrooms.
2. In each room used for sleeping purposes.

   ~~**Exception:** Single- or multiple-station smoke alarms in Group I-1 shall not be required where smoke detectors are provided in the sleeping rooms as part of an automatic smoke detection system.~~

3. In each *story* within *a dwelling unit,* including basements but not including crawl spaces and uninhabitable *attics.* In *dwellings* or *dwelling units* with split levels and without an intervening door between the adjacent levels, a smoke alarm or smoke detector installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full *story* below the upper level.

   Exception: Single- or multiple-station smoke alarms in Groups R-2, R-3, R-4, and I-1 shall not be required where smoke detectors are part of an automatic smoke detection system and installed in all the locations required by Section 907.2.11.2.

Reason: There is no logical reason that these other groups (R-2, R-3, R-4) should be discouraged from installing superior fire alarm and detection systems. Professional protection using system-type smoke detection, with all its associated technological features, should be allowed for all similar occupancies, not just I-1. Chapter one of this code at 104.09 states that equal or superior alternate methods are allowed.

Cost Impact: The code change proposal will not increase the cost of construction. (No increase is required, but the change allows for optional protection at additional costs.)

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SHEETS-F7-907.2.11.2.DOC

F114–09/10

907.2.11.3 (IBC [F] 907.2.11.3), 4603.7, 4603.7.1; IPMC [F] 704.2, [F] 704.3, [F] 704.4; IBC 3403.5 (New) [IEBC [B] 302.5 (New)], 3404.7 (New) [IEBC [B] 303.7 (New)]; IEBC 704.4.3, 1004.1;

Proponent: Jonathan C. Siu, City of Seattle, representing the Seattle Department of Planning and Development

THIS IS A 3 PART CODE CHANGE. ALL PARTS WILL BE HEARD BY THE FIRE CODE COMMITTEE AS 3 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE FIRE CODE COMMITTEE.

PART I – IFC and IPMC

1. Revise IFC as follows:

907.2.11.3 (IBC [F] 907.2.11.3) Interconnection. Where more than one smoke alarm is required to be installed within an individual *dwelling unit* or *sleeping unit* in Group ~~R-1, R-2, R-3 or R-4~~ R or I-1 occupancies, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

4603.7 Single- and multiple-station smoke alarms. Single and multiple-station smoke alarms shall be installed in existing Group R and I-1 occupancies ~~and in *dwellings* not classified as Group R occupancies~~ in accordance with Sections 4603.7.1 through 4603.7.3.

4603.7.1 Where required. Existing Group R and I-1 occupancies ~~and in *dwellings* not classified as Group R occupancies~~ not already provided with single-station smoke alarms shall be provided with single-station smoke alarms. Installation shall be in accordance with Section 907.2.11, except as provided in Sections 4603.7.2 and 4603.7.3.

2. Revise IPMC as follows:

[F] 704.2 Smoke alarms. Single- or multiple-station smoke alarms shall be installed and maintained in Groups~~ R-2, R-3, R-4 and in dwellings not regulated in group~~ R or I-1 occupancies, regardless of *occupant* load at all of the following locations:

1. On the ceiling or wall outside of each separate sleeping area in the immediate vicinity of *bedrooms*.
2. In each room used for sleeping purposes.
3. In each story within a *dwelling unit*, including *basements* and cellars but not including crawl spaces and uninhabitable attics. In dwellings or *dwelling units* with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

~~Single- or multiple-station smoke alarms shall be installed in other groups in accordance with the *International Fire Code*.~~

[F] 704.3 Power source. In Group R or I-1 occupancies ~~and in dwellings not regulated as Group R occupancies~~, single-station smoke alarms shall receive their primary power from the building wiring provided that such wiring is served from a commercial source and shall be equipped with a battery backup. Smoke alarms shall emit a signal when the batteries are low. Wiring shall be permanent and without a disconnecting switch other than as required for overcurrent protection.

Exception: Smoke alarms are permitted to be solely battery operated in buildings where no construction is taking place, buildings that are not served from a commercial power source and in existing areas of buildings undergoing alterations or repairs that do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or *basement* available which could provide access for building wiring without the removal of interior finishes.

[F] 704.4 Interconnection. Where more than one smoke alarm is required to be installed within an individual *dwelling unit* in Groups~~ R-2, R-3, R-4 and in dwellings not regulated in group~~ R or I-1 occupancies, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. The alarm shall be clearly audible in all *bedrooms* over background noise levels with all intervening doors closed.

Exceptions:

1. Interconnection is not required in buildings which are not undergoing alterations, repairs or construction of any kind.
2. Smoke alarms in existing areas are not required to be interconnected where alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or *basement* available which could provide access for interconnection without the removal of interior finishes.

PART II – IBC GENERAL

Add new text to IBC as follows:

3403.5 (IEBC [B] 302.5) Smoke alarms in existing portions of a building. Where an *addition* is made to a building or structure of a Group R or I-1 occupancy, the *existing building* shall be provided with smoke alarms in accordance with Section 4603.7 of the *International Fire Code*.

3404.7 (IEBC [B] 303.7) Smoke alarms. Individual sleeping units and individual dwelling units in Group R and I-1 occupancies shall be provided with smoke alarms in accordance with Section 4603.7 of the *International Fire Code*.

PART III – IEBC

Revise IEBC as follows:

704.4.3 Smoke Alarms. Individual sleeping units and individual dwelling units in any *work area* in Group ~~R-1, R-2, R-3, R-4,~~ R and I-1 occupancies shall be provided with smoke alarms in accordance with the *International Fire Code*.

Exception: Interconnection of smoke alarms outside of the ~~rehabilitation~~ *work area* shall not be required.

1004.1 Smoke Alarms in existing portions of a building. ~~Whenever~~ Where an *addition* is made to a building or structure of a Group ~~R-3, or R-4~~ R or I-1 occupancy, the *existing building* shall be provided with smoke alarms as required by Section 4603.7 of the *International ~~Building~~ Fire Code* or Section R314 of the *International Residential Code* as applicable.

Reason (Part I): The purpose of this code change is to align the IFC, IBC, and IEBC requirements.

The change in Section 4607.3 clarifies what non-Group R dwellings are being referred to, and is part of an effort to align the requirements in the IFC, IBC, and IEBC.

The change to refer to Group R occupancies rather than listing them individually in Section 907.2.11.3 is strictly editorial. Addition of Group I-1 occupancies is to align this section with IFC Section 4603.7 and IEBC Section 704.4.3.

Reason (Part II): For many years, the code community has been touting the efficacy of smoke alarms in saving lives. While there are requirements in the Fire Code to provide smoke alarms in existing buildings, there is no clear path to get to the requirements from the building code. As the ICC codes currently stand, only the Existing Building Code references the Fire Code for this important requirement. This proposal adds requirements in the building code to provide smoke alarms in existing buildings with residential and supervised residential occupancies when additions or alterations are made to the building, with text that is modeled on Sections 704.4.3 and 1004.1 of the IEBC.

In some jurisdictions where the review for building code and fire code compliance are split between the building and fire departments, additions and alterations, particularly those for single family residences, are not reviewed by the fire department. Without a clear path to the requirements, it would be easy for a building code reviewer to miss that smoke alarms are indeed required in areas of dwelling or sleeping units where there may not be construction occurring. For those of us who were accustomed to finding such a requirement in a legacy building code, it is disconcerting to find that the topic is not addressed at all in the IBC, and it would be helpful to have a pointer to the provisions.

This proposal is one of 3 submitted to coordinate the IFC, IBC, and IEBC, provisions relating to smoke alarms in existing buildings.

Reason (Part III): The purposes of this code change proposal are to provide a correct cross-reference to the requirements for retrofitting smoke alarms, and to align the Existing Building Code with the Fire Code.

As currently written, the IBC does not address the issue of providing smoke alarms in the existing portion of a building in Chapter 34 or anywhere else, so the reference to the IBC in this section is confusing. Those requirements are actually contained in the Fire Code (IFC Section 4603.7). While the proponent has submitted a separate proposal to modify Chapter 34 of the IBC to provide a cross-reference to the Fire Code, a direct reference to the Fire Code from the IEBC is clearer than referring to the IBC which then refers to the IFC. Note that for alterations, IEBC Section 704.4.3 already correctly refers the user to the Fire Code, rather than the Building Code.

The extension of the requirement to all Group R occupancies and to I-1 occupancies is to align this section with IEBC Section 704.4.3 (Level 2 alterations), as well as IFC Section 903.2.11.3 (smoke alarms in new construction).

The proposed change to refer to Group R occupancies in general rather than listing them individually in Section 704.4.3 is editorial, and is one of several proposals to align the text in the Building, Fire, and Existing Building codes. The deletion of the redundant “rehabilitation” in the exception is also editorial.

Cost Impact (Parts I-III): The code change proposal will cause a decrease in cost of construction.

PART I – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III – IEBC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SIU-F1-907.2.11.3-2.DOC

F115–09/10

907.2.11.3 (IBC [F] 907.2.11.3), 4603.7.2; IPMC [F] 704.4; IRC R314.3, R314.4, R314.5 (New)

Proponent: Jonathan C. Siu, City of Seattle, WA, representing the Seattle Department of Planning and Development

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IFC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IFC and IPMC

1. Revise IFC as follows:

907.2.11.3 (IBC [F] 907.2.11.3) Interconnection. Where more than one smoke alarm is required to be installed within an individual *dwelling unit* or *sleeping unit* in Group R-1, R-2, R-3 or R-4, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

4603.7.2 Interconnection. Where more than one smoke alarm is required to be installed within an individual *dwelling* or *sleeping unit,* the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed.

Exceptions:

1. Interconnection is not required in buildings that are not undergoing *alterations*, repairs or construction of any kind.
2. Smoke alarms in existing areas are not required to be interconnected where *alterations* or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or *basement* available which could provide access for interconnection without the removal of interior finishes.

2. Revise IPMC as follows:

[F] 704.4 Interconnection. Where more than one smoke alarm is required to be installed within an individual *dwelling unit* in Group R-2, R-3, R-4 and in dwellings not regulated as Group R occupancies, the smoke alarms shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. . Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm. The alarm shall be clearly audible in all *bedrooms* over background noise levels with all intervening doors closed.

Exceptions:

1. Interconnection is not required in buildings which are not undergoing alterations, repairs or construction of any kind.
2. Smoke alarms in existing areas are not required to be interconnected where alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or *basement* available which could provide access for interconnection without the removal of interior finishes.

PART II – IRC BUILDING/ENERGY

Revise IRC as follows:

R314.3 Location. Smoke alarms shall be installed in the following locations:

1. In each sleeping room.
2. Outside each separate sleeping area in the immediate vicinity of the bedrooms.
3. On each additional *story* of the *dwelling*, including *basements* and habitable attics but not including crawl spaces and uninhabitable *attics*. In *dwellings* or *dwelling units* with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full *story* below the upper level.

~~When more than one smoke alarm is required to be installed within an individual *dwelling* unit the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual unit.~~

R314.4 Power source. Smoke alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection. ~~Smoke alarms shall be interconnected.~~

Exceptions:

1. Smoke alarms shall be permitted to be battery operated when installed in buildings without commercial power.
2. ~~Interconnection and~~ Hard-wiring of smoke alarms in existing areas shall not be required where *alterations* or repairs do not result in removal of interior wall or ceiling finishes exposing the structure, unless there is an *attic*, crawl space or *basement* available which could provide access for hard-wiring ~~and interconnection~~ without the removal of interior finishes.

R314.5 Interconnection. Where more than one smoke alarm is required to be installed within an individual *dwelling* unit in accordance with Section R314.3, the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual unit. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm.

Exception: Interconnection of smoke alarms in existing areas shall not be required where *alterations* or repairs do not result in removal of interior wall or ceiling finishes exposing the structure, unless there is an *attic*, crawl space or *basement* available which could provide access for interconnection without the removal of interior finishes.

Reason (Part I): The purpose of this proposal is to recognize listed wireless smoke alarms.

This proposal adds language that would allow listed wireless alarms to substitute for wired interconnection of the smoke alarms in both new and existing construction. While the code officials with whom we have discussed this issue would accept wireless systems as being interconnected, we have heard from other sources that some code officials do not recognize wireless interconnection as meeting the code requirement for interconnection. Adding the proposed text would make it clear that listed wireless systems comply with the code. It is the intent of this code change proposal that the new text in IFC Section 907.2.11.3 would appear in the same section in the IBC.

Reason (Part II): The requirements for interconnection of smoke alarms in the 2009 IRC are divided between two sections, neither of whose titles reflect they contain any requirements relating to interconnection. (See the second paragraph of Section R314.3, titled "Location" and Section R314.4, titled "Power Source"). This can make it difficult to find the requirements for interconnection, unless the code user already knows where to look. The editorial change being proposed creates a new section that consolidates the interconnection requirements into a new section (R314.5), separate from the other two, with an appropriate title. This format is similar to the IFC and IBC, Sections 907.2.11.3 (interconnection) and 907.2.11.4 (power source), as well as IFC Sections 4603.7.2 and 4603.7.3.

The substantive change being proposed is to add language that would allow listed wireless alarms to substitute for wired interconnection of the smoke alarms in both new and existing construction. While the code officials with whom we have discussed this issue would accept wireless systems as being interconnected, we have heard from other sources that some code officials do not recognize wireless interconnection as meeting the code requirement for interconnection. Adding the proposed text would make it clear that listed wireless systems comply with the code.

Cost Impact (Parts I-II): The code change proposal will decrease the cost of construction.

PART I – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SIU-F2-907.2.11.3.DOC

F116–09/10

907.2.12 (New) [IBC [F] 907.2.12 (New)], 4603.8 (New); IRC R314.5 (New), R314.5.1(New), R314.5.2 (New), R314.5.3 (New)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IFC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: David Fredrick Scarelli representing DBA-Sentry Signal Company

PART I – IFC

Add new text as follows:

907.2.12 (IBC [F] 907.2.12) Line type heat detection. A line type heat detection system that activates at 475°F (246°C) shall be installed in Group R Occupancies in accordance with Sections 907.2.12.1 through 907.2.12.2, NFPA 72, NFPA 70 and manufacturer's instructions.

907.2.12.1 (IBC [F] 907.2.12.1) Location. A line type heat detection shall be installed in the following locations:

1. Above all NM-B Cable
2. Above all electrical boxes
3. Above or near all raceways.

907.2.12.2 (IBC [F] 907.2.12.2) Interconnection. The line type heat detection system shall be interconnected with the smoke alarms required by Section 907.2.11 in such a manner that when the line type heat detection activates such detection shall activate the smoke alarms in all sleeping units and dwelling units.

4603.8 Line type heat detection. A line type heat detection that activates at 475° F (246°C) shall be installed in existing Group R Occupancies in accordance with Sections 4603.8.1 through 4603.8.2, NFPA 72, NFPA 70 and manufacturer's instructions.

4603.8.1 Location. Line type heat detection shall be installed in the following locations:

1. Above all exposed NM-B Cable
2. Above all electrical boxes
3. Above or near all raceways.

4603.8.2 Interconnection. The line type heat detection system shall be interconnected with the smoke alarms required by Section 907.2.11 in such a manner that when the line type heat detection activates such detection shall activate the smoke alarms in all sleeping and dwelling units.

PART II – IRC

Add new text as follows:

R314.5 Line type heat detection. A line type heat detection system that activates at 475°F(246°C) shall be installed in accordance with Sections 314.5.1 through 314.5.2, NFPA 72, NFPA 70 and manufacturer's instructions.

R314.5.1 Location. Line type heat detection shall be installed in the following locations:

1. Above all NM-B Cable
2. Above all electrical boxes
3. Above or near all raceways.

R314.5.2 Interconnection. The line type heat detection system shall be interconnected with the smoke alarms in such a manner that when the line type heat detection activates such detection shall activate all of the alarms in the dwelling unit. Where there are two dwelling units the line type heat detection shall be interconnected with the smoke alarms in both dwelling units.

Reason: According to death certificate data, 25% of fire and flame deaths in 2002 were due to smoke inhalation alone, 26% due to burns and 21% to a combination of burns and smoke inhalation. There were 517,000 structural, 3,140 civilian deaths and 17,730 civilian induries. *(page 37).

ESCAPING – all seemed savable …; SLEEPING – 1/3 estimated as savable; RESCUING OR FIREFIGHTING – ¾ estimated savable … **Reanalysis of who can be saved.** (see additional data attached)

Deterioration of electrical wiring caused by time or the environment is a predominant cause of ignition. *+ (pg. 24)

Fires in electrical distribution systems contribute significantly to the U.S. fire problem, accounting for a consistent portion of the problem year after year. *+ (page 69)

In 2006 an estimated 71,360 injuries involving electrical distribution or lighting equipment were reported to hospital emergency rooms. +

Electrical distributions and lighting equipment dwelling fires are the only type of home fires that have been shown to increase in frequency with increasing dwelling age. *+

The majority of 2002-2005 non-confined home structure fires involving electrical distribution or lighting equipment began with the ignition of products and materials often found in structural areas, including wire or cable insulation (30%), structural members or framing (12%), insulation within the structural area (5%). Pg 6#

Three-fourths (75%) of deaths in 2002-2005 home fires involving electrical distribution or lighting equipment involved victims who were outside the area of origin when the fire began. (pg 6#)

Branch circuit wiring (51%) accounted for half of the 2002-2005 non-confined home structure fires involving wiring. (pg 54 #)

Half (52%) of 2002-2005 non-confined home structure fires involving wiring began in fire areas of origin that are all concealed or exterior spaces. (pg 55 #)

The majority (57%) of 2002-2005 non-confined home structure fires involving overcurrent protection devices began with ignition wire or cable insulation. (pg 89#)

SUMMARY: Electrical distribution equipment is a highly significant contributor to the high number of civilian deaths and civilian injuries resulting year after year in home fires. Many lives can be saved and injuries prevented if earlier warning can be sounded.

CONCLUSION: The line type open switch activated by heat and/or fire is designed by earliest warning to prevent death by asphyxiation and burning.

(6b) Circuitry short circuits and overloads trip the circuit breakers when the breaker rating is reached. Lower leakage causes hot spots along the line and eventually causes fires that could be detected long before they could become autocatalytic. The line type open switch is designed to detect this hazard long before life is endangered.

Bibliography

+ Characteristics of Home Fire Victims, NFPA, Fire analysis and Research Division. July, 2005. Pg. 59, John R. Hall Jr.

** How Many People Can be Saved From Home Fires if Given More Time to Escape? Fire Technology, 40. Pgs 117-126, 2004: John R. Hall Jr. Fire Analysis and Research Division, NFPA

+ Statistics from National Electronic Injury Surveillance System (NEISS). Data obtained from the U.S. Consumer Product Safety Commission (CPSC) website, www.cpsc.gov

*+ Linda E. Smith and Dennis McCoskrie, "What Causes Wiring Fires in Residences?" Fire Journal, Jan/Feb 1990. Volume 84, Number 1

"Home Structure Fires Involving Electrical Distribution and Lighting Equpment." John R. Hall, Jr., Fire Analysis and Research Division, NFPA, March 2008.

Cost Impact: This code change proposal will increase the cost of construction.

PART I – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SCARELLI F1-907.2.12.DOC

F117–09/10
907.2.12.1 (IBC [F] 907.2.12.1)

Proponent: Rick Sheets, Fire Committee Chair, Brinks Home Security, representing National Burglar and Fire Alarm Association

Revise as follows:

907.2.12.1 (IBC [F] 907.2.12.1) Alarm. Activation of any single smoke detector, the *automatic sprinkler system* or any other automatic fire detection device shall immediately sound an alarm at ~~the building at~~ a constantly attended location from which emergency action can be initiated, including the capability of manual initiation of requirements in Section 907.2.12.2.

Reason: Deleting the words "at the building" allows for a broader interpretation of a suitable location from which to take action.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SHEETS-F8-907.2.12.1-PRIMARY.DOC

F118–09/10
907.2.12.1 (IBC [F] 907.2.12.1)

Proponent: Rick Sheets, Fire Committee Chair, Brinks Home Security, representing National Burglar and Fire Alarm Association

Revise as follows:

907.2.12.1 (IBC [F] 907.2.12.1) Alarm. Activation of any single smoke detector, the *automatic sprinkler system* or any other automatic fire detection device shall immediately ~~sound an~~ activate an audible and visible alarm at the building at a constantly attended location from which emergency action can be initiated, including the capability of manual initiation of requirements in Section 907.2.12.2.

Reason: The confusing language contained in the existing code is the problem, as it is not consisted with NFPA 72, nor other references in this code or the IBC.

This could be resolved by using the word "activate" instead of "sound". Also, adding the words "audible and visible" is consistent with other codes and standards where private mode signaling is required or permitted.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SHEETS-F9-907.2.12.1-SECONDARY.DOC

F119–09/10
907.2.13.1.1 (IBC [F] 907.2.13.1.1)

Proponent: Thomas P. Hammerberg, Automatic Fire Alarm Association, Inc.

Revise as follows:

907.2.13.1.1 (IBC [F] 907.2.13.1.1) Area smoke detection. Area smoke detectors shall be provided in accordance with this section. Smoke detectors shall be connected to an automatic fire alarm system. The activation of any detector required by this section shall operate the emergency voice/alarm communication system in accordance with Section 907.6.2.2. In addition to smoke detectors required by Sections 907.2.1 through 907.2.10, smoke detectors shall be located as follows:

1. In each mechanical equipment, electrical, transformer, telephone equipment or similar room which is not provided with sprinkler protection.
2. In each elevator machine room and in elevator lobbies.

Reason: This change will provide more clarity for the requirements for smoke detectors in high-rise buildings. Without this language, it is possible to interpret this to mean that the only smoke detectors required in a high-rise are as listed in this Section. It further clarifies which detectors must activate the emergency voice alarm communication system.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HAMMERBERG-F1-907.2.13.1.1.DOC

F120–09/10
907.2.13.1.2 (IBC [F] 907.2.13.1.2); IMC 606.2.1 (New), 606.2.2

Proponent: Dave Frable, U.S. General Services Administration

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE FIRE CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE FIRE CODE COMMITTEE.

PART I – IFC

Revise as follows:

907.2.13.1.2 (IBC [F] 907.2.13.1.2) Duct smoke detection. Duct smoke detectors complying with Section 907.3.1 shall be located as follows:

1. In the main supply air duct of each air-handling system having a design capacity greater than 2,000 cubic feet per minute (cfm) (0.94 m^3/s), downstream of any filters.

~~1.~~ 2. In the main return ~~air and exhaust air plenum~~ of each air-~~conditioning~~ handling system having a design capacity greater than ~~2,000~~ 15,000 cubic feet per minute (cfm) ~~(0.94 m^3/s)~~(7.1 m^3/s). Such detectors shall be located in a serviceable area downstream of the last duct inlet.

3. In the supply air system where multiple air-handling systems share common or supply return air ducts or plenums with a combined design capacity greater than 2,000 cfm (0.9 m^3/s),

4. At each story in return air systems having a design capacity greater than 15,000 cfm (7.1 m^3/s), where return air risers serve two or more stories.

~~2.~~ 5. At each connection to a vertical duct or riser serving two or more stories from a return air duct or plenum of an air-conditioning system with a design capacity of greater than 15,000 cfm (7.1 m^3/s). In Group R-1 and R-2 occupancies a listed smoke detector is allowed to be used in each return air riser carrying not more than 5,000 cfm (2.4 m^3/s) and serving not more than 10 air inlet openings.

Exception: Smoke detectors are not required in the return air system where all portions of the building served by the air distribution system are protected by area smoke detectors connected to a fire alarm system in accordance with the *International Fire Code*.

PART II – IMC

Revise as follows:

606.2 Where required. Smoke detectors shall be installed where indicated in Sections 606.2.1 through ~~606.2.3~~ 606.2.4.

Exception: Smoke detectors shall not be required where air distribution systems are incapable of spreading smoke beyond the enclosing walls, floors and ceilings of the room or space in which the smoke is generated.

606.2.1 Supply air systems. Smoke detectors shall be installed in supply air systems with a design capacity greater than 2,000 cubic feet per minute (cfm) (0.94 m^3/s), in the supply air duct or plenum downstream of any filters.

~~606.2.1~~ 606.2.2 Return air systems. Smoke detectors shall be installed in return air systems with a design capacity greater than ~~2,000~~ 15,000 cfm (~~0.9~~ 7.1m^3/s), in the return air duct or plenum upstream of any filters, exhaust air connections, outdoor air connections, or decontamination equipment and appliances.

Exception: Smoke detectors are not required in the return air system where all portions of the building served by the air distribution system are protected by area smoke detectors connected to a fire alarm system in accordance with the *International Fire Cod*e. The area smoke detection system shall comply with Section 606.4.

~~**606.2.2**~~ **606.2.3 Common supply and return air systems.** Where multiple air-handling systems share common supply or return air ducts or plenums with a combined design capacity greater than 2,000 cfm (0.9 m^3/s), the supply ~~return~~ air system shall be provided with smoke detectors in accordance with Section 606.2.1.

~~**Exception:** Individual smoke detectors shall not be required for each fan-powered terminal unit, provided that such units do not have an individual design capacity greater than 2,000 cfm (0.9 m^3/s) and will be shut down by activation of one of the following:~~

~~1. Smoke detectors required by Sections 606.2.1 and 606.2.3.~~
~~2. An approved area smoke detector system located in the return air plenum serving such units.~~
~~3. An area smoke detector system as prescribed in the exception to Section 606.2.1~~.

In all cases, the smoke detectors shall comply with Sections 606.4 and 606.4.1.

Reason: The intent of this proposal is to improve the level of detection of smoke within air handling units cost effectively and to correlate smoke detector requirements in air handling systems in the IBC, IFC and IMC with the requirements currently found in NFPA 90A, *Standard for the Installation of Air-Conditioning and Ventilating Systems*.

During the 2006/2007 ICC Code Development Hearings in Orlando, both the Fire Code Committee and Mechanical Code Committee recommended approval of two similar code change proposals (F113-06/07 – Part 1& Part 2). However, at the Final Action Hearings of the ICC in May 2007, the ICC membership voted to overturn both the Fire Code Committee and the Mechanical Code Committee's recommendations and disapproved the subject code change proposals. At the hearings, no new information or technical substantiation was brought forth to substantiate overturning the two Code Committee's recommendations for approval. It should be emphasized that the main issue of contention by the opponents of this code change proposal at both the Code Committee and Final Action Hearings was that this issue had been debated many times before in the ICC Code Development Process. However, that is untrue. During the 2009 Code Hearings in Minneapolis, the only mention of this occurring was in the Commonwealth of Virginia's Mechanical Code over 10 years ago.

The technical substantiation to revise the location of smoke detectors from the return air side to the supply air side is valid; and will improve the level of detection of smoke within air-handling units. Opponents may argue that return air detectors will detect fires in a building much quicker than detectors located on the supply air side, but return air detectors are **not** a substitute for area detectors. If there is a desire for early detection of smoke, area smoke detectors should be installed. However, we contend that the detector serving the supply air detector will operate as desired once the smoke concentration levels in the supply air exceeds the alarm threshold so occupants should not be at risk should the return air fan continues to run prior to the supply air fan shutting down. In addition, return air detectors will not be able to detect smoke from a fire on the supply side of air handling units due to fan belts, motors or combustible filters so their respective fan will shut off appropriately. A smoke detector located on the supply side can also detect smoke from an exterior fire that gets pulled into the fresh air intake for the air handling system. Thus, a smoke detector located on the supply side will serve the purpose of protecting building occupants from smoke produced by air handling unit fire or smoke ingress via the fresh air intake for the air handling unit. Therefore overall detection is improved.

Correlating the IFC, IBC and IMC with NFPA 90A is also important as many jurisdictions adopt both the IFC/IMC and NFPA 90A. Accredited health care organizations are required by law to comply with NFPA 90A. Not having the subject requirements in the IBC in concert with NFPA 90A results in the unnecessary installation of smoke detectors in both the return and supply air systems. This code change proposal aims to maintain detection in air handling systems, not remove it. There should be no increase in installation costs as this code change proposal merely shifts the location of devices from the return air side to the supply air side, where air handling units are greater than 2000 cfm. In fact, changing the requirement as proposed will reduce the cost in jurisdictions that must comply with the IFC/IMC and NFPA 90A (i.e., leaving the requirements as currently stated in both the IFC and IMC already results in unnecessary additional costs).

Specific code changes are as follows:

PART I:
(New) IFC 907.2.13.1.2, paragraph 1
Over the past few years, the U.S. General Services Administration has had a number of fire incidences that did not activate the building fire alarm system because there were no smoke detectors installed in the main supply air duct of the air-handling system downstream of any filter. Conversely, GSA has no incidence of a return air duct smoke detector activating as a result of detecting smoke in the return air handling system. Installing duct smoke detectors in the supply air system would ensure that a fire within the supply air filters, in the air handling motors or originating outside near air intakes can be discovered before it spreads. Establishing a 2,000 cfm threshold for installing detectors in supply air fans appears to be an industry standard.

(New) 907.2.13.1.2, paragraphs 2 & 3 (Note: the intent is for 907.2.13.1.2 to be have similar language as 606.2.2 and 606.2.3 so the codes are coordinated). The current requirement for installing duct smoke detectors in return air systems exceeding 2,000 cfm is overly restrictive. The 15,000 cfm threshold for return air systems appears to be an industry standard, as this capacity was used in the legacy codes and is currently used by NFPA 90A. The term "air conditioning system" has been replaced with "air handling system to more accurately reflect the type of system used in buildings today.

(Deleted text) Per the commentary for Section 606.1, requiring duct smoke detectors in exhaust air plenums does not provide any protection for the fan or the building occupants, since smoke is being exhausted out of the building. In addition, return air smoke detection is not supposed to be used as a means for detecting smoke in buildings.

(New) IFC 907.2.13.1.2, paragraph 4 is material extracted from IMC existing 606.2.3 (changed to 606.2.4).
This is an editorial change to coordinate the two codes.

(Revision) 907.2.13.1.2 Paragraph No. 5 (formally Paragraph No. 2) – The purpose of this code change is to correlate this paragraph with the changes above. The code language contained in the IBC does not have a capacity threshold for return air ducts/plenum with connections to more than two stories and, therefore, all return duct/plenum system that connects more than two floors would require duct mounted smoke detectors at the connection to the riser regardless of the size of the system. This would be onerous to smaller buildings that have multi-story returns. In addition, no other code (either the legacy codes or NFPA 90A require duct smoke detectors in multi-story return air systems unless they exceed 15,000 cfm. This change also would correlate the capacity requirements currently specified in NFPA 90A - 2007 edition (NFPA 90A – 6.4.2).

(New) Exception to IFC 907.2.13.1.2 (2) through (5) is material extracted from the IMC existing exception to 606.2.1 (changed to 606.2.2) that eliminates the need for duct smoke detectors in return air systems when the entire building is protected by area smoke detectors.

PART II:
(Revision) 606.2. This is an editorial change to coordinate the two codes.

(New) IMC 606.2.1

Over the past few years, the U.S. General Services Administration has had a number of fire incidences that did not activate the building fire alarm system because there were no smoke detectors installed in the main supply air duct of the air-handling system downstream of any filter. Conversely, GSA has no incidence of a return air duct smoke detector activating as a result of detecting smoke in the return air handling system. Installing duct smoke detectors in the supply air system would ensure that a fire within the supply air filters, in the air handling motors or originating outside near air intakes can be discovered before it spreads. Establishing a 2,000 cfm threshold for installing detectors in supply air fans appears to be an industry standard.

(Revision/New) 606.2.1 and 606.2.2 (changed to 606.2.2 and 606.2.3, respectively) (Note: the intent is for 907.2.13.1.2 paragraphs 2 & 3 to have similar language as 606.2.2 and 606.2.3 so the codes are coordinated). The current requirement for installing duct smoke detectors in return air systems exceeding 2,000 cfm is overly restrictive. The 15,000 cfm threshold for return air systems appears to be an industry standard, as this capacity was used in the legacy codes and is currently used by NFPA 90A. The term "air conditioning system" has been replaced with "air handling system to more accurately reflect the type of system used in buildings today.

(Deletion) Exception to IMC 606.2.2 (changed to IMC 606.2.3):

The 2,000 cfm requirement has been applied to the supply air side. Therefore the Exception needs to be deleted given the proposed new return air threshold will be increased from 2,000 cfm to 15,000 cfm.

(Revision) IMC 606.2.3 (changed to IMC 606.2.4) editorial as a new section was inserted. Existing text unchanged.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FRABLE-F1-907.2.13.1.2.DOC

F121–09/10

907.4, 907.4.1 (New) [IBC [F] 907.3, [F] 907.3.1 (New)]

Proponent: Rick Sheets, Fire Committee Chair, Brinks Home Security, representing National Burglar and Fire Alarm Association

Revise as follows:

907.4 (IBC [F] 907.3) Fire safety functions. Automatic fire detectors utilized for the purpose of performing fire safety functions shall be connected to the building's fire alarm control unit where a fire alarm system is required by Section 907.2. Detectors shall, upon actuation, perform the intended function and activate the alarm notification appliances or activate a visible and audible supervisory signal at *a constantly attended location.*

907.4.1 (IBC [F] 907.3.1) Power source. In buildings not equipped with a fire alarm system, the automatic fire detector shall be powered by normal electrical service and, upon actuation, perform the intended function. The detectors shall be located in accordance with NFPA 72.

Exception: Elevator recall and supervisory service detectors shall be connected to a dedicated function fire alarm control unit that shall be designated as "Elevator Recall Control & Supervisory Unit".

Reason: Including this exception means-monitoring the integrity of the initiating device circuits cannot be omitted. In the past, smoke alarms and heat detectors were directly wired in the elevator equipment without providing the required monitoring for integrity of the circuit wiring, allowing elevators to be used during a fire. The requirement for the use of a fire alarm control unit for elevator recall is also a requirement of NFPA 72, (found in Section 6.16.3 in the 2007 edition), and should be added here for conformity as well as safety.

Cost Impact: The code change proposal will not increase the cost of construction since compliance with NFPA 72 is already required by this code and elevator codes.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SHEETS-F12-907.4.1.DOC

F122–09/10
907.5.1 (IBC [F] 907.4.1)

Proponent: Thomas P. Hammerberg, Automatic Fire Alarm Association, Inc

Revise as follows:

907.5.1 (IBC [F] 907.4.1) Protection of fire alarm control unit. In areas that are not continuously occupied, a single smoke detector shall be provided at the location of each fire alarm control unit, notification appliance circuit power extenders and supervising station transmitting equipment.

Exceptions:

1. Where ambient conditions prohibit installation of smoke detector, a *heat detector* shall be permitted.
2. The smoke detector shall not be required where the building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.

Reason: This exception was added to this requirement during the last code cycle so the language would be consistent with NFPA 72. This exception was deleted in the 2010 edition of NFPA 72, so needs to be deleted here for consistency.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HAMMERBERG-F2-907.5.1.DOC

F123–09/10
907.5.2.6 (New) [IBC [F] 907.4.2.6 (New)]

Proponent: Patrick D. Bradshaw, CFI-II, CFPE; Richland County Emergency Services (Fire Marshal's Office), SC, representing self

Add new text as follows:

907.5.2.6 (IBC [F] 907.4.2.6) Unobstructed and unobscured. Manual fire alarm boxes shall be accessible, unobstructed, unobscured and visible at all times

Reason: Currently there is no clear requirement in the IFC for maintaining manual fire alarm boxes clear and unobstructed. It is recommended that a minimum of 3 feet be kept clear but more may be needed. NFPA 72 does address the installation to be unobstructed in section 5.13.5 of the 2007 edition. NFPA 1 and NFPA 101 both address this requirement. For those jurisdictions adopting the ICC family of codes, this apparent common sense requirement is not found. Adding this requirement to the IFC will streamline inspections and enforcement by mandating this in the body of the code in a concise manner and not a secondary reference.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BRADSHAW-F1-907.4.6.DOC

F124–09/10
907.6.2.1 (IBC [F] 907.5.2.1)

Proponent: Dave Frable, U.S. General Services Administration

Revise as follows:

907.6.2.1 (IBC [F] 907.5.2.1) Audible alarms. Audible alarm notification appliances shall be provided and emit a distinctive sound that is not to be used for any purpose other than that of a fire alarm.

Exceptions

1. Visible alarm notification appliances shall be allowed in lieu of audible alarm notification appliances in critical care areas of Group I-2 occupancies.
2. Where provided, audible notification appliances located in each occupant evacuation elevator lobby in accordance with Section 3008.5.1 of the *International Building Code* shall be connected to a separate notification zone for manual paging only.

Reason: The intent of this code change is to ensure that automatic emergency voice/alarm messages do not interfere with operation of the two-way communication. Ensures that live voice messages from the emergency voice/alarm communication will only transmit into the subject enclosed elevator lobby.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FRABLE-F2-907.6.2.1.DOC

F125–09/10
907.6.2.1.1 (IBC [F] 907.5.2.1.1)

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Revise as follows:

907.6.2.1.1 (IBC [F] 907.5.2.1.1) Average sound pressure. The audible alarm notification appliances shall provide a sound pressure level of 15 decibels (dBA) above the average ambient sound level or 5 dBA above the maximum sound level having a duration of at least 60 seconds, whichever is greater, in every occupiable space within the building. ~~The minimum sound pressure levels shall be 75 dBA in occupancies in Groups R and I-1; 90 dBA in mechanical equipment rooms; and 60 dBA in other occupancies.~~

Reason: The concept of providing a minimum dBA level in the code was contained in the First Draft of the IFC/IBC. This concept can be traced back to the Legacy Codes and was added in 1990. At that time, the code requirement was consistent with, or more restrictive than, the requirements contained in NFPA 72G. NFPA 72G has since been incorporated into NFPA 72 and the sound levels have not only been relocated from the body of the standard to Annex B, but have also been revised in NFPA 72. The subsequent revisions of the sound levels in NFPA 72 occurred without a corresponding revision to the sound levels now found in the International Codes. In other words, the IFC/IBC has not kept up with these revisions in NFPA 72.

Both NFPA 72G and NFPA 72 provide guidance on the expected ambient sound level. Whereas, the IFC provides a minimum level of the notification appliance. Both IFC and NFPA 72 require 15 dBA above the ambient sound level. The required notification sound levels in NFPA 72G, NFPA 72 and IFC are shown below:

Use or Occupancy	NFPA 72G	NFPA 72	IFC/IBC
Business Occupancies	45 + 15 = **60**	55 + 15 = **70**	**60**
Educational Occupancies	45 + 15 = **60**	45 + 15 = **60**	**60**
Industrial Occupancies	80 + 15 = **95**	80 + 15 = **95**	**60**
Institutional Occupancies	50 + 15 = **65**	50 + 15 = **65**	**75**
Mercantile Occupancies	40 + 15 = **55**	40 + 15 = **55**	**60**
Piers and Water surrounded structures	40 + 15 = **55**	40 + 15 = **55**	**60**
Places of Assembly	40 + 15 = **55**	55 + 15 = **70**	**60**
Residential Occupancies	35 + 15 = **50**	35 + 15 = **50**	**75**
Residential at the pillow	Na	**75** dBA	**not specified**
Storage Occupancies	30 + 15 = **45**	30 + 15 = **45**	**60**
Thoroughfares, High Density Urban	70 + 15 = **85**	70 + 15 = **85**	**60**
Thoroughfares, Medium Density Urban	55 + 15 = **70**	55 + 15 = **70**	**60**
Thoroughfares, Rural and Suburban	40 + 15 = **55**	40 + 15 = **55**	**60**
Tower Occupancies	35 + 15 = **50**	35 + 15 = **50**	**60**
Underground Structures and Windowless Buildings	40 + 15 = **55**	40 + 15 = **55**	**60**
Vehicles and Vessels	50 + 15 = **65**	50 + 15 = **65**	**60**
Mechanical Equipment Rooms	85 + 15 = **100**	85 + 15 = **100**	**90**

The sound levels required in the IFC are not consistent with the ambient sound levels recommended for design in NFPA 72. In some cases, the IFC requirement is a higher sound level and in some cases it is lower. More importantly, the requirements in the IFC do not cover all of the possible categories or uses of the building. There is no justification to continue with the requirement in IFC and it should be deleted.

By deleting the specific sound levels specified in the IFC/IBC, the requirement then falls back to 15 dbA above the ambient sound level. This is the true test - whether or not the audibility is 15dBA over the ambient sound level. As an example, the IFC requires that the sound level for a notification device in a casino is 60 dBA; while NFPA 72 would recommend 70 dBA; while the actual ambient sound level may require devices at 95 dBA.

Therefore, these requirements in the IFC are too limited and are proposed to be deleted. Even the sound levels in NFPA 72 are only recommendations for design. The actual requirement of 15 dBA above the ambient sound level is retained in the IFC and is consistent with NFPA 72.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F16-907.6.2.1.1.DOC

F126–09/10
907.6.2.2 (IBC [F] 907.5.2.2), 907.6.2.2.5 (New) [IBC [F] 907.5.2.2.5 (New)]

Proponent: Gene Boecker, Code Consultants, Inc.

1. Revise as follows:

907.6.2.2 (IBC [F] 907.5.2.2) Emergency voice/alarm communication systems. Emergency voice/alarm communication systems required by this code shall be designed and installed in accordance with NFPA 72. ~~The operation of any automatic fire detector, sprinkler waterflow device or manual fire alarm box shall automatically sound an alert tone followed by voice instructions giving approved information and directions for a general or staged evacuation in accordance with the building's fire safety and evacuation plans required by Section 404. In high-rise buildings, the system shall operate on a minimum of the alarming floor, the floor above and the floor below. Speakers shall be provided throughout the building by paging zones. At a minimum, paging zones shall be provided as follows:~~

~~1. Elevator groups.~~
~~2. Exit stairways.~~
~~3. Each floor.~~
~~4. Areas of refuge as defined in Section 1002.1.~~

~~**Exception:** In Group I-1 and I-2 occupancies, the alarm shall sound in a constantly attended area and a general occupant notification shall be broadcast over the overhead page.~~

2. Add new text as follows:

907.6.2.2.5 (IBC [F] 907.5.2.2.5) High-rise buildings. The operation of any automatic fire detector, sprinkler waterflow device or manual fire alarm box shall automatically sound an alert tone followed by voice instructions giving approved information and directions for a general or staged evacuation in accordance with the building's fire safety and evacuation plans required by Section 404. In high-rise buildings, the system shall operate on a minimum of the alarming floor, the floor above and the floor below. Speakers shall be provided throughout the building by paging zones. At a minimum, paging zones shall be provided as follows:

1. Elevator groups.
2. Exit stairways.
3. Each floor.
4. Areas of refuge as defined in Section 1002.1.

Exception: In Group I-1 and I-2 occupancies, the alarm shall sound in a constantly attended area and a general occupant notification shall be broadcast over the overhead page.

Reason: This code change proposal clarifies the requirements of the Code for voice/alarm communication systems. In addition to high-rise buildings, voice/alarm communications systems may also be required in assembly occupancies, buildings with an atrium, and covered mall buildings. The second, third, and fourth sentences of Section 907.6.2.2 (IBC [F] 907.5.2.2) and the associated exception have been relocated to a new Section 907.6.2.2.5 (IBC [F] 907.5.2.2.5), because these sentences refer solely to high-rise voice/alarm communication system requirements and do not apply to all voice/alarm communication systems required by other sections of the Code. The revised section clearly differentiates between requirements applicable to all voice/alarm communication systems and requirements solely applicable to voice/alarm communication systems in high-rise buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOECKER-F8-907.6.2.2.DOC

F127–09/10
907.6.2.2 (IBC [F] 907.5.2.2)

Proponent: Rick Sheets, Fire Committee Chair, Brinks Home Security, representing National Burglar and Fire Alarm Association

Revise as follows:

907.6.2.2 (IBC [F] 907.5.2.2)Emergency voice/alarm communication systems. Emergency voice/alarm communication systems required by this code shall be designed and installed in accordance with NFPA 72. The operation of any automatic fire detector, sprinkler water flow device or manual fire alarm box shall automatically sound an alert tone followed by voice instructions giving *approved* information and directions for a general or staged evacuation in accordance with the building's fire safety and evacuation plans required by Section 404. In high-rise buildings, the system shall operate on a minimum of the alarming floor, the floor above and the floor below. Speakers shall be provided throughout the building by paging zones. At a minimum, paging zones shall be provided as follows:

1. Each elevator group~~s~~.
2. Each interior exit stairway~~s~~.
3. Each floor.
4. Areas of refuge as defined in Section 1002.1

Reason: The problem is that exterior stairways that are not enclosed cannot be properly served by an Emergency Voice Alarm Communication speaker system.

The requirement for speakers as part of an EVAC system to be installed in exterior stairways should be eliminated due to fact that a voice announcement's effectiveness is lost in an open environment because of wind and street noise. The quantity and volume of speakers necessitated by this requirement would be impractical. Their use would be startling to anyone near them, and offset any perceived value.

Stairways and elevators not within a common hoistway should not be grouped together so the word "each" should be added.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SHEETS-F13-907.6.2.2.DOC

F128–09/10
907.6.2.3.4 (IBC [F] 907.5.2.3.4)

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

907.6.2.3.4 (IBC [F] 907.5.2.3.4) Group R-2. In Group R-2 occupancies required by Section 907 to have a fire alarm system, all dwelling units and sleeping units shall be provided with the ~~capability~~ capacity at the fire alarm control unit to support visible alarm notification appliances in accordance with ICC A117.1.

Reason: The section indicates that all dwelling units shall be provided with the capability to support visible alarm notification appliances in accordance with ICC/ANSI A117.1. The code requires that all dwelling units be provided with the capability to support visible notification appliances, which allows for misinterpretation. The added text clarifies the intent for the dwelling units being capable of supporting visible notification appliances and provides a means of enforcing the intent of the code.

The cost of construction may or may not be increased depending on what is currently being used as the "norm" for meeting this provision. Therefore, the comment below is stating the position with regards to increase in cost. It is just as likely, however, that the cost will be reduced if there are more restrictive interpretations being used to meet the requirement.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOECKER-F5-907.6.2.3.4.DOC

F129–09/10
907.7.3 (IBC [F] 907.7.3)

Proponent: Jeff Hugo, CBO, National Fire Sprinkler Association

Revise as follows:

907.7.3 (IBC [F] 907.7.3) Zones. Each floor shall be zoned separately and a zone shall not exceed 22,500 square feet (2090 m^2). The length of any zone shall not exceed 300 feet (91 440 mm) in any direction.

Exceptions:

1. Automatic sprinkler system zones shall not exceed the area permitted by NFPA 13.
2. For buildings with one exit complying with Section 1019.2, the sprinkler system in the building shall be permitted to be a single zone.

Reason: The requirement for each floor to be a separate zone hampers innovative design of sprinkler systems. If the building is permitted to be a single zone, piping for sprinklers on the top floor can be fed through the walls from the floor below, keeping sprinkler piping out of the attic, which will eliminate concerns over pipe freezing and reduce the cost of the installation.

Typically, codes have required water flow alarms on each floor because fire fighters want to know which floor the fire is on when they arrive at the building. In a small building (so small that it complies with the rules for a single exit), you will not need a water flow alarm to tell you which floor the fire is on. You will be able to hear the water flowing from the sprinkler from the single stairwell.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HUGO-F1-907.8.DOC

F130–09/10
907.9.4

Proponent: Thomas P. Hammerberg, Automatic Fire Alarm Association, Inc.

Revise as follows:

907.9.4 Method. To verify that each smoke detector is within its *listed* and marked sensitivity range, it shall be tested using one of the following methods:

1. A calibrated test method;
2. The manufacturer's calibrated sensitivity test instrument;
3. *Listed* control equipment arranged for the purpose;
4. A smoke detector/control unit arrangement whereby the detector causes a signal at the control unit where the detector's sensitivity is outside its acceptable sensitivity range; or
5. Another calibrated sensitivity test method acceptable to the *fire code official*.

Detectors found to have a sensitivity outside the *listed* and marked sensitivity range shall be cleaned and recalibrated or replaced.

Exceptions:

1. Detectors *listed* as field adjustable shall be permitted to be either adjusted within the *listed* and marked sensitivity range and cleaned and recalibrated or they shall be replaced.
2. This requirement shall not apply to single-station smoke alarms in one- or two-family dwellings.

Reason: This change is required for consistency with the requirements for NFPA 72. NFPA 72 presently requires sensitivity testing for all smoke detectors and smoke alarms other than those installed in one- or two-family dwellings. This is not a new requirement in NFPA 72.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HAMMERBERG-F3-907.9.4.DOC

F131–09/10
907.9.4

Proponent: Thomas P. Hammerberg, Automatic Fire Alarm Association, Inc.

Revise as follows:

907.9.4 Method. To verify that each smoke detector is within its *listed* and marked sensitivity range, it shall be tested using one of the following methods:

1. A calibrated test method;
2. The manufacturer's calibrated sensitivity test instrument;
3. *Listed* control equipment arranged for the purpose;
4. A smoke detector/control unit arrangement whereby the detector causes a signal at the control unit where the detector's sensitivity is outside its acceptable sensitivity range; or
5. Another calibrated sensitivity test method acceptable to the *fire code official*.

Detectors found to have a sensitivity outside the *listed* and marked sensitivity range shall be cleaned and recalibrated or replaced.

Exceptions:

1. Detectors *listed* as field adjustable shall be permitted to be either adjusted within the *listed* and marked sensitivity range and cleaned and recalibrated or they shall be replaced.
2. This requirement shall not apply to single-or multiple-station smoke alarms in one- or two-family dwellings.

Reason: This change is required for consistency with the requirements for NFPA 72. NFPA 72 presently requires sensitivity testing for all smoke detectors and smoke alarms other than those installed in one- or two-family dwellings. This is not a new requirement in NFPA 72.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HAMMERBERG-F4-907.9.4-2.DOC

F132–09/10
908 (New) [IBC [F] 908(New)], 902 (IBC [F] 902), Chapter 47 (IBC Chapter 35); IRC R315, R202, Chapter 44

Proponent: Roger Evans, Park City Municipal Corporation, representing Utah Chapter of ICC

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IFC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IFC

1. Add new text as follows:

SECTION 908 (IBC SECTION [F] 908)
CARBON MONOXIDE ALARMS AND
CARBON MONOXIDE DETECTION SYSTEMS

908.1 General. This section covers the application, installation, performance and maintenance of carbon monoxide alarms and carbon monoxide detection systems in new buildings and structures.

908.1.1 Carbon monoxide alarms, carbon monoxide detectors and combination smoke/carbon monoxide devices. Carbon monoxide alarms, carbon monoxide detectors and combination smoke/carbon monoxide alarms and combination smoke/carbon monoxide detectors described in sections 908.1.2 through 908.1.5 shall be installed and maintained in accordance with the provisions of this code, NFPA 72 and NFPA 720.

908.1.2 Carbon monoxide alarms. Single- or multiple-station carbon monoxide alarms shall be listed and labeled in accordance with ANSI/UL 2034.

908.1.3 Carbon monoxide detectors. Carbon monoxide detectors shall be listed and labeled in accordance with ANSI/UL 2075.

908.1.4 Combination smoke/carbon monoxide alarms. Combination smoke/carbon monoxide alarms shall be listed and labeled in accordance with ANSI/UL 217 and ANSI/UL 2034

908.1.5 Combination smoke/carbon monoxide detectors. Combination smoke/carbon monoxide detectors shall be listed and labeled in accordance with ANSI/UL 268 and ANSI/UL 2075

908.2 Power Source. Required single- or multiple-station carbon monoxide alarms, carbon monoxide detectors, combination smoke/carbon monoxide alarms or combination smoke/carbon monoxide detectors shall receive their power by one of the following means:

1. Listed carbon monoxide alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source with secondary power backup and without a disconnecting switch other than those required for overcurrent protection. Listed carbon monoxide alarms that are battery-powered or plug-in with battery backup shall not be permitted in new construction.
2. Listed carbon monoxide detectors shall receive their power from the approved control panel. The approved control panel shall receive its primary power from the building wiring when such wiring is served from a commercial source and the primary power source shall not include a disconnecting switch other than those required for overcurrent protection. The control panel shall be equipped with rechargeable batteries for secondary power backup.
3. Listed low-power radio frequency (wireless) detectors shall be permitted to be battery powered when the battery is electrically supervised and shall be capable of sending an alarm signal to the approved control panel for a minimum of 7 days after sending the initial battery depletion signal.

908.2.1 Interconnection. Where more than one listed carbon monoxide alarm, or, combination smoke/carbon monoxide alarm is required to be installed within a dwelling unit they shall be interconnected in such a manner that the activation of one carbon monoxide alarm shall activate all of the carbon monoxide alarms in the dwelling unit and the activation of a carbon monoxide detector or combination smoke/carbon monoxide detector shall activate the carbon monoxide audible notification devices throughout the individual dwelling unit. The required carbon monoxide alarm signal shall be clearly audible in all sleeping rooms, having a sound level of at least 15 db above average ambient sound level or 5 db above the maximum sound level, or a sound level at least 75 db at the pillow.

Exception: Carbon monoxide alarms, carbon monoxide detectors, combination smoke/carbon monoxide alarms or combination smoke/carbon monoxide detectors installed in existing construction shall not be required to cause all carbon monoxide alarms to sound.

908.2.2 Acceptance testing. When the installation of carbon monoxide alarms, carbon monoxide detectors, combination smoke/carbon monoxide alarms or combination smoke/carbon monoxide detectors is complete, each alarm or detector and interconnecting wiring shall be tested in accordance with NFPA 72 and NFPA 720.

908.2.3 Where required. Listed single- or multiple-station carbon monoxide alarms, carbon monoxide detectors, combination smoke/carbon monoxide alarms or combination smoke/carbon monoxide detectors shall be installed in locations described in sections 908.2.4 through 908.2.5.

908.2.4 Group R-1. Group R-1 occupancies located in a buildings that contain fuel burning appliances or which have attached garages, listed multiple-station carbon monoxide alarms, carbon monoxide detectors, combination smoke/carbon monoxide alarms or combination smoke/carbon monoxide detectors shall be installed in the following locations:

1. On the ceiling or wall of the same room as permanently installed fuel burning appliances in accordance with manufacturers published instructions
2. Centrally located on every habitable level, in every HVAC zone of the building

Exception: Carbon monoxide alarms or carbon monoxide detectors shall not be required in sleeping units unless the sleeping unit contains a fuel-burning appliance.

The required carbon monoxide alarms or carbon monoxide detectors shall be annunciated at a constantly attended location

908.2.5 Groups R-2, R-3 and R-4. Group R-2, R-3 and R-4 occupancies located in buildings that contain fuel burning appliances or which have attached garages, listed multiple-station carbon monoxide alarms, carbon monoxide detectors, combination smoke/carbon monoxide alarms or combination smoke/carbon monoxide detectors shall be installed in the following:

1. Outside each separate dwelling unit sleeping area in the immediate vicinity of the bedrooms
2. On every level of a dwelling unit, including basements and in every HVAC zone of the building
3. On the ceiling or wall of the same room as permanently installed fuel burning appliances in accordance with manufacturers published instructions.

   Exception: Carbon monoxide alarms or carbon monoxide detectors shall not be required in sleeping units unless the sleeping unit contains a fuel-burning appliance.

The required carbon monoxide alarms or carbon monoxide detectors shall be annunciated at a constantly attended location

2. Add new definitions as follows:

902.1(IBC [F] 902.1) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

CARBON MONOXIDE.

Single-Station Carbon Monoxide Alarm. A device intended for the purpose of detecting carbon monoxide gas and alerting occupants by a distinct and audible signal comprising of an assembly that incorporates a sensor, control components and an alarm notification appliance in a single unit operated from a power source either located in the unit or obtained at the point of installation.

Multiple-Station Carbon Monoxide Alarm. A carbon monoxide alarm capable of being interconnected to one or more additional carbon monoxide alarms so that the actuation of one causes the appropriate alarm signal to be annunciated in all interconnected alarms.

Carbon Monoxide Detector. A device intended to be connected to an approved carbon monoxide detection system for the purpose of detecting carbon monoxide gas and alerting occupants by a distinct and audible signal.

Carbon Monoxide Detection System. A system of devices that consists of a control panel and circuits arranged to monitor and annunciate the status of carbon monoxide detectors and to initiate the appropriate response to those signals.

Combination Smoke/Carbon Monoxide Device. A device that combines a carbon monoxide alarm or carbon monoxide detector with smoke sensing technology; provided that the combined device is listed by a nationally recognized testing laboratory (NRTL) to the applicable ANSI/ UL Standards for both smoke detection and carbon monoxide detection. Such combined alarm units or detection systems shall emit an audible alarm in a manner that clearly differentiates between the two hazards as specified in the appropriate NFPA and ANSI/UL Standard.

3. Add new standards to Chapter 47 (IBC Chapter 35) as follows:

NFPA

720-2009	Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment 2009 Edition

UL

2034-2008	Standard for Single and Multiple Station Carbon Monoxide Alarms, with Revisions through February 20, 2009
2075-2004	Standard for Gas and vapor Detectors and Sensors, with revisions through September 28, 2007

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

R315.1. Carbon monoxide alarms, carbon monoxide detectors or combination smoke/carbon monoxide devices. Carbon monoxide alarms, carbon monoxide detectors and combination smoke/carbon monoxide devices described in sections R315.1.1 through R315.1.4 shall be installed and maintained in accordance with the provisions of this code, NFPA 72 and NFPA 720. ~~**Carbon monoxide alarms.** In new construction, dwelling units within which fuel-fired appliances are installed or have attached garages shall be provided with an approved carbon monoxide alarm installed outside of each separate sleeping area in the immediate vicinity of the bedroom(s).~~

R315.1.1 Carbon monoxide alarms. Single- or multiple-station carbon monoxide alarms shall be listed and labeled in accordance with ANSI/UL 2034.

R315.1.2 Carbon monoxide detectors. Carbon monoxide detectors shall be listed and labeled in accordance with ANSI/UL 2075.

R315.1.3 Combination smoke/carbon monoxide alarms. Combination smoke/carbon monoxide alarms shall be listed and labeled in accordance with ANSI/UL 217 and ANSI/UL 2034

R315.1.4 Combination smoke/carbon monoxide detectors. Combination smoke/carbon monoxide detectors shall be listed and labeled in accordance with ANSI/UL 268 and ANSI/UL 2075.

R315.2 Where Required in New Construction. In new construction within which fuel burning appliances exist or which have attached garages, carbon monoxide alarms, carbon monoxide detectors, combination smoke/carbon monoxide alarms or combination smoke/carbon monoxide detectors shall be installed in the following locations:

1. Outside each separate dwelling unit sleeping area in the immediate vicinity of the bedrooms.
2. On every level of a dwelling unit, including basements

~~**R315.2**~~ **R315.3 Where required in existing dwellings.** Where work requiring a permit occurs in existing dwellings that have attached garages or in existing dwellings within which fuel-fired appliances exist, carbon monoxide alarms/detectors shall be provided in accordance with Sections R315.1 and R315.2.

~~**R315.3 Alarm Requirements** Single station carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.~~

R315.4 Carbon monoxide alarm signal requirements. Where more than one listed carbon monoxide alarm, or combination smoke/carbon monoxide is required to be installed within a dwelling unit they shall be interconnected in such a manner that the activation of one carbon monoxide alarm shall activate all of the carbon monoxide alarms in the dwelling unit and the activation of a carbon monoxide detector or combination smoke/carbon monoxide detector shall activate the carbon monoxide audible notification devices throughout the individual dwelling unit. The required carbon monoxide alarm signal shall be clearly audible in all sleeping rooms, having a sound level of at least 15 db above average ambient sound level or 5 db above the maximum sound level, or a sound level at least 75 db at the pillow.

R315.5 Power source. Required single- or multiple-station carbon monoxide alarms, carbon monoxide detectors, combination smoke/carbon monoxide alarms or combination smoke/carbon monoxide detectors shall receive their power by one of the following means:

1. Listed carbon monoxide alarms shall be battery-powered, plug-in with battery backup, or receive their primary power from the building wiring when such wiring is served from a commercial source with secondary power backup and without a disconnecting switch other than those required for overcurrent protection.Listed carbon monoxide alarms that are battery-powered or plug-in with battery backup shall not be permitted in new construction.
2. Listed carbon monoxide detectors shall receive their power from the approved control panel. The approved control panel shall receive its primary power from the building wiring when such wiring is served from a commercial source and the primary power source shall not include a disconnecting switch other than those required for overcurrent protection. The control panel shall be equipped with rechargeable batteries for secondary power backup.
3. Listed low-power radio frequency (wireless) detectors shall be permitted to be battery powered when the battery is electrically supervised and shall be capable of sending an alarm signal to the approved control panel for a minimum of 7 days after sending the initial battery depletion signal.

2. Add new definition to Section R202 as follows:

CARBON MONOXIDE.

Single-Station Carbon Monoxide Alarm. A device intended for the purpose of detecting carbon monoxide gas and alerting occupants by a distinct and audible signal comprising of an assembly that incorporates a sensor, control components and an alarm notification appliance in a single unit operated from a power source either located in the unit or obtained at the point of installation.

Multiple-Station Carbon Monoxide Alarm. A carbon monoxide alarm capable of being interconnected to one or more additional carbon monoxide alarms so that the actuation of one causes the appropriate alarm signal to be annunciated in all interconnected alarms.

Carbon Monoxide Detector. A device intended to be connected to an approved carbon monoxide detection system for the purpose of detecting carbon monoxide gas and alerting occupants by a distinct and audible signal.

Carbon Monoxide Detection System. A system of devices that consists of a control panel and circuits arranged to monitor and annunciate the status of carbon monoxide detectors and to initiate the appropriate response to those signals.

Combination Smoke/Carbon Monoxide Device. A device that combines a carbon monoxide alarm or carbon monoxide detector with smoke sensing technology; provided that the combined device is listed by a nationally recognized testing laboratory (NRTL) to the applicable ANSI/ UL Standards for both smoke detection and carbon monoxide detection. Such combined alarm units or detection systems shall emit an audible alarm in a manner that clearly differentiates between the two hazards as specified in the appropriate NFPA and ANSI/UL Standard.

3. Add new standards to Chapter 44 as follows:

NFPA

720-2009	Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment 2009 Edition

UL

2075-2004	First Edition of the Standard for Gas and vapor Detectors and Sensors, with revisions through September 28, 2007

Reason (Part I): The purpose for this code change is to protect people sleeping in commercial Group R occupancies such as hotels, motels, adult & child day care, apartments and dormitories from serious injury or possibly death from unintentional non-fire related carbon monoxide (CO) exposure by mandating the installation of carbon monoxide detection devices. The Centers for Disease Control and Prevention (CDC) reports that an estimated 15,000 emergency department visits and 500 unintentional deaths in the United States each year for the six year period 1999-2004. These carbon monoxide incidents were a contributing factor for 20 states enacting laws to require the installation of carbon monoxide detection devices. Of the 20 states that have adopted requirements for carbon monoxide detection, ten require the installation of carbon monoxide detectors in commercial Group R occupancies. In the absence of a national installation standard for commercial Group R occupancies each jurisdiction developed its own regulations with varying installation requirements.

We recommend that the International Fire Code develop the necessary installation requirements for CO detection devices in commercial Group R.

Cost Impact (Part I): It is estimated that the proposed code modification will have a minimal cost impact on the construction of Group R occupancies. For example in R-1 occupancies a CO alarm or detector will be installed by fuel burning appliance(s) and in each HVAC zone. In other R occupancies cost will be minimal as installation requirements are outside of each sleeping area and on each floor.

Analysis (Part I): UL 2034 is already referenced in the IRC but not currently in the IFC or IBC. If the code change is approved, UL 2034 would be added to Chapter 47 of the IFC and Chapter 35 of the IBC as a referenced standard.

UL 2075 is already referenced in the IFC but not currently in the IBC. If the code change is approved, UL 2075 would be added to Chapter 35 of the IBC as a referenced standard.

Reason (Part II): The purpose for this code change is to improve the life safety of citizens by reducing the incidence of carbon monoxide (CO) poisoning in dwellings and to revise the language in the 2009 edition of the IRC so it is consistent with nationally recognized industry consensus standards.

The CO provisions in the 2009 edition of the IRC did not include the reliable, proven and tested technologies of system-connected CO detectors even though they meet nationally recognized industry consensus standards

1. ANSI/UL 2075, *Gas and Vapor Detectors and Sensors*
2. ANSI/NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Detection and Warning Equipment*

The performance and reliability of system-connected CO detectors have shown to be extremely high if they are listed and maintained to ANSI/UL 2075 and installed in accordance with NFPA 720. System-connected CO detectors designed to be part of a carbon monoxide detection system are required to be connected to an approved panel. The panel is required to be equipped with rechargeable batteries that keep the carbon monoxide

detection system operating during a power outage and will communicate the power loss condition to the supervising station. When the primary power is restored, the control panel will fully recharge the standby batteries. An added feature of a carbon monoxide detection system is that the interconnecting wiring to system-connected CO detectors are supervised such that a wiring fault results in a trouble signal at the premises and the supervising station.

The installation provisions in the 2009 edition of the IRC seem inconsistent with NFPA 720 when two or more CO alarms are installed within a dwelling unit. Section 9.6.5 of NFPA 720 requires that when two or more carbon monoxide alarms are to be installed that they are interconnected.. The rationale for this requirement is if a CO device is activated in the basement the occupants on the second floor on the opposite end of the home is unable to hear the audible alarm if the devices are not interconnected.

The 2009 edition of the IRC requires CO alarms outside each separate dwelling unit sleeping area in the immediate vicinity of the bedrooms. However, NFPA 720 requires CO devices to be installed on every level of a dwelling unit, including basements as well as outside each separate dwelling unit sleeping area in the immediate vicinity of the bedrooms.

Cost Impact (Part II): It is estimated that the proposed code modification will have a minimal cost impact on the construction of one- and two- family dwellings and townhouses. The proposed new requirements will not require addition CO detection devices to be installed; however the proposed changes will require additional wiring. While there are many variables that affect the cost of construction, most new dwelling construction is anticipated no more than two stories in height and will require wiring between no more than three CO detection devices: one per floor and one in the basement.

Analysis (Part II): A review of the standard(s) proposed for inclusion in the code, NFPA 720-2009, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

UL 2075 is already referenced in the IFC but not currently in the IBC. If the code change is approved, UL 2075 would be added to Chapter 35 of the IBC as a referenced standard.

PART I – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EVANSR-F1-908.DOC

F133–09/10

908.7 (New) [IBC [F] 908.7 (New)], 4606.1 (New), Chapter 47 (IBC Chapter 35)

Proponent: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

1. Add new text as follows:

908.7 (IBC [F] 908.7) Carbon monoxide alarms. Group I or R occupancies located in a building containing a fuel-burning appliance or a building which has an attached garage shall be provided with single station carbon monoxide alarms. The carbon monoxide alarms shall be listed as complying with UL 2034 and be installed and maintained in accordance with NFPA 720 and the manufacturer's instructions. An open parking garage, as defined in the *International Building Code*, shall not be deemed to be an attached garage.

Exception: Sleeping units or dwelling units which do not themselves contain a fuel-burning appliance or have an attached garage, but which are located in a building with a fuel-burning appliance or an attached garage, need not be provided with single station carbon monoxide alarms provided that:

1. The ~~s~~leeping unit or dwelling unit is located more than one story above or below any story which contains a fuel-burning appliance or an attached garage;
2. The sleeping unit or dwelling unit is not connected by duct work or ventilation shafts to any room containing a fuel-burning appliance or to an attached garage; and
3. The building is provided with a common area carbon monoxide alarm system.

4606.1 Carbon monoxide alarms. Existing Group I or R occupancies located in a building containing a fuel-burning appliance or a building which has an attached garage shall be provided with single station carbon monoxide alarms. The carbon monoxide alarms shall be listed as complying with UL 2034 and be installed and maintained in accordance with NFPA 720 and the manufacturer's instructions. An open parking garage, as defined in the *International Building Code*, shall not be deemed to be an attached garage.

Exception: Sleeping units or dwelling units which do not themselves contain a fuel-burning appliance or have an attached garage, but which are located in a building with a fuel-burning appliance or an attached garage, need not be provided with single station carbon monoxide alarms provided that:

1. The sleeping units or dwelling unit is located more than one story above or below any story which contains a fuel-burning appliance or an attached garage;
2. The sleeping units or dwelling unit is not connected by duct work or ventilation shafts to any room containing a fuel-burning appliance or to an attached garage; and
3. The building is provided with a common area carbon monoxide alarm system.

2. Add new standards to Chapter 47 (IBC Chapter 35) as follows:

NFPA
720-2005 Standard for the Installation of Carbon Monoxide (CO) Warning Equipment in Dwelling Units

UL
2034-2008 Standard for Single and Multiple Station Carbon Monoxide Alarms

Reason: At the final action hearings for the last code change cycle held in Minnesota the voting membership present voted overwhelmingly to add requirements for the installation of carbon monoxide alarms for dwelling units built in compliance with the International Residential Code (IRC). The threat of poisoning from exposure to carbon monoxide is not limited to dwellings regulated by the IRC, it includes other institutional and residential occupancies. This proposal is intended to provide correlation with the position the membership took on this issue and add language to the IBC/IFC requiring the installation of carbon monoxide alarms in institutional and residential group occupancies.

According to the Journal of the American Medical Association (JAMA), carbon monoxide is the leading cause of accidental poisoning deaths in America with approximately 2,100 deaths per year. http://jama.ama-assn.org/cgi/search?fulltext=Carbon+Monoxide Over 15,000 people seek medical attention due to carbon monoxide exposure each year. http://www.ul.com/newsroom/newsrel/nr012609a.html

The industry has addressed the issue of reliability by updating the requirements of the UL 2034 standard. http://www.iccsafe.org/cs/cc/ctc/CO/CO_UL2034History.pdf Underwriters Laboratories instituted a Carbon Monoxide Field Study in 1994 and completed the study in March of 2004. The report on the study includes the following summary:

"Throughout the first phase of this study, the CO alarms have performed in an effective manor. During the September 2002 tests we recorded our first false positive at 70ppm CO (94 minutes into the test, post 1998 alarm). Also during the September 2002 tests we recorded our first no response sample (pre1998 alarm). During the September 2003 we recorded a significant late response sample (pre1998 alarm). These samples have been returned and analyzed by the manufacturer and/or the UL Field Report Group has opened an investigation. Other samples in the survey of the same, or similar, models are continuing to perform as expected.

On one occasion, a field study CO sample alarmed in an employee's home after their furnace was serviced. It was confirmed that there was a high level of CO present in their home. The problem was corrected and the alarm continues to function properly during follow-up sensitivity tests. On another occasion, a field sample was activated when the damper on a fireplace closed prematurely. The damper was opened, the house vented, and the alarm returned to its normal standby condition.

Throughout the entire survey program we have experienced a few units providing early/delayed signals during the sensitivity tests, but all of these CO alarms would provide effective signaling protection to the users should there be a fatal concentration of CO.

Of the few CO alarms that did not meet the UL2034 test points, most of them alarmed early and it was determined with the Stability Test results that these samples would most likely not false alarm in the field.

It is important to note that providing effective signaling protection does not necessarily mean complying with the finite test points of UL2034. All the alarms would have sounded while a person can react and follow the recommended procedures during an alarm signal.

The data shows that these CO alarms are providing the necessary signaling protection."
http://www.iccsafe.org/cs/cc/ctc/CO/CO_UL_AlarmSurvey.doc

All carbon monoxide detectors available today meet the updated requirements of the UL standard which eliminated the false positive indications that occurred when carbon monoxide detectors were first brought to market in the 1990's. The State of New Jersey has had regulations mandating the installation of carbon monoxide alarms in all new and existing residential occupancies since 1992. The state implemented a reporting program at that time to identify reliability and false positive indication problems and there have been no problems identified in over 10 years.

Carbon monoxide poisonings leading to injury or death is well documented and the only way to protect the occupants from this odorless and tasteless product of combustion, known as the "Silent Killer" is through the installation of detectors complying with today's standards.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: A review of the standards proposed for inclusion in the code, NFPA 720-2005 and UL 2034-2008, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F14-908.7.DOC

F134–09/10
909.2 (IBC [F] 909.2), 909.10.2.1 (IBC [F] 909.10.2.1)

Proponent: Tony Crimi, A.C. Consulting Solutions Inc., representing International Firestop Council

Revise as follows:

909.2 (IBC [F] 909.2) General design requirements. Buildings, structures or parts thereof required by this code to have a smoke control system or systems, or a stair pressurization system shall have such systems designed in accordance with the applicable requirements of Section 909 and the generally accepted and well-established principles of engineering relevant to the design. The construction documents shall include sufficient information and detail to adequately describe the elements of the design necessary for the proper implementation of the smoke control systems. These documents shall be accompanied by sufficient information and analysis to demonstrate compliance with these provisions.

909.20.6.1 Ventilation systems. Smokeproof enclosure and pressurized stairway ventilation systems shall be independent of other building ventilation systems. The equipment, control wiring, power wiring and ductwork shall comply with one of the following:

1. Equipment, control wiring, power wiring and ductwork shall be located exterior to the building and directly connected to the smokeproof enclosure or pressurized stairway or connected to the smokeproof enclosure or pressurized stairway by ductwork enclosed by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 712, or both.
2. Equipment, control wiring, power wiring and ductwork shall be located within the smokeproof enclosure or pressurized stairway with intake or exhaust directly from and to the outside or through ductwork enclosed by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 712, or both.
3. Equipment, control wiring, power wiring and ductwork shall be located within the building if separated from the remainder of the building, including other mechanical equipment, by not less than 2-hour *fire barriers* constructed in accordance with Section 707 or *horizontal assemblies* constructed in accordance with Section 712, or both.

Exceptions:

1. Control wiring and power wiring utilizing a 2-hour rated cable or cable system.
2. Where encased with not less than 2 inches (51 mm) of concrete.
3. Ductwork shall be permitted to be protected using an approved alternative fire-resistive duct assembly that is a *listed* and *labeled* specifically for such purpose.

Reason: This proposal would require Stair pressurization ducts installed for the purposes of stairwell pressurization to be enclosed within a shaft or protected by an equivalent tested and listed assembly or system evaluated for the purpose. Smoke control systems have been required in nearly two thirds of the United States for over a decade. High-rise buildings constructed to the requirements of International Building Code, but without any specific measures to control smoke migration, are all the more vulnerable to property damage and occupants' loss of life.

The purpose of a closed pressurization system is to provide fresh air directly to stairwells or egress areas. This design air pressures need to be sufficient to maintain closed doors while preventing smoke from entering the egress path. Several incidents in North America during the past 40 years have demonstrated that serious fires can occur in modern high-rise buildings, that these fires can generate tremendous quantities of smoke, and that smoke can spread rapidly throughout these buildings. Most notable were the 1970 One New York Plaza fire, the1973 Hyatt Regency O'Hare Hotel fire, the 1980 MGM Grand Hotel in Las Vegas, a 1981 fire in North York Ontario at the Inn on the Park Hotel, the 1983 First Canadian Place in Toronto, Ontario, One Meridian Plaza, Philadelphia, Pennsylvania and the First Interstate Bank in Los Angeles, California in the 1990's, and the 2001 World Trade Center.

There is a large body of available research that indicates the need for smoke control is more pressing in tall buildings that in any other type of construction. Pressurization results in airflows of high velocity in the gaps around closed doors and construction cracks, thereby preventing smoke from flowing back into the pressurized space through these openings. Pressurized stairwells are provided with the goal of maintaining a tenable environment within the escape routes in the event of a building fire. While the option to use stairwell pressurization exists, the IBC does not require stairwell pressurization in high-rise buildings, and only requires smoke control in underground buildings, atriums, and covered mall buildings. Section 403.13 of the 2009 IBC requires smokeproof exit enclosures for high-rise buildings in every required stairway serving floors more than 75 feet (22.86 m) above the ground. Section 909.20.5 merely permits sprinklered Buildings to use stairwell pressurization as an alternate to the smokeproof enclosures. When employed, ducts used for Stair pressurization to provide uncontaminated air within required interior exit stairwells or areas of egress need to be protected from the effect of fire, or constructed as fire resistant systems.

Particularly in the case of tall buildings, the predominant factors that cause smoke movement in tall buildings are stack effects, the affect of external wind forces, and forced air movement within the building. Smoke removal and venting practices are complicated by stack effects, which will tend to favor natural air movement vertically through the building as a result of differences in temperature and densities between the inside and outside air. [1]

Options such as the use of natural ventilation are only available where openings in exterior stairwells can be accommodated. Even then, a number of problems have been identified with this approach. Firstly, the required volume of fresh air is high. Secondly, natural supply and exhaust through vents may be subject to adverse exterior wind conditions, and even when functioning satisfactorily, would generally require vents located on different exterior walls. Thirdly, the performance of natural vents is influenced by building stack effects, which may be particularly significant on the upper or lowermost stories for tall buildings. This effect can range from either strong inflow or strong outflow from all natural vents on a given storey.[2]

The IBC needs to provide more effective means to prevent smoke from entering critical exit stairwells in high-rise buildings. Properly designed stairwell pressurization prevents smoke from flowing back into the pressurized exit stairwells and smokeproof enclosures. The goal of this proposal is maintaining a tenable environment within the escape routes in the event of a building fire.

Bibliography:

1. Klote, J.H. and Milke, J.A. Fire Protection Handbook, NFPA 19th Edition, Volume II, Smoke Movement in Buildings, Chapter 6, Section 12-113 –12-126
2. Building Research Establishment, UK, Smoke Ventillation of Common Access Areas of Flats & Maisonettes (BD2410), Final Factual Report, Appendix A (Review), BRE Ltd, 2005

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRIMI-F1-909.2.DOC

F135–09/10

909.3 (IBC [F] 909.3, IMC [F] 513.3), 909.18.8 (IBC [F] 909.18.8), 909.18.8.1 (IBC [F] 909.18.8.1), 909.18.8.2 (IBC [F] 909.18.8.2), 909.18.8.2.1 (IBC [F] 909.18.8.2.1), 909.18.8.2.2 (IBC [F] 909.18.8.2.2), 909.18.8.2.3 (IBC [F] 909.18.8.2.3); IBC [F] 1704.16, [F] 1704.16.1, [F] 1704.16.2

Proponent: Vickie Lovell, Representing National Energy Management Institute

1. Revise as follows:

909.3 (IBC [F] 909.3, IMC [F] 513.3) Special inspection and test requirements. In addition to the ordinary inspection and test requirements to which buildings, structures and parts thereof are required to undergo, smoke control systems subject to the provisions of Section 909 shall undergo special inspections and tests sufficient to verify the proper commissioning of the smoke control design in its final installed condition. The design submission accompanying the *construction documents* shall clearly detail procedures and methods to be used and the items subject to such inspections and tests. Such commissioning shall be in accordance with generally accepted engineering practice and, where possible, based on published standards for the particular testing involved. The special inspections and tests required by this section shall be conducted under the same terms as in Section 1704 of the International Building Code and Section 909.18 of this code.

909.18.8 (IBC [F] 909.18.8) Special inspections for smoke control. Smoke control systems shall be tested by a special inspector in accordance with the requirements for special inspections in Sections 909.18 through 909.19 and Section 909.20.6.3 of the *International Building Code*.

909.18.8.1 (IBC [F] 909.18.8.1) Scope of testing. Special inspections shall be conducted in accordance with the following:

1. During erection of ductwork and prior to concealment for the purposes of leakage testing and recording of device location.
2. Prior to occupancy and after sufficient completion for the purposes of pressure-difference testing, flow measurements, and detection and control verification.

909.18.8.2 (IBC [F] 909.18.8.2) Qualifications. Special inspection agencies for smoke control shall have expertise in fire protection engineering, mechanical engineering and certification as air balancers, or be certified by a third party accreditation program for air testing, adjusting and air balancing and for inspection of smoke control systems. An approved special inspection agency shall provide all information as necessary for the building official to determine that the agency meets the applicable requirements and shall be qualified to conduct, supervise and evaluate tests and periodic inspections and maintenance.

909.18.8.2.1 (IBC [F] 909.18.8.2.1) Independence. An approved special inspection agency shall be objective, competent and independent from the contractor responsible for the work being inspected. The agency shall also disclose possible conflicts of interest so that objectivity can be confirmed.

909.18.8.2.2 (IBC [F] 909.18.8.2.2) Equipment. An approved special inspection agency shall have adequate equipment to perform required tests. The equipment shall be periodically calibrated.

909.18.8.2.3 (IBC [F] 909.18.8.2.3) Personnel. An approved special inspection agency shall employ experienced personnel educated in conducting, supervising and evaluating tests and inspections.

IBC [F] 1704.16 Special inspection for smoke control. Smoke control systems shall be tested by a special inspector in accordance with Section 909.18.8.

~~**IBC [F] 1704.16.1 Testing scope.** The test scope shall be as follows:~~

~~1. During erection of ductwork and prior to concealment for the purposes of leakage testing and recording of device location.~~
~~2. Prior to occupancy and after sufficient completion for the purposes of pressure difference testing, flow measurements and detection and control verification.~~

~~**IBC [F] 1704.16.2 Qualifications**. *Special inspection* agencies for smoke control shall have expertise in fire protection engineering, mechanical engineering and certification as air balancers.~~

Reason: The purpose of this code change is to clarify and centralize the language as it relates to the qualifications of special inspectors and special inspection agencies of smoke control systems. This ties together the IBC, IFC, and IMC with consistent language as it relates to special inspections, testing and maintenance of smoke control systems.
909.3. This is an editorial change which adds the reference of the new language in Sections 909.18.
909.18.8. The addition of the referenced sections clarifies the intent of the code's requirement of special inspections, agencies, and inspectors.
909.18.8.2. through 909.18.8.2.3. This language is derived from Chapter 1703.1.1 of the 2009 IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LOVELL-F2-909.3

F136–09/10
909.5.2 (IBC [F] 909.5.2; IMC [F] 513.5.2)

Proponent: Douglas H. Evans, PE, FSFPE, Clark County, NV, representing the Department of Development Services – Building Division

Revise as follows:

909.5.2 (IBC [F] 909.5.2; IMC [F] 513.5.2) Opening protection. Openings in smoke barriers shall be protected by automatic-closing devices actuated by the required controls for the mechanical smoke control system. Door openings shall be protected by fire door assemblies complying with Section 715.4.3.

Exceptions:

1. Passive smoke control systems with automatic-closing devices actuated by spot-type smoke detectors listed for releasing service installed in accordance with Section 907.10.
2. Fixed openings between smoke zones that are protected utilizing the airflow method.
3. In Group I-2, where such doors are installed across corridors, a pair of opposite-swinging doors without a center mullion shall be installed having vision panels with fire protection-rated glazing materials in fire protection-rated frames, the area of which shall not exceed that tested. The doors shall be close-fitting within operational tolerances and shall not have undercuts, louvers or grilles. The doors shall have head and jamb stops, astragals or rabbets at meeting edges and shall be automatic- closing by smoke detection in accordance with Section 715.4.7.3. Positive-latching devices are not required.
4. Group I-3.
5. Openings between smoke zones with clear ceiling heights of 14 feet (4267 mm) or greater and bank-down capacity of greater than 20 minutes as determined by the design fire size.
6. Door openings in smoke barriers shall be permitted to be protected by self-closing fire doors in the following locations:
   6.1. Sleeping units.
   6.2. Individual dwelling units.

6.3. Mechanical rooms.
6.4. Elevator machine rooms.
6.5. Electrical rooms used exclusively for that purpose.
6.6. Doors typically maintained in a closed position as approved by the Building Official.

Reason: Section 909.5.2 requires all doors in smoke barriers that are part of a 909 smoke control system to be automatic-closing. Section 3.3.7 of NFPA 80 (2007 edition) defines an "automatic-closing door" as "A door that normally is open but that closes when the automatic-closing device is activated."

For buildings with a substantial number of doors in smoke barriers, the IBC requirement for all such doors to be automatic-closing results in a significant, and frequently unnecessary, cost increase for the project. The proposed amendment allows normally closed doors in smoke barriers to be self-closing and can even apply to pressurized stair doors if deemed acceptable to the Building Official.

The proposed amendment has been part of the Southern Nevada Building Code for several years and has proven to be a reasonable accommodation to owners and designers without negatively impacting life safety.

Cost Impact: The code change proposal will decrease the cost of construction.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EVANS-F2-909.5.2.DOC

F137–09/10
909.10.2 (IBC [F] 909.10.2; IMC [F] 513.10.2)

Proponent: Eli P. Howard, III, Sheet Metal & Air Conditioning Contractors National Association, Inc. (SMACNA)

Revise as follows:

909.10.2 (IBC [F] 909.10.2; IMC [F] 513.10.2) Ducts. Duct materials and joints shall be capable of withstanding the probable temperatures and pressures to which they are exposed as determined in accordance with Section 909.10.1. Ducts shall be constructed and supported in accordance with the *International Mechanical Code*. Ducts shall be leak tested to ~~1.5 times~~ the maximum design pressure in accordance with nationally accepted practices. Measured leakage shall not exceed 5 percent of design flow. Results of such testing shall be a part of the documentation procedure. Ducts shall be supported directly from fire-resistance-rated structural elements of the building by substantial, noncombustible supports.

Exception: Flexible connections (for the purpose of vibration isolation) complying with the *International Mechanical Code* and which are constructed of *approved* fire-resistance-rated materials.

Reason: The SMACNA/ANSI HVAC Duct Construction Standards call for leakage testing when required to be performed only to the operating pressure of the system. Exceeding this requirement for leakage testing will cause sealant within the joints to be pushed beyond its design limitation and cause further air leakage within the system.

Testing of systems at 1.5 times the operating pressure is only for structural integrity and is not recommended nor mandated by the SMACNA Standards.

Cost Impact: The code change proposal will cause a reduction in costs

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOWARD-F1-909.10.2.DOC

F138–09/10
909.12 (IBC [F] 909.12; IMC [F] 513.12)

Proponent: Douglas H. Evans, PE, FSFPE, Clark County, NV, representing the Department of Development Services – Building Division

Revise as follows:

909.12 (IBC [F] 909.12; IMC [F] 513.12) Detection and control systems. Fire detection systems providing control input or output signals to mechanical smoke control systems or elements thereof shall comply with the requirements of Section 907. Such systems shall be equipped with a control unit complying with UL 864 and listed as smoke control equipment.

Control systems for mechanical smoke control systems shall include provisions for verification. Verification shall include positive confirmation of actuation, testing, manual override~~, the presence of power downstream of all disconnects~~ and, through a preprogrammed weekly test sequence, report abnormal conditions audibly, visually and by printed report.

Reason: The fire alarm system, associated initiating devices and all portions of the smoke control system that transfer fire alarm commands (e.g. BMS) meet the requirements outlined in the first paragraph of 909.12 through their UL 864 listing. This can be performed by **electrical supervision**, which verifies that the conductors are intact, but **provides no assurance that** the **monitored devices** will **function correctly**.

The second paragraph of 909.12 is intended to confirm that the mechanical components (fans, motors, belts, dampers, actuators, etc.) function properly. This is performed by verifying proper functioning through the use of position sensors for dampers and an acceptable method for confirming fan induced air movement. **Functional verification does not confirm continuity of conductors until the system is configured** (alarm condition or testing).

Both of the preceding options have advantages and disadvantages, but neither provides complete verification.

Except when the system configures (alarm or testing), there is no power supplied to the output side of smoke control components (fans and dampers). As such, it is not possible to continuously monitor power to these components and **one cannot be assured of continuity of conductors for the output side (fans and dampers) of a smoke control system** until the system configures.

The preprogrammed weekly test sequence, as required by 909.12, is intended to notify building operations of an improperly functioning system so it can be repaired when necessary. Worst case, it may not be known for one week that some portion of the distribution side of the smoke control system is not performing properly. This requirement confirms that components properly configure, as well as continuity of conductors. The weekly diagnostic provides the required level of assurance that the entire smoke control system will function within the intent of its design.

As described above, monitoring power downstream of all disconnects cannot be provided as required, is misleading and may be unnecessary.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EVANS-F1-909.12.DOC

F139–09/10
909.12.1 (IBC [F] 909.12.1; IMC [F] 513.12.1)

Proponent: Howard Hardy, South Metro Fire Rescue Authority, representing the Fire Marshals Association of Colorado

Revise as follows:

909.12.1 (IBC [F] 909.12.1) (IMC [F] 513.12.1) Wiring. In addition to meeting requirements of NFPA 70, all wiring, regardless of voltage, shall be fully enclosed within continuous <u>metal</u> raceways.

Reason: This requirement dates back to the 1994 UBC and has not been updated. The purpose of enclosing the wiring in a raceway is to provide for survivability. There are many products available today that were not available when this section first appeared in the code. Many of the products are plastics and will not withstand the heat that may be present. We feel that clarifying the type of materials for the raceway will maintain the original code intent.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HARDY-F1-909.12.1.DOC

F140–09/10
909.13.1 (IBC [F] 909.13.1; IMC [F] 513.13.1)

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

909.13.1 (IBC [F] 909.13.1; IMC [F] 513.13.1) Materials. Control-air tubing shall be hard-drawn copper, Type L, ACR in accordance with ASTM B 42, ASTM B 43, ASTM B 68, ASTM B 88, ASTM B 251 and ASTM B 280. Fittings shall be wrought copper or brass, solder type in accordance with ASME B 16.18 or ASME B 16.22. Changes in direction shall be made with appropriate tool bends. Brass compression-type fittings shall be used at final connection to devices; other joints shall be brazed using a BCuP5 brazing alloy with solidus above 1,100ºF (593ºC) and liquids below 1,500ºF (816ºC). Brazing flux shall be used on copper-to-brass joints only.

Exception: Nonmetallic tubing used within control panels and at the final connection to devices provided all of the following conditions are met:

1. Tubing shall ~~be listed by an approved agency for flame and smoke characteristics~~ comply with the requirements of Section 602.2.1.3 of the *International Mechanical Code*.
2. Tubing and connected device shall be completely enclosed within a galvanized or paint-grade steel enclosure having a minimum thickness of 0.0296 inch (0.7534 mm) (No. 22 gage). Entry to the enclosure shall be by copper tubing with a protective grommet of Neoprene or Teflon or by suitable brass compression to male barbed adapter.
3. Tubing shall be identified by appropriately documented coding.
4. Tubing shall be neatly tied and supported within the enclosure. Tubing bridging cabinets and doors or moveable devices shall be of sufficient length to avoid tension and excessive stress. Tubing shall be protected against abrasion. Tubing serving devices on doors shall be fastened along hinges.

Reason: The code needs to provide specifics as to what surface burning characteristics the tubing needs to meet, and what test standard to use in listing the tubing. Control air tubing is similar to pneumatic tubing, whose listing requirements are specified in Section 602.2.1.3.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-F8-909.13.1.DOC

F141–09/10
909.19 (IBC [F] 909.19)

Proponent: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Revise as follows:

909.19 (IBC [F] 909.19) System acceptance. Buildings, or portions thereof, required by this code to comply with this section shall not be issued a certificate of occupancy until such time that the fire code official determines that the provisions of this section have been fully complied with and that the fire department has received satisfactory instruction on the operation, both automatic and manual, of the system and a written maintenance program complying with the requirements of Section 909.20.1 has been submitted and approved.

> **Exception:** In buildings of phased construction, a temporary certificate of occupancy, as approved by the fire code official, shall be allowed provided that those portions of the building to be occupied meet the requirements of this section and that the remainder does not pose a significant hazard to the safety of the proposed occupants or adjacent buildings.

Reason: The maintenance requirements for a smoke control system are comprehensive and the International Fire Code specifies that:

> *909.20.1 Schedule. A routine maintenance and operational testing program shall be initiated immediately after the smoke control system has passed the acceptance tests. A written schedule for routine maintenance and operational testing shall be established..*

For this action to occur, the written schedule must be developed and approved prior to approval of the system. The coordination problem is that Section 909 matches between the two codes up to Section 909.19 and the requirement for the application of the maintenance document is only found in the fire code. Unfortunately, this causes designers and installers (and some code officials) to miss this requirement the maintenance plan that must take effect upon approval is often overlooked.

The purpose of this modification is to provide a simple pointer as a reminder.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F15-909.19.DOC

F142–09/10
909.20

Proponent: Vickie Lovell, Representing National Energy Management Institute

Add new text as follows:

909.20 Maintenance. Smoke control systems shall be maintained to ensure to a reasonable degree that the system is capable of controlling smoke for the duration required. The maintenance and testing of the smoke control system shall be supervised by personnel who have expertise in fire protection engineering, mechanical engineering and certified as air balancers, or are certified by a third party accreditation program for air testing, adjusting and air balancing and for inspection of smoke control systems. The system shall be maintained in accordance with the manufacturer's instructions and Sections 909.20.1 through 909.20.5.

Reason: The purpose of this addition is to further clarify the requirements of those supervising individuals who test and maintain smoke control systems. Third-party accreditation programs provide individuals with the needed expertise in fire-protection engineering, mechanical engineering, and air adjusting and balancing.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LOVELL-F3-909.20

F143–09/10
910 (IBC [F] 910), 604.2.19 (New), Chapter 47 (IBC Chapter 35)

Proponent: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

1. Revise as follows:

SECTION 910 (IBC [F] 910)
SMOKE AND HEAT VENTS

910.1 (IBC [F] 910.1) General. Where required by this code or otherwise installed, smoke and heat vents, or mechanical smoke exhaust systems, and draft curtains shall conform to the requirements of this section.

Exceptions:

1. Frozen food warehouses used solely for storage of Class I and II commodities where protected by an approved automatic sprinkler system.
2. Where areas of buildings are equipped with early suppression fast-response (ESFR) sprinklers, automatic smoke and heat vents shall not be required within these areas.
3. Where areas of buildings are equipped with ESFR sprinklers, draft curtains shall not be provided within these areas. Draft curtains shall only be provided at the separation between the ESFR sprinklers and the conventional sprinklers.

910.2 (IBC [F] 910.2) Where required. Smoke and heat vents or mechanical smoke exhaust shall be installed in the roofs of one-story buildings or portions thereof occupied for the uses set forth in Sections 910.2.1 through 910.2.2.

910.3 (IBC [F] 910.3) Design and , installation and maintenance. The design and , installation and maintenance of smoke and heat vents, and draft curtains and mechanical exhaust systems shall be as specified in Sections 910.3.1 through 910.3.5.2 and Table 910.3 in accordance with NFPA 204.

~~**910.3.1 (IBC [F] 910.3.1) Design.** Smoke and heat vents shall be *listed* and *labeled* to indicate compliance with UL 793.~~

~~**910.3.2 (IBC [F] 910.3.2) Vent operation.** Smoke and heat vents shall be capable of being operated by *approved* automatic and manual means. Automatic operation of smoke and heat vents shall conform to the provisions of Sections 910.3.2.1 through 910.3.2.3.~~

~~**910.3.2.1 (IBC [F] 910.3.2.1) Gravity-operated drop out vents.** Automatic smoke and heat vents containing heat-sensitive glazing designed to shrink and drop out of the vent opening when exposed to fire shall fully open within 5 minutes after the vent cavity is exposed to a simulated fire represented by a time-temperature gradient that reaches an air temperature of 500°F (260°C) within 5 minutes.~~

~~**910.3.2.2 (IBC [F] 910.3.2.2) Sprinklered buildings.** Where installed in buildings equipped with an *approved automatic sprinkler system*, smoke and heat vents shall be designed to operate automatically.~~

~~**910.3.2.3 (IBC [F] 910.3.2.3) Nonsprinklered buildings.** Where installed in buildings not equippedwith an *approved automatic sprinkler system*, smoke and heat vents shall operate automatically by actuation of a heat-responsive device rated at between 100°F (56°C) and 220°F (122°C) above ambient.~~

~~**Exception:** Gravity-operated drop out vents complying with Section 910.3.2.1.~~

~~**910.3.3 (IBC [F] 910.3.3) Vent dimensions.** The effective venting area shall not be less than 16 square feet (1.5 m_2) with no dimension less than 4 feet (1219 mm), excluding ribs or gutters having a total width not exceeding 6 inches (152 mm).~~

~~**910.3.4 (IBC [F] 910.3.4) Vent locations.** Smoke and heat vents shall be located 20 feet (6096 mm) or more from adjacent *lot lines* and *fire walls* and 10 feet (3048 mm) or more from *fire barriers*. Vents shall be uniformly located within the roof in the areas of the building where the vents are required to be installed by Section 910.2, with consideration given to roof pitch, draft curtain location, sprinkler location and structural members.~~
~~**910.3.5 (IBC [F] 910.3.5) Draft curtains.** Where required by Table 910.3, draft curtains shall be installed on the underside of the roof in accordance with this section.~~

~~**Exception:** Where areas of buildings are equipped with ESFR sprinklers, draft curtains shall not be provided within these areas. Draft curtains shall only be provided at the separation between the ESFR sprinklers and the non-ESFR sprinklers.~~

~~**910.3.5.1 (IBC [F] 910.3.5.1) Construction.** Draft curtains shall be constructed of sheet metal, lath and plaster, gypsum board or other *approved* materials that provide equivalent performance to resist the passage of smoke. Joints and connections shall be smoke tight.~~

~~**910.3.5.2 (IBC [F] 910.3.5.2) Location and depth.** The location and minimum depth of draft curtains shall be in accordance with Table 910.3.~~

~~**910.4 (IBC [F] 910.4) Mechanical smoke exhaust.** Where *approved* by the *fire code official*, engineered mechanical smoke exhaust shall be an acceptable alternative to smoke and heat vents.~~

~~**910.4.1 (IBC [F] 910.4.1) Location.** Exhaust fans shall be uniformly spaced within each draft-curtained area and the maximum distance between fans shall not be greater than 100 feet (30 480 mm).~~

~~**910.4.2 (IBC [F] 910.4.2) Size.** Fans shall have a maximum individual capacity of 30,000 cfm (14.2 m^3/s). The aggregate capacity of smoke exhaust fans shall be determined by the equation:~~

~~$C = A \times 300$ **(Equation 9-4)**~~

~~where:~~
~~C = Capacity of mechanical ventilation required, in cubic feet per minute (m_3/s).~~
~~A = Area of roof vents provided in square feet (m_2) in accordance with Table 910.3.~~

~~**910.4.3 Operation.** Mechanical smoke exhaust fans shall be automatically activated by the *automatic sprinkler system* or by *heat detectors* having operating characteristics equivalent to those described in Section 910.3.2. Individual manual controls for each fan unit shall also be provided.~~

~~**TABLE 910.3 (IBC TABLE [F] 910.3)**~~
~~**REQUIREMENTS FOR DRAFT CURTAINS AND SMOKE AND HEAT VENTSa**~~

910.4 (IBC [F] 910.4) Activation. Smoke and heat vents or mechanical exhaust systems shall be manually activated from a listed or approved control panel installed in a location approved by the fire department.

~~**910.4.4**~~ **910.5 (IBC ~~[F] 910.4.4~~ [F] 910.4.5) Wiring and control.** Wiring for operation and control of smoke exhaust fans and for activation of smoke and heat vents shall be ~~connected ahead of the main disconnect~~ provided with an approved standby source complying with Section 604 and protected against exposure to temperatures in excess of 1,000°F (538°C) for a period of not less than ~~15 minutes~~ 1 hour. Controls shall be located so as to be accessible to the fire service from the exterior of the building and be protected against interior fire exposure by not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both

~~**910.4.5 Supply air.** Supply air for exhaust fans shall be provided at or near the floor level and shall be sized to provide a minimum of 50 percent of required exhaust. Openings for supply air shall be uniformly distributed around the periphery of the area served.~~

~~**910.4.6 Interlocks.** On combination comfort air-handling/smoke removal systems or independent comfort air-handling systems, fans shall be controlled to shut down in accordance with the *approved* smoke control sequence.~~

2. Add new text as follows:

604.2.19 Smoke exhaust and smoke and heat vents. In buildings and structures where standby power is required for the operation and control of smoke exhaust fans or for smoke and heat vents as required by Section 910.5.

3. Add new standard to Chapter 47/IBC Chapter 35 as follows:

NFPA
204-2010 Standard for Smoke and Heat Venting

Reason: Since the adoption of the 2000 International Fire and Building Codes, opponents of the Section 910 smoke and heat vents requirements have consistently submitted code change proposals to eliminate them from the code. The IFC committee has consistently turned down those submittals due to a lack of data indicating there was a reason to eliminate a necessary firefighter safety feature.

> ***IFC Fire Code Commentary:*** *The purpose of smoke and heat vents has historically been related to the needs of the fire department. More specifically, smoke and heat vents, when activated, have the potential effect of raising the height of the smoke layer and providing more tenable conditions in which to undertake fire-fighting activities.*

The original arguments against smoke and heat vents were that they interfered with the operation of the sprinkler systems. However, the reams of test report data submitted to the IFC Committee over the years did not support that position. In fact, the last full scale testing to occur, in Ghent, Belgium, documented there was a positive benefit to the use of smoke and heat vents with no negative impact on sprinkler systems performance e en when all of the smoke vents were opened simultaneously in a ganged operation or when the vents were open at the time the fire occurred.

As more and more code officials became educated on the details of the test data inaccurately being portrayed by the smoke and heat opponents over the years the argument shift to one of, “well, not all the vents open as expected after sprinkler activation so the smoke and heat vents should be removed”. This new reason ignores the fact that the smoke still needs to go somewhere and the code requires manual activation capabilities for the fire department to use to open the vents once they arrive.

It also introduces a concept that is troubling, i.e., smoke detection systems, sprinkler systems and fire hydrants, to name a few protective systems, do not always perform as expected, but we don’t simply eliminate them. Accepted practice is to identify any potential problems and if necessary improve the codes and standards to eliminate any deficiencies and to increase reliability.

The latest tactic is to misrepresent a NIOSH guidance documents addressing firefighter safety by claiming it tells fire departments to never put their personnel on the roofs of buildings. The document does not include that admonition, it advises fire scene commanders to use caution and not to risk a firefighter solely to protect property. It also makes it clear that one of the factors to include is if there is a life risk in the building.

While misapplying this NIOSH document the new argument is that when the fire service arrives at a building protected by an automatic fire suppression system they should just wait outside for 30 minutes or so and allow the sprinkler system to extinguish the fire and then they can simply perform mop up and overhaul activities. If only firefighting responsibilities were that simple. (It should be noted that in arguing this position they also intend to modify the intent of the fire code, i.e., that the smoke and heat vents are a firefighter safety feature).

We do not believe that a firefighter safety feature should be removed. Even when automatic sprinkler systems properly function a lot of heat and smoke is generated and the fire service needs a method to get that smoke and heat out to allow for safer access to the seat of the fire to complete extinguishment and then to ensure that the fire has been completely extinguished.

If there are no smoke and heat vents or a properly designed and installed smoke exhaust system, how does the fire service get the smoke out? Even using positive pressure ventilation you need to push it somewhere. Lacking smoke and heat vents or a properly designed smoke exhaust system the fire service is back to putting what limited manpower is available on the roof attempting to cut holes in it.

This code change proposal takes a different direction. Recognizing that some improvements are necessary to modernize the requirements of the International Fire and Building Codes and that the cookie cutter one size all approach is no longer the correct one based upon the advancement of design methods placed in the code for other smoke control systems. This proposal is to keep the requirements in the code for what buildings shall be provided with smoke and heat vents or mechanical exhaust and to then refer to NFPA 204 as the design, installation and maintenance standard.

This will provide a more balance approach by utilizing a much improved referenced standard to design the solution around the design of the building and the contents of the building. The same approach currently allowed for other types of smoke control systems and for the installation of automatic fire sprinkler systems protecting the same building and contents.

The NFPA 204 technical committee has faced the same arguments put forth to the IFC committee and rejected the elimination of smoke and heat vents from sprinklered buildings. Just as the IFC/IBC does for smoke control systems for high occupancy buildings, they simply advise the designer to document any reliance on sprinkler system fire control with an engineering analysis. (See Section 909.9.4 of the IFC and Chapter 11 of NFPA 204).

Another major benefit of this proposal is to take this discussion of vents versus no vents due to sprinkler system functioning off the table. It does that by switching to manual activation after fire department arrival which will be well after sprinkler system activation. It also does that by referencing a standard for the design, installation and maintenance of the smoke and heat vents or mechanical exhaust that is maintained by a balanced committee for this particular and specialized topic. If the committee that specializes in this topic does not see the need to eliminate the use of this important firefighter safety feature after looking at all of the information and issues presented to them, far more than the IFC committee has seen, why should the IFC committee see a need?

The specific changes are as follow:

910.1 was modified to add an exception 3 which simply relocates language for an exception for ESFR protected areas (See existing 910.3.5)

910.2 has been modified to identify that either smoke and heat vents or mechanical smoke exhaust shall be installed and the reference to one story buildings has been deleted. If the F or S occupancy is in a multi-story building the mechanical exhaust option can be used. The generation of smoke and heat does not have to be ignored.

910.3 was modified to add "maintenance" to ensure the smoke and heat vents or mechanical smoke exhaust is maintained and the reference to NFPA 204 as the design, installation and maintenance standard has been added.

Sections 910.3.1 through 910.4.3 have been deleted as no longer needed due to the reference to NFPA 204. This eliminates the cookie cutter approach to the installations that the IFC uses as one size fits all.

A new Section 910.4 has been added to specify that either smoke and heat vents or mechanical smoke exhaust shall be manually activated from a listed or approved control panel and the panel must be located as approved by the fire department. This eliminates any concern over smoke removal activating before the sprinkler system operates and allows the fire department to activate the smoke removal without placing manpower on the roof.

Section 910.4.4 has been renumbered as 910.5 and the requirement to connect the power ahead of the main disconnect has been deleted in favor of installing an approved standby power source as is done for ALL other fire protection systems. The protection of the wiring has been increased from 15 minutes to 1 hour to correlate to the 1 hour protection the code already provides for the location of the control panel. Why would we provide 1 hour protection for the control panel but let the wiring burn up in 15 minutes? This also correlates to the fact that we expect the smoke removal to be available to the fire department for firefighting operations which will take more than 15 minutes.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard NFPA 204-2010 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F19-910.DOC

F144–09/10

910 (IBC [F] 910), 2306, Chapter 47 (IBC Chapter 35)

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC)

1. Revise as follows:

SECTION 910
SMOKE AND HEAT VENTS

910.1 (IBC [F] 910.1) General. Where required by this code ~~or otherwise installed~~, smoke and heat vents and draft curtains or mechanical smoke ~~exhaust~~ removal systems~~, and draft curtains~~ shall conform to the requirements of this section. The provisions of Section 910.3 shall only apply to buildings or portions thereof, which are not protected by an automatic sprinkler system. The provisions of Section 910.4 shall apply to buildings or portions thereof which are protected by an automatic sprinkler system in accordance with Section 903.3.1.1.

~~**Exceptions:**~~

1. ~~Frozen food warehouses used solely for storage of Class I and II commodities where protected by an approved automatic sprinkler system.~~
2. ~~Where areas of buildings are equipped with early suppression fast-response (ESFR) sprinklers, automatic smoke and heat vents shall not be required within these areas.~~

910.2 (IBC [F] 910.2) Where required. Smoke and heat vents and draft curtains or a smoke removal system shall be ~~installed in the roofs of one-story buildings or portions thereof occupied for the uses set forth in Sections 910.2.1 through 910.2.3.~~ provided as required by Sections 910.2.1 through 910.2.3

910.2.1 (IBC [F] 910.2.1) Group F-1 or S-1. ~~Buildings and portions thereof used as~~ A mechanical smoke removal system shall be installed in one story buildings or portions thereof used as a Group F-1 or S-1 occupancy exceeding 50,000 square feet. ~~having more than 50,000 square feet (4645 m^2) in undivided area.~~

~~**Exception:** Group S-1 aircraft repair hangars.~~

910.2.2 (IBC [F] 910.2.2) Nonsprinklered high-piled combustible storage. ~~.~~ Smoke and heat vents and draft curtains shall be installed in one story buildings or portions thereof containing high-piled combustible storage ~~stock~~ which is not protected by an automatic sprinkler system ~~or rack storage in any occupancy group~~ in accordance with Section 2306.7.

910.2.3 (IBC [F] 910.2.3) Sprinklered high-piled combustible storage. A mechanical smoke removal system shall be installed in one story buildings or portions thereof containing high-piled combustible storage which is protected by an automatic sprinkler system in accordance with Section 413 and the *International Fire Code*.

910.3 (IBC [F] 910.3) Design and installation. The design and installation of smoke and heat vents and draft curtains in buildings which are not protected by an automatic sprinkler system shall be as specified in Sections 910.3.1 through 910.3.5.2 and Table 910.3. in accordance with NFPA 204 and this section.

TABLE 910.3 (IBC [F] TABLE 910.3)
REQUIREMENTS FOR DRAFT CURTAINS AND SMOKE AND HEAT VENTS[a]
(Delete table and notes in their entirety)

910.3.1 (IBC [F] 910.3.1) Smoke boundary layer. Smoke and heat vents and draft curtain installations shall be designed to maintain the elevation of the smoke boundary layer as defined by NFPA 204 a minimum of 6 feet above the elevation of the means of egress for a period of 20 minutes after effective ignition.

910.3.1 (IBC [F] 910.3.1) Design. **910.3.2 (IBC [F] 910.3.2) Listing and labeling.** Smoke and heat vents shall be listed and labeled to indicate compliance with UL 793 or FM 4430..

910.3.2 (IBC [F] 910.3.2) Vent operation. Smoke and heat vents shall be capable of being operated by approved automatic and manual means. Automatic operation of smoke and heat vents shall conform to the provisions of Sections 910.3.2.1 through 910.3.2.3.

910.3.2.1 (IBC [F] 910.3.2.1) Gravity-operated drop-out vents. Automatic smoke and heat vents containing heat-sensitive glazing designed to shrink and drop out of the vent opening when exposed to fire shall fully open within 5 minutes after the vent cavity is exposed to a simulated fire, represented by a time-temperature gradient that reaches an air temperature of 500°F (260°C) within 5 minutes.

910.3.2.2 (IBC [F] 910.3.2.2) Sprinklered buildings. Where installed in buildings provided with an approved automatic sprinkler system, smoke and heat vents shall be designed to operate automatically.

910.3.2.3 (IBC [F] 910.3.2.3) Nonsprinklered buildings. Where installed in buildings not provided with an approved automatic sprinkler system, smoke and heat vents shall operate automatically by actuation of a heat-responsive device rated at between 100°F (38°C) and 220°F (104°C) above ambient.

Exception: Gravity-operated drop-out vents complying with Section 910.3.2.1

910.3.3 (IBC [F] 910.3.3) Vent dimensions. The effective venting area shall not be less than 16 square feet (1.5 m^2) with no dimension less than 4 feet (1219 mm), excluding ribs or gutters having a total width not exceeding 6 inches (152 mm).

910.3.4 (IBC [F] 910.3.4 910.3.3 (IBC [F] 910.3.3 Vent locations. Smoke and heat vents shall be located 20 feet (6096 mm) or more from adjacent lot lines and fire walls and 10 feet (3048 mm) or more from fire barriers. Vents shall be uniformly located within the roof in the areas of the building where the vents are required to be installed by Section 910.2 with consideration given to roof pitch, draft curtain location, sprinkler location and structural members.

910.3.5 (IBC [F] 910.3.5) 910.3.4 (IBC [F] 910.3.4 Draft curtains. Where required by Table 910.3 NFPA 204, draft curtains shall be installed on the underside of the roof in accordance with this section.

Exception: Where areas of buildings are equipped with ESFR sprinklers, draft curtains shall not be provided within these areas. Draft curtains shall only be provided at the separation between the ESFR sprinklers and the non ESFR sprinklers.

910.3.5.1 (IBC [F] 910.3.5.1 910.3.4.1 (IBC [F] 910.3.4.1) Construction. Draft curtains shall be constructed of sheet metal, lath and plaster, gypsum board or other approved materials which provide equivalent performance to resist the passage of smoke. Joints and connections shall be smoke tight.

910.3.5.2 (IBC [F] 910.3.5.2) Location and depth. The location and minimum depth of draft curtains shall be in accordance with Table 910.3.

910.4 (IBC [F] 910.4) Mechanical smoke exhaust. Where approved by the fire code official, engineered mechanical smoke exhaust shall be an acceptable alternate to smoke and heat vents.

[F] 910.4. Mechanical smoke removal system. Where required by Sections 910.2.1 and 910.2.3, a mechanical smoke removal system shall be provided in accordance with this section.

Exception: Buildings or portions thereof which are protected by ESFR sprinklers.

~~**910.4.1 (IBC [F] 910.4.1) Location.** Exhaust fans shall be uniformly spaced within each draft-curtained area and the maximum distance between fans shall not be greater than 100 feet (30 480 mm).~~

910.4.1 (IBC [F] 910.4.1) Exhaust fan number and spacing. A minimum of two exhaust fans shall be provided. The spacing between exhaust inlets shall be a minimum of 40 feet and not exceed 100 feet.

~~**910.4.2 (IBC [F] 910.4.2) Size.** Fans shall have a maximum individual capacity of 30,000 cfm (14.2 m3/s). The aggregate capacity of smoke exhaust fans shall be determined by the equation:~~

~~$C = A \times 300$ **(Equation 9-10)**~~

~~where:~~
~~C = Capacity of mechanical ventilation required, in cubic feet per minute (m3/s).~~
~~A = Area of roof vents provided in square feet (m2) in accordance with Table 910.3.~~

910.4.2 (IBC [F] 910.4.2) Exhaust fan construction. Exhaust fans which are part of the smoke removal system shall be rated for operation at ambient temperatures. Exhaust fan motors shall be located outside of the exhaust air stream.

910.4.2 (IBC [F] 910.4.3) System design criteria. The mechanical smoke removal system shall be sized to exhaust the building at a minimum rate of 4 air changes per hour based upon the volume of the building or portion thereof without contents. The capacity of each exhaust fan shall not exceed 30,000 cubic feet per minute. Adequate make-up air shall be available and approved.

~~**910.4.3 (IBC [F] 910.4.3) Operation.** Mechanical smoke exhaust fans shall be automatically activated by the automatic sprinkler system or by heat detectors having operating characteristics equivalent to those described in Section 910.3.2. Individual manual controls of each fan unit shall also be provided.~~

910.4.4 (IBC [F] 910.4.4) Activation. The mechanical smoke removal system shall be activated by manual controls. The mechanical smoke removal system shall not be automatically activated.

910.4.5 (IBC [F] 910.4.5) Manual control location. Manual controls shall be located so as to be accessible to the fire service from the exterior of the building and be protected against interior fire exposure by not less than 1-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both.

~~**[F] 910.4.4 Wiring and control.** Wiring for operation and control of smoke exhaust fans shall be connected ahead of the main disconnect and protected against exposure to temperatures in excess of 1,000°F (538°C) for a period of not less than 15 minutes. Controls shall be located so as to be immediately accessible to the fire service from the exterior of the building and protected against interior fire exposure by not less than 1-hour fire barriers constructed in accordance with Section 706 or horizontal assemblies constructed in accordance with Section 711, or both.~~

910.4.6 (IBC [F] 910.4.6) Wiring and control. Wiring for the operation and control of smoke removal system fans shall be connected ahead of the main disconnect and be protected by materials with a finish rating of 30 minutes.

~~**910.4.5 (IBC [F] 910.4.5) Supply air.** Supply air for exhaust fans shall be provided at or near the floor level and shall be sized to provide a minimum of 50 percent of required exhaust. Openings for supply air shall be uniformly distributed around the periphery of the area served.~~

~~**910.4.6 (IBC [F] 910.4.6) Interlocks.** In combination comfort air-handling/ smoke removal systems or independent comfort air-handling systems, fans shall be controlled to shut down in accordance with the approved smoke control sequence.~~

910.4.7 (IBC [F] 910.4.7) Interlocks. Where building air-handling and smoke removal systems are combined or where independent building air-handling systems are provided, fans shall automatically shut down in accordance with the *International Mechanical Code*. The manual controls provided for the smoke removal system shall have the cability to override the automatic shutdown of fans that are part of the smoke removal system.

TABLE 2306.2
GENERAL FIRE PROTECTION AND LIFE SAFETY REQUIREMENTS

COMMODITY CLASS	SIZE OF HIGH-PILED STORAGE AREA[a] (square feet) (see Sections 2306.2 and 2306.4)	ALL STORAGE AREAS (See Sections 2306, 2307 and 2308)[b]				
		Automatic fire-extinguishing system (see Section 2306.4)	Fire detection system (see Section 2306.5)	Building access (see Section 2306.6)	Smoke and heat ~~removal~~ venting (see Section 2306.7)	~~Draft curtains (see Section 2306.7)~~
I-IV	0-500	Not Required[a]	Not Required	Not Required[e]	Not Required	~~Not Required~~
	501-2,500	Not Required[a]	Yes[i]	Not Required[e]	Not Required	~~Not Required~~
	2,501-12,000 Public accessible	Yes	Not Required	Not Required[e]	Not Required	~~Not Required~~
	2,501-12,000 Nonpublic accessible (Option 1)	Yes	Not Required	Not Required[e]	Not Required	~~Not Required~~
	2,501-12,000 Nonpublic accessible (Option 2)	Not Required[a]	Yes	Yes	Yes	~~Yes~~[j]
	12,001-20,000	Yes	Not Required	Yes	Yes[j]	~~Not Required~~
	20,001-500,000	Yes	Not required	Yes	Yes[l]	~~Not required~~
	Greater than 500,000 ~~g~~ d	Yes	Not required	Yes	Yes[l]	~~Not required~~
High hazard	0-500	Not Required[a]	Not Required	Not Required[e]	Not Required	~~Not Required~~
	501-2,500 Public accessible	Yes	Not Required	Not Required[e]	Not Required	~~Not Required~~
	501-2,500 Nonpublic accessible (Option 1)	Yes	Not Required	Not Required[e]	Not Required	~~Not Required~~
	501-2,500 Nonpublic accessible (Option 2)	Not Required[a]	Yes	Yes	Yes	~~Yes~~[j]
	2,501-300,000	Yes	Not required	Yes	Yes[j]	~~Not required~~
	300,001-500,000 ~~g~~ d, h	Yes	Not required	Yes	Yes[l]	~~Not required~~

(Portions of table not shown remain unchanged)

For SI: 1 foot = 304.8 mm, 1 cubic foot = 0.02832 m^3 , 1 square foot = 0.0929 m^2 .

a. When automatic sprinklers are required for reasons other than those in Chapter 23, the portion of the sprinkler system protecting the high-piled storage area shall be designed and installed in accordance with Sections 2307 and 2308.
b. For aisles, see Section 2306.9.

c. Piles shall be separated by aisles complying with Section 2306.9.
d. For storage in excess of the height indicated, and high hazard storage areas greater than 300, 000 square feet, ~~special fire protection~~ an approved engineering design such as fire protection of structural elements and enhanced fire suppression shall be provided ~~in accordance with Note g when required by the fire code official~~. See also Chapters 28 and 34 for special limitations for aerosols and flammable and combustible liquids, respectively.
e. Section 503 shall apply for fire apparatus access.
f. For storage exceeding 30 feet in height, Option 1 shall be used.
~~g. Special fire protection provisions including, but not limited to, fire protection of exposed steel columns; increased sprinkler density; additional in-rack sprinklers, without associated reductions in ceiling sprinkler density; or additional fire department hose connections shall be provided when required by the fire code official.~~
h. High-piled storage areas shall not exceed 500,000 square feet. A 2-hour fire wall constructed in accordance with the International Building Code shall be used to divide high-piled storage exceeding 500,000 square feet in area.
i. Not required when an automatic fire-extinguishing system is designed and installed to protect the high-piled storage area in accordance with Sections 2307 and 2308.
j. Smoke and heat venting shall not be ~~Not~~ required when storage areas are protected by early suppression fast response (ESFR) sprinkler systems installed in accordance with NFPA 13. Where a standard sprinkler system is installed in these locations, a mechanical smoke removal system shall be provided in accordance with Section 910.4. See Section 2306.7.

2306.7 Smoke and heat ~~removal~~ venting. Where smoke and heat ~~removal~~ venting ~~are~~ is required by Table 2306.2 in buildings not protected by an automatic sprinkler system, smoke and heat vents and draft curtains shall be provided in accordance with Section 910. Smoke and heat venting shall not be required where storage areas are protected by early suppression fast response (ESFR) sprinkler systems installed in accordance with NFPA 13. Where Table 2306.2 requires smoke and heat venting in a building with a standard sprinkler system, a mechanical smoke removal system shall be provided in accordance with Section 910.4. Where draft curtains are required by Table 2306.2, they shall be provided in accordance with Section 910.3.4.

2. Add new standards to Chapter 47 (IBC Chapter 35) as follows:

FM
4430-07 Approval Standard for Heat and Smoke Vents

NFPA
204-2010 Standard for Smoke and Heat Venting

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.

This proposed change is a result of the CTC's investigation of the area of study entitled "Balanced Fire Protection – Roof vents". The scope of the activity is noted as:

Review the current IBC/IFC requirements for smoke/heat vents and draft curtains relative to balanced fire protection**.**

The purpose of this code change is to update the provisions which mandate roof vents in one-story industrial and storage buildings. The code change will delete the specification-oriented provisions for roof vents and draft curtains for unsprinklered buildings and substitute a reference to NFPA 204. The code change will further require that a manually-operated mechanical smoke removal system be provided for large one-story industrial and storage buildings protected by a sprinkler system in lieu of the requirements for roof vents and draft curtains.

The first issue assigned by the ICC Board of Directors to the Code Technology Committee (CTC) in 2005 was the issue of "balanced" fire protection. As part of the CTC's review of the "balanced" fire protection issue, the CTC formed a Study Group to review the issue of whether or not smoke/heat vents were necessary in large buildings protected by a sprinkler system.

After reviewing the available research on the interaction of standard sprinklers and roof vents (NISTIR 6196-1), it was determined that individually-activated automatic roof vents are unlikely to activate automatically in buildings protected by standard spray sprinklers (provided that the sprinkler system is adequate for the hazard protected and is operational). Given this determination, it was concluded that the performance of individually-activated automatic roof vents is essentially the same as manually-operated roof vents in buildings protected by a sprinkler system.

The explanatory information provided in NFPA 204 indicates that the capabilities of roof vents to perform their function are dependent upon the depth of the smoke layer which develops and the temperature differential between the smoke layer and ambient temperature. Given that standard spray sprinklers are highly efficient in reducing ceiling temperatures due to the finely divided water spray produced by these types of sprinklers, the ceiling temperatures produced even in "high challenges" fires are rapidly reduced and, after about 10 minutes of sprinkler discharge, return to near ambient and continue to drop with additional time. Based upon this, it can be concluded that roof vents which are manually opened 10 minutes or more after sprinkler activation will not provide effective venting for the building.

Where the smoke layer temperature differentials are less than 110^{o}C (198^{o}F), NFPA 204 recommends that a powered (mechanical) exhaust system be provided in lieu of providing roof vents. Based upon the recommendations contained in NFPA 204, the provisions for providing roof vents have been deleted and a requirement for a manually-operated mechanical smoke removal system has been substituted.

The proposal requires that the manually-operated mechanical smoke removal system be sized to provide a minimum of 6 air changes per hour. Since the use of roof vents for the purpose of providing venting in sprinklered buildings has been acceptable for over 25 years, the sizing of the mechanical smoke removal system has been determined based upon the venting capabilities of roof vents at a time equal to the typical fire department response time, 10 minutes and beyond. Given that opened roof vents will provide little actual venting capability after the sprinkler system

has been discharging water spray for 10 minutes, providing a mechanical smoke removal system which provides a minimum of 4 air changes an hour will be a substantial improvement over the presently acceptable venting capabilities for sprinklered buildings required by the IBC/IFC. The 4 air changes were viewed as a reasonable value when compared against the BOCA National Building Code which required 2 and the Uniform Building Code which required 6.

It should be noted that this code change proposal permits the mechanical smoke removal system to designed to operate at ambient temperatures. The rationale for this provision is that the ceiling temperatures throughout the building will be returned to close to ambient at between 10 and 15 minutes after the first sprinkler activates. Given that the typical response time for fire departments is roughly 10 minutes, and the ceiling temperatures expected after 10 minutes, there is no need to design the mechanical system to withstand temperatures higher than ambient.

In the opinion of the Study Group which has developed this code change proposal, the proposal is a vast improvement over the existing provisions for roof venting presently contained in the IBC/IFC.

It should be noted that simply making a reference to NFPA 204 as a substitute for the present specification-oriented provisions for roof vents/draft curtains contained in the IBC/ IFC is not an option because the current edition of NFPA 204 does not contain specific design provisions for the design of roof vent systems in buildings protected by a standard sprinkler system. Without specific provisions for roof vent system in sprinklered buildings, the requirements for roof vent systems in sprinklered buildings cannot be enforced in a uniform manner in all jurisdictions which utilize the IBC/IFC.

It should also be noted that the NFPA 204 committee is presently working developing provisions which address the design of roof venting systems in sprinklered buildings; however, these provisions have been under development for more than 30 years. It is the Study Group's opinion that the IBC/IFC should not be written based upon the assumption that the NFPA 204 committee will be able to develop provisions for the design of venting systems anytime in the near future.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, FM 4430-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009. Review of proposed new standard NFPA 204-2010 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HEILSTEDT-F1-910.1.DOC

F145–09/10
910.3.5.2.1 (New) [IBC [F] 910.3.5.2.1 (New)]

Proponent: Richard Davis, FM Global

Add new text as follows:

910.3.5.2.1 (IBC [F] 910.3.5.2.1) Aisle location. Draft curtains located in high-piled storage areas classified as Class I-IV and High Hazard in sprinklered buildings shall be located over an aisle space. The distance between the face of storage and the draft curtain on both sides of the draft curtain shall not be less than 0.75 times the spacing between sprinklers in the direction perpendicular to the draft curtain.

Reason: If draft curtains are not located over sufficiently large aisle spaces, they can have a detrimental effect on fire control by sprinklers. Draft curtains can prevent pre-wetting of storage adjacent to the area of fire origin, and can delay actuation of sprinklers on the opposite side of the draft curtain with respect to the fire origin. Pre-wetting of adjacent storage is important in establishing fire control by sprinklers in storage areas. The operation of an excessive number of sprinklers, potentially depleting the water supply, can result. This has been substantiated by tests done at FM Global Research (Joan Troup). Additional discussion is provided in Annex F of NFPA 204.

Cost Impact: The code change proposal will slightly increase costs based on the current requirements of the code, because it will result in an aisle space that is likely wider than it would be otherwise

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIS-F1-910.3.5.3.DOC

F146–09/10
910.5 (New) [IBC ([F] 910.5 (New)], Chapter 47

Proponent: Justin H. Beal, representing the City of Fresno, CA, Fire Department

1. Add new text as follows:

910.5 (IBC [F] 910.5) Maintenance. Smoke and heat vents and mechanical smoke exhaust systems shall be maintained in an operative condition in accordance with NFPA 204. Fusible links shall be promptly replaced whenever fused, damaged or painted. Smoke and heat vents and mechanical smoke exhaust systems shall not be modified.

2. Add new standard to Chapter 47 as follows:

NFPA	
204-2007	Standard for Smoke and Heat Venting

Reason: The maintenance of heat and smoke vents and mechanical smoke exhaust systems is not clearly addressed within the model International Fire Code. Installation and design criteria for smoke and heat vents can be found in I.F.C. section 910.3.1 (U.L. 793), however, maintenance provisions for these systems should be included within section 910 to provide clarity for the end user of the code. This proposal incorporates National Fire Protection Association Standard 204, Standard for Smoke and Heat Venting, 2007 edition, as the referenced standard for the maintenance of smoke and heat vents and mechanical smoke exhaust systems.

Routine inspection, testing and maintenance of these devices is essential for several reasons: These devices are typically only found in the largest commercial structures, and within these structures, the amount of fire loading is usually very high, to include high piled combustible storage.

Ensuring that these devices are inspected, tested and maintained in proper working order by the building owner (as specified in the new referenced standard) will have several positive effects for firefighter safety. These benefits include: easy identification of the location of the fire within the structure, the release of excess heat within the structure decreasing fire severity, increased visibility for firefighters within the structure, and the reduction of toxic products of combustion within the structure.

Additionally, the maintenance of these devices will have a mitigating effect on damage to the structure and/or its contents should a fire occur. These include: decreased likelihood of structural failure from heat retained within the structure and reduced damage to the structure and stored materials from smoke.

Finally, these devices are considered “fire protection systems” as noted in the I.F.C. section 902.1, and as such, a provision requiring specified inspection, testing and maintenance intervals via a referenced standard should be included within the body of the code.

The language of this section has been developed to follow (and is substantially similar to, and consistent with) the format found within the International Fire Code, Section 703.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard NFPA 204-2007 indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEAL-F1-910.5.DOC

F147–09/10
912.4 (IBC [F] 912.4)

Proponent: Joshua D. Smith, New York State Department of State, Office of Fire Prevention and Control

Revise as follows:

912.4 ~~Signs~~ Markings. A metal sign with raised letters at least 1 inch (25 mm) in size shall be mounted on all fire department connections ~~serving automatic sprinklers, standpipes or fire pump connections~~ to indicate their function. The caps of fire department connections shall also be color-coded to indicate their function. ~~Such signs shall read: AUTOMATIC SPRINKLERS or STANDPIPES or TEST CONNECTION or a combination thereof as applicable.~~ Where the fire department connection does not serve the entire building, a sign shall be provided indicating the portions of the building served. The signs and the caps shall be marked as follows:

1. For a connection serving only a standpipe the sign shall read STANDPIPE and the cap shall be colored red.
2. For a connection serving a combination automatic sprinkler and standpipe system the sign shall read COMBINATION STANDPIPE AND SPRINKLER and the cap shall be colored yellow. If the automatic sprinkler system only covers a portion of the building the sign shall also indicate where the protected areas are located in the building.
3. For a connection serving an automatic sprinkler system only the sign shall read SPRINKLER or AUTOMATIC SPRINKLER and the cap shall be colored green. If the automatic system only covers a portion of the building the sign shall also indicate where the protected areas are located in the building.
4. For a connection serving a systems other than an automatic sprinkler system the sign shall read NON-AUTOMATIC SPRINKLER and the cap shall be colored silver.
5. Test connections shall have signs that read TEST CONNECTION and the caps shall be colored black.

Reason: There are often signs installed for fire department connections that are often a single color, such as chrome or brass signs, that are not easily read from the point where a fire apparatus will be able to first see the connection. The color coding of the caps will make identifying the function of the fire department connection more easily discernable from a greater distance for fire apparatus fire fighters.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SMITHJ-F1-912.4.DOC

F148–09/10
915 (New) [IBC [F] 916 (New)]; IFGC 410.4 (New)

Proponent: Ronald Paskiewicz, President, Craft-Weld Enterprises, Inc., representing himself and Craft-Weld, for U.S. Patent No. 6,199,573 Gas Flow Arrestor (GFA) system

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE FIRE CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE FIRE CODE COMMITTEE.

PART I – IFC

Add new text as follows:

SECTION 915 (IBC 916)
AUTOMATIC FUEL GAS SERVICE SHUT OFF

915.1 Automatic fuel gas shut-off. Each fuel gas service to a building shall be equipped with an approved, fire alarm activated automatic fuel gas shut-off device installed between the gas service meter and the building or, where there is no gas service meter, within 2 feet (610 mm) of where the gas service pipe enters the building. Where no fire alarm system is installed, the automatic fuel gas shut-off device shall be activated by an approved smoke detector equipped with an approved heat sensor. The device shall stop the flow of fuel gas to the building upon activation by the fire alarm system or by activation of the heat sensor in the smoke detector.

915.2 Protection of non-metered branch services. Where a metered fuel gas service serves more than one building, or a complex of buildings, or a building that is subdivided into fire areas, each of which is served by a separate branch line from the metered gas service main, each such branch line shall be protected by an approved automatic fuel gas shut-off device activated in accordance with Section 915.1and installed within 2 feet (610 mm) of the building at the fuel gas service entrance.

915.3 Protection of branch lines to mechanical and electrical equipment. Branch lines to rooftop heating, ventilating and air conditioning units, and to pad-mounted emergency generators shall be protected by heat detector actuated automatic fuel gas shut-off systems.

PART II – IFGC

Add new text as follows:

410.4 Automatic fuel gas shut-off. An automatic fuel gas shut-off device shall be provided for buildings in accordance with Section 915 of the *International Fire Code*.

Reason: These requirements introduce a requirement for fire alarm actuated automatic gas shut-off valves at all metered fuel gas services to buildings or separate subdivisions of buildings, for example, a commercial mall or plaza, or an office building where each tenant's service is separately metered, or an industrial "incubator" complex of small leased spaces on separate meters. At the same time, 915.2 provides for the many situations where a single utility company meter serves an entire complex of buildings and subdivisions of these buildings, such as office campuses, large industrial complexes, military bases, airports and college and university campuses. and branch mains and branch lines of various sizes serve each building, and separate parts of these buildings, where fire alarm actuated automatic gas shut-off valves, or gas flow arrestors, on each of the individual branch mains or branch lines will protect the building that main or branch line serves without automatically shutting off gas services to all of the other buildings.

Cost Impact: The code change will only very slightly increase the cost of construction. Protection of each service or branch service can cost as little as a few hundred dollars, but even the most complex and sophisticated systems for the largest installations will cost no more than a few thousand dollars. Any increase in cost will be recovered within one to at the most three years in the reduction of insurance premiums, this on the authority of several major insurance companies that are poised to reduce the cost of their policies to insured who have installed GFA's.

PART I – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IFGC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PASKIEWICZ-F1-915

F149–09/10
1030.2

Proponent: John Woestman, The Kellen Company, representing the Door Safety Council (DSC)

Revise as follows:

1030.2 Reliability. Required exit accesses, exits ~~or~~ and exit discharges shall be continuously maintained free from obstructions or impediments to full instant use in the case of fire or other emergency when the building area~~s~~ served by ~~such exits~~ the means of egress ~~are~~ is occupied. Security devices affecting means of egress shall be subject to approval of the fire code official.

Reason: This proposal clarifies and improves enforceability of this paragraph of the code. One of the most common violations of the fire code is means of egress that have impediments to full instant use.

This proposal revises the code to more accurately reflect the intent of the code in that all three of the critical parts of the means of egress are required to meet the "full instant use" reliability requirements. Without this code change, it could be argued that this paragraph of the code may be satisfied if only one of the three separate and distinct parts of a means of egress is maintained free from obstructions and impediments to full instant use.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WOESTMAN-F4-1030.2.DOC

F150–09/10
1030.2, 1030.2.1 (New)

Proponent: John Woestman, The Kellen Company, representing the Door Safety Council (DSC)

Revise as follows:

1030.2 Reliability. Required exit accesses, exits or exit discharges shall be continuously maintained free from obstructions or impediments to full instant use in the case of fire or other emergency when the areas served by such exits are occupied. Security devices affecting means of egress shall be subject to approval of the fire code official.

A building is regarded as occupied when it is open for use, open to the public, or when more than 10 persons are present within the building.

1030.2.1 In occupancy Groups A, B, E, and M, when the building is regarded as not occupied and means of egress doors are locked, individuals in the building shall be able to unlock means of egress doors for emergency egress.

Reason: This proposal introduces to the IFC a description of occupancy consistent with the updated NFPA 101 Life Safety Code and, for occupancy groups A, B, E, & M, adds enforceable language that addresses the challenge of ensuring reliable emergency escape while at the same time providing for occupant and property protection and security.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WOESTMAN-F3-1030.2-2.DOC

F151–09/10
1030.2, 1030.2.1, 1030.6, 1030.9 (New)

Proponent: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

1. Revise as follows:

1030.2 Reliability. Required exit accesses, exits or exit discharges shall be continuously maintained free from obstructions or impediments to full instant use in the case of fire or other emergency when the areas served by such exits are occupied. An exit or exit passageway shall not be used for any purpose other than as a means of egress.

1030.2.1 Security devices and egress locks. Security devices affecting means of egress shall be subject to approval of the fire code official. Special locking arrangements including, but not limited to access-controlled egress doors, security grills, locks and latches, and delayed egress locks shall be installed and maintained as required by this chapter.

1030.6 Finishes, furnishings and decorations. Means of egress doors shall be readily maintained in such a manner as to be distinguishable from the adjacent construction and finishes such that the doors are easily recognizable as doors. Furnishings, decorations or other objects shall not be placed so as to obstruct exits, access thereto, egress therefrom, or visibility thereof. Hangings and draperies shall not be placed over exit doors or otherwise be located to conceal or obstruct an exit. Mirrors shall not be placed on exit doors. Mirrors shall not be placed in or adjacent to any exit in such a manner as to confuse the direction of exit.

2. Add new text as follows:

1030.9 Floor identification signs. The floor identification signs required by Sections 1022.8 and 4604.22 shall be maintained in an approved manner.

Reason: The proposed modification Section 1030.2 has taken language that currently exists in Sections 1020.1 and 1023.1 and added it to this section since the requirement is one that not only applies at the time of construction, but must be maintained for the life of the building or structure.

> *1020.1 General. Exits shall comply with Sections1020 through 1026 and the applicable requirements of Section1003 through 1013. An exit shall not be used for any purpose that interferes with its function as a means of egress. Once a given level of exit protection is achieved, such level of protection shall not be reduced until arrival at the exit discharge.*
>
> *1023.1 Exit passageway. Exit passageways serving as an exit component in a means of egress system shall comply with the requirements of this section. An exit passageway shall not be used for any purpose other than as a means of egress.*

The last sentence of Section 1030.2 addressing "security" is a special topic and has been separated out and designated as 1030.2.1. Language has been added to make it clear any of a number of methods used to control the use of or secure egress doors must be done in compliance with Chapter 10, which has specific provisions governing the installations when approved.

The proposed change to 1030.6 takes a restriction found in Section 1008.1 that equally applies to new construction, but also must be addressed through the life of the building or structure. It is not uncommon for a building owner to refinish the inside of an occupancy and paint or otherwise apply a matching finish to a door and the surrounding wall making the door indistinguishable. This commonly occurs with murals that are painted on walls of corridors.

> 1008.1 Doors. Means of egress doors shall meet the requirements of this section. Doors serving a means of egress system shall meet the requirements of this section and Section 1017.2. Doors provided for egress purposes in numbers greater than required by this code shall meet the requirements of this section.
>
> Means of egress doors shall be readily distinguishable from the adjacent construction and finishes such that the doors are easily recognizable as doors. Mirrors or similar reflecting materials shall not be used on means of egress doors. Means of egress doors shall not be concealed by curtains, drapes, decorations or similar materials.

A new Section 1030.9 is proposed which references the language found in existing Section 1022.8. The requirement for the maintenance of signs designating floor levels in interior stairway exit enclosures has equal importance in existing buildings.

Cost Impact: The code change proposal will not increase the cost of construction other than the signs needed for compliance with proposed Section 1028.8.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F3-1030.2.DOC

F152–09/10
1206.2, 1206.2.1 (New), 1206.3, 1206.4

Proponent: David W. Dawson, R. R. Street & Co. Inc.

1. Revise as follows:

1206.2 ~~Type~~ Class I solvents. The maximum quantity of ~~Type I~~ Class I solvents permitted at any work station shall be 1 gallon (4 L). ~~Class I solvents shall be stored in approved safety cans or in sealed DOTn-approved metal shipping containers of not more than 1-gallon (4 L) capacity. Dispensing shall be from approved safety cans.~~ Spotting or pre-spotting shall be permitted to be conducted with Class I solvents where they are stored in and dispensed from approved safety cans or in sealed DOT-approved shipping containers of not more than 1 gallon (4 L) capacity.

2. Add new text as follows:

1206.2.1 Spotting and pre-spotting. Spotting and pre-spotting shall be permitted to be conducted with Class I solvents where dispensed from plastic containers of not more than 1 pint (0.5 L) capacity.

3. Revise as follows:

1206.3 ~~Type~~ Class II and III solvents. Scouring, brushing, and spotting and pretreating shall be permitted to be conducted with Class II or III solvents. The maximum quantity of ~~Type~~ Class II or III solvents permitted at any work station shall be 1 gallon (4 L). In other than Group H-2 occupancy, the aggregate quantities of solvents shall not exceed the maximum allowable quantity per control area for use-open system.

1206.4 Type IV systems. Flammable and combustible liquids used for spotting operations shall be stored in approved safety cans or in sealed DOT~~n~~-approved ~~metal~~ shipping containers of not more than 1 gallon (4 L) in capacity. ~~Dispensing shall be from approved safety cans.~~ Aggregate amounts shall not exceed 10 gallons (38 L).

Reason: The purpose of the change is to revise outdated material. The proposed wording is intended to recognize the wide use of DOT-approved plastic containers to ship and store chemicals used in dry cleaning plants, including spotting chemicals. Use of these containers is permitted by OSHA for the storage of flammable and combustible liquids under conditions described in OSHA Directive STD 01-05-014. Equivalent changes have been made to NFPA 32.

Bibliography: 29 CFR 1910.106 Flammable and combustible liquids; OSHA Directive STD-01-05-014; NFPA 32.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAWSON-F2-1206.2.DOC

F153–09/10
1208.2

Proponent: David W. Dawson, R. R. Street & Co. Inc., representing Textile Care Allied Trades Association (TCATA) and Drycleaning and Laundry Institute (DLI).

Revise as follows:

1208.2 Automatic sprinkler system. An automatic sprinkler system shall be installed in accordance with Section 903.3.1.1 throughout dry cleaning plants containing Type II, Type III-A or Type III-B dry cleaning systems.

Exceptions:

1. An automatic sprinkler system shall not be required in Type III-A dry cleaning plants where the aggregate quantity of Class III-A solvent in dry cleaning machines and storage does not exceed 330 gal (1250 L) and dry cleaning machines are equipped with a feature that will accomplish any one of the following:

    1.1. Prevent oxygen concentrations from reaching 8 percent or more by volume.
    1.2. Keep the temperature of the solvent at least 30ºF (16.7ºC) below the flash point.

1.3. Maintain the solvent vapor concentration at a level lower than 25 percent of the lower explosive limit (LEL).

1.4. Utilize equipment approved for use in Class I, Division 2 hazardous locations in accordance with NFPA 70.

1.5. Utilize an integrated automatic fire-extinguishing system complying with Section 4.6 of NFPA 32.

2. An automatic sprinkler system shall not be required in Type III-B dry cleaning plants where the aggregate quantity of Class III-B solvent in dry cleaning machines and storage does not exceed 3300 gal (12,490 L).

Reason: The purpose of this proposed code change is to eliminate the overly restrictive requirements for automatic sprinkler systems in dry cleaning facilities using modern dry cleaning equipment. Modern Type IIIA dry cleaning machines have intrinsic safety features that prevent fires from starting within the dry cleaning machine. It is preferable to prevent fires from starting in the first place, rather than extinguishing ones that have already started. NFPA 32 already allows these safety features to be used in lieu of automatic sprinkler systems.

Bibliography: NFPA 32

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The action on this proposal should be consistent with the action on Code Change F154-09/10.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAWSON-F1-1208.2.DOC

F154–09/10
1208.2

Proponent: Howard Hardy, South Metro Fire Rescue Authority, representing Fire Marshal's Association of Colorado

Revise as follows:

1208.2 Automatic sprinkler system. An automatic sprinkler system shall be installed in accordance with Section 903.3.1.1 throughout dry cleaning plants containing Type II, Type III-A or Type III-B dry cleaning systems.

Exception: Sprinklers shall be permitted to be omitted in dry cleaning plants complying with the exceptions in NFPA 32.

Reason: The purpose of this code change proposal is to clarify conflicting requirements between the International Fire Code and NFPA 32. The International Fire Code indicates that the installation of drycleaning systems is to be in accordance with the requirements of NFPA 32 The construction provisions of NFPA 32 addresses the installation of automatic sprinklers and allows several exceptions that would not require the installation of automatic sprinklers in type II, IIIA and IIIB drycleaning plants. The exceptions in NFPA 32 are based on providing equivalent levels of protection in drycleaning plants with limited quantities of solvents in use and storage. The International Fire Code currently allows no exception to providing automatic sprinkler systems throughout type II and III drycleaning plants. This requirement is in conflict with the requirements of NFPA 32. The exceptions in NFPA 32 are similar to provisions in the International Fire Code allowing alternative automatic fire extinguishing systems, such as for commercial cooking operations, where the specific hazard is addressed rather than requiring automatic sprinklers in the entire occupancy.
We are seeing a trend to change current type IV drycleaning plants to type III drycleaning plants to eliminate the use of existing type IV solvents that are serious health hazards. It causes extreme financial hardship to business owners when they are required to provide automatic sprinkler systems to their occupancy due to a change in the type of plant and are not allowed to utilize any of the exceptions currently allowed in NFPA 32 for alternative protection. The typical small drycleaning establishment normally has minimal equipment and chemicals and is no more and often less hazardous than other occupancies that do not require automatic sprinkler systems. It seems unreasonable to require sprinklers throughout when they change the type of plant by installing a new drycleaning machine that provides adequate safety for the drycleaning machine.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The action on this proposal should be consistent with the action on Code Change F153-09/10.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HARDY-F2-1208.2.DOC

F155–09/10
1501.1, 1501.2; IBC [F] 416

Proponent: Tom Lariviere, Chairman - Joint Fire Service Review Committee

1. Revise IFC as follows:

1501.1 Scope. This chapter shall apply to locations or areas where any of the following activities are conducted:

1. The application of ~~flammable or combustible paint, varnish, lacquer, stain, fiberglass resins or other flammable or combustible liquid applied~~ flammable finishes to articles or materials by means of spray apparatus ~~in continuous or intermittent processes~~.
2. ~~Dip-tank operations in which articles or materials are passed through contents of tanks, vats or containers of flammable or combustible liquids, including coating, finishing, treatment and similar processes.~~ The application of flammable finishes by dipping or immersing articles or materials into the contents of tanks, vats or containers of flammable or combustible liquids for coating, finishing, treatment or similar processes.
3. The application of flammable finishes by applying combustible powders to articles or materials utilizing ~~when applied by~~ powder spray guns, electrostatic powder spray guns, fluidized beds or electrostatic fluidized beds.
4. Floor surfacing or finishing operations using Class I or II liquids in areas exceeding 350 square feet (32.5 m^2).
5. The application of flammable finishes consisting of dual-component coatings or Class I or II liquids when applied by brush or roller in quantities exceeding 1 gallon (4 L).
6. ~~Spraying and dipping operations.~~

1502.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

FLAMMABLE FINISHES. ~~Material coatings~~ Coatings to articles or materials in which the material being applied is a flammable liquid, combustible liquid, combustible powder, fiberglass resin or flammable or combustible gel coating.

2. Revise IBC as follows:

SECTION 416
SPRAY APPLICATION OF FLAMMABLE FINISHES

[F] 416.1 General. The provisions of this section shall apply to the construction, installation and use of buildings and structures, or parts thereof, for the spraying of flammable ~~paints, varnishes and lacquers~~ finishes ~~or other flammable materials or mixtures or compounds used for painting, varnishing, staining or similar purposes~~. Such construction and equipment shall comply with the International Fire Code.

[F] 416.2 Spray rooms. (No change to current text.)

[F] 416.2.1 Surfaces. (No change to current text.)

[F] 416.2.2 Ventilation. Mechanical ventilation and interlocks with the spraying operation shall be in accordance with the International Fire Code.

[F] 416.3 Spraying spaces. (No change to current text.)

[F] 416.3.1 Surfaces. (No change to current text.)

[F] 416.4 Spray booths. (No change to current text.)

[F] 416.5 Fire protection. An automatic fire-extinguishing system shall be provided in all spray~~, dip and immersing spaces and storage~~ rooms and shall be installed in accordance with Chapter 9.

Reason: Item 1 – IFC: The revisions in this section are intended to clarify the application of Chapter 15. There is no change in application of this Chapter or the requirements therein.

First, the Scope is revised using the defined term of "flammable finishes".
1. Item #1 covers spray operations
2. Item #2 covers dipping operations
3. Item #3 covers electrostatic and fluidized beds

4. Item #4 specifies the limitation of Class I or II liquids when conducting floor surfacing
5. Item #5 covers dual-component coatings
6. Item #6 is deleted since it is covered in Items #1 and #2.

Second, the definition of "flammable finishes" is revised to include the coatings that are already regulated in Chapter 15.

These revisions are essentially editorial changes that will add clarity in the application of Chapter 15.

Item 2 – IBC: This proposal is designed to correlate the requirements for spray operations found in the IBC and the IFC.

Section 416 is revised to specify spray application of materials. This is consistent with the wording in Section 416.1 which limits the application of these requirements to spray operations.

Section 416.1 is revised to provide consistency with the scope in IFC Section 1501.1. This revision will include all of the operations that would be regulated within a spray room or spray booth.

Section 416.2.2 is added to reference the IFC which contains requirements for ventilation velocities and for interlocking the ventilation system with the spraying apparatus.

Section 416.5 is revised to be consistent with IFC Section 1505.4. A fire extinguishing system is not required for all dipping operations. For example, when using dip tanks of less than 150 gallons, a fire extinguishing system is an optional method of protection.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F17-1501.1-G2-IBC416.DOC

F156–09/10
1504.6.1.2.1

Proponent: Geoff Raifsnider, Global Finishing Solutions, representing self

Revise as follows:

1504.6.1.2.1 Interlocks. The spraying apparatus, drying apparatus and ventilating system for the spray booth or spray room shall be equipped with interlocks arranged to:

1. Prevent operation of the spraying apparatus while drying operations are in progress.
2. Prevent operation of the drying appratus until a timed purge of spray vapors from the spray booth or spray room is complete. This purge time shall be based upon introducing at least 4 standard cubic feet of fresh air per cubic foot of spray booth or spray room volume. ~~Purge spray vapors from the spray booth or spray room for a period of not less than 3 minutes before the drying apparatus is rendered operable.~~
3. Have the ventilating system maintain a safe atmosphere within the spray booth or spray room during the drying process and automatically shut off drying apparatus in the event of a failure of the ventilating system.
4. Shut off the drying apparatus automatically if the air temperature within the booth exceeds 200°F (93°C).

Reason: Although "not less than" implies that the value could be more, the current language does not state how the value is calculated. The proposed language clarifies how to calculate the purge time and bases it upon the amount of fresh air introduced. This proposal also eliminates the 3 minute minimum. There are applications where the delay in proceeding to curing can affect the quality of the product finish. In these applications the heating apparatus is often the same industrial heater that maintains the temperature during painting and the apparatus is outside the spray area and not subject to exposure to overspray. It should be acceptable to have a design where the purge time is a function of air flow.

Cost Impact: Any additional cost would be justified based upon the importance of the reduced purge time to achieve the quality of the product. This additional cost may be offset by the reduction in operating cost.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RAIFSNIDER-F2-1504.6.1.2.1.DOC

F157–09/10
1504.7.3

Proponent: Geoff Raifsnider, Global Finishing Solutions, representing self

Revise as follows:

1504.7.3 Air velocity. Ventilation systems shall be designed, installed and maintained to be capable of confining and removing overspray and vapors. The vapor concentration in the exhaust air stream shall be less than 25 percent of the lower flammable limit. ~~such that the average air velocity over the open face of the booth, or booth cross section in the direction of airflow during spraying operations, shall not be less than 100 feet per minute (0.51 m/s).~~

Reason: This proposal eliminates the 100 fpm minimum air velocity. The proposed language removes the specific value while still stating the required performance. There are many types of booths and rooms in which the 100 fpm value would be detrimental to the quality of the product and is well in excess of the minimum dilution air needed to keep the space and exhaust below 25% of the LFL. This extra air also increases the operating costs. The air velocities for a specific spray booth or spray room should be specific to the individual design that accomplishes the desired performance (ie. 25% LFL or containment of overspray at openings). Chapter 13.75 of Industrial Ventilation – A Manual of Recommended Practice 26th Edition Published by ACGIH, lists many air velocity ranges for various painting operations, some above and some below 100 fpm. This publication could be included in the standard as reference material.

Cost Impact: The code change proposal would decrease the construction and operating costs.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RAIFSNIDER-F1-1504.7.3.DOC

F158–09/10
1701.1, 1702.1, 1703.1, 1703.2, 1703.3, 1703.3.2, 1703.4

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Revise as follows:

CHAPTER 17
FUMIGATION AND ~~THERMAL~~ INSECTICIDAL FOGGING

1701.1 Scope. Fumigation and ~~thermal~~ insecticidal fogging operations within structures shall comply with this chapter.

1702.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

~~THERMAL~~ INSECTICIDAL FOGGING. The utilization of insecticidal liquids passed through ~~thermal~~ fog-generating units where, by means of ~~heat,~~ pressure and turbulence, with or without the application of heat, such liquids are transformed and discharged in the form of fog or mist blown into an area to be treated.

1703.1 General. Structures in which fumigation and ~~thermal~~ insecticidal fogging operations are conducted shall comply with the fire protection and safety requirements of Sections 1703.2 through 1703.7.

1703.2 Sources of ignition. Fires, open flames and similar sources of ignition shall be eliminated from the space under fumigation or ~~thermal~~ insecticidal fogging. Heating, where needed, shall be of an *approved* type.

1703.3 Notification. The *fire code official* and fire chief shall be notified in writing at least 24 hours before the structure is to be closed in connection with the utilization of any toxic or flammable fumigant. Notification shall give the location of the enclosed space to be fumigated or fogged, the occupancy, the fumigants or insecticides to be utilized, the *person* or *persons* responsible for the operation, and the date and time at which the operation will begin. Notice of any fumigation or ~~thermal~~ insecticidal fogging shall be served with sufficient advance notice to the occupants of the enclosed space involved to enable the occupants to evacuate the premises.

1703.3.2 Breathing apparatus. *Persons* engaged in the business of fumigation or ~~thermal~~ insecticidal fogging shall maintain and have available *approved* protective breathing apparatus.

1703.4 ~~Thermal insecticidal~~ Insecticidal fogging liquids. ~~Thermal insecticidal~~ Insecticidal fogging liquids with a *flash point* below 100ºF (38ºC) shall not be utilized.

Reason: IFC Chapter 17 regulates fumigation and thermal insecticidal fogging, but fails to regulate insecticidal fogging operations that do not involve the application of heat, known as "cold fogging". Cold fogging is an insecticidal fogging technique in common use, and the ignitable vapors generated by the fogging operations pose explosion hazards equivalent to thermal insecticidal fogging.

The definition of "insecticidal fogging" is revised to include those operations where the product is heated and where it is not heated. In this manner, the definition will cover all insecticidal fogging operations.

The chapter title, scope, and Sections 1701.1, 1702.1, 1703.1, 1703.2, 1703.3, 1703.3.2 and 1703.3.4 of the chapter are proposed to be amended to reflect that the chapter also regulates cold fogging operations.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F26-CHAPTER 17-2.DOC

F159–09/10

1701.1, 1703.1, 1703.2.1, 1703.2.2 (New), 1703.2.3 (New), 1703.3, 1703.3.1, 1703.3.3, 1703.3.4 (New), 1703.3.5 (New), 1703.5, 1703.5.1 (New)

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

1. Revise as follows:

1701.1 Scope. Fumigation and thermal insecticidal fogging operations within buildings, structures and spaces shall comply with this chapter.

1703.1 General. ~~Structures~~ Buildings, structures and spaces in which fumigation and thermal insecticidal fogging operations are conducted shall comply with the fire protection and safety requirements of Sections 1703.2 through 1703.7.

1703.2.1 Electricity. ~~Electricity shall be shut off~~ Electricity in any part of the building, structure or space where operation of switches or electrical devices, equipment or systems could serve as a source of ignition shall be shut off.

> **Exception:** Circulating fans that have been specifically designed for utilization in hazardous atmospheres and installed in accordance with NFPA 70.

2. Add new text as follows:

1703.2.2 Electronic devices. Electronic devices, including portable equipment and cellular phones, shall be shut off. Telephone lines shall be disconnected from telephones.

1703.2.3 Duration. Sources of ignition shall be shut off during the fumigation activity and remain shut off until the ventilation required in Section 1703.6 is completed.

3. Revise as follows:

1703.3 Notification. The *fire code official* and fire chief shall be notified in writing at least ~~24~~ 48 hours before the building, structure or space is to be closed in connection with the utilization of any toxic or flammable fumigant. Notification shall give the location of the enclosed space to be fumigated or fogged, the occupancy, the fumigants or insecticides to be utilized, the *person* or *persons* responsible for the operation, and the date and time at which the operation will begin. ~~Notice~~ Written notice of any fumigation or thermal insecticidal fogging operation shall be ~~served with sufficient advance notice to the occupants of the enclosed space involved to enable the occupants to evacuate the premises~~ given to all affected occupants of the building, structure or space in which such operations are to be conducted with sufficient advance notice to allow the occupants to evacuate the building, structure or space. Such notice shall inform the occupants as to the purposes, anticipated duration and hazards associated with the fumigation or insecticidal operation.

1703.3.1 Warning signs. *Approved* warning signs indicating the danger, type of chemical involved and necessary precautions shall be posted on all doors and entrances to the ~~premises~~ affected building, structure or space and upon all gangplanks and ladders from the deck, pier or land to ~~the~~ a ship. Such notices shall be printed in red ink on a white

background. Letters in the headlines shall be at least 2 inches (51 mm) in height and shall state the date and time of the operation, the name and address of the person, the name of the operator in charge, and a warning stating that the ~~occupied premises~~ affected building, structure or space shall be vacated at least 1 hour before the operation begins and shall not be reentered until the danger signs have been removed by the proper authorities.

1703.3.3 Watch personnel. During the period fumigation is in progress, except when fumigation is conducted in a gas-tight vault or tank, a ~~capable, alert watcher~~ responsible watchperson shall remain on duty at the entrance or entrances to the enclosed fumigated space until after the fumigation is completed and the ~~premises~~ building, structure or space is properly ventilated and safe for occupancy. Sufficient watchers shall be provided to prevent *persons* from entering the enclosed space under fumigation without being observed.

4. Add new text as follows:

1703.3.4 Evacuation during fumigation. Occupants of the building, structure or space to be fumigated, except the personnel conducting the fumigation, shall be evacuated from such building, structure or space prior to commencing fumigation operations.

1703.3.5 Evacuation during insecticidal fogging operations. Occupants in the building, structure or space to be fogged, except the personnel conducting the insecticidal fogging operations, shall be evacuated from such building, structure or space prior to commencing fogging operations.

5. Revise as follows:

1703.5 Sealing of buildings, structures and spaces. Paper and other similar materials that do not meet the flame propagation performance criteria of NFPA 701 shall not be used to wrap or cover a building, structure or space in excess of that required for the sealing of cracks, casements and similar openings.

6. Add new text as follows:

1703.5.1 Maintenance of openings. All openings to the building, structure or space to be fumigated or fogged shall be kept securely closed during such operation.

Reason: Chapter 17 regulates fumigation and fogging operations. This proposal is designed to provide additional clarification for application of the requirements.

Sections 1703.2 through 1703.2.3 are amended to clarify the intent of the code requirement to "shut off electricity", and to prohibit other ignition sources associated with portable electronic devices. Additionally, the proposal will specify that the devices need to remain shut off until the ventilation operation is completed.

Section 1703.3 is amended to require that the notification to the fire code official and fire chief when toxic or flammable fumigants are to be used be made 48 hours not 24 hours prior to such operation being conducted, and that the notification given to occupants of an effected building, structure or space be in writing.

Sections 1703.3.4 and 1703.3.5 are added and intend to specify the obvious intent of the chapter, but which is not currently stated. The building, structure or space undergoing fumigation or insecticidal fogging operations must be evacuated during such operations.

Section 1703.3.1 is amended to reflect that warning signs are required to be posted at all entrances to an effected building, structure or space, and not as the code currently requires, at the entrance to the premises.

Finally, Section 1703.5.1, a proposed new section, is added to require that openings to the effected building, structure or spaces undergoing fumigation or fogging operations be maintained closed.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F25-CHAPTER 17.DOC

F160–09/10
1803.10.1.2, Chapter 47

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

1803.10.1.2 Combustible tools. Where the horizontal surface of a combustible tool is obstructed from ceiling sprinkler discharge, automatic sprinkler protection that covers the horizontal surface of the tool shall be provided.

Exceptions:

1. An automatic gaseous fire-extinguishing local surface application system shall be allowed as an alternative to sprinklers. Gaseous-extinguishing systems shall be actuated by infrared (IR) or ultraviolet/infrared (UVIR) optical detectors.
2. Tools constructed of materials that are listed as Class 1 or Class 2 in accordance with UL 2360 and ~~or~~ approved for use without internal fire extinguishing system protection.

2. Add new standard to Chapter 47 as follows:

UL

2360-00	Standard for Test Methods for Determining the Combustibility Characteristics of Plastics Used in Semi-Conductor Tool Construction – with revisions through June 2008

Reason: The code currently indicates that these materials need to be listed for use without internal fire extinguishing system protection, but does not describe the test standard to be used, or a specific Classification or rating that the code user can reference to easily determine compliance.

UL 2360 is an ANSI approved American national standard that includes the test methods for measuring the fire performance of sheet plastics used in semi-conductor wet bench tool construction using small scale and large scale tests. Plastic materials that are classified as Class 1 or Class 2 in accordance with UL 2360 demonstrate limited fire propagation without the use of fire sprinklers, which is the level of protection currently required in this section.

This proposal assist the code user in determining compliance with this section by identifying the nationally recognized standard used to List (Classify) these materials, and the Class ratings that correspond with materials certified for use without internal fire extinguishing system protection. Including the Class ratings in the code eliminates the need to also indicate that these materials must be approved for use without internal fire extinguishing system protection.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, UL 2360-00, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-F3-1803.10.1.2.DOC

F161–09/10
1803.10.4.1 (IBC [F] 415.8.11.2); IMC 510.7

Proponent: Patrick A. McLaughlin, McLaughlin & Associates, representing The Semiconductor Industry Association

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE FIRE CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE FIRE CODE COMMITTEE.

PART I – IFC

Delete without substitution:

~~**1803.10.4.1 (IBC [F]415.8.11.2) Metallic and noncombustible non metallic exhaust ducts.** An approved automatic sprinkler system shall be provided in metallic and noncombustible nonmetallic exhaust ducts when all of the following conditions apply:~~

~~1. When the largest cross-sectional diameter is equal to or greater than 10 inches (254 mm).~~
~~2. The ducts are within the building.~~
~~3. The ducts are conveying flammable gases, vapors or fumes.~~

(Renumber subsequent sections)

PART II – IMC

Revise as follows:

510.7 Suppression required. Ducts shall be protected with an approved automatic fire suppression system installed in accordance with the *International Building Code*.

Exceptions:

1. An approved automatic fire suppression system shall not be required in ducts conveying materials, fumes, mists and vapors that are nonflammable and noncombustible and where flammable contaminant are diluted to below 25% of their lower flammability limit ~~under all conditions and at any concentrations~~.
2. An *approved* automatic fire suppression system shall not be required in ducts where the largest cross-sectional diameter of the duct is less than 10 inches (254 mm).
3. For laboratories, as defined in Section 510.1, automatic fire protection systems shall not be required in laboratory hoods or exhaust systems.

Reason: To clarify that automatic fire suppression is not required for diluted flammable contaminants. IMC Section 510.3 require that flammable contaminants be diluted below 25% of the lower flammability limit therefore it is not a hazardous exhaust system under Section 510.2 and a fire suppression system is not required. Even though a suppression system is not required, as presently written there has been misapplication of the provisions. The change to IFC 1803.10.4.1 is the corresponding Fire Code change.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis for Part II: Current Section 510.3 of the IMC requires hazardous exhaust systems to operate at a dilution rate of 25% of the LFL. As revised, suppression will not be required in any case because the exception will always apply.

PART I – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCLAUGHLIN-F8-1803.10.4.1.DOC

F162–09/10

1803.14.2; IBC [F] 415.8.2.6, 716.5.1; IMC [F] 502.10.2, 607.5.1

Proponent: Vickie Lovell representing 3M Company

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE FIRE CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE FIRE CODE COMMITTEE.

PART I – IFC

1. Revise as follows:

1803.14.2 Penetrations. Exhaust ducts penetrating fire ~~barrier~~ resistance rated assemblies shall be contained in a ~~shaft of equivalent~~ fire-resistance rated ~~resistive construction~~ enclosure that is a construction specifically evaluated for such purpose as follows:

1. A shaft constructed in accordance with International Building Code having a fire-resistance rating equal to the fire-resistance rating of the assembly penetrated, or
2. A field-applied duct enclosure protected with a through penetration firestop system classified in accordance with ASTM E814 having an "F" and "T" rating equal to the fire-resistance rating of the assembly penetrated. The protected duct assembly shall be tested and listed in accordance with ASTM E 2336, and installed in accordance with the manufacturer's instructions .

The surface of the duct shall be continuously covered on all sides from the point at which the duct enclosure penetrates a ceiling, wall or floor to the outlet terminal.

Exhaust ducts shall not penetrate fire walls. Fire dampers shall not be installed in exhaust ducts.

2. Revise IBC as follows:

[F] 415.8.2.6 Ventilation. Mechanical exhaust ventilation at the rate of not less than 1 cubic foot per minute per square foot [0.0051m3/(s m2)] of floor area shall be provided throughout the portions of the fabrication area where HPM are used or stored. The exhaust air duct system of one fabrication area shall not connect to another duct system outside that fabrication area within the building.

A ventilation system shall be provided to capture and exhaust gases, fumes and vapors at workstations.

Two or more operations at a workstation shall not be connected to the same exhaust system where either one or the combination of the substances removed could constitute a fire, explosion or hazardous chemical reaction within the exhaust duct system.

Exhaust ducts penetrating ~~occupancy separations~~ fire resistance rated-assemblies shall be contained in a ~~shaft of equivalent~~ fire-resistance- rated ~~construction~~ enclosure that is a construction specifically evaluated for such purpose as follows:

1. A shaft constructed in accordance with International Building Code having a fire-resistance rating equal to the fire-resistance rating of the assembly penetrated, or
2. A field-applied duct enclosure protected with a through penetration firestop system classified in accordance with ASTM E814 having an "F" and "T" rating equal to the fire-resistance rating of the assembly penetrated. The protected duct assembly shall be tested and listed in accordance with ASTM E 2336, and installed in accordance with the manufacturer's instructions .

The surface of the duct shall be continuously covered on all sides from the point at which the duct enclosure penetrates a ceiling, wall or floor to the outlet terminal.

Exhaust ducts shall not penetrate fire walls.

Fire dampers shall not be installed in exhaust ducts.

3. Revise IMC as follows:

[F] 502.10.2 Penetrations. Exhaust ducts penetrating fire ~~barrier~~ resistance rated-assemblies shall be contained in a ~~shaft of equivalent~~ fire-resistance rated ~~resistive construction~~ enclosure that is a construction specifically evaluated for such purpose as follows:

1. A shaft constructed in accordance with *International Building Code* having a fire-resistance rating equal to the fire-resistance rating of the assembly penetrated, or
2. A field-applied duct enclosure protected with a through penetration firestop system classified in accordance with ASTM E814 having an "F" and "T" rating equal to the fire-resistance rating of the assembly penetrated. The protected duct assembly shall be tested and listed in accordance with ASTM E 2336, and installed in accordance with the manufacturer's instructions .

The surface of the duct shall be continuously covered on all sides from the point at which the duct enclosure penetrates a ceiling, wall or floor to the outlet terminal. Exhaust ducts shall not penetrate ~~building separation~~ fire walls. Fire dampers shall not be installed in exhaust ducts.

PART II – IBC FIRE SAFETY

1. Revise IBC as follows:

716.5.1 Fire walls. Ducts and air transfer openings permitted in fire walls in accordance with Section 706.11 of the *International Building Code* shall be protected with *listed* fire dampers installed in accordance with their listing. Exhaust ducts for hazardous production materials (HPM) shall comply with Section 415.8.2.6.

2. Revise IMC as follows:

[B] 607.5.1 Fire walls. Ducts and air transfer openings permitted in fire walls in accordance with Section 706.11 of the *International Building Code* shall be protected with *listed* fire dampers installed in accordance with their listing. Exhaust ducts for hazardous production materials (HPM) shall comply with Section 502.10.2.

Reason: This additional text is intended to clarify what types of enclosures would be appropriate for protecting ducts through fire rated assemblies. Alternative enclosure methods should be made acceptable as an alternative to a shaft when appropriate. In all cases, the duct should be protected as through penetration through rated assemblies in accordance with Chapter 7 of the IBC. The language on fire walls and the added exception are extracted from Section 706.11 of the IBC. The IMC and IBC are currently conflicted about whether penetrations are allowed in fire walls. (See 607.5.1 and 502.10.2 in IMC and 706.11 in IBC). By incorporating this new language to the IMC, the two codes are brought into agreement. 607.5.1 is an editorial change to point to the correct section of the IMC.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LOVELL-F1-1803.14.2

F163–09/10
1803.16 (New), 1802.1, 3704.1.2, 3704.1.3

Proponent: Ron Fuhrhop, Praxair, Inc.

1. Add new text as follows:

1803.16 Sub-atmospheric Gas Systems (SAGS) Type 1 and Type 2. The storage and use of Sub-atmospheric Gas Systems (SAGS) shall be in accordance with Sections 1803.16.1 through 1803.16.1.3.

1803.16.1 General. Sub-atmospheric Gas Systems (SAGS) gas source packages shall meet all of the requirements for compressed gases and gases except as provided for in 1803.16.1.1 through 1803.16.1.3.

1803.16.1.1 Incompatible gases. Sub-atmospheric Gas Systems (SAGS) gas source packages with a water volume of 2.64 gallons (10 L) or less containing incompatible gases shall be permitted to occupy the same gas cabinet or exhausted enclosure.

1803.16.1.2 Ventilation. For Sub-atmospheric Gas Systems (SAGS), gas source packages, ventilation in gas cabinets and exhausted enclosures shall be sufficient to maintain vapors below 25 percent of LFL and below the IDLH concentration.

1803.16.1.3 Overpressure protection. The gas distribution system to which Sub-atmospheric Gas Systems (SAGS) are connected shall be equipped with an approved method of protection against components exceeding their pressure rating in the event of a failure in a SAGS.

1802.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

SUB-ATMOSPHERIC GAS SYSTEM (SAGS) Type 1. A gas source package that stores and delivers gas at sub-atmospheric pressure and includes a container (e.g., gas cylinder and outlet valve) that stores and delivers gas at a pressure of less than 14.7 psia at a package temperature of less than 110° F.

SUB-ATMOSPHERIC GAS SYSTEM (SAGS) Type 2. A gas source package that stores compressed gas and delivers gas sub-atmospherically and includes a container (e.g., gas cylinder and outlet valve) that stores gas at a pressure greater than 14.7 psia and delivers gas at a pressure of less than 14.7 psia at a package temperature of less than 110° F.

2. Revise as follows:

3704.1.2 Gas cabinets. Gas cabinets containing highly toxic or toxic *compressed gases* shall comply with Section 2703.8.6 and the following requirements:

1. The average ventilation velocity at the face of gas cabinet access ports or windows shall not be less than 200 feet per minute (1.02 m/s) with a minimum of 150 feet per minute (0.76 m/s) at any point of the access port or window.
2. Gas cabinets shall be connected to an exhaust system.
3. Gas cabinets shall not be used as the sole means of exhaust for any room or area.
4. The maximum number of cylinders located in a single gas cabinet shall not exceed three, except that cabinets containing cylinders not over 1 pound (0.454 kg) net contents are allowed to contain up to 100 cylinders.
5. Gas cabinets required by Section 3704.2 or 3704.3 shall be equipped with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1. Alternative fire-extinguishing systems shall not be used.

   Exception: Sub-atmospheric Gas Systems (SAGS) Type 1 and Type 2 shall be in accordance with Section 1803.16.1.2

3704.1.3 Exhausted enclosures. 3704.1.3 Exhausted enclosures. Exhausted enclosures containing highly toxic or toxic *compressed gases* shall comply with Section 2703.8.5 and the following requirements:

1. The average ventilation velocity at the face of the enclosure shall not be less than 200 feet per minute (1.02 m/s) with a minimum of 150 feet per minute (0.76 m/s).
2. Exhausted enclosures shall be connected to an exhaust system.
3. Exhausted enclosures shall not be used as the sole means of exhaust for any room or area.
4. Exhausted enclosures required by Section 3704.2 or 3704.3 shall be equipped with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1. Alternative fire-extinguishing systems shall not be used.

   Exception: Sub-atmospheric Gas Systems (SAGS) Type 1 and Type 2 shall be in accordance with Section 1803.16.1.2.

Reason: This code change proposal adds definitions and requirements to address the technology of sub-atmospheric gas systems (SAGS), which are not currently found in the code. This new language is proposed for Chapter 18, since SAGS's are exclusively used in Semiconductor Fabs.

A primary goal of SAGS is to improve safety by reducing the risk of a gas release. The risk is reduced, because SAGS only deliver gas when a vacuum is applied to the cylinder connection. In a SAGS, the cylinder valve can be opened, but no gas is released until the pressure downstream of the outlet connection is below atmospheric pressure. This is in contrast to a typical gas cylinder, which releases gas when the cylinder valve is opened. The semiconductor industry has used SAGS successfully for ten years.

1802.1: The proposed definitions are similar to the definitions in the 2009 Edition of NFPA 318, Standard for the Protection of Semiconductor Fabrication Facilities. However, one change was made (110 ^{o} F is referenced instead of NTP). To meet the SAGS definition in NFPA 318, the pressure in a SAGS container must be sub-atmospheric at or below NTP, which is a temperature of 70 ^{o} F. SAGS used in semiconductor tools are located in exhausted enclosures with internal temperatures of 86^{o} F to 104^{o} F (above 70^{o} F). SAGS stored outside may reach temperatures of 110^{o} F (above 70^{o} F). So, to meet this proposed definition for SAGS, the container pressure should be sub-atmospheric at temperatures up to 110^{o} F. If NTP is used as a reference, some Type 1 SAGS could go "above" atmospheric pressure under these normal storage and use conditions.

1803.16.1: All SAGS shall meet the requirements for gases and compressed gases set forth throughout the IFC & IBC, with the specific exceptions allowed in the new SAGS section. Treating SAGS as compressed gases or gases maintains risk-mitigating controls that are well-established in safety and fire protection standards.

1803.16.1.1: This section will allow the placement of SAGS containers with incompatible gases in the same exhausted enclosure, such as containers of arsine and boron trifluoride. IFC Section 1804.3.3 requires the separation of these containers. This separation does not reflect current industry practice and is not necessary with the enhanced safety provided by SAGS. It should be noted, this exception is limited to small cylinders of 10 L of water volume or less. This limits the quantity of material and covers current semiconductor tool applications where SAGS are used.

1803.16.1.2: Ventilation is still required for SAGS. Potential releases from SAGS are very small. For this reason lower ventilation rates are acceptable. The performance standard (maintain vapors below 25 percent of LFL and below IDLH) was used instead of velocity or other prescribed values.

1803.16.1.3: Overpressure protection is standard practice for piping systems. Since SAGS delivery piping systems normally operate in a vacuum, this requirement was added to clarify that overpressure condition could result from potential failure scenarios. There are several methods used today to address this issue. It is also a performance based requirement.

3704.1.2 and 3704.1.3: These additions eliminate a conflict in Chapter 37 that would be created by adopting the new language of 1803.16.1.2. They refer the code user back to Chapter 18 to determine exhaust requirements for SAGS.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The action on this proposal should be consistent with the action on Code Change F164-09/10.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FUHRHOP -F1-1802.1.DOC

F164–09/10
1803.16 (New), Chapter 47

Proponent: James McManus, ATMI, Inc.

1. **Add new text as follows:**

1803.16 Sub-atmospheric pressure gas systems. Sub-atmospheric pressure gas systems (SAGS) shall be in accordance with NFPA 318.

2. Add new standard to Chapter 47 as follows:

NFPA
318—09 Standard for the Protection of Semiconductor Fabrication Facilities

Reason: Sub-atmospheric pressure gas systems (SAGS) are the preferred method for storing and delivering the toxic and corrosive dopant gases used in ion implantation processes worldwide. Other uses include solar and electronics. SAGS operate by either removing pressure [Type 1] or internally controlling gas pressure [Type 2]. Both require a vacuum [sub-atmospheric condition, < 14.7 psia] before flow from a cylinder will occur. SAGS significantly reduce the risk associated with Hazardous Production Materials because they mitigate the likelihood and magnitude of a gas release and their use is becoming more common. As such, provisions regulating SAGS should be included in the code.

NFPA 318 already defines and addresses these systems so there is no reason to reinvent provisions for these systems. This proposal recommends that provisions for SAGS be adopted by reference as shown. It is the intent of this code change to adopt only the provisions relating to SAGS within NFPA 318. Those sections are: Section 3.3.28.5 for the definition, and Section 8.6.2 addressing uses and controls. It is not the intent of this proposal to adopt NFPA 318 in total. The charging statement of this proposal clearly indicates that only SAGS be in accordance with NFPA 318.

The definition and controls for use of SAGS are the work-product of a lengthy public debate and consensus building effort undertaken by knowledgeable ESH and risk management professionals. The NFPA 318 Technical Committee approved the language unanimously and it was adopted by a substantial majority at the NFPA annual meeting in June 2008.

Using the NFPA definition in section 3.3.28.5 incorporates language that most accurately defines SAGS and avoids possible conflicts that may be inadvertently introduced with alternative language.

Systems fitting this description include:
Sub-atmospheric Gas System. [Type 1/SAGS] A gas source container where the contents are at sub-atmospheric pressure [<14.7 psia] at NTP* [21ºC and 1 atmosphere]. Type 1/SAGS are not compressed gases.

Vacuum Initiated Gas Cylinder. [Type 2/SAGS] A compressed gas cylinder, modified internally using pressure and flow components to limit and control delivery pressure to sub-atmospheric pressure operation [<14.7 psia]. Today such systems are *designed to fail* in a closed [no-flow] position.

Section 8.6.2 contains requirements consistent with the risk reduction afforded by the SAGS technology. Local jurisdictions may, at their discretion, further modify the uses and controls based on existing ordinances or practice, or exceptions to the provisions could be added to this proposal.

Recognizing SAGS in the code helps officials and users ensure uniform application and understanding of this important risk reduction technology.

*NTP—see 2702.1

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, NFPA 318—09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009. The action on this proposal should be consistent with the action on Code Change F163-09/10.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANUS-F1-1803.16.DOC

F165–09/10
1805.2.3.4, Tables 1804.2.2.1 (IBC [F] Table 415.8.2.1.1), 1805.2.2

Proponent: Patrick A. McLaughlin, McLaughlin & Associates, representing The Semiconductor Industry Association

Revise as follows:

1805.2.3.4 Pyrophoric solids, liquids and Class 3 water-reactive liquids. Pyrophoric liquids and Class 3 water-reactive liquids in containers greater than 0.5-gallon (2 L) but not exceeding 5.3-gallon (20 L) capacity and pyrophoric solids in containers greater than 4.4 lbs (2 kg) but not exceeding 44 pounds (20 kg) shall be allowed at workstations when located inside cabinets and the following conditions are met:

1. Maximum amount per cabinet: The maximum amount per cabinet shall be limited to 5.3 gallons (20L) of liquids and 44 pounds (20 kg) of total liquids and solids.
2. Cabinet construction: Cabinets shall be constructed in accordance with the following:
   2.1. Cabinets shall be constructed of not less than 0.097-inch (2.5 mm) (12 gage) steel.
   2.2. Cabinets shall be permitted to have self-closing limited access ports or noncombustible windows that provide access to equipment controls.
   2.3. Cabinets shall be provided with self- or manual-closing doors. Manual-closing doors shall be equipped with a door switch that will initiate local audible and visual alarms when the door is in the open position.
3. Cabinet exhaust ventilation system: An exhaust ventilation system shall be provided for cabinets and shall comply with the following:
   3.1. The system shall be designed to operate at a negative pressure in relation to the surrounding area.
   3.2. The system shall be equipped with a pressure monitor and a flow switch alarm monitored at the on-site *emergency control station*.
4. Cabinet spill containment: Spill containment shall be provided in each cabinet, with the spill containment capable of holding the contents of the aggregate amount of liquids in containers in each cabinet.
5. Valves: Valves in supply piping between the product containers in the cabinet and the workstation served by the containers shall fail in the closed position upon power failure, loss of exhaust ventilation and upon actuation of the fire control system.
6. Fire detection system: Each cabinet shall be equipped with an automatic fire detection system complying with the following conditions:
   6.1. Automatic detection system: UV/IR, highsensitivity smoke detection (HSSD) or other *approved d*etection systems shall be provided inside each cabinet.
   6.2. Automatic shutoff: Activation of the detection system shall automatically close the shutoff valves at the source on the liquid supply.
   6.3. Alarms and signals: Activation of the detection system shall initiate a local alarm within the *fabrication area* and transmit a signal to the *emergency control station*. The alarms and signals shall be both visual and audible.

TABLE 1804.2.2.1 (IBC [F] TABLE 415.8.2.1.1)
QUANTITY LIMITS FOR HAZARDOUS MATERIALS IN A SINGLE FABRICATION AREA IN GROUP H-5[a]

HAZARD CATEGORY	SOLIDS (pounds/square foot)	LIQUIDS (gallons/square foot)	GAS (cubic feet@NTP/square foot)
PHYSICAL-HAZARD MATERIALS			
Pyrophoric	~~Note b~~ 0.01	0.00125	Notes d and e

(Portions of table and footnotes not shown remain unchanged)

TABLE 1805.2.2
MAXIMUM QUANTITIES OF HPM AT A WORKSTATION[d]

HPM CLASSIFICATION	STATE	MAXIMUM QUANTITY
Pyrophoric	Liquid Solid	0.5 gallon [c, f] ~~See Table 1804.2.2.1~~ 4.4 pounds [c, f]

f. A maximum quantity of 5.3 gallons of liquids and 44 pounds of total liquids and solids shall be allowed at a workstation when conditions are in accordance with Section 1805.2.3.5.

(Portions of table and footnotes not shown remain unchanged)

Reason: This change would bring pyrophoric solid quantity limitations at workstations and in fabrication areas equal to equivalent mass limitations of pyrophoric liquids with the same controls. **S**olids are easier and safer to handle than a liquid because they do not have the potential to rapidly spread when a spill occurs. When this allowance was approved for liquids, solids were not included because they were not used in the process at that time.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: MCLAUGHLIN-F5-1805.2.3.4.DOC

F166–09/10
1805.2.3.4

Proponent: Patrick A. McLaughlin, McLaughlin & Associates, representing The Semiconductor Industry Association

Revise as follows:

1805.2.3.4 Pyrophoric liquids and Class 3 water-reactive liquids. Pyrophoric liquids and Class 3 water-reactive liquids in containers greater than 0.5-gallon (2 L) but not exceeding 5.3-gallon (20 L) capacity shall be allowed at workstations when located inside cabinets and the following conditions are met:

1. Maximum amount per cabinet: The maximum amount per cabinet shall be limited to 5.3 gallons (20L).
2. Cabinet construction: Cabinets shall be constructed in accordance with the following:
   2.1. Cabinets shall be constructed of not less than 0.097-inch (2.5 mm) (12 gage) steel.
   2.2. Cabinets shall be permitted to have self-closing limited access ports or noncombustible windows that provide access to equipment controls.
   2.3. Cabinets shall be provided with self- or manual-closing doors. Manual-closing doors shall be equipped with a door switch that will initiate local audible and visual alarms when the door is in the open position.
3. Cabinet exhaust ventilation system: An exhaust ventilation system shall be provided for cabinets and shall comply with the following:
   3.1. The system shall be designed to operate at a negative pressure in relation to the surrounding area.
   3.2. The system shall be equipped with ~~a pressure monitor and a flow switch alarm monitored~~ monitoring equipment to ensure exhaust flow and alarmed at the on-site *emergency control station*.
4. Cabinet spill containment: Spill containment shall be provided in each cabinet, with the spill containment capable of holding the contents of the aggregate amount of liquids in containers in each cabinet.
5. Valves: Valves in supply piping between the product containers in the cabinet and the workstation served by the containers shall fail in the closed position upon power failure, loss of exhaust ventilation and upon actuation of the fire control system.
6. Fire detection system: Each cabinet shall be equipped with an automatic fire detection system complying with the following conditions:
   6.1. Automatic detection system: UV/IR, highsensitivity smoke detection (HSSD) or other *approved d*etection systems shall be provided inside each cabinet.
   6.2. Automatic shutoff: Activation of the detection system shall automatically close the shutoff valves at the source on the liquid supply.
   6.3. Alarms and signals: Activation of the detection system shall initiate a local alarm within the *fabrication area* and transmit a signal to the *emergency control station*. The alarms and signals shall be both visual and audible.

Reason: Several commercially available bulk liquid pyrophoric cabinets are designed to meet the requirements of the IFC Chapter 18 section 1805.2.3.5 Pyrophoric Liquids and Class 3 water-reactive liquids. Typical pyrophoric cabinets are designed with nitrogen gas (N_2) fire protection systems to meet the requirements for pyrophoric liquids as outlined in Chapter 18 Table 1805.2.2 note d "Allowed only in workstations that are internally protected with an approved automatic fire-extinguishing or fire protection system complying with Chapter 9 and compatible with the reactivity of the materials in use at the workstation." In order for an N_2 fire suppression system to be effective it must displace the O_2 within the cabinet. In order to displace O_2 within the cabinet and still maintain at a negative exhaust pressure within the cabinet in relation to the surrounding area, these cabinets must be airtight. Airtight indicates that these cabinets will operate under static only, when exhaust is applied, however, there will be no exhaust flow because there is no mechanism for make-up air into the cabinet. Design criteria are currently specified for liquid pyrophoric cabinets on site to meet O_2 levels below 1% within 60 seconds during discharge of the N_2 fire suppression system, which again requires these cabinets to be airtight. The current exhaust flow within these cabinets with the doors closed is effectively zero and to low for commercially available exhaust flow meters to detect. Cabinet exhaust is monitored with an exhaust pressure switch to detect available exhaust static. Some facilities currently monitor cabinet exhaust static within cabinets with a Neo-Dyn pressure switch (part#142P80CC3443) or a Dwyer (part#1910-1) and alarm for exhaust static below 1" w.c. The installation of a flow switch in addition to the pressure switch is redundant to the pressure switch. The installation of a flow switch is also ineffective due to the zero exhaust flow condition based on the cabinet design. Therefore requirements for exhaust flow monitoring are being changed to a performance requirement.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCLAUGHLIN-F6-1805.2.3.4-2.DOC

F167–09/10
1805.3.1 through 1805.3.4; IBC [F] 415.8.3

Proponent: Patrick A. McLaughlin, McLaughlin & Associates, representing The Semiconductor Industry Association

1. Revise as follows:

1805.3.1 Corridors and exit enclosures. Corridors and exit enclosures in new buildings or serving new fabrication areas shall not contain HPM, in quantities greater than the maximum allowable quantity per control area, except as permitted in exit corridors by section 415.8.6.3 of the *International Building Code*.

1805.3.2 Transport in ~~existing~~ corridors. Transport in corridors shall be in accordance with Sections 1805.3.2.1 through 1805.3.3.

1805.3.2.1 Fabrication area alterations. When existing fabrication areas are altered or modified in existing buildings, HPM is allowed to be transported in existing corridors when such corridors comply with Section 415.8.3 of the *International Building Code* and Section ~~Transport in corridors shall comply with section~~ 2703.10 of this Code.

1805.3.2.2 HPM transport in corridors. HPM in quantities equal to or less than the maximum allowable quantity per control area is allowed to be transported in corridors when the transportation is in accordance with Section 2703.10.

1805.3.3 Service corridors. When a new fabrication area is constructed, a service corridor shall be provided where it is necessary to transport HPM, in quantities greater than the maximum allowable quantity per control area, from a liquid storage room, HPM room, gas room, or from the outside of a building to the perimeter wall of a fabrication areas. Service corridors shall be designed and constructed in accordance with the International Building Code.

1805.3.4 Carts and trucks. Carts and trucks used to transport HPM in corridors and exit enclosures ~~in existing buildings~~ shall comply with section 2703.10.3.

2. Revise IBC Section [F] 415.8.3 as follows:.

[F] 415.8.3 Corridors. Corridors shall comply with Chapter 10 and shall be separated from fabrication areas as specified in section 415.8.2.2. Corridors shall not contain HPM and shall not be used for transporting such materials in quantities greater than the maximum allowable quantity per control area except through closed piping systems as provided in section 415.8.6.3

Exception: Where existing fabrication areas are altered or modified, HPM is allowed to be transported in existing *corridors,* subject to the following conditions:

1. Corridors. *Corridors* adjacent to the fabrication area where the *alteration* work is to be done shall comply with Section 1018 for a length determined as follows:
   1.1. The length of the common wall of the *corridor* and the fabrication area; and
   1.2. For the distance along the *corridor* to the point of entry of HPM into the *corridor* serving that fabrication area.
2. Emergency alarm system. There shall be an emergency telephone system, a local manual alarm station or other *approved* alarm-initiating device within *corridors* at not more than 150-foot (45 720 mm) intervals and at each *exit* and doorway. The signal shall be relayed to an *approved* central, proprietary or remote station service or the emergency control station and shall also initiate a local audible alarm.
3. Pass-throughs. Self-closing doors having a *fire protection rating* of not less than 1 hour shall separate pass-throughs from existing *corridors*. Pass-throughs shall be constructed as required for the *corridors* and protected by an *approved* automatic fire-extinguishing system.

Reason: Section 1805.3 places limitations on the use of egress corridors for chemical transport that when first required, the industry was heavily utilizing and dependant on chemical transport form the HPM storage area to the fabrication area. Due to the increased scale in these operations, bulk chemical delivery is more the standard and the transport of chemicals in carts is much more infrequent and volumes are smaller. In fact, small quantities from labs are the biggest issue for the industry. The current restriction limits facilities design flexibility and costs without adding to the safety of the occupants or emergency responders. The industry feels this requirement should be reevaluated. In addition, for non-H5 occupancies, chemical transport of hazardous materials is allowed by the requirements of 2703.10 in corridors or exit enclosures. By definition, Hazardous Materials include all materials that are defined by the code in Chapter 18 as HPM's. The non-H areas allow for transport of chemistries when conditions in 2703.10 are met as well as IBC 414.7.2. Areas that are not H Occupancy do not have the requirement to use service corridor for the transport of HPM.

The proposal would align transport of HPM's in corridors to the following restrictions (Summary of IFC 2703.10 and IBC 414.7.2)

- Emergency phone system, a local manual alarm, or an approved alarm initiating device at not more than 150 foot intervals.(IBC 414.7.2)
- Valve protection. (IFC 2703)
- Limitations on volumes . (IFC 2703)
  - Liquids in containers exceeding 5 gallons (19 L) in a corridor or exit enclosure shall be transported on a cart or truck.
  - Two hazardous material liquid containers, which are hand carried in acceptable safety carriers.
  - Not more than four drums not exceeding 55 gallons transported by suitable drum trucks.
  - Containers and cylinders of compressed gases, which are transported by approved hand trucks,
  - Containers and cylinders not exceeding 25 pounds, which are hand carried.
  - Solid hazardous materials not exceeding 100 pounds transported by approved hand trucks,
  - A single container not exceeding 50 pounds, which is hand carried.

Carts and trucks shall be designed to provide a stable base for the commodities to be transported and shall have a means of restraining containers, provided with a stops or speed-reduction devices, be compatible with the material transported, and be capable of containing a spill from the largest single container transported. (IFC 2703)

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCLAUGHLIN-F4-1805.3.1.DOC

F168–09/10

2205.1, 2206.2, 2206.2.3, 2206.2.5, 2206.6.2, 2206.7.6, 2206.7.6.1, Table 2206.2.3

Proponent: Lynne M. Kilpatrick, Fire Department, City of Seattle WA, representing Washington State Association of Fire Marshals

Revise as follows:

2205.1 Tank filling operations for Class I, II or ~~III~~A liquids. Delivery operations to tanks for Class I, II or ~~IIIA~~ III liquids shall comply with Sections 2205.1.1 through 2205.1.3 and the applicable requirements of Chapter 34.

2206.2 Method of storage. *Approved* methods of storage for Class I, II and ~~IIIA~~ III liquid fuels at motor fuel-dispensing facilities shall be in accordance with Sections 2206.2.1 through 2206.2.5.

2206.2.3 Above-ground tanks located outside, above grade. Above-ground tanks shall not be used for the storage of Class I, II or ~~IIIA~~ III liquid motor fuels except as provided by this section.

1. Above-ground tanks used for outside, above-grade storage of Class I liquids shall be listed and labeled as protected above-ground tanks and shall be in accordance with Chapter 34. Such tanks shall be located in accordance with Table 2206.2.3.
2. Above-ground tanks used for outside, above-grade storage of Class II or IIIA liquids ~~are allowed to~~ shall be listed and labeled as protected above-ground tanks in accordance with UL 2085 and shall be installed in accordance ~~or, when approved by the fire code official, other above-ground tanks that comply~~ with Chapter 34. Tank locations shall be in accordance with Table 2206.2.3.

   Exception: Other aboveground tanks that comply with Chapter 34 when approved by the fire code official.

3. Tanks containing fuels shall not exceed 12,000 gallons (45 420 L) in individual capacity or 48,000 gallons (181 680 L) in aggregate capacity. Installations with the maximum allowable aggregate capacity shall be separated from other such installations by not less than 100 feet (30 480 mm).
4. Tanks located at farms, construction projects, or rural areas shall comply with Section 3406.2.
5. Above-ground tanks used for outside above-grade storage of Class IIIB liquid motor fuel shall be listed and labeled in accordance with UL 142 or listed and labeled as protected aboveground tanks in accordance with UL 2085 and shall be installed in accordance with Chapter 34. Tank locations shall be in accordance with Table 2206.2.3.

2206.2.5 Portable tanks. Where approved by the fire code official, portable tanks are allowed to be temporarily used in conjunction with the dispensing of Class I, II or ~~IIIA~~ III liquids into the fuel tanks of motor vehicles or motorized equipment on premises not normally accessible to the public. The approval shall include a definite time limit.

2206.6.2 Piping, valves, fittings and ancillary equipment for above-ground tanks for Class I, II and ~~IIIA~~ III liquids. Piping, valves, fittings and ancillary equipment for above-ground tanks storing Class I, II and ~~IIIA~~ III liquids shall comply with Sections 2206.6.2.1 through 2206.6.2.6.

2206.7.6 Fuel delivery nozzles. A listed automatic-closing- type hose nozzle valve with or without a latch-open device shall be provided on island-type dispensers used for dispensing Class I, II or ~~IIIA~~ III liquids.

Overhead-type dispensing units shall be provided with a listed automatic-closing-type hose nozzle valve without a latch-open device.

Exception: A listed automatic-closing-type hose nozzle valve with latch-open device is allowed to be used on overhead-type dispensing units where the design of the system is such that the hose nozzle valve will close automatically in the event the valve is released from a fill opening or upon impact with a driveway.

2206.7.6.1 Special requirements for nozzles. Where dispensing of Class I, II or ~~IIIA~~ III liquids is performed, a listed automatic-closing-type hose nozzle valve shall be used incorporating all of the following features:

1. The hose nozzle valve shall be equipped with an integral latch-open device.
2. When the flow of product is normally controlled by devices or equipment other than the hose nozzle valve, the hose nozzle valve shall not be capable of being opened unless the delivery hose is pressurized. If pressure to the hose is lost, the nozzle shall close automatically.

   Exception: Vapor recovery nozzles incorporating insertion interlock devices designed to achieve shutoff on disconnect from the vehicle fill pipe.

3. The hose nozzle shall be designed such that the nozzle is retained in the fill pipe during the filling operation.
4. The system shall include listed equipment with a feature that causes or requires the closing of the hose nozzle valve before the product flow can be resumed or before the hose nozzle valve can be replaced in its normal position in the dispenser.

TABLE 2206.2.3
MINIMUM SEPARATION REQUIREMENTS FOR ABOVE-GROUND TANKS

CLASS OF LIQUID AND TANK TYPE	INDIVIDUAL TANK CAPACITY (gallons)	MINIMUM DISTANCE FROM NEAREST IMPORTANT BUILDING ON SAME PROPERTY (feet)	MINIMUM DISTANCE FROM NEAREST FUEL DISPENSER (feet)	MINIMUM DISTANCE FROM LOT LINE THAT IS OR CAN BE BUILT UPON, INCLUDING THE OPPOSITE SIDE OF A PUBLIC WAY (feet)	MINIMUM DISTANCE FROM NEAREST SIDE OF ANY PUBLIC WAY (feet)	MINIMUM DISTANCE BETWEEN TANKS
Class I protected above-ground tanks	Less than or equal to 6,000	5	25[a]	15	5	3
	Greater than 6,000	15	25[a]	25	15	3
Class II and III protected above-ground tanks	Same as Class I	Same as Class I	Same as Class I [c]	Same as Class I	Same as Class I	Same as Class I
Tanks in vaults	0-20,000	0[b]	0	0 [b]	0	Separate compartment required for each tank
Other tanks	All	50	50	100	50	3

a. At fleet vehicle motor fuel-dispensing facilities, no minimum separation distance is required.
b. Underground vaults shall be located such that they will not be subject to loading from nearby structures, or they shall be designed to accommodate applied loads from existing or future structures that can be built nearby.
c. For Class IIIB liquids in protected above-ground tanks, no minimum separation distance is required.

Reason: An increasing number of facilities are establishing motor vehicle fuel-dispensing stations for dispensing B100/B99 biodiesel, a Class IIIB liquid, into motor vehicles. In many cases these fueling stations are not set up as traditional gas stations but rather they consist of a small stand alone fuel dispensing operation using a 500-3,000 gallon fuel tank located near a drive-through espresso stand or mini market. Chapter 22 has only minimal requirements for the installation of tanks and fueling operations for dispensing Class IIIB liquids into motor vehicles and it does not adequately address the potential hazards associated with this increasing trend. This proposal will add the following new requirements for dispensing Class IIIB liquids into motor vehicles:

1. Tanks for dispensing Class IIIB liquids into the fuel tanks of motor vehicles will need to be listed to UL 142 or UL 2085 to eliminate the common practice of dispensing directly from plastic IBC totes,
2. The driver or operator of the fuel delivery vehicle will be required to gauge the tank to determine how much fuel is needed before filling the tank,
3. An approved method of storage will have to be provided for the Class IIIB fuel in accordance with the MAQ allowed in Chapter 27 for storage in a single control area (13,200 gallons in an unsprinklered building and unlimited in a sprinklered building) when dispensing from tanks located inside buildings,
4. Fueling Class IIIB liquids into motor vehicles from portable tanks will only be allowed on a temporary basis,
5. Piping, valves, fittings and ancillary equipment will need to comply with the same requirements that currently apply to Class I, II and IIIA liquid fuel dispensing operations, including but not limited to, proper tank fill openings and connections, approved method to prevent overfilling and anti-siphon systems, and
6. Fuel delivery nozzles will be required to be the listed automatic-closing type.

Table 2206.2.3, which appears to already regulate Class IIIB liquids even though the corresponding Section 2206.2.3 makes reference only to Class II and IIIA liquids, has also been modified by adding a new footnote c. The footnote is added to eliminate the 50 foot separation that is required between protected (UL 2085) tanks containing Class IIIB liquids and the fuel dispenser. Note that even with this change Class IIIB liquids in non-protected tanks (UL 142) will be required to comply with Table 2206.2.3 requirements for "other tanks" which still requires a 50 foot separation between that tank and the dispenser.

We believe that these proposed changes provide for prudent controls for Class IIIB tank systems at motor vehicle fueling stations which currently are largely unregulated.

Cost Impact: Costs will increase because listed tanks are being required for Class IIIB liquids but there may be a cost savings where the 25-foot separation distance between Class IIIB tank and dispenser is eliminated.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KILPATRICK-F1-2205.1.DOC

F169–09/10
2205.2.2

Proponent: Jeffrey M. Shapiro, PE, International Code Consultants, representing National Steel Tank Institute

Revise as follows:

2205.2.2 Repairs and service. The fire code official is authorized to require damaged or unsafe containment and dispensing equipment to be repaired or serviced in an approved manner ~~including, but not limited to, equipment that shows signs of physical damage, internal and external corrosion, leakage, brittleness, aging or undue wear and tear~~.

Reason: Section 2205.2.2 was added to the IFC last cycle. The beginning of the sentence provides a valuable code requirement authorizing the fire code official to require damaged or unsafe equipment to be fixed. The end of the sentence a subjective "laundry list" of conditions that may or may not warrant concern, depending on the severity, and it is unnecessary. For example, 1) Limited surface corrosion on steel tanks and equipment is common, and it does not necessarily represent an unsafe condition, 2) Aging equipment may or may not need attention simply because it's old, and 3) The phrase "undue wear and tear" is subjective and adds nothing.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SHAPIRO-F2-2205.2.2.DOC

F170–09/10
2206.2.2

Proponent: Lynne M. Kilpatrick, Fire Department, City of Seattle WA, representing Washington State Association of Fire Marshals

Revise as follows:

2206.2.2 Above-ground tanks located inside buildings. Above-ground tanks for the storage of Class I, II and III~~A~~ liquid fuels are allowed to be located in buildings. Such tanks shall be located in special enclosures complying with Section 2206.2.6, or in a liquid storage room or a liquid storage warehouse complying with Chapter 34~~, or shall be listed and labeled as protected above-ground tanks~~.

Exceptions:

1. Protected aboveground tanks having an aggregate capacity not exceeding 1,500 gallons (454 L) storing Class I liquids in a room or rooms protected by an approved automatic sprinkler system complying with Section 903.3.1.1.
2. Protected aboveground tanks having an aggregate capacity not exceeding 3,000 gallons (908 L) storing Class II or IIIA liquids in a room or rooms protected by an approved automatic sprinkler system complying with Section 903.3.1.1.
3. Aboveground tanks other than protected aboveground tanks storing Class II and III liquids in accordance with the maximum allowable quantity per control area set forth in Table 2703.1.1(1).

Reason: Currently Section 2206.2.2 allows an unlimited quantity of Class I, II and IIIA liquids inside buildings for fueling motor vehicles provided the fuel is stored in a protected aboveground tank listed to UL 2085. This proposal attempts to establish reasonable limits for the aggregate quantity of fuel in protected aboveground tanks that can be installed inside buildings for fueling motor vehicles. The 3,000-gallon limit for Class II and IIIA liquids in Exception 2 is consistent with the maximum quantity currently allowed in Section 603.3.2.1 for protected aboveground tanks installed inside buildings supporting fuel-burning equipment. Exception 3 limits Class II and III liquids in tanks other than protected tanks to the MAQ per control area set forth in Chapter 27. Since there is no code precedent for limiting Class I flammable liquids in protected aboveground tanks inside buildings, Exception 1 of the proposal establishes a limit of 1,500 gallons. This quantity (1500 gallons) exceeds the 120 gallon MAQ (240 gallons in sprinklered buildings) established for Class I liquids but gives some 'credit' for installing a protected tank and is one-half the already accepted limit of 3,000 gallons for Class II and III-A liquids. It is necessary to approve this code change in order to establish some quantity limits for flammable and combustible liquids in protected aboveground tanks installed inside buildings used for fueling motor vehicles. Without this change, an unlimited quantity of Class I, II and IIIA liquids is allowed inside buildings in protected tanks not confined to a Group H occupancy or special enclosure.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KILPATRICK-F2-2206.2.2.DOC

F171–09/10
2206.2.2, 2206.2.3

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

2206.2.2 Above-ground tanks located inside buildings. Above-ground tanks for the storage of Class I, II and IIIA liquid fuels are allowed to be located in buildings. Such tanks shall be located in special enclosures complying with Section 2206.2.6, in a liquid storage room or a liquid storage warehouse complying with Chapter 34, or shall be listed and labeled as protected above-ground tanks in accordance with UL 2085.

2206.2.3 Above-ground tanks located outside, above grade. Above-ground tanks shall not be used for the storage of Class I, II or IIIA liquid motor fuels except as provided by this section.

1. Above-ground tanks used for outside, above-grade storage of Class I liquids shall be listed and labeled as protected above-ground tanks in accordance with UL 2085, and be in accordance with Chapter 34. Such tanks shall be located in accordance with Table 2206.2.3.
2. Above-ground tanks used for above-grade storage of Class II or IIIA liquids are allowed to be protected above-ground tanks or, when *approved* by the *fire code official*, other above-ground tanks that comply with Chapter 34. Tank locations shall be in accordance with Table 2206.2.3.

3. Tanks containing fuels shall not exceed 12,000 gallons (45 420 L) in individual capacity or 48,000 gallons (181 680 L) in aggregate capacity. Installations with the maximum allowable aggregate capacity shall be separated from other such installations by not less than 100 feet (30 480 mm).
4. Tanks located at farms, construction projects, or rural areas shall comply with Section 3406.2.

Reason: This proposal is to provide the fire code user with an easy reference to the appropriate Standard that is already referenced in Chapter 2 definitions and as used in Chapter 34 for Protected Above-ground Tanks without having to search through the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-F4-2206.2.2.DOC

F172–09/10

2206.7.1, 2206.7.5, 2206.7.5.1, 2206.7.6, 2206.7.7.1, 2206.7.9.1.1, 2206.7.9.2.1, 3403.6.2, 3403.6.9, 3404.2.7

Proponent: Brian Knapp, American Petroleum Institute

Revise as follows:

2206.7.1 Listed equipment. Electrical equipments, dispensers, hose, nozzles and submersible or subsurface pumps used in fuel-dispensing systems shall be listed or certified by the manufacturer for the fuel dispensed.

2206.7.5 Dispenser hose. Dispenser hoses shall be a maximum of 18 feet (5486 mm) in length unless otherwise *approved*. Dispenser hoses shall be listed and approved or certified by the manufacturer for the fuel dispensed. When not in use, hoses shall be reeled, racked or otherwise protected from damage.

2206.7.5.1 Breakaway devices. Dispenser hoses for Class I and II liquids shall be equipped with ~~a listed~~ an emergency breakaway device that is listed or certified by the manufacturer for the fuel dispensed and designed to retain liquid on both sides of a breakaway point. Such devices shall be installed and maintained in accordance with the manufacturer's instructions. Where hoses are attached to hose-retrieving mechanisms, the emergency breakaway device shall be located between the hose nozzle and the point of attachment of the hose-retrieval mechanism to the hose.

2206.7.6 Fuel delivery nozzles. ~~A listed~~ An automatic-closing-type hose nozzle valve, that must be listed or certified by the manufacturer for the fuel dispensed, with or without a latch-open device shall be provided on island-type dispensers used for dispensing Class I, II, or IIIA liquids.

Overhead-type dispensing units shall be provided with a ~~listed~~ automatic-closing-type hose nozzle valve without a latch-open device, that must be listed or certified by the manufacturer for the fuel dispensed,

Exception: A *listed* automatic-closing-type hose nozzle valve with latch-open device is allowed to be used on overhead-type dispensing units where the design of the system is such that the hose nozzle valve will close automatically in the event the valve is released from a fill opening or upon impact with a driveway.

2206.7.7.1 Leak detection. Where remote pumps are used to supply fuel dispensers, each pump shall have installed on the discharge side a ~~*listed*~~ leak detection device, that is listed or certified by the manufacturer for the fuel used, that will detect a leak in the piping and dispensers and provide an indication. A leak detection device is not required if the piping from the pump discharge to under the dispenser is above ground and visible.

2206.7.9.1.1 Dispensing devices. Dispensing devices incorporating provisions for vapor recovery shall be listed and labeled~~.~~, or certified by the manufacturer for the fuel dispensed. When existing listed or labeled dispensing devices are modified for vapor recovery, such modifications shall be listed by report by a nationally recognized testing laboratory~~.~~, or certified by the manufacturer for the fuel dispensed. The listing by report shall contain a description of the component parts used in the modification and recommended method of installation on specific dispensers. Such report shall be made available on request of the *fire code official*.

Means shall be provided to shut down fuel dispensing in the event the vapor return line becomes blocked.

2206.7.9.2.1 Equipment. Equipment in vapor-processing systems, including hose nozzle valves, vapor pumps, flame arresters, fire checks or systems for prevention of flame propagation, controls and vapor-processing equipment, shall be individually listed, or certified by the manufacturer, for the intended use in a specified manner.

Vapor-processing systems that introduce air into the underground piping or storage tanks shall be provided with equipment for prevention of flame propagation that has been tested and listed, or certified by the manufacturer, as suitable for the intended use.

3403.6.2 Design, fabrication and installation of piping systems and components. Piping system components shall be designed and fabricated in accordance with the applicable standard listed in Table 3403.6.2 and Chapter 27 of NFPA 30, except as modified by Section 3403.6.2.1.

Exception: Where piping system components are certified by the manufacturer for the fuel stored.

3403.6.9 Flexible joints. Flexible joints shall be listed and approved, or certified by the manufacturer for the fuel used, and shall be installed on underground liquid, vapor and vent piping at all of the following locations:

1. Where piping connects to underground tanks.
2. Where piping ends at pump islands and vent risers.
3. At points where differential movement in the piping can occur.

3404.2.7 Design, construction and general installation requirements for tanks. The design, fabrication and construction of tanks shall comply with NFPA 30. Each tank shall bear a permanent nameplate or marking indicating the standard used as the basis of design.

Exception: Where tanks are certified by the manufacturer for the fuel stored.

Reason: The requirement for a listing by an "approved testing laboratory, inspection agency or other organization concerned with current product evaluation" (IFC 202) can prove a considerable hindrance to the propagation of new fuels, such as biofuels. The most often used listing laboratory, UL, requires at least 18 months of testing prior to offering a listing which may not be feasible in light of federal regulations requiring new fuels in a certain time period. Moreover, as is the case with ethanol, blend levels may be adjusted in short time periods making the ICC requirement for a listing an inflexible barrier to fuel retailers. An alternate requirement must be found that ensures the protection of public safety while requiring less time to obtain. A manufacturer's certification has been one idea that has received some support among API members, but other alternatives should also be considered. API would encourage the ICC to allow for potential modifications of this requirement after the Code Development hearings when other potential alternatives may be presented and vetted.

Cost Impact: This proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KNAPP-F2-F11-COMBINED.DOC

F173–09/10
2206.8.1, 2206.8.2 (New), 2202.1

Proponent: Ken Boyce, Underwriters Laboratories, representing Doug Horne, Clean Vehicle Education Foundation; Wendy Clark, National renewable Energy Laboratory

1. Revise as follows:

2206.8.1 Approval of equipment. Dispensers, hoses, nozzles, breakaway fittings, swivels, flexible connectors or dispenser emergency shutoff valves, vapor recovery systems, leak detection devices and pumps used in alcohol blended fuel-dispensing systems shall be listed or approved for the specific purpose.

2. Add new text as follows:

2206.8.2 Material compatibility. Tanks and fluid handling components that contact alcohol blended fuels shall be fabricated from corrosion resistant materials that mitigate galvanic action and resist corrosion from internal and external sources. Dissimilar metallic parts that promote galvanic action shall not be joined.

(Renumber subsequent sections)

3. Revise definition as follows:

2202.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

ALCOHOL BLENDED FUELS. Alcohol blended fuels, including those containing nominally 85-percent ethanol 15-percent unleaded gasoline (E85), are flammable liquids consisting of ethanol or other alcohols blended greater than ~~15~~10-percent by volume.

Reason: This proposal updates E85 and other alcohol blended fuel dispensing requirements. Specifically, the proposal:

1. Revises the definition of alcohol blended fuels that was introduced into the 2006 IFC. The proposed revision clarifies that these are fuels containing between 10 and 85% ethanol by volume. Presently, gasoline blends containing up to 10% ethanol (also known as "gasohol") are permitted to be dispensed into conventional (non-flex fuel) vehicles, although there the possibility in the near-term that blends containing more that 10% ethanol may be permitted for conventional vehicles. Clarifying the limit from 15 to 10% is necessary and will help the IFC address potential near-term deployment of fuels with more ethanol.
2, Adds leak detection devices to the types of equipment specifically requiring approval for use with alcohol blended fuels. Practical experience has shown that leak detection equipment needs to be compatible for use with alcohol blended fuels or it may not be able to perform its intended function.
3. Adds a new section 2606.8.2 with requirements covering the compatibility of the fuel containment systems materials with the alcohol blended fuels. The wording for this section is similar to wording currently in Section 3403.6.5, which addresses external corrosion, not internal corrosion. Alcohols are polar compounds that exhibit increased moisture absorption, water solubility, polar solvency and solution conductivity relative to gasoline, and can cause increased corrosion.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOYCE-F1-2206.8.1.DOC

F174–09/10
2209

Proponents: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

1. Revise as follows:

2209.2.1 Approved equipment. Cylinders, containers and tanks; pressure relief devices, including pressure valves; hydrogen vaporizers; pressure regulators; and piping used for gaseous hydrogen systems shall be designed and constructed in accordance with ~~Section 3003, 3203 or NFPA 55~~ Chapters 30, 32 and 35.

2209.3 Location on property. In addition to the requirements of Section 2203.1, ~~Generation, compression, storage and~~ dispensing equipment shall be located in accordance with Sections 2209.3.1 through Section 2209.3.3.

2. Delete sections and table in their entirety without substitution:

~~**2209.3.1 Separation from outdoor exposure hazards.**~~

~~**TABLE 2209.3.1**~~
~~**MINIMUM SEPARATION FOR GASEOUS HYDROGEN**~~
~~**DISPENSERS, COMPRESSORS, GENERATORS AND STORAGE VESSELS**~~

~~**2209.3.1.1 Barrier wall construction–gaseous hydrogen.**~~
~~**2209.3.1.2 Location of equipment**~~.

3. Add new text as follows:

2209.3.1 Location of dispensing devices. Dispensing devices shall be located above ground. In addition to the requirements of Section 2203.1, dispensing shall be located in accordance with the following:

1. Ten feet (3048 mm) or more from the nearest public street or sidewalk.
2. Fifty feet (15,240 mm) from the nearest rail of any railroad main track.
3. Five feet or more from the nearest enclosing wall.

4. Dispensing equipment shall be allowed under weather protection in accordance with the requirements of Section 2704.13 and constructed in a manner that prevents the accumulation of hydrogen gas.

Exceptions:

1. Compression, storage or dispensing equipment shall be allowed in buildings in accordance with Section 2209.3.2.2.
2. Compression, storage and dispensing equipment shall be allowed in vaults in accordance with Chapter 30.

4. Revise as follows:

2209.3.2 Location of ~~dispensing~~ operations and equipment. Generation, compression, storage and dispensing equipment shall be located in accordance with Sections 2209.3.2.1 through 2209.3.2.6.3.

2209.3.2.1 Outdoors. Generation, compression, or storage ~~or dispensing~~ equipment shall be allowed outdoors in accordance with ~~Section 2209.3.1~~ Chapter 35.

5. Delete section in its entirety without substitution:

~~**2209.3.2.2 Weather protection**.~~

(Renumber remaining sections 2209.3.2.3 through 2209.3.2.4)

6. Revise as follows:

2209.3.2.~~5~~ 4 ~~Liquefied~~ Cryogenic fluid hydrogen storage. Storage of Cryogenic fluid hydrogen shall be in accordance with Chapters 32 and 35.

7. Delete sections in their entirety without substitution:

~~**2209.3.2.5.1 Location on property.**~~
~~**2209.3.2.5.1.1 Barrier wall construction–liquefied hydrogen.**~~
~~**2209.3.2.5.1.2 Location of equipment.**~~

(Renumber Sections 2209.3.2.6 through 2209.3.2.6.3)

~~**2209.5.4 Venting of hydrogen systems.**~~
~~**2209.5.4.1 Location of discharge.**~~
~~**2209.5.4.2 Pressure relief devices.**~~
~~**2209.5.4.2.1 Minimum rate of discharge.**~~
~~**2209.5.4.3 Vent pipe.**~~
~~**2209.5.4.3.1 Materials of construction.**~~
~~**2209.5.4.3.2 Structural support.**~~
~~**2209.5.4.3.3Obstructions.**~~
~~**2209.5.4.3.4 Height of vent and separation.**~~
~~**TABLE 2209.5.4.3.4**~~
~~**FIGURE 2209.5.4.3.4**~~
~~**2209.5.4.3.5 Maximum flow rate.**~~
~~**2209.5.4.3.6 Alternative venting systems.**~~
~~**TABLE 2209.5.4.3.6(1)**~~
~~**TABLE 2209.5.4.3.6(2)**~~

Reason: This proposal is intended to provide correlation with changes to Chapter 35 contained within a separate proposal that will update references to NFPA 55 to apply updated separation distances tables added to that standard. When the separation distances were added to Chapter 22 the proponents indicated in the written reason and in testimony that the distances provided were the best that could be developed at that time and that once better distances were determined through research and analysis the IFC would be updated. This proposal is one of several that fulfill that intent.

Section 2209 addresses issues specific to dispensing operations. Storage is addressed by Chapter 35 and 2209.3.2.1 and 2209.3.2.4 refers the code user to Chapters 30 and 35 for storage.

The change to 2209.2.1 eliminates an incorrect “or” phrase in applicability and replaces the language with references to the relevant chapters to correlate with references to each of the chapters found in the remaining portions of 2209.

Deleting the struck text from Section 2209.3 and 2209.5.4 clarifies applicability of Section 2209.

Replacing the current Section 2209.3.1 with the proposed text clarifies that the separation required is from the dispensing equipment and not from the storage system. The storage system separation distances are addressed in Chapter 35. The weather protection for equipment found at Section 2209.3.2.2 has been added to the new 2209.3.1 language for the dispenser.

Deleting Table 2209.3.1 and replacing it with the text proposed for 2209.3.1 correlates the IFC with NFPA 52 Table 9.3.1.4 in the 2010 edition per approved ROP-81. The two separation distances listed in the proposed text for 2209.3.1 are the only ones that need to be added to the requirements of 2203.1 in order to achieve correlation with NFPA 52 Table 9.3.1.4 (2010 edition per ROP-81). See below for an image of the draft NFPA 52 Table 9.3.1.4 for convenience. The 1st row in table establishes a separation distance requirement between dispensing equipment and buildings. This NFPA 52 requirement corresponds to the existing text in IFC 2203.1. The next two items are not currently in IFC and are added to 2209.3.1 by this proposal.

The remaining deletions are of language that is no longer required due to the application of modifications to Chapter 35 of the IFC and the updated reference to NFPA 55.

The change at 2209.3.2.5 is a terminology correlation that has already been made to Chapter 32,

Approval of this proposal will simplify the application of the IFC to the outdoor storage of hydrogen and continue the efforts of ICC to provide for improved levels of safety in the application of new hydrogen technology and hydrogen as an alternative fuel.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The related code change proposal referred to in the first paragraph of the reason statement is F214-09/10. The action on this proposal should be consistent with the action on Code Change F176-09/10.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F18-2209.DOC

F175–09/10

2209.2.2, Table 2209.2.2 (New), Chapter 47

Proponent: Julie Cairns, CSA America, Inc., representing CSA America Automotive Technical Committee

1. Revise as follows:

2209.2.2 Listed equipment. Hoses, hose connections, compressors, hydrogen generators, dispensers, detection systems and electrical equipment used for hydrogen shall be *listed* for use with hydrogen <u>in accordance with the applicable standard in Table 2209.2.2.</u> Hydrogen motor fueling connections shall be *listed* and *labeled* for use with hydrogen.

<u>TABLE 2209.2.2</u>
<u>HYDROGEN HANDLING COMPONENT STANDARDS</u>

<u>HYDROGEN HANDLING COMPONENT</u>	<u>STANDARD</u>
<u>Compressed Hydrogen Dispensers</u>	<u>CSA America HGV 4.1</u>
<u>Hoses and Hose Assemblies for Gaseous Hydrogen Vehicles and Dispensing Systems</u>	<u>CSA America HGV 4.2</u>
<u>Breakaway Devices for Hoses Used in Compressed Hydrogen Vehicle Fueling Stations</u>	<u>CSA America HGV 4.4</u>
<u>Priority and Sequencing Equipment for Gaseous Hydrogen Dispensing Systems</u>	<u>CSA America HGV 4.5</u>
<u>Manually Operated Valves Used in Gaseous Hydrogen Vehicle Fueling Stations</u>	<u>CSA America HGV 4.6</u>
<u>Standard for Automatic Pressure Operated Valves for Use in Gaseous Hydrogen Vehicle Fueling Stations</u>	<u>CSA America HGV 4.7</u>
<u>Hydrogen Gas Vehicle Fueling Station Compressor</u>	<u>CSA America HGV 4.8</u>
<u>Fittings for Compressed Hydrogen Gas and Hydrogen Rich Gas Mixtures</u>	<u>CSA America HGV 4.10</u>

2. Add new standards to Chapter 47 as follows:

CSA America, Inc.
8501 E. Pleasant Valley Rd.
Cleveland, OH 44131

HGV 4.1	Compressed Hydrogen Dispensers
HGV 4.2	Hoses and Hose Assemblies for Gaseous Hydrogen Vehicles and Dispensing Systems
HGV 4.4	Breakaway Devices for Hoses Used in Compressed Hydrogen Vehicle Fueling Stations
HGV 4.5	Priority and Sequencing Equipment for Gaseous Hydrogen Dispensing Systems
HGV 4.6	Manually Operated Valves Used in Gaseous Hydrogen Vehicle Fueling Stations
HGV 4.7	Standard for Automatic Pressure Operated Valves for Use in Gaseous Hydrogen Vehicle Fueling Stations
HGV 4.8	Hydrogen Gas Vehicle Fueling Station Compressor
HGV 4.10	Fittings for Compressed Hydrogen Gas and Hydrogen Rich Gas Mixtures

Reason: The proposal is to reference CSA America documents used by industry for certification of the dispenser and related equipment.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, CSA HGV 4.1, 4.2, 4.4, 4.5, 4.6, 4.7, 4.8 and 4.10, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CAIRNS-F1-2209.2.2

F176–09/10

2209.3, 2209.3.1, Table 2209.3.1, 2209.3.1.1

Proponent: Robert Boyd, LINDE North America, Inc., representing Hydrogen Industry Panel on Codes (HIPOC)

1. Revise as follows:

2209.3 Location on property. In addition to the requirements of Section 2203.1, ~~generation, compression, storage and~~ dispensing equipment shall be located in accordance with Section~~s~~ 2203 and Sections 2209.3.1 through Section 2209.3.3.

2. Delete and substitute as follows:

~~**2209.3.1 Separation from outdoor exposure hazards.** Generation, compression and dispensing equipment shall be separated from other fuels or equivalent risks to life, safety and buildings or public areas in accordance with Table 2209.3.1.~~

~~**Exception:** *Closed systems* with a hydrogen capacity of 3,000 cubic feet (85 m^3) or less at NTP.~~

2209.3.1 Location of dispensing operations and equipment. Dispensing operations and equipment shall be located above ground. In addition to the requirements of Section 2203.1, the point of transfer dispensing shall be located in accordance with the following:

1. Ten feet (3048 mm) or more from the nearest public street or sidewalk.
2. Ten feet (3048 mm from the nearest rail of any railroad track.
3. Dispensing equipment shall be allowed under weather protection in accordance with the requirements of Section 2704.13 and constructed in a manner that prevents the accumulation of hydrogen gas.

3. Delete section and table in their entirety without substitution:

~~**TABLE 2209.3.1**~~
~~**MINIMUM SEPARATION FOR GASEOUS HYDDROGEN DISPENSERS, COMPRESSORS, GENERATORS AND STORAGE VESSELS**~~
(Delete entire table and notes)

~~**2209.3.1.1 Barrier wall construction—gaseous hydrogen.** The outdoor separation shall be allowed to be reduced to 5 feet (1524 mm) where a 2-hour *fire barrier* interrupts the line of sight between equipment, other than dispensers, and the exposure within the radial distance as indicated by the tabular value. The height of the barrier shall be a minimum of 6 feet (1829 mm), but not less than 1.5 times the height of the equipment, measured vertically. The length of the wall shall be not less than 1.5 times the maximum diameter or length of the tank.~~

Reason: This proposal is intended to provide correlation with changes to Chapter 35 contained within separate proposals that will update references to NFPA 55 to apply updated separation distances tables added to that standard. When the separation distances were added to Chapter 22, the proponents indicated, in the written reason and in testimony, that the distances provided were the best that could be developed at that time and that once better distances were determined through research and analysis, the IFC would be updated. This proposal is one of several which fulfills that intent.

The remaining deletions are of language that is no longer required due to the application of modifications to Chapter 35 of the IFC and the updated reference to NFPA 55. Approval of this proposal will simplify the application of the IFC to the outdoor storage of hydrogen and continue the efforts of ICC to provide for improved levels of safety in the application of new hydrogen technology and hydrogen as an alternative fuel.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The related code change proposal referred to in the first paragraph of the reason statement is F214-09/10. The action on this proposal should be consistent with the action on Code Change F174-09/10.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOYD-F2-2209.3.DOC

F177–09/10
2209.3.1.2

Proponent: Robert Boyd, Linde North America, Inc.

Revise as follows:

2209.3.1.2 Location of equipment. ~~Equipment shall be located from the enclosing walls at a distance not less than one tank diameter. When horizontal tanks are used,~~ The distance from equipment to any one enclosing wall shall be not less than ~~one-half the length of the tank or a minimum of~~ 5 feet (1524 mm).

Reason: During the most recent HIPOC meeting, the need for such large setback distance between tanks and enclosing walls was reviewed. Tanks are typically 8 or 10 feet in diameter and there is no justifiable reason to have more than a 5 foot walkway between tanks and enclosing walls. The requirement to have walls be half the length of the horizontal tank to the enclosing walls is even more out of line with what is needed.

This proposal came out of a final review of Chapter 22 after HIPOC had last convened. HIPOC will review this proposal in detail and will likely speak on behalf of this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOYD-F1-2209.3.1.2.DOC

F178–09/10
2211.7.2.1 (IBC [F] 406.6.6.1); 2211.7.2.2 (New) [IBC [F] 406.6.6.1.1 (New)]; 3704.2.2.10.1 (New)

Proponent: Bob Eugene/Underwriters Laboratories Inc. representing Underwriters Laboratories, Inc.

1. Add new text follows:

2211.7.2.1 (IBC [F]406.6.6.1) System design. The flammable gas detection system shall be *listed* or *approved* and shall be calibrated to the types of fuels or gases used by vehicles to be repaired. ~~Gas detectors or sensors shall be *listed* in accordance with UL 2075 and shall indicate the gases they are intended to detect~~. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL). Gas detection shall also be provided in lubrication or chassis service pits of repair garages used for repairing nonodorized LNG-fueled vehicles.

2211.7.2.1.1 (IBC [F] 406.6.6.1.1) Gas detection system components. Gas detection system control units shall be listed and labeled in accordance with UL 864 or UL 2017. Gas detectors shall be listed and labeled in accordance with UL 2075 for use with the gases and vapors being detected.

3704.2.2.10.1 Gas detection system components. Gas detection system control units shall be listed and labeled in accordance with UL 864 or UL 2017. Gas detectors shall be listed and labeled in accordance with UL 2075 for use with the gases and vapors being detected.

2. Add new standard to Chapter 47 (IBC Chapter 35) as follows:

UL
2017-08 Standard for General Purpose Signaling Devices and Systems

Reason: The change is designed to ensure that gas detection system components are listed in accordance with nationally recognized safety standards. These standards include a comprehensive set of construction and performance requirements that are used to evaluate and list gas detection system control units and gas detectors.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, UL 2017-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-F7-3704.3.4.3.1

F179–09/10
2301.5 (New), 2302 (New), 2303.2, 2303.6, 2308.2.1, Chapter 47

Proponent: Jimbo Schifiliti, Fire Safety Consultants, Inc., representing self

1. Add new text as follows:

2301.5 Pallets. All pallets shall be wooden as defined by this Chapter or shall be *listed* and *labeled* in accordance with UL 2335 or FM 4996

SECTION 2302
DEFINITIONS

2302.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

WOODEN PALLET. A wooden pallet is defined as a 42 in. x 42 in., 2-way entry Stringer Pallet constructed from hardwood as described in ASME MH1.

2. Revise as follows:

2303.2 Class I commodities.Class I commodities are essentially noncombustible products ~~on wooden or nonexpanded polyethylene solid deck~~ with or without pallets , in ordinary corrugated cartons with or without single-thickness dividers, or in ordinary paper wrappings with or without pallets. Class I commodities are allowed to contain a limited amount of Group A plastics in accordance with Section 2303.7.4. Examples of Class I commodities include, but are not limited to, the following:

Alcoholic beverages not exceeding 20-percent alcohol
Appliances noncombustible, electrical
Cement in bags
Ceramics
Dairy products in nonwax-coated containers (excluding bottles)
Dry insecticides
Foods in noncombustible containers
Fresh fruits and vegetables in nonplastic trays or containers
Frozen foods
Glass
Glycol in metal cans
Gypsum board
Inert materials, bagged

Insulation, noncombustible
Noncombustible liquids in plastic containers having less than a 5-gallon (19 L) capacity
Noncombustible metal products

2303.6 High-hazard commodities. High-hazard commodities are high-hazard products presenting special fire hazards beyond those of Class I, II, III or IV. Group A plastics not otherwise classified are included in this class. Examples of high-hazard commodities include, but are not limited to, the following:

Aerosol, Level 3 (see Chapter 28)
Alcoholic beverages, exceeding 80-percent alcohol, in bottles or cartons
Commodities of any class in plastic containers in carousel storage
Flammable solids (except solid combustible metals)
Glycol in combustible containers (50 percent or greater)
Lacquers, which dry by solvent evaporation, in metal cans or cartons
Lubricating or hydraulic fluid in plastic containers
Mattresses, foam rubber or foam plastics
~~Pallets and flats which are idle combustible~~
Paper, asphalt, rolled, horizontal storage
Paper, asphalt, rolled, vertical storage
Paper and pulp, rolled, in vertical storage which is unbanded or not protected with an *approved* wrap
Pillows, foam rubber and foam plastics
Pyroxylin
Rubber tires
Vegetable oil and butter in plastic containers

2308.2.1 Plastic ~~pallets and~~ shelves. Storage on ~~plastic pallets or~~ plastic shelves shall be protected by *approved* specially engineered *fire protection systems*.

> **~~Exception:~~** ~~Plastic pallets listed and labeled in accordance with UL 2335 shall be treated as wood pallets for determining required sprinkler protection~~.

3. Add new standards to Chapter 47 as follows:

ANSI/FM 4996-2007	American National Standard for Classification of Idle Plastic Pallets as Equivalent to Wood Pallets
ASME MH1-2005	Pallets, Slip Sheets, and Other Bases for Unit Loads

Reason: Over the years the types of pallets utilized in day to day commerce has changed. When the density requirements relative to the impact pallets have on commodity classification and as idle pallet storage the standard wooden pallet was the hardwood, stringer type. Today a wooden pallet may be a 9-block, 4-way, softwood type or other variations including “one-way” pallets of a mixture of wood and composites. Some pallets are plastic, some are a combination of plastic and wood products.

NFPA 13 has undergone revisions over the last several cycles to increase density requirements based upon test data for the newer wood pallets. In addition, NFPA 13 added definitions as follows:

> “3.10.12 Wood Pallet. A wood pallet is defined as a pallet constructed entirely of wood with metal fasteners.”
>
> “3.10.13 Plastic Pallet. A plastic pallet is defined as a pallet having any portion of its construction consisting of a plastic material.”

The new definitions serve as a partial solution in that the pallet is either wood or plastic, and if classified as plastic verification of whether or not it is a listed and labeled plastic pallet can be made.

But the changes in NFPA 13 do not address the entire problem. Though the more recent additions of NFPA 13 have had increases made to density requirements to handle the challenge of some of the newer wood pallet types or new construction projects, those densities do not cover all of the newer types of materials in use in pallets and do not address the fact that the pallets are in use in facilities built under early editions of NFPA 13 and as a result do not have the needed water flow densities.

> We have an additional problem in Chapter 23. Whereas NFPA 13 addresses the impact of pallets at “5.6.2 Pallet Types”, (which may require a one or two class commodity increase or specific laboratory testing), and at “12.12 Protection of Idle Pallets” regardless or storage method, (solid pile versus rack storage), the IFC only addresses the issue in relation to rack storage and by classifying “*Pallets and flats which are idle combustible*” as a High-hazard commodities.

> “2308.2.1 Plastic pallets and shelves. Storage on plastic pallets or plastic shelves shall be protected by approved specially engineered fire protection systems.
>
> > Exception: Plastic pallets listed and labeled in accordance with UL 2335 shall be treated as wood pallets for determining required sprinkler protection”

This presents the real possibility that a building designed under the IFC did not have the correct commodity class for determining sprinkler density assigned unless the designer, plan reviewer and/or field inspector was aware of this issue and applied NFPA 13 to this topic even though classification is covered by the IFC.

In a practical sense, we cannot expect every existing building containing pallets with a fire suppression system installed prior to the 2002 edition of NFPA 13 to have the systems retroactively reassessed by a design professional and upgraded to handle the increased sprinkler demands of a violating product introduced after the building was constructed. It is easier and more cost effective to address the offending product, i.e., the unlisted or labeled pallet.

This proposal addresses the issue by requiring all pallets other than the hardwood, stringer type to be listed and labeled in accordance with the existing UL or FM standards. There is already one wood pallet provider that had their "yellow pine, 9-block" pallet tested for listed under the standards documenting that it can be done. In fact, it was some of those tests that identified the need to make changes to NFPA 13.

By requiring all pallets to be listed or labeled it will ensure that the pallets present can be handled by the existing suppression systems including those designed under the IFC where the required commodity class increase may have been missed and provide the code official with an effective tool to apply during maintenance inspections by spot checking for labels. It will also serve the building owner/operator by making it easy for him/her to verify that the pallets entering their facility do not place it at risk from a damaging fire.

Cost Impact: The code change will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ANSI/FM 4996-2007 and ASME MH1-2005, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SCHIFILITI-F1-2301.5.DOC

F180–09/10
2302.1

Proponent: Ron Clements, Chesterfield County Virginia Building Inspection Department, representing self

Revise as follows:

2302.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

HIGH-PILED STORAGE AREA. An area within a building which is designed, intended, proposed or actually used for high-piled combustible storage. <u>The area of aisles is not included in the determination of the size of the high-piled storage area.</u>

Reason: There is some ambiguity regarding if the area of aisles within high piled storage areas is to be included in the high-piled storage area value used by this chapter per this definition. Section 2306.9.1.1 bases some required aisle widths on the high-piled storage area. If the aisle widths area required to be included in the high piled storage area by definition, then it would be mathematically impossible to calculate the high-piled storage area because you cannot determine the aisle widths needed to calculate the aisle areas without the high-piled storage area. Additionally it does not make sense to include large aisles widths of 20', 30' or more between storage racks as part of the storage area. Clearly the intent is to measure the actual area of floor that is covered by the stored commodity.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CLEMENTS-F1-2302.DOC

F181–09/10
2306.3.2.2

Proponent: Will Smith, PE, Code Consultants, Inc.

Revise as follows:

2306.3.2.2 Multiclass high piled storage areas. *High-piled storage areas* classified as Class I through IV not separated from *high-piled storage areas* classified as high hazard shall utilize the aggregate of all *high-piled storage areas* as high hazard for the purposes of the application of Table 2306.2. To be considered as separated, 1-hour *fire barrier* walls shall be constructed in accordance with the International Building Code. Openings in such walls shall be protected by opening protective assemblies having a 1-hour *fire protection rating*.

Exceptions:

1. As provided for in Section 2304.2.
2. When automatic sprinkler systems are designed for high hazard commodities throughout the high-piled storage area, the actual high-piled storage area classified as high hazard commodities and the actual high-piled storage area classified as Class I through IV commodities, individually, shall be used for the application of Table 2306.2.

Reason: The engineered solution provided in section 2304.2 allows for limiting the size of the high hazard areas to 120 sq ft and separating them by 25 ft. This exception is allowed when the sprinkler system is capable of delivering a sprinkler density that will protect high hazard commodities over a 900 sq ft area. The proposed exception provides an alternate solution when the sprinkler system is designed for high hazard commodities throughout the storage area.

Further research where the sprinkler system has been designed for the proper design density has proven that smoke and heat vents in most cases will not operate. At most, one vent will operate in the area.

This exception will allow the elimination of smoke and heat vents and building access requirements in a building when the design of the sprinkler system is for high hazard commodities, and the total amount of high-piled storage of high hazard commodities is less than 2,500 sq ft.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SMITH-F2-2306.3.2.2.DOC

F182–09/10
2306.6.1.1

Proponent: Will Smith, PE, Code Consultants, Inc.

Revise as follows:

2306.6.1.1 Number of doors required. A minimum of one access door shall be provided in each 100 lineal feet (30 480 mm), or fraction thereof, of the exterior walls that face required fire apparatus access roads. The required access doors shall be distributed such that the lineal distance between adjacent access doors does not exceed 100 feet (30 80 mm).

Exception: Where exterior walls that face required fire apparatus access roads do not exceed a linear distance of 200 feet, two access doors shall be permitted such that the linear distance between adjacent access doors does not exceed 200 feet.

Reason: Where an exterior wall, 200 ft long, faces a required fire apparatus access road, the number of access doors required would be two. The distance between doors could be no less than 1 ft and no more than 100 ft apart. Three doors would be required if two existing doors were located more than 100 ft apart. This revision would allow a condition where the exterior wall is not greater than 200 ft, a minimum two doors would still be required, one door in each linear 100 ft. This condition still maintains a two door minimum requirement for a 200 ft long exterior wall.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SMITH-F1-2306.6.1.1.DOC

F183–09/10
2308.2.1, Chapter 47

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing FM Approvals

1. Revise as follows:

2308.2.1 Plastic pallets and shelves. Storage on plastic pallets or plastic shelves shall be protected by approved specially engineered fire protection systems.

Exception: Plastic pallets listed and labeled in accordance with UL 2335 or ANSI/FM 4996 shall be treated as wood pallets for determining required sprinkler protection.

2. Add new standard to Chapter 47 as follows:

FM

ANSI/FM 4996-2007 American National Standard for Classification of Idle Plastic Pallets as Equivalent to Wood Pallets

Reason: The purpose of this code change is to include reference to ANSI/FM 4996 as an alternate to UL 2335 in the International Fire Code. ANSI/FM 4996 is an ANSI approved standard.

The inclusion of this alternate test method would provide the authority having jurisdiction with the flexibility to accept listed and labeled products evaluated in accordance with either UL 2335 or ANSI/FM 4996. This will also assist pallet manufacturers by providing two sources of listings and also not require pallet manufacturers currently listed with FM to have to retest and co-list with another laboratory/agency.

Both standards are similar in that they require full-scale fire tests and they address the issue of appropriate sprinkler protection for plastic pallets.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ANSI/FM 4996-2007, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEITEL-F1-2308.2.1.DOC

F184–09/10
2308.3.1 (New)

Proponent: Amber Anderson/Stuart Tom, Cosumnes CSD Fire Department, representing California Fire Chief's Association

Add new text as follows:

2308.3.1 Flue space protection. Where required by the fire code official, flue spaces required by Table 2308.3, in single, double or multiple row rack storage installations shall be equipped with approved devices to protect the required flue spaces. Such devices shall not be removed or modified.

Reason: This proposal authorizes the enforcing agency to require devices, when appropriate, to maintain the required flue spaces in rack storage systems found in IFC Section 2308 and IFC Table 2308.3. It is not the intent of this proposal to require such devices in each instance, but rather when the business practice has established a history of poor flue space maintenance.

Approved devices to protect required flue spaces may be any of the following: brackets, cables or other elements that are securely fastened to the load bearing columns of racks, which control the depth or width to which a product, pallet or similar material can be stored in the rack system thereby preventing obstruction of the required flue space.

Once approved devices are installed, most business owner confusion regarding flue space requirements are removed. Other benefits include; property loss reduction through quick activation of the fire protection system; improved penetration of extinguishing agent through the rack system to the seat of the fire; faster activation of smoke and heat vent systems, improved employee safety, public safety and firefighter safety.

Cost Impact: The code change proposal will increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ANDERSON-TOM-F1-2308.3.1.DOC

F185–09/10
2309.4, 2309.5 (New)

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

1. Revise as follows:

2309.4 Automated rack storage. *High-piled storage areas* with more than 500 square feet (46 m^2) of automated rack storage shall be provided with automatic shutdown in accordance with the following:

1. Activation of the fire detection system or automatic fire sprinkler system required by Table 2306.2 shall sound an alarm at the operator's station and stop the automated rack storage system.

2. ~~*High-piled storage areas* with automated~~ Automated rack storage systems shall be provided with a manually activated emergency shut down switch for use by emergency personnel. The switch shall be clearly identified and shall be in a location *approved* by the fire chief.
3. The automated rack storage system shall be provided with manual override for fire department use during or after a fire incident. When the manual override is utilized, the automated rack storage system will travel at a speed *approved* by the fire chief.

2. Add new text as follows:

2309.5 Automated pallet movers. Automated pallet movers associated with *high-piled storage areas* shall be provided with automatic shutdown in accordance with the following:

1. Activation of the fire detection system or automatic fire sprinkler system required by Table 2306.2 shall sound an alarm at the operator's station and stop the automated pallet movers.
2. Automated pallet movers shall be provided with a manually activated emergency shut down switch for use by emergency personnel. The switch shall be clearly identified and shall be in a location *approved* by the fire chief.

Reason: Automated rack storage is occurring in many large warehousing operations. This proposal will add requirements specifying that if a fire occurs in an automated rack storage facility the remotely controlled pallet moving equipment will automatically shut-down. This automatic shut-down accomplishes two objectives. First, the potential to either move additional product into the fire or move burning product through the storage area via remotely controlled pallet movers is halted. Secondly, firefighting personnel cannot safely operate within the automated storage area when the system is still active. Many of these automated rack storage have equipment that moves quite fast, and there is a physical danger to the firefighters. This shut-down will eliminate this danger to firefighters.

Whether the products stored are Class I-IV commodities or High Hazard commodities, Table 2306.2 requires that any high piled storage area exceeding 500 sq.ft. will be protected with either a fire detection system or a fire sprinkler system. The activation of a fire detector, or the activation of a water flow switch will cause the remotely controlled devices to cease operation.

Additionally, Item #3 will allow the fire department to utilize the rack storage equipment after the system has been shut-down. The control of the speed at this point is critical. Since automated systems move extremely fast, it is necessary to slow the speed down while firefighting personnel are in and around this equipment.

Also, Section 2309.5 is added to require that automated pallet movers which are carrying pallets to and from the automated rack storage area shut down in addition to the automated rack storage equipment. This is just an extension of shutting down the equipment within the storage racks. This requirement will eliminate moving additional fuel load into the fire area.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: LARIVIERE-F18-2309.4.DOC

F186–09/10

Table 2703.1.1(1) [IBC [F] Table 307.1(1)]; 3302.1 (IBC [F]307.2)

Proponent: Glenn A. Dean, Virginia State Fire Marshal's Office

Revise as follows:

TABLE 2703.1.1(1) [IBC TABLE [F] 307.1(1)]
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a,j,n,p]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEM[b]			USE-OPEN SYSTEMS	
			SOLID POUNDS (CUBIC FEET)	LIQUID GALLONS (POUNDS)	GAS (CUBIC FEET AT NTP)	SOLID POUNDS (CUBIC FEET)	LIQUID GALLONS (POUNDS)	GAS (CUBIC FEET AT NTP)	SOLID POUNDS (CUBIC FEET)	LIQUID GALLONS (POUNDS)
~~Consumer fireworks (Class C, Common)~~	~~1.4G~~	~~H-3~~	~~125[d,e,i]~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~	~~N/A~~

(Portions of table and notes not shown remain unchanged)

3302.1 (IBC [F]307.2) Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

FIREWORKS, 1.4G. (Formerly known as Class C, Common Fireworks.) Small fireworks devices containing restricted amounts of pyrotechnic composition designed primarily to produce visible or audible effects by combustion or deflagration that complies~~. Such 1.4G fireworks which comply~~ with the construction, chemical composition and labeling regulations of the DOTn for Fireworks, UN 0336, and the U.S. Consumer Product Safety Commission as set forth in CPSC 16 CFR: Parts 1500 and 1507,~~ are not explosive materials for the purpose of this code~~.

(Portions of definition of "Fireworks" not shown remain unchanged)

Reason: The intent of this change is to revert to language stating consumer fireworks are explosive in nature.

The IFC definition language denoting that consumer fireworks would not be considered "explosive materials for the purpose of this code" originated through IFC code change F97-99. The proponent at the time stated the change was to "revise the definitions for consumer fireworks and display to be more closely aligned with the definitions contained in the 1997 IFCI Uniform Fire Code including 1999 Accumulative Supplement and the 1999 BOCA National Fire Prevention Code."

In looking back for the UFC and BOCA fire codes that were referenced in the F97-99 change to the IFC, code change B3-97 introduced language through the BOCA building code claiming consumer fireworks are not explosive materials and did not provide any technical substantiation to support the claim. I would accept the proponent was making the claim as a means to justify reclassifying the storage and/or sale of consumer fireworks from an H-1 to an H-3 building. For that, I would agree somewhat with the proponent in saying that it "appears reasonable" given the comparison for other H-3 commodities but that is not the issue in this proposed change.

The next BOCA cycle saw the introduction of F18-98 changing the definition of consumer fireworks, 1.4G as "not explosive materials for the purpose of this code". The committee hearing the change at the time denied the proposal with a conference action to amend. Subsequently the proponent brought the issue back in the form of an amendment. But here again, a technical substantiation was not provided.

This same F18-98 change, as amended, carved out consumer fireworks from BOCA's MAQ table to "correlate with code change B3-97 to the 1996 BOCA National Building Code" to be shown as a Group H-3 building instead of a Group H-1. The proponent also stated that it was to "correlate definitions used in the BOCA National Fire Prevention Code and Building Code with terminology used in the new DOTn/UN classifications and regulations and NFPA standards." That may be true to a point and it's that point that gets to the heart of the reason behind this proposed change, which is, DOTn 49 CFR Parts 100-178, U.S Consumer Products Safety Commission as set forth in CPSC 16 CFR, UN 0336, NFPA standards 495, 1123, 1124, and 1126 **do not** contain language saying consumer fireworks are not explosive, at least not that I found. I went so far as to check pamphlets published by the Institute of Makers of Explosives; the U.S. Department of Justice, Bureau of Alcohol, Tobacco, Firearms and Explosives, AFT Publication 5400.7; the American Pyrotechnics Association Standard 87-1, and found nothing in that respect. In fact, everything found labels fireworks as "explosive" without distinction for 1.4G "consumer fireworks" versus a 1.4G professional pyrotechnic device such as the "gerb" that was used and ignited The Station nightclub fire in Rhode Island.

It is the accumulative results of B3-97 and F18-98 that lent itself to the reference in IFC code change F97-99 supporting statement.

That portion of the proposed definition change to include "deflagration" is a resurrection of a previously used descriptor and is to more accurately reflect the functioning of some consumer fireworks. While a sparkler or fountain may operate through combustion, simple combustion does not necessarily mean enough force will be produced quickly enough for the device to function in a desired manner. If the pyrotechnic material does not deflagrate, the flaming balls of roman candles may not launch; aerial devices may not have enough expelling force to obtain the needed altitude.

The change to Table 2703.1.1(1) is a change to reflect that consumer fireworks are indeed properly classified as an Explosive 1.4G and it's not necessary to have a separate line with identical threshold values, including all footnotes, to determine at what point a building would be classified as a Group H-3. It's redundant within the same table. In reality, at the model code level, other than the deletion of language saying consumer fireworks are not explosive, the net effect of this change will be zero to what is taking place in the world of consumer fireworks manufacturing, storage, sale and use.

At the time of this submission I have not located copies of the UFC code changes referenced above but I suspect the supporting statements closely resembled those submitted to BOCA.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: DEAN-F1-TABLE 2703.1.1(1).DOC

F187–09/10

Table 2703.1.1(1) [IBC Table [F] 307.1(1)]; IBC [F] 307.4 (IFC 202)

Proponent: William Winslow, CIH, CFI, CMI, Winslow Partnership, representing himself

1. Revise table as follows:

TABLE 2703.1.1(1) [IBC [F] Table 307.1(1)]
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, j, m, n, p]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas cubic feet at NTP	Solid pounds (cubic feet)	Liquid gallons (pounds)
Combustible Dust	Not Applicable	H-2	See Note q	Not Applicable	Not Applicable	See Note q	Not Applicable	Not Applicable	See Note q	Not Applicable

a. through p. (No change to current text.)
q. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.7.2 [IBC 414.1.3] .

(Portions of table not shown do not change.)

2. Revise IBC as follows:

[F] 307.4 (IFC 202) High-hazard Group H-2. Buildings and structures containing materials that pose a deflagration hazard or a hazard from accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or combustible liquids which are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 psi (103.4 kPa) gage.

Combustible dusts, where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 414.1.3

Cryogenic fluids, flammable
Flammable gases
Organic peroxides, Class I
Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or system pressurized at more than 15 psi (103 kPa) gage
Pyrophoric liquids, solids and gases, nondetonable
Unstable (reactive) materials, Class 3, nondetonable
Water-reactive materials, Class 3

Reason: As it stands now, an occupancy with combustible dust is classified H-2 in accordance with IBC 307.4, with the exception of certain woodworking uses classified F-1. Many spaces with combustible dust should be classified H-2. However, others may fall into the F or S category depending on the specifics of the process. Item 1 adds combustible dust to the MAQ table, so the code user will not miss this important hazard category. New Note q directs the code user to pertinent sections in the IBC and IFC to determine if a dust hazard exists. Item 2 of this code change, which was found in the UBC, establishes that a potential combustible dust hazard has to be evaluated to determine the correct occupancy classification and safety controls

Cost Impact: The code change proposal may reduce the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WINSLOW-F2-T2703.1.1-REVISED

F188–09/10
2703.2.2

Proponent: William Winslow, CIH, CFI, CMI, Winslow Partnership, representing self

Revise as follows:

2703.2.2 Piping, tubing, valves and fittings.Piping, tubing, valves, and fittings conveying hazardous materials shall be designed and installed in accordance with ASME B31, Code for Pressure Piping or other approved standards and shall be in accordance with Sections 2703.2.2.1 and 2703.2.2.2

Reason: ANSI/AMSE B31 is the primary code for pressure piping. It is separated into 9 sections, each regulating a different type of piping, and it has detailed requirements for installation, inspection and testing. Including it in the general section on piping will assist designers to reference the correct standard in project specifications. To address past concerns, this change continues to allow the use of other approved piping standards.

ASME B31 is referenced in the NFPA standards that deal with piping, with the exception of the fuel gas code, which primarily covers low pressure gas supplies to appliances. ASME B31 is also referenced in ASHRAE Standard 15, Safety Standard for Refrigeration Systems, IIAR 2, Equipment, Design, and Installation of Ammonia Mechanical Refrigerating Systems, Chlorine Institute Pamphlet 6, Piping Systems for Dry Chlorine, and API 14E, Recommended Practice for Design and Installation of Offshore Production Platform Piping.

There has been a concern expressed that jurisdictions will have to purchase ASME B31 if it is referenced in the code. My experience is that AHJs do not have many standards listed in project specifications, so this proposal will not change that situation. The proposal's goal is to help ensure that designers specify the correct piping standard and that contractors install piping in accordance with the standard. It will save the designer time in that ASME B31 will not have to be approved by the FCO.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WINSLOW-F4-2703.2.2.DOC

F189–09/10

2703.8.3.1 (IBC [F] 414.2.1), 2703.8.3.4 (IBC [F] 414.2.4), Table 2703.8.3.2 (IBC [F] Table 414.2.2)

Proponent: Gregory R. Keith, Professional heuristic Development, representing The Boeing Company

Revise as follows:

2703.8.3.1 (IBC [F] 414.2.1) Construction ~~requirements~~. Control areas shall be separated from each other, and from other portions of the building, by fire barriers constructed in accordance with Section 707 of the *International Building Code* or horizontal assemblies constructed in accordance with Section 712 of the *International Building Code*, or both.

2703.8.3.4 (IBC [F] 414.2.4) Fire-resistance rating ~~requirements~~. The required fire-resistance rating for fire barriers and horizontal assemblies shall be in accordance with Table 2703.8.3.2 (IBC [F] Table 414.2.2). ~~The floor assembly of the control area and the construction supporting the floor of the control area shall have a minimum 2-hour fire-resistance rating.~~

Exception: The floor assembly of the *control area* and the construction supporting the floor of the *control area* is allowed to be 1-hour *fire-resistance* rated in buildings of Type IIA, IIIA and VA construction, provided that both of the following conditions exist:

1. The building is equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1; and
2. The building is three stories or less above grade plane.

TABLE 2703.8.3.2 (IBC [F] TABLE 414.2.2)
DESIGN AND NUMBER OF CONTROL AREAS

~~FLOOR~~ STORY LEVEL	PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA[a]	NUMBER OF CONTROL AREAS PER ~~FLOOR~~ STORY	FIRE-RESISTANCE RATING FOR FIRE BARRIERS AND HORIZONTAL ASSEMBLIES IN HOURS[b]

(Portions of table not shown do not change.)

a. Percentages shall be of the maximum allowable quantity per control area indicated ~~shown~~ in Tables 2703.1.1(1) and 2703.1.1(2) [IBC [F] Tables 307.1(1) and 307.1(2)], with all increases allowed in the notes to those tables.

~~b. Fire barriers shall include walls and floors as necessary to provide separation from other portions of the building.~~

b. The floor assembly of the control area and the construction supporting the floor of the control area shall have a minimum 2-hour fire-resistance rating.

Reason: This proposal is intended to clarify IBC and IFC control area construction requirements. No technical changes are intended. Currently, Section 2703.8.3.1 (IBC [F] 414.2.1) states that control areas are to be constructed as fire barriers or horizontal assemblies. Section 2703.8.3.4 (IBC [F] 414.2.4) and Table 2703.8.3.2 (IBC [F] Table 414.2.2), however, only refer to fire barriers. A reference to horizontal assemblies has been added in each location.

Additionally, two current provisions have been relocated so as to be in technical context. Although Table 2703.8.3.2 (IBC [F] Table 414.2.2) provides fire-resistance rating requirements for fire assemblies used in the construction of control areas, Footnote b currently states a general design requirement. This design requirement has been placed in context in Section 2703.8.3.1 (IBC [F] 414.2.1). Similarly, Section 2703.8.3.4 (IBC [F] 414.2.4) provides a reference to Table 2703.8.3.2 (IBC [F] Table 414.2.2) for specific fire-resistance rating requirements based on the building story level.

Section 2703.8.3.4 (IBC [F] 414.2.4) also provides a detailed rating requirement for floor assemblies. That provision has been placed in context as a footnote to Table 414.2.2. Many practitioners determine technical requirements from tables without consulting charging text. Placing all applicable fire-resistive rating requirements in the same location will reduce the possibility of oversight. Additionally, several editorial changes have been made. The word "requirements" has been removed from Sections 2703.8.3.1 (IBC [F] 414.2.1) and 2703.8.3.4 (IBC [F] 414.2.4) headings. This is to be consistent with other IFC/IBC section headings. Virtually everything in the IFC/IBC is a requirement. This does not need to be stated in section headings. The height of a building is determined based on the number of stories, not the number of floors. Therefore, Table 2703.8.3.2 (IBC [F] Table 414.2.2) column headings have been revised to be consistent with that methodology. Approval of this proposal will assist users in the proper determination of requirements applicable to the design and construction of control areas.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICC FILENAME: KEITH-F1-2703.8.3.1.DOC

F190–09/10
2703.8.3.2 (IBC [F] 414.2.2); 2702.1 (IBC [F] 307.2)

Proponent: Sarah A. Rice, CBO, representing herself

Revise as follows:

2703.8.3.2 (IBC [F] 414.2.2) Percentage of maximum allowable quantities. The percentage of maximum allowable quantities of hazardous materials per *control area* allowed at each floor level within a building hall be in accordance with Table 2703.8.3.2. Where the quantity of hazardous material stored in the building is equal to or less than the maximum allowable quantity per control area in Tables 2703.1.1(1) and 2703.1.1(2), the entire building shall be considered a single control area and the maximum allowable quantity of hazardous material shall be permitted to be located anywhere in the building subject to the per-floor limitations of Table 2703.8.3.2.

2702.1 (IBC [F] 307.2) Definitions. The following words and terms shall, for the purposes of this chapter, Chapters 28 through 44 and as used elsewhere in this code, have the meanings shown herein.

CONTROL AREA. A space or spaces within a building where quantities of hazardous materials not exceeding the maximum allowable quantities per control area are stored, dispensed, used or handled. A control area may be an entire building or a portion of a building. See also the definition of AOutdoor control area.@

Reason: The intent of this proposal is to codify IFC Committee Interpretations #51-07 and #52-07. Interpretation #51-07 states that "When the quantity of hazardous material stored in the building is equal to or less than the maximum allowable quantity per control area in Tables 2703.1.1(1) and 2703.1.1(2), the entire building would be considered the control area. When the entire building is the control area, the maximum allowable quantity of material may be located anywhere in the building subject to the per-floor limitations of Table 2703.8.3.2." Interpretation #52-07 states that "When the quantity of hazardous material being stored in each control area is equal to or less than the maximum allowable quantity per control area in Tables 2703.1.1(1) and 2703.1.1(2), the maximum allowable quantity of material per control area may be located anywhere within a multi-story control area, subject to the per-floor limitations of Table 2703.8.3.2."

This proposal revises Section 2703.8.3.2 to clarify that the provisions of Table 2703.8.3.2 are applicable to a multi-story building that is a single control area. The control area definition is also being revised to clarify that an entire building of any height or area can, in fact, be considered a control area

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-G5-414~RENAMED-F1-2703.8.2

F191–09/10
2703.8.5.2, 2703.8.6.2, 2702

Proponent: Lynne M. Kilpatrick, Fire Department, City of Seattle WA

Revise as follows:

2703.8.5.2 Ventilation. Exhausted enclosures shall be provided with an exhaust ventilation system. The ventilation system for exhausted enclosures shall be designed to operate at a negative pressure in relation to the surrounding area. Ventilation systems used for highly toxic and toxic gases shall also comply with Items 1, 2 and 3 of Section 3704.1.2. The ventilation system shall be installed in accordance with the *International Mechanical Code*.

2703.8.6.2 Ventilation. Gas cabinets shall be provided with an exhaust ventilation system. The ventilation system for gas cabinets shall be designed to operate at a negative pressure in relation to the surrounding area. Ventilation systems used for highly toxic and toxic gases shall also comply with Items 1, 2 and 3 of Section 3704.1.2. The ventilation system shall be installed in accordance with the *International Mechanical Code*.

2702.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

GAS CABINET. A fully enclosed, ventilated, noncombustible enclosure used to provide an isolated environment for *compressed gas* cylinders in storage or use. Doors and access ports for exchanging cylinders and accessing pressure-regulating controls are allowed to be included.

Reason: The proposal adds a new sentence in both 2703.8.5.2 and 2703.8.6.2 mandating that an exhaust ventilation system be provided for exhausted enclosures and gas cabinets. Both sections set forth the design criteria for the ventilation systems but neither section clearly requires the ventilation system. This code change proposal also modifies the definition of gas cabinet to clearly state that a gas cabinet is ventilated.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KILPATRICK-F7-2702.DOC

F192–09/10
2703.12

Proponent: Larry Fluer, Fluer, Inc. and Patrick McLaughlin, McLaughlin & Associates, representing the Compressed Gas Association

Revise as follows:

2703.12 Outdoor control areas. Outdoor control areas for hazardous materials in amounts not exceeding the maximum allowable quantity per outdoor control area shall be in accordance with the following:

1. Outdoor control area shall be kept free from weeds, debris and common combustible materials not necessary to the storage. The area surrounding an outdoor control area shall be kept clear of such materials for a minimum of 15 feet (4572 mm).
2. Outdoor control areas shall be located not closer than 20 feet (6096 mm) from a lot line that can be built upon, public street, public alley or public way. ~~A 2-hour fire-resistance-rated wall without openings extending not less than 30 inches (762 mm) above and to the sides of the storage area is allowed in lieu of such distance.~~

   Exceptions:

   1. For solid and liquid hazardous materials, a 2-hour fire-resistance-rated wall without openings extending not less than 30 inches (762 mm) above and to the sides of the storage area shall be allowed in lieu of such distance.
   2. For compressed gas hazardous materials, unless otherwise specified the minimum required distances shall not apply when fire barriers without openings or penetrations having a minimum fire-resistance rating of 2 hours interrupt the line of sight between the storage and the exposure. The configuration of the fire barrier shall be designed to allow natural ventilation to prevent the accumulation of hazardous gas concentrations.

3. Where a property exceeds 10,000 square feet (929 m^2), a group of two outdoor *control areas* is allowed when *approved* and when each *control area* is separated by a minimum distance of 50 feet (15 240 mm).
4. Where a property exceeds 35,000 square feet (3252 m^2), additional groups of outdoor *control areas* are allowed when approved and when each group is separated by a minimum distance of 300 feet (91 440 mm).

Reason: Correlation with requirements for separation provided for various compressed gases as found in Table 3504.2.1 note a; 3704.3.2.1.1; Table 4004.2.2 note a; Table 4104.2.1 note a; and Section 4304.2.3. The wording "unless otherwise specified is intended to recognize that there may be exceptions based on a specific application. For example, Sections 2209.3.1.1 and 2209.3.2.5.1.1 unique to fueling operations where hydrogen gas is utilized recognize the line of sight concept, but height minimums are determined based on specific items of equipment.

Acceptance of this code change will result in correlating requirements generally used for compressed gases without changing established requirements recognized for use with solids and liquids.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FLUER-MCLAUGHLIN-F1-2703.12

F193–09/10
2704.10, 2705.1.6; IBC 901.6.3

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee and Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE FIRE CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE FIRE CODE COMMITTEE.

PART I – IFC

Revise as follows:

2704.10 Supervision and monitoring. Emergency alarm, detection and automatic fire-extinguishing systems required by Section 2704 shall be electrically supervised and monitored by an *approved* ~~central, proprietary or remote~~ supervising station ~~service~~ or, when approved, shall initiate an audible and visual signal at a constantly attended on-site location.

2705.1.6 Supervision and monitoring. Manual alarm, detection and automatic fire-extinguishing systems required by other provisions of Section 2705 shall be electrically supervised and monitored by an *approved* ~~central, proprietary or remote station~~ supervisory service or, when approved, shall initiate an audible and visual signal at a constantly attended on-site location.

PART II – IBC FIRE SAFETY

901.6.3 Group H. ~~Manual fire alarm, automatic fire-extinguishing and emergency alarm systems in Group H occupancies shall be monitored by an *approved* supervising station.~~
~~**Exception:** When *approved* by the *building official*, on-site monitoring at a *constantly attended location* shall be permitted provided that notifications to the fire department will be equal to those provided by an *approved* supervising station.~~ Supervision and monitoring of emergency alarm, detection and automatic fire-extinguishing systems in Group H occupancies shall be in accordance with the *International Fire Code*.

Reason: The purpose of this proposal is twofold. First, it will provide correlation between the fire code and the building code. Second, it will correlate the monitoring and supervision requirements in Chapter 27 and IBC 901.6.3 with the revisions that occurred in the 2007 Supplement.

Supervision is when the electrical integrity of the wiring system and device is checked and reported as a trouble when a fault occurs. Supervision is done on-site with a local control panel. Monitoring is when a fire protection system or fire alarm control panel sends a signal to another location such as to a central station.

Therefore, the following revisions occur:

1. The section title is revised to include supervision and monitoring.
2. The term “approved supervisory service” is utilized to replace “central station, proprietary station, or remote station”. This change occurred in the 2007 Supplement in Section 903.4.1. The term “approved supervisory service” includes central station, proprietary station, and remote station services.
3. Both IBC 901.6.3 and the IFC requiring monitoring, but they say it in a different fashion. IBC Section 901.6.3 is revised to make a simple reference to the IFC. This will maintain the correlation between the IBC and the requirements in IFC 2704.10.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F19-2704.10.DOC

F194–09/10
2705.1, 2705.2.1.1; IMC [F] 502.8.4

Proponent: Kenneth Kretchman, NC State University, representing the American Industrial Hygiene Association

1. Revise IFC as follows:

2705.1 General. Use, dispensing and handling of hazardous materials in amounts exceeding the *maximum allowable quantity per control area* set forth in Section 2703.1 shall be in accordance with Sections 2701, 2703 and 2705. Use, dispensing and handling of hazardous materials in amounts not exceeding the *maximum allowable quantity per control area* set forth in Section 2703.1 shall be in accordance with Sections 2701 and 2703.

Exception: Indoor dispensing and use in any amount of hazardous materials in open containers or systems shall be ventilated in accordance with Section 2705.2.1.1.

2705.2.1.1 Ventilation. Where gases, liquids or solids having a hazard ranking of 3 or 4 in accordance with NFPA 704 will be ~~are~~ dispensed or used in a manner which could result in personnel exposures in excess of levels established in DOL 29 CFR 1910.1000, Table Z-1,Z-2, and Z-3 or other regulatory airborne exposure limits established in their jurisdiction, mechanical exhaust ventilation shall be provided to capture these gases, fumes, mists or vapors at the point of generation.

Exception: Gases, liquids or solids that can be demonstrated not to create harmful gases, fumes, mists or vapors which could result in exposures in excess of levels established in DOL 29 CFR 1910.1000, Tables Z-1,Z-2, and Z-3 or other regulatory airborne exposure limits established in their jurisdiction or can demonstrate that other forms of exhaust ventilation or other control methodologies will effectively limit exposures.

2. Revise IMC as follows:

[F] 502.8.4 Indoor dispensing and use-point sources. Where gases, liquids or solids having a hazard rating of 3 or 4 in accordance with NFPA 704 will be ~~are~~ dispensed or used in a manner which may result in personnel exposures in excess of levels established in DOL 29 CFR 1910.1000, Table Z-1,Z-2, and Z-3 or other regulatory airborne exposure limits established in their jurisdiction, ~~in amounts exceeding the maximum allowable quantity per control area and having a hazard ranking of 3 or 4 in accordance with NFPA 704,~~ mechanical exhaust ventilation shall be provided to capture these gases, fumes, mists or vapors at the point of generation.

Exception: Where it can be demonstrated that the gases, liquids, or solids do not create harmful gases, fumes, mists, or vapors which may result in exposures in excess of levels established in OSHA 29 CFR 1910.1000, Tables Z-1,Z-2, and Z-3 or other regulatory airborne exposure limits established in their jurisdiction or can demonstrate that other forms of exhaust ventilation or other control methodologies will effectively limit exposures.

Reason: The limitation of applying this engineering approach to those substances rated 3 or 4 only when in amounts in excess of allowable control area storage and use limits can easily result in a final design that neglects adequate control of emissions resulting in overexposures and also can result in the need for costly retrofits to achieve safety and energy efficiency goals. Conversely, requiring point of generation exhaust for all operations within a control area where quantities are exceeded may represent the unnecessary cost of additional ventilation where not needed.

As stated in the 2006 Commentary to the International Mechanical Code, "The intent of this section is to ensure that hazardous vapors and fumes are captured and exhausted at the point where the materials are being dispensed or used rather than allowing them to disperse into the room where occupants could be exposed to the harmful effects. According to this section, this form of controls required only where the materials have an NFPA 704 hazard ranking of 3 or 4 and also exceed the maximum allowable amount for the control area." While the first sentence in this reference is well stated and addresses an important issue, employee or public overexposures to hazardous materials can readily occur in a location within a control area even though each hazardous material in that control area is within its allowable storage and use quantities. The added text referencing DOL/OSHA exposure limits is consistent with the language provided in 502.19 (Indoor firing ranges) recognizing that regulations exist which limit airborne exposures to hazardous materials.

The edit to the Exception recognizes both that very slight airborne emissions, even though class 3 or 4 rated, may not need point of generation ventilation or that other control methodologies may also be effective, leaving the registered design professional and the design team the ability to select the most appropriate control method.

Retroactive engineering efforts are in effect at many institutions to add or modify existing mechanical exhaust systems to point of generation exhaust to reduce operating costs as this method will typically utilize less exhaust than dilution ventilation. This approach has the primary safety value of capturing the contaminant before it reaches the persons breathing zone, providing both safety and energy savings benefits. (The Specific Operations section of the Industrial Ventilation Manual, published by the American Conference of Governmental Industrial Hygienists, provides examples of long established design methodologies to capture contaminants at the point of generation, customized for particular processes, and is a useful tool for designers).

Cost Impact: None and reduction in ongoing energy consumption costs in many cases.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KRETCHMAN-F1-2705.1

F195–09/10
3006

Proponent: Lynne M. Kilpatrick, Fire Department, City of Seattle, WA

Delete section without substitution:

~~**SECTION 3006**~~
~~**MEDICAL GAS SYSTEMS**~~

Reason: Section 3006 requires confinement of compressed medical gases intended for inhalation or sedation in quantities exceeding the permit threshold to a one-hour 'med gas' room equipped with at least one sprinkler head. Further, existing text clarifies that a Group H Occupancy is required when quantities of medical gases in the one-hour 'med gas' room that are also hazardous materials exceed the MAQ set forth in Chapter 27 (e.g. 1500 cu ft oxidizing gases in unsprinklered buildings; 3000 cu ft oxidizing gases in sprinkered buildings). This proposal deletes the requirement for the special one-hour 'med gas' room in its entirety and defaults to regulation of the gases in accordance with Chapter 27 and NFPA 99.

Cost Impact: The code change proposal may decrease the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KILPATRICK-F3-3006.DOC

F196–09/10
3301.1, 3301.1.3.1 (New), 3302.1, Chapter 47; IBC [F] 307.2, IBC Chapter 35

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing: American Pyrotechnics Association (APA)

1. Revise the IFC as follows:

3301.1 Scope. The provisions of this chapter shall govern the possession, manufacture, storage, handling, sale and use of explosives, explosive materials, fireworks and small arms ammunition.

Exceptions:

1. The Armed Forces of the United States, Coast Guard or National Guard.
2. Explosives in forms prescribed by the official United States Pharmacopoeia.
3. The possession, storage and use of small arms ammunition when packaged in accordance with DOTn packaging requirements.
4. The possession, storage and use of not more than 1 pound (0.454 kg) of commercially manufactured sporting black powder, 20 pounds (9 kg) of smokeless powder and 10,000 small arms primers for hand loading of small arms ammunition for personal consumption.
5. The use of explosive materials by federal, state and local regulatory, law enforcement and fire agencies acting in their official capacities.
6. Special industrial explosive devices which in the aggregate contain less than 50 pounds (23 kg) of explosive materials.
7. The possession, storage and use of blank industrial power load cartridges when packaged in accordance with DOTn packaging regulations.
8. Transportation in accordance with DOTn 49 CFR Part 100-185.
9. Items preempted by federal regulations.
10. <u>Novelties.</u>

3302.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

EXPLOSIVE. A chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, igniters and display fireworks, 1.3G (Class B, Special).

The term "Explosive" includes any material determined to be within the scope of USC Title 18: Chapter 40 and also includes any material classified as an explosive other than consumer fireworks, 1.4G (Class C, Common) <u>and novelties, 1.4G</u> by hazardous materials regulations of DOTn 49 CFR Parts 100-185.

2. Add new text to the IFC as follows:

3301.1.3.1 Novelties, 1.4G. Novelties, 1.4G shall be regulated as fireworks, 1.4G for the purpose of this code.

3302.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

NOVELTIES. Small pyrotechnic devices not requiring DOTn approval and containing small amounts of pyrotechnic or explosive composition designed to produce limited visible or audible effects and not classified as consumer fireworks, 1.4G or novelties, 1.4G. Such novelties which comply with the labeling regulations of the US Consumer Product Safety Commission as set forth in CPSC 16 CFR: Parts 1500 and 1507 are not explosive materials for the purpose of this code.

NOVELTIES, 1.4G. Small pyrotechnic devices approved by DOTn and containing small amounts of pyrotechnic or explosive composition designed to produce limited visible or audible effects and not classified as consumer fireworks, 1.4G. Such 1.4G novelties which comply with the construction, chemical composition, and labeling regulations of American Pyrotechnics Association Standard 87-1 and the US Consumer Products Safety Commission as set forth in CPSC 16 CFR: Parts 1500 and 1507 are not explosive materials for the purpose of this code.

3. Revise the IBC as follows:

IBC [F] 307.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

EXPLOSIVE. A chemical compound, mixture or device, the primary or common purpose of which is to function by explosion. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators, safety fuses, squibs, detonating cord, igniter cord, igniters and display fireworks, 1.3G (Class B, Special).

The term "Explosive" includes any material determined to be within the scope of USC Title 18: Chapter 40 and also includes any material classified as an explosive other than consumer fireworks, 1.4G (Class C, Common) and novelties, 1.4G by hazardous materials regulations of DOTn 49 CFR Parts 100-185.

4. Add new text to the IBC as follows:

IBC [F] 307.2 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

NOVELTIES, 1.4G. Small pyrotechnic devices approved by DOTn and containing small amounts of pyrotechnic or explosive composition designed to produce limited visible or audible effects and not classified as consumer fireworks, 1.4G. Such 1.4G novelties which comply with the construction, chemical composition, and labeling regulations of American Pyrotechnics Association Standard 87-1 and the US Consumer Products Safety Commission as set forth in CPSC 16 CFR: Parts 1500 and 1507 are not explosive materials and shall be regulated as fireworks, 1.4G for the purpose of this code.

5. Add new referenced standard to IFC Chapter 47 and IBC Chapter 35 as follows:

APA
American Pyrotechnics Association
Post Office Box 30438
Bethesda, MD 20824

87-1 (2001)	Standard for Construction and Approval for Transportation of Fireworks, Novelties, and Theatrical Pyrotechnics

Reason: Items 1 and 2: The purpose of this proposed code change is to close a loophole in the current requirements in Chapter 33 that regulate consumer fireworks, 1.4G. There is another class of similar fireworks items with a lesser hazard that are classified as novelties, 1.4G. These items, in general, have less pyrotechnic and/or explosive composition than consumer fireworks, 1.4G so they are less of a fire and life safety hazard. However, they are still regulated by the DOTn and are also required to meet the labeling requirements of the CPSC for consumer fireworks, 1.4G. This information can be found in Section C.3.2 Novelty of American Pyrotechnics Association APA Standard 87-1 which is being proposed as a referenced standard. APA Standard 87-1 is titled "Standard for Construction and Approval for Transportation of Fireworks, Novelties, and Theatrical Pyrotechnics." APA Standard 87-1 comprises Annex C of NFPA 1124-2006, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnics Articles. It is also referenced by the DOTn in Title 49, CFR, 171-180 and by the CPSC in Title 16, CFR, 1000 to End. It is available from both the federal government and the APA.

This code change proposal also clarifies that novelties which are not classed as novelties, 1.4G because they do not require DOTn approval and they are not regulated as explosives by the DOTn are exempt from the requirements of Chapter 33. However, they are still required to comply with the labeling regulations of the US Consumer Products Safety Commission as set forth in CPSC 16, CFR: Parts 1500 and 1507.

New definitions have also been provided for "Novelties" and "Novelties, 1.4G" in order to help implement this code change proposal.

The proposed new definition for "Novelties" is necessary so the term can be referenced in this code change proposal in order to specifically exempt "novelties" from the requirements of Chapter 33. This will make the International Fire Code consistent with the DOTn regulations which do not require approval of novelties meeting the specific requirements of Section C.3.2 of APA Standard 87-1. In fact, such novelties are not regulated by the DOTn as explosives, although they are still required to comply with CPSC labeling requirements for consumer fireworks. Such "novelties" contain very small amounts of pyrotechnic and/or explosive compositions which for transportation purposes are not considered to be a fire or explosion hazard in their manufactured form.

The proposed new definition for "Novelties, 1.4G" is based on the definition contained in Section C.2.12 Novelty of the American Pyrotechnics Association APA Standard 87-1.

Items 3 and 4: The purpose of this proposed code change is to close a loophole in the current requirements that regulate consumer fireworks, 1.4G. There is another class of similar fireworks items with a lesser hazard that are classified as novelties, 1.4G. These items, in general, have less pyrotechnic and/or explosive composition than consumer fireworks, 1.4G so they are less of a fire and life safety hazard. However, they are still regulated by the DOTn and are also required to meet the labeling requirements of the CPSC for consumer fireworks, 1.4G.

A new definition has also been provided for "Novelties, 1.4G" in order to help implement this code change proposal. This proposed new definition for "Novelties, 1.4G" is based on the definition contained in Section C.2.12 Novelty of the American Pyrotechnics Association APA Standard 87-1, Standard for Construction and Approval for Transportation of Fireworks, Novelties, and Theatrical Pyrotechnics which is being proposed as a referenced standard. APA Standard 87-1 comprises Annex C of NFPA 1124-2006, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnics Articles. It is also referenced by the DOTn in Title 49, CFR, 171-180 and by the CPSC in Title 16, CFR, 1000 to End. It is available from both the federal government and the APA. Additional information can also be found in Section C.3.2 Novelty of APA Standard 87-1.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, APA 87-1 (2001), for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THORNBERRY-F1-3301 COMBINED W-G3-307.2

F197–09/10
Table 3301.8.1(3)

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing American Pyrotechnics Association (APA)

Revise table note as follows:

TABLE 3301.8.1(3)
APPLICATION OF SEPARATION DISTANCE (Q-D) TABLES—DIVISION 1.4 EXPLOSIVES[a,b,c,d]

d. This table shall not apply to consumer fireworks, 1.4 G and novelties, 1.4G.

(Portions of table and notes not shown remain unchanged)

Reason: The purpose of this code change proposal is to include novelties, 1.4G in the same category of hazard as consumer fireworks, 1.4G for the purpose of exempting them from the application of this table for separation distances for Division 1.4 explosives. In general, novelties are no more of a fire and explosion hazard than consumer fireworks and in many cases are even less of a hazard if they are considered novelties exempt from DOTn approval and classification as explosives.

Novelties are classified and defined in the American Pyrotechnics Association APA Standard 87-1, Standard for Construction and Approval for Transportation of Fireworks, Novelties, and Theatrical Pyrotechnics. It can be found in Annex C of NFPA 1124-2006, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles. APA Standard 87-1 is also referenced by the DOTn in Title 49, CFR 171-180 and by the CPSC in Title 16, CFR 1000 to the End. It is available from the federal government, as well as the APA. A separate code change proposal has been submitted to define novelties and clarify how Chapter 33 should address them in relationship to their relative hazard compared to consumer fireworks, 1.4G.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change F196-09/10 proposes to add a definition for "Novelties, 1.4G"

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THORNBERRY-F4-T3301.8.1(3).DOC

F198–09/10
Table 3304.3

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing American Pyrotechnics Association (APA)

Revise table note as follows:

TABLE 3304.3
STORAGE AMOUNTS AND MAGAZINE REQUIREMENTS FOR EXPLOSIVES, EXPLOSIVE MATERIALS AND FIREWORKS, 1.3G MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA

c. This table shall not apply to consumer fireworks, 1.4G and novelties, 1.4G.

(Portions of table and notes not shown remain unchanged)

Reason: The purpose of this code change proposal is to include novelties, 1.4G in the same category of hazard as consumer fireworks, 1.4G for the purpose of exempting them from the application of this table for separation distances for Division 1.4 explosives. In general, novelties are no more of a fire and explosion hazard than consumer fireworks and in many cases are even less of a hazard if they are considered novelties exempt from DOTn approval and classification as explosives.

Novelties are classified and defined in the American Pyrotechnics Association APA Standard 87-1, Standard for Construction and Approval for Transportation of Fireworks, Novelties, and Theatrical Pyrotechnics. It can be found in Annex C of NFPA 1124-2006, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles. APA Standard 87-1 is also referenced by the DOTn in Title 49, CFR 171-180 and by the CPSC in Title 16, CFR 1000 to the End. It is available from the federal government, as well as the APA. A separate code change proposal has been submitted to define novelties and clarify how Chapter 33 should address them in relationship to their relative hazard compared to consumer fireworks, 1.4G.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change F196-09/10 proposes to add a definition for “Novelties, 1.4G”

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THORNBERRY-F5-T3304.3.DOC

F199–09/10
Table 3304.5.2(3)

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing American Pyrotechnics Association (APA)

Revise table note as follows:

TABLE 3304.5.2(3)
TABLE OF DISTANCES (Q-D) FOR BUILDINGS AND MAGAZINES CONTAINING EXPLOSIVES—DIVISION 1.4[c]

c. Restricted to articles, including articles packaged for shipment, that are not regulated as an explosive under Bureau of Alcohol, Tobacco and Firearms regulations, or unpacked articles used in process operations that do not propagate a detonation or deflagration between articles. This table shall not apply to consumer fireworks, 1.4G and novelties, 1.4G.

(Portions of table and notes not shown remain unchanged)

Reason: The revision to the title of the table is editorial. This correlates the title of the table with the subject of Section 3304.5.2 Outdoor Magazines that references the table.

This code change proposal also includes novelties, 1.4G in the same category of hazard as consumer fireworks, 1.4G for the purpose of exempting them from the application of this table for separation distances for Division 1.4 explosives. In general, novelties are no more of a fire and explosion hazard than consumer fireworks and in many cases are even less of a hazard if they are considered novelties exempt from DOTn approval and classification as explosives.

Novelties are classified and defined in the American Pyrotechnics Association APA Standard 87-1, Standard for Construction and Approval for Transportation of Fireworks, Novelties, and Theatrical Pyrotechnics. It can be found in Annex C of NFPA 1124-2006, Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles. APA Standard 87-1 is also referenced by the DOTn in Title 49, CFR 171-180 and by the CPSC Title 16, CFR 1000 to the End. It is available from the federal government, as well as the APA. A separate code change proposal has been submitted to define novelties and clarify how Chapter 33 should address them in relationship to their relative hazard compared to consumer fireworks, 1.4G.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change F196-09/10 proposes to add a definition for “Novelties, 1.4G”

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: THORNBERRY-F7-T3304.5.2(3).DOC

F200–09/10
3402.1

Proponent: Jesse J. Beitel, Hughes Associates, Inc. representing Bode Chemie GmbH and Medline Industries, Inc. and Thomas W. Jaeger, PE, Jaeger & Associates, LLC, representing GOJO Industries, Inc.

Revise definition as follows:

3402.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

ALCOHOL-BASED HAND RUB. An alcohol-containing preparation designed for application to the hands for reducing the number of viable microorganisms on the hands and containing ethanol or isopropanol in an amount not exceeding ~~70~~ 95 percent by volume.

Reason: Beitel: Alcohol-based hand rubs are defined in Section 3402.1 of the IFC and their use is regulated by Section 3405.5 of the IFC. This Code proposal requests that the limit for the alcohol content of these materials be increased from 70% to 95%. No changes are being requested to Section 3405.5.

This change is to recognize the necessity for higher concentrations of alcohol in Hand and Surgical Hygiene products (alcohol-based hand rubs) in order to provide much needed improved efficacy against relevant pathogens

Actions by respected world-wide health organizations are specifically calling for higher concentrations of alcohol (higher than 70% v/v limit of the IFC) in order to better combat evolving multi-drug resistant bacteria such as MRSA and VRE (so-called “super bugs’) and to have sufficient efficacy against relevant viruses like Influenza A, HIV, Hepatitis, RSV, Rhino, Rota and Adenovirus. Increasingly, we live in a world facing real dangers from potential epidemic and pandemic viruses such as norovirus, SARS, H5N1 Avian Influenza "bird flu" and H1N1 "swine flu" viruses.

Published in 1994 [1] and later reinforced by the CDC in its 2002 "Guideline for Hand Hygiene in Health-Care Settings,” [2] the FDA defined antiseptic handwash or healthcare personnel handwash active ingredients as “Alcohol 60 to 95% by volume.”

Clinical Microbiology Review [3] reports, “Higher concentrations of ethanol (e.g., 95%) generally have better virucidal activity than do lower concentrations, such as 60 to 80%...Preparations containing less than 85% ethanol are usually less effective against viruses.”

While there is some scientific debate over the upper limit for the most effective alcohol concentration (90 – 95%), there is very little question that stronger, more effective higher concentration (above 70% v/v) alcohol-based antiseptics is needed. This need is clearly recognized by the FDA, CDC and other world health organizations.

Alcohol-based hand antiseptics with concentrations above 70% and up to the FDA limit of 95% v/v will play a critical role to protect healthcare workers, hospital patients and long-term care residents against the threat of healthcare acquired infection. Emerging community-acquired strains of multi-drug resistant bacteria (ex. Ca-MRSA) and the very real threat of pandemic make development of and access to hand antiseptic products with alcohol concentrations above 70% v/v and up to 95% a healthcare necessity.

Originally, when this issue was introduced into the IFC, the fire aspect was addressed via a fire modeling study which established that the 1.2-liter size for corridors and the 2-liter size for rooms was an acceptable hazard.

Since that time additional testing and modeling have been conducted by Hughes Associates, Inc. In order to evaluate potential differences in fire characteristics, four products were evaluated based on the formation of pool fires using 1.2 L of each hand-rub. The 1.2 L volume is currently allowed by the codes for a single station of hand-rub. Calculations were performed to determine heat release and burn time for each hand-rub. The calculations were conducted using equations and formulas provided in the SFPE Handbook of Fire protection Engineering [4] and as required, data from the ASTM E1354 tests. The results are provided in Table I.

Table I. – Pool Fire Calculations

Specimen	Formula	Heat release (kW)	Burn Time (sec)
Commercial Product A	85% ETOH (w/w)	240	95
Commercial Product B	62% ETOH (v/v) plus 5% Isopropanol	146	117
Commercial Product C	70% ETOH plus 10% Isopropanol	146	119
Non-commercial test sample	95% ETOH (v/v)	282	83

As shown in Table I, there is an increase in fire size due to the increased percentage of ethanol in the hand-rubs. However, all formulations are well within the range of incidental fires associated with small portable items (trash bags, cartoned materials, cushions, etc.) that are routinely found in medical facilities and elsewhere. [5] Additionally, the hand-rubs with the higher ethanol content exhibit comparable flame heights and shorter burn times than currently allowed 60–70% hand-rubs. As a point of perspective, the increase in fire size is equivalent to approximately one 2.5 lb. trash bag.

Flame heights associated with these spills were calculated and found to be a small fraction of the spill diameter. Under these conditions, the flames break up into individual flamelets, such that flame height is not dependent upon the heat release rate as is the case with larger fires [6]. As such, the ability of the spill fire to ignite a second object is not directly impacted by the change in ethanol content. Further testing has shown that radiant heat exposures from alcohol pool fires are low. A pool fire of 95% Ethanol provided a peak radiant heat flux of 9 kW/m^2 for a short period of time. This heat flux is well below the typical minimum 12 kW/m^2 critical flux value for ignition of most materials.

In summary, fire test data shows that while there is some increase in the flammability of alcohol-based hand rubs with higher alcohol content, the increase is not a significant increase above the currently allowed materials. Based on the health benefits of the higher alcohol content hand rubs, and their limited increase to the overall fire hazard, it is recommended that this Code proposal be adopted.

Bibliography:

1. Annonymous, 1994. Tentative Final Monograph for health-care antiseptic products; proposed rule, Federal Register 59:31401-31452;
2. Guideline for Hand Hygiene in Health-Care Settings, Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force" published in the Morbidity and Mortality Weekly Report, Recommendations and Reports October 25, 2002 / Vol. 51 / No. RR-16.
3. CLINICAL MICROBIOLOGY REVIEWS, Oct. 2004, p. 876 Epidemiologic Background of Hand Hygiene and Evaluation of the Most Important Agents for Scrubs and Rubs, Gunter Kampf and Axel Kramer
4. Gottuk, D., and White D., "Liquid Fuel Fires," Chapter 2-15, *SFPE Handbook of Fire Protection Engineering*, 4th Edition, National Fire Protection Association, Quincy, MA, pp 2-337 to 2-355.
5. Babrauskas, V., "Heat Release Rates," Chapter 3-1, *SFPE Handbook of Fire Protection Engineering*, 4th Edition, National Fire Protection Association, Quincy, MA, pp 3-46.
6. Heskestad, G., "Luminous Heights of Turbulent Diffusion Flames," *Fire Safety Journal*, **5** (1983) pp 103–108.

Reason: Jaeger: I was the project manager for the 2003 Gage Babcock & Associates study that was the basis for the code requirements for the alcohol-based hand rubs (ABHR) in health care facilities. At the time of the study, all ABHR's were 70% or less alcohol by volume based on European studies and use in Europe for the previous 25 years. In the past 6 years the regulatory and infection control arenas for ABHR's have changed and the demand for higher levels of alcohol in the products has emerged. World-wide health organizations are now recommending higher percentages of alcohol and therefore the market is demanding ABHR's with a higher percentage of alcohol. US customers have watched the international debate and are requesting a broader variety of products at various alcohol levels including products in the 70-95% level.

The consensus of the experts in the area of infection control is that there is an upper limit on efficacy as to the percentage of alcohol, somewhere around 90-95%. There are some data to suggest that higher percentages above 70% are more effective against some important infectious organisms. In order to protect the patients and staff of health care facilities, we need to add the option of higher alcohol levels within the fire code. Infections contacted in hospital and nursing homes is one of the largest causes of patient deaths in these facilities. At the time of the 2003 study, the Center for Disease Control (CDC) data showed that in hospitals alone, 90,000 patients died per year from infections contacted within the hospital.

Additional fire testing and modeling have been conducted since the 2003 work of Gage Babcock by Hughes Associates, Inc. Please see the proposal and substantiation for revising Section 3402.1 submitted by Jesse Beitel of Hughes Associates, Inc. As expected, the increased alcohol content of the ABHR's resulted in some increase in the flammability of the ABHR's, but the increase was minor compared to the 70% currently allowed in the Code. The results of the Hughes' study are consistent with the 2003 Gage Babcock study in that the 1.2 liters of alcohol burns off quickly and has a very low potential to ignite other objects.

Health care facilities have many risks that need to be addressed other than the risk of fire, one of these being infections. In 2003, the studies showed that the hazard of installing limited quantities of ABHR's in health care facilities along with the other requirements in Section 3405.5 rightfully did not significantly increase the risk to the occupants of health care facilities. The current Hughes study again documents that even with an increase of the alcohol content from 70% to 95%, the increase in the fire risk is minimal and justified to adequately address the hazard of infections.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEITEL-F2-3402.1.DOC

F201–09/10
Table 3403.1.1

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Revise table as follows:

TABLE 3403.1.1
CLASS I ELECTRICAL EQUIPMENT LOCATIONS[a]

LOCATION	GROUP D DIVISION	EXTENT OF CLASSIFIED AREA
Pumps, bleeders, withdrawal fittings, meters and similar devices		
Indoor	2	Within 5 feet of any edge of such devices, extending in all directions. Also up to 3 feet above floor or grade level within 25 feet horizontally from any edge of such devices.
Outdoor	2	Within 3 feet of any edge of such devices, extending in all directions. Also up to 18 inches above floor or grade level within 10 feet horizontally from an edge of such devices.
Tank vehicle and tank car[b]		
Loading through open dome	1	Within 3 feet of edge of dome, extending in all directions.
	2	Area between 3 feet and 15 feet from edge of dome, extending in all directions.
Loading through bottom connections with atmospheric venting	1	Within 3 feet of point of venting to atmosphere, extending in all directions.
	2	Area between 3 feet and 15 feet from point of venting to atmosphere, extending in all directions. Also up to 18 inches above grade within a horizontal radius of 10 feet from point of loading connection.
~~Office and restrooms~~	~~Ordinary~~	~~Where there is an opening to these rooms within the extent of an indoor classified location, the room shall be classified the same as if the wall, curb or partition did not exist.~~
Loading through closed dome with atmospheric venting	1	Within 3 feet of open end of vent, extending in all directions.
	2	Area between 3 feet and 15 feet from open end of vent, extending in all directions. Also within 3 feet of edge of dome, extending in all directions.
Loading through closed dome with vapor control	2	Within 3 feet of point of connection of both fill and vapor lines, extending in all directions.
Bottom loading with vapor control or any bottom unloading	2	Within 3 feet of point of connection, extending in all directions. Also up to 18 inches above grade within a horizontal radius of 10 feet from point of connection.
Office and restrooms	Ordinary	Where there is an opening to these rooms within the extent of an indoor classified location, the room shall be classified the same as if the wall, curb or partition did not exist.

(Portions of table and notes not shown do not change)

Reason: Revision #1 – Pumps and devices: This revision is made because the current wording does not make sense. Part of the sentence has been lost and this correction will provide the appropriate diameter to be used with the height of 18". This revision will also provide consistency with NFPA 30 Table 7.3.3.

Revision #2 – Office and restrooms: This revision moves the requirement for protecting offices and restrooms when they are part of a facility requiring classified electrical. The issue of office and restrooms is not specific to the heading of "tank cars". It is a situation that applies wherever the office space occurs. Relocating the requirement to its own line will allow offices and restrooms to be treated as ordinary electrical unless they are located within the classified area of a hazard. In that case, the office or restroom would be of the same classification as the room to which it is attached

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: LARIVIERE-F32-T3403.1.1.DOC

F202–09/10
3403.6.5.1 (New), 3404.2.7.9.2 (New)

Proponent: Douglas Horne PE, Clean Vehicle Education Foundation, representing self

Add new text as follows:

3403.6.5.1 Protection from internal corrosion due to galvanic action. In alcohol blended fuel systems fluid–handling components shall be fabricated from materials that mitigate galvanic action. Dissimilar metallic parts that promote galvanic action shall not be joined.

3404.2.7.9.1 Protection from internal corrosion due to galvanic action. Tanks storing alcohol blended fuels shall be fabricated from materials that mitigate galvanic action. Dissimilar metallic parts that promote galvanic action shall not be joined.

Reason: Adds new Sections 3403.6.5.1 and 3404.2.7.9.1 with requirements covering the compatibility of the fuel containment systems materials with the alcohol blended fuels. The wording for this section is similar to wording currently in Sections 3403.6.5 and 3404.2.7.9, which addresses external corrosion, not internal corrosion. Alcohols are polar compounds that exhibit increased moisture absorption, water solubility, polar solvency and solution conductivity relative to gasoline. Alcohol-gasoline blended fuels have unique properties that affect material compatibility and fire response.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HORNE-F1-F2-COMBINED-3403.6.5.1.DOC

F203–09/10
3404.2.7.3.2, 3404.2.9.7.3

Proponent: Steve M. Crothers, Seattle Fire Department, representing Washington State Association of Fire Marshals

Revise as follows:

1. Revise as follows:

3404.2.7.3.2 Vent-line flame arresters and ~~venting devices~~ pressure-vacuum vents. Listed or approved flame arresters or pressure-vacuum (PV) vents that remain closed unless venting under pressure or vacuum conditions shall be installed in normal vents of tanks containing Class IB and IC liquids.

Exception: When determined by the fire code official that the use of such devices can result in damage to the tank.

Vent-line flame arresters and venting devices shall be installed and maintained in accordance with their listings and API 2000. ~~Use of~~ In-line flame arresters in piping systems shall be installed and maintained in accordance with their listing and API 2028. Pressure vacuum vents shall be installed and maintained in accordance with API 2000.

2. Delete without substitution:

~~**3404.2.9.7.3 Flame arresters.** Approved flame arresters or pressure breather valves shall be installed in normal vents.~~

(Renumber subsequent sections)

Reason: The code currently requires that a flame arrester or pressure-vacuum (PV) vent be installed in the normal vent of all protected aboveground tanks containing flammable or combustible liquids but it does not have a similar requirement for other aboveground tanks whose design and construction provides significantly less protection and control than a protected tank. This code change accomplishes several things, it:

1. Correlates the requirement for flame arresters and PV vents so that regardless of the tank type the requirement is the same.
2. Modifies the current provision requiring a flame arrester for all flammable and combustible liquids so that a flame arrester or PV vent is only required for tanks containing Class IB and IC liquids. Because the primary function of a flame arrester is to prevent the unrestricted propagation of flame through flammable gas or vapor mixtures, it is not necessary to install a flame arrester on tanks containing combustible liquids. Additionally, because flame arresters cannot prevent detonation or control flame propagation speeds associated with a detonation (flame speeds greater than the speed of sound), flame arresters are not effective when installed on tanks containing Class IA liquids. This revision establishes a requirement for a tank vent flame arrester only when there is a sound technical reason to provide one.

3. Provides a much needed correlation between the IFC and NFPA 30, *Code for Flammable and Combustible Liquids*, for establishing when flame arresters are required on tank vents.
4. Adds a new exception that allows omitting the use of a tank vent flame arrester in situations where the properties of the liquid can cause the tank to be damaged by use of the device. Properties of some Class IB and IC liquids such as crystallization, polymerization and corrosion can present obstructions in flame arresters that may justify omitting the device.
5. Clarifies that the existing API reference document (API 2028) addresses in-line flame arresters for piping systems. An end-of-line flame arrester is a flame arrester that is mounted at the end of a pipe (flanged or threaded inlet connection) and vents directly to the atmosphere whereas an in-line flame arrester may be mounted upstream of a pressure/vacuum relief vent, or may be located upstream of a specified maximum length of vent piping to atmosphere. Both are approved devices.
6. Addresses maintenance of flame arresters and pressure vacuum vents. Not only is proper installation of these devices important but their maintenance is critical. A blocked or corroded flame arrester can render the device ineffective and lead to catastrophic results. This code change adds a new requirement to maintain flame arresters and PV devices in accordance with their listings and API 2000.

Cost Impact: Costs will decrease since currently any aboveground tank containing Class I, II or III liquids requires a flame arrestor on the normal vent and this proposal will require flame arrestors only on Class I liquid tanks. There could be some cost increase where maintenance of flame arrestors does not currently occur.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CROTHERS-F2-3404.2.9.7.3.DOC

F204–09/10
3404.2.7.4

Proponent: Lynne M. Kilpatrick, Fire Department, City of Seattle, WA, representing Washington State Association of Fire Marshals

Revise as follows:

3404.2.7.4 Emergency venting. Stationary, aboveground tanks shall be equipped with additional venting that will relieve excessive internal pressure caused by exposure to fires. Emergency vents for Class I, II and IIIA liquids shall not discharge inside buildings. The venting shall be installed and maintained in accordance with Section 22.7 of NFPA 30.

Exception<u>s</u>:

1. <u>Tanks larger than 12,000 gallons (45 420 L) in capacity storing Class IIIB liquids which are not within the diked area or the drainage path of Class I or II liquids do not require emergency relief venting.</u>
2. <u>Emergency vents on protected aboveground tanks complying with UL 2085 containing Class II or IIIA liquids are allowed to discharge inside the building.</u>

Reason: UL 2085 protected aboveground tanks are designed and constructed to withstand a two-hour fire test of 2000°F during which no single point temperature may exceed 400°F and the average temperature rise throughout the internal tank can be no greater than 260°F. The largest quantity of Class II or IIIA liquid that can be stored indoors in a UL 2085 tank unprotected by an approved automatic sprinkler system is 660 gallons. Given the stringent testing requirement, and the required sprinkler coverage, activation of the emergency vent is likely only under extreme fire conditions over an extended period of time. Further, NFPA 30 requires that emergency vents placed on vent pipes that extend beyond twelve inches from the tank be reengineered to account for the potential back pressure and ensure activation at the appropriate pressure. It is not unusual to see vent lines extending 30 or 40 feet or more through a building in order to achieve the exterior discharge. Allowing the emergency vent to discharge inside eliminates the need to reengineer the venting and ensures proper sizing and activation of the emergency vent.

Cost Impact: There is a cost savings since emergency vent lines would not be required to extend through buildings to the exterior.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KILPATRICK-F4-3404.2.7.4.DOC

F205–09/10
3404.2.9.5, 3404.2.9.5.1 (New), 3404.2.9.5.2 (New)

Proponent: Steve M. Crothers, Seattle Fire Department, representing Washington State Association of Fire Marshals

Revise as follows:

3404.2.9.5 Above-ground tanks inside of buildings. <u>Above-ground tanks inside of buildings shall comply with Sections 3404.2.9.5.1 and 3404.2.9.5.2.</u>

3404.2.9.5.1 Overfill prevention. Above-ground tanks storing Class I, II and IIIA liquids inside buildings shall be equipped with a device or other means to prevent overflow into the building including, but not limited to: a float valve; a preset meter on the fill line; a valve actuated by the weight of the tank's contents; a low-head pump that is incapable of producing overflow; or a liquid-tight overflow pipe at least one pipe size larger than the fill pipe and discharging by gravity back to the outside source of liquid or to an *approved* location. Tanks containing Class IIIB liquids and connected to fuel-burning equipment shall be provided with a means to prevent overflow into buildings in accordance with Section 3404.2.7.5.8.

3404.2.9.5.2 Fill pipe connections. Fill pipe connections shall be in accordance with Section 3404.2.9.7.7.

Reason: This code change requires that fill pipes on aboveground tanks located inside buildings be equipped with a means to make a direct connection with the tank vehicle's fuel delivery hose. Essentially it requires a camlock or other similar device and prohibits filling a tank located inside a building through the use of a hand held nozzle. This requirement already exists for protected aboveground tanks in Section 3404.2.9.7.7 so a reference in this section establishes parity between protected tanks and other types of tanks.

Cost Impact: Cost will increase for tanks other than protected aboveground tanks.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CROTHERS-F1-3404.2.9.5

F206–09/10
3404.3.6, 3404.3.8.4

Proponent: Patrick A. McLaughlin, McLaughlin & Associates, representing The Sherwin Williams Company

Revise as follows:

3404.3.6 Wholesale and retail sales uses. Flammable and combustible liquids in Group M occupancy wholesale and retail sales uses shall be in accordance with Sections 3404.3.6.1 through 3404.3.6.5, or Sections 10.10.2, 12.3.8, 16.4.1 through 16.4.3, 16.5.1 through 16.5.2.12, Tables 16.5.2.1 through ~~16.5.2.6~~ 16.5.2.12, and Figures 16.4.1 (a) through (c) of NFPA 30.

3404.3.8.4 Fire-extinguishing systems. Liquid storage warehouses shall be protected by automatic sprinkler systems installed in accordance with Chapter 9 and Tables 3404.3.6.3(4) through 3404.3.6.3(7) and Table 3404.3.7.5.1, or Sections 16.4.1 through 16.4.3, 16.5.1 through 16.5.2.12, and Tables 16.5.2.1 through ~~16.5.2.6~~ 16.5.2.12 and Figures 16.4.1 (a) through (c) of NFPA 30. In-rack sprinklers shall also comply with NFPA 13.

Automatic foam-water systems and automatic AFFF water sprinkler systems shall not be used except when approved.

Protection criteria developed from fire modeling or full-scale fire testing conducted at an approved testing laboratory are allowed in lieu of the protection as shown in Tables 3404.3.6.3(2) through 3404.3.6.3(7) and Table 3404.3.7.5.1 when approved.

Reason: NFPA 30 was completely reorganized in the 2008 edition. Staff editorially updated the section but did not include all the sprinkler designs because they were not previously referenced by the IFC. This proposal adds the additional designs with protection criteria and storage arrangements for flammable and combustible liquids.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCLAUGHLIN-F2-3404.3.6-REVISED.DOC

F207–09/10
Table 3404.3.6.3(5)

Proponent: Patrick A. McLaughlin, McLaughlin & Associates, representing The Sherwin Williams Company

Revise table as follows:

TABLE 3404.3.6.3(5)
AUTOMATIC SPRINKLER PROTECTION REQUIREMENTS FOR RACK STORAGE OF LIQUIDS IN METAL CONTAINERS OF 5-GALLONS CAPACITY OR LESS WITH OR WITHOUT CARTONS ON COVENTIONAL WOOD PALLETS

I and II (maximum 14-foot storage height) (maximum three tiers)	0.55[c]	2000 ~~b~~[b,d]	Not Applicable	100 ft^2/head	Not Applicable None for maximum 6-foot-deep racks	Not Applicable	Not Applicable	Not Applicable	500	2

(Portions of table and notes not shown remain unchanged)

Reason: Footnote "b" allows for a maximum 30 ft. ceiling for Class I and II liquids stored up to 14 feet high with up to three tier. The large-scale fire testing conducted at Underwriters Laboratories by Sherwin-Williams supporting these storage and protection arrangements for Class I and II liquids was conducted under an 18 ft. ceiling. Therefore, the increased ceiling height (i.e. 30 ft.) option noted by footnote "b" should be deleted, subject to further research and testing.

Cost Impact: The code change proposal does not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCLAUGHLIN-F7-T3404.3.6.3(5)

F208–09/10
3405.2.4

Proponent: Ronald Keefer, Menlo Park Fire District, representing California Fire Chiefs Association

Revise as follows:
3405.2.4 Class I, II and III liquids. Class I liquids or <u>when heated to above their flash points</u>, Class II and Class III liquids ~~that are heated up to or above their *flash points*~~ shall be transferred by one of the following methods:

1. From safety cans complying with UL 30.
2. Through an *approved* closed piping system.
3. From containers or tanks by an *approved* pump taking suction through an opening in the top of the container or tank.
4. For Class IB, IC, II and III liquids, from containers or tanks by gravity through an *approved* self-closing or automatic-closing valve when the container or tank and dispensing operations are provided with spill control and secondary containment in accordance with Section 3403.4. Class IA liquids shall not be dispensed by gravity from tanks.
5. *Approved* engineered liquid transfer systems.

Exception: Liquids in containers not exceeding a 5.3-gallon (20 L) capacity.

Reason: The code section applies to Class I regardless of their flashpoint, and Class II and III liquids only when they have been heated to above their flashpoints. As currently written, it can be easily misinterpreted as applying to all Class I, II, or III Liquids when they have been heated to above their flashpoints during dispensing. The change is meant to provide clarity only, and is not meant to change the intent of the Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KEEFER-F1-3405.2.4~REVISED.DOC

F209–09/10
3405.2.4

Proponent: Bob Eugene, Underwriters Laboratories Inc.

Revise as follows:

3405.2.4 Class I, II and III liquids. Class I liquids or Class II liquids and Class III liquids that are heated up to or above their flash points, shall be transferred by one of the following methods:

1. From listed and labeled safety cans complying with UL 30 or UL 1313.
2. Through an *approved* closed piping system.
3. From containers or tanks by an *approved* pump taking suction through an opening in the top of the container or tank.
4. For Class IB, IC, II and III liquids, from containers or tanks by gravity through an *approved* self-closing or automatic-closing valve when the container or tank and dispensing operations are provided with spill control and secondary containment in accordance with Section 3403.4. Class IA liquids shall not be dispensed by gravity from tanks.
5. Approved engineered liquid transfer systems.

Exception: Liquids in containers not exceeding a 5.3-gallon (20 L) capacity.

Reason: This proposal accomplishes two things, to clarify that safety cans shall be listed in accordance with UL 30, and to allow listed safety cans listed in accordance with UL 1313 to be used to transfer flammable and combustible liquids.

UL 1313 includes requirements for evaluating nonmetallic safety cans, while UL 30 is meant for metal containers only. The addition of the UL 1313 option is appropriate for situation when flammable and combustible liquids cannot be storage or transferred into metal containers due to corrosive or reaction nature of the metal components of the containers.
Currently, UL 1313 is referenced in Chapter 27 and this will only expand the reference to this section.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-F1-3405.2.4.DOC

F210–09/10
3405.2.4

Proponent: Bob Eugene, Underwriters Laboratories Inc.

Revise as follows:

3405.2.4 Class I, II and III liquids. Class I liquids or Class II liquids and Class III liquids that are heated up to or above their flash points shall be transferred by one of the following methods:

1. From safety cans with UL 30.
2. Through an *approved* closed piping system.
3. From containers or tanks by an *approved* pump taking suction through an opening in the top of the container or tank.
4. For Class IB, IC, II and III liquids, from containers or tanks by gravity through an *approved* self-closing or automatic-closing valve when the container or tank and dispensing operations are provided with spill control and secondary containment in accordance with Section 3403.4. Class IA liquids shall not be dispensed by gravity from tanks.
5. Approved engineered liquid transfer systems.

Exception: Liquids in containers not exceeding a ~~5.3-gallon (20 L)~~ 1.3-gallon (5 L) capacity.

Reason: As written, the exception to this section allows transferring from any type of container up to 5.3 gallons. This appears to be an excessive amount of liquid within any type of container, and conflicts with maximum amount of flammable liquids allowed for portable containers in NFPA 30, Table 9.4.3. By reducing the amount of liquid to a maximum of 1.3 gallons for transferring from a container, this is consistent with the NFPA 30 limits, while still allowing for smaller amounts found in laboratory glassware and other containers.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-F5-3405.2.4-2.DOC

F211–09/10
3405.3.6.1, Chapter 47

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

3405.3.6.1 Cleaning operations. Class IA liquids shall not be used for cleaning. Cleaning with Class IB, IC or II liquids shall be conducted as follows:

1. In a room or building in accordance with Section 3405.3.7; or
2. In a parts cleaner ~~machine~~ listed and labeled in accordance with UL 1204 and approved for the purpose in accordance with Section 3405.3.6.2.

Exception: Materials used in commercial and industrial process-related cleaning operations in accordance with other provisions of this code and not involving facilities maintenance cleaning operations.

2. Add new standard to Chapter 47 as follows:

UL
1204-04 Outline of Investigation for Parts Cleaners

Reason: UL's Subject 1204 Outline of Investigation includes a comprehensive set of construction and performance requirements that are used to evaluate and list parts cleaners. This equipment is reviewed to ensure the use and operation of the equipment provides a safe involvement using the flammable and combustible solvents. Five companies currently have parts cleaners listed.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, UL 1204-04, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-F6-3405.3.6.1.DOC

F212–09/10
3405.4.1

Proponent: Lynne M. Kilpatrick, Fire Department, City of Seattle WA, representing Washington State Association of Fire Marshals

Revise as follows:

3405.4.1 Unit with a capacity of 60 gallons or less. Solvent distillation units used to recycle Class I, II or IIIA liquids having a distillation chamber capacity of 60 gallons (227 L) or less shall be *listed*, *labeled* and installed in accordance with Section 3405.4 and UL 2208.

Exceptions:

~~1. Solvent distillation units installed in dry cleaning plants in accordance with Chapter 12.~~
~~2.~~ 1. Solvent distillation units used in continuous through-put industrial processes where the source of heat is remotely supplied using steam, hot water, oil or other heat transfer fluids, the temperature of which is below the auto-ignition point of the solvent.
~~3. Solvent distillation units *listed* for and used in laboratories.~~
~~4.~~ 2. Approved research, testing and experimental processes.

Reason: As currently written, Section 3405.4.1 Exception 1 exempts solvent distillation units installed in dry cleaning plants in accordance with Chapter 12 from meeting the UL 2208 listing standard. Likewise, exception 4 also exempts solvent distillation units listed for and used in laboratories from meeting the UL 2208 standard. The scope of UL 2208 not only covers solvent distillation units in dry cleaning plants and labs, it also states the units are intended for installation in dry cleaning plants and labs meeting NFPA 32 and NFPA 45 respectively. This proposal eliminates both exception 1 and exception 4 and thus will require solvent distillation units in dry cleaning plants and laboratories unless used for research, testing or experimentation, to meet UL 2008, consistent with units installed elsewhere and the scope of UL 2208.

Cost Impact: The code change proposal may increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: KILPATRICK-F5-3405.4.1.DOC

F213–09/10
3405.5, Chapter 47

Proponent: Thomas W. Jaeger, PE, Jaeger & Associates, LLC, representing GOJO Industries, Inc.

1. Revise as follows:

3405.5 Alcohol-based hand rubs classified as Class I or II liquids. The use of wall-mounted dispensers containing alcohol-based hand rubs classified as Class I or II liquids shall be in accordance with all of the following:

1. The maximum capacity of each dispenser shall be 68 ounces (2 L).
2. The minimum separation between dispensers shall be 48 inches (1219 mm).
3. The dispensers shall not be installed directly adjacent to, directly above or below an electrical receptacle, switch, appliance, device or other ignition source. The wall space between the dispenser and the floor shall remain clear and unobstructed.
4. Dispensers shall be mounted so that the bottom of the dispenser is a minimum of 42 inches (1067 mm) and a maximum of 48 inches (1219 mm) above the finished floor.
5. Dispensers shall not release their contents except when the dispenser is manually activated. Facilities shall be permitted to install and use automatically activated "Touch Free" alcohol based handrub dispensing devices with the following requirements:
   - 5.1. The touch free dispensing system shall be listed as being in compliance with UL/CE 60601-1 and IEC 60601-1-2 for medical devices.
   - 5.2. The facility or persons responsible for the dispensers shall test the dispensers each time a new refill is installed in accordance with the manufacturer's care and use instructions
   - 5.3. Dispensers shall be designed and must operate in a manner that ensures accidental or malicious activations of the dispensing device are minimized. At a minimum, all devices subject to or used in accordance with this section shall have the following safety features:
     - 5.3.1. Any activations of the dispenser shall only occur when an object is placed within four inches of the sensing device.
     - 5.3.2. The dispenser shall not dispense more than the amount required for hand hygiene consistent with label instructions as regulated by the Food and Drug Administration.
     - 5.3.3. An object placed within the activation zone and left in place will cause only one activation.
6. Storage and use of alcohol-based hand rubs shall be in accordance with the applicable provisions of Sections 3404 and 3405.
7. Dispensers installed in occupancies with carpeted floors shall only be allowed in smoke compartments or *fire areas* equipped throughout with an *approved* automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

2. Add new standards to Chapter 47 as follows:

IEC
International Electrotechnical Commission
IEC Central Office
3. ru de Varembe, P.O. Box 131,
CH-1211 GENEVA 20, Switzerland.

60601-1-2:2004 EMC Standards for Electrical Medical Equipment

UL
UL/CE 60601-1-03 Medical Electrical Equipment, Part I: General Requirements for Safety

Reason: Interpretation of the current code varies widely. Some inspectors are allowing touch free dispensing units and consider that placing the hand within the sensing area of the unit meets the intent of manual activation of this section while others have not allowed touch free systems. The proposed revised content above represents the content of a variance obtained with the State Fire Marshal in Ohio. It defines the engineering parameters required for safe operation of touch free systems while ensuring facilities have access to current touch free technologies that promote hand hygiene compliance. Touch free systems have been demonstrated to improve hand hygiene compliance by 20.8%[1]

More and more clients and users are demanding touch free dispensers so that contaminated hands never touch the dispenser and pass infections on to other users of the dispensers. When the original Alcohol-based Hand Rub study and fire modeling was done by Gage Babcock & Associates in 2003 the state of art for dispensers was solely manually operated push type dispensers and the development of the code language currently in all codes is based on the original study and state of the art in 2003. The state of art for dispensers and the demands, requirements of the users and the requirements of the infection control experts now require touch free dispensers.

GOJO Industries manufactures and sells the leading "Touch Free" alcohol based hand sanitizer dispensers in the US. GOJO has placed more than a million dispensers in the US with additional units internationally for PURELL Instant Hand Sanitizer dating back to our first touch free dispenser in 2003. There have been many hand sanitizer refills cycled through these dispensers with no reported fire incidents. This includes gel type formulations and non-aerosol foam units.

As project manager of the original Gage Babcock & Associates study, I consider the proposed change more of an editorial change to recognize current types of new dispensers than a technical change to the Fire Code.

[1]. Larson E. Albrecht S, O'Keefe M., Hand Hygiene in a Pediatric Emergency Department and a Pediatric Intensive Care Unit: Comparison of Use of 2 Dispenser Systems, American Journal of Critical Care July, 2005, Volume 14, no 1 p 304-311

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standards proposed for inclusion in the code, IEC 60601-1-2:2004 and UL/CE 60601-1-03, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: JAEGER-F2-3404.5.DOC

F214–09/10
3501.1, 3502.1, 3504.2.1

Proponents: Robert Boyd, Linde North America, Inc., representing Hydrogen Industry Panel on Codes (HIPOC); Robert J. Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

1. Revise as follows:

3501.1 Scope. The storage and use of flammable gases and flammable cryogenic fluids shall be in accordance with this chapter and NFPA 55. Compressed gases shall also comply with Chapter 30 and cryogenic fluids shall also comply with Chapter 32. Flammable cryogenic fluids shall comply with Section 3506. ~~Bulk hydrogen compressed gas systems and bulk liquefied hydrogen gas systems shall comply with NFPA 55~~. Hydrogen motor fuel-dispensing stations and repair garages and their associated above-ground hydrogen storage systems shall also be designed and constructed in accordance with Chapter 22.

Exceptions:

1. Gases used as refrigerants in refrigeration systems (see Section 606).
2. Liquefied petroleum gases and natural gases regulated by Chapter 38.
3. Fuel-gas systems and appliances regulated under the International Fuel Gas Code other than gaseous hydrogen systems and appliances.
4. Pyrophoric gases in accordance with Chapter 41.

2. Delete definitions without substitution:

3502.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

~~**BULK HYDROGEN COMPRESSED GAS SYSTEM.** An assembly of equipment, consisting of but not limited to, storage containers, pressure regulators, pressure relief devices, vaporizers, manifolds, and piping, with a storage capacity of more than 400 ft^3 (scf) (11 m^3) of compressed hydrogen gas including unconnected reserves integral to the system. The bulk system terminates at the point where the gas supply, at service pressure, first enters the supply line. The containers are either stationary or portable, and the gas is stored as a compressed gas.~~

~~**BULK LIQUEFIED HYDROGEN GAS SYSTEM.** An assembly of equipment, consisting of but not limited to, storage containers, pressure regulators, pressure relief devices, vaporizers, manifolds, and piping, with a storage capacity of more than 39.7 gal (150 L) of liquefied hydrogen including unconnected reserves integral to the system. The bulk system terminates at the point where the gas supply, at service pressure, first enters the supply line. The containers are either stationary or portable, and the gas is stored as a cryogenic fluid.~~

3. Revise as follows:

3504.2.1 Distance limitation to exposures. Outdoor storage or use of flammable compressed gases other than hydrogen shall be located from a lot line, public street, public alley, public way, or building not associated with the manufacture or distribution of such gases in accordance with Table 3504.2.1. The outdoor storage of hydrogen compressed gas shall comply with the separation distances in NFPA 55.

Reason (Boyd): Adding the text and flammable cryogenic fluids to the 1st sentence of Section 3501.1 and the text Flammable cryogenic fluids shall comply with Section 3506. to Section 3501.1 is an editorial clarification for consistency that is proposed based upon the modification of the Chapter 35 title which was changed from "FLAMMABLE GASES" to "FLAMMABLE GASES AND FLAMMABLE CRYOGENIC FLUIDS" in the 2009 edition. The proposed changes increase clarity

Adding the text and NFPA 55 to the 1st sentence of 3501.1 requires the provisions of both Chapter 35 and NFPA 55 be applied to both flammable gases and flammable cryogenic fluids. This is a reversal of the action taken by the committee in the 2009 IFC and this proposal offers a simpler solution with the same basic intent. The term also was removed during the Final Action hearings for the 2009 IFC in order to remove any potential conflict caused by different separation distances in IFC Table 3504.2.1 and the separation distances presented in NFPA 55. The 2009 change also exempted bulk hydrogen compressed gas systems from the rest of IFC Chapter 35 as well. This was a greater effect than is considered appropriate by HIPOC. This 2009/2010 proposal clarifies that compliance with Chapter 35 requirements is required for all storage and use of flammable gases and flammable cryogenic fluids. Any conflict with NFPA 55 separation distance requirements is eliminated by the proposed revisions in Section 3504.2.1 that exclude storage or use of gaseous hydrogen from complying with the separation distances in Table 3504.2.1 and instead requires them to comply with the separation distances in NFPA 55.

The elimination of the definitions of a bulk hydrogen compressed gas system and a bulk liquefied hydrogen gas system simplifies Chapter 35 because the definitions has no other relationship to the code and the requirement to distinguish between bulk and non-bulk hydrogen systems will not be needed for proper application of Chapter 35 requirements, if the other changes in this proposal are accepted.

The Hydrogen Industry requests the IFC Code Development Committee vote in favor of this proposal.

Reason (Davidson-Shuman): Adding the text and flammable cryogenic fluids to the 1st sentence of Section 3501.1 and the text Flammable cryogenic fluids shall comply with Section 3506. to Section 3501.1 is an editorial clarification for consistency that is proposed based upon the modification of the Chapter 35 title which was changed from "FLAMMABLE GASES" to "FLAMMABLE GASES AND FLAMMABLE CRYOGENIC FLUIDS" in the 2009 edition. The proposed changes increase clarity.

Adding the text and NFPA 55 to the 1st sentence of 3501.1 requires the provisions of both Chapter 35 and NFPA 55 be applied to both flammable gases and flammable cryogenic fluids. This is a reversal of the action taken by the committee in the 2009 IFC and this proposal offers a simpler solution with the same basic intent. The term also was removed during the Final Action hearings for the 2009 IFC in order to remove any potential conflict caused by different separation distances in IFC Table 3504.2.1 and the separation distances presented in NFPA 55. However, the 2009 change also was intended to exempt bulk hydrogen compressed gas systems from the rest of IFC Chapter 35 as well, but to properly accomplish that the sentence modified should have been relocated to the exceptions list. This was a greater intended effect than is considered appropriate by HIPOC. This (2009/10) proposal clarifies that compliance with Chapter 35 requirements is required for all storage and use of flammable gases and flammable cryogenic fluids. Any conflict with NFPA 55 separation distance requirements is eliminated by the proposed revisions in Section 3504.2.1 that exclude storage or use of gaseous hydrogen from complying with the separation distances in Table 3504.2.1 and instead requires them to comply with the separation distances in NFPA 55.

The elimination of the definitions of a bulk hydrogen compressed gas system and a bulk liquefied hydrogen gas system simplifies Chapter 35 because the definitions has no other relationship to the code and the requirement to distinguish between bulk and non-bulk hydrogen systems will not be needed for proper application of Chapter 35 requirements, if the other changes in this proposal are accepted.

The approval of this code change will increase the effectiveness of the code for the safe siting of hydrogen storage installations by applying the new NFPA 55 separation distances now that the work to upgrade that standard has been completed for this cycle, and will serve as completion of a stated goal when the hydrogen motor-fueling language was first added to the IFC, i.e., a more appropriate separation distance table will be provided for based upon research and testing.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOYD-F3-DAVIDSON-SHUMAN-F1-3501.1-COMBINED.DOC

F215–09/10

3501.1, 3502.1, 3504.2.1, Table 3504.2.1, 3504.2.1.1, 3504.2.1.2 (New), 3504.2.1.2.1 (New)

Proponents: Larry Fluer, Fluer, Inc. and Patrick McLaughlin, McLaughlin & Associates, representing the Compressed Gas Association

1. Revise as follows:

3501.1 Scope. The storage and use of flammable gases shall be in accordance with this chapter. Compressed gases shall also comply with Chapter 30 and cryogenic fluids shall also comply with Chapter 32. Bulk hydrogen and other bulk flammable compressed gas systems and bulk liquefied hydrogen and other bulk flammable cryogenic fluid gas systems shall comply with NFPA 55. Hydrogen motor fuel-dispensing stations and repair garages and their associated aboveground hydrogen storage systems shall also be designed and constructed in accordance with Chapter 22.

2. Add new definitions as follows:

3502.1 Definitions. The following words and terms shall, for the purposes of this chapter and as used elsewhere in this code, have the meanings shown herein.

BULK FLAMMABLE COMPRESSED GAS SYSTEM. An assembly of equipment, consisting of but not limited to, storage containers, pressure regulators, pressure relief devices, vaporizers, manifolds, and piping, with a storage capacity of more than 5000 ft^3 (scf) (142 m^3) of compressed flammable gas including unconnected reserves integral to the system. The bulk system terminates at the point where the gas supply, at service pressure, first enters the supply line. The containers are either stationary or portable, and the gas is stored as a compressed gas.

BULK FLAMMABLE CRYOGENIC FLUID GAS SYSTEM. An assembly of equipment, consisting of but not limited to, storage containers, pressure regulators, pressure relief devices, vaporizers, manifolds, and piping, with a storage capacity of more than 45 gal (170 L) of flammable cryogenic fluid including unconnected reserves integral to the system. The bulk system terminates at the point where the gas supply, at service pressure, first enters the supply line. The containers are either stationary or portable, and the gas is stored as a cryogenic fluid.

3. Revise as follows:

3504.2.1 Distance limitation to exposures. Outdoor storage or use of non-bulk flammable compressed gases shall be located from ~~a lot line, public street, public alley, public way, or building~~ exposures not associated with the manufacture or distribution of such gases in accordance with Table 3504.2.1.

TABLE 3504.2.1
NON-BULK FLAMMABLE GASES – DISTANCE ~~FROM STORAGE~~ TO EXPOSURES[a]

MAXIMUM AMOUNT PER STORAGE OR USE AREA (cubic feet)	MINIMUM DISTANCE BETWEEN STORAGE OR USE AREAS (feet)[a]	MINIMUM DISTANCE TO LOT LINES OF PROPERTY THAT CAN BE BUILT UPON (feet)[a]	MINIMUM DISTANCE TO PUBLIC STREETS, PUBLIC ALLEYS OR PUBLIC WAYS (feet)	MINIMUM DISTANCE TO BUILDINGS ON THE SAME PROPERTY		
				~~Nonrated construction or openings with 25 feet~~ Less Than 2-Hour Construction	2-hour construction ~~and no openings within 25 feet~~	4-hour construction ~~and no openings within 25 feet~~
0-4,225	5	5	5	5	0	0
4,226 – 21,225	10	10	10	10	5	0
21,126-50,700	10	15	15	20	5	0
50,701 – 84,500	10	20	20	20	5	0
84,501 – ~~or greater~~ 200,000	20	25	25	20	5	0

For SI: 1 foot = 304.8 mm, 1 cubic foot = 0.02832 m^3

a. The minimum required distances shall not apply when fire barriers without openings or penetrations having a minimum fire-resistance rating of 2 hours interrupt the line of sight between the storage and the exposure. The configuration of the fire barrier shall be designed to allow natural ventilation to prevent the accumulation of hazardous gas concentrations.

3504.2.1.1 Weather protection canopies. Where weather protection is provided for sheltering outdoor non-bulk flammable gas storage or use areas, such areas shall be constructed in accordance with Section 2704.13 and the International Building Code. Outdoor storage or use of non-bulk flammable compressed gases shall be located from ~~a lot line, public street, public alley, public way~~ exposures in accordance with Table 3504.2.1 except that Note a of Table 3504.2.1 shall not apply to separation from lot lines, public streets, public alleys or public ways when storage or use areas are sheltered by weather protection.

4. Add new text as follows:

3504.2.1.2 Building openings. Outdoor storage and use of non-bulk flammable gases shall be separated from building openings by 25 feet.

3504.2.1.2.1 Fire barrier. Fire barriers as shown in Note a to Table 3504.2.1 shall be allowed to be used as a means to separate storage and use areas from openings including building exits and the exit discharge.

Reason: Section 3501.1. The section has been expanded to address bulk flammable gas systems, and two new definitions have been provided to address systems (gaseous and liquefied) of this nature. These definitions are based in part on definitions for bulk hydrogen compressed and liquefied gas systems that were added to the last edition of the code. The quantity thresholds used to define the bulk systems for hydrogen have been well established and have a long history of use. For other flammable gases such as methane the 5,000 cubic foot requirement for gaseous systems will correlate the IFC with the approach used by NFPA 55 thereby producing national harmony between the codes. The quantity used for other flammable cryogenic fluid gas systems has been provided based on an equivalent amount of gas using hydrogen as the index for comparison.

Section 3504.2.1: The intent of Section 3504.2.1 was to address non-bulk flammable gas storage. Bulk hydrogen compressed gas systems are required to be in compliance with NFPA 55 by Section 3501.1 as that section of the code was revised in the last code cycle. Section 3504.2.1 has been modified to simplify the list of exposures by the use of the term in lieu of a detailed listing while maintaining the restriction against using footnote "a" to allow encroachment by structures (weather protection) on the property line, and other elements of the public way.

Table 3504.2.1: Footnote "a" to Table 3504.2.1 has been revised to be applicable to the table as a whole as fire barriers are a recognized means to provide the required separation between exposures and non-bulk gas storage or small non-bulk systems.

A "cap" of 200,000 cubic feet has been added as a means to limit the quantity of material in a single outdoor area. Additional storage areas can either be provided by the use of separation distance as shown in column 2 or by constructing a fire barrier that separates one storage area from another. The 200,000 cubic foot limitation has been established based on the typical quantity of gas loaded onto the typical single tractor-trailer unit used throughout the industry or approximately 225 cylinders. The establishment of a quantity cap is warranted based on recent fire history involving flammable gases experienced with flammable gas fires occurring in storage areas. In terms of area or footprint when conventional cylinders are stored, 200,000 cubic feet of gas occupies an area of about 400 square feet. The 200,000 cubic foot limitation has been integrated into similar tables developed and adopted into NFPA 55 for use with non-bulk flammable gases. The overall risk embodied in terms of quantity has been determined to be equivalent of a single tractor-trailer unit which when unloaded occupies approximately 400 square feet.

The "term openings" has been removed from the heading row describing building construction and are now included in a new section (3504.2.1.2).

Section 3504.2.1.1. Modifications have been made to limit the use of the provision to non-bulk systems. The list of exposures has been simplified by the use of the term "exposures" in lieu of a detailed listing to correlate with Section 3504.2.1.

Section 3504.2.1.2 (new) and 3504.2.1.2.1 (new): This section has been developed by separating the requirements between building openings and type of construction so as not to confuse requirements for openings with those imposed by the building code. Provisions have been added to allow the use of fire barrier walls as a means to separate the area of storage or "non-bulk" use from building openings including exits. When exits are involved fire barriers can serve as an effective means to safeguard the exit as well as the discharge to the public way.

Acceptance of this code change will serve to clarify the application of the table for the use intended (non-bulk) as well as to resolve questions as to application for non-bulk systems. Importantly it will serve to further correlate the approach used with other model codes thereby promoting harmonization for code enforcement as well as the user community.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FLUER-MCLAUGHLIN-F2-3501.1.DOC

F216–09/10
3804.3.1 (New)

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Add new text as follows:

3804.3.1 Installation on roof prohibited. The installation of LP-gas containers on the roofs of buildings is prohibited.

(Renumber subsequent sections)

Reason: Currently, Chapter 38 also refers to NFPA 58. NFPA 58 will allow the installation of LP-gas containers on rooftops. This proposal will include a specific restriction which will supersede the provisions in the referenced standard NFPA 58. As a result, propane tank installation will not be permitted on roof tops.

LP-gas is a flammable gas with a vapor density heavier than air. The heavier vapor density means that any leak from a roof mounted propane storage tank will travel down into the occupied spaces of the building where there is a very high probability of fire or explosion due to all the potential ignition sources.

Additionally, a building fire beneath the LP-gas container will impinge upon or heat the tank causing activation of the pressure relief valve. When the pressure relief valve is activated, it will release propane, which still is heavier than air, and the propane will travel downwards toward the fire and increase fire intensity. This could endanger the building or neighboring buildings and exposures.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F20-3804.3.1.DOC

F217–09/10
3806.1

Proponent: Bruce Swiecicki, National Propane Gas Association

Revise as follows:

3806.1 Attendants. Dispensing of LP-gas shall be performed by a qualified attendant. A container installed on site shall only be filled by its owner or with the owner's authorization.

Reason: The purpose of the proposed change is to require LP-gas containers to be filled only by the owner of the container or with the owner's permission. Prior to filling a stationary propane container (one that is installed on site), the container and system must undergo a visual inspection to ensure they are suitable for continued service. It is common practice in the propane industry for ASME stationary containers to be leased to customers, rather than sold to the customer. Because the propane marketer that owns the container is responsible for ensuring that it is in suitable condition and safe to be continued in service, the proposed change will have a positive impact on the safe operation of stationary LP-gas systems.

From the earliest days of the compressed gas industry, a fundamental safety principle has been that cylinders may only be filled by the owner or his designee. This industry safety requirement is predicated on the belief that only the owner knows how the container has been used or how it will be used and is, therefore, accountable. Accountability is very important for safety. Accountability underpins industry practices, industry standards, and state and federal laws and regulations, as will be demonstrated in this substantiation for the proposed change to the IFC.

From time to time, questions have arisen regarding this principle, asking whether such a restriction is necessary for safety, or whether it constrains consumer choice. For example, in 1991 the Utah Attorney General issued a legal opinion that such a rule of the state propane regulatory authority was a violation of the antitrust laws. However, the Utah Attorney General's opinion was overturned when a U.S. District Court declared that there was no antitrust violation. In addition, earlier in 1992, the Utah state legislature amended the Utah state propane law to add a specific container law prohibition into the statutes so as to avoid any future challenges.

The purpose of this document is to explain what a container law is, the rationale behind the principle of ownership filling, and to document the many standards, laws and regulations that have codified the principle.

How does the container filling restriction work?
Simply stated, the proposed change to the IFC would restrict the filling of a propane gas storage tank, or container, to its owner or someone having the owner's written authorization.

Why is a container filling restriction needed?
The need for accountability underscores the need to restrict who can fill a container. Safety requires more than just specifying that a person be qualified or trained to fill a container. The container is an integral part of a pressurized fuel system. If it is filled improperly, becomes damaged because of the filler's negligence, or is filled with contaminated gas, an accident could occur, resulting in property damage and personal injury. By restricting filling and servicing operations to the owner or his designee, there is greater assurance that these operations are performed only by those with the greatest interest in seeing that they are performed properly.

The container's owner is in the best position to know the condition of the tank, and only the owner or the owner's authorized agent can be counted on to take the necessary safety precautions during the filling operation and to thoroughly inspect the container and its appurtenances at each filling. Moreover, both industry standards and federal rules hold a container owner responsible for ensuring the container's suitability and qualification for service. If anyone is permitted to fill a container without the owner's knowledge or authority, it would be difficult for the owner to meet these legal obligations.

Aren't many tanks owned by the consumer? How do they assure safe filling and proper maintenance?
First, it is important to distinguish between the typical propane containers used for home heating, cooking or water heating, and those portable cylinders used for outdoor barbecue grilling or recreational vehicles. A typical home propane container is either a large DOT-specification cylinder or an ASME container holding from 100 to 1000 gallons of product. A small cylinder, commonly referred to as a 20-pound cylinder, holds about 5 gallons of propane gas.

The proposed container filling restriction would apply only to larger ASME containers and not portable cylinders, and it is common industry practice for the propane retailer to retain ownership of those containers and lease them to their customers. By leasing the container, the retailer retains responsibility for its maintenance and inspection, and the container laws help to insure that he retains control over who puts product into the container.

Yet, despite this common industry practice, some consumers insist upon owning their containers and most retail propane dealers will sell the container to the consumer, usually with great reluctance. In those cases, the consumer then assumes full responsibility for the container's maintenance and it is his responsibility to insure that the retail supplier from whom he purchases propane is supplying only specification product and is safely performing all required steps in the filling process.

The propane industry views consumer-owned containers as less than an ideal situation since the consumer is not an expert on propane gas or the maintenance of propane gas systems. A random filler has no vested interest in inspecting the system each time it is filled, or to alert the consumer to a potential problem with his consumer-owned tank. Moreover, if a random filler is allowed to fill a container owned by another propane marketer and not the consumer, the marketer who owns the container will be exposed to liability for any acts or failure to act by the random filler. These situations should be avoided and discouraged in the interest of maintaining safety.

Is there a Federal law restricting the filling of containers?
The origins of restrictions on the filling of propane containers can be traced to the Interstate Commerce Commission (ICC) whose rules contained the proscription in the first publication of the Code of Federal Regulations, effective as of June 1, 1938. Industry believes this original rule dates to at least 1919. The U.S. Department of Transportation regulations, which incorporated the old ICC rules, currently provide as follows:

> "(e) *Ownership of cylinder.* A cylinder filled with a hazardous material may not be offered for transportation unless it was filled by the owner of the cylinder or with the owner's consent.

In their rules governing workplace safety, the U.S. Department of Labor's Occupational Safety & Health Administration includes the following provision:

> "(ii) Containers shall be filled or used only upon authorization of the owner."

The staff of the Federal agency dedicated to consumer safety, the U.S. Consumer Product Safety Commission, endorsed the principle of a container filling restriction law in 1991.

Why have a code provision in addition to Federal?
Federal laws and regulations generally apply only to interstate commerce. State agencies that regulate the use of propane gas typically base their regulations on industry codes and standards. While this system has generally worked well, it can leave gaps in the state's regulatory scheme if, for example, a federal law does not apply or an industry standard is modified. This was demonstrated vividly in 1991 when NFPA, out of concern about its antitrust liability exposure due to the erroneous legal opinion of the Utah Attorney General, modified NFPA-58 to remove the container filling restriction.

Is a container filling restriction in the public interest?
In the absence of a container law, anyone is free to fill any tank, regardless of ownership. This undermines accountability and renders moot all safety programs. Without a restriction on filling, there is no incentive for the propane retailer to continue to carry the responsibility for tank maintenance.

With no limitation on who may fill a container, the propane retailer who owns a leased tank could be found liable, even though blameless, if an accident occurred because of negligence on the part of the supplier who filled the tank. The likelihood is that tank leasing would cease without restrictions on who may fill containers, consumers would be forced to purchase and maintain their own tanks, and safety would be degraded.

Insurance companies are concerned about the potential for increased liability exposure. In 1991, four of the industry's major insurers wrote in opposition to removal of the ownership restrictions from NFPA-58. This increased risk exposure would force insurers to raise premiums on propane gas retailers and possibly result in some small retailers being unable to afford insurance.

Inevitably, safety will deteriorate as more and more tanks are owned by consumers who buy their fuel from small, undercapitalized and underinsured suppliers who fill tanks but provide no inspection, maintenance, or repair service.

Is a container filling restriction a restraint on trade?
A container law reflects basic property law rights. Antitrust scholars have examined this issue from many angles and concluded that the elements of an antitrust violation simply are not present.

1. Leasing tanks to consumers gives propane retailers no control over the market. Consumers can easily change gas suppliers, with only a minimal cost for switching tanks.
2. Entry into the propane gas market is relatively easy for start-up companies or for established companies expanding into new market areas. A fundamental principle of antitrust law is that absence of entry barriers into a market constrains anticompetitive conduct, irrespective of market share.
3. There is ample justification on the grounds of consumer safety, and it is clear from court cases that there is no antirust violation in adopting a policy designed to promote safety.

Summary and Conclusion
After nearly a century of industry standards and regulations restricting the filling of propane gas containers to the owner or the owner's authorized agent, this commonly accepted practice has proven its value as a safety rule. Endorsed by safety engineers, state and federal regulatory authorities, insurance companies, adopted as law by legislatures in at least 39 states and tested in court, it is a rule by which propane retailers and consumers can live, and one they should.

[1] Letter of March 5, 1991, from Arthur M. Strong, Utah Assistant Attorney General, and R. Paul Van Dam, Utah Attorney General, to D. Douglas Bodrero, Commissioner, Utah Department of Safety, in re: Request for Legal Opinion: Antitrust Considerations and NFPA 58 sec. 4-2.2.1.

[1] Declaratory Judgment in Civil Case No. 91-C-382G, April 15, 1992, Suburban Propane Division of Quantum Chemical Corporation, et al, vs. D. Douglas Bodrero and R. Paul Van Dam, Judge J. Thomas Greene, United States District Court, District of Utah, Central Division.

Letters from Stephen P. Lincavage, Loss Control Manager, Continental Insurance, October 28, 1991; Charles A. Taylor, Jr., President, LPG Risk Retention Group Insurance Company, June 27, 1991; Wm. David Knight, Vice President, Ranger Insurance Company, June 19, 1991; and, William M. Sutcliffe, President, Underwriters Management Associates, Inc., July 3, 1991.

In Title 49 CFR §80.172(d) as: "*Cylinders, charged by owner*. Cylinders containing compressed gas must not be shipped unless they were charged by or with the consent of the owner of the cylinders."
Title 49 CFR §173.301(e).
Title 29 CFR §1910.110(b)(14)(ii).
Letter from Donald W. Switzer, CPSC Chemical Engineer, Directorate for Engineering Sciences, to T. C. Lemoff, NFPA, June 19, 1991.
Letters from Stephen P. Lincavage, Loss Control Manager, Continental Insurance, October 28, 1991; Charles A. Taylor, Jr., President, LPG Risk Retention Group Insurance Company, June 27, 1991; Wm. David Knight, Vice President, Ranger Insurance Company, June 19, 1991; and, William M. Sutcliffe, President, Underwriters Management Associates, Inc., July 3, 1991.
See, e.g., Clamp-All, 851 F.2d at 487; United States v. National Malleable & Steel Castings Co., 1957 Trade Cas. (CCH) ¶ 68,890 (N.D. Ohio), aff'd per curiam, 358 U.S. 38 (1958); Hatley v. American Quarter Horse Ass'n, 552 F.2d 646, 653 (5th Cir. 1977); Roofire Alarm Co. v. Royal Indem. Co., 202 F.Supp. 166, 169 (E.D. Tenn. 1962), aff'd, 313 F.2d 635 (6th Cir.), cert. denied, 373 U.S. 949 (1963); Structural Laminating, Inc. v. Douglas Fir Plywood Ass'n, 261 F.Supp. 154 (D. Or.), aff'd, 399 F.2d 155 (9th Cir. 1966), cert. denied, 393 U.S. 1024 (1968). See also ECOS Elecs. Corp. v. Underwriters Laboratories, 743 F.2d 498, 503 (7th Cir. 1984), cert. denied, 469 U.S. 1210 (1985). Courts have recognized safety concerns as legitimate business justifications. Mozart Co. v. Mercedes-Benz of N. Am., Inc., 593 F.Supp. 1506, 1522 (N.D. Cal. 1984); Polytechnic Data Corp. v. Xerox Corp., 362 F. Supp. 1 (N.D. Ill. 1973). As stated by the court in Polytechnic Data: "It is clear from the cases that there is not an antitrust violation in adopting and implementing a policy which is designed to promote safety, protect the integrity of one's property or good will or assure proper functioning of equipment." 362 F. Supp. At 1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SWIECICKI-F1-3806.1.DOC

F218–09/10
3809.14 (New)

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Add new text as follows:

3809.14 Automated LP-gas vending m**achines.** The use of automated LP-gas vending machines or racks that are not operated by an attendant to purchase or exchange LP-gas containers is prohibited.

(Renumber subsequent sections)

Reason: Over the last ten years, there has been a rapid increase in the use of automated LP-gas vending machines for consumer propane tanks. The next step of providing better accessibility to propane tanks is the introduction of automated exchange machines. An automated LP-gas vending machine requires minimal or no interaction by anyone on-site. The automated LP-gas vending machine is completely operated by just a consumer with a credit card and an empty tank.

The hazard with this operation is that the enforcement of basic safety issues are problematic with exchange racks and the removal of an attendant or knowledgeable person increases these deficiencies and hazards. It is not uncommon to see tanks stored upside down, rotted, pitted, or stored with the valve open. Tanks may also be left outside this unattended storage rack, creating security and/or vandalism related hazards for release of propane from unsecured tanks.

Automated LP-gas vending machines increase the likelihood of placing hazardous tanks in these machines that are situated in the existing locations of manual exchange racks. In addition, unattended automated racks increase the likelihood of tampering with the machine and providing access to unauthorized persons.

As a comparison, if someone brings a tank in for exchange at a conventional propane exchange rack and it starts to leak, the likelihood of someone calling it in (clerk or otherwise) is pretty good due to the odor. Conversely, a leaky tank in an unattended, automated machine outside of a closed store could leak for hours undetected.

Other issues include the absence of fire department access (i.e. cutting the lock) and the security issues regarding the access to a large quantity of flammable gas without supervision.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F21-3809.14.DOC

F219–09/10
4601.2 through 4601.4.2, Table 4603.1, 4604.1, Table 4604.18.2

Proponent: Tom Lariviere, Chairman - Joint Fire Service Review Committee

Revise as follows:

4601.2 Intent. The intent of this chapter is to provide a minimum degree of fire and life safety to *persons* occupying existing buildings by providing minimum construction requirements when ~~for *alterations* to~~ such existing buildings ~~which~~ do not comply with the minimum requirements of the *International Building Code.*

4601.3 Permits. Permits shall be required as set forth in Sections 105.6 and 105.7 and the *International Building Code* ~~and this code~~.

4601.4 Owner notification. When a building is found to be in non-compliance with this chapter, the *fire code official* shall duly notify the *owner* of the building. Upon receipt of such notice, the *owner* shall, subject to the following time limits, take necessary actions to comply with the provisions of this chapter.

4601.4.1 Construction documents. *Construction documents* ~~for the~~ necessary ~~*alterations*~~ to comply with this chapter shall be completed and submitted within a time schedule *approved* by the *fire code official.*

4601.4.2 Completion of work. Work ~~on the required *alterations* to the building~~ necessary to comply with this chapter shall be completed within a time schedule *approved* by the *fire code official*.

TABLE 4603.1
OCCUPANCY AND USE REQUIREMENTS[a]

Section	Use			Occupancy Classification																		
	High Rise	Atrium ~~and~~ or Covered Mall	Under ground Building	A	B	E	F	H-1	H-2	H-3	H-4	H-5	I-1	I-2	I-3	I-4	M	R-1	R-2	R-3	R-4	S

a. Existing buildings shall comply with the sections identified "as Required" based on occupancy classification or use, or both, whichever is applicable.

(Portions of table not shown remain unchanged)

4604.1 General. *Means of egress* in existing buildings shall comply with the minimum egress requirements when specified in Table 4603.1 as further enumerated in Sections 4604.2 through 4604.23, and the building code that applied at the time of construction. Where the provisions of this chapter conflict with the original building code, the most restrictive provision shall apply. Existing buildings that were not required to comply with a building code at the time of construction shall comply with the minimum egress requirements when specified in Table 4603.1 as further enumerated in Sections 4604.2 through 4604.23~~, and, in addition, shall have a life safety evaluation prepared, consistent with the requirements of Section 104.7.2. The life safety evaluation shall identify any changes to the *means of egress* that are necessary to provide safe egress to occupants and shall be subject to review and approval by the *fire code official*. The building shall be modified to comply with the recommendations set forth in the *approved* evaluation~~.

TABLE 4604.18.2
COMMON PATH, DEAD-END AND TRAVEL DISTANCE LIMITS (by occupancy)

Occupancy	Common Path Limit		Dead-End Limit		Travel Distance Limit	
	Unsprinklered (feet)	Sprinklered (feet)	Unsprinklered (feet)	Sprinklered (feet)	Unsprinklered (feet)	Sprinklered (feet)
Group B	75	100	50	50	200	~~250~~ 300
Group R-2 (Apartments)	75	~~75~~ 125	50	50	200	250
Group U	75	~~75~~ 100	20	50	200	250

(Portions of table and footnotes not shown remain unchanged)

Reason: The revisions in this proposal are added to further clarify to the intent of each of the sections in the new Chapter 46. The modifications herein do not alter the requirements currently found in the IFC.

Section 4601.2 is revised to remove the word "alterations". "Alteration" is used as a trigger point for the *International Existing Building Code* and is specifically defined. The desire is to remove the potential confusion with that definition. The retroactive requirements in Chapter 46 are not triggered by "alteration". These requirements apply to all existing buildings regardless of alteration or remodel permits.

Section 4601.3: At Palm Springs, the Code Committee added the phrase "and this code" because of a desire to include other permit requirements in the IFC. There is no need to reference IFC Section 105.7 and then say the entire code, 105.7 is part of the entire code. However, this proposal takes a different approach to solve the concern for other potential permits and add a reference to Section 105.6 "Operational Permits", and the reference to the entire code is deleted. The reference to the specific sections provides the user with more guidance than just stating the entire code.

Section 4601.4 is revised to clarify that the requirement for owner notification in Section 4601.4 is specific to this chapter and not to the entire code. Violations of other code sections are already handled in Chapter 1. This provision is specific since it refers to developing a timeline for repair as stated in the Subsection 4601.4.2.

Sections 4601.4.1 and 4601.4.2 are revised to remove the term "alterations". These requirements are not triggered by alterations or remodels. These requirements are applicable as soon as the code is adopted. This provides consistency with Item #1 above.

Table 4603.1 is revised by adding Footnote A to provide direction on the application of the table. Additionally, the heading of "Atrium and Covered Mall" is revised to read "Atrium or Covered Mall" to eliminate the possible confusion that if a building does not have an atrium and a covered mall that it does not need to comply.

The 1st paragraph of Section 4604.1 is revised to clarify that the intent of the paragraph is to resolve conflicts between the original building code and this chapter, not the entire IFC.

The 2nd paragraph of Section 4604.1 is revised by deleting the requirement for a life safety evaluation. The minimum egress requirements are already established within Chapter 46. If additional egress issues exist, Section 102.1 allows for the code official to address distinct hazards. There is no need to additionally require a full life safety evaluation.

Table 4604.18.2 is revised to provide correlation with IBC requirements for new construction. If these revisions are not made, then the requirements for new buildings will be less restrictive than the requirements for existing buildings. Changes as follows:

1. For Group B, "Travel Distance Limit", "Sprinklered", 250' is revised to 300' to be consistent with IBC Table 1016.1.
2. For Group R-2, "Common Path Limit", "Sprinklered", 75' is revised to 125' to be consistent with IBC Section 1014.3 Exception #4.
3. For Group U, "Common Path Limit", "Sprinklered", 75' is revised to 100' to be consistent with IBC Section 1014.3 Exception #2.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: LARIVIERE-F22-4601.2.DOC

F220–09/10
4603.4.3, 4603.4.4, 4603.4.5 (All New)

Proponents: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Add new text as follows:

4603.4.3 Group F-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group F-1 occupancy used for the manufacture of upholstered furniture or mattresses.

4603.4.4 Group M. An automatic sprinkler system shall be provided throughout all buildings containing a Group M occupancy used for the display and sale of upholstered furniture or mattresses.

4603.4.5 Group S-1. An automatic sprinkler system shall be provided throughout all buildings containing a Group S-1 occupancy used for the storage of upholstered furniture or mattresses.

Reason: This proposal adds retroactive requirements to install an automatic sprinkler system in buildings containing F-1, M and S-1 occupancies involving upholstered furniture and mattresses. The purpose is to build upon the change approved last cycle to require mercantile occupancies with any amount of upholstered furniture to be suppressed as requested by the upholstered furniture industry.

The recognized hazard by a fuel load consisting of upholstered furniture and mattresses has been as identified as requiring sprinkler protection in newly constructed buildings that would also be required to meet all other current requirements of the International Series of Codes. Most, if not all existing buildings do not meet the current requirements of the International Series of Codes. A building that existed prior to the current editions of the International Series Codes most likely has less protective features and the existence of the fuel load presented by upholstered furniture and mattress would then create a greater hazard and an increased need for automatic fire suppression.

Cost Impact: The code change proposal will increase the cost of existing occupancies containing these hazards.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F11-4603.4.3.DOC

F221–09/10
4603.5, 4603.5.1 (New), 4603.5.2 (New)

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Revise as follows:

4603.5 Standpipes. Existing structures ~~with occupied floors located more than 50 feet (15 240 mm) above or below the lowest level of fire department access~~ shall be equipped with standpipes installed in accordance with Section 905 when required in Sections 4603.5.1 through 4603.5.2. ~~The standpipes shall have an *approved* fire department connection with hose connections at each floor level above or below the lowest level of fire department access.~~ The *fire code official* is authorized to approve the installation of manual standpipe systems to achieve compliance with this section where the responding fire department is capable of providing the required hose flow at the highest standpipe outlet.

4603.5.1 Existing multi-story buildings. Existing buildings with occupied floors located more than 50 feet (15 240 mm) above the lowest level of fire department access or more than 50 feet (15 240 mm) below the highest level of fire department access shall be equipped with standpipes.

4603.5.2 Existing helistops and heliports. Existing buildings with a *helistop* or *heliport* located more than 30 feet above the lowest level of fire department access to the roof level on which the *helistop* or *heliport* is located shall be equipped with standpipes in accordance with Section 1107.5.

Reason: A heliport is a distinct hazard that will involve flammable fuels. In the event of an emergency, rapid deployment of hand hose lines will be necessary to attack a resulting fire, effectuate rescue and to protect exposures and the remainder of the building. This proposal will specify that when existing buildings have a helistop or heliport on a rooftop location, then a standpipe system is required.

The current Section 4603.5 is reformatted as a general section which refers back to Section 905 for standpipe design. The sentence requiring hose connections on each floor is deleted. This sentence is deleted because the section already refers back to Section 905 for design and Section 905.4 #1 requires hose connections on each floor. So this sentence in Section 4603.5 is redundant and not necessary.

The new Section 4603.5.1 is the current requirement found in 4603.5 for buildings with an occupied floor level over 50 feet in height.

The new Section 4603.5.2 requires a standpipe system in existing buildings with a heliport or helistop. This section refers back to Section 1107.5 for design and hose connection location for the rooftop heliport.

The requirement is for a standpipe system throughout the building, not just a connection at the roof level. This is critical in firefighting operations because many times the connection below the rooftop level may be needed just to gain access onto the roof. If the only connection is on the roof, it is of no use if the firefighters cannot get to it. Additionally, a heliport includes fueling operations. It is entirely possible for a spill to not only affect the rooftop, but also floors below as the liquid fuel spreads. The standpipe system will again be utilized in these situations.

Cost Impact: The code change proposal will not increase the cost of new construction, but will affect existing buildings.

Analysis: Similar requirements are proposed in code change proposal F222-09/10.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F23-4603.5.DOC

F222–09/10
4603.5, 4603.5.1 (New), 4603.5.2 (New)

Proponents: Robert J Davidson, Code Consultant/Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Revise as follows:

4603.5 Standpipes. Existing structures ~~with occupied floors located more than 50 feet (15 240 mm) above or below the lowest level of fire department access~~ shall be equipped with standpipes installed in accordance with Section 905 where required in Sections 4603.5.1 through 4603.5.2. ~~The standpipes shall have an approved fire department connection with hose connections at each floor level above or below the lowest level of fire department access.~~ The fire code official is authorized to approve the installation of manual standpipe systems to achieve compliance with this section where the responding fire department is capable of providing the required hose flow at the highest standpipe outlet.

4603.5.1 Existing multi-story buildings. Existing buildings with occupied floors located more than 50 feet (15 240 mm) above the lowest level of fire department access or more than 50 feet (15 240 mm) below the highest level of fire department access shall be equipped with standpipes.

4603.5.2 Roof gardens and landscaped roofs. Buildings or structures with roof gardens or landscaped roofs and that are equipped with a standpipe shall extend the standpipe to the roof level on which the roof garden or landscaped roof is located.

Reason: A rooftop garden or landscaped roof is a distinct hazard that adds combustible fuel loads to the roof level. In the event of a fire, rapid deployment of hand hose lines will be necessary to effect extinguishment and to protect exposures and the remainder of the building. This proposal will specify that when existing buildings have a standpipe system and a rooftop garden or landscaped roof on a rooftop location, then a standpipe system is required to be extended to the roof level with the roof garden or landscaped roof.

The current Section 4603.5 is reformatted as a general section which refers back to Section 905 for standpipe design. The sentence requiring hose connections on each floor is deleted. This sentence is deleted because the section already refers back to Section 905 for design and Section 905.4, #1 requires hose connections on each floor. So this sentence in Section 4603.5 is redundant and not necessary.

The new Section 4603.5.1 is the current requirement found in 4603.5 for buildings with an occupied floor level over 50 feet in height.

The new Section 4603.5.2 requires an existing standpipe system in existing buildings with a roof garden or landscaped roof to be extended to that roof level.

Cost Impact: The code change proposal will increase the cost of existing occupancies containing these hazards.

Analysis: Similar requirements are proposed in code change proposal F221-09/10.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-F10-4603.5.DOC

F223–09/10
4603.6.6

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

4603.6.6 Group R-2. ~~An automatic or~~ A manual fire alarm system that activates the occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-2 occupancies more than three stories in height or with more than 16 *dwelling* or *sleeping units*.

Exceptions:

1. Where each living unit is separated from other contiguous living units by *fire barriers* having a *fire-resistance rating* of not less than 0.75 hour, and where each living unit has either its own independent *exit* or its own independent stairway or ramp discharging at grade.
2. A separate fire alarm system is not required in buildings that are equipped throughout with an *approved* supervised *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2 and having a local alarm to notify all occupants.
3. A fire alarm system is not required in buildings that do not have interior *corridors* serving *dwelling units* and are protected by an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.2, provided that *dwelling units* either have a *means of egress* door opening directly to an exterior *exit access* that leads directly to the *exits* or are served by open-ended *corridors* designed in accordance with Section 1023.6, Exception 4.

Reason: During the prior code change cycle the effort was made to clear up the confusion between whether the required system must be a manual or automatic fire alarm system. Consistently, the code changes noted that the required retrofit system must be a manual one. However, in a few instances the clarification was not addressed in a code change.

This proposal is an effort to finish up the clean-up which began with the prior code change cycles in rewriting the requirements for fire alarms in existing buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOECKER-F10-4603.6.6.DOC

F224–09/10
4603.6.7

Proponent: Gene Boecker, Code Consultants, Inc.

Revise as follows:

4603.6.7 Group R-4. ~~An automatic or~~ A manual fire alarm system that activates an occupant notification system in accordance with Section 907.6 shall be installed in existing Group R-2 residential care/assisted living facilities in accordance with Section ~~907.2.10~~ 907.2.10.1.

Exceptions:

1. Where there are interconnected smoke alarms meeting the requirements of Section 907.2.11 and there is at least one manual fire alarm box per floor arranged to continuously sound the smoke alarms.
2. Other manually activated, continuously sounding alarms *approved* by the *fire code official*.

Reason: During the prior code change cycle the effort was made to clear up the confusion between whether the required system must be a manual or automatic fire alarm system. Consistently, the code changes noted that the required retrofit system must be a manual one. However, in a few instances the clarification was not addressed in a code change.

This proposal is an effort to finish up the clean-up which began with the prior code change cycles in rewriting the requirements for fire alarms in existing buildings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOECKER-F11-4603.6.7.DOC

F225–09/10
4603.7.1

Proponent: Jeffrey M. Shapiro, PE, International Code Consultants, representing National Multi Housing Council

Revise as follows:

4603.7.1 Where required. Existing Group R occupancies and *dwellings* not classified as Group R occupancies, which are not already provided with single-station smoke alarms complying with requirements of the code that governed at the time of construction, shall be provided with single-station smoke alarms~~. Installation shall be~~ in accordance with Section 907.2.11, except as provided in Sections 4603.7.2 and 4603.7.3.

Reason: This proposal is intended as a clarification to assist in proper application of the existing text. The key phrase that determines exactly what is required in existing Group R occupancies is "Existing Group R occupancies…not already provided with single station smoke alarms..." Although this statement appears fairly straightforward in its intended application, it is occasionally misinterpreted, perhaps because the IFC Commentary on this issue is even more misleading than the code itself. To some, the text suggests that anytime smoke alarms are not already installed throughout a Group R occupancy, located as required for new construction in accordance with Section 907.2.10, additional alarms must be installed to protect any areas, such as bedrooms, that would require protection in new construction. However, I can state with great certainty that this was never the intended application of the code.

The IFC text originated in the UFC in 1995, and it was carried directly into the IFC during the drafting process. Thereby, the intent of this section was established by the original UFC provision. The provision in question resulted from a code change proposal submitted by the Minnesota State Fire Chiefs Association in 1995 (Proposal #21, 1007-95-1). The proposal was initially disapproved by the UFC Code Development Committee, but was approved at the final action hearing after initial objections were addressed by a public comment.

Part 4 of the public comment was further revised by a floor motion at the hearing, which was when the text "not already provided with single station smoke detectors" was added to the code. This text replaced other proposed text "…in accordance with the building code under which the building was constructed. Buildings that were not constructed under the requirements of a building code shall meet the minimum requirements of Section 1007.2.9.2," which needed to be changed because it didn't require buildings that were constructed under an old building code, prior to when smoke alarms were first required, to be retrofitted. By adding "not already provided with single station smoke detectors," the intent was to retain a "grandfather" clause for existing buildings that were previously provided with smoke alarms, while adding a requirement to retrofit buildings that were not.

When the IFC was developed, it was drafted using a combination of NFPA 1 Fire Prevention Code, NFPA 101 Life Safety Code and the UFC. Documentation from the drafting committee's work on the retroactive smoke alarm section show that the committee was given a choice of accepting either the NFPA 101 provisions (Sections 19-3.4 through 19.3.4.4.2) or the UFC provisions (Sections 1007.2.9.2 through 1007.2.9.2.4) for apartments. With respect to smoke alarms in sleeping rooms, the choice made no difference because neither code required smoke alarms to be retrofitted in these areas. In fact, NFPA 101 quite clearly maintains that approach today in Section 31.3.4.5.1.

In the end, the IFC adopted the UFC text, which included the "Existing Group R occupancies not already provided with single station smoke alarms..." text that remains today. Lacking any code change that would have revised the intended application of Section 4603.7.1, I am confident that the original intent of the code, to grandfather existing buildings that had smoke alarms installed prior to adoption of the IFC, remains the proper application of the code today. Accordingly, this proposal should be approved to remove the existing ambiguity.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SHAPIRO-F1-4603.7.1.DOC

F226–09/10
4603.8 (New)

Proponent: A. Hal Key, P.E., Fire Department, Mesa, AZ

Add new text as follows:

4603.8 Existing fire alarm systems. When an existing fire alarm system becomes unserviceable due to non-availability of components or parts, that system shall be replaced in accordance with Section 907.2.

Reason: When a fire alarm system becomes unserviceable due to the age of the equipment, the entire system must be replaced to maintain the system in operation. In most cases, the type of system (addressable vs. analog) changes and these systems need to be installed to the latest edition of the adopted code. Where an existing system has not yet been upgraded to the latest ADA requirements, the owners of these systems are already required to upgrade the system annunciation.

Cost Impact: The code change proposal will increase the cost of maintaining the system.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KEY-F2-4603.8.DOC

F227–09/10
4604.17.5, 4604.17.5.1 (New)

Proponent: Kathleen A. Way, Fire Protection Specialist, NYS Department of State, Office of Fire Prevention & Control; Daniel E. Nichols, PE, New York State Department of State, Div. of Code Enforcement and Administration

1. Revise as follows:

4604.17.5 Materials and strength. Components of fire escape stairs shall be constructed of noncombustible materials. Fire escape stairs and balconies shall support the dead load plus a live load of not less than 100 pounds per square foot (4.78 kN/m^2). Fire escape stairs and balconies shall be provided with a top and intermediate handrail on each side. ~~The *fire code official* is authorized to require testing or other satisfactory evidence that an existing fire escape stair meets the requirements of this section.~~

2. Add new text as follows:

4604.17.5.1 Examination. Fire escape stairs and balconies shall be examined for structural adequacy and safety, in accordance with Section 4604.17.5, by a registered design professional or others acceptable to the fire code official every five years, or as required by the fire code official. An inspection report shall be submitted to the fire code official after such examination.

Reason: Fire escapes are necessary and essential, where provided as a second means of egress for occupants. In some jurisdictions, the fire service may also utilize fire escapes for the purpose of fire suppression and rescue. Unfortunately, normal day to day maintenance of fire escapes is not sufficient enough to determine if they are truly safe for use. It would be necessary, at some interval to have a qualified person determine, structurally that the fire escape is structurally sound. Determining a set time frame is left with the fire code official due to many factors that affect the condition of fire escapes including weathering, temperatures, building condition, and previous upkeep. Currently, the States of Massachusetts and New Jersey have specific code provisions with regard to certification of fire escapes.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NICHOLS-F1-4604.17.5.DOC

F228–09/10
Table 4604.18.2

Proponent: Gene Boecker, Code Consultants, Inc.

Revise table as follows:

TABLE 4604.18.2
COMMON PATH, DEAD-END AND TRAVEL DISTANCE LIMITS (by occupancy)

OCCUPANCY	COMMON PATH LIMIT		DEAD-END LIMIT		TRAVEL DISTANCE LIMIT	
	Unsprinklered (feet)	Sprinklered (feet)	Unsprinklered (feet)	Sprinklered (feet)	Unsprinklered (feet)	Sprinklered (feet)
Group A	20/75[a]	20/75[a]	20[b]	20[b]	200	250
Group B [f]	75	100	50	50	200	250
Group E	75	75	20	20	200	250
Groups F-1, S-1[d,f]	75	75	20	20	200	250
Groups F-2, S-2[d,f]	75	100	50	50	200	250
Group H-1	25	25	0	0	75	75
Group H-2	50	100	0	0	75	100
Group H-3	50	100	20	20	100	150
Group H-4	75	75	20	20	150	175
Group H-5	75	75	20	50	150	200
Group I-1	75	75	20	20	200	250
Group I-2 (Health Care)	NR[e]	NR[e]	NR	NR	150	200[c]
Group I-3 (Detention and Correctional—Use Conditions II, III, IV, V	NR	NR	20	20	200	250
Group I-4 (Day Care Centers)	100	100	NR	NR	150[c]	200[c]
Group M (Covered Mall)	75	100	50	50	200	400
Group M (Mercantile)	75	100	50	50	200	250
Group R-1 (Hotels)	75	75	50	50	200	250
Group R-2 (Apartments)	75	75	50	50	200	250
Group R-3 (One- and Two-Family)	NR	NR	NR	NR	NR	NR
Group R-4 (Residential Care/Assisted Living)	NR	NR	NR	NR	NR	NR
Group U [f]	75	75	20	20	200	250

For SI: 1 foot = 304.8 mm.

a. 20 feet for common path serving 50 or more persons; 75 feet for common path serving less than 50 persons.
b. See Section 1025.9.5 for dead-end aisles in Group A occupancies.
c. This dimension is for the total travel distance, assuming incremental portions have fully utilized their allowable maximums. For travel distance within the room, and from the room exit access door to the exit, see the appropriate occupancy chapter.
d. See the *International Building Code* for special requirements on spacing of doors in aircraft hangars.

e. Any patient sleeping room, or any suite that includes patient sleeping rooms, of more than 1,000 square feet (93 m^2) shall have at least two exit access doors placed a distance apart equal to not less than one-third the length of the maximum overall diagonal dimension of the patient sleeping room or suite to be served, measured in a straight line between exit access doors.

f. Where a tenant space in Group B, S and U occupancies has an occupant load of not more than 30, the length of a common path of egress travel shall not be more than 100 feet (30 480 mm).

NR = No requirements.

Reason: The proposal corrects a conflict between the International Building Code and the International Fire Code. The added footnote addresses exception #2 in Section 1014.3. The code grants this allowance for new construction. It should be reflected in the table as allowable for existing conditions. Otherwise the building could be cited for non-compliance the day after it is issued a certificate of occupancy.

For clarity to the reader, because it is not easy to see superscripts in the table, this is being proposed for "B," "S-1," "S-2," and "U" occupancies; consistent with the provisions in IBC Section 1014.3; exception #2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOECKER-F12-T4604.18.2.DOC

F229–09/10
Chapter 46, 102.1

Proponent: Lawrence G. Perry, AIA, representing Building Owners and Managers Association (BOMA) International

1. Revise by relocating Chapter 46 in its entirety as follows:

~~CHAPTER 46~~ APPENDIX K
CONSTRUCTION REQUIREMENTS FOR EXISTING BUILDINGS

2. Revise as follows:

102.1 Construction and design provisions. The construction and design provisions of this code shall apply to:

1. Structures, facilities and conditions arising after the adoption of this code.
2. Existing structures, facilities and conditions not legally in existence at the time of adoption of this code.
3. ~~Existing structures, facilities and conditions when required in Chapter 46.~~
4. ~~4.~~ 3. Existing structures, facilities and conditions which, in the opinion of the *fire code official*, constitute a distinct hazard to life or property.

Reason: Many jurisdictions that adopt a model fire code lack the authority to retroactively mandate construction upgrades to existing buildings without some specific 'triggering' event. Additionally, as written, the triggering language in Chapter 46 is vague, and would lead to a lack of consistency in enforcement. Section 4601.4 states "Where a building is found to be in noncompliance, the fire code official shall duly notify the owner of the building." What is the mechanism for the fire code official to 'find' the building in noncompliance? Without some specific mechanism in the code, this will lead to arbitrary application of these retroactive requirements.

By relocating Chapter 46 to an appendix Chapter, those jurisdictions that have the authority, the mechanism, and the desire to require assessment and retrofit of existing buildings will have a framework on which they can build a comprehensive package. By removing the Chapter from the body of the code, the majority of jurisdictions, who are either unauthorized or unable to assess every existing building and mandate every possible retrofit outlined in the chapter, will not need to amend these provisions out of the code, or ignore the potential impact that the breadth of this Chapter would have on some older existing buildings. Note that even with the deletion of this Chapter from the body of the code, the fire code official still has the authority to mandate that 'distinct hazards to life and property' be mitigated.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PERRY-F1-CHAP46.DOC

F230–09/10
Appendix D103.6.1, D103.6.2

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Revise as follows:

D103.6.1 Roads 20 to 26 feet in width. Fire lane signs as specified in D103.6 shall be posted on both sides of fire apparatus access roads that are 20 to 26 feet wide (6096 to 7925 mm) ~~shall be posted on both sides as a fire lane~~.

D103.6.2 Roads more than 26 feet in width. Fire lane signs as specified in D103.6 shall be posted on one side of apparatus access roads more than 26 feet wide (7925 mm) ~~to~~ and less than 32 feet wide (9754 mm) ~~shall be posted on one side of the road as a fire lane~~.

Reason: This proposal completes the requirement in each of the sections. Currently each section states that "access road shall be posted", but gives no guidance as to what needs to be posted. This revision specifies that the posting of the access road is with the FIRE LANE sign specified in Section D103.6. This proposal provides correlation with Section D103.6.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F27-D103.6.1.DOC

F231–09/10
Appendix D105.1, D105.2, D105.3, D105.4 (New)

Proponent: Daniel E. Nichols, PE, New York State Department of State, Div. of Code Enforcement and Administration

Revise as follows:

D105.1 Where required. Where the vertical distance between the grade plane and the highest roof surface exceeds ~~Buildings or portions of buildings or facilities exceeding~~ 30 feet (9144 mm) ~~in height above the lowest level of fire department vehicle access shall be provided with~~, *approved* ~~fire~~ aerial apparatus access roads ~~capable of accommodating fire department aerial apparatus~~ shall be provided. ~~Overhead utility and power lines shall not be located within the aerial fire apparatus access roadway.~~ For purposes of this section, the highest roof surface shall be determined by measurement to the eave of a pitched roof, the intersection of the roof to the exterior wall, or the top of parapet walls, whichever is greater.

D105.2 Width. Aerial fire apparatus access roads shall have a minimum unobstructed width of 26 feet (7925 mm), exclusive of shoulders, in the immediate vicinity of ~~any~~ the building or portion thereof. ~~of building more than 30 feet (9144 mm) in height.~~

D105.3 Proximity to building. At least one of the required access routes meeting this condition shall be located within a minimum of 15 feet (4572 mm) and a maximum of 30 feet (9144 mm) from the building, and shall be positioned parallel to one entire side of the building. The side of the building on which the aerial apparatus access road is positioned shall be approved by the fire code official.

D105.4 Obstructions. Overhead utility and power lines shall not be located over the aerial fire apparatus access road or between the road and the building. Other obstructions shall be permitted to be placed with the approval of the fire code official.

Reason: Aerial apparatus access roads are required when the fire department cannot reach the roof or upper stories with ground ladders. ISO fire suppression rating schedule requires that fire department's carry a 35' ground ladder (35' ladder is now acceptable under the alternative equipment list). When setting up a 35' ground ladder appropriately, the effective vertical reach of this ladder is approximately 30'; hence the 30' requirement within this section.

Section D105.1- The height requirement should be based on the fire department's ability to utilize a ground ladder, or lack thereof. The current language takes into account the height of the building compared to the fire apparatus access road. This is not the intent; a one story building that is on a hill above the fire apparatus access road could be subject to the aerial access road requirements when ground ladder access is provided. The proposed language takes the measurement from grade plane to the edge of the roof where the ladder would be placed. If this is greater than 30', then an aerial apparatus access road would be required. The term accessible point of the highest roof surface has been used as 'building height' would be too high for peaked roofs (midpoint measurement) and too low for flat roofs with parapet walls. The term eave is the most common term used in the IBC when describing the edge of a peaked roof, thus incorporated herein.

D105.2- The measurement of the 'height' has been removed. This removes the potential confusion between 'height' and 'height above lowest level of FD access.'

D105.3- Currently, the language allows the designer to determine the side that aerial apparatus access is provided. This has caused issues where the code provisions were met by providing aerial access on the end of a building or on the gable end of a structure. The two aforementioned situations are not beneficial to fire department operations as it hinders access to emergency escape and rescue openings (this section, if adopted, is a component of Section 503 and applicable to IRC constructed buildings by ICC interpretation) and roof surfaces for firefighting operations.

D105.4- This is a new section that has been pulled out D105.1 for better clarity. The overhead obstructions have been expanded to be prohibited between the road and the building. It also adds a statement that allows the fire code official to allow some obstructions that do not affect the aerial apparatus operation, such a portico over the road or vegetation.

Cost Impact: The code change proposal will increase the cost of construction in certain situations and not increase the cost in certain situations.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NICHOLS-F4-D105.1.DOC

F232–09/10
Appendix D105.3

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Delete without substitution:

~~**D105.3 Proximity to building.** At least one of the required access routes meeting this condition shall be located within a minimum of 15 feet (4572 mm) and a maximum of 30 feet (9144 mm) from the building, and shall be positioned parallel to one entire side of the building.~~

Reason: The current language has created confusion and difficulty in application of these requirements as follows:

1. In many cases it has been misinterpreted to say that the entire access road must be within 15' of the building.
2. In several building designs, the distance of 15' from the building places the ladder at angle that is less than preferred. This will occur when a building has a height of less than 50'. With the access road at least 15' from the building, the ladder turntable will be approximately 23' from the exterior wall, and approximately 8' above grade. This places the ladder at less than a 30 degree climbing angle.

This proposal will delete the requirement for location of the access road and default back to Section D105.1. Section D105.1 already specifies that buildings over 30' in height must provide "approved fire apparatus access roads capable of accommodating fire department aerial apparatus".

The access road for aerial apparatus is still required, and must meet the approval of the fire code official. This will allow for the spacing from the building as may be appropriate based on the actual configuration of the building, grade, and obstructions.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F28-D105.3.DOC

F233–09/10
Appendix D107.1

Proponent: Tom Lariviere, Chairman, Joint Fire Service Review Committee

Revise as follows:

D107.1 One- or two-family dwelling residential developments. Developments of one- or two-family *dwellings* where the number of *dwelling units* exceeds 30 shall be provided with <u>two</u> separate and *approved* fire apparatus access roads and shall meet the requirements of Section D104.3.

Exceptions:

1. Where there are more than 30 *dwelling units* on a single public or private fire apparatus access road and all *dwelling units* are equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3, access from two directions shall not be required.
2. The number of *dwelling units* on a single fire apparatus access road shall not be increased unless fire apparatus access roads will connect with future development, as determined by the *fire code official*.

Reason: This proposal will clarify the requirement for two separate access roads into facilities with more than 30 units. The same language appears in Sections D106.1 and D106.2 when dealing with multi-family units. The intent of this section is similar to D106.1 and D106.2. When the wording is different, the code user is wondering what else was meant to be different in this application as compared to D106.1 or D06.2. Whereas the actuality is that the requirement is meant to require two means of access to developments with more than 30 dwellings.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARIVIERE-F29-D107.1.DOC

F234–09/10
Appendix H101.4

Proponent: Lynne M. Kilpatrick, Fire Department, City of Seattle WA, representing Washington State Association of Fire Marshals

Delete without substitution:

~~**H101.4 HMMP short form.** Facilities with the *maximum allowable quantities or less per control area* in Tables 2703.3.3(10) through 2703.1.1(4) of the *International Fire Code* and where the threshold planning quantities at EPA 40 CFR Part 355, Sections 302 and 304 are not exceeded, shall be allowed to file a short form HMMP which shall include all of the following components:~~

~~1. General facility information.~~
~~2. A simple line drawing of the facility showing the location of storage facilities and indicating the hazard class or classes and physical state of the hazardous materials being stored.~~
~~3. Information that the hazardous materials will be stored and handled in a safe manner and will be appropriately contained, separated and monitored.~~
~~4. Assurance that security precautions have been taken, employees have been appropriately trained to handle the hazardous materials and react to emergency situations, adequate labeling and warning signs are posted, adequate emergency equipment is maintained and the disposal of hazardous materials will be in an appropriate manner.~~

~~Facilities which have prepared, filed and submitted a Tier II Inventory Report required by the U.S. Environmental Protection Agency (USEPA) or required by a state which has secured USEPA approval for a similar form shall be deemed to have complied with this section.~~

Reason: This proposal proposes to delete the new HMMP short form for the following reasons:

Item 3 is requesting information presumably attesting that the hazardous materials will be stored and handled in a safe manner and will be appropriately contained, separated and monitored. This request is ambiguous and unclear. Documents to verify compliance with the containment, separation and monitoring provisions of this Code should more appropriately be requested.

Item 4 is requesting assurance that security, training, labeling, signage, equipment and disposal will be appropriate. What does that assurance look like and what is appropriate?

Further, under this Section facilities that have submitted a Tier Two Inventory Report required by EPA are deemed to have met the HMMP short form requirements. Section 2701.5.2 states that where the fire code official requires an approved HMIS statement (format). To state that submittal of the Tier Two or other USEPA approved form meets the requirement is not appropriate. Generally the reportable quantities are 500 pounds – 10,000 pounds and do not provide a complete picture of the hazardous materials present on site.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KILPATRICK-F6-H101.4.DOC

F235–09/10
Appendix K (New)

Proponent: Michael Jacoby, Seven Valleys, PA, representing self

Add new text as follows:

APPENDIX K
EMERGENCY COMMUNICATION SYSTEMS
(HAZARDOUS SUBSTANCE)

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION K101
GENERAL

K101.1 Scope. This appendix contains provisions that are available for adoption by governments, communities or tribes who will have an opportunity to use the National Fire Protection Association's (NFPA) NFPA 72 codes that just added three new chapters at the same time made a name change to the National Fire Alarm and Signaling Codes that also includes the requirements for mass notification systems that can be found in a new chapter called Emergency Communication System (ECS) in NFPA 72-2010.

By adopting the provisions within this appendix it will give governments, communities or tribes etc. who already adopted the International Code Council (ICC) Codes, the ability to enhance their emergency communication by bringing these two major code organizations together to ensure that NFPA 72/National Fire Alarm and Signaling Codes, Emergency Communication Systems (ECS) such as in one-way, two-way and mass notification systems etc. are being designed and later installed per code as desired.

These requirements/codes/specifications could then be used in such applications as for college campuses, schools, and stadiums, community centers to include even local community warning/notification systems etc. when these emergency communication systems are being upgraded or initially installed thus providing early warning messages before, during or after manmade disasters/situations/events, natural disasters such as hurricanes, tornadoes, snowstorms, blizzards, flooding, massive fires while giving instructions to the public in times of crisis etc.

This appendix will also address system upgrades or the initial requirements for fixed sites/facilities with hazardous substances.

K101.2 Emergency communication system requirements. Fire alarm system upgrades to the new National Fire Alarm and Signaling Codes can be applied to such sites that meet the requirements set forth in ICC IFC Section 2701.5.1 and 2701.5.2 or for those sites that already meet the following criteria with the focus being on outside emergency communication that is commonly known as mass notification now known as emergency communications systems while other parts of the National Fire Alarm and Signaling Codes can also be applied.

Guidelines:

1. Sites containing hazardous substances subject to **Pub.L. 109-295** that is commonly referred to by the public as the Department of Homeland Security's Chemical Facility Anti-Terrorism Standards (CFATS).
2. Sites containing hazardous substances with a federal recognized classification of **SARA Title III**, Superfund Amendments and Reauthorization Act (SARA) Title III of SARA ("SARA Title III") that is part of the Emergency Planning and Community Right-To-Know Act (EPCRA) requiring a Risk Management Plan (RMP) as part of a site's emergency response also known by the International Fire Code (IFC) as sites/facilities having a Hazardous Materials Management Plan (HMMP) sometimes referred to by federal or state governments as a Crisis Response Plan, Hazardous Material Emergency Plan or Hazardous Material Off-Site Response Plan.
3. Emergency Communication System Upgrade clarification: A site's risk analysis, being the basis of site's emergency communication design will be done by others unless the fire code official is qualified, and the future site designs of an IFC H classification site/facility/structure has a potential of reaching a DHS/CFATS, SARA Title III classification or will meet ICC IFC Section 2701.5.1 and or 2701.5.2 and the requirements when applicable for the new National Fire Alarm and Signaling Codes with their Emergency Communication System (ECS) or is already specified in the site's fire alarm system plans and a site risk analysis is already incorporated into the emergency communication design as part of their overall design is then complete.

K101.2.1 Retroactive emergency communication system upgrade requirements. The option of upgrading a Fire alarm system to the new National Fire Alarm and Signaling Codes for those sites applicable that in the past required emergency HazMat responses or activated their Hazardous Materials Management Plan (HMMP) the local authority having jurisdiction can review the present status of the site/facility with their fire code official and based on the site's risk analysis a system upgrade can be applied.

SECTION K102
REFERENCED STANDARDS

ICC IFC-06 International Fire Code K101.1, K101.2
NFPA 72-2010 National Fire Alarm Code K101.1, K101.2, K101.2.1

Commenter's Reason: This Appendix with its provisions could be a **key element** that could be used to protect millions throughout our nation by giving those governments, communities or tribes etc. who are presently **ICC compliant** the opportunity to enhance emergency communication within their communities by using these new codes.

For many years our nation waited for codes as such to catch up to the NEW state-of-the-art technology being used in emergency communication systems. Just imagine how much deliberation took place when the NFPA they decided to change the name of their new codes that now might have others confused. Within the codes you might find upgrades to one-way, two-way and mass emergency communication systems etc. that many have been waiting for, for many years. Depending on when you have the opportunity to read this proposed appendix you might discover that due to overlapping code development cycles between organizations the printed form of these new code showing you these upgrades may not yet be available so… I recommend that you use the Internet to find updated NFPA information if you would like to do some research.

Since this new terminology maybe a concern, background information is available through the internet by searching for articles such as Emergency Communications Systems and or the new NFPA 72-2010 codes. If you are interested in some detailed information, you could try to contact somebody at the NFPA that you might know who sat on the NFPA 72 development committee who is familiar with the final ratification of these new NFPA 72/National Fire Alarm and Signaling Codes, Emergency Communication Systems specifications etc. and he or she might be able to fill you in or…at least tell you where you can find these new codes changes on their website, that is if you did not already find what you were looking for.

In the past awareness about emergency communication issues were brought to the ICC IFC attention in the attempt to establish a standard within the IFC so emergency communication/notifications systems being a outside annunciator devices /speakers etc. could be installed by code, but now that the NFPA 72 committee has moved forward… in my opinion I think it does not make any sense to have duplicate codes in the IFC, so that is why this proposed appendix with these new codes I believe should now be used.

What did it take for our Federal Government to get involved? Did you know that it actually took a Presidential Executive Order 13407 followed by Congress's involvement with requirements to start to upgrade our national standards to reflect the new state-of-the-art technology in emergency communications? As an end result our Department of Homeland Security is now involved through an agency that presently falls under their umbrella that is called the Federal Emergency Management Agency (FEMA) and in layman's terms, now has a goal to provide alert and warnings throughout our infrastructure no matter what the crisis by using communication systems that could then provide life-saving information no matter where you are located or what time of the day it might be, such as during a natural or man-made disaster/ event… or in times of crisis. This federal government program is commonly known today as the Integrated Public Alert Warning System (IPAWS).

Do you agree? Washington with all of their wisdom forgot the basics, it appears that they forgot that when it comes to upgrading the alert/warning, emergency communication systems used for early warning mass notification everything starts with codes/specifications and implementation of systems with requirements at the local government level. Now do you realize why these upgraded NFPA 72/National Fire Alarm and Signaling Codes are so important?

Understanding why DHS's CFATS and the SARA Title III classifications are being used as guidelines to start a site's analysis are a very important part of this appendix. In this case you need a benchmark based on a time factor of how long it will take local first responders from the first millisecond of the event to be on scene, to then mitigate the event.

As you will discover our federal government gave an industry a wake-up call. The industry that many knew is now changing and by the time you read this proposal you might already be familiar with the following Federal Law, Pub.L.109-295 publicly known as our Department of Homeland Security's (DHS) and their Chemical Facility Anti-Terrorism Standards (CFATS). Keep in mind that DHS is a Security department and not a Code organization. I think you will quickly understand why CFATS is being used as a guideline if not simply contact the Department of Homeland Security and have them explain to you their Top Screening process that they used and how they determined their multiple tier structure to identify certain sites of concern. Once you understand their methods I feel that you will be able to see why this appendix is so important.

The short version back in 2008 after an official release the national media reported that more than 7,000 sites were chosen by using DHS's Top Screening process based on their tier structure as being sites of potential high-risk for terrorist attack. By the time code officials read this information some of the DHS security inspections at these sites that were on the schedule to start in January 2009 should already be completed. DHS should be the first to see how many of these sites with hazardous substances actually have any outside emergency communication warning devices/systems in place and operational to warn the surrounding public who could be outside exposed to the atmosphere when an event containing hazardous substances takes place at their facility that for many years others "assumed" such early warning devices were being installed. Having emergency communication notification systems in place with the ability to warn the public before exposure is one of the reasons for proposing this appendix. For too many years the mind-set has been that the general public will be sitting in their homes or have their electronic devices turned on just waiting for emergency warnings when in reality they are discovering that depending on the geographical area and the time of day that numbers will vary. Note that each geographical area of a site of interest that could be applicable is different and that is why a site analysis study is required. The most important part of our general public which are those who are less fortunate, our poor, the handicapped and those with special needs have a problem. Emergency Communication Systems used for outside early warning notification have the potential of reaching a large percentage of the affected population almost immediately unlike other means that could be subject to system loads and possible time delays. Another factor that has been increasing is the demand on our electrical grid and at times there are areas within our nation who might already be without electrical service (a major power outage), and or do not have telecom, broadcast, or cable connectivity. As the public starts to do their math and these deficiencies are known is strange how quiet it is now getting. Who was responsible for doing the math?

You probably are questioning why the terms SARA Title III is used as a guideline benchmark, it is simple many elected officials understand the term SARA Title III rather than the H classification being used in present code. Since governments, communities or tribes etc. will be involved in the decision-making on whether or not to adopt this proposed Appendix the term SARA that is an abbreviation for Superfund Amendments and Reauthorization Act, which is more universally understood by elected officials or others who participate in their (LEPC) Local Emergency Planning Committees, this terminology should make it easier for fire code officials to work with local governments to determine which sites located within their communities these upgrades and or new installation requirements will apply. Since fire code officials may not be familiar with the new technology in

the world of emergency communication, in order to relieve the fire code official of additional burdens as it pertains to the acoustical designs and decision making a site's risk analysis, being the basis of site emergency communication design will be done by others, unless the fire code official is qualified and he or she would like to get involved.

For the second part of this requirement for installation being that if the site's designer already incorporated the new NFPA 72 codes to be known as National Fire Alarm and Signaling Codes, Emergency Communication System codes in the IFC H classification of a site/facility/structure and the acoustical designs including the decision making as it pertains to a site's risk analysis is already in their site design plans, and everything has been accounted for, thus meeting local government and fire code official approval everything should be Good-To-Go.

Please note that designers have been doing acoustical studies/designs for many years and emergency communication systems are being used throughout the world. Now our fire code officials will have an opportunity to have a closer working relationship with their local governments as being the Authority Having Jurisdiction (AHJ) to ensure that all related code preparedness and public safety communication concerns are met.

As discussions at the local level will always seem to continue on how to activate the emergency communications system, being the trigger, that is why a site analysis of the facility/building/structure is done first because each site maybe unique. These are decisions that are made after the appendix is adopted.

As you consider this proposed appendix for approval please keep in mind that this appendix addresses the ability of a community to adopt the appendix so they can use these new NFPA codes to ensure that early warning emergency communication is available for those who may be outside fully exposed to the atmosphere being that of employees at a site/facility or the public in the surrounding community at site/facilities where these code requirements may apply will then be installed by code. Again in doing so this will address the larger portion of the effectiveness of the notification problem because the majority of the public depending on the geographical area and time of day could be outside of their homes and outside emergency communication early warning notification is essential so that they can protect their families by turning on their electronic devices and waiting for further instructions.

For some areas of our nation emergency communication systems as such are already installed at facilities/sites etc. and even emergency communication systems are being used for public community notification so this appendix may have little or no impact on those who choose to adopt this appendix.

Please consider this proposed Appendix with it's provisions/requirements that will give those governments, communities or tribes who are presently ICC compliant the opportunity to protect their communities, families, loved ones and especially those with special needs by using these new codes that many have been waiting for, for so many years.

Cost Impact: The cost impact of this code proposal will depend on many factors such as when this code is adopted, site inspections are done in order to determine what is required after doing a site analysis, the acoustical design and or other actions are performed in order to determine the cost of construction since the emergency communications system in some applications could also be considered an add-on, even an estimated cost of construction cannot honestly be determined at this time because each site will be different.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: JACOBY-F2-APPENDIX K.DOC

F236–09/10

Appendix K (New); IBC Appendix L (New)

Proponent: Sean DeCrane, Cleveland Fire Department, representing International Association of Fire Fighters

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE FIRE CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE FIRE CODE COMMITTEE.

PART I – IFC

Add new appendix as follows:

APPENDIX K
BUILDING INFORMATION SIGN

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION K 101
GENERAL

K101.1 Scope New buildings shall have a building information sign(s) that shall comply with Sections 505.3.1 through 505.3.7. Existing buildings shall be brought into conformance with Sections K101.1 through K101.9 when one of the following occurs:

1. The fire department conducts an annual inspection intended to verify compliance with this section of the code, or any required inspection.
2. When a Change in Use or Occupancy has occurred.

Exceptions:

1. Utility occupancies
2. One and Two-family dwellings

K101.1.1 Sign location. The building information sign shall be placed on one of the following:

1. The entry door or sidelight at a minimum height of 42" above the walking surface on the address side of the building or structure;
2. The exterior surface of the building or structure no further than 3' from the entrance door, on either side of the entry door, at a minimum height of 42" above the walking surface on the address side of the building or structure;
3. Conspicuously placed, inside an enclosed entrance lobby, on any vertical surface within 10 feet of the entrance door at a minimum height of 42" above the walking surface;
4. Located inside the building's fire command center;
5. Located on the exterior of the fire alarm panel or immediately along side the panel door on the wall if the alarm panel is located in the enclosed main lobby.

K101.1.2 Sign features. The building information sign shall consist of:

1. White reflective background with red letters;
2. Durable material;
3. Numerals shall be Roman or Latin numerals, as required, and/or alphabet letters;
4. Permanently affixed to the building or structure in an approved manner.

K101.1.3 Sign shape. The building information sign shall be a Maltese Cross as shown in Figure K101.1.3

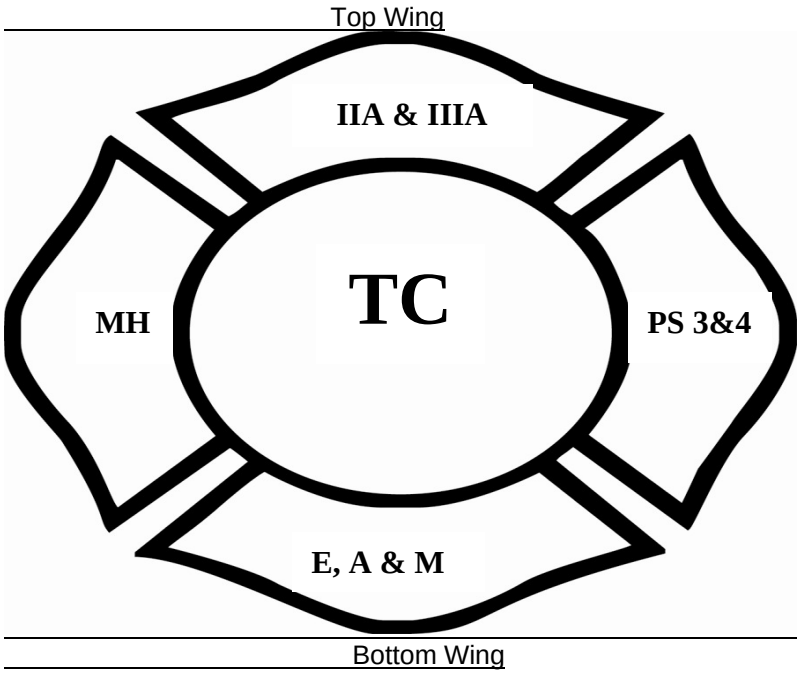


FIGURE K101.1.3
BUILDING INFORMATION SIGN

K101.1.4 Sign size and lettering. The minimum size of the building information sign and lettering shall be in accordance with the following:

1. The width and height shall be 6 inches by 6 inches
2. The height or width of each Maltese cross wing area shall be 1 1/8 inches and have a stroke width of ½ inch;
3. The center of the Maltese cross a circle of oval 3 ⅛ inches in diameter and has a stroke width of ½ inch;
4. All roman numerals and alphabetic designations, shall be 1 ¼ inch height and have a stroke width of ¼ inch.

K101.2 Sign designations. Designations shall be made based upon the construction type, content, hazard, fire protection systems, life safety and occupancy. Where multiple designations occur within a classification Category, the designation used shall be based on the greatest potential risk.

K101.3 Construction type (TOP WING). The construction types shall be designated by assigning the appropriate Roman numeral, and letter, placed inside the top wing of the Maltese cross. The hourly rating provided is for the structural framing in accordance with Table 601 of the *International Building Code*,

Construction Type	**Hourly Rating**
IA - Non-Combustible Construction -	3 Hour Rating
IB –Non-Combustible Construction -	2 Hour Rating
IIA – Non-Combustible Construction -	1 Hour Rating
IIB – Non-Combustible Construction -	0 Hour Rating
IIIA – Non-Combustible/Combustible Construction -	1 Hour Rating
IIIB – Non-Combustible/Combustible Construction -	0 Hour Rating
IV – Heavy Timber Construction -	
VA – Combustible Construction -	1 Hour Rating
VB – Combustible Construction –	0 Hour Rating

K101.4 Fire protection systems (Right Wing). The fire protection systems shall be designated by determining its level of protection and assigning the appropriate designation to the right wing of the Maltese cross. Where multiple systems are provided, all shall be listed:

AS – Automated Fire Sprinkler System installed throughout;
DS – Dry Sprinkler System and designated areas
FAS – Fire Alarm System
FP – Fire Pump
FW – Fire Wall and designated areas
PAS – Pre-Action Sprinkler System and designated floor
PS – Partial Automatic Fire Sprinkler System, and designate floor;
CES – Chemical Extinguishing System and designated area,
CS – Combination Sprinkler and Standpipe System;
S – Standpipe System;
NS – No system installed

K101.5 Occupancy type (Bottom Wing). The occupancy of a building or structure shall be designated in accordance with the occupancy classification found in Section 302.1 of the *International Building Code* and the corresponding designation shall be placed in the bottom wing of the Maltese cross. When a building or structure contains a mixture of uses and occupancies; all uses and occupancies shall be identified.

A – Assembly
B – Business
E – Educational
F – Factory or Industrial
H – High Hazard
I – Institutional
M – Mercantile
R – Residential
S – Storage

K101.6 Hazards of content (Left Wing). The hazards of building contents shall be designated by one of the following classifications as defined in NFPA 13 and the appropriate designation shall be placed inside the left wing of the Maltese cross:

LH - Light Hazard
MH - Moderate Hazard
HH - High Hazard

K101.7 Tactical Considerations (Center Circle). The Center Circle shall include the name of the local Fire Service and when required the letters TC for Tactical Considerations. When fire fighters conduct pre-plan operations, a unique situation(s) for tactical considerations shall be identified and the information provided to the fire dispatch communications center to further assist fire fighters in identifying that there is special consideration(s) for this occupancy. Special consideration designations include, but are not limited to:

1. Impact resistant drywall
2. Impact resistant glazing, such as blast or hurricane type glass
3. All types of roof and floor structural members including but not limited to post tension concrete, bar joists, solid wood joists, rafters, trusses, cold-formed galvanized steel, I-joists and I-beams; Green roof with vegetation, soil & plants
4. Hazardous materials, explosives, chemicals, plastics, etc;
5. Solar Panels and DC electrical energy
6. HVAC system; and smoke management system for pressurization and exhaust methods
7. Other unique characteristic(s) within the building that are ranked according to a potential risk to occupants and firefighters

K101.8 Sign classification maintenance, Building information sign maintenance shall comply with each of the following:

1. Fire departments in the jurisdiction shall define the designations to be placed within the sign.
2. Fire departments in the jurisdiction shall conduct annual inspections to verify compliance with this section of the code and shall notify the owner, or the owners agent, of any required updates to the sign in accordance with fire department designations and the owner, or the owner's agent, shall comply within thirty (30) days.
3. The owner of a building shall be responsible for the maintenance and updates to the sign in accordance to fire department designations.
4. The owner of a building shall notify the fire department of any changes that possibly effect the classifications, of the system, within thirty (30) days of the changes and the Fire Department shall conduct an inspection.
5. The owner of a building shall change the effected classification posted on the sign within thirty (30) days of the changes.

K101.9 Training. Jurisdictions shall train all fire department personnel on Sections K101.1 through K101.9

PART II – IBC GENERAL

Add new appendix as follows:

APPENDIX L
BUILDING INFORMATION SIGN

SECTION L101
GENERAL

L101.1 Scope New buildings shall have a building information sign(s) that shall comply with Sections 505.3.1 through 505.3.7. Existing buildings shall be brought into conformance with Sections L101.1 through L101.9 when one of the following occurs:

1. The fire department conducts an annual inspection intended to verify compliance with this section of the code, or any required inspection.
2. When a Change in Use or Occupancy has occurred.

Exceptions:

1. Utility occupancies
2. One and Two-family homes

L101.1.1 Sign location. The building information sign shall be placed on one of the following:

1. The entry door or sidelight at a minimum height of 42" above the walking surface on the address side of the building or structure;
2. The exterior surface of the building or structure no further than 3' from the entrance door, on either side of the entry door, at a minimum height of 42" above the walking surface on the address side of the building or structure;
3. Conspicuously placed, inside an enclosed entrance lobby, on any vertical surface within 10 feet of the entrance door at a minimum height of 42" above the walking surface;
4. Located inside the building's fire command center;
5. Located on the exterior of the fire alarm panel or immediately along side the panel door on the wall if the alarm panel is located in the enclosed main lobby.

L101.1.2 Sign features. The building information sign shall consist of:

1. White reflective background with red letters;
2. Durable material;
3. Numerals shall be Roman or Latin numerals, as required, and/or alphabet letters;
4. Permanently affixed to the building or structure in an approved manner.

L101.1.3 Sign shape. The building information sign shall be a Maltese Cross as shown in Figure L101.1.3

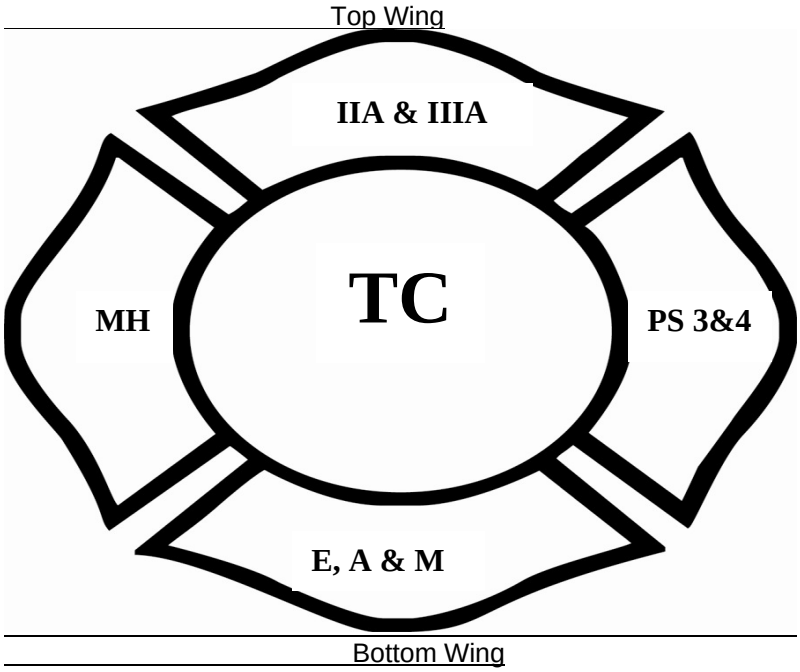


FIGURE L101.1.3
BUILDING INFORMATION SIGN

L101.1.4 Sign size and lettering. The minimum size of the building information sign and lettering shall be in accordance with the following:

1. The width and height shall be 6 inches by 6 inches
2. The height or width of each Maltese cross wing area shall be 1 1/8 inches and have a stroke width of ½ inch;
3. The center of the Maltese cross a circle of oval 3 ⅛ inches in diameter and has a stroke width of ½ inch;
4. All roman numerals and/or alphabetic designations, shall be 1 ¼ inch height and have a stroke width of ¼ inch.

L101.2 Sign designations. Designations shall be made based upon the construction type, content, hazard, fire protection systems, life safety and occupancy. Where multiple designations occur within a classification Category, the designation used shall be based on the greatest potential risk.

L101.3 Construction type (TOP WING). The construction types shall be designated by assigning the appropriate Roman numeral, and letter, placed inside the top wing of the Maltese cross. The hourly rating provided is for the structural framing in accordance with Table 601 of the *International Building Code*,

Construction Type	**Hourly Rating**
IA - Non-Combustible Construction -	3 Hour Rating
IB –Non-Combustible Construction -	2 Hour Rating
IIA – Non-Combustible Construction -	1 Hour Rating
IIB – Non-Combustible Construction -	0 Hour Rating
IIIA – Non-Combustible/Combustible Construction -	1 Hour Rating
IIIB – Non-Combustible/Combustible Construction -	0 Hour Rating
IV – Heavy Timber Construction -	
VA – Combustible Construction -	1 Hour Rating
VB – Combustible Construction –	0 Hour Rating

L101.4 Fire protection systems (RIGHT WING). The fire protection systems shall be designated by determining its level of protection and assigning the appropriate designation to the right wing of the Maltese cross. Where multiple systems are provided, all shall be listed:

AS – Automated Fire Sprinkler System installed throughout;
DS – Dry Sprinkler System and designated areas
FAS – Fire Alarm System
FP – Fire Pump
FW – Fire Wall and designated areas
PAS – Pre-Action Sprinkler System and designated floor
PS – Partial Automatic Fire Sprinkler System, and designate floor;
CES – Chemical Extinguishing System and designated area,
CS – Combination Sprinkler and Standpipe System;
S – Standpipe System;
NS – No system installed

L101.5 Occupancy type (Bottom Wing). The occupancy of a building or structure shall be designated in accordance with the occupancy classification found in Section 302.1 of the *International Building Code* and the corresponding designation shall be placed in the bottom wing of the Maltese cross. When a building or structure contains a mixture of uses and occupancies; all uses and occupancies shall be identified.

A – Assembly
B – Business
E – Educational
F – Factory or Industrial
H – High Hazard
I – Institutional
M – Mercantile
R – Residential
S – Storage

L101.6 Hazards of content (Left Wing). The hazards of building contents shall be designated by one of the following classifications as defined in NFPA 13 and the appropriate designation shall be placed inside the left wing of the Maltese cross:

LH - Light Hazard
MH - Moderate Hazard
HH - High Hazard

L101.7 Tactical considerations (Center Circle). The Center Circle shall include the name of the local Fire Service and when required the letters TC for Tactical Considerations. When fire fighters conduct pre-plan operations, a unique situation(s) for tactical considerations shall be identified and the information provided to the fire dispatch communications center to further assist fire fighters in identifying that there is special consideration(s) for this occupancy. Special consideration designations include, but are not limited to:

1. Impact resistant drywall
2. Impact resistant glazing, such as blast or hurricane type glass
3. All types of roof and floor structural members including but not limited to post tension concrete, bar joists, solid wood joists, rafters, trusses, cold-formed galvanized steel, I-joists and I-beams; Green roof with vegetation, soil & plants
4. Hazardous materials, explosives, chemicals, plastics, etc;
5. Solar Panels and DC electrical energy
6. HVAC system; and smoke management system for pressurization and exhaust methods
7. Other unique characteristic(s) within the building that are ranked according to a potential risk to occupants and firefighters

L101.8 Sign classification maintenance, Building information sign maintenance shall comply with each of the following:

1. Fire departments in the jurisdiction shall define the designations to be placed within the sign.
2. Fire departments in the jurisdiction shall conduct annual inspections to verify compliance with this section of the code and shall notify the owner, or the owners agent, of any required updates to the sign in accordance with fire department designations and the owner, or the owner's agent, shall comply within thirty (30) days.
3. The owner of a building shall be responsible for the maintenance and updates to the sign in accordance to fire department designations.
4. The owner of a building shall notify the fire department of any changes that possibly effect the classifications, of the system, within thirty (30) days of the changes and the Fire Department shall conduct an inspection.
5. The owner of a building shall change the effected classification posted on the sign within thirty (30) days of the changes.

L101.9 Training. Jurisdictions shall train all fire department personnel on Sections L101.1 through L101.9

Reason: This Building Information Sign (BIS) is designed to be utilized in the crucial initial response of fire fighters to a structure fire. Similar to the Emergency Response Guidebook, published by the Department of Transportation, the BIS placard is designed to be utilized within the initial response time frame of an incident. Firefighters are trained to size-up a situation as early as possible after notification. The outward appearances of a building can be deceiving and the type of construction may not appear to be what it really is. This is becoming a more frequent occurrence within many communities.. Having the BIS placard will allow responding fire companies to make an informed tactical decision. The responding fire company will be able to identify the type of construction, hazard level of the contents, structural framework, occupancy of the building and the building fire protection system features , as well as he extent of the protection,

In the fire service there are many times we are dispatched to a location or area without an address, I.e. A fire company is dispatched in the vicinity of: Main St. and 5th Ave.. placing this information electronically will not address those incidents. Once the fire company has located the building or structure, the company officer can relay the correct address to the Dispatching Center and exit the apparatus to begin an assessment by making tactical decisions from the BIS building placard. The company officer cannot afford to wait until Dispatch sends an electronic form of the placard to t a mobile computer unit. This sign will give the arriving fire officer information to rapidly begin his/her assessment.

Another instance where a BIS placard is valuable for a Mutual Aid response to your community. Mutual Aid fire companies do not always share the same Dispatching Centers therefore they would not have the ability to receive the electronic communication. Placing this placard in designated locations will allow arriving Mutual Aid companies to begin proper tactical assessments.

Also within the Tactical Considerations (TC) section, the BIS placard will allow fire fighters to identify additional considerations. Just by seeing that there are additional TC considerations would give firefighters pause to consider unique aspects of the situation, such as:

Are there special needs for the occupants?
Is the interior constructed of impact resistant dry wall which will make wall breeching very difficult?
Is there hurricane glazing?
Is there an above ground 1500 gallons fuel oil tank in the basement?

Does the building contain dimension lumber, trusses, I-joists, cold formed steel, etc. in the roof or floors members?

These TC concerns can be identified and placed within the Tactical Considerations section of the BIS placard. The National Institute for Occupational Safety and Health (NIOSH) released an Alert Report, 'Preventing Injuries and Deaths of Fire Fighters Due to Truss System Failures[1] and made recommendations to identifying structures by suggesting that building owners and managers "Consider placing building construction information outside the building. Include information about roof and floor type (presence of trusses, materials used), roof loads (heating, ventilation, and air conditioning (HVAC) units, sprinkler systems, utilities, hazardous materials stored on site and emergency contact numbers. Use and follow the proper building codes."

This Building Information Sign has brought many people together from various private industries and public agencies such as:

Structural Building Component,
Steel & Wood industries,
Building officials, and the
Fire Service,

So as to collaborate on a BIS system that is comprehensive and meets the need of the fire service for information that allows for a quicker building assessment on the fire ground. This addresses a key question that has been asked for quite some time -- "How do we provide building information to the fire service?". With this Building Information Sign we will be providing fire fighters crucial information at the most important time period. Fire Officers will be able to make decisions-based tactics on the knowledge provided within this building BIS placard or be prompted by other Tactical Considerations to request more information from the dispatch center.

Bibliography:

1. NIOSH Alert – "Preventing Injuries and Deaths of Fire Fighters Due to Truss System Failures" April 2005

Cost Impact: The code change proposal will have a minimal increase to the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DECRANE-F3-APPENDIX K.DOC

F237–09/10
Appendix K (New)

Proponents: Patrick Siegman, Principal, Nelson, Nygaard Consulting Associates, representing the Congress for the New Urbanism; Peter Swift, Owner, Swift and Associates, representing the Congress for the New Urbanism; John Norquist, CEO, Congress for the New Urbanism

Add new Appendix as follows:

APPENDIX K
STREET DESIGN FOR LIFE SAFETY

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION K101
GENERAL

K101.1 Intent. The purpose of this appendix is allow jurisdictions to adopt performance-based requirements for fire apparatus access roads, in order to achieve all of the following purposes:

1. Establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide safety to fire fighters and emergency responders during emergency operations.
2. On the new and existing fire apparatus access roads required by and regulated by this code, establish requirements consistent with nationally and internationally recognized good practice for achieving a reasonable level of overall life safety, by taking into account and balancing the need to prevent road traffic deaths and injuries and the need to safeguard against the hazards of fire, explosions and other dangerous conditions.

K101.2 Scope. If this appendix is adopted by a jurisdiction, then the following changes to the current provisions of the code come into effect within the jurisdiction:

101.2 Scope. This code establishes regulations affecting or relating to structures, processes, premises and safeguards regarding:

1. The hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices;
2. Conditions hazardous to life, property or public welfare in the occupancy of structures or premises;
3. Conditions hazardous to life, property or public welfare on or relating to the design of fire apparatus access roads, including the hazards of traffic, fire, explosion and other dangerous conditions;
4. Fire hazards in the structure or on the premises from occupancy or operation;
5. Matters related to the construction, extension, repair, alteration or removal of fire suppression or alarm systems.
6. Conditions affecting the safety of fire fighters and emergency responders during emergency operations.

101.3 Intent. The purpose of this code is to establish the minimum requirements consistent with nationally recognized good practice for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide safety to fire fighters and emergency responders during emergency operations. Additionally, on the new and existing fire apparatus access roads required by and regulated by this code, the purpose of this code is to establish requirements consistent with nationally and internationally recognized good practice for achieving a reasonable level of overall life safety, by taking into account and balancing the need to prevent road traffic deaths and injuries and the need to safeguard against the hazards of fire, explosions and other dangerous conditions.

503.2.1 Dimensions. Fire apparatus access roads shall have an unobstructed width ~~of not less than 20 feet (6096 mm), exclusive of shoulders, except for approved security gates in accordance with Section 503.6,~~ and an unobstructed vertical clearance ~~of not less than 13 feet 6 inches (4115 mm).~~ that permits passage of the

jurisdiction's fire apparatus and, wherever necessary, provides adequate space for deploying the jurisdiction's fire apparatus and for conducting fire and rescue operations.

~~**503.2.2 Authority.** The fire code official shall have the authority to require an increase in the minimum access widths where they are inadequate for fire or rescue operations.~~

503.2.4 Turning radius. The required turning radius of a fire apparatus access road shall ~~be determined by the fire code official.~~ provide for the passage of the jurisdiction's fire apparatus.

503.2.7 Grade. The grade of the fire apparatus access road shall be ~~within the limits established by the fire code official based on the fire department's apparatus.~~ limited to grades that permit passage by, and, wherever necessary, fire and rescue operations by, the jurisdiction's fire apparatus.

503.2.8 Design for road traffic safety. Fire apparatus access roads shall be designed and maintained so as to minimize road traffic deaths and injuries, while maintaining adequate provision for the passage of fire apparatus and for fire and rescue operations. To achieve these goals, fire apparatus access roads shall be designed and maintained to both: (a) permit passage of the jurisdiction's fire apparatus and, wherever necessary, provide adequate space for deploying the jurisdiction's fire apparatus and conducting fire and rescue operations; and (b) minimize excess and inappropriate vehicle speeds.

Reason: This proposed code change provides an appendix that allows, but does not require, a jurisdiction to substitute revised material for current provisions of the code. That is, if the appendix is adopted by a jurisdiction, then the jurisdiction has elected to substitute revised materials for current provisions of the code. This appendix is intended to allow jurisdictions to take an approach to the design of fire apparatus access roads that improves overall life safety, by allowing jurisdictions to adopt roadway designs that strike the best possible balance between reducing the hazards of fire and reducing road traffic deaths and injuries, given the jurisdiction's own particular circumstances and particular choice of fire apparatus.

The text below attempts to provide clear and succinct answers to the questions asked for in the "Supporting Information" Section of the Code Change Proposal Instructions. That is, the following paragraphs state the purpose of the proposed code change, justify changing the current code provisions and seek to explain why the proposed code change is superior to the current provisions of the code.

1. What is the purpose of this proposed code change (e.g., clarify the code; revise outdated material; substitute new or revised material for current provision of the code; add new requirements to the code; delete current requirements, etc.)?

Response: This proposed code change provides an appendix that allows, but does not require, a jurisdiction to substitute revised material for current provisions of the code. That is, if the appendix is adopted by a jurisdiction, then the jurisdiction has elected to substitute revised materials for current provisions of the code. This approach will allow jurisdictions to take an approach to the design of fire apparatus access roads that we believe improves overall life safety, by allowing jurisdictions to adopt roadway designs that strike the best possible balance between reducing the hazards of fire and reducing road traffic deaths and injuries, given the jurisdiction's own particular circumstances and particular choice of fire apparatus. By allowing, but not requiring, jurisdictions to adopt this proposed appendix, the ICC will make it possible for jurisdictions to demonstrate the efficacy of this approach, without taking the more far-reaching step of simply altering the basic code.

2. What is the justification for changing the current code provisions? Why is the proposal superior to the current provisions of the code? Proposals that add or delete requirements shall be supported by a logical explanation which clearly shows why the current code provisions are inadequate or overly restrictive, specifies the shortcomings of the current code provisions and explains how such proposals will improve the code.

Response: The current International Fire Code specifies dimensions for fire apparatus access roads. Three key points about fire apparatus access roads should be noted:

1. The code requires that at least one fire apparatus access road be provided for every facility, building or a portion of the building hereafter constructed or moved into within a jurisdiction.
2. The code defines a fire apparatus access road as a road that provides fire apparatus access from a fire station to a facility, building or portion thereof.
3. The code defines fire apparatus access road as a general term inclusive of all other terms such as fire lane, public street, private street, parking lot lane and access roadway.

Therefore, since at least one fire apparatus access road must reach from a fire station to every building and facility constructed once the code is adopted, **the current International Fire Code specifies the key dimensions of many, if not most, public and private streets.** This is significant not only for fire safety, but also for road safety. A substantial body of traffic safety research literature has found conclusively that the dimensions of streets significantly affect road safety. Therefore, **the current International Fire Code sets specifications for the design of many, if not most, public and private streets, and these specifications significantly affect traffic safety.**

Since the essential purpose of the International Fire Code is to provide for a reasonable level of life safety and property protections from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide safety to fire fighters and emergency responders during emergency operations, the code may not always be thought of as a code that has significant and far-reaching effects on road safety. The reality, however, is that the International Fire Code does significantly affect road design, and therefore, significantly affects road traffic deaths and injuries.

We believe that the International Code Council can substantially advance the cause of improving overall life safety by taking the following actions:

1. ***Embrace the goal of improving overall life safety***, including preventing not only the tragedies caused by fire, structural collapse and other hazards that have long been explicitly focused on by code enforcement and fire officials, but also road traffic deaths and injuries.

2. ***Dedicate itself to reducing the burden of global road traffic deaths and injuries***, by committing itself to work in partnership with a broad range of organizations and governments to develop and implement road safety strategies, plans and codes.
3. ***Work together with road safety organizations to thoroughly review the existing codes promulgated by the International Code Council to ensure that the codes embrace internationally recognized good practices for protecting life safety, including not only reducing the hazards of fire, explosion and other dangerous conditions in buildings, but also reducing road safety hazards.***

While the International Code Council may never wish to expand its mission to include the task of writing full road safety codes, the Council can and we believe should work closely with road safety organizations to ensure that building codes and regulations, such as the fire apparatus access road provisions of the International Fire Code, allow for and encourage best practices in road safety.

The attached code change proposal is submitted in the spirit of cooperation between code enforcement and fire officials and road safety professionals. It was drafted out of our concern that the current provisions of the International Fire Code for fire apparatus access roads do not strike the best possible balance between reducing the hazards of fire and other building-related hazards, and reducing road traffic deaths and injuries. This submission is intended as a first step in bringing road safety professionals and fire service professionals together to work on an area of mutual concern: fire apparatus access roads are not only the areas where firefighters must set up equipment and fight conflagrations, but also the site of innumerable traffic deaths and injuries. The design of fire apparatus access roads (that is, the design of many public and private streets) is necessarily a balancing act, where there are frequently conflicts, tensions and trade-offs between the goals of improving road safety and improving fire safety. The very best design for bringing fire engines quickly to the scene of an incident, or the very best design for providing room to deploy equipment at the scene of a fire, is often not the best design for ensuring low motor vehicle speeds and pedestrian safety at a school crosswalk, or on a quiet residential street.

In drafting this code change proposal, we sought to recognize these tensions and trade-offs regarding fire apparatus access roads, and then to draft a code change proposal that would allow jurisdictions to do a better job of overcoming these conflicts. This code change proposal is intended to allow jurisdictions to design roads for overall life safety, including both fire safety and road safety. It is based on the following principles:

1. The necessary minimum dimensions of fire apparatus access roads are driven in large part by the size, weight, configuration and capabilities of a jurisdiction's fire apparatus.
2. The necessary minimum dimensions of fire apparatus access roads also depend on the staffing, strategies and tactics employed by a jurisdiction.
3. The characteristics of fire apparatus, and the staffing, strategies, and tactics of firefighters and emergency responders, vary widely from jurisdiction to jurisdiction, both internationally and within nations.
4. Roadway dimensions and design significantly affect road safety.
5. Therefore, the roadway designs that can be used by a jurisdiction to improve road safety on fire apparatus access roads vary depending on the fire apparatus employed by that community. Designs for road safety that work well in one jurisdiction may introduce significant difficulties for fire fighting in another jurisdiction where the fire apparatus that is in use is significantly larger, less maneuverable or less capable of deploying in a smaller space.
6. Therefore, rather than employing a one-size-fits-all approach to fire apparatus access roads, which assumes that all jurisdictions around the world and across the nation employ similar fire apparatus, this proposed code change recommends a performance-based approach.
7. Employing a more performance-based approach will make it possible to better balance the goals of improving road safety and improving fire and building safety, while taking into account the major differences between jurisdictions in fire apparatus, staffing, strategies and tactics.

We note that the existing provisions for fire apparatus access roads in Section 503 contain a mix of prescriptive and performance-based requirements. This proposed code change moves further in the direction of a performance-based approach, in the interest of making it more feasible to adopt roadway design solutions that resolve conflicts between road safety and fire safety, are carefully tailored to the fire apparatus in use in a jurisdiction, and improve overall life safety.

As background, the following sections briefly review several considerations that are crucial for designing streets that improve overall life safety. These sections briefly review:

- the magnitude of road traffic deaths and injuries
- road safety risk factors
- the relationship between street design and road safety
- examples of roadway design elements that improve road safety
- the tensions and trade-offs between accommodating needed access for and operations of fire apparatus, and designing streets that improve road safety

First, what is the magnitude of the road traffic safety problem, and why should the ICC be concerned about it?

Why should the International Code Council be concerned about road safety?

The Commission for Global Road Safety succinctly describes the reasons why all citizens, and particularly those of us who dedicate their professional lives to improving public safety, should focus our attention on road safety. According to the Commission's 2006 report, *Make Roads Safe*[1]:

> *Deaths and injuries from road traffic crashes are a major and growing public health epidemic. The World Health Organization has estimated that in 2002 almost 1.2 million people died in road crashes worldwide and as many as 50 million were injured. Unless action is taken, global road deaths are forecast to double by 2020 and yet many of these deaths and injuries are known to be preventable…*
> *High income countries have developed effective road safety measures after decades of trial and error and human tragedy. While more effort is still needed in the industrialised nations the major challenge now is to ensure through early intervention that low and middle income countries do not have to experience the same bitter learning curve…*
> *The World Report on road traffic injury prevention, published by WHO and the World Bank in 2004, details the key road injury 'risk factors', the major contributing factors to road crashes and injury severity, including drink driving; lack of helmet use; seat belt non compliance; excessive speed; and poor infrastructure design and management.*

1 Commission for Global Road Safety. *Make Roads Safe*. London, United Kingdom. Commission for Global Road Safety, 2006, p. 2. [Accessed June 1, 2009]. Available at http://www.makeroadssafe.org/publications/Documents/mrs_report_2007.pdf

As a leading international organization -- if not the leading international organization -- devoted to building a safer world, the International Code Council can play an important role in solving this epidemic. At a minimum, even if it seeks no active role, the ICC will nonetheless be involved, because by specifying the key dimensions of so many public streets (i.e., the dimensions of fire apparatus access roads), the ICC's codes now play a major role in street design and therefore in road safety.

What Are Road Safety Risk Factors?
As the Commission for Global Road Safety's *Make Roads Safe* report notes, road safety specialists frequently refer to risk factors.

Primary Risk
The report notes that, "Primary risk describes the factors that contribute to the risk of occurrence of a road crash." Two of the four primary risk factors are *behavioral factors*, which are influenced by roadway dimensions and design, and the *road environment*, which is directly determined by roadway dimensions and design.[2]
According to the report, regarding behavioral factors:

> *Excessive or inappropriate speed is a key contributor to crash risk. Speed choice is influenced by the legal speed limit, but also by road layout...*

According to the report, regarding road environment:

> *Road safety engineering and traffic management make a direct contribution to reduction of crash risk. Crash risk is increased by lack of attention to safety in both planning and design of new road networks and new roads. Road design affects road user behavior and crash risk through the speed the drivers will perceive as appropriate, through detailed design factors such as curves...*
> *In modern road systems, vulnerable road users are disadvantaged because such systems are largely designed for the motor vehicle. The absence of footpath and cycle tracks, or traffic calming measures to reduce speed where pedestrians and cyclists mix with motorized traffic, increases the risk of a crash occurring and its severity.*

Secondary Risk
"Secondary risk", the report explains, "includes the likelihood of injury occurring and its severity." As with primary risk, two of the major risk factors are behavioral factors, which are influenced by roadway dimensions and design, and the road environment, which is directly determined by roadway dimensions and design. As the report explains:

> *Impact speed is a crucial determinant of injury severity for vulnerable road users. For example, 90% of pedestrian survive impacts with cars at speeds up to 30 km/hour [18 mph], but more than half will die at speeds of 45 km/hour [27 mph] or more…*
> *[F]or vehicle occupants also, injury severity increases with impact speed. The probability of fatal injury increases from close to zero to almost 100% as the change in impact speed increases from 20 km/hour to 100 km/hour…*
> *Road design can also provide protection for vulnerable road users by reducing impact speed through traffic calming measures.*

Other traffic safety research arises similar conclusions. For example, other research studies have found that when people walking are hit by a car:

- At 20 mph, only 5 percent of walkers are killed, most injuries are slight, and 30 percent suffer no injury;
- At 30 mph, 45 percent of walkers are killed, and many are seriously injured;
- At 40 mph, 85 percent of walkers are killed.[3]

Understanding the links between the dimensions of fire apparatus access roads and the likelihood of road traffic deaths and injuries on these roads
The transportation safety research literature makes clear that:

1. The behavior of motor vehicle drivers, bicyclists, pedestrians and other road users is substantially affected by the dimensions of streets.
2. Key roadway dimensions which have been found to significantly affect driver behavior include the following:

    a. roadway widths,
    b. lane widths,
    c. the presence or absence of raised medians, pedestrian refuges and similar measures (note that feasibility of including such measures in a roadway design is often dependent upon the requirements for roadway widths in the vicinity of these measures)
    d. the presence or absence of roundabouts, traffic circles, splitter islands and similar intersection design measures (again, note that feasibility of such intersection designs is highly dependent upon the requirements for roadway widths in the vicinity of these measures)
    e. turning radii (a.k.a. horizontal curvature) at curves in a roadway,
    f. turning radii (i.e., horizontal deflection) at roundabouts, traffic circles, median islands and channelized turns,
    g. curb radii at intersections,

3. The roadway dimensions and features described above affect important aspects of driver and pedestrian behavior. For example, the presence or absence of a raised median on a roadway affects the ability of drivers to make passing maneuvers, midblock turns or to drift into oncoming traffic.
4. It is particularly important to note that the key roadway dimensions mentioned above affect the speed at which motor vehicle drivers choose to drive. As described above, motor vehicle speed is a key determinant of both the likelihood of a crash occurring and crash severity.
5. Because the dimensions of streets strongly affect the behavior of motorists, bicyclists, pedestrians and other road users, the dimensions of streets significantly affect traffic safety.

Section 503.2 of the current code sets specifications for the dimensions of fire apparatus access roads, including specifying the following key dimensions:

- fire apparatus access roads shall have an unobstructed width of not less than 20 feet;
- the required turning radii of fire apparatus access roads shall be determined by the fire code official.

---

[2] Ibid. p. 60.
3 Limpert, Rudolph. *Motor Vehicle Accident Reconstruction and Cause Analysis*. Fourth Edition. Charlottesville, VA. The Michie Company, 1994, p. 663. See also *Killing Speed and Saving Lives*, United Kingdom Dept. of Transportation, London, England.

While these two specifications are brief, their effect is far-reaching. By setting specifications for the key dimensions of road width and turning radii, Section 503.2 of the code sets specifications for many of the roadway dimensions and street design features (mentioned above) which are known to significantly affect traffic safety.

The following paragraphs provide several examples of the relationship between these two crucial street dimensions (roadway width and turning radii) and the ability to include important design features for traffic safety in a roadway design. In many circumstances, an absolute requirement to provide an unobstructed width of not less than 20 feet at every point along a roadway creates significant conflicts with the need to include roadway design features that improve traffic safety.

Often, these conflicts can be and have been resolved through careful design that consciously balances the need for traffic safety and the needs of firefighters to reach incidents and conduct fire and rescue operations. For example, while particular critical points along a roadway may be intentionally designed with a width of less than 20 foot clear, in order to reduce vehicle speeds and improve traffic safety, other areas along the same block will be provided with at least 20 foot clear, in order to provide, wherever necessary, sufficient space to set up equipment and fight fires.

The proposed appendix, by creating performance-based standards for fire apparatus access roads, will assist in the process of reconciling these conflicts. It provides more flexibility for street design, while still ensuring that streets are designed to allow for the passage of fire apparatus, and space to conduct fire and rescue operations.

Street Design for Traffic Safety: Examples

A few examples of roadway designs that can significantly improve traffic safety, but that frequently require roadway designs with less than 20 foot clear (at some, though not all places along a roadway) include the following:

1. Modern roundabouts
2. Raised medians
3. Low-volume local streets

Each is described in turn below.

1. Modern Roundabouts: The California Department of Transportation recently concluded, "The modern roundabout is now recognized nationally as an intersection type and traffic control treatment capable of providing unique and significant operational and safety benefits over a wide range of traffic volume and conditions. In particular, national research has confirmed that the single-lane version is especially effective in reducing collision frequency and/or severity for all highway users."[4]

Safety of modern roundabouts: Both overseas and in the United States, modern roundabouts have achieved a 50% to 90% reduction in injury accidents compared with intersections using stop control or traffic signals. The most comprehensive survey of roundabout safety in the United States was carried out in 1997 by the Transportation Research Board, and found that at intersections which were converted to roundabouts, overall crashes were reduced by 37% and injury accidents by 51%. The study also broke the results down for large roundabouts with three-lane entries, and smaller roundabouts with one- or two-lane entries. At these smaller roundabouts, crash reductions were even more pronounced: total crashes fell by 51%, with injury crashes reduced by 73%.

Capacity: roundabouts can often offer higher traffic-moving capacity than traffic signals, which in many circumstances leads to significantly reduced delays. The Transportation Research Board survey of intersections converted to roundabouts in the United States, for example, found that in the eight cases where vehicle delays had been measured, rush hour delays had been reduced by an average of 77%.

[4] *California Department of Transportation Design Information Bulletin #80-01: Roundabouts*. October 3, 2003, p. 1. [Accessed June 1, 2009]. Available at http://www.dot.ca.gov/hq/oppd/dib/dib80-01.pdf.

A typical modern roundabout in University Place, WA. At the roundabout entry, the clear width provided is only approximately 13 feet: this is an intentional design element to keep vehicle speeds low. Photo: IMG0032.jpg

Another modern roundabout near a school in Montpelier, VT. Again, note that the entry widths are kept to no more than 13 feet, to ensure low speeds both at the pedestrian crosswalks and within the intersection. Photo: IMG0027.jpg

The conflict between the current code requirement for 20 foot clear width at all points along every fire apparatus access road and the design of roundabouts occurs primarily with the design of roundabouts with one-lane entries. Roundabouts *are* designed to ensure that the largest fire apparatus (as well as tractor-trailer trucks and other large vehicles) that will use the roundabout are accommodated. However, as explained in

Roundabouts: an Informational Guide, the Federal Highway Administration's widely-used guide to roundabout design:

> *Roundabouts operate most safely when the geometry forces traffic to enter and circulate at slow speeds. Horizontal curvature and narrow pavement widths are used to produce this reduced-speed environment.* [5]

Furthermore, the Guide explains:

> *To maximize the roundabout's safety, entry widths should be kept to a minimum..The design should provide the minimum width necessary for capacity and accommodation of the design vehicle in order to maintain the highest level of safety. Typical entry widths for single-lane entrances range from 4.3 to 4.9m (14 to 16 ft); however, values…lower than this range may be required for site-specific design vehicle and speed requirements for critical vehicle paths.*

Thus, to design safe single-lane roundabouts, it is routinely necessary that at the roundabout entries, entry widths must be kept below 20 foot clear. This particular circumstance occurs only for a short distance at the intersection entry. However, it is a critical dimension and one that constantly conflicts with a requirement of 20 foot unobstructed width at all points along fire apparatus access roads.

2. Landscaped medians: There are important advantages to raised and landscaped medians, beyond their aesthetic appeal. In general, published studies conclude that on major roadways, raised central medians provide significant safety benefits when compared to undivided roads and roads with two-way left-turn lanes.

For example, examining overall crash rates – both midblock and intersection – for suburban arterials, Bowman & Vecellio's comprehensive study[6] found a rate of 373 vehicular crashes per million vehicle miles for roadways with a raised median, versus 676 vehicular crashes per million vehicle miles (or some 80% higher) for roadways with a two-way left-turn lane. Overall rates of rear end, right angle, head-on and left-turn crashes were all significantly reduced by the use of a median. Medians also ease crossings for pedestrians, and studies have found medians to be significantly safer for them. On suburban arterials, Bowman & Vecellio found the pedestrian crash rate for suburban arterials with raised medians to be 6.3 per million vehicle miles, versus 12.9 pedestrian crashes per million vehicle miles for those with two-way left-turn lanes. The conflict that occurs here with the requirement for 20 foot clear is that many roadways only have room within the right-of-way for, and also function most safely (from the point of view of traffic safety) with one traffic lane and one bicycle lane in each direction on each side of the median. This results in a roadway cross section typically provides 17 feet of clear width on each side of the median.

An example of an undivided roadway. Photo: IMG0064.jpg

[5] *Roundabouts: An Informational Guide*. US Department of Transportation Federal Highway Administration Publication No. FHWA-RD-00-067. Washington, D.C., 2000. , p. 130. [Accessed June 1, 2009]. Available at http://www.tfhrc.gov/safety/00-0676.pdf.

6 B. L. Bowman and R.L. Vecellio. *Effect of Urban and Suburban Median Types on Both Vehicular and Pedestrian Safety*. Transportation Research Record No. 1445. TRB, National Research Council. Washington D.C., 1994.

An example of a roadway with a raised median and approximately 17 feet of clear width on each side of the median. Photo: median.jpg

3. Local Street Standards: Low-volume local streets are often purposefully designed to enforce low-driving speeds, obviating the need for future retrofits with speed bumps and other harsh traffic calming measures that can severely impact fire apparatus. For best traffic safety result, these minor residential streets are consciously designed to maintain average speeds of 20 mph or less. To achieve this, low-volume local streets are designed as traditional "yield streets". As the Institute of Transportation Engineers' Residential Streets, Third Edition explains:

> *Yield flow occurs when two-way traffic is impossible where parked vehicles are present. Thus, some motorists must stop and yield the right-of-way to oncoming vehicles. For decades prior to the 1960's, yield flow was the widely accepted norm for local streets. …Most local streets with low ADT [average daily traffic] may have yield-flow operation.*[7]

The AASHTO Greenbook, the standard reference on the geometric design of streets, also explicitly endorses yield streets:

> *The level of user inconvenience occasioned by the lack of two moving lanes is remarkably low in areas where single-family units prevail… In many residential areas a 26-ft.-wide roadway is typical. This curb-face-to-curb-face width provides for a 12-ft. center travel lane and two 7-ft. parking lanes. Opposing conflicting traffic will yield and pause on the parking lane area until there is sufficient width to pass*.[8]

The traffic safety research literature finds that yield streets result in a strong reduction in injury accident rates. Recent research compared injury accidents per mile per year on local streets against thirteen physical characteristics.[9] Street width was found to be significantly related to injury accidents, with the authors concluding that, "as street width widens, accidents per mile per year increases exponentially." The study's regression analysis found that a typical 36-foot wide residential street has 0.16 accidents per mile per year as opposed to 0.03 accidents per mile per year for a 24 foot wide street. This difference is about a 487 percent increase in accident rates (see figure, below). The safest streets were the narrow, 24-foot wide streets, with parking allowed on both sides, resulting in a clear width of approximately 10 feet.

[7] Kulash, Walter. *Residential Streets, 3rd Edition*. Washington, D.C.: Institute of Transportation Engineers, National Association of Home Builders, American Society of Civil Engineers, and Urban Land Institute, 2001.
[8] American Association of State Highway and Transportation Officials. A Policy on Geometric Design of Highways and Streets (a.k.a. the AASHTO Greenbook). Washington, D.C.: AASHTO, 1990.
[9] Swift, Peter, Dan Painter, AICP and Matthew Goldstein. *Residential Street Typology and Injury Accident Frequency*. Denver, Colorado: Swift & Associates, 2006.

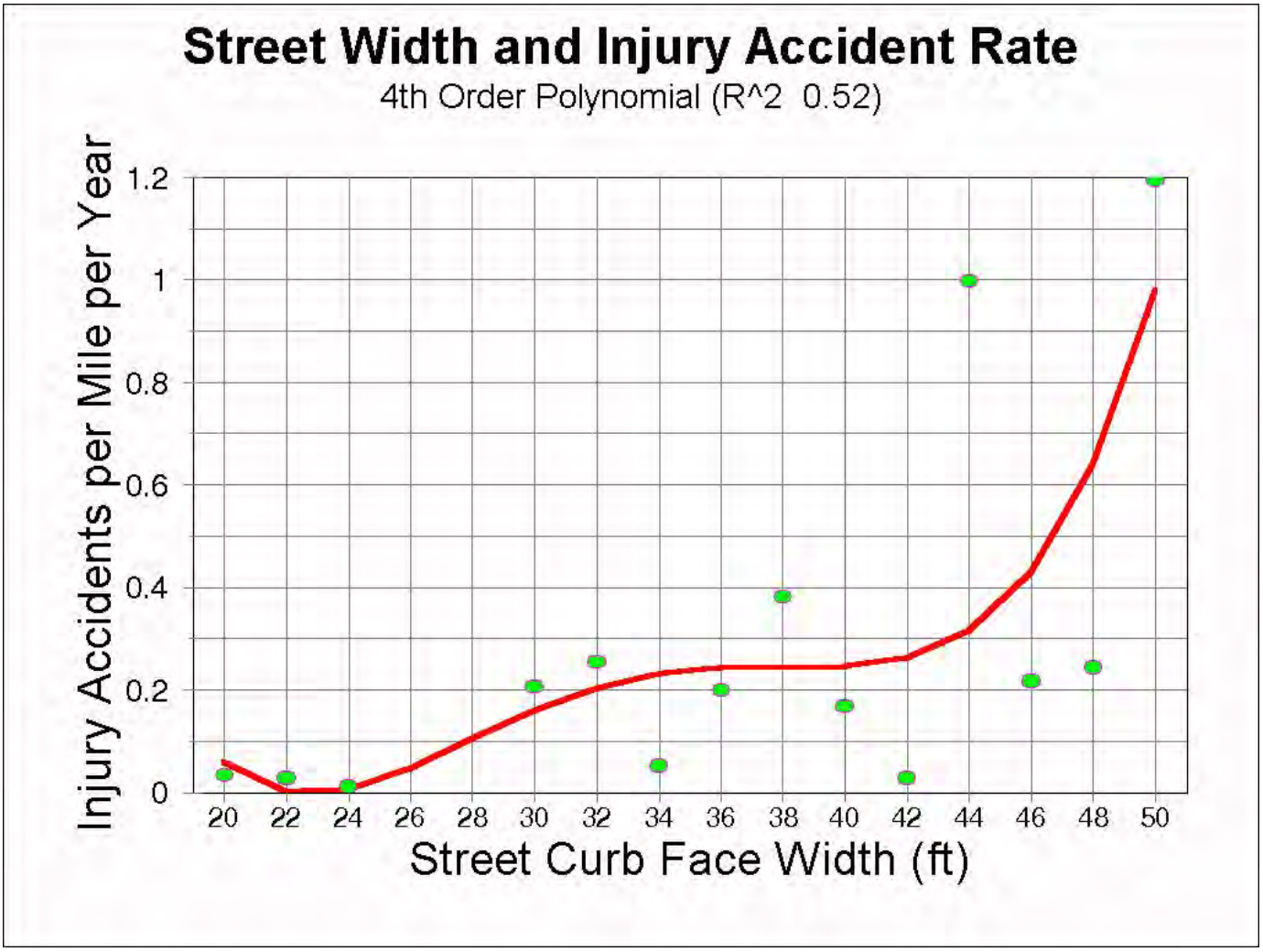


Photo: 4THORDER.JPG

On low-volume local streets, providing widths of less than 20 foot clear can clearly provide numerous traffic safety benefits. The conflict between creating yield streets to meet this traffic safety goal, and the goal of ensuring safe access for fire and rescue operations, has been reconciled in numerous different ways by different jurisdictions. Frequent solutions include requiring that such streets always be through streets (rather than cul-de-sacs); requiring such streets to provide locations with 20 foot clear width at regular intervals (e.g., at all fire hydrants), so that areas exist to allow fire engines to set up and hook up hoses; and limiting building heights on such streets, so that is not necessary to deploy aerial ladders.

Bibliography

Commission for Global Road Safety. *Make Roads Safe*. London, United Kingdom. Commission for Global Road Safety, 2006, p. 2. [Accessed June 1, 2009]. Available at http://www.makeroadssafe.org/publications/Documents/mrs_report_2007.pdf

Limpert, Rudolph. *Motor Vehicle Accident Reconstruction and Cause Analysis*. *Fourth Edition*. Charlottesville, VA. The Michie Company, 1994, p. 663. See also Killing Speed and Saving Lives, United Kingdom Dept. of Transportation, London, England.

California Department of Transportation. *Design Information Bulletin #80-01: Roundabouts*. October 3, 2003, p. 1. [Accessed June 1, 2009]. Available at http://www.dot.ca.gov/hq/oppd/dib/dib80-01.pdf.

Roundabouts: An Informational Guide. US Department of Transportation Federal Highway Administration Publication No. FHWA-RD-00-067. Washington, D.C., 2000. , p. XX. [Accessed June 1, 2009]. Available at http://www.tfhrc.gov/safety/00-0676.pdf.

B. L. Bowman and R.L. Vecellio. *Effect of Urban and Suburban Median Types on Both Vehicular and Pedestrian Safety*. Transportation Research Record No. 1445. TRB, National Research Council. Washington D.C., 1994.

Kulash, Walter. *Residential Streets, 3rd Edition*. Washington, D.C.: Institute of Transportation Engineers, National Association of Home Builders, American Society of Civil Engineers, and Urban Land Institute, 2001.

American Association of State Highway and Transportation Officials. *A Policy on Geometric Design of Highways and Streets* (a.k.a. the *AASHTO Greenbook*). Washington, D.C.: AASHTO, 1990.

Swift, Peter, Dan Painter, AICP and Matthew Goldstein. *Residential Street Typology and Injury Accident Frequency*. Denver, Colorado: Swift & Associates, 2006. [Accessed on June 1, 2009]. Available at http://www.cuesfau.org/cnu/docs/Residential_Street_Typology_and_Injury_Accident_Frequency-Swift-Painter-Goldstein.pdf.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: SIEGMAN-SWIFT-NORQUIST-F1-APPENDIX K.DOC

F238–09/10
Appendix K (New)

Proponent: Mark Nelson, Fire Marshal, County of Los Angeles, CA Fire Department

Add new appendix as follows:

APPENDIX K
ROOF OBSTRUCTIONS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

SECTION K101
GENERAL

K101.1 Scope: This Appendix shall apply to the design, construction, and installation of solar photovoltaic systems, roof gardens and landscaped roofs on building roofs that obstruct more than 50% or 10,000 square feet of the total roof surface area.

Exception: Buildings that are four or more stories in height and protected with an approved automatic fire extinguishing system throughout.

SECTION K102
REVIEW

K102.1 Review: The fire code official shall review and approve the installation of solar photovoltaic systems, roof gardens, landscaped roofs or similar equipment or conditions as defined in the scope of this appendix prior to the building code official issuing a permit for the installation for such roof obstructions.

SECTION K103
SOLAR PHOTOVOLTAIC SYSTEMS SPECIFICATIONS

K103.1. Solar photovoltaic systems specifications: The California Office of the State Fire Marshal Solar Photovoltaic Installation Guideline, April 22, 2008, shall apply to the design, construction and installation of solar photovoltaic systems on roofs.

SECTION K104
ROOF GARDEN AND LANDSCAPED ROOFS
SPECIFICATIONS

K104.1 Roof gardens and landscaped roofs: Roof gardens and landscaped roofs shall be designed, constructed and installed in accordance with Sections J101.4.1.1 through J104.1.2.4.

K104.1.1 Single and two-unit residential dwellings: Installation of roof gardens and landscaped roofs on single and two-unit residential dwellings shall be in accordance with Sections J104.1.1.1 through J104.1.1.3.

K104.1.1.1 Hip roof design: Planted sections shall be located in a manner that provides a three (3') foot wide clear access pathway from the eave to the ridge on each roof slope where the planted sections are located. The access pathway shall be located at a structurally strong location on the building such as a bearing wall.

K104.1.1.2 Single ridge roof design: Planted sections shall be located in a manner that provides two (2) three (3') foot wide access pathways from the eave to the ridge on each roof slope where the planted sections are located.

K104.1.1.3 Hips and valleys: Planted sections shall be located no closer than one and one half (1.5') feet to a hip or a valley if planted sections are to be placed on both sides of a hip or valley. If the planted sections are to be located on only one side of a hip or valley that is of equal length then the planted sections may be placed directly adjacent to the hip or valley. Planted sections shall not be located closer than three feet (3') below the ridge.

K104.1.2 Commercial, industrial and multi-residential buildings. Installation of roof gardens and landscaped roofs on commercial, industrial and multi-residential buildings comprised of three or more dwelling units shall be in accordance with Sections J104.1.2.1 through J104.1.2.4.

> **Exception:** If the fire code official determines that the roof configuration is similar to that found in single and two-unit residential dwellings, the design requirements found in J101.3.2.1 may be utilized.

K104.1.2.1 Access: There shall be a minimum six (6') foot wide clear perimeter around the edges of the roof.

> **Exception:** If either axis of the building is 250 feet or less, there shall be a minimum four feet (4') wide clear perimeter around the edges of the roof.

K104.1.2.2 Pathways: Pathways shall be established in the design of the roof garden or landscaped roof installation. Pathways shall meet the following requirements:

K104.1.2.2.1 Location: The center line axis of pathways shall run on structural members or over the next closest structural member nearest to the center lines of the roof.

K104.1.2.2.2 Center line: The center line axis of pathways shall be provided in both axis of the roof.

K104.1.2.2.3 Alignment and Access: Pathways shall be in a straight line and provide not less than four (4') feet clear to skylights, ventilation hatches or roof standpipes.

K104.1.2.2.4 Clearance Around Roof Access Hatch: Pathways shall provide not less than four (4') feet of clearance around roof access hatch with at least one not less than four feet (4') clear pathway to parapet or roof edge.

K104.1.2.3 Size: Planted sections shall be no greater than 150 by 150 feet in distance in either axis.

K104.1.2.4 Emergency Fire Ventilation: Areas for emergency fire ventilation between planted sections shall be either:

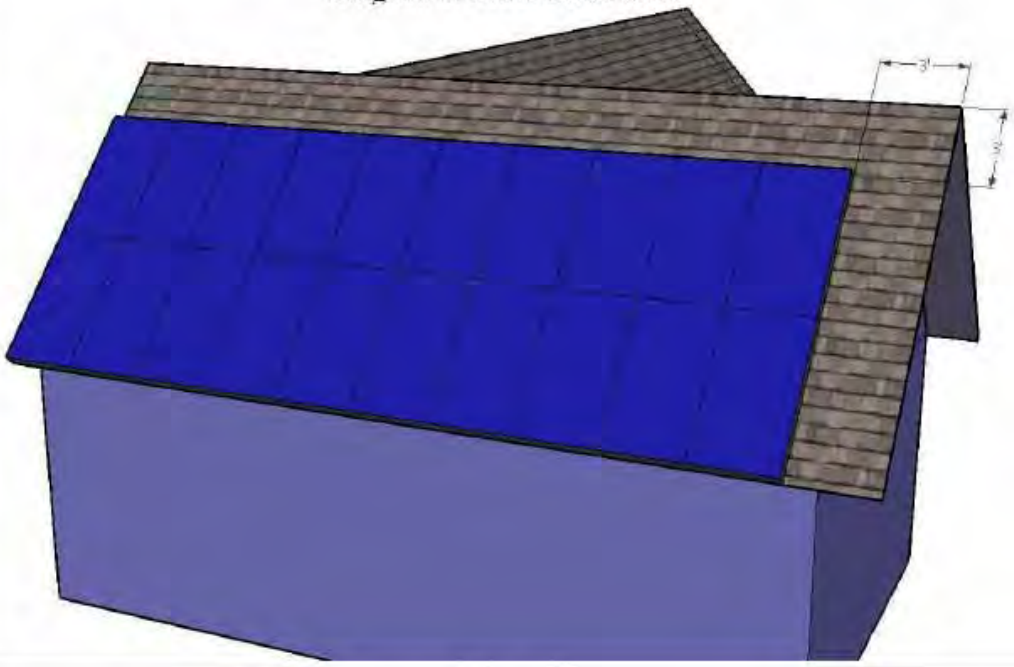
1. A pathway that is eight (8') feet or greater in width.
2. A pathway that is four (4') feet or greater in width and bordering on existing roof skylights for ventilation hatches.
3. A pathway that is four (4') feet or greater in width with bordering four (4') feet by eight (8') feet "venting cutouts" every twenty (20') feet on alternating sides of the pathway.

SECTION K105
REFERENCED STANDARD

CSFM	*Solar Photovoltaic Installation Guideline*, April 22, 2008, Office of the State Fire Marshal, California Department of Forestry and Fire Protection	K103

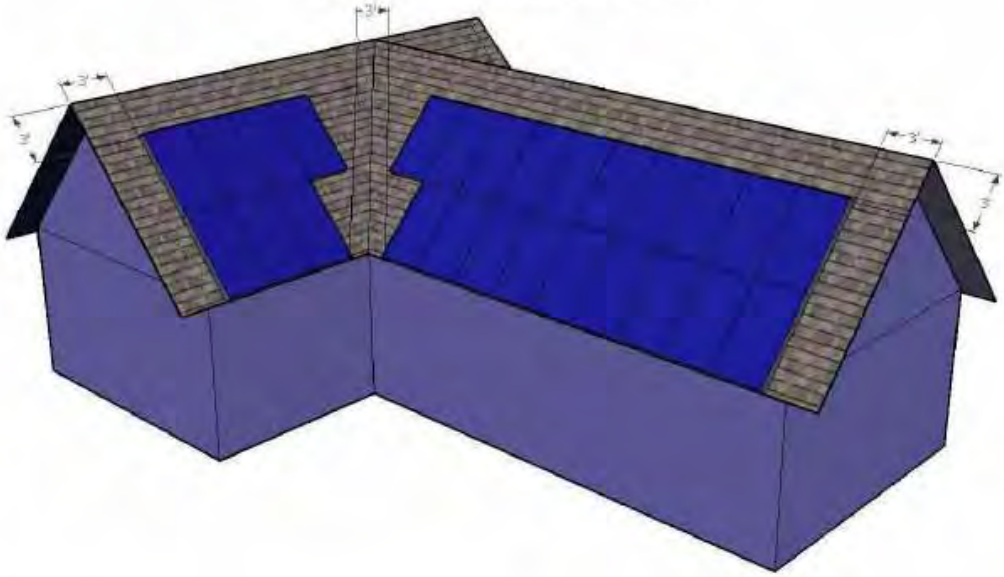
EXAMPLE 1

Diagram 1: Cross Gable Roof



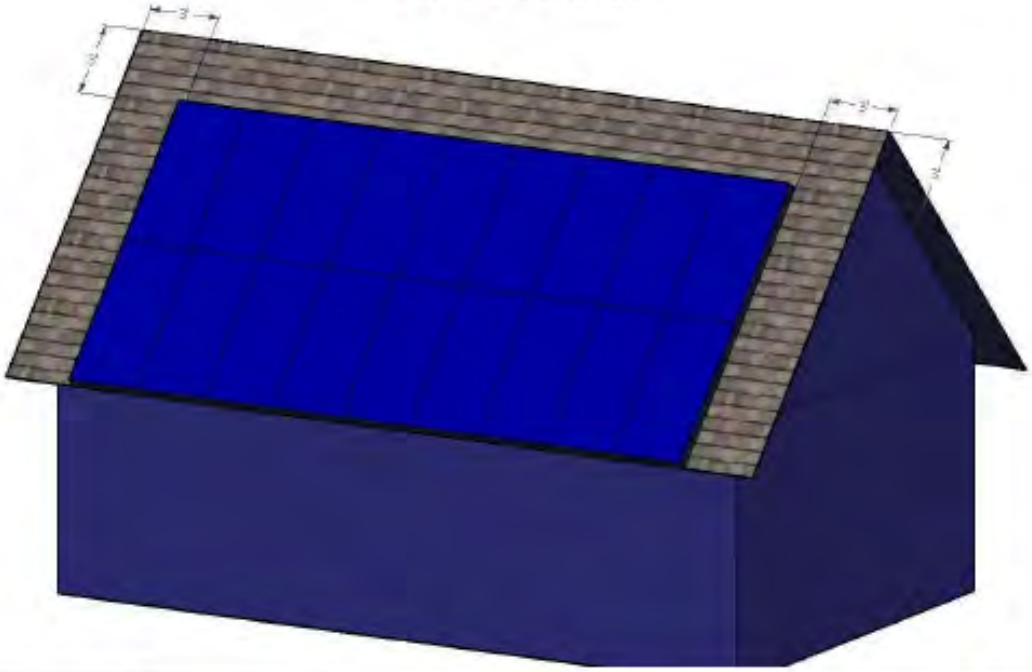
EXAMPLE 2

Diagram 2: Cross Gable with Valley



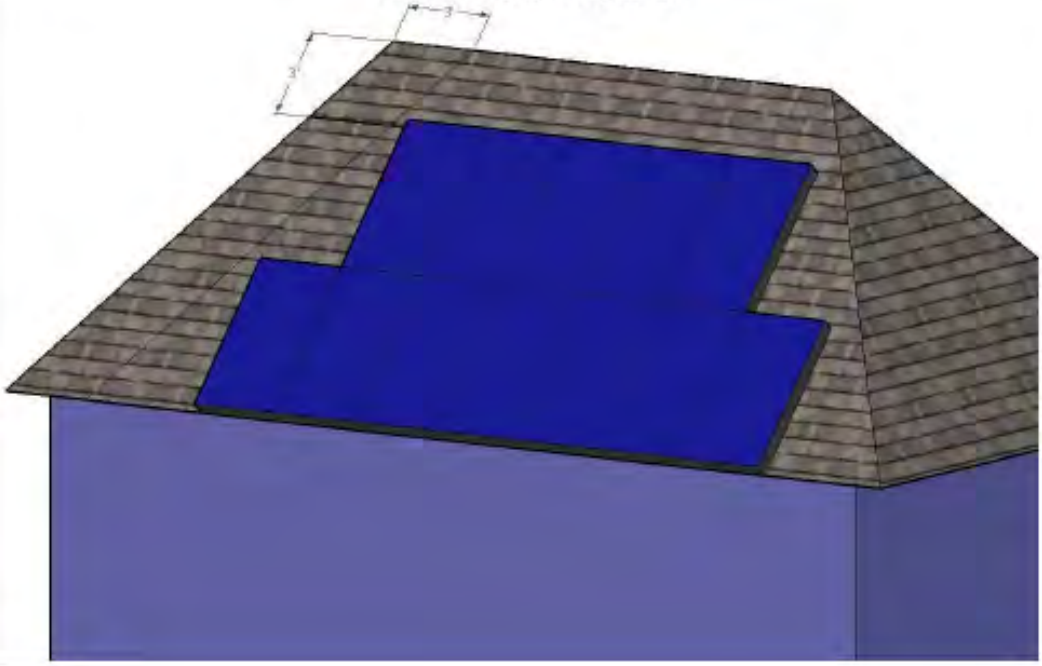
EXAMPLE 3

Diagram 3: Full Gable



EXAMPLE 4

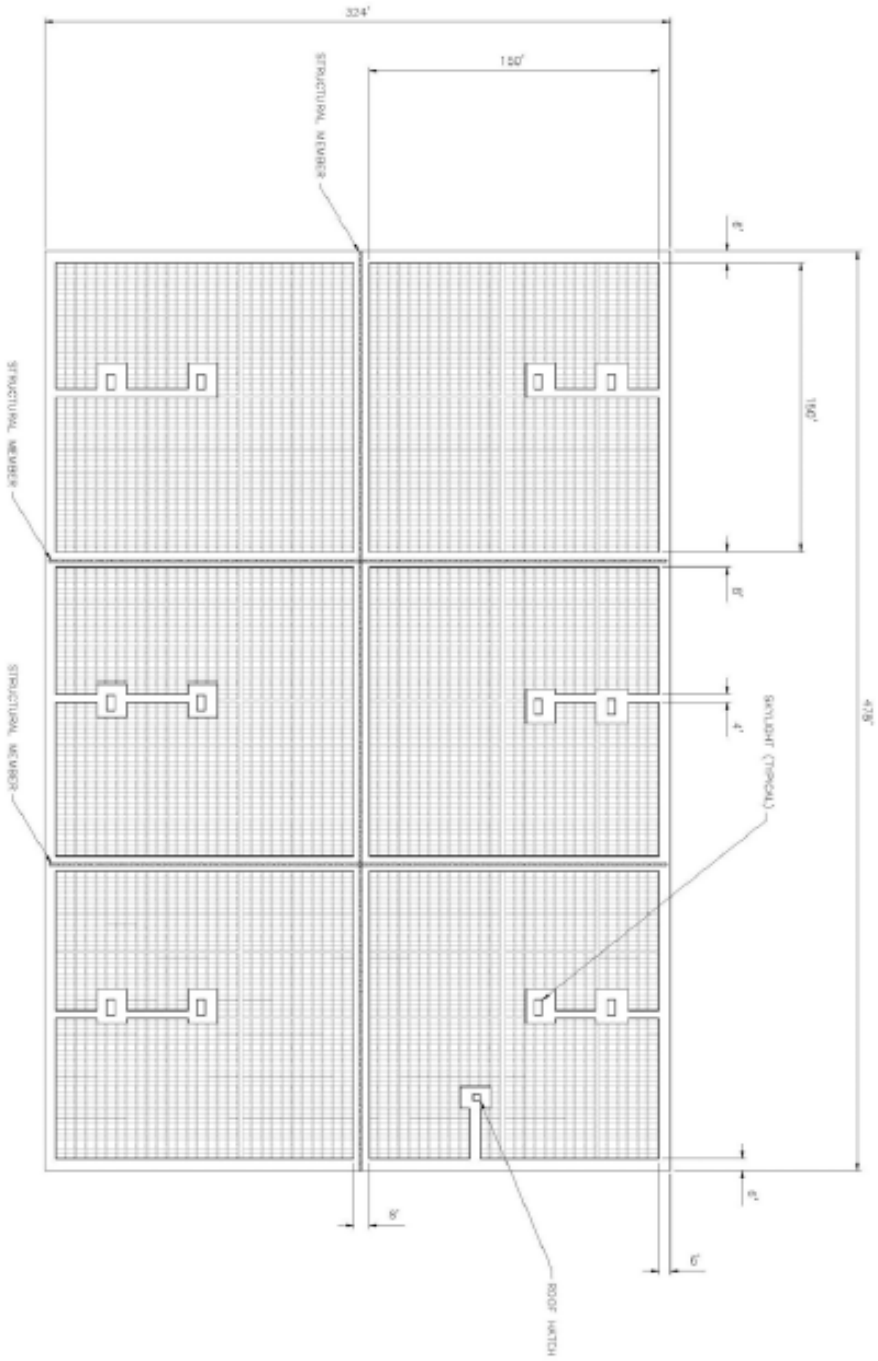
Example 4: Full Hip Roof



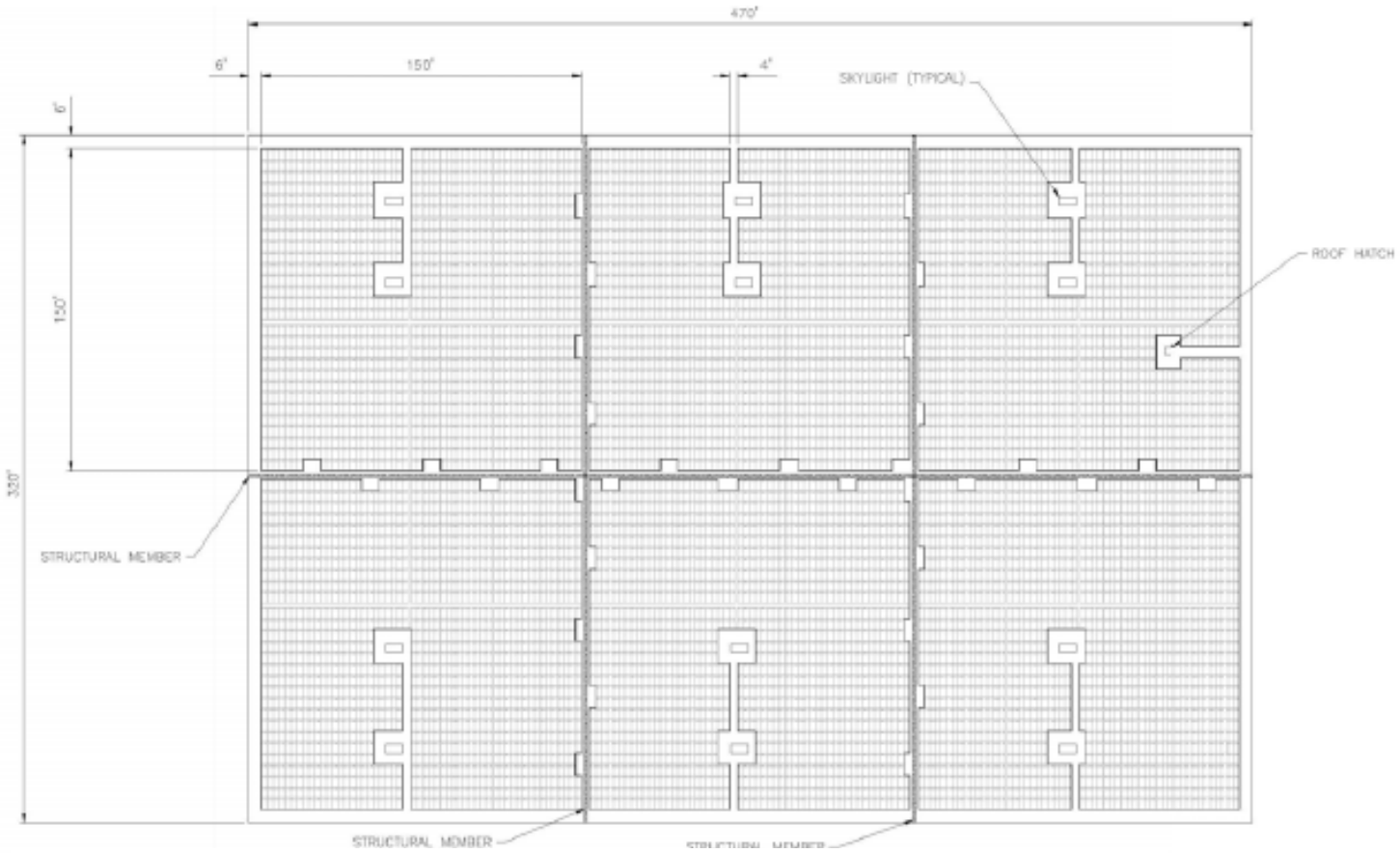
EXAMPLE 5

SOLAR ARRAY, ROOF GARDEN OR LANDSCAPED ROOF EXAMPLE

- LARGE COMMERCIAL
- 8 FOOT WALKWAYS



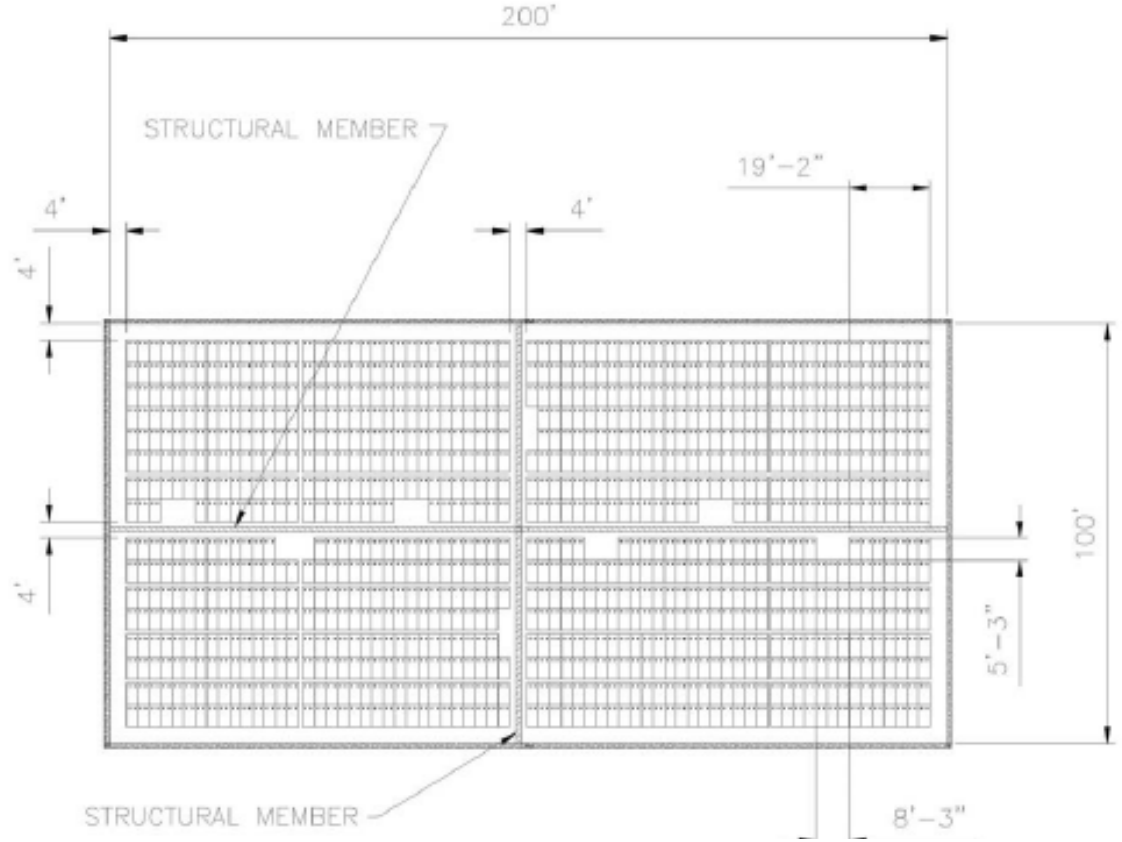
EXAMPLE 6



SOLAR ARRAY, ROOF GARDEN OR LANDSCAPED ROOF EXAMPLE

- LARGE COMMERCIAL
- 4’ WALKWAYS WITH 4’ X 8’ VENTING OPPORTUNITIES EVERY 20’

EXAMPLE 7



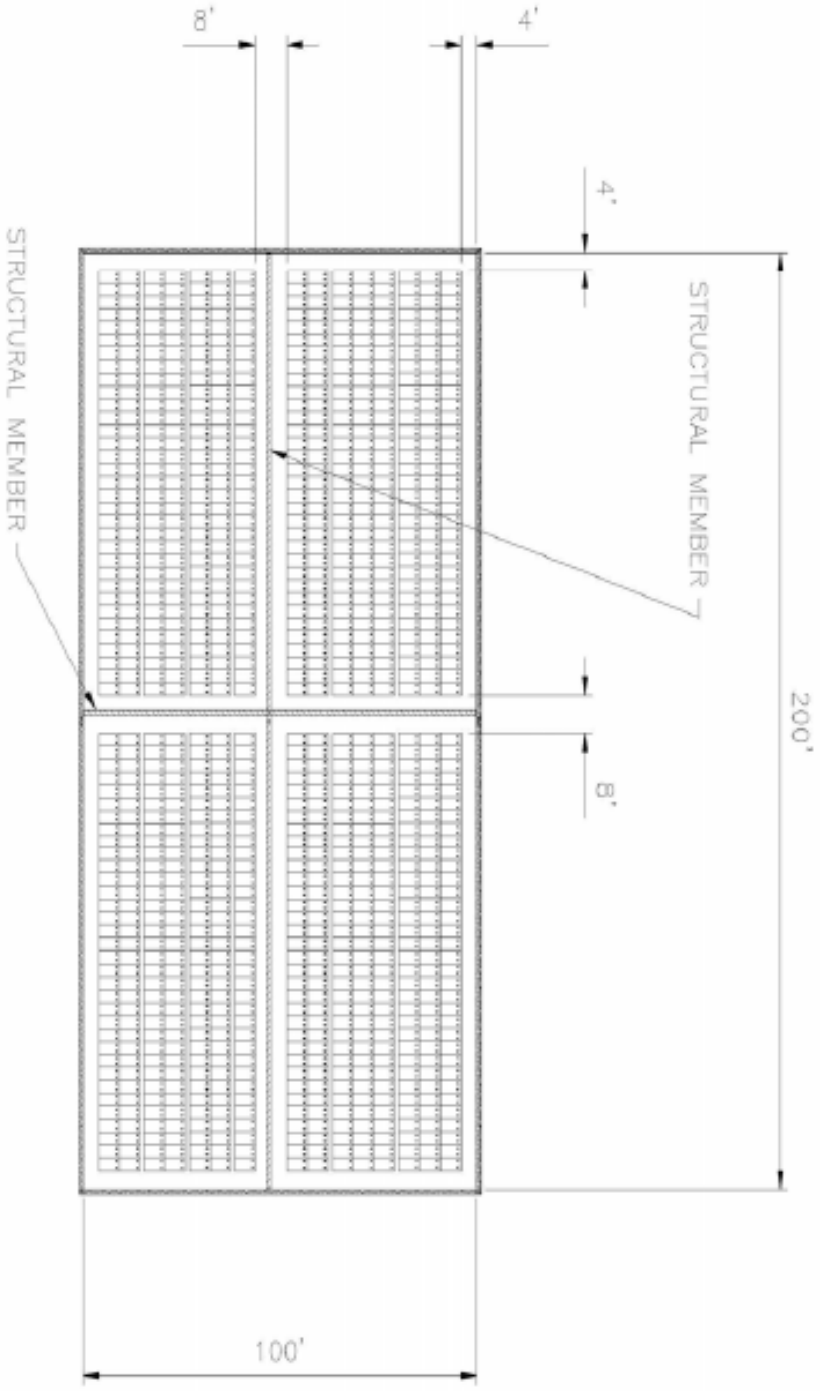
SOLAR ARRAY, ROOF GARDEN OR LANDSCAPED ROOF EXAMPLE

- SMALL COMMERCIAL
- 4' WALKWAYS WITH 4' X 8' VENTING OPPORTUNITIES EVERY 20' ALONG WALKWAYS

EXAMPLE 8

SOLAR ARRAY, ROOF GARDEN OR LANDSCAPED ROOF EXAMPLE

- SMALL COMMERCIAL
- 8 ' WALKWAYS



Reason: Unregulated installations of solar photovoltaic systems, gardens, and landscaping located on the roofs of buildings can create conditions which severely hinder firefighting ventilation operations. Firefighting ventilation allows the escape of heat, smoke, and gases from the interior compartments of a building, reduces the chances of a flashover condition, and greatly helps to restore and maintain a tenable interior environment in a building during a fire.

In many firefighting situations, roof top vertical ventilation is the only form of ventilation that can be employed to meet the need to quickly and effectively ventilate a building's interior. Rapid ventilation is often a critical element in allowing firefighters to enter a burning building to search for and rescue occupants, control the spread of fire, and create a tenable environment to extend the time a person could survive within a burning building.

In order to traverse a roof to place an effective ventilation opening near a fire, firefighters require access to the roof surface. Firefighters utilize techniques including "sounding" roofs with tools such as a rubbish hook, cutting small inspections holes with power saws in roofs to check for fire extension, and by using infrared cameras to check for heat concentrations on the surface of a roof. Installing roof obstructions without regard for firefighting ventilation operations may prevent firefighters from safely traveling along strong underlying roof structural members. Installing layers of waterproofing, building material, soil, and vegetation to the surface of a roof will very likely delay or preclude firefighting roof top ventilation operations unless consideration for ventilation operations were incorporated into the layout design of the roof obstruction.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code Change S10-09/10 appears on the hearing order of the IBC-Fire Safety Committee and proposes revisions to IBC Table 1505.1 and Section 1507.16 on this topic. Code changes F8-09/10 and F30-09/10 propose similar requirements. A review of the standard proposed for inclusion in the code, CSFM Solar Photovoltaic Installation Guideline, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NELSON-F1-APPENDIX J.DOC

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL FUEL GAS CODE

FUEL GAS CODE COMMITTEE

John Wiggins, PE - ***Chair***
Senior Project Engineer
Underwriters Laboratories Inc.
Research Triangle Park, NC

Tennison Barry – ***Vice Chair***
Chief Mechanical Division
State of Michigan
Lansing, MI

Edward Angelone, C.G.E
Rep: American Gas Association
Consultant
National Grid
Brooklyn, NY

James Anjam
Chief, Inspection Section
Inspection Services, Arlington County, VA
Arlington, VA

Keith Bienvenu
Rep: Plumbing Heating and Cooling Contractors
Bienvenu Brothers Enterprises, Inc.
Sec/Treasurer
Metairie, LA

Paul Cabot, C.G.E
Rep: American Gas Association
Administrator, National Fuel Gas Code
American Gas Association
Washington, DC

Mike Deegan
Rep: American Gas Association
Gas Operations Manager
Clearwater Gas System
Clearwater, FL

Ronnie Ray Frazier
Rep: American Gas Association
Codes and Standard Manager
Atmos Energy
Dallas, TX

David Hall, CFM
Director of Inspection Services – Building Official
City of Georgetown
Georgetown, TX

Dennis Holden
Rep: American Gas Association
Director, Customer Relations
Southwest Gas Corporation
Tucson, AZ

Windell Peters, CBO
Rep: American Gas Association
AGL Resources, Inc.
Atlanta, GA

Thomas Pitcherello
Code Specialist
State of New Jersey - Dept. of Community Affairs
Trenton, NJ

Staff Secretariat:
Gregg Gress
Senior Technical Staff
International Code Council

TENTATIVE ORDER OF DISCUSSION

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL FUEL GAS CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does **not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair.

FG1-09/10
FG2-09/10
FG3-09/10
FG4-09/10
FG5-09/10
FG6-09/10
FG7-09/10
FG8-09/10
FG9-09/10
FG10-09/10, Part I
FG10-09/10, Part II
FG11-09/10, Part I
FG11-09/10, Part II
FG12-09/10
FG13-09/10
FG14-09/10, Part I
FG14-09/10, Part II
FG15-09/10
FG16-09/10
FG17-09/10
FG18-09/10
FG19-09/10
FG20-09/10
FG21-09/10
FG22-09/10
FG23-09/10
FG24-09/10
FG25-09/10
FG26-09/10
FG27-09/10
FG28-09/10
FG29-09/10
FG30-09/10
FG31-09/10
FG32-09/10, Part I
FG32-09/10, Part II
FG33-09/10
FG34-09/10
FG35-09/10
FG36-09/10
FG37-09/10

FG1 –09/10
202

Proponent: James Ranfone, representing American Gas Association

Revise definition as follows:

APPLIANCE. Any apparatus or device that utilizes ~~gas as~~ a fuel or raw material to produce light, heat, power, refrigeration or air conditioning.

Reason: The term "appliance" mainly applies to gas-fueled appliances in the IFGC but there are code requirements applying to appliances that use solid and oil fuels such as in Sections 503.5.7.1, 503.5.7.2, 503.5.7.3 and 503.5.7.4. Revising the term to become more general in nature improves the code by providing an accurate definition.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RANFONE-FG18-202.DOC:

FG2 –09/10
202

Proponent: Guy Tomberlin, Bluemont, VA, representing self

Add new definitions follows:

COMBUSTIBLE ASSEMBLY. Wall, floor, ceiling or other assembly constructed of one or more component materials that are not defined as noncombustible.

COMBUSTIBLE MATERIAL. Any material not defined as noncombustible.

NONCOMBUSTIBLE MATERIALS. Materials that, when tested in accordance with ASTM E 136, have at least three of four specimens tested meeting all of the following criteria:

1. The recorded temperature of the surface and interior thermocouples shall not at any time during the test rise more than 54ºF (30ºC) above the furnace temperature at the beginning of the test.
2. There shall not be flaming from the specimen after the first 30 seconds.
3. If the weight loss of the specimen during testing exceeds 50 percent, the recorded temperature of the surface and interior thermocouples shall not at any time during the test rise above the furnace air temperature at the beginning of the test, and there shall not be flaming of the specimen.

Reason: These are the exact terms and definitions found in the IMC. They have been used for many years as the guiding principals for the installation of mechanical equipment. Please recall the first edition of the IMC which included fuel gas provisions, these were the definitions used. Since the IFGC fails to provide the definitions of these terms they are applied inconsistently and non-uniformly. Gypsum is a non combustible product according to the IBC however the application of gypsum in the IMC and IFGC is quite different. The IBC addresses gypsum when used to construct walls ceilings, etc.. In the IFGC, the only reference to gypsum would be when dealing with clearance to combustibles. It is common knowledge that gypsum is typically covered with a paper product which will in fact burn. It is not uncommon to see a brown or charred section of gypsum when it has been installed within the prohibited dimension of 6" for a single wall or 1" for a double wall chimney or vent (or connecter). You wouldn't want this situation any more than a wood stove installed to close to gypsum, there is no difference. Excessive heat next to paper will cause fire.

The testimony on this proposal has done nothing but create confusion in fact some actually want a third definition to be added to the IFGC. That is ridiculous. The current definition in the IMC is exactly what the IFGC needs to say. Yes, gypsum is noncombustible according to the IBC but as previously stated the reference to gypsum is entirely a different application in the IFGC. Paper burns and needs to be installed outside the allowable distances according to Section 308.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-FG5-202

FG3–09/10
202

Proponent: James Ranfone, representing American Gas Association

Add new definition as follows:

EXCESS FLOW VALVE (EFV). A valve designed to activate when the fuel gas passing through it exceeds a prescribed flow rate.

Reason: AGA has proposed an extract of the EFV coverage contained in the 2009 National Fuel Gas Code. The proposed EFV definition would be needed should the extract be approved. The definition is taken from the NFGC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RANFONE-FG16-202.DOC:

FG4–09/10
202

Proponent: James Ranfone, representing American Gas Association

Delete definition without substitution:

~~**FUEL GAS UTILIZATION EQUIPMENT.** See "Appliance."~~

Reason: The term is no longer used in the IFGC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RANFONE-FG14-202.DOC:

FG5–09/10
202

Proponent: Andrew Granzow, representing Viega LLC

Revise definition as follows:

SECTION 202 (IFGC)
GENERAL DEFINITIONS

JOINT, MECHANICAL. A general form of gas-tight joints obtained by the joining of metal parts through a positive-holding mechanical construction, such as press joint, flanged joint, threaded joint, flared joint or compression joint.

Reason: The proposed change will include press joints into the appropriate general group as it pertains to general definitions. This will provide clarification to the joint referenced in section 403.10.2 of this code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

GRANZOW-FG2-202.DOC:

FG6–09/10
202

Proponent: John England, MCO, England Enterprises Inc., representing self.

Revise definition as follows:

Oxygen depletion safety shutoff system. A system designed to act to shut off the gas supply to the main and *pilot burners* if the oxygen in the surrounding atmosphere is reduced below a predetermined level <u>not less than 18%</u>

Reason: In room heaters the predetermined level is 18% --and should be added to the definitions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ENGLAND-FG5-202.DOC:

FG7–09/10
202

Proponent: James Ranfone, representing American Gas Association

Revise definitions as follows:

SECTION 202

POINT OF DELIVERY. For natural gas systems, point of delivery. For undiluted liquefied petroleum gas systems, the point of delivery shall be considered to be the outlet of the ~~first pressure regulator that reduces pressure to 2 psig (13.8 kPag) or less~~ <u>service pressure regulator, exclusive of line gas regulators, in the system.</u>

REGULATOR, SERVICE PRESSURE. <u>For natural gas systems,</u> a device installed by the serving gas supplier to reduce and limit the service line pressure to delivery pressure. <u>For undiluted liquefied petroleum gas systems, the regulator located upstream from all line gas pressure regulators, where installed, and downstream from any first stage or a high pressure regulator in the system.</u>

Reason: The changes to the *Point of Delivery* and the *Service Pressure Regulator* definitions are being made to eliminate a gap in coverage resulting from inconsistencies between the IFGC scope section 101.2.2, and the definition of point of delivery as they pertain to propane (liquefied petroleum gas) systems. The scope section 101.2.2 states that the code covers LP systems 20 psig or less from the "point of delivery" to the appliance shutoff valve. For LP systems, the existing definition of "Point of Delivery" limits coverage to piping systems delivering pressure at 2 psig or less. By doing so, the code inadvertently does not cover LP systems between 2 psig and 20 psig. The revisions to the POD definition will now refer to the outlet of the service pressure regulator which can be set at a supply pressure of 20 psig or less consistent with section 101.2.2. The revision to Service Pressure Regulator definition will provide two distinct definitions, one for natural gas and one for LP. A LP service pressure regulator would be defined as the regulator located between higher pressure regulator (with an outlet above 20 psig) and any line regulator (with inlet pressure varying with system design).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RANFONE-FG19-202.DOC:

FG8–09/10
202

Proponent: Andrew Granzow, representing Viega LLC

Add new definition as follows:

Section 202 (IFGC)
GENERAL DEFINITIONS

PRESS JOINT. A permanent irreversible mechanical joint incorporating an elastomeric seal or an elastomeric seal and corrosion-resistant grip ring. The joint is made with a pressing tool and jaw or ring approved by the fitting manufacturer.

Reason: The proposed change will assist in the clarification of the connection method identified in section 403.10.2 of this code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

GRANZOW-FG1-202.DOC:

FG9–09/10
202

Proponents: James Ranfone, representing American Gas Association;
Don Surrena, CBO, representing National Association of Home Builders (NAHB)

Revise definition as follows:

ROOM LARGE IN COMPARISON WITH SIZE OF THE APPLIANCE. Rooms having a volume equal to at least 12 times the total volume of a furnace, ~~water heater~~ or air-conditioning appliance and at least 16 times the total volume of a boiler. Total volume of the appliance is determined from exterior dimensions and is to include fan compartments and burner vestibules, when used. When the actual ceiling height of a room is greater than 8 feet (2438 mm), the volume of the room is figured on the basis of a ceiling height of 8 feet (2438 mm).

Reason:
(RANFONE)- The definition phrase "Room Large in Comparison with Size of the Appliance" is not used in relation to the installation of water heaters and therefore the term "water heater" is not technically appropriate for the definition. The phrase is only used in section 308.3(that covers air conditioning appliances) and section 308.4 (that covers central-heating boilers and furnaces).
(SURRENA)- In the 2009 IFGC the words "water heater" were added to this definition. There already exist requirements in the IFGC to cover the issue of volume of space for fuel fired appliances. Specifically, Section 304.5 covers indoor combustion air, relating to the required volume of the room. The change to this definition does not take into consideration compensation for the use of outside air, nor does it defer to manufactures installation instructions. By adding "Water Heater" to the definition, the size of the room will increase to 12 times the volume of the water heater.

This change in the sizing of rooms for water heaters is inconsistent with conventional building practices. Sizing principles and methods for providing adequate combustion air, and clearances for appliances in closets and other rooms already exist within the IFGC. Also by the definition requiring oversized rooms for water heaters, goes directly against the instructions of many manufacturers. Requiring spaces that are current code requirements for providing combustion air and clearances are unsafe or otherwise unacceptable. Manufacturer's instructions and Section 304.5 adequately cover the installation without requiring a random volume ratio.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RANFONE-FG17-202; SURRENA-FG2-202 DOC:

FG10–09/10
301.5; IMC 301.6; IRC M1303.1

Proponent: Edward A. Spiers, representing Delaware County

THIS IS A 3 PART CODE CHANGE. PART I AND II WILL BE HEARD BY THE IFGC COMMITTEE. PART III WILL BE HEARD BY THE IRC M&P COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IMC

Revise as follows:

301.6 Label information. A permanent factory-applied nameplate(s) shall be affixed to appliances, heat pump units and condensing units on which shall appear in legible lettering, the manufacturer's name or trademark, the model number, serial number, the energy efficiency rating and the seal or mark of the *approved* agency. A label shall also include the following:

1. Electrical *equipment* and appliances: Electrical rating in volts, amperes and motor phase; identification of individual electrical components in volts, amperes or watts, motor phase; Btu/h (W) output; and required clearances.
2. Absorption units: Hourly rating in Btu/h (W); minimum hourly rating for units having step or automatic modulating controls; type of fuel; type of refrigerant; cooling capacity in Btu/h (W); and required clearances.
3. Fuel-burning units: Hourly rating in Btu/h (W); type of fuel *approved* for use with the *appliance*; and required clearances.
4. Electric comfort heating appliances: Name and trade-mark of the manufacturer; the model number or equivalent; the electric rating in volts, ~~ampacity~~ amperes and phase; Btu/h (W) output rating; individual marking for each electrical component in amperes or watts, volts and phase; required clearances from combustibles; and a seal indicating approval of the *appliance* by an *approved* agency.

PART II – IFGC

Revise as follows:

301.5 Label information. A permanent factory-applied nameplate(s) shall be affixed to appliances, heat pump units and condensing units on which shall appear in legible lettering, the manufacturer's name or trademark, the model number, serial number, the energy efficiency rating and, for listed appliances, the seal or mark of the testing agency. A label shall also include the hourly rating in British thermal units per hour (BTU/h) (W); the type of fuel approved for use with the appliance; and the minimum clearance requirements.

PART III- IRC-M

Revise as follows:

M1303.1 Label information. A permanent factory-applied nameplate(s) shall be affixed to *appliances*, heat pump units and condensing units on which shall appear, in legible lettering, the manufacturer's name or trademark, the model number, a serial number the energy efficiency rating and the seal or *mark* of the testing agency. A *label* shall also include the following:

1. Electrical *appliances*. Electrical rating in volts, amperes and motor phase; identification of individual electrical components in volts, amperes or watts and motor phase; and in Btu/h (W) output and required clearances.
2. Absorption units. Hourly rating in Btu/h (W), minimum hourly rating for units having step or automatic modulating controls, type of fuel, type of refrigerant, cooling capacity in Btu/h (W) and required clearances.
3. Fuel-burning units. Hourly rating in Btu/h (W), type of fuel *approved* for use with the *appliance* and required clearances.
4. Electric comfort heating *appliances*. Name and trademark of the manufacturer; the model number or equivalent; the electric rating in volts, amperes and phase; Btu/h (W) output rating; individual marking for each electrical component in amperes or watts, volts and phase; required clearances from combustibles and a seal indicating approval of the *appliance* by an *approved agency*.
5. Maintenance instructions. Required regular maintenance actions and title or publication number for the operation and maintenance manual for that particular model and type of product.

Reason*:* The change is necessitated by the enforcement of the current conservation codes. We have been instructed to verify the efficiency ratings of the equipment that is used on any particular project; it must match the RES check report or the approved plans. The information in question is currently not being put on the units themselves. The problem being, that if the box that the unit has been delivered in is gone or the efficiency sticker (with the rating on it) has been removed the information is not readily available. With most heat pumps the information is hidden in the model or serial number, but that would mean that all inspectors would have to have special knowledge of every manufacturer's information coding in order to decipher the needed information. The efficiency of a gas furnace can be figured as well if one has the knowledge to do so, but becomes problematic when multistage, variable, and modulating units are employed. This leaves the inspector to have to possess special knowledge once again, and homeowners for that matter as well. It would seem a minor cost to print this information on a unit's label, rather than having code enforcement personnel calling different contractors or suppliers to find out what EER rating a heat pump might have or the rating of a geothermal unit.

It is not a problem when the minimum rating is specified on a RES check. However, when a job is only 1% or 0.6% better than required by the IECC and a 20 SEER heat pump is called for under the heating equipment. How does one find out what has been installed to verify this information. If a 13 SEER unit is installed instead, the job would then fall short of it's required RES compliance. My understanding is that with the 2006 IECC the scenario above could be quite normal. Contractors may be tempted to spec equipment with very high efficiency ratings to be able to pass the RES compliance form and then actually use the less efficient unit(s) on the job. Or, when the process of cost trade-offs begins to take place on the project it is very normal for items that are not absolutely necessary to get chopped, efficiency ratings to get dropped. Ampacity relates to wire sizing and amperes was the intended term as used in M1303.1, Item 4.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I- IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II- IFGC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III- IRC-M

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SPIERS-FG2-301.6

FG11–09/10
IMC 307.3 (New); IFGC 307.6 (New); IRC M1411.5 (New)

Proponent: Edward A. Spiers, BI, Delaware County Code Compliance, representing self

THIS IS A 3 PART CODE CHANGE. PART I AND II WILL BE HEARD BY THE IFGC COMMITTEE. PART III WILL BE HEARD BY THE IRC M&P COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Add new text as follows:

SECTION 307
CONDENSATE DISPOSAL AND SAFETY DRAIN PANS

307.3 Leakage Safety Pans. HVAC appliances that contain water or other liquid heat transfer medium shall be provided with a safety drain pan where damage to any building component will occur as a result of leakage of water or a heat transfer medium. The safety pan shall be constructed in accordance with item 1 or 2 of Section 307.2.3. The intent of this section is satisfied where means for protection against condensate overflow or leakage is provided as required by Section 307.2.3 of this code or Section 307.5 of the *International Fuel Gas Code*.

PART II – IFGC

Add new text as follows:

SECTION 307
CONDENSATE DISPOSAL AND SAFETY DRAIN PANS

307.6 Leakage Safety Pans. HVAC appliances that contain water or other liquid heat transfer medium shall be provided with a safety drain pan where damage to any building component will occur as a result of leakage of water or a heat transfer medium. The safety pan shall be constructed in accordance with item 1 or 2 of Section 307.2.3 of the *International Mechanical Code*. The intent of this section is satisfied where means for protection against condensate overflow or leakage is provided as required by Section 307.1 or 307.5.

PART III – IRC-M

Add new text as follows:

M1411.5 Leakage Safety Pans. HVAC appliances that contain water or other liquid heat transfer medium shall be provided with a safety drain pan where damage to any building component will occur as a result of leakage of water or a heat transfer medium. The safety pan shall be constructed in accordance with item 1 or 2 of Section M1411.3.1. The intent of this section is satisfied where means for protection against condensate overflow or leakage is provided as required by Section M1411.3.1 or M1411.4.

Reason: The current code is specific to cooling or evaporator coils to protect structures. The market now offers a wide range of equipment that is being installed in areas other than the basement that contain or use water: for example, humidifiers, geothermal units, boilers, instant water heaters used as boilers and condensing furnaces. These items are being installed in attics, first and second floors often and the codes do not grant the authority to require a safety pan unless there are the prescribed coils with them. Some geothermal units always contain water, or a type of antifreeze, whether they are cooling or heating. Condensing furnaces that do not have air conditioning do not need a safety pan according to the current code, as it is not addressed. If the contractor runs a secondary line or water safety device to the evaporator coil's secondary outlet, then the current code is satisfied without providing a pan under the condensing furnace. With the increased use of radiant floor heating, more and more small boilers or water heaters are making their way from the basement to other areas of the house. And while we can't protect all of the piping or pressurized lines that burst, surely we can protect the equipment itself from small leaks that may greatly damage a property.

Cost Impact: The cost impact would be wide and varied depending on the types of materials that a contractor may choose to employ. A sheet metal pan with a drain can be fabricated with one hour of labor and one sheet of metal for most residential units. Commercial units could be a huge variation based on the size of the equipment.

Analysis: Section 307.5 of the IFGC and M1411.4 of the IRC require auxiliary drain pans for condensing appliances such as furnaces.

PART I- IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II- IFGC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III- IRC M

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

SPIERS-FG1-307_NEW.DOC:

FG12–09/10
308.1

Proponent: Guy Tomberlin, representing self

Revise as follows:

308.1 Scope. This section shall govern the reduction in required clearances to combustible materials, <u>including gypsum board,</u> and combustible assemblies for chimneys, vents, appliances, devices and equipment. Clearance requirements for air-conditioning equipment and central heating boilers and furnaces shall comply with Sections 308.3 and 308.4.

Reason: This adds clarification that gypsum has a combustible covering and therefore must be considered a combustible product. The clearances prescribed by manufacturers are typically directed to allow for adequate heat dissipation, and prevent potential fire. Paper coated products are a prime candidate for these clearances.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: This section is an IFGS section and IFGS sections are normally subject to the process that maintains the NFGC, ANSI Z223.1, however, the proposed revision affects only the IFGC, therefore, the proposal is subject to the ICC process that maintains the IFGC.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-FG2-308.1

FG13–09/10
310.2 (New), Chapter 8

Proponent: James Ranfone representing American Gas Association

1. Add new text as follows:

310.2 Lightning Protection System. Where a lightning protection system is installed, the bonding of the gas piping shall be in accordance with NFPA 780.

2. Add new standard to Chapter 8 as follows:

NFPA

NFPA 780-08	Standard for the Installation of Lightning Protection Systems

Reason: Provide installation coverage for the bonding of lightning protection systems. Lightning protection systems, where installed, are required to be bonded the structure's grounding electrode system. This extract will help improve the code by adding important installation and safety requirements from the National Fuel Gas Code. The American Gas Association is asking the ICC membership whether this provision is necessary in the IFGC and to consider extracting section 7.13.4 from the 2009 National Fuel Gas Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Standard: A review of the standard(s) proposed for inclusion in the code, NFPA 780-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RANFONE-FG10-310.2.NEW.DOC:

FG14–09/10
202, 401.9 (New), 401.10 (New), 404.1 (New); IMC 202, 301.3 (New), 301.4 (New), 301.5 (New); IRC R202, M1301.2 (New), M1301.3 (New), M1301.4 (New), M1301.5 (New)

Proponent: Guy Tomberlin representing VA Plumbing and Mechanical Inspectors/VA Building and Code Officials and ICC Region 7.

THIS IS A 3 PART CODE CHANGE. PARTS I AND II WILL BE HEARD BY THE IFGC COMMITTEE. PART III WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

PART I-IFGC

1. Add new definitions as follows:

SECTION 202

THIRD-PARTY CERTIFICATION AGENCY. An approved agency operating a product or material certification system that incorporates initial product testing, assessment and surveillance of a manufacturer's quality control system.

THIRD-PARTY CERTIFIED. Certification obtained by the manufacturer indicating that the function and performance characteristics of a product or material have been determined by testing and ongoing surveillance by an approved third-party certification agency. Assertion of certification is in the form of identification in accordance with the requirements of the third-party certification agency.

THIRD-PARTY TESTED. Procedure by which an approved testing laboratory provides documentation that a product, material or system conforms to specified requirements.

2. Add new text as follows:

401.9 Identification. Each length of pipe and tubing and each pipe fitting, utilized in a fuel gas system shall bear the identification of the manufacturer.

401.10 Third-party testing and certification. All piping, tubing and fittings shall comply with the applicable referenced standards, specifications and performance criteria of this code and shall be identified in accordance with Section 401.9. Piping, tubing and fittings shall either be tested by an approved third-party testing agency or certified by an approved third-party certification agency.

404.1 Installation of materials. All materials used shall be installed in strict accordance with the standards under which the materials are accepted and approved. In the absence of such installation procedures, the manufacturer's installation instructions shall be followed. Where the requirements of referenced standards or manufacturer's installation instructions do not conform to minimum provisions of this code, the provisions of this code shall apply.

PART II - IMC

1. Add new definitions as follows:

THIRD-PARTY CERTIFICATION AGENCY. An approved agency operating a product or material certification system that incorporates initial product testing, assessment and surveillance of a manufacturer's quality control system.

THIRD-PARTY CERTIFIED. Certification obtained by the manufacturer indicating that the function and performance characteristics of a product or material have been determined by testing and ongoing surveillance by an approved third-party certification agency. Assertion of certification is in the form of identification in accordance with the requirements of the third-party certification agency.

THIRD-PARTY TESTED. Procedure by which an approved testing laboratory provides documentation that a product, material or system conforms to specified requirements.

2. Add new text as follows:

301.3 Identification. Each length of pipe and tubing and each pipe fitting, utilized in a mechanical system shall bear the identification of the manufacturer.

301.4 Plastic pipe, fittings and components. Plastic pipe, fittings and components shall be third-party certified as conforming to NSF 14.

301.5 Third-party testing and certification. Piping, tubing and fittings shall comply with the applicable referenced standards, specifications and performance criteria of this code and shall be identified in accordance with Section 301.3. Piping, tubing and fittings shall either be tested by an approved third-party testing agency or certified by an approved third-party certification agency.

PART III – IRC

1. Add new definitions as follows:

THIRD-PARTY CERTIFICATION AGENCY. An approved agency operating a product or material certification system that incorporates initial product testing, assessment and surveillance of a manufacturer's quality control system.

THIRD-PARTY CERTIFIED. Certification obtained by the manufacturer indicating that the function and performance characteristics of a product or material have been determined by testing and ongoing surveillance by an approved third-party certification agency. Assertion of certification is in the form of identification in accordance with the requirements of the third-party certification agency.

THIRD-PARTY TESTED. Procedure by which an approved testing laboratory provides documentation that a product, material or system conforms to specified requirements.

2. Add new text as follows:

M1301.2 Identification. Each length of pipe and tubing and each pipe fitting, utilized in a mechanical system shall bear the identification of the manufacturer.

M1301.3 Installation of materials. All materials used shall be installed in strict accordance with the standards under which the materials are accepted and approved. In the absence of such installation procedures, the manufacturer's installation instructions shall be followed. Where the requirements of referenced standards or manufacturer's installation instructions do not conform to minimum provisions of this code, the provisions of this code shall apply.

M1301.4 Plastic pipe, fittings and components. Plastic pipe, fittings and components shall be third-party certified as conforming to NSF 14.

M1301.5 Third-party testing and certification. Piping, tubing and fittings shall comply with the applicable referenced standards, specifications and performance criteria of this code and shall be identified in accordance with Section M1301.2. Piping, tubing and fittings shall either be tested by an approved third-party testing agency or certified by an approved third-party certification agency.

Reason:
PART I-Current IFGC contains several pipe, tube and fitting standards but never indicates how the industry must verify compliance with these standards. The proposed text is taken from the IPC and altered slightly to fit fuel gas system applications. This is the current typical industry method to demonstrate compliance with the appropriate standards. The new text provides guidance on how to achieve code compliance as intended.
PART II & III- Current IMC and IRC mechanical sections contain several pipe, tube and fitting standards but never indicates how the industry must verify compliance with these standards. The proposed text is taken from the IPC and altered slightly to fit mechanical system applications. This is the current typical industry method to demonstrate compliance with the appropriate standards. The new text provides guidance on how to achieve code compliance as intended.

Cost Impact: The code proposal will not increase the cost of construction. Tomberlin-M-5-303-RM-1-R1303

PART I- IFGC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II- IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III- IRC M

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICC FILENAME: TOMBERLIN -FG1-202.M5-303-RM1-R1303

FG15–09/10
404.2 (New)

Proponent: James Ranfone representing American Gas Association

Add new text as follows:

404.2 CSST. CSST piping systems shall be installed in accordance with the terms of their approval, the conditions of listing, the manufacturer's installation instructions and this code.

Reason: The code requires that equipment and appliances be listed. Section 305.1 requires that equipment and appliances be installed by the terms of their approval, in accordance with the conditions of listing, the manufacturer's installation and this code. The terms equipment and appliance do not necessarily cover CSST which is the only gas piping system that is required to be listed to an ANSI standard. Therefore, the code is missing a specific statement regarding the installation of CSST as a listed system.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RANFONE-FG12-404.2_NEW.DOC:

FG16–09/10
404.4

Proponents: James Ranfone, representing American Gas Association;
Don Surrena, CBO, representing National Association of Home Builders (NAHB)

Delete and substitute as follows:

~~**404.4 Underground penetrations prohibited.** Gas piping shall not penetrate building foundation walls at any point below grade. Gas piping shall enter and exit a building at a point above grade and the annular space between the pipe and the wall shall be sealed.~~

404.4 Piping through foundation wall. Underground piping, where installed below grade through the outer foundation or basement wall of a building, shall be encased in a protective pipe sleeve or shall be protected by an approved device or method. The annular space between the gas piping and the sleeve and between the sleeve and the wall shall be sealed.

Reason:
(RANFONE)- No evidence was provided during the 2007-2008 revision cycle that justified adding the prohibition of customer-owned gas piping from penetrating a foundation wall below grade. Testimony centered on the possibility that gas from an underground leak would be significant enough to cause gas migration along the buried gas piping and entry into the building. No statistics were presented and AGA does not know of any incidents of gas migrating along a customer-owned underground piping that has resulted in an explosion. Section 404.4 covers only customer-owned piping, most of which would be low pressure (the remaining would be a maximum of 2 psi) that does not result , in the event of a underground leak, in significant gas leakage and migration. The low number of incidences AGA is aware of were traced to utility-owned gas service lines that operate at much higher pressures (often up to 40 psi). The proposed language combines the 2006 IFGC language with the approved changes FG20-07/08 and FG21-07/08.
(SURRENA)- The purpose of this proposal is to allow gas piping to enter a foundation below grade as it has done in the past. Without this change, gas piping will have to come above ground before entering a building.

The conventional installation practice of allowing piping to go through foundation walls below grade should not be prohibited. This is an installation method that has been used for decades. No data was ever presented that would show a safety problem or inadequacy when a proper installation and sealing of the opening was installed in accordance with the IFGC.

Requiring above grade entry points into the foundation will require extra piping and joints, both inside and outside, exposing the piping system to physical damage and increased risk of leakage on the outside of buildings as well as within the building. This increase in outside exposure will be particularly significant in a city or at congested commercial locations where piping must come above grade at times through sidewalks at the front or rear of the building or come through the ground in public ways before turning to enter the foundation or building. This will also present practical issues of locating the exterior and interior piping system to have entry points that are compatible with the building design, i.e., doorways, loading docks, accessible entry systems (ramps) etc. There will also be additional costs in these circumstances when the underground piping must be relocated to miss one of the items just mentioned.

Accepting this change will coordinate the IFGC provisions with all other industry Fuel Gas Codes.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RANFONE-FG13-404.4-SURRENA-FG3-404.4DOC:

FG17–09/10
404.16

Proponent: James Ranfone, representing American Gas Association

Revise as follows:

404.16 Prohibited devices. A device shall not be placed inside the piping or fittings that will reduce the cross-sectional area or otherwise obstruct the free flow of gas.

Exceptions:

1. Approved gas filters.
2. An approved fitting or device where the gas piping system has been sized to accommodate the pressure drop of the fitting or device.

Reason: Section 404.16 has been interpreted as restricting the installation of an excess flow valve. The new exception is designed to allow an approved EFV where the gas piping system has been sized to accommodate its pressure drop.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: RANFONE-FG15- 404.16

FG18–09/10
407.2

Proponent: Don Surrena, CBO, representing National Association of Home Builders (NAHB)

Revise as follows:

407.2. Design and Installation. *Piping* shall be supported with ~~metal~~ pipe hooks, ~~metal~~ pipe straps, ~~metal~~ bands, ~~metal~~ brackets, or ~~metal~~ hangers, or building structural components, suitable for the size of *piping*, of adequate strength and quality, located at intervals so as to prevent or damp out excessive vibration. *Piping* shall be anchored to prevent undue strains on connected appliances and shall not be supported by other *piping*. Pipe hangers and supports shall conform to the requirements of MSS SP-58 and shall be spaced in accordance with Section 415. Supports, hangers, and anchors shall be installed so as not to interfere with the free expansion and contraction of the *piping* between anchors. All parts of the supporting equipment shall be designed and installed so they will not be disengaged by movement of the supported *piping*.

Reason: The purpose of this proposal is to retain the provisions of the 2006 International Code (IFGC) allowing for more than just metal to be used as pipe strapping.

This change from the 2006 International Fuel Gas Code (IFGC) is clearly proprietary in nature. To disallow any other material that is proven to meet the requirements for support is contrary to the spirit of the ICC family of codes (I-Codes). Favoring one type of material without reason is unacceptable. The change to the 2009 IFGC is too restrictive and eliminates other support materials that have been used successfully for years. The 2009 change will have a significant impact on several manufacturers that have established alternate materials other than metal supports. If the structural properties of a material is tested and proven to meet the structural specifications for supporting the piping it should be accepted for use. These other materials should be eliminated and the code allowed to become exclusionary. The I-Codes have railed from the exclusivity of other codes that limit the type of materials. These other materials have proven themselves acceptable over the years and should not be eliminated to prosper one type of material.

We encourage the adoption of this proposal to allow any and all materials that meet the requirements of the code to be used, not just a proprietary product or single material.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

SURRENA_FG1-407.2.DOC:

FG19–09/10
408.4, Figure 408.4 (New)

Proponent: James Ranfone, representing American Gas Association

1. Revise as follows:

408.4 Sediment trap.-Where a sediment trap is not incorporated as part of the appliance, a sediment trap shall be installed downstream of the appliance shutoff valve as close to the inlet of the appliance as practical. The sediment trap shall be either a tee fitting having a capped nipple of any length installed vertically in the bottommost opening of the tee <u>as illustrated in Figure 408.4</u> or other device approved as and effective sediment trap. Illuminating appliances, ranges, clothes dryers, decorative vented appliances for installation in vented fireplaces, gas fireplaces, and outdoor grills need not be so equipped.

2. Add new figure as follows:

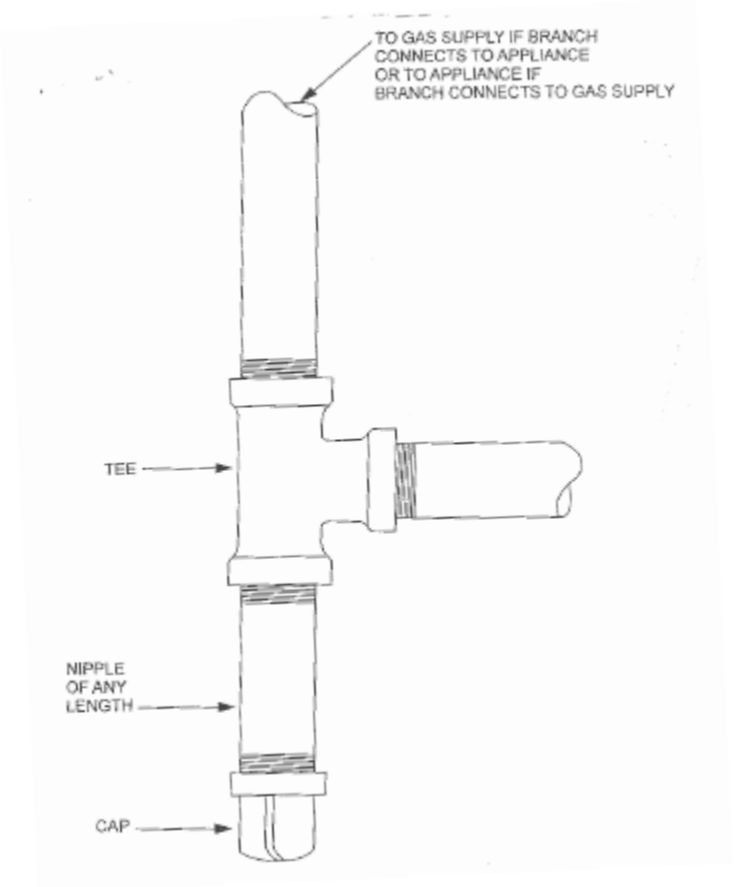


Figure 408.4
Method of Installing a tee fitting sediment trap

Reason: The figure will provide a graphic illustration of how a sediment trap should be constructed. The current verbiage, especially, "… vertically in the…" Fails to convey that for the trap to be effective, it needs to have the nipple installed nearly or at a 90 degree angle to the floor.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RANFONE-FG7-408.4.DOC:

FG20–09/10
408.4

Proponent: James Ranfone, representing American Gas Association

Revise as follows:

408.4 Sediment trap. Where a sediment trap is not incorporated as part of the appliance, a sediment trap shall be installed downstream of the appliance shutoff valve as close to the inlet of the appliance as practical. The sediment trap shall be either a tee fitting having a capped nipple of any length installed vertically in the bottom most opening of the tee or other device approved as and effective sediment trap. Illuminating appliances, ranges, clothes dryers, decorative vented appliances for installation in vented fireplaces, gas fireplaces. and outdoor grills need not be so equipped.

Reason: Sediment traps are generally required for appliances such as furnaces, boilers and water heaters. The revision would add two types of decorative appliances to the exemption list. The revision would make the IFGC 408.4 exemption list similar to the list in the National Fuel Gas Code section 9.6.7.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: RANFONE-FG6-408.4

FG21–09/10
Table 409.1.1, Chapter 8

Proponent: James Ranfone, representing American Gas Association

1. Revise table as follows:

TABLE 409.1.1
MANUAL GAS VALVE STANDARDS

VALVE STANDARDS	APPLIANCE SHUTOFF VALVE APPLICATION UP TO ½ psig PRESSURE	OTHER VALVE APPLICATIONS			
		UP TO ½ psig PRESSURE	UP TO 2 psig PRESSURE	UP TO 5 psig PRESSURE	UP TO 125 psig PRESSURE
ANSI Z21.15	X	—	—	—	—
~~CSA Requirement 3-88~~	~~X~~	~~X~~	~~X[a]~~	~~X[b]~~	~~—~~
ASME B16.44	X	X	X[a]	X[b]	—
ASME B16.33	X	X	X	X	X

For SI: 1 pound per square inch gauge = 6.895 kPa.
a. If labeled 2G.
b. If labeled 5G

2. Delete standard from Chapter 8 as follows:

CSA

~~CSA Requirement 3-88~~ ~~Manually Operated Gas Valves for Use in House Piping Systems~~

Reason: The CSA requirement CSA 3-88 has been withdrawn in favor of the ASME B16.44 standard.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: RANFONE-FG2-TABLE 409.1.1

FG22–09/10
409.5, 409.5.1, 409.5.2, 409.5.3

Proponent: John England, England Enterprises, Inc., representing Cities of Beaufort, Hardeeville, SC

1. Revise as follows:

409.5 Appliance shutoff valve. Each *appliance* shall be provided with a shutoff *valve* ~~in accordance with Section 409.5.1, 409.5.2 or 409.5.3.~~

409.5.1 Located within same room. The shutoff *valve* shall be located in the same room as the *appliance*. The shutoff *valve* shall be within 6 feet (1829 mm) of the *appliance*, and shall be installed upstream of the union, connector or quick disconnect device it serves. Such shutoff *valves* shall be provided with *ready* access and shall be able to be operated without leaving the room or moving the appliance. *Appliance shutoff valves* shall not be *located* in the firebox of a *fireplace* and shall be installed in accordance with the *appliance* manufacturer's instructions.

2. Delete without substitution:

~~**409.5.2 Vented decorative appliances and room heaters.** Shutoff *valves* for vented decorative *appliances*, room heaters and decorative *appliances* for installation in vented fireplaces shall be permitted to be installed in an area~~

~~remote from the *appliances* where such *valves* are provided with *ready access*. Such *valves* shall be permanently identified and shall serve no other *appliance*. The *piping* from the shutoff *valve* to within 6 feet (1829 mm) of the *appliance* shall be designed, sized and installed in accordance with Sections 401 through 408.~~

~~**409.5.3 Located at manifold.** Where the *appliance shutoff valve* is installed at a manifold, such shutoff valve shall be located within 50 feet (15 240 mm) of the *appliance* served and shall be readily accessible and permanently identified. The *piping* from the manifold to within 6 feet (1829 mm) of the *appliance* shall be designed, sized and installed in accordance with Sections 401 through 408~~

Reason: Shut off valve should be as close as possible and accessible to anyone in the room to cut off in case of a gas leak. There have been conditions where the shut off valve has been in the same room (hotel laundry) , but getting to it would require going outside of the building, finding a key and then getting back into the room to cut it off.

As with manifolds ---are the manifolds accessible or are they locked behind doors. When the appliance is removed for servicing what is to prevent someone from turning the gas back on.

For decades, we have required a gas cutoff to be in the same room (6') as the appliance –why are we changing it now. There is no savings, only the possibility of a gas explosion because we cannot find the cutoff to the appliance, because it is 50' away in another room.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ENGLAND-FG1-409.5.DOC:

FG23–09/10
409.5.3

Proponent: Brent Ursenbach, Salt Lake County, representing Utah Chapter of ICC

Revise text as follows:

409.5.3 Located at manifold. Where the *appliance* shutoff valve is installed at a manifold, such shutoff valve shall be located within 50 feet (15 240 mm) of the *appliance* served, <u>shall be located on the same building level,</u> and shall be readily accessible and permanently identified. The *piping* from the manifold to within 6 feet (1829 mm) of the *appliance* shall be designed, sized and installed in accordance with Sections 401 through 408.

Reason: It is common to have a gas manifold located in a basement level furnace room, with another furnace for an upper level of a 2 story home located in the attic. The commissioning/start-up, altitude or gas heat value adjustments that may be required on gas furnaces typically require the gas control valve and manifold to be removed from the furnace for orifice inspection and orifice changing, which requires the gas to be shut off outside the furnace. Performing an inlet gas pressure test at a furnace requires removal of a plug at the gas inlet of the gas control valve, which also requires the gas to be shut off outside the furnace to attach a test gauge adapter. It is unreasonable and may pose a safety hazard to expect a technician to make multiple trips from the upper attic mechanical room down a ladder, then down two flights of stairs to the basement furnace room where the manifold is located shut off the gas. The technician then returns to the upper furnace. Typically the gas needs to be turned on and off two, three or four times or more to complete these procedures. It is reasonable to expect a shut off valve to be located on the same level as the appliance.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: URSENBACH-FG1-409.5.3.doc

FG24–09/10
410.1

Proponent: Joe Underwood, Hugo, MN representing himself.

Revise as follows:

410.1 Pressure regulators. A line pressure regulator shall be installed where the appliance is designed to operate at a lower pressure than the supply pressure. Line gas pressure regulators shall be listed as complying with ANSI Z21.80. Access shall be provided to pressure regulators. Pressure regulators shall be protected from physical damage. Regulators installed on the exterior of the building shall be approved for outdoor installation. <u>Regulators installed outdoors shall be designed, installed or protected so that their vent will not be affected by the elements including freezing rain, sleet, snow, ice, mud and debris</u>.

Reason: The regulator vent allows the regulator to "breathe" during normal operation and functions as a pressure relief opening in an overpressure situation. It must remain free of dirt and debris for the purpose of safety. If the regulator vent becomes blocked or the airflow is restricted for any reason, the regulator may operate incorrectly and present an unsafe situation for equipment downstream from the regulator. For this reason, the vent opening must be protected so that insects, water, snow ice, debris or other elements are unable to enter the regulator vent opening. Regulator vent protection is currently required by IFGC 413.5, NFPA 58 L.P. Gas Code, NFPA 501A Standards for Fire Safety for Manufactured Home Installations Sites and Communities, 2006 Uniform Mechanical Code. This proposal simply brings the IFGC 410 in line with the industry standard for regulator vent protection. The IFGC currently requires regulator protection from the elements but only in Section 413.5. It would seem logical that regulator vent protection from the elements should also be required in Section 410 Flow Controls since this is the section that deals with the regulators. Section 410.3 addresses the protection of vents but only with regard to regulators installed indoors with an independent vent to the outside of the building. My proposal is meant to address regulator vent protection for regulators installed outdoors.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

UNDERWOOD-FG1-410.1.DOC:

FG25–09/10
202 (New), 410.4 (New)

Proponent: Sidney Cavanaugh, Cavanaugh Consulting, representing Brass Craft.

1. Add new text as follows:

410.4 Excess Flow Valve. Where automatic excess flow valves are installed, they shall be listed as complying with ANSI Z21.93/CSA 6.30 and shall be sized and installed in accordance with the manufacturer's installation instructions.

2. Add new definition as follows:

SECTION 202

EXCESS FLOW VALVE. A valve designed to activate when the fuel gas passing through it exceeds a prescribed flow rate.

3. Add new standard to Chapter 8 as follows:

ANSI/CSA

ANSI Z21.93/CSA 6.30-XX Excess Flow Valves for Natural and LP Gas Up to Pressures of 5 Psi.

Reason: These devices increase the protection of health and safety of consumers and meet appropriate standards CSA 3-92 and ANSI Z21.93-CSA 6.30. The code change provides guidance to installations that are already occurring in many local jurisdictions for EFVs which can be used on low pressure fuel lines to prevent the open flow of gas in the event of a pipe disconnect or rupture. It is a companion to other code changes. Similar wording has been adopted in the UPC, UMC and the NFGC/NFPA 42 ANSI Z223.1.

Cost Impact: Minimal.

Analysis: A review of the standard(s) proposed for inclusion in the code, ANSI Z21.93/CSA 6.30-xx, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CAVANAUGH-FG2-202_410.4

FG26–09/10
410.4 (New)

Proponent: James Ranfone representing American Gas Association

Add new text as follows:

410.4 Excess Flow Valves. Where automatic excess flow valves are installed, they shall be listed for the application and shall be sized and installed in accordance with the manufacturers' instructions.

Reason: Provide installation coverage for excess flow valves (EFV). EFVs are being sold and installed. These devices must be sized and installed correctly for their proper functioning. This extract will help improve the code by adding important inst0allation and safety requirements from

the National Fuel Gas Code. The American Gas Association is asking the ICC membership whether this provision is necessary in the IFGC and to consider extracting section 5.13 from the 2009 National Fuel Gas Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RANFONE-FG11-410.4 NEW.DOC:

FG27–09/10
410.5 (New), 202

Proponent: James Ranfone representing American Gas Association

1. Add new text as follows:

410.5 Flashback arrestor check valve. Where fuel gas is used with oxygen in any hot work operation, a listed protective device that serves as a combination flashback arrestor and backflow check valve shall be installed at an approved location on both the fuel gas and oxygen supply lines. Where the pressure of the piped fuel gas supply is insufficient to ensure such safe operation, approved equipment shall be installed between the gas meter and the appliance that increases pressure to the level required for such safe operation.

2. Add new definition as follows:

Flashback arrestor check valve. A device that will prevent the backflow of one gas into the supply system of another gas and prevent the passage of flame into the gas supply system.

Reason: When a torch flashback occurs there is a 5,000 degree flame inside the hose and pipe and it will melt right through a regular check valve. A flashback arrestor will extinguish this flame, as well as prevent oxygen from getting into the gas pipe, and thus will protect the gas meter. A flashback arrestor check valve would ensure safe operation of all devices, equipment and systems, including the utility gas meter.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RANFONE-FG-8-410.5_NEW_202.DOC:

FG28–09/10
501.8

Proponent: John England, MCO, England Enterprises, Inc., representing himself

Revise as follows:

501.8 Appliances not required to be vented. The following *appliances* shall not be required to be vented.

1. Ranges.
2. Built-in domestic cooking units *listed* and marked for optional venting.
3. ~~Hot plates and laundry stoves.~~
4. ~~4.~~3. *Type 1 clothes dryers (Type 1 clothes dryers* shall be exhausted in accordance with the requirements of Section 614).
5. ~~5~~ 4. A single booster-type automatic instantaneous water heater, where designed and used solely for the sanitizing rinse requirements of a dishwashing machine, provided that the heater is installed in a commercial kitchen having a mechanical exhaust system. Where installed in this manner, the draft hood, if required, shall be in place and unaltered and the draft hood *outlet* shall be not less than 36 inches (914 mm) vertically and 6 inches (152 mm) horizontally from any surface other than the heater.
6. ~~6~~5. Refrigerators.
7. ~~7~~6. Counter *appliances*.
8. ~~8~~7. Room heaters *listed* for unvented use.
9. ~~9~~8. Direct-fired makeup air heaters.
10. ~~10~~9. Other *appliances listed* for unvented use and not provided with flue collars.
11. ~~11~~10. Specialized *appliances* of limited input such as laboratory burners and gas lights.

Where the *appliances* listed in Items ~~5~~ 4 through ~~11~~ 10 above are installed so that the aggregate input rating exceeds 20 British thermal units (Btu) per hour per cubic feet (207watts perm3) of volume of the room or space in which such *appliances* are installed, one or more shall be provided with venting systems or other *approved* means for conveying the vent gases to the outdoor atmosphere so that the aggregate input rating of the remaining unvented *appliances* does not exceed 20 Btu per hour per cubic foot (207 watts per m3). Where the room or space in which the *appliance* is installed is directly connected to another room or space by a doorway, archway or other opening of comparable size that cannot be closed, the volume of such adjacent room or space shall be permitted to be included in the calculations.

Reason: Gas fired hot plates and laundry stoves no longer exist.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ENGLAND-FG6-501.8.DOC:

FG29–09/10
503.7.1 (New)

Proponent: James Ranfone representing American Gas Association

Add new text as follows:

503.7.1 Prohibited use. Single-wall metal pipe shall not be used as a vent in dwellings and residential occupancies.

Reason: Venting systems for listed residential appliances cannot use single-wall metal pipe according to their listing. This prohibition applies to single-wall pipe used as a vent, not to single-wall pipe used as a vent connector. This extract from the National Fuel Gas Code will help improve the code by adding important installation and safety requirements. The American Gas Association is asking the ICC membership whether this provision is necessary in the IFGC and to consider extracting section 12.8.4.1 from the 2009 National Fuel Gas Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Section 503 is an IFGS section controlled by the ANSI Z223.1 Standard Development process. The proposed text is extracted from ANSI Z223.1 and is being offered "as is" with no intent to allow modification.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RANFONE-FG5-503.7.1.DOC:

FG30–09/10
202, 603.1, Chapter 8

Proponent: James Ranfone representing American Gas Association

1. Revise definition as follows:

SECTION 202

~~**LOG LIGHTER**~~ **FIREPLACE ACCESSORY DEVICE.** A manually operated ~~solid fuel ignition appliance~~ fireplace accessory device ~~for installation~~ installed in a vented solid fuel-burning fireplace and used to ignite the solid fuel.

2. Revise text as follows:

603.1 General. Log lighter~~s~~ fireplace accessory devices shall be approved ~~tested in accordance with CSA 8~~ and shall be installed in accordance with the manufacturer's installation instructions.

3. Delete standard in Chapter 8 as follows:

CSA

~~CSA 8-93~~ ~~Requirements for Gas-fired Log Lighters for Wood Burning Fireplaces – with Revisions through January 1999~~

Reason: The following reasons support the proposed revised coverage for log lighters:
CSA Requirement No. 8 covering log lighters was withdrawn on January 1, 2009.
The definition is being revised since a log lighter is more typically viewed as a fireplace accessory then an appliance.
The revisions to section 608.1 allows for the installation of an unlisted log lighter fireplace accessory when approved by the code official. While section 105.2 can be used to approve these accessories, specific coverage in 608.1 is being proposed since unlisted log lighters are the only types available. The accessory's inherent simplicity is the reason for the lack of listing and the withdrawal of the CSA requirement. A typical log lighter is an iron pipe with drilled holes and shut off valve. They can be constructed on site from readily available materials or are available from small fabricators as complete units or kits. There is a lack of a mass market demand and thus the market is supplied by small fabricators.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RANFONE-FG9-603.1_202.DOC:

FG31–09/10
618.4

Proponent: James Ranfone, representing American Gas Association

Delete without substitution:

~~618.4 Circulating air ducts for forced-air warm-air furnaces.~~ ~~Circulating air for fuel-burning, forces-air-type, warm-air furnaces shall be conducted into the blower housing from outside the furnace enclosure by continuous air-tight ducts~~.

Reason: Section 618.4 and 618.8 address the same code requirement. Section 618.4 is being deleted in favor of 618.8 since it provides a clearer description of the type of installation where ducts are required for safety and efficiency, furnaces that distribute all supply air outside of the space in which it is installed. 618.8 states "*Furnace plenums and air ducts. Where a furnace is installed so that supply ducts carry air circulated by the furnace to areas outside of the space containing the furnace, the return air shall also be handled by a duct(s) sealed to the furnace casing and terminating outside of the space containing the furnace.*"

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RANFONE-FG1-618.4.DOC:

FG32–09/10
618.5; IMC 918.6; IRC M1602.2

Proponent: Guy McMann, Jefferson County, Colorado, representing Colorado Association of Plumbing and Mechanicals (CAPMO)

THIS IS A 3 PART CODE CHANGE. PART I AND II WILL BE HEARD BY THE IFGC COMMITTEE. PART III WILL BE HEARD BY THE IRC COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I- IFGC

Revise as follows:

618.5 Prohibited sources. ~~Outside~~ Outdoor or return air for a forced-air heating system shall not be taken from the following locations:

1. Closer than 10 feet (3048 mm) from an *appliance* vent outlet, a vent opening from a plumbing drainage system or the discharge outlet of an exhaust fan, unless the outlet is 3 feet (914 mm) above the outside air inlet.
2. Where there is the presence of objectionable odors, fumes or flammable vapors; or where located less than 10 feet (3048 mm)above the surface of any abutting public way or driveway; or where located at grade level by a sidewalk, street, alley or driveway.

3. A hazardous or insanitary location or a refrigeration machinery room as defined in the *International Mechanical Code*.
4. A room or space, the volume of which is less than 25 percent of the entire volume served by such system. Where connected by a permanent opening having an area sized in accordance with Section 618.2, adjoining rooms or spaces shall be considered as a single room or space for the purpose of determining the volume of such rooms or spaces.

   Exception: The minimum volume requirement shall not apply where the amount of return air taken from a room or space is less than or equal to the amount of supply air delivered to such room or space.

5. A room or space containing an *appliance* where such a room or space serves as the sole source of return air.

   Exception: This shall not apply where:

   1. The *appliance* is a direct-vent *appliance* or an *appliance* not requiring a vent in accordance with Section 501.8.
   2. The room or space complies with the following requirements:
      2.1. The return air shall be taken from a room or space having a volume exceeding 1 cubic foot for each 10 Btu/h (9.6L/W) of combined input rating of all fuel-burning appliances therein.
      2.2. The volume of supply air discharged back into the same space shall be approximately equal to the volume of return air taken from the space.
      2.3. Return-air inlets shall not be located within 10 feet (3048 mm) of a draft hood in the same room or space or the combustion chamber of any atmospheric burner *appliance* ~~firebox or draft hood~~ in the same room or space.
   3. Rooms or spaces containing solid fuel-burning appliances, provided that return-air inlets are located not less than 10 feet (3048 mm) from the firebox of such appliances.

6. A closet, bathroom, toilet room, kitchen, garage, ~~mechanical room~~, boiler room, furnace room or unconditioned attic.

   Exceptions:

   1. Where return air intakes are located not less than 10 feet (3048 mm) from cooking appliances and serve only the kitchen area, taking return air from a kitchen area shall not be prohibited.

   2. Dedicated forced air systems serving only a garage shall not be prohibited from obtaining return air from the garage.

7. A crawl space by means of direct connection to the return side of a forced-air system. Transfer openings in the crawl space enclosure shall not be prohibited.

PART II- IMC

Revise as follows:

918.6 Prohibited sources. Outdoor or return air for a forced-air heating system shall not be taken from the following locations:

1. Less than 10 feet (3048 mm) from an *appliance* vent outlet, a vent opening from a plumbing drainage system or the discharge outlet of an exhaust fan, unless the outlet is 3 feet (914 mm) above the outdoor air inlet.
2. Where there is the presence of objectionable odors, fumes or flammable vapors; or where located less than 10 feet (3048 mm)above the surface of any abutting public way or driveway; or where located at grade level by a sidewalk, street, alley or driveway.
3. A hazardous or insanitary location or a refrigeration *machinery room* as defined in this code.
4. A room or space, the volume of which is less than 25 percent of the entire volume served by such system. Where connected by a permanent opening having an area sized in accordance with Sections 918.2 and 918.3, adjoining rooms or spaces shall be considered as a single room or space for the purpose of determining the volume of such rooms or spaces.

   Exception: The minimum volume requirement shall not apply where the amount of return air taken from a room or space is less than or equal to the amount of supply air delivered to such room or space.

5. A closet, bathroom, toilet room, kitchen, garage, ~~mechanical room,~~ boiler room, furnace room or unconditioned attic.

   Exceptions:

   5.1. Where return air intakes are located not less than 10 feet (3048 mm) from cooking appliances, and serve the kitchen area only, taking return air from a kitchen shall not be prohibited.
   5.2. Dedicated forced air systems serving only a garage shall not be prohibited from obtaining return air from the garage.

6. An unconditioned crawl space by means of direct connection to the return side of a forced air system. Transfer openings in the crawl space enclosure shall not be prohibited.
7. A room or space containing a fuel-burning *appliance* where such room or space serves as the sole source of return air.

   Exceptions:

   7.1. This shall not apply where the fuel-burning *appliance* is a direct-vent *appliance*.
   7.2. This shall not apply where the room or space complies with the following requirements:
      7.2.1. The return air shall be taken from a room or space having a volume exceeding 1 cubic foot for each 10 Btu/h (9.6 L/W) of combined input rating of all fuel-burning appliances therein.
      7.2.2. The volume of supply air discharged back into the same space shall be approximately equal to the volume of return air taken from the space.
      7.2.3. Return-air inlets shall not be located within 10 feet (3048 mm) of a draft hood in the same room or space or the combustion chamber of any atmospheric burner *appliance* ~~firebox or draft hood~~ in the same room or space.
   7.3. This shall not apply to rooms or spaces containing solid-fuel-burning appliances, provided that return-air inlets are located not less than 10 feet (3048 mm) from the firebox of the appliances.

PART III- IRC

M1602.2 Prohibited sources. Outdoor and return air for a forced-air heating or cooling system shall not be taken from the following locations:

1. Closer than 10 feet (3048 mm) to an *appliance* vent outlet, a vent opening from a plumbing drainage system or the discharge outlet of an exhaust fan, unless the outlet is 3 feet (914 mm) above the outside air inlet.
2. Where flammable vapors are present; or where located less than 10 feet (3048 mm) above the surface of any abutting public way or driveway; or where located at grade level by a sidewalk, street, alley or driveway.
3. A room or space, the volume of which is less than 25 percent of the entire volume served by the system. Where connected by a permanent opening having an area sized in accordance with ACCA Manual D, adjoining rooms or spaces shall be considered as a single room or space for the purpose of determining the volume of the rooms or spaces.

   Exception: The minimum volume requirement shall not apply where the amount of return air taken from a room or space is less than or equal to the amount of supply air delivered to the room or space.

4. A closet, bathroom, toilet room, kitchen, garage, ~~mechanical room~~, boiler room, furnace room, unconditioned *attic* or other *dwelling unit*.

   Exception: Dedicated forced air systems serving only a garage shall not be prohibited from obtaining return air from the garage.

5. A room or space containing a fuel-burning *appliance* where such room or space serves as the sole source of return air.

   Exceptions:

   1. The fuel-burning *appliance* is a direct-vent *appliance* or an *appliance* not requiring a vent in accordance with Section M1801.1 or Chapter 24.

2. The room or space complies with the following requirements:
   2.1. The return air shall be taken from a room or space having a volume exceeding 1 cubic foot for each 10 Btu/h (9.6 L/W) of combined input rating of all fuel-burning *appliances* therein.
   2.2. The volume of supply air discharged back into the same space shall be approximately equal to the volume of return air taken from the space.
   2.3. Return-air inlets shall not be located within 10 feet (3048 mm) of a draft hood in the same room or space or the combustion chamber of any atmospheric burner *appliance* ~~firebox or draft hood~~ in the same room or space.
3. Rooms or spaces containing solid-fuel burning *appliances*, if return-air inlets are located not less than 10 feet (3048 mm) from the firebox of those *appliances*.

6. An unconditioned crawl space by means of direct connection to the return side of a forced air system. Transfer openings in the crawl space enclosure shall not be prohibited.

Reason: The definition of "mechanical room" states that there are no fuel fired appliances located in the space, therefore pulling air thru one should not be an issue. This section precludes pulling return air from a garage but doesn't recognize a dedicated garage system where doing so is perfectly acceptable. Adding the word "atmospheric" differentiates between open and closed combustion chambers.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I- IFGC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II- IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART III- IRC M

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

MCMANN-FG2-618.5.DOC:

FG33–09/10
621.2, 621.4

Proponent: Craig Conner, Building Quality representing self.

1. Delete without substitution.

~~**621.2 Prohibited use.** One or more unvented room heaters shall not be used as the sole source of comfort heating in a dwelling unit~~.

2. Revise as follows:

621.4 Prohibited locations. Unvented room heaters shall not be installed within occupancies in Groups A, E and I and shall not be installed within dwelling units. The location of unvented room heaters shall also comply with Section 303.3.

Reason: This proposal prohibits unvented gas room heaters in residences. Energy efficiency in buildings is becoming increasingly important. Reduced air infiltration from airtight new buildings is a key part of making buildings more energy efficient. Obviously all products of combustion from these heaters are vented directly into the building, including venting moisture and nitrous oxides. Airtight residences are not compatible with unvented room heaters.

The 2009 IRC and IECC were made significantly more energy efficient in the last code cycle. The added efficiency included a requirement for an air tightness inspection or an air tightness test (IRC N1102.4.2, IECC 402.4.2). Incoming code changes by multiple parties are likely to greatly increase residential air tightness. There may even be a Federal law requiring increased energy efficiency in energy codes, with the prospect of a "Federalized energy code" if there is not a substantial increase in IECC energy efficiency. The increased energy efficiency in the IRC and IECC is not compatible with unvented room heaters.

Manufacturers are pushing unvented heaters to provide a greater portion of the heating for residences. Unvented heaters are called the most efficient form of heating or touted as 99% efficient. Although they legalistically including the word "supplemental" in most literature, unvented heater manufacturers focus on encouraging unvented heaters as zone or room heaters. Manufacturers or their representatives, such as the Vent-

Free Alliance, even suggest lowering the thermostat of the central heating system so that more space heating is provided by the unvented heater. Greater use of unvented heaters means increased venting of combustion products directly into the living space.

The addition of vents to room heaters and fireplaces solves the problem. The most effective strategy for limiting indoor pollutants and moisture is to prevent them from being released inside in the first place, which is a key principal of indoor air quality. For room heaters and fireplaces this means exhausting the combustion products outside. Diluting the combustion products by venting the whole house is an energy-wasteful way of dealing with combustion products. Over ventilation of the residence on the possibility that an unvented heater might be in some part of the home, or might be added at a future date, is especially wasteful of energy.

So where is the evidence of a problem? The best evidence of a problem is the programs, standards, and companies "voting with their feet". ICC's new National Green Building Standard (ICC-700) outright disqualifies a residence with an unvented heater from a green designation at any level. Similarly, Energy Star, LEED and the American Lung Association's Health House outright prohibit unvented heaters in any residence in their programs. Unvented room heaters are not "green", they are "brown".

Likewise codes and standards are singling out unvented heaters. The 2009 IRC and IECC require homes with unvented heaters to state "gas-fired unvented room heater" as part of the energy certificate required to be posted on each residence (IRC N1101.9, IECC 401.3). To prevent claims of high efficiency heating, the IRC and IECC prohibit listing an efficiency for unvented heaters on the energy certificate. ASHRAE 62.2, the standard for residential indoor air quality, does not even apply in residences with unvented heaters (see scope section).

Unvented heaters are prohibited in new manufactured (HUD-code) homes by both HUD's Manufactured Home Construction and Safety Standards (Section 3280.707) and NFPA 501, the "Standard for Mobile Homes". NFPA 501, Section 10.6 states:

"Fuel-burning, heat-producing appliances and refrigeration appliances shall be of the vented type and shall vent to the outside. Exception: Ranges and ovens."

In spite of HUD and NFPA 501's regulation, unvented heaters are often sold for use in existing manufactured homes. The I-codes should not allow heating combustion products to be vented directly into an existing manufactured, as those homes were never designed to accommodate a heater's combustion products.

The trend among manufacturers is clear- several companies refuse to make unvented heaters (Hearth & Home Technologies, Jotul, Kozy Heat Fireplaces, Mendota Fireplaces, Travis Industries), including the largest maker of fireplaces and hearth products. Recently Renni went from being a Vent-Free Alliance member to not producing unvented heaters.

Unvented gas room heaters are an impediment to greater energy efficiency. Unvented gas room heaters do not belong in residences.

Cost Impact: This code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

CONNOR-FG1-621.2.DOC:

FG34–09/10
621.2

Proponent: Jimmy F. Stevens, Peoria, IL representing City of Peoria, IL

Delete and substitute as follows:

~~**621.2 Prohibited use.** One or more unvented room heaters shall not be used as the sole source of comfort heating in a *dwelling unit*.~~

621.2 Prohibited installation. Unvented room heaters shall not be installed in a dwelling unit that is not served by a vented fuel-fired or non-fuel-fired space heating system capable of providing for 100% of the space heating load of the dwelling unit.

Reason: As currently written, one could interpret Section 621.2 to imply that as long as there is at least one vented room heater in the dwelling the intent of the code is met. I believe the intent is that unvented heaters are not to be allowed as the primary source of comfort heating. Therefore, some other source of heating must be installed as the primary source. The revised text assures that the unvented heaters can be used as intended, as supplemental heat sources.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

STEVENS-FG1-621.2.DOC:

FG35–09/10
630.1, Chapter 8

Proponent: James Ranfone, representing American Gas Association

1. Revise as follows:

630.1 General. Infrared radiant heaters shall be tested in accordance with ANSI ~~Z83.6~~ ANSI Z83.19 or Z83.20 and shall be installed in accordance with the manufacturer's installation instructions.

2. Delete standard from Chapter 8 as follows:

~~Z83.6-90 (R1998)~~ ~~Gas-fired Infrared Heater~~

3. Add new standards to Chapter 8 as follows:

ANSI

Z83.19-01(R2005)	Gas-Fired High-Intensity Infrared Heaters
Z83.20-08	Gas-Fired Low-Intensity Infrared Heaters

Reason: The ANSI standards that cover infrared radiant heaters are now ANSI Z83.19 and ANSI Z83.20.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ANSI Z83.19-01 and Z83.20-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RANFONE-FG3-630.1.DOC:

FG36–09/10
636.1 (New), 636.2 (New), Chapter 8

Proponent: James Ranfone, representing American Gas Association

1. Add new text as follows:

SECTION 636 (IFGC)
OUTDOOR DECORATIVE APPLIANCES

636.1 General. Permanently fixed-in-place outdoor decorative appliances shall be tested in accordance with ANSI Z21.97 and shall be installed in accordance with the manufacturer's installation instructions.

636.2 Unlisted Units. Unlisted outdoor decorative appliances shall be approved and shall be installed outdoors in accordance with the manufacturer's installation instructions, and with clearances to combustible materials of not less than 36 in. (910 mm) from the sides measured horizontally. Such appliances shall not be located under combustible construction.

2. Add standard to Chapter 8 as follows:

ANSI

ANSI Z21.97-09	Outdoor Decorative Appliances

Reason: Would add specific coverage for outdoor decorative appliances that the code is currently lacking. The new ANSI standard Z21.97 was developed to specifically address an increasing popular appliance class. Coverage for unlisted units is being added since there is likely to be a large number of unlisted appliances in the market place until the new certification standard gains traction.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ANSI Z21.97-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

RANFONE-FG4-636_NEW.DOC:

FG37–09/10
703.1 (IMC [FG] 304.5)

Proponent: Guy Tomberlin, Bluemont, VA, representing self

Revise as follows:

703.1 Hydrogen-generating and refueling operations. Hydrogen-generating and refueling appliances shall be installed and located in accordance with their listing and the manufacturer's installation instructions. Ventilation shall be required in accordance with and Section 703.1.1, 703.1.2 or 703.1.3 in public garages, private garages, repair garages, automotive motor fuel-dispensing facilities and parking garages that contain hydrogen-generating appliances or refueling systems. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

Reason: The original text attempts to cover "generic" ventilation requirements for these type appliances. However, these are not generic type appliances they are specific. The installation, location and minimum ventilation need to be prescribed by the listing of the appliance and referenced by the installation instructions the same as any other appliance.

Cost Impact: None given.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

TOMBERLIN-FG4-703.1.DOC:

2007/2008 PROPOSED CHANGES TO THE INTERNATIONAL MECHANICAL CODE

MECHANICAL CODE COMMITTEE

Edmund Velaski, CBO - *Chair*
Chief Mechanical Inspector
City of Mobile
Mobile, AL

Tony Longino, CBO – *Vice Chair*
Chief Mechanical Inspector
County of Greenville
Greenville, SC

Wm. Scott Copp
Senior Project Manager
FRA Engineering
Rochester, NY

Robert Daly, PE
Technical Director of Boilers
New York City Dept. of Bldgs
New York, NY

Ernest Filippone
Chief Plumbing & Mechanical Inspector
Irving, TX Dept. 11
Irving, TX

Richard Grace, MCP
Engineer III
Fairfax County Government
Fairfax, VA

Billy Hinton, Jr., PE
Code Official - Chief Mechanical Engineer
NC Department of Insurance
- Engineering Division
Raleigh, NC

William Ivey, PE
President
Ivey Engineering Inc.
San Diego, CA

David McMillan, CBO
City of San Marcos
San Marcos, TX

Mark Riley
Inspector Supervisor
City of Troy
Troy, MI

Matthew Rowland
Director of Building, Planning & Code Enforcement
City of Arkansas City
Arkansas City, KS

John Sedine
President
Engineered Heating & Cooling
Walker, MI

Walter Sperko, PE
President
Sperko Engineering
Greensboro, NC

John Taecker, PE
Senior Staff Engineer
Underwriters Laboratories Inc.
San Jose, CA

David Velderman
Rep: National Assoc. of Home Builders
President/Owner
Dimension 4 Design
Twentynine Palms, CA

Staff Secretariat:
Gregg Gress
Senior Technical Staff
International Code Council

TENTATIVE ORDER OF DISCUSSION

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL MECHANICAL CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does **not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair.

ADM36-09/10
ADM37-09/10
M1-09/10, Part I
M2-09/10
M3-09/10
M4-09/10
M5-09/10
M6-09/10, Part I
M7-09/10, Part I
M8-09/10
M9-09/10, Part I
M10-09/10, Part I
M11-09/10, Part I
M12-09/10
M13-09/10
M14-09/10
M15-09/10
M16-09/10
M17-09/10
M18-09/10
M19-09/10
M20-09/10
M21-09/10
M22-09/10
M23-09/10
M24-09/10
M25-09/10
M26-09/10
M27-09/10
M28-09/10
M29-09/10
M30-09/10
M31-09/10, Part I
M34-09/10
M35-09/10, Part I
M36-09/10, Part I
M37-09/10
M38-09/10, Part I
M39-09/10, Part I
M40-09/10, Part I
M41-09/10
M42-09/10
M43-09/10
M44-09/10
M45-09/10, Part I
M46-09/10, Part I
M47-09/10
M48-09/10
M49-09/10
M50-09/10
M51-09/10
M52-09/10
M53-09/10
M54-09/10
M55-09/10
M56-09/10
M57-09/10
M58-09/10
M59-09/10
M60-09/10
M61-09/10
M62-09/10
M63-09/10
M64-09/10
M65-09/10
M66-09/10
M67-09/10
M68-09/10
M69-09/10
M70-09/10
M71-09/10
M72-09/10
M73-09/10
M74-09/10
M75-09/10
M76-09/10
M77-09/10
M78-09/10
M79-09/10
M80-09/10
M81-09/10
M82-09/10
M83-09/10
M84-09/10
M85-09/10
M86-09/10
M87-09/10
M88-09/10
M89-09/10
M90-09/10
M91-09/10
M92-09/10
M93-09/10
M94-09/10
M95-09/10
M96-09/10
M97-09/10, Part I
M98-09/10, Part I
M99-09/10
M100-09/10
M101-09/10
M102-09/10, Part I
M103-09/10, Part I
M104-09/10
M105-09/10, Part I
M106-09/10
M107-09/10
M108-09/10
M109-09/10
M110-09/10, Part I
M111-09/10, Part I
M112-09/10, Part I
M113-09/10
M114-09/10, Part I
M115-09/10
M116-09/10
M117-09/10, Part I
M118-09/10
M119-09/10, Part I
M120-09/10, Part I
M121-09/10, Part I
M122-09/10
M123-09/10
M124-09/10
M125-09/10
M126-09/10, Part I
M127-09/10, Part I
M128-09/10, Part I
M129-09/10
M130-09/10, Part I
M131-09/10, Part I
M132-09/10
M133-09/10, Part I
M134-09/10
M135-09/10
M136-09/10
M137-09/10
M138-09/10
M139-09/10
M140-09/10, Part I
M141-09/10, Part I
M142-09/10, Part I
M143-09/10
M144-09/10
M145-09/10
M146-09/10
M147-09/10
M148-09/10, Part I
M149-09/10
M150-09/10
M151-09/10, Part I
M152-09/10, Part I
M153-09/10
M154-09/10

M1–09/10
202 (New); IRC R202 (New)

Proponent: Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Add new definitions as follows:

CONTINUOUS OPERATION. Automatically activated and operating 24 hours a day or whenever the space is occupied.

INTERMITTENT OPERATION. Manually activated.

PART II – IRC MECHANICAL

Add new definitions as follows:

CONTINUOUS OPERATION. Automatically activated and operating 24 hours a day or whenever the space is occupied.

INTERMITTENT OPERATION. Manually activated.

Reason: Currently the IMC and the IRC has several sections that require continuous or intermittent operation but never provides the guidance for how either is to be achieved. This addition to the definition section clearly provides the guidance necessary to address these specific sections.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-M-4-M-13-202-RB-3-R202

M2–09/10
202

Proponent: Lee J. Kranz, City of Bellevue, WA, representing The Washington Association of Building Officials (WABO), Technical Code Development Committee

Revise as follows:

ENVIRONMENTAL AIR. Air that is conveyed to or from occupied areas through ducts which are not part of the heating or air-conditioning system, such as ventilation for human usage, domestic kitchen range exhaust, bathroom exhaust, ~~and~~ domestic clothes dryer exhaust and parking garage exhaust.

Reason: Currently, parking garage exhaust ducts and terminals may be considered to be environmental air or product conveyance. Adding parking garage exhaust to the list of items considered to be environmental air will reduce ambiguity for enforcement of location of exhaust air outlets specified in IMC Section 501.2.1. Exhaust air conveyed from parking garages is of the same concentration or ratio as the air contained within the occupied space of the garage and should not be considered to be product conveying.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KRANZ-M-1-202

M3–09/10
202

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Delete definitions and substitute as follows:

~~**JOINT, MECHANICAL.** A general form of gas-tight joints obtained by the joining of metal parts through a positive-holding mechanical construction, such as flanged joint, screwed joint or flared joint.~~

~~**MECHANICAL JOINT.** A connection between pipes, fittings, or pipes and fittings, which is neither screwed, caulked, threaded, soldered, solvent cemented, brazed nor welded. Also, a joint in which compression is applied along the centerline of the pieces being joined. Some joints are part of a coupling, fitting or adapter. These joints include both the press-type and push-fit joining systems.~~

MECHANICAL JOINT.

A) A connection between pipes, fittings, or pipes and fittings that is not welded, brazed, caulked, soldered or solvent cemented.
B) A general form of gas or liquid-tight connections obtained by the joining of parts through a positive holding mechanical construction such as but not limited to flanged, screwed, clamped or flared connections.

Reason: There is no good reason to have two definitions covering the same subject matter. The “mechanical joint” definition is in direct conflict with the same definition located in the IPC. That definition excludes threaded joints and rightly so. A mechanical joint is one that can be generally disassembled. Welded, cemented, braised and solvent cemented connections cannot be separated without cutting. A little cleanup was undertaken in the form of not including the last sentence in “mechanical joint” as this is commentary and should not be included in the definition. Also, the term being defined should not be used in the definition.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-16-202

M4–09/10
202

Proponent: Bob Glaze, Chief Plumbing, Gas and Mechanical Inspector (Retired)

Delete definition without substitution:

~~**MECHANICAL JOINT.** A connection between pipes, fittings, or pipes and fittings, which is neither screwed, caulked, threaded, soldered, solvent cemented, brazed nor welded. Also, a joint in which compression is applied along the centerline of the pieces being joined. Some joints are part of a coupling, fitting or adapter. These joints include both the press-type and push-fit joining systems.~~

Reason: Definition of ‘**MECHANICAL JOINT**’ **and** ‘**JOINT, MECHANICAL**’ disagree with each other, therefore it can be confusing and contradicting. For Mechanical systems ground joints should be used where slip-joints, caulked and solvent cemented joint should not be used except in Plumbing systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GLAZE-M-1-202

M5–09/10
202 (New)

Proponent: Andrew Granzow, Viega, LLC

Add new definition as follows:

PRESS JOINT. A permanent mechanical joint incorporating an elastomeric seal or an elastomeric seal and corrosion-resistant grip ring. The joint is made with a pressing tool and jaw or ring approved by the fitting manufacturer.

Reason: This change will clarify the difference between a press joint and other connection types.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRANZOW-M-5-202

M6–09/10
301.6; IRC M1303.1

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

301.6 Label information. A permanent factory-applied name plate(s) shall be affixed to appliances on which shall appear in legible lettering, the manufacturer's name or trademark, the model number, serial number and the seal or mark of the approved agency. A label shall also include the following:

1. Electrical equipment and appliances: Electrical rating in volts, amperes and motor phase; identification of individual electrical components in volts, amperes or watts, motor phase; Btu/h (W) output; and required clearances.
2. Absorption units: Hourly rating in Btu/h (W); minimum hourly rating for units having step or automatic modulating controls; type of fuel; type of refrigerant; cooling capacity in Btu/h (W); and required clearances.
3. Fuel-burning units: Hourly rating in Btu/h (W); type of fuel approved for use with the appliance; and required clearances.
4. Electric comfort heating appliances: ~~Name and trade-mark of the manufacturer; the model number or equivalent; the~~ electric rating in volts, ~~ampacity~~ amperes and phase; Btu/h (W) output rating; individual marking for each electrical component in amperes or watts, volts and phase; and required clearances from combustibles; ~~and a seal indicating approval of the appliance by an approved agency~~.

PART II – IRC MECHANICAL

Revise as follows:

M1303.1 Label information. A permanent factory-applied nameplate(s) shall be affixed to appliances on which shall appear, in legible lettering, the manufacturer's name or trademark, the model number, a serial number and the seal or mark of the testing agency. A label shall also include the following:

1. Electrical appliances. Electrical rating in volts, amperes and motor phase; identification of individual electrical components in volts, amperes or watts and motor phase; and in Btu/h (W) output and required clearances.
2. Absorption units. Hourly rating in Btu/h (W), minimum hourly rating for units having step or automatic modulating controls, type of fuel, type of refrigerant, cooling capacity in Btu/h (W) and required clearances.
3. Fuel-burning units. Hourly rating in Btu/h (W), type of fuel approved for use with the appliance and required clearances.

4. Electric comfort heating appliances. ~~Name and trademark of the manufacturer; the model number or equivalent;~~ the electric rating in volts, amperes and phase; Btu/h (W) output rating; individual marking for each electrical component in amperes or watts, volts and phase; and required clearances from combustibles ~~and a seal indicating approval of the appliance by an approved agency~~.
5. Maintenance instructions. Required regular maintenance actions and title or publication number for the operation and maintenance manual for that particular model and type of product.

Reason: (**Part I**) The wording in Item 4 is already in the main paragraph. This proposal removes language that is redundant.

(Part II) Requirement is already covered in the main section. This proposal removes language that is redundant.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-6-301.6-RM-1-M1303.1

M7–09/10
302.2

Proponent: Vickie Lovell, InterCode, Inc., representing the 3M Company

Revise as follows:

302.2 Penetrations of floor/ceiling assemblies and fire-resistance-rated assemblies. Penetrations of floor/ceiling assemblies and assemblies required to have a fire-resistance rating shall be protected in accordance with Chapter 7 of the *International Building Code*.

Reason: This change directs the code user to the specific chapter for protection of ducts.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LOVELL-M-4-303.2

M8–09/10
202 (New), 303.3, 927 (New), 927.1 (New); IFC 603.4

Proponent: Byron "BJ" Foster, The McMullen Company, Inc., representing the Fire Company, Pty. Ltd., Warriewood, Australia

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IMC CODE COMMITTEE AS 2 SEPARATE CODE CHANGES. SEE THE TENTATIVE HEARING ORDER FOR THE IMC CODE COMMITTEE.

PART I – IMC

1. Add new definition as follows:

UNVENTED DECORATIVE APPLIANCE. An appliance designed and listed for burning alcohol or ethanol. Such appliances are not vented to the outdoors and have passed an indoor air quality test in accordance with the National Ambient Air Quality Standards as published by the Environmental Protection Agency and the Consumer Product Safety Commission standard for reportable levels of carbon monoxide.

2. Revise as follows:

303.3 Prohibited locations. Fuel-fired appliances shall not be located in, or obtain *combustion* air from, any of the following rooms or spaces:

1. Sleeping rooms.
2. Bathrooms.
3. Toilet rooms.
4. Storage closets.
5. Surgical rooms.

Exception: This section shall not apply to the following appliances:

1. *Direct-vent appliances* that obtain all *combustion air* directly from the outdoors.
2. Solid fuel-fired appliances, provided that the room is not a confined space and the building is not of unusually tight construction.
3. Appliances installed in a dedicated enclosure in which all *combustion* air is taken directly from the outdoors, in accordance with Chapter 7. *Access to* such enclosure shall be through a solid door, weather-stripped in accordance with the exterior door air leakage requirements of the *International Energy Conservation Code* and equipped with an *approved* self-closing device.
4. Unvented alcohol or ethanol burning decorative appliances that are listed and labeled for indoor applications and pass an indoor air quality test in accordance with the National Ambient Air Quality Standards as published by the Environmental Protection Agency and the Consumer Product Safety Commission standard for reportable levels of carbon monoxide.

3. Add new text as follows:

SECTION 927
UNVENTED ALCOHOL AND ETHANOL BURNING APPLIANCES

927.1 General. Unvented decorative appliances. Unvented decorative appliances shall be listed for indoor applications and pass an indoor air quality test in accordance with the National Ambient Air Quality Standards as published by the Environmental Protection Agency and the Consumer Product Safety Commission standard for reportable levels of carbon monoxide.

PART II – IFC

Revise as follows:

603.4 Portable unvented heaters. Portable unvented fuel-fired heating equipment shall be prohibited in occupancies in Groups A, E, I, R-1, R-2, R-3 and R-4.

Exceptions:

1. Listed and approved unvented fuel-fired heaters, including portable outdoor gas-fired heating appliances, in one- and two-family dwellings.
2. Portable outdoor gas-fired heating appliances shall be allowed in accordance with Section 603.4.2.
3. In other than one- and two-family dwellings, listed and approved unvented alcohol or ethanol fuel-fired decorative appliances that are listed for indoor applications and have passed an indoor air quality test in accordance with the National Ambient Air Quality Standards as published in the EPA and Consumer Products Safety Commission standard for carbon monoxide.

Reason: There is currently no category in any of the ICC codes for alcohol burning appliances. This text will allow building and fire officials to evaluate and permit the installation of unvented alcohol burning decorative appliances that are not primarily for heating purposes. This category of appliance is relatively new on the market and is considered a “green appliance”. They produce almost no detectable levels of carbon monoxide. The primary products of combustion are steam and carbon dioxide and are well below the minimum reporting levels as published by the EPA and CPSC. Even in unusually tight construction and very small spaces, these units produce less than half the reportable levels of CO over an eight (8) hour burn period.

Bibliography

UL Listing Summery and listing sheet for the EcoSmart Fire Unit

Indoor Air Quality Test Summery by Air Quality Sciences

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The proponent did not provide Code of Federal Regulations (CFR) citations for either the "National Ambient Air Quality Standards as published in the EPA or the Consumer Products Safety Commission standard for carbon monoxide". Review copies were also not provided in accordance with Section 3.6 of ICC CP-28.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FOSTER-M-3-202-M-2-303-M-1-927-IFC 603.4

M9-09/10
304.1, Chapter 15; IRC M1401.1, Chapter 44

Proponent: Brent Ursenbach, Salt Lake County, representing the Utah Chapter of ICC

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

1. Revise as follows:

304.1 General. *Equipment* and appliances shall be installed as required by the terms of their approval, in accordance with the conditions of the listing, the manufacturer's installation instructions, the requirements of ANSI/ACCA 5 QI-2007 where applicable and this code. Manufacturer's installation instructions shall be available on the job site at the time of inspection.

2. Add new standard to Chapter 15 as follows:

ACCA 5 Q1-2007	HVAC Quality Installation Specification Residential and Commercial Heating, Ventilating and Air Conditioning (HVAC) Applications

PART II – IRC MECHANICAL

1. Revise as follows:

M1401.1 Installation. Heating and cooling *equipment* and *appliances* shall be installed in accordance with the manufacturer's installation instructions, the requirements of ACCA Standard 5 and the requirements of this code.

2. Add new standard to Chapter 44 as follows:

ACCA 5 Q1-2007	HVAC Quality Installation Specification Residential and Commercial Heating, Ventilating and Air Conditioning (HVAC) Applications

Reason: Maximum energy efficiency from heat and cooling equipment will not be realized until such systems are properly installed. Quoting the *Foreword of Standard 5:*

"There is a need to establish a raised bar to improve the core competencies of contractors to ensure that quality installations ensue. This is beneficial not only as a process improvement for contracting businesses, but, more importantly, for fulfilling the needs of building owners/operators in quality installations – comfortable, healthy, safe, energy-efficient indoor environments. Yet, until now, across the broad spectrum of the industry (manufacturers, distributors, contractors, user groups, customers, utilities, environmental groups, associations/professional societies, governmental agencies, etc.), there has been no universally accepted definition of a quality contractor or a quality installation. Full observance of the quality installation elements may increase the initial "cost" to the residential or commercial building owner/operator. However, the increased "value" – resulting from improved energy efficiency, better comfort, enhanced IAQ, improved equipment reliability, longer equipment life, etc. – is expected to far exceed any added upfront price. Additionally, adherence to the elements in this specification provides intangible societal benefits in the form of reduced power grid energy demand that aids in reducing pollution and dependence on foreign oil."

Cost Impact: The code change proposal will increase the cost of construction; however it will decrease the operating cost for HVAC equipment throughout the life of the appliances.

Analysis: Review of proposed new standard, ACCA 5 Q1-9-2007, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: URSENBACH-M-1-304.1-RM-1-M1401.1

M10–09/10
304.3; IRC M1307.3, P2801.6

Proponent: Don Surrena, CBO, representing the National Association of Home Builders (NAHB)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING/MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

304.3 Elevation of ignition source. Equipment and appliances having an *ignition source* and located in hazardous locations and public garages, private garages, repair garages, automotive motor fuel-dispensing facilities and parking garages shall be elevated such that the source of ignition is not less than 18 inches (457 mm) above the floor surface on which the *equipment* or *appliance* rests. For the purpose of this section, rooms or spaces that are not part of the living space of a *dwelling unit* and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

> **Exception:** Elevation of the ignition source is not required for appliances that are listed as flammable vapor ignition resistant.

Reason: This change provides uniformity between the IFGC the IRC and the IMC for consistence of the codes to allow "flammable vapor ignition resistant" appliances to not be required to be elevated. As currently written the provisions for elevation from ignition source is covered in the IRC Section 2408.2 and the IFGC in Section 305.3. The IMC and the IRC Section P2801.6 do not recognize the flammable vapor ignition resistant technology.

Bibliography
ANSI Z21.10.1a-2002/CSA4.1a-2002

Cost Impact: The code change proposal will not increase the cost of construction.

PART II – IRC PLUMBING/MECHANICAL

Revise as follows:

M1307.3 Elevation of ignition source. *Appliances* having an *ignition source* shall be elevated such that the source of ignition is not less than 18 inches (457 mm) above the floor in garages. For the purpose of this section, rooms or spaces that are not part of the living space of a *dwelling unit* and that communicate with a private garage through openings shall be considered to be part of the garage.

> **Exception:** Elevation of the ignition source is not required for appliances that are listed as flammable vapor ignition resistant.

P2801.6 Water heaters installed in garages. Water heaters having an ignition source shall be elevated such that the source of ignition is not less than 18 inches (457 mm) above the garage floor

> **Exception:** Elevation of the ignition source is not required for appliances that are listed as flammable vapor ignition resistant.

Reason: This change provides uniformity between the IFGC the IRC and the IMC. If adopted the requirements regarding "flammable vapor ignition resistant" appliances will be consistent throughout the codes. As currently written the provisions for elevation from ignition source is covered in the IRC Section G2408.2 and the IFGC in Section 305.3.

Bibliography
ANSI Z21.10.1a-2002/CSA4.1a-2002

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC PLUMBING/MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SURRENA-M-1-304.3-RM-1-M1307.3-RP-1-P2801.6

M11–09/10
306.5 (IFGC 306.5)

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

306.5 (IFGC 306.5) Equipment and appliances on roofs or elevated structures. Where equipment requiring access or appliances are located on an elevated structure or the roof of a building such that personnel will have to climb higher than 16 feet above grade to access such equipment or appliances, an interior or exterior means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) high or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope). Such access shall not require the use of portable ladders.\

~~Where equipment requiring access and appliances are installed on roofs or elevated structures at a height exceeding 16 feet (4877 mm), such access shall be provided by a permanent approved means of access, the extent of which shall be from grade or floor level to the equipment and appliances' level service space. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) high or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope)~~ Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.

Permanent ladders installed to provide the required access shall comply with the following minimum design criteria:

1. The side railing shall extend above the parapet or roof edge not less than 30 inches (762 mm).
2. Ladders shall have rung spacing not to exceed 14 inches (356 mm) on center.
3. Ladders shall have a toe spacing not less than 6 inches (152 mm) deep.
4. There shall be a minimum of 18 inches (457 mm) between rails.
5. Rungs shall have a minimum 0.75-inch (19 mm) diameter and be capable of withstanding a 300-pound (136.1 kg) load.
6. Ladders over 30 feet (9144 mm) in height shall be provided with offset sections and landings capable of with standing 100 pounds per square foot (488.2 kg/m2). Landing dimensions shall be not less than 18 inches (457 mm) and not less than the width of the ladder served. A guard rail shall be provided on all open sides of the landing.
7. Ladders shall be protected against corrosion by *approved* means.

Catwalks installed to provide the required access shall be not less than 24 inches (610 mm) wide and shall have railings as required for service platforms.

Exception: This section shall not apply to Group R-3 occupancies.

Reason: This is an effort to stream-line and simplify this section and exclude unnecessary language. This text eliminates where roofs are to be measured by prescribing that if the roof is greater than 16 feet, inside or outdoor access is required regardless of how high parapets are. Prohibiting the use of portable ladders assures that the ladders associated with access are close enough to the ground or floor to access. There is nothing new in this text.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-33-306.5

M12–09/10
306.5 (IFGC 306.5)

Proponent: Guy McMann and Troy Jones, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

306.5 (IFGC 306.5)Equipment and appliances on roofs or elevated structures. Where *equipment* requiring access and appliances are installed on roofs or elevated structures at a height exceeding 16 feet (4877 mm), such access shall be provided by a permanent *approved* means of access, the extent of which shall be from grade or floor level to the *equipment* and appliances' level service space. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) high or walking on roofs having a slope greater than four units vertical in 12 units horizontal (33-percent slope). Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall. Permanent ladders installed to provide the required access shall comply with the following minimum design criteria:

1. The side railing shall extend above the parapet or roof edge not less than 30 inches (762 mm).
2. Ladders shall have rung spacing not to exceed 14 inches (356 mm) on center. <u>The upper-most rung shall be a maximum of 24 inches (610 mm) below the upper edge of the roof hatch, roof or parapet, as applicable.</u>
3. Ladders shall have a toe spacing not less than 6 inches (152 mm) deep.
4. There shall be a minimum of 18 inches (457 mm) between rails.
5. Rungs shall have a minimum 0.75-inch (19 mm) diameter and be capable of withstanding a 300-pound (136.1 kg) load.
6. Ladders over 30 feet (9144 mm) in height shall be provided with offset sections and landings capable of withstanding 100 pounds per square foot (488.2 kg/m2). Landing dimensions shall be not less than 18 inches (457 mm) and not less than the width of the ladder served. A guard rail shall be provided on all open sides of the landing.
7. <u>Climbing clearance. The distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder shall be a minimum of 30 inches (762 mm) measured perpendicular to the rungs. This distance shall be maintained from the point of ladder access to the bottom of the roof hatch. A minimum clear width of 15-inches (381 mm) shall be provided on both sides of the ladder measured from the midpoint of and parallel with the rungs except where cages or wells are installed.</u>
8. <u>Landing required. The ladder shall be provided with a clear and unobstructed bottom landing area having a minimum dimension of 30 inches (762 mm) by 30 inches (762 mm) centered in front of the ladder.</u>
~~7~~<u>9</u>. Ladders shall be protected against corrosion by *approved* means.
10. <u>Ladders shall be accessible at all times.</u>

Catwalks installed to provide the required access shall be not less than 24 inches (610 mm) wide and shall have railings as required for service platforms.

Exception: This section shall not apply to Group R-3 occupancies.

Reason: There can be many dangers when utilizing permanently installed ladders, most notably falling down or off for one reason or another. There needs to be clear and unobstructed passage up and down the ladder. Currently there is no guidance as to climbing clearances. These requirements come directly from *OSHA Standard 1910.27.* It's hard enough for those whom access is required to properly climb without having to dodge pipes, ducts or walls that encroach on the minimum climbing clearances established in the standard. The 30" clearance makes total sense because many times tools, parts or other items must be carried at the same time while climbing. Likewise, the bottom landing area serves as a staging point for maintenance and fire personnel. These ladders many times are located in small closets or electrical rooms with little regard to accessing or exiting the ladder. There are documented cases where switch gear has been located too close to the ladder causing tail bone and back injuries when descending the ladder. Also, there is no guidance in the code as to how far the top rung needs to be from the very top of the hatch. A rung located too far down creates a tripping hazard. These minimum requirements will help ensure a safer environment when accessing, climbing and descending these ladders.

Ladders also need to be accessible at all times. As is, there is nothing prohibiting a ladder from being installed in the middle of a building or in the middle of an upper floor during the "core and shell" portion of construction. This is ok up to the point where that portion of the floor or building becomes consumed by a tenant later on, rendering the ladder inaccessible by other tenants or fire personnel when the tenant is closed for business. For obvious security reasons only the tenant themselves should access their space. These ladders need to be placed in a neutral location that all tenants and fire personnel can access at all times. This language will provide a "trigger" for plan reviewers when evaluating core and shell plans and permitting them to require a more neutral location when the need arises.

Cost Impact: This code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-11-306.5

M13–09/10
306.5.1 (IFGC 306.5.1)

Proponent: Gary Buck, Salt Lake City Corporation, representing the Utah Chapter of ICC

Revise as follows:

306.5.1 (IFGC 306.5.1) Sloped roofs. Where appliances, *equipment*, fans or other components that require service are installed on a roof having a slope of ~~three~~ five units vertical in 12 units horizontal (~~25~~ 42-percent slope) or greater and having an edge more than 30 inches (762 mm) above grade at such edge, a level platform shall be provided on each side of the *appliance* or *equipment* to which access is required for service, repair or maintenance. The platform shall be not less than 30 inches (762 mm) in any dimension and shall be provided with guards. The guards shall extend not less than 42 inches (1067 mm) above the platform, shall be constructed so as to prevent the passage of a 21-inch diameter (533 mm) sphere and shall comply with the loading requirements for guards specified in the *International Building Code*. Access shall not require walking on roofs having a slope greater than four units vertical in 12 units horizontal (33-percent slope). Where access involves obstructions greater than 30 inches (762 mm) in height, such obstructions shall be provided with ladders installed in accordance with Section 306.5 or stairs installed in accordance with the requirements specified in the *International Building Code* in the path of travel to and from appliances, fans or *equipment* requiring service.

Reason: We feel that this requirement of the code for platforms on roofs is generally ignored because of the comparatively low threshold of the slope of the roof. We feel that slopes of 5:12 or less are relatively safe surfaces to maintain mechanical equipment. The platforms are rarely used and are unsightly. By increasing the slope we feel that this requirement will be less likely overlooked in review and inspections.

Cost Impact: Reduced cost.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BUCK-M-1-306.5.1

M14–09/10
308.5, Chapter 15

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

308.5 Labeled assemblies. The allowable clearance reduction shall be based on an approved reduced clearance protective assembly that ~~has been tested and bears the~~ is listed and labeled in accordance with UL 1618 ~~of an approved agency~~.

2. Add new standard to Chapter 15 as follows:

UL
618-09 Wall Protectors, Floor Protectors, and Hearth Extensions

Reason: The UL 1618 standard includes a comprehensive set of construction and performance requirements that are used to evaluate and list wall protectors, floor protectors, and hearth extensions that are intended for use with heat producing devices, such as fireplaces, fireplace stoves, fireplace inserts, and solid-fuel type room heaters.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard, UL 1618-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME:E UGENE-M-10-308.5-CH 15

M15–09/10
Table 308.6 (New), Figure 308.6(1) (New), Figure 308.6(2) (New)

Proponent: John England, MCO, England Enterprises, Inc.

1. Delete existing table and substitute with Table M1306.2 from the IRC as follows:

TABLE 308.6
~~CLEARANCE REDUCTION METHODS~~

	~~REDUCED CLEARANCE WITH PROTECTION (inches)a~~							
	~~Horizontal combustible assemblies located above the heat source~~				~~Horizontal combustible assemblies located beneath the heat source and all vertical combustible assemblies~~			
	~~Required clearance to combustibles without protection (inches)a~~				~~Required clearance to combustibles without protection (inches)~~			
~~TYPE OF PROTECTIVE ASSEMBLYa~~	~~36~~	~~18~~	~~9~~	~~6~~	~~36~~	~~18~~	~~9~~	~~6~~
~~Galvanized sheet steel, having a minimum thickness of 0.0236 inch (0.6010 mm) (No. 24 gage), mounted on 1-inch glass fiber or mineral wool batt reinforced with wire on the back, 1 inch off the combustible assembly~~	~~18~~	~~9~~	~~5~~	~~3~~	~~12~~	~~6~~	~~3~~	~~3~~
~~Galvanized sheet steel, having a minimum thickness of 0.0236 inch (0.6010 mm) (No. 24 gage), spaced 1 inch off the combustible assembly~~	~~18~~	~~9~~	~~5~~	~~3~~	~~12~~	~~6~~	~~3~~	~~2~~
~~Two layers of galvanized sheet steel, having a minimum thickness of 0.0236 inch (0.6010 mm) (No. 24 gage), having a 1-inch airspace between layers, spaced 1 inch off the combustible assembly~~	~~18~~	~~9~~	~~5~~	~~3~~	~~12~~	~~6~~	~~3~~	~~3~~
~~Two layers of galvanized sheet steel, having a minimum thickness of 0.0236 inch (0.6010 mm) (No. 24 gage), having 1 inch of fiberglass insulation between layers, spaced 1 inch off the combustible assembly~~	~~18~~	~~9~~	~~5~~	~~3~~	~~12~~	~~6~~	~~3~~	~~3~~
~~0.5-inch inorganic insulating board, over 1 inch of fiberglass or mineral wool batt, against the combustible assembly~~	~~24~~	~~12~~	~~6~~	~~4~~	~~18~~	~~9~~	~~5~~	~~3~~
~~31/2-inch brick wall, spaced 1 inch off the combustible wall~~	~~—~~	~~—~~	~~—~~	~~—~~	~~12~~	~~6~~	~~6~~	~~6~~
~~31/2-inch brick wall, against the combustible wall~~	~~—~~	~~—~~	~~—~~	~~—~~	~~24~~	~~12~~	~~6~~	~~5~~

~~For SI: 1 inch = 25.4 mm, ºC = [(ºF)-32]/1.8, 1 pound per cubic foot = 16.02 kg/m3, 1.0 Btu • in/ft2 • h • ºF = 0.144 W/m2 • K.~~

~~a. Mineral wool and glass fiber batts (blanket or board) shall have a minimum density of 8 pounds per cubic foot and a minimum melting point of 1,500ºF. Insulation material utilized as part of a clearance reduction system shall have a thermal conductivity of 1.0 Btu • in/(ft2 • h • ºF) or less. Insulation board shall be formed of noncombustible material.~~

~~b. For limitations on clearance reduction for solid fuel burning appliances, masonry chimneys, connector pass-throughs, masonry fireplaces and kitchen ducts, see Sections 308.7 through 308.11.~~

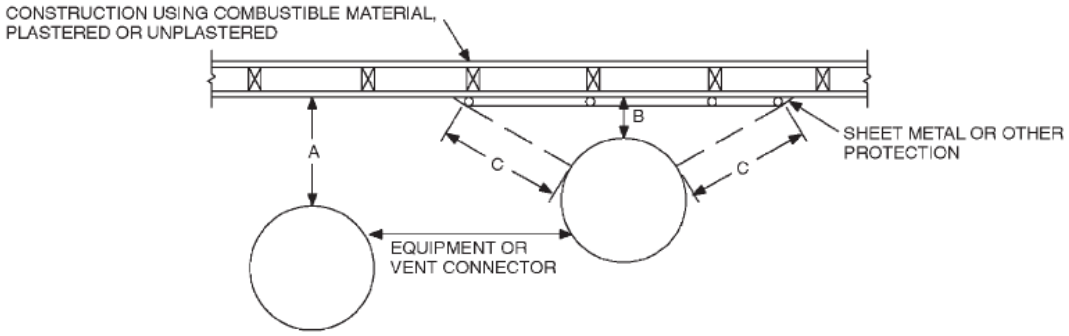
TABLE ~~M1306.2~~ 308.6
REDUCTION OF CLEARANCES WITH SPECIFIED FORMS OF PROTECTION[a, c, d, e, f, g, h, l, j, k, l]

TYPE OF PROTECTION APPLIED TO AND COVERING ALL SURFACES OF COMBUSTIBLE MATERIAL WITHIN THE DISTANCE SPECIFIED AS THE REQUIRED CLEARANCE WITH NO PROTECTION (See Figures 308.6(1) and 308.6(2)	WHERE THE REQUIRED CLEARANCE WITH NO PROTECTION FROM APPLIANCE, VENT CONNECTOR, OR SINGLE WALL METAL PIPE IS:									
	36 inches		18 inches		12 inches		9 inches		6 inches	
	Allowable clearances with specified protection (Inches)[b]									
	Use column 1 for clearances above an appliance or horizontal connector. Use column 2 for clearances from an appliance, vertical connector and single-wall metal pipe.									
	Above column 1	Sides and rear column 2	Above column 1	Sides and rear column 2	Above column 1	Sides and rear column 2	Above column 1	Sides and rear column 2	Above column 1	Sides and rear column 2
31/2-inch thick masonry wall without ventilated air space	—	24	—	12	—	9	—	6	—	5
1/2-in. insulation board over 1-inch glass fiber or mineral wool batts	24	18	12	9	9	6	6	5	4	3
Galvanized sheet steel having a minimum thickness of 0.0236-inch (No. 24 gage) over 1-inch glass fiber or mineral wool batts reinforced with wire or rear face with a ventilated air space	18	12	9	6	6	4	5	3	3	3
31/2-inch thick masonry wall with ventilated air space	—	12	—	6	—	6	—	6	—	6
Galvanized sheet steel having a minimum thickness of 0.0236-inch (No. 24 gage) with a ventilated air space 1-inch off the combustible assembly	18	12	9	6	6	4	5	3	3	2
1/2-inch thick insulation board with ventilated air space	18	12	9	6	6	4	5	3	3	3
Galvanized sheet steel having a minimum thickness of 0.0236-inch (No. 24 gage) with ventilated air space over 24 gage sheet steel with a ventilated space	18	12	9	6	6	4	5	3	3	3
1-inch glass fiber or mineral wool batts sandwiched between two sheets of galvanized sheet steel having a minimum thickness of 0.0236-inch (No. 24 gage) with a ventilated air space	18	12	9	6	6	4	5	3	3	3

For SI: 1 inch = 25.4 mm, 1 pound per cubic foot = 16.019 kg/m3, °C = [(°F)-32/1.8], 1 Btu/(h _ ft2 _ °F/in.) = 0.001442299 (W/cm2 × °C/cm).

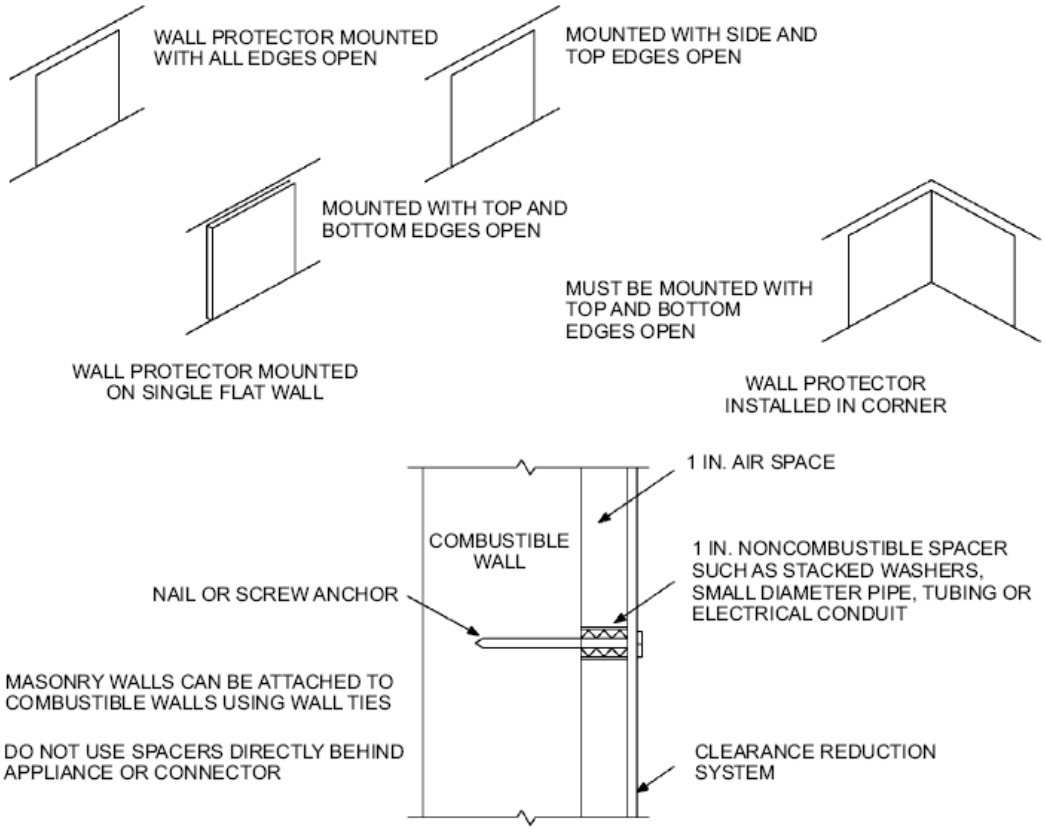
a. Reduction of clearances from combustible materials shall not interfere with combustion air, draft hood clearance and relief, and accessibility of servicing.
b. Clearances shall be measured from the surface of the heat producing appliance or equipment to the outer surface of the combustible material or combustible assembly.
c. Spacers and ties shall be of noncombustible material. No spacer or tie shall be used directly opposite appliance or connector.
d. Where all clearance reduction systems use a ventilated air space, adequate provision for air circulation shall be provided as described. [See Figures 308.6(1) and 308.6(2)]
e. There shall be at least 1 inch between clearance reduction systems and combustible walls and ceilings for reduction systems using ventilated air space.
f. If a wall protector is mounted on a single flat wall away from corners, adequate air circulation shall be permitted to be provided by leaving only the bottom and top edges or only the side and top edges open with at least a 1-inch air gap.
g. Mineral wool and glass fiber batts (blanket or board) shall have a minimum density of 8 pounds per cubic foot and a minimum melting point of1,500 °F.
h. Insulation material used as part of a clearance reduction system shall have a thermal conductivity of 1.0 Btu inch per square foot per hour °F or less. Insulation board shall be formed of noncombustible material.
i. There shall be at least 1 inch between the appliance and the protector. In no case shall the clearance between the appliance and the combustible surface be reduced below that allowed in this table.
j. All clearances and thicknesses are minimum; larger clearances and thicknesses are acceptable.
k. Listed single-wall connectors shall be permitted to be installed in accordance with the terms of their listing and the manufacturer's instructions.
l. For limitations on clearance reduction for solid-fuel-burning appliances, masonry chimneys, connector pass-throughs, masonry fireplaces and kitchen ducts, see Sections 308.7 through 308.11.

2. Add new figures as follows:



NOTE: "A" equals the required clearance with no protection. "B" equals the reduced clearance permitted in accordance with Table M1306.2. The protection applied to the construction using combustible material shall extend far enough in each direction to make "C" equal to "A."

FIGURE 308.6(1)
REDUCED CLEARANCE DIAGRAM



For SI: 1 inch = 25.4 mm.

FIGURE 308.6(2)
WALL PROTECTOR CLEARANCE REDUCTION SYSTEM

Reason: So table can be consistent with the IFGC and the mechanical and gas sections of the IRC.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Tables M1306.2 and G2409.2 are specific to appliances, vent and chimney connectors and single-wall metal vents, whereas, Table 308.6 is applicable to any heat source.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENGLAND-M-5-T. 308.6

M16–09/10
401.4 (New)

Proponent: Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

Add new text as follows:

401.4 Exhaust required. Exhaust shall be provided as specified in Table 403.3 except as otherwise specified in this code.

Reason: There is no current text to direct the user to Table 403.3 for exhaust system design and construction. Other sections of the IMC require exhaust for specific applications such as parking garage, commercial hood system, and hazardous exhaust system. This added wording simply provides acknowledgement that exhaust is required as specified in Table 403.3 unless there is an overriding section detailing other exhaust rates and alternatives.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: T OMBERLIN-M-14-401.4

M17–09/10
401.4

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

401.4 Intake opening location. Air intake openings shall comply with all of the following:

1. Intake openings shall be located a minimum of 10 feet (3048 mm) from lot lines or buildings on the same lot. Where openings front on a street or public way, the distance shall be measured to the centerline of the street or public way.
2. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) horizontally or 25 feet (7620 mm) vertically from any hazardous or noxious contaminant source, such as vents, streets, alleys, parking lots and loading docks, except as specified in Item 3 or Section 501.2.1.
3. Intake openings shall be located not less than 3 feet (914 mm) below contaminant sources where such sources are located within 10 feet (3048 mm) of the opening.
4. Intake openings on structures in flood hazard areas shall be at or above the design flood level.

Reason: Currently there is no relief provided by the code for openings located closer than 10 feet to contaminants when such openings are much higher than the contaminant source. At some point there will be little chance that anything will enter. Take an opening facing a street or alley, if the opening is located at least 25 feet above, the exhaust from a truck will disperse before being drawn in. This dimension will put an opening roughly between a 2nd and 3rd story. At some point there needs to be credit given in the code for height.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-19-401.4

M18–09/10
401.4

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

401.4 Intake opening location. Air intake openings shall comply with all the following:

1. Intake openings shall be located a minimum of 10 feet (3048 mm) from lot lines or buildings on the same lot. ~~Where openings front on a street or public way, the distance shall be measured to the centerline of the street or public way~~.
2. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) horizontally from any hazardous or noxious contaminant source, such as vents, streets, alleys, ~~parking lots~~ and loading docks. Where openings front on a street or public way, the distance shall be measured from the ~~centerline~~ closest edge of the street or public way.
3. Intake openings shall be located not less than 3 feet (914 mm) below contaminant sources where such sources are located within 10 feet (3048 mm) of the opening.
4. Intake openings on structures in flood hazard areas shall be at or above the design flood level.

Reason: The second sentence seems to be misplaced as the dialogue concerning streets and alleys is in item # 2. Another problem here is that most streets are 20 feet wide. Measuring from the center places an opening directly on the side of the street which defeats the purpose. The contaminant sources listed make sense due to constant vehicle movement and idling but parking lots don't fit. Parking lots generally have vehicles that are not running and are open on all sides preventing an accumulating emission problem. An occasional vehicle entering or leaving a lot should not present a significant concern.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-35-401.4

M19–09/10
401.5, Chapter 15

Proponent: Vickie Lovell, InterCode, Inc., representing the Air Movement and Control Association

1. Revise as follows:

401.5 Intake opening protection. Air intake openings that terminate outdoors shall be protected with corrosion-resistant screens, louvers or grilles. Openings in louvers, grilles and screens shall be sized in accordance with Table 401.5, and shall be protected against local weather conditions. Louvers that protect air intake openings in structures located in hurricane-prone regions, as defined in the International Building Code, shall comply with AMCA 550. Outdoor air intake openings located in exterior walls shall meet the provisions for exterior wall opening protectives in accordance with the *International Building Code.*

2. Add new standard as follows:

AMCA 550-08 Test Method for High Velocity Wind Driven Rain Resistant Louvers

Reason: AMCA Standard 550-08 *Test Method for High Velocity Wind Driven Rain Resistant Louvers* standardizes uniform laboratory test methods and minimum performance ratings for water rejection capabilities of louvers intended to be used in high velocity wind conditions.

The tests conducted in accordance with the requirements of this standard are intended to demonstrate the acceptability of the louver for installation in facilities (essential and nonessential) that will remain in operation during a high velocity wind condition and where water infiltration must be kept to manageable amounts.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard, AMCA 550-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: LOVELL-M-3-401.5-CH 15

M20 –09/10
Table 403.3

Proponent: Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

Revise table as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	~~PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE R_P CFM/PERSON~~ DEFAULT OCCUPANT DENSITY #/1000 FT^{2a}	~~AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE R_a CFM/FT^{2a}~~ PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE R_P CFM/PERSON	~~DEFAULT OCCUPANT DENSITY #/1000 FT^{2a}~~ AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE R_a CFM/FT^{2a}	EXHAUST AIRFLOW RATE CFM/FT^{2a}

(The columns in the table will shift in accordance with the shift in column titles.)

Reason: Simplified, the DEFAULT OCCUPANT DENSITY column shifts two columns left. PEOPLE and AREA OUTDOOR AIR columns both shift one column to the right. All figures contained within (below) these columns shift accordingly. This proposed change is an attempt to make the table a little more user friendly. Putting the occupant density next to the occupant outdoor air requirement will give the table better flow.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: TOMBERLIN-M-8-T. 403.3

M21–09/10
Table 403.3

Proponent: Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

Revise table as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE R_a CFM/FT^{2a}	~~DEFAULT~~ OCCUPANT DENSITY #/1000 FT^{2a}	EXHAUST AIRFLOW RATE CFM/FT^{2a}

(Portions of table not shown remain unchanged)

Reason: The term default is unnecessary. It is simply the occupant density. By including the term default it would assume there is some other method of determining the occupant density, which there is not according to current text. The intent of this proposal is to remove any misunderstanding that may lead to any mis-application.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: TOMBERLIN-M-1-T. 403.3

M22–09/10
Table 403.3

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise table as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

Occupancy Classification.	People Outdoor Airflow Rate in Breathing Zone CFM/Person	Area Outdoor Airflow rate in Breathing Zone R_a CFM/FT ^{2a}	~~Default~~ Occupant Density #/1000 FT.$^{2\ a}$	Exhaust Airflow Rate CFM Ft $^{2\ a}$

(Portions of table not shown remain unchanged)

For SI: 1 cubic foot per minute = 0.0004719 m^3/s, 1 ton = 908 kg, 1 cubic foot per minute per square foot = 0.00508 $m^3/(s \_ m^2)$,
C = [(F) -32]/1.8, 1 square foot = 0.0929 m^2.

a. Based upon net occupiable floor area.
b. Mechanical exhaust is required as prescribed in Table 403.3 and the recirculation of air from such spaces is prohibited (see Section 403.2.1, Item 3).
c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.
d. Ventilation systems in enclosed parking garages shall comply with Section 404.
e. Rates are per water closet or urinal. The higher rate shall be provided where periods of heavy use are expected to occur, such as toilets in theaters, schools and sports facilities. The lower rate shall be permitted where periods of heavy use are not expected.
f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted where the exhaust system is designed to operate continuously during normal hours of use.
g. Mechanical exhaust is required as prescribed in Table 403.3 and recirculation is prohibited except that recirculation shall be permitted where the resulting supply airstream consists of not more than 10 percent air recirculated from these spaces (see Section 403.2.1, Items 2 and 4).
h. For nail salons, the required exhaust shall include ventilation tables or other systems that capture the contaminants and odors at their source and are capable of exhausting a minimum of 50 cfm per station.

Reason: The word "default" here is a carryover from ASHRAE 62.1 and has no meaning in the context of the IMC text.. This is the only Table to be used as charged by the 2nd sentence of 403.3. The revised notes for Table 403.3 recognize the exhaust column in the table. Currently, no text refers to this column in the table.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: MCMANN-M-29-T. 403.3

M23–09/10
Table 403.3

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise table as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE R_A CFM/FT$^{2\ A}$	DEFAULT OCCUPANT DENSITY #/1000 FT^{2A}	EXHAUST AIRFLOW RATE CFM/FT^{2A}
Public Spaces				
Corridors	-	0.06	-	-
Stairway enclosures [i]	-	0.06	-	-

a. through h. (No change)

i. The square footage of a stairway enclosure shall be the area of the bottom of the enclosure multiplied by the number of stories served by the stairway.

(Portions of table and notes not shown remain unchanged)

Reason: There are good reasons to ventilate a stairway enclosure and currently, there are no requirements in the IMC for such ventilation. Stairway enclosures are becoming even more occupied due to an increase in traffic by occupants who use the stairway as a means of exercise. Also, people are being encouraged to save elevator energy by choosing the stairways. A lack of ventilation could also promote an environment for mold growth. It is quite possible that in today's world, occupants could be intentionally held in a stairway enclosure by authorities as this would be considered an *area of refuge* according to IBC 1007.6, due to possible security issues that may be occurring within or outside the building. Even though IMC 601.3 calls for an independent system, this alone should not be the deciding factor for not ventilating stairway enclosures.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME MCMANN-M-36-T. 403.3

M24–09/10
Table 403.3

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise table as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE RP CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE RA CFM/FT2 [A]	DEFAULT OCCUPANT DENSITY #/1000 FT2[A]	EXHAUST AIRFLOW RATE CFM/FT2[A]
Beauty and nail salons~~[b,h]~~ Nail salon stations [h]	20 -	0.12 -	25 -	0.6 50 per station[h]

h. For Nail Salons, ~~the required exhaust shall include ventilation tables or other systems that capture the contaminants and odors at their source and are capable of exhausting a minimum of 50 cfm per station~~ each nail station shall be provided with a *source capture system* capable of exhausting not less than 50 cfm per station.

(Portions of table and notes not shown remain unchanged)

Reason: Beauty and nail salons should not be combined and treated the same way as it relates to exhaust. Beauty salons in general do not use the same chemicals as found in nail stations. When a properly installed source capture system is employed, as defined in this code, recirculation of air should not be an issue. Source capture systems may take many forms and include ventilation tables and small hood arraignments that are intended to capture the contaminants at their source. This is why some of the language in the footnote has been removed because source capture systems include all these. The definition also states that the exhaust must be discharged to the outdoors. The general area of a nail salon should not be prohibited from recirculation because the source capture system has solved the concerns involving contamination associated with the use of acetone and other chemicals. The exhaust requirements in the table take care of the mild odors commonly found in these occupancies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-24-T. 403.3

M25–09/10
Table 403.3

Proponent: Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

Revise as follows:

TABLE 403.3
MINIMUM VENTILATION RATES

(Portions of table not shown remain unchanged)

a. though d. (No change)

e. Rates are per water closet or urinal. ~~The higher rate shall be provided where periods of heavy use are expected to occur, such as, toilets in theaters, schools, and sports facilities. The lower rate shall be permitted where periods of heavy use are not expected.~~ The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously during occupancy.

f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously during occupancy ~~normal hours of use~~.

g. and h. (No change)

Reason: These revisions allow for consistent and uniform application. The current text is vague and ambiguous.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: TOMBERLIN-M-11-T. 403.3

M26–09/10
403.7

Proponent: Eli P. Howard, III, Sheet Metal and Air Conditioning Contractors National Association, Inc.

Revise as follows:

403.7 Balancing. The *ventilation air* distribution system shall be provided with means to adjust the system to achieve at least the minimum ventilation airflow rate as required by Sections 403.3 and 403.4. Ventilation systems shall be balanced ~~by an *approved* method~~ as specified in SMACNA *HVAC Systems Testing, Adjusting & Balancing*. Such balancing shall verify that the ventilation system is capable of supplying and exhausting the airflow rates required by Sections 403.3 and 403.4.

Reason: The current balancing requirements in the IMC does not provide for clearly defined methods or procedures for testing, adjusting, and balancing of HVAC systems. SMACNA's *HVAC Systems Testing, Adjusting & Balancing* manual provides specific methods and procedures—a complete process—that ensures all HVAC systems have been properly adjusted and balanced.

Cost Impact: Using established, time-tested procedures to correctly balance HVAC airflows the first time should have no cost impact.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: HOWARD-M-8-403.7

M27–09/10
404.1

Proponent: Donald R. Monahan, PE, Walker Parking Consultants, representing the National Parking Association and the Automated & Mechanical Parking Association

Revise as follows:

404.1 Enclosed parking garages. Mechanical ventilation systems for enclosed parking garages shall be permitted to operate intermittently where the system is arranged to operate automatically upon detection of ~~vehicle operation or the presence of occupants by approved automatic detection devices.~~carbon monoxide levels equal to or greater than 35 parts per million by approved automatic detection devices. Upon activation, such systems shall operate for a period of not less than 30 minutes.

Reason: The current language implies occupancy sensors are required to detect vehicles and/or occupants when it is the concentration of vehicle emissions that is the reason for mechanical ventilation in enclosed parking garages. Merely the presence of vehicles or occupants does not mean that there will be excessive levels of CO. Therefore, the mechanical ventilation system should operate intermittently when the carbon monoxide concentration exceeds acceptable levels. The concentration will not exceed acceptable levels if there are not moving vehicles in the garage which also indicates that there will be people going to or from those vehicles in addition to the driver being exposed to the CO levels via the vehicle's ventilation system.

References:
ANSI/ASHRAE Standard 62.1-2007, *Ventilation for Acceptable Indoor Air Quality,* Atlanta 2007
Moncef Krarti and Arselene Ayari*, CFD Analysis of Ventilation System Performance for Enclosed Parking Garages,* ASHRAE Transactions, Vol. 109, Part 2, pages 21-29, Atlanta 2003

Cost Impact: Installation cost difference is neglible as occupancy sensors are replaced by carbon monoxide detectors, however, the operating costs will be minimized as the fans will only operate when CO limits are exceeded.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: MONAHAN-M-1-404.1

M28–09/10
404.1

Proponent: Larry Lincoln, Salt Lake City Corporation, representing the Utah Chapter of ICC

Revise as follows:

404.1 Enclosed parking garages. Mechanical ventilation systems for enclosed parking garages shall be permitted to operate intermittently in accordance with Item 1, Item 2 or both. ~~where~~

1. The system ~~is~~ shall be arranged to operate automatically upon detection of vehicle operation or the presence of occupants by approved automatic detection devices.
2. The system shall be arranged to operate automatically by means of carbon monoxide detectors applied in conjunction with nitrogen dioxide detectors. Such detectors shall be installed in accordance with their manufacturers' recommendations.

Reason: Our experience on the last several projects is that the operation of motion sensors in parking garages is very costly and energy inefficient. Initially the code just required carbon monoxide detectors and there was a concern about diesel emissions which would not be detected by the carbon monoxide detectors. Since that time, nitrogen dioxide detectors have been developed which will detect diesel emissions solving the concern about the increase of diesel powered vehicles in parking garages. Using both detectors has been the preferred option as an alternate method of addressing the problem.

Cost Impact: Less overall expenses in power bills.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LINCOLN-M-1-404.1

M29–09/10
501.2 (New), 506.4

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

1. Add new text as follows:

501.2 Independent System Required. Single or combined mechanical exhaust systems for environmental air shall be independent of all other exhaust systems. Dryer exhaust shall be independent of all other systems. Type I exhaust systems shall be independent of all other exhaust systems except as provided in Section 506.3.5. Single or combined Type II exhaust systems for food-processing operations shall be independent of all other exhaust systems. Kitchen exhaust systems shall be constructed in accordance with Section 505 for domestic equipment and Sections 506 through 509 for commercial equipment.

2. Revise as follows:

506.4 Ducts serving Type II hoods. ~~Single or combined Type II exhaust systems for food-processing operations shall be independent of all other exhaust systems.~~ Commercial kitchen exhaust systems serving Type II hoods shall comply with Sections 506.4.1 and 506.4.2.

Reason: This is an important clarification that needs to be reinstated in the code, that all exhaust systems are independent of all other exhaust systems unless the code specifically states otherwise. This was removed during the 2001 cycle but in doing so, the baby was thrown out with the bath water. There are other types of exhaust other than kitchens that this applies to. Hazardous, environmental, dryer and so forth. This will clarify, for instance, that an environmental air duct could not discharge into a kitchen exhaust duct or combine dryer exhaust with environmental exhaust and so on. Independent systems will also minimize the potential for spreading contaminants, hazard exhaust, fire and smoke to other parts of the building.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-1-501.2

M30–09/10
501.2.2, Chapter 15

Proponent: Vickie Lovell, InterCode, Inc., representing Air Movement and Control Association

1. Revise as follows:

501.2.2 Exhaust opening protection. Exhaust openings that terminate outdoors shall be protected with corrosion-resistant screens, louvers or grilles. Openings in screens, louvers and grilles shall be sized not less than ¼ inch (6 mm) and not larger than 1/2 inch (13 mm). Openings shall be protected against local weather conditions. Louvers that protect exhaust openings in structures located in hurricane-prone regions, as defined in the International Building Code, shall comply with AMCA Standard 550. Outdoor openings located in exterior walls shall meet the provisions for exterior wall opening protectives in accordance with the *International Building Code*.

2. Add new standard as follows:

AMCA 550-08 Test Method for High Velocity Wind Driven Rain Resistant Louvers

Reason: AMCA Standard 550-08 *Test Method for High Velocity Wind Driven Rain Resistant Louvers* standardizes uniform laboratory test methods and minimum performance ratings for water rejection capabilities of louvers intended to be used in high velocity wind conditions.

The tests conducted in accordance with the requirements of this standard are intended to demonstrate the acceptability of the louver for installation in facilities (essential and nonessential) that will remain in operation during a high velocity wind condition and where water infiltration must be kept to manageable amounts

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard, AMCA 550-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LOVELL-M-6-501.2.2-CH 15

M31–09/10
501.5 (New); IRC M1506.1 (New)

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Add new text as follows:

501.5 Domestic exhaust fan manifolding prohibited. Domestic-type environmental air exhaust fans shall not be interconnected to a common discharge duct. Such fans shall be independently exhausted to the outdoors.

PART II – IRC MECHANICAL

Add new text as follows:

M1506.1 Exhaust fan manifolding prohibited. Exhaust fans shall not be interconnected utilizing a common discharge duct. Exhaust fans shall be independently exhausted to the outdoors.

Reason: The code does not address the manifolding of residential type exhaust fans. This practice produces poor results for venting. Air, like water, will seek the path of least resistance and the back-draft dampers are not intended to be air tight. Once the duct is pressurized, air still makes it way back into the building. The practice of combining fans and enlarging ducts produces velocity issues as the manufacturers will agree with, resulting in poor performance which is just one of the reasons this type of arrangement is not printed in any of the instructions. Conversations with engineers at Braun/Nu Tone agree, the best performance is achieved when these fans are exhausted independently. Rarely when combined is it done correctly, which would require extra back-draft dampers at wye locations and the calculations required to properly size ducts and determine maximum lengths. The practice of throwing two, three or more fans together defeats the purpose from an effective ventilation standpoint. The excuse that multiple penetrations in the building are undesirable cannot be the reason for this practice. If a single penetration is desired for multiple bathrooms, then a central exhaust system properly designed for the load is the way to achieve it.

As we can see in this poor example, the code does not address this situation. There needs to be clear guidance in order to prevent this type of installation.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-31-501.5-RM-2-M1506.1

M32–09/10
502.8.1

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing: American Pyrotechnics Association (APA)

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IFC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

[F] 502.8.1 Storage in excess of the maximum allowable quantities. Indoor storage areas and storage buildings for hazardous materials in amounts exceeding the maximum allowable quantity per control area shall be provided with mechanical exhaust ventilation or natural ventilation where natural ventilation can be shown to be acceptable for the materials as stored.

Exceptions:

1. Storage areas for flammable solids complying with Section 3604 of the *International Fire Code*.
2. Storage areas and storage buildings for fireworks and explosives complying with Chapter 33 of the *International Fire Code*.

Reason: The purpose of this code change is to better correlate Section 502.8.1 requirements with the requirements in Section 2704.3 Ventilation of the 2009 International Fire Code from which this section is extracted text. Unfortunately, when this text was extracted to be incorporated into the International Mechanical Code, it was taken slightly out of context. That is because the scoping provisions of Chapter 27 of the International Fire Code in Section 2701.1 Scope has specific exceptions that indicate that certain hazardous materials are not required to be in compliance with Chapter 27. This is the case for fireworks and explosives as indicated in Exception 7 to Section 2701.1 which states: "The display, storage, sale or use of fireworks and explosives in accordance with Chapter 33." Therefore, we have added a new Exception 2 to Section 502.8.1 to correlate with Exception 7 to Section 2701.1 for the storage of fireworks and explosives.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THORNBERRY-M-1-502.8.1

M33–09/10
[F] 502.9.1, [F] 502.9.1.1 (New), [F] 502.9.1.2 (New), [F] 502.9.1.3 (New)

Proponent: Gary Kreutziger, City of San Antonio, TX, representing the Planning and Development Services Department

THIS PROPOSAL IS ON THE AGENDA OF THE IFC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THAT COMMITTEE.

Revise as follows:

[F] 502.9.1 Compressed gases-medical gas systems. ~~Rooms for the storage of compressed medical gases in amounts exceeding the maximum allowable exempt quantity per control area, and which do not have an exterior wall, shall be exhausted through a duct to the exterior of the building. Both separate airstreams shall be enclosed in a 1-hour-rated shaft enclosure from the room to the exterior. *Approved* mechanical ventilation shall be provided at a minimum rate of 1 cfm/ft² [0.00508 m³/(s·m²)] of the area of the room.~~ Where containers of medical gases in quantities greater than the *permit amount* in accordance with the *International Fire Code* are located inside buildings, the rooms for the storage of such compressed medical gases shall be ventilated in accordance with Sections 502.9.1.1 through 502.9.1.1.3.

[F] 502.9.1.1 Exterior room. Rooms shall have at least one exterior wall that is provided with at least two vents. Each vent shall be not less than 36 square inches (0.023 m²) in area. One vent shall be within 6 inches (152 mm) of the floor and one shall be within 6 inches (152 mm) of the ceiling.

[F] 502.9.1.2 Interior room. Where an exterior wall cannot be provided, the room shall be exhausted through a duct to the exterior. Supply and exhaust ducts shall be enclosed in a 1-hour-rated shaft enclosure from the room to the exterior. *Approved* mechanical ventilation shall be provided at a minimum rate of 1cfm/ft² [0.00508 m³/(s·m²)] of the area of the room.

[F] 502.9.1.3 Gas cabinets. Gas cabinets for the storage of compressed medical gases in amounts exceeding the maximum allowable quantity per control area shall be connected to an exhaust system. The average velocity of ventilation at the face of access ports or windows shall not be less than 200 feet per minute (1.02 m/s) with a minimum velocity of 150 feet per minute (0.76 m/s) at any point of the access port or window.

Reason: The purpose of the proposed code change is to eliminate confusion and create consistency between the International Fire Code section 3006.2 and the International Mechanical Code section 502.9.1, which both address medical gas storage room exhaust ventilation. The current text in section 502.9.1 of the IMC uses language no longer found elsewhere in the ICC family of codes. The terminology "*maximum allowable exempt quantity*" is used in the IMC while the IFC uses the common terminology "*permit amount*". The IFC includes tables that provide "*permit amounts"* and the IBC and the IFC both include tables that provide "*maximum allowable quantity*", but, there is not a table in any I-code document to provide a

"*maximum allowable exempt quantity*". The creation of sub-sections 502.9.1.1, 502.9.1.2 and 502.9.1.3 in the IMC are to provide the same format, level of detail and language found in the IFC for the three prescriptive methods for medical gas storage room ventilation as that found in the IFC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KREUTZIGER-M-2-502.9.1

M34–09/10
504.4

Proponent: Eli P. Howard, III, Sheet Metal and Air Conditioning Contractors National Association, Inc.

Revise as follows:

504.4 Exhaust installation. Dryer exhaust ducts for clothes dryers shall terminate on the outside of the building and shall be equipped with a backdraft damper. Screens shall not be installed at the duct termination. Ducts shall not be connected or installed with sheet metal screws or other fasteners that will obstruct the exhaust flow. Clothes dryer exhaust ducts shall not be connected to a vent connector, vent or *chimney*. Clothes dryer exhaust ducts shall not extend into or through ducts or plenums. The use of rivets shall not be prohibited.

Reason: All mechanical fasteners protrude inside duct, however rivets provide the least amount of protrusion.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOWARD-M-6-504.4

M35–09/10
504.4, 504.6.2; IRC M1502.4.1, M1502.4.2, M1502.4.4.1

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

504.4 Exhaust installation. Dryer exhaust ducts for clothes dryers shall terminate on the outside of the building and shall be equipped with a back-draft damper. Screens shall not be installed at the duct termination. Ducts shall ~~not be connected or installed with sheet metal screws or other fasteners that will obstruct the exhaust flow.~~ be mechanically fastened in accordance with *SMACNA Duct Construction Standard- Metal and Flexible.* Fasteners shall not protrude into the duct more than 1/8 inch. Ducts shall be sealed in accordance with Section 603.9. Clothes dryer exhaust ducts shall not be connected to a vent connector, vent or chimney. Clothes dryer exhaust ducts shall not extend into or through ducts or plenums.

504.6.2 Duct installation. Exhaust ducts shall be supported at ~~4~~ 12 foot intervals and secured in place. The insert end of the duct shall extend into the adjoining duct or fitting in the direction of airflow. ~~Ducts shall not be joined with screws or similar fasteners that protrude into the inside of the duct.~~

PART II – IRC MECHANICAL

Revise as follows:

M1502.4.1 Material and size Exhaust ducts shall have a smooth interior finish and be constructed of metal having a minimum thickness of ~~0.016 inch (0.4 mm~~) 0.0157 inches (.3950 mm) (No. 28 gage). ~~thick~~. The duct shall be 4 inches nominal in diameter.

M1502.4.2 Duct installation. Exhaust ducts shall be supported at ~~4~~ 12 foot intervals and secured in place. The insert end of the duct shall extend into the adjoining duct or fitting in the direction of airflow. Exhaust duct joints shall be sealed in accordance with Section M1601.4.1 and shall be mechanically fastened. Ducts shall not be joined with screws or similar fasteners that protrude more than 1/8 inch (3.2 mm) into the inside of the duct.

M1502.4.4.1 Specified length. The maximum length of the exhaust duct shall be ~~25 feet (7620 mm)~~ 35 feet (1068 mm) from the connection to the transition duct from the dryer to the outlet terminal. Where fittings are used, the maximum length of the exhaust duct shall be reduced in accordance with Table M1502.4.4.1.

Reason: (PART I) 504.4 and 504.6.2 conflict with the SMACNA Standard and contain conflicting or, at least, redundant text. Tape alone is no means of correctly fastening any duct. Code Officials may certainly permit this practice if they chose to do so but the code should not direct a practice that conflicts with the Standard it condones. There is nothing wrong with small fasteners as long as they don't extend too far into the duct. A maximum penetration of 1/8 inch will assure minimum lint buildup as much more than that collects on the duct walls. Duct cleaning firms are having difficulties because the ducts are coming apart, requiring them to open up finished walls to repair them, there by creating added expenses and unhappy customers. Duct separations in any location, especially in concealed locations, could result in a fire hazard and moisture and lint accumulation. Mechanically fastened ducts can tolerate a longer interval (12 feet) between supports and the current 4 feet interval is overkill.

Reason: (PART II) The language in M1502.4.1 is consistent with language in last cycles M-16 Part II which was approved. M1502.4.2 violates the SMACNA Standard for hanger spacing and the last sentence also violates M1502.5 in that tape alone is not a means of connection for dryer vents. Duct cleaning firms are having fits because the ducts are coming apart requiring them to open up finished walls to repair them thereby creating added expense and unhappy customers. The 35-foot dimension is consistent with what is already in the IMC and IFGC.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-27-504.4-504.6.2-RM-6-M1502.4.1

M36–09/10
504.6.1; IRC M1502.4.1

Proponent: John England, MCO, England Enterprises, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

504.6.1 Material and size. Exhaust ducts shall have a smooth interior finish and shall be constructed of metal a minimum 0.016 inch (0.4 mm) thick. The exhaust duct size shall be 4 inches (102 mm) nominal in diameter.

Exception: Ducts for domestic dryers shall be permitted to be constructed of Schedule 40 PVC pipe and fittings provided that the installation complies with all of the following:

1. The duct is installed under a concrete slab poured on grade.
2. The underfloor trench in which the duct is installed is completely backfilled with sand or gravel.
3. The PVC duct shall extend not more than 1 inch (25 mm) above the indoor concrete floor surface.
4. The PVC duct shall extend not more than 1 inch (25 mm) above grade outside of the building.
5. The PVC ducts shall be solvent cemented.
6. Long sweep PVC fittings shall be used.
7. The PVC piping shall be reamed.

PART II – IRC MECHANICAL

Revise as follows:

M1502.4.1 Material and size. Exhaust ducts shall have a smooth interior finish and shall be constructed of metal a minimum 0.016-inch (0.4 mm) thick. The exhaust duct size shall be 4 inches (102 mm) nominal in diameter.

Exception: Ducts for domestic dryers shall be permitted to be constructed of Schedule 40 PVC pipe and fittings provided that the installation complies with all of the following:

1. The duct is installed under a concrete slab poured on grade.
2. The underfloor trench in which the duct is installed is completely backfilled with sand or gravel.
3. The PVC duct shall extend not more than 1 inch (25 mm) above the indoor concrete floor surface.
4. The PVC duct shall extend not more than 1 inch (25 mm) above grade outside of the building.
5. The PVC ducts shall be solvent cemented.
6. Long sweep PVC fittings shall be used.
7. The PVC piping shall be reamed.

Reason: These sections are taken from the down-draft ranges, Section 505.1 and Section M1503.2 of the IRC. Many times dryers can be vented in the slab to the exterior with shorter distances than are up and through the attic. I know of many building officials that have allowed this as an alternative method.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENGLAND-M-1-504.6.1-RM-3-M1502.4.1

M37–09/10
504.6.2

Proponent: Eli P. Howard, III, Sheet Metal and Air Conditioning Contractors National Association, Inc.

Revise as follows:

504.6.2 Duct installation. Exhaust ducts shall be supported at 4-foot (1219 mm) intervals and secured in place. The insert end of the duct shall extend into the adjoining duct or fitting in the direction of airflow. Ducts shall not be joined with screws or similar fasteners that protrude into the inside of the duct. <u>The use of rivets shall not be prohibited.</u>

Reason: All mechanical fasteners to some degree protrude into the inside of duct when used, however the rivet has the least protrusion effect inside the duct.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOWARD-M-1-504.6.2

M38–09/10
504.6.4; IRC M1502.4.4, M1502.4.4.2

Proponent: John England, MCO, England Enterprises, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

504.6.4 Duct length. The maximum allowable exhaust duct length shall be determined by ~~one of~~ the method~~s~~ specified in Section 504.6.4.1 or <u>for other than dwelling units, Section</u> 504.6.4.2.

PART II – IRC MECHANICAL

1. Revise as follows:

M1502.4.4 Duct length. The maximum allowable exhaust duct length shall be determined by ~~one of the methods specified in~~ Section M1502.4.4.1 ~~or M1502.4.4.2~~.

2. Delete without substitution:

~~**M1502.4.4.2 Manufacturer's instructions.** The size and maximum length of the exhaust duct shall be determined by the dryer manufacturer's installation instructions. The code official shall be provided with a copy of the installation instructions for the make and model of the dryer at the concealment inspection. In the absence of fitting equivalent length calculations from the clothes dryer manufacturer, Table M1502.4.4.1 shall be used.~~

Reason: (PART I) In R-2 apartments and single family housing the possibility of changing the dryer out every 5-7 years can create a fire hazard if an equivalent unit is not installed.

(PART II) In R-2 Dwelling units and R-3 occupancies there is a potential fire hazard if a dryer is replaced with a older unit. Since there is no annual fire inspections done in these occupancies and occupants move on average of 5 – 7 years the potential is great for a different unit to be improperly installed.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENGLAND-M-3-504.6.4-RM-M1502.4.4

M39–09/10
504.6.4, 504.6.4.3 (New); IRC M1502.4.4, M1502.4.4.3 (New)

Proponent: Julius Ballanco, PE, JB Engineering and Code Consulting, P.C., representing the Home Ventilating Institute

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

1. Revise as follows:

504.6.4 Duct length. The maximum allowable exhaust duct length shall be determined by one of the methods specified in Sections 504.6.4.1 ~~or~~ through ~~504.6.4.2~~ 504.6.4.3.

2. Add new text as follows:

504.6.4.3 Dryer exhaust duct power ventilator. The maximum length of the exhaust duct shall be determined by the manufacturer's installation instructions for the dryer exhaust duct power ventilator. Dryer exhaust duct power ventilators shall be listed and labeled for use in dryer exhaust duct systems and shall be installed in accordance with the manufacturer's installation instructions.

PART II – IRC MECHANICAL

1. Revise as follows:

M1502.4.4 Duct length. The maximum allowable exhaust duct length shall be determined by one of the methods specified in Sections M1502.4.4.1 ~~or~~ through ~~M1502.4.4.2~~ M1502.4.4.3.

2. Add new text as follows:

M1502.4.4.3 Dryer exhaust duct power ventilator. The maximum length of the exhaust duct shall be determined by the manufacturer's installation instructions for the dryer exhaust duct power ventilator. Dryer exhaust duct power ventilators shall be listed and labeled for use in dryer exhaust duct systems and shall be installed in accordance with the manufacturer's installation instructions.

Reason: During the rewrite of this section, dryer exhaust duct power ventilators were originally a part of the requirements. The section was deleted when the Supplemental requirements were not completed prior to the final code change hearing. This proposed text is similar to the original language proposed during the last cycle.

Dryer exhaust duct power ventilators are now regulated by Supplemental requirements to UL 705. These supplemental requirements specify testing for ventilators used in this application. The requirements include many safety provisions for the ventilators. The ventilator manufacturer specifies the maximum length of the dryer exhaust duct. This length is used for testing and listing the ventilator, thus verifying the instructions.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART I – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BALLANCO-M-1-504.6.4-RM-1-M1502.4.4

M40–09/10
504.6.4, 504.6.4.3 (New); IRC M1502.4.4, M1502.4.4.3 (New)

Proponent: John England, MCO, England Enterprises, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

1. Revise as follows:

504.6.4 Duct length. The maximum allowable exhaust duct length shall be determined by one of the methods specified in Section 504.6.4.1, ~~or~~ 504.6.4.2 or 504.6.4.3.

2. Add new text as follows:

504.6.4.3 Dryer exhaust duct power ventilator. Where a dryer exhaust duct power ventilator is installed, the maximum length of the exhaust duct shall be determined in accordance with the manufacturer's installation instructions for the dryer exhaust duct power ventilator. A placard with the following statement shall be placed at the location of the dryer. "IF THE DRYER'S ELECTRICAL SYSTEM IS NOT CONNECTED TO THE DRYER EXHAUST DUCT POWER VENTILATOR BEFORE THE DRYER IS USED, A FIRE IN THE DRYER EXHAUST DUCT COULD OCCUR."

PART II – IRC MECHANICAL

1. Revise as follows:

M1502.4.4 Duct length. The maximum allowable exhaust duct length shall be determined by one of the methods specified in Section M1502.4.4.1, ~~or~~ M1502.4.4.2 or M1502.4.4.3.

2. Add new text as follows:

M1502.4.4.3 Dryer exhaust duct power ventilator. Where a dryer exhaust duct power ventilator is installed, the maximum length of the exhaust duct shall be determined in accordance with the manufacturer's installation instructions for the dryer exhaust duct power ventilator. A placard with the following statement shall be placed at the location of the dryer. "IF THE DRYER'S ELECTRICAL SYSTEM IS NOT CONNECTED TO THE DRYER EXHAUST DUCT POWER VENTILATOR BEFORE THE DRYER IS USED, A FIRE IN THE DRYER EXHAUST DUCT COULD OCCUR."

Reason: Dryer boosters are common and occupants should be notified when changing dryers to hook up the dryer booster to the electrical system.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENGLAND-M-6-504.6.4.3-RM-1-M1502.4.4.3

M41–09/10
504.6.4.1

Proponent: John England, MCO, England Enterprises, Inc.

Revise as follows:

504.6.4.1 Specified length. The maximum length of the exhaust duct shall be ~~35 feet~~ ~~(10 668 mm)~~ 25 feet (7620 mm) from the connection to the transition duct from the dryer to the outlet terminal. Where fittings are used, the maximum length of the exhaust duct shall be reduced in accordance with Table 504.6.4.1

Reason: The IRC and the IMC should be consistent with each other.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENGLAND-M-2-504.6.4.1

M42–09/10
202, 504.7

Proponent: Bob Eugene, representing Underwriters Laboratories, Inc.

1. Revise definition as follows:

CLOTHES DRYER. An appliance used to dry wet laundry by means of heat. ~~Dryer classifications are as follows:~~

~~**Type 1.** Factory-built package, multiple production. Primarily used in family living environment. Usually the smallest unit physically and in function output.~~

~~**Type 2.** Factory-built package, multiple production. Used in business with direct intercourse of the function with the public. Not designed for use in individual family living environment.~~

2. Revise as follows:

504.7 Commercial clothes dryers. The installation of dryer exhaust ducts serving ~~Type 2~~ commercial clothes dryers shall comply with the appliance manufacturer's installation instructions. Exhaust fan motors installed in exhaust systems shall be located outside of the airstream. In multiple installations, the fan shall operate continuously or be interlocked to operate when any individual unit is operating. Ducts shall have a minimum *clearance* of 6 inches (152 mm) to combustible materials. Clothes dryer transition ducts used to connect the *appliance* to the exhaust duct system shall be limited to single lengths not to exceed 8 feet (2438 mm) in length and shall be *listed* and *labeled* for the application. Transition ducts shall not be concealed within construction.

Reason: The dryer classifications noted in the definition only apply to gas-fired clothes dryers. Gas-fired clothes dryers are not covered by the International Mechanical Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-1-202-504.7

M43–09/10
504.8

Proponent: John R. Addario, PE, New York State Department of State, Division of Code Enforcement and Administration

Revise as follows:

504.8 Common exhaust systems for clothes dryers located in multistory structures. Where a common multistory duct system is designed and installed to convey exhaust from multiple clothes dryers, the construction of the system shall be in accordance with all of the following:

1. The shaft in which the duct is installed shall be constructed and fire-resistance rated as required by the *International Building Code*.
2. Dampers shall be prohibited in the exhaust duct. Penetrations of the shaft and ductwork shall be protected in accordance with Section 607.5.5, Exception 2.
3. Rigid metal ductwork shall be installed within the shaft to convey the exhaust. The ductwork shall be constructed of sheet steel having a minimum thickness of 0.0187 inch (0.4712 mm) (No. 26 gage) and in accordance with SMACNA *Duct Construction Standards*.
4. The ductwork within the shaft shall be designed and installed without offsets.
5. The exhaust fan motor design shall be in accordance with Section 503.2.
6. The exhaust fan motor shall be located outside of the airstream.
7. The exhaust fan shall run continuously, and shall be connected to a standby power source.

   Exception: Where the exhaust fan is interlocked with the dryer so as to operate when any individual dryer is operating, the exhaust fan need not run continuously or be connected to a standby power source.

8. Exhaust fan operation shall be monitored in an *approved* location and shall initiate an audible or visual signal when the fan is not in operation.
9. Makeup air shall be provided for the exhaust system.
10. A cleanout opening shall be located at the base of the shaft to provide *access* to the duct to allow for cleaning and inspection. The finished opening shall be not less than 12 inches by 12 inches (305 mm by 305 mm).
11. Screens shall not be installed at the termination.

Reason: Currently Section 504.8 Item 7 requires an exhaust fan to run continuously and be connected to standby power. In most cases, in a standby power situation the dryers themselves will be inoperable. The requirement for the exhaust fan to run continuously is to ensure that the system is drawing exhaust air from each clothes dryer unit that is in operation at any given time. Having the exhaust system interconnected with each individual unit ensures that the exhaust fan will run as needed and therefore meets the intent of the code. This proposal provides an option from the requirement of a standby power source while still meeting the original intent of the code. This proposal will also save considerable energy by allowing the exhaust fan to be shut down while not in use.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ADDARIO-M-1-504.8

M44–09/10
504.8

Proponent: Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

Revise as follows:

504.8 Common exhaust systems for clothes dryers located in multistory structures. Where a common multistory duct system is designed and installed to convey exhaust from multiple clothes dryers, the construction of the system shall be in accordance with all of the following:

1. The shaft in which the duct is installed shall be constructed and fire-resistance rated as required by the *International Building Code*.

2. Dampers shall be prohibited in the exhaust duct. Penetrations of the shaft and ductwork shall be protected in accordance with Section 607.5.5, Exception 2.
3. Rigid metal ductwork shall be installed within the shaft to convey the exhaust. The ductwork shall be constructed of sheet steel having a minimum thickness of 0.0187 inch (0.4712 mm) (No. 26 gage) and in accordance with SMACNA *Duct Construction Standards*.
4. The ductwork within the shaft shall be designed and installed without offsets.
5. The exhaust fan motor design shall be in accordance with Section 503.2.
6. The exhaust fan motor shall be located outside of the airstream.
7. The exhaust fan shall run continuously, and shall be connected to a standby power source.
8. Exhaust fan operation shall be monitored in an *approved* location and shall initiate an audible or visual signal when the fan is not in operation.
9. Makeup air shall be provided for the exhaust system.
10. A cleanout opening shall be located at the base of the shaft to provide *access* to the duct to allow for cleaning and inspection. The finished opening shall be not less than 12 inches by 12 inches (305 mm by 305 mm).
11. Screens shall not be installed at the termination.
12. The common multistory duct system shall serve only clothes dryers and shall be independent of other exhaust systems.

Reason: Current text fails to prohibit the interconnection of other exhaust systems. This is providing the guidance that maintains the original intent for these systems to remain independent.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-M-15-504.8

M45–09/10
505.1; IRC M1503.1

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

505.1 Domestic systems. Where domestic range hoods and domestic appliances equipped with downdraft exhaust are located within dwelling units, such hoods and appliances shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum or copper. Such ducts shall have smooth inner walls, ~~and~~ shall be air tight, ~~and~~ shall be equipped with a back-draft damper, and shall be independent of all other exhaust systems.

Exceptions:

1. Where installed in accordance with the manufacturer's installation instructions and where mechanical or *natural ventilation* is otherwise provided in accordance with Chapter 4, *listed* and *labeled* ductless range hoods shall not be required to discharge to the outdoors.
2. Ducts for domestic kitchen cooking appliances equipped with downdraft exhaust systems shall be permitted to be constructed of Schedule 40 PVC pipe and fittings provided that the installation complies with all of the following:
   2.1. The duct shall be installed under a concrete slab poured on grade.
   2.2. The underfloor trench in which the duct is installed shall be completely backfilled with sand or gravel.
   2.3. The PVC duct shall extend not more than 1 inch (25 mm) above the indoor concrete floor surface.
   2.4. The PVC duct shall extend not more than 1 inch (25 mm) above grade outside of the building.
   2.5. The PVC ducts shall be solvent cemented.

PART II – IRC MECHANICAL

Revise as follows:

M1503.1 General. Range hoods shall discharge to the outdoors through a single-wall duct. The duct serving the hood shall have a smooth interior surface, shall be air tight, ~~and~~ shall be equipped with a back-draft damper, and shall be independent of all other exhaust systems. Ducts serving range hoods shall not terminate in an attic or crawl space or areas inside the building.

Exception: Where installed in accordance with the manufacturer's installation instructions, and where mechanical or natural ventilation is otherwise provided, listed and labeled ductless range hoods shall not be required to discharge to the outdoors

Reason: Range hood exhaust needs to be independent from all other exhaust systems. This is a very specific application involving much larger fans than one would find elsewhere in a typical residence. Bathroom fans should not be discharged into a range hood exhaust duct as the volume of air and the velocity at which it operates will over-power any back-draft damper on such a small fan. These fans should not be manifolded in the first place as the manufacturers will attest to.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-22-505.1-RM-4-M1503.1

M46–09/10
505.1; IRC M1503.2

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

505.1 Domestic systems. Where domestic range hoods and domestic appliances equipped with downdraft exhaust are located within dwelling units, such hoods and appliances shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum or copper. Such ducts shall have smooth inner walls and shall be air tight and equipped with a back-draft damper.

Exceptions:

1. Where installed in accordance with the manufacturer's installation instructions and where mechanical or natural ventilation is otherwise provided in accordance with Chapter 4, listed and labeled ductless range hoods shall not be required to discharge to the outdoors.
2. Ducts for domestic kitchen cooking appliances equipped with downdraft exhaust systems shall be permitted to be constructed of Schedule 40 PVC pipe provided that the installation complies with all of the following:
   2.1. The duct shall be installed under a concrete slab poured on grade.
   2.2. The under-floor trench in which the duct is installed shall be completely backfilled with sand, ~~or~~ gravel or clean earth.

2.3. The ~~PVC~~ duct shall extend not greater than 1 inch (25 mm) above the indoor concrete floor surface.

2.4. ~~The PVC duct shall extend not more than 1 inch (25 mm) above grade outside of the building~~. The duct shall terminate at a tee fitting that is open on the bottom and positioned over a gravel bed that is not less than 1 foot deep and 1 cubic foot in volume. The duct shall slope toward the gravel bed at not less than 1/8 inch per foot. The riser from the top of the tee fitting shall extend above grade not less than 6 inches. Both ends of the Tee fitting shall be protected in accordance with Section 501.2.2.

2.5. The ~~PVC~~ duct~~s~~ joints shall be solvent cemented.

Reason: As currently written, Exception # 2 requires the PVC duct to be trapped. Where is the water from condensation going to go? Where is the trapped grease going to go? This proposal will eliminate the problem. A simple gravel bed will provide a reasonable place for fluids to drain. This text provides minimal guidance as to the size and depth of the gravel bed. It makes sense to terminate into a Tee fitting as it does double duty, providing a means of draining and a means of discharge for the exhaust. The requirement to extend 6 inches above grade as opposed to 1 inch ensures that debris, grass or dirt won't obstruct the opening. The opening will need to be protected with screens. The acronym PVC was deleted because it is stated in the body of the section and does not need to be constantly repeated. Since the duct is constructed of PVC, there is no reason to prohibit clean fill as a backfill material, thus cutting some cost.

Cost Impact: None, permitting earth as a backfill offsets the cost of sand or gravel backfill.

PART II – IRC MECHANICAL

Revise as follows:

M1503.2 Duct material .Single-wall ducts serving range hoods shall be constructed of galvanized steel, stainless steel or copper.

Exception: Ducts for domestic kitchen cooking appliances equipped with down-draft exhaust systems shall be permitted to be constructed of schedule 40 PVC pipe provided that the installation complies with all of the following:

1. The duct is installed under a concrete slab poured on grade~~; and~~.
2. The under-floor trench in which the duct is installed is completely backfilled with sand, ~~or~~ gravel~~; and~~ or clean earth.
3. The ~~PVC~~ duct extends not more than 1 inch (25 mm) above the indoor concrete floor surface~~; and~~.
4. ~~The PVC duct extends not more than 1 inch (25 mm) above grade outside of the building; and~~ The duct shall terminate at a tee fitting that is open on the bottom and positioned over a gravel bed that is not less than 1 foot deep and 1 cubic foot in volume. The duct shall slope toward the gravel bed at not less than 1/8 inch per foot. The riser from the top of the tee fitting shall extend above grade not less than 6 inches. Both ends of the Tee fitting shall be protected in accordance with Section R303.5
5. The ~~PVC~~ duct~~s~~ joints are solvent cemented.

Reason: As currently written, Exception # 4 unintentionally requires the PVC duct to be trapped. Where is the water from condensation going to go? Where is the trapped grease going to go? This proposal will eliminate the problem. A simple gravel bed will provide a reasonable place for fluids to drain. This text provides minimal guidance as to the size and depth of the gravel bed. It makes sense to terminate into a Tee fitting as it does double duty, providing a means of draining and a means of discharge for the exhaust. The requirement to extend 6 inches above grade as opposed to 1 inch insures that debris, grass or dirt won't obstruct the opening. The opening will need to be protected with screens. The acronym PVC was deleted because it is stated in the body of the section and does not need to be constantly repeated. Since the duct is constructed of PVC, there is no reason to prohibit clean fill as a backfill material, thus cutting some cost.

Cost Impact: NONE, permitting earth as a backfill offsets the cost of sand or gravel backfill.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-23-505.1-RM-1-M1503.2

M47–09/10
506.3.2.3

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

506.3.2.3 Duct-to-exhaust fan connections. Duct- to-exhaust fan connections shall be flanged and gasketed at the base of the fan for vertical discharge fans; shall be flanged, gasketed and bolted to the inlet of the fan for side-inlet utility fans; and shall be flanged, gasketed and bolted to the inlet and outlet of the fan for in-line fans. Gasket and sealing materials shall be rated for continuous duty at a temperature of not less than 1500 degrees F.(815-degree C.)

Reason: This section is silent when it comes to providing guidance as to what the gasket material and sealants used to keep them in place should be rated for as it relates to temperature. This text comes from the National Standard and makes this section consistent with Section 506.3.2.2 # 1.3

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME :MCMANN-M-3-506.3.2.3

M48–09/10
506.3.6

Proponent: Tony Crimi, A.C. Consulting Solutions, Inc., representing the International Firestop Council

Revise as follows:

506.3.6 Grease duct clearances. Where enclosures are not required, grease duct systems and exhaust *equipment* serving a Type I hood shall have a *clearance* to combustible construction of not less than 18 inches (457 mm), and shall have a *clearance* to noncombustible construction
and gypsum wallboard attached to noncombustible structures of not less than 3 inches (76 mm).

Exceptions:

1. ~~Factory-built~~ Commercial kitchen grease ducts *listed* and *labeled* in accordance with UL 1978.
2. *Listed* and *labeled* exhaust *equipment* installed in accordance with Section 304.1.
3. Where commercial kitchen grease ducts are continuously covered on all sides with a *listed* and *labeled* field-applied grease duct enclosure material, system, product or method of construction specifically evaluated for such purpose in accordance with ASTM E 2336, the required *clearance* shall be in accordance with the listing of such material, system, product or method.

Reason: The revision to exception 1 is to identify that both Factory-Built and Field-Fabricated commercial grease ducts can be fabricated, listed, and labeled in accordance with UL 1978. UL 1978 can be applied to all grease duct assemblies that are intended to be installed at reduced clearances where 18 inch (457 mm) clearance

Justification: This proposal clarifies the application of the existing provision in 506.3.6 of the Code for commercial grease ducts. The Scope of UL 1978 states the following:

1.1 These requirements cover factory-built grease ducts, and grease duct assemblies that are intended to be installed at reduced clearances where 18 inch (457 mm) clearance is specified in the Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, NFPA 96, and the International Mechanical Code.

Commercial grease ducts which are tested, listed and labeled in accordance with the requirements of UL 1978 should all be equally acceptable for clearance reductions in the IMC, given that they would be required to meet the same performance levels.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRIMI-M-1-506.3.6

M49–09/10
506.3.7, 506.3.7.1 (New)

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

1. Revise as follows:

506.3.7 Prevention of grease accumulation in grease ducts. Duct systems serving a Type I hood shall be constructed and installed so that grease cannot collect in any portion thereof, and the system shall slope not less than one-fourth unit vertical in 12 units horizontal (2-percent slope) toward the hood or toward a~~n approved~~ grease reservoir constructed and installed in accordance with Section 506.3.7.1. Where horizontal ducts exceed 75 feet (22 860 mm) in length, the slope shall not be less than one unit vertical in 12 units horizontal (8.3-percent slope).

2. Add new text as follows:

506.3.7.1 Grease duct reservoirs. Grease duct reservoirs shall:

1. Be constructed as required for grease ducts.
2. Be located on the bottom of the horizontal duct or duct riser.
3. Extend for the full width of the duct.
4. Have a depth equal to one-half of the smallest duct dimension.
5. Have a bottom that pitches to a point of drainage.
6. Be provided with a cleanout constructed in accordance with Section 506.3.8 and installed directly above the reservoir, on a vertical side or on top of the duct.
7. Be installed in accordance with the manufacturer's installation instructions where factory-built.

Reason: There has been much confusion over exactly what an "approved grease reservoir" really is. This is an attempt to clarify how shop-built reservoirs should be constructed and installed, such that it will capture grease in an effective way that won't promote pooling except in the trap itself. A cleanout at this point in imperative in order to determine not only when it is full, but physically to perform the function of cleaning. The term 'approved" has been removed because this text eliminates all ambiguity about what a grease reservoir really is and how it should be installed. This provides clear and concise guidance for the user and removes some guess work.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-21-506.3.7

M50–09/10
506.3.7, 506.3.7.1 (New)

Proponent: Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

1. Revise as follows:

506.3.7 Prevention of grease accumulation in grease ducts. Duct systems serving a Type I hood shall be constructed and installed so that grease cannot collect in any portion thereof, and the system shall slope not less than one-fourth unit vertical in 12 units horizontal (2-percent slope) toward the hood or toward ~~an approved~~ a grease reservoir designed and installed in accordance with Section 506.3.7.1. Where horizontal ducts exceed 75 feet (22 860 mm) in length, the slope shall not be less than one unit vertical in 12 units horizontal (8.3-percent slope)

2. Add new text as follows:

506.3.7.1 Grease reservoirs Grease reservoirs shall:

1. Be constructed as required for the grease duct it serves.
2. Be located on the bottom of the horizontal duct or the bottommost section of the duct riser.
3. Have a length and width of not less than 12 inches. Where the grease duct is less than 12 inches in a dimension, the reservoir shall be not less than 2 inches smaller than the duct in that dimension.

4. Have a minimum depth of not less than 1 inch.
5. Have a bottom that is sloped to a point for drainage.
6. Be provided with a cleanout opening constructed in accordance with Section 506.3.8 and installed to provide direct access to the reservoir. The cleanout opening shall be located on a side or on top of the duct so as to permit cleaning of the reservoir.
7. Be installed in accordance with the manufacturer's installation instructions where manufactured devices are utilized.

Reason: Current text allows an approved reservoir. Where the code uses the term approved it leaves the subject matter up to the interpretation of the code official and unfortunately non-uniform application can be the end result. This proposal puts any potential non-uniformity to rest. It provides clear concise guidance to the user and leaves no room for misunderstanding.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-M-2-506.3.7

M51–09/10
506.3.8

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Delete and substitute as follows:

~~**506.3.8 Grease duct cleanouts and other openings.** Grease duct systems shall not have openings therein other than those required for proper operation and maintenance of the system. Any portion of such system having sections not provided with access from the duct entry or discharge shall be provided with cleanout openings. Cleanout openings shall be equipped with tight-fitting doors constructed of steel having a thickness not less than that required for the duct. Doors shall be equipped with a substantial method of latching, sufficient to hold the door tightly closed. Door assemblies, including any frames and gasketing, shall be approved for the purpose, and shall not have fasteners that penetrate the duct. Listed and labeled access door assemblies shall be installed in accordance with the terms of the listing.~~

506.3.8 Grease duct cleanouts and openings. Grease duct cleanouts and openings shall comply with all of the following:

1. Grease ducts shall not have openings except where required for the operation and maintenance of the system.
2. Sections of grease ducts that are inaccessible from the hood or discharge openings shall be provided with cleanout openings.
3. Cleanouts and openings shall be equipped with tight fitting doors constructed of steel having a thickness not less than that required for the duct.
4. Cleanout doors shall be installed liquid tight.
5. Door assemblies including any frames and gaskets shall be approved for the application and shall not have fasteners that penetrate the duct.
6. Gasket and sealing materials shall be rated for not less than 1500 degrees F. (815.6 C).
7. Listed door assemblies shall be installed in accordance with the manufacturer's installation instructions.

Reason: The only new requirement is item # 6 which was taken from the national standard. The balance was reorganized in an easy to read format with some unnecessary language removed. This format seems to invite one to read the bullets as opposed to reading long paragraphs, making the text easier to comprehend.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-14-506.3.8

M52–09/10
506.3.8 (New)

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Add new text as follows:

506.3.8 Underground Grease Duct Installation. Underground grease duct installations shall comply with all of the following:

1. Underground grease ducts shall be constructed of 304-L or 316 stainless steel having a minimum thickness of 0.0565 inch (1.435 mm) (No.16 gage).
2. The ducts shall be installed over a bed of gravel not less than 4 inches thick.
3. The ducts shall slope in accordance with Section 506.3.7 and toward a grease reservoir. The grease reservoir shall be located at the point where the duct exits the ground and shall be provided with a cleanout.
4. The grease reservoir shall be constructed in accordance with Section 506.3.7.1.
5. Cleanouts shall extend to within 6 inches of the floor level or where outdoors, shall extend to grade.
6. Cleanouts shall be installed on the top of the duct.
7. Cleanout locations shall be identified in an approved manner.

Reason: Currently there is no guidance in the code for underground grease duct installation. This is becoming a popular installation involving table top cooking where the cooking operations are being conducted in the middle of the dining area. This type of cooking produces smoke, grease laden vapors and intentional flare-ups that are handled within the tables themselves. Underground grease duct connects to the bottom of the table and proceeds to a fan at some other location. This proposal requires that all underground grease ducts be constructed of 304-L or 316 stainless steel which is recommended by SMACNA for its ability to resist corrosion. Installing the duct on gravel will aid in elevating the duct above possible moisture in the earth and provide a means for establishing pitch. Cleanouts must be installed on top of the duct for obvious reasons and needs to extend to a reasonable distance to the floor for accessibility. All requirements for protection to combustible construction apply. Cleanout locations need to be identified in a manner that is effective and practical as it pertains to the specific installation. Galvanized or black iron duct will not hold up to the normal burial process of underground duct because the cleaning process and the cleanouts themselves would prevent concrete encasement. It is unlikely that cleanouts will be installed outdoors at grade level but the text recognizes the possibility.

Cost Impact: The code change proposal may increase cost of construction.

Analysis: Item #4 is dependent upon the approval of M50-09/10 which creates the new Section 506.3.7.1.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-30-506.3.8

M53–09/10
506.3.8 (New)

Proponent: Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

Add new text as follows:

506.3.8 Underground grease duct installation. Underground grease duct installations shall comply with all of the following:

1. Underground grease ducts shall be constructed of steel having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 gage) and shall be coated to provide protection from corrosion or shall be constructed of stainless steel having a minimum thickness of 0.0450 inch (1.1400 mm) (No.18 gage).
2. The underground duct system shall be tested and approved in accordance with Section 506.3.2.5 prior to coating or placement in the ground.
3. The underground duct system shall be completely encased in concrete with a minimum thickness of 4 inches.
4. Ducts shall slope toward grease reservoirs.
5. A grease reservoir with a cleanout to allow cleaning of the reservoir shall be provided at the base of each vertical duct riser.
6. Cleanouts shall be provided with access to permit cleaning and inspection of the duct in accordance with Section 506.3.
7. Cleanouts in horizontal ducts shall be installed on the topside of the duct.
8. Cleanout locations shall be legibly identified at the point of access from the interior space.

Reason: Underground duct systems are becoming increasingly popular. For example, It has become a desirable application to provide cooking operations at the actual table itself in many areas of the country. Installing hoods and the associated equipment is excessively costly and often times impractical for the table type cooking establishment. Often times many tables are included, 30-50 or even more. This proposal includes the same level of safety but is an alternative that allows the modern day restaurant design to afford the established level of safety while accommodating the obstacles related to commercial down-draft appliances.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-M-6-506.3.8

M54–09/10
506.3.9

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Delete and substitute as follows:

506.3.9 Grease duct horizontal cleanouts~~. Cleanouts located on horizontal sections of ducts shall be spaced not more than 20 feet (6096 mm) apart. The cleanouts shall be located on the side of the duct with the opening not less than 1.5 inches (38 mm) above the bottom of the duct, and not less than 1 inch (25 mm) below the top of the duct. The opening minimum dimensions shall be 12 inches (305 mm) on each side. Where the dimensions of the side of the duct prohibit the cleanout installation prescribed herein, the openings shall be on the top of the duct or the bottom of the duct. Where located on the top of the duct, the opening edges shall be a minimum of 1 inch (25 mm) from the edges of the duct. Where located in the bottom of the duct, cleanout openings shall be designed to provide internal damming around the opening, shall be provided with gasketing to preclude grease leakage, shall provide for drainage of grease down the duct around the dam, and shall be approved for the application. Where the dimensions of the sides, top or bottom of the duct preclude the installation of the prescribed minimum-size cleanout opening, the cleanout shall be located on the duct face that affords the largest opening dimension and shall be installed with the opening edges at the prescribed distances from the duct edges as previously set forth in this section~~.

Cleanouts serving horizontal sections of grease duct shall:

1. Be spaced not more than 20 feet apart.
2. Be located not more than 10 feet from changes in direction.
3. Be located on the bottom only where no other locations are available and shall be provided with internal damming of the opening such that grease will flow past the opening without pooling. Bottom cleanouts and openings shall be approved for the application and installed liquid tight.
4. Not be closer than 1 inch from the edges of the duct.
5. Have opening dimensions of not less than 12 inches by 12 inches. Where such dimensions preclude installation, the opening shall be not less than 12 inches on one side and shall be large enough to provide access for cleaning and maintenance.
6. Shall be located at grease reservoirs.

Reason: This is a novel of a section, packed with information and in need of updating. Item # 2 is somewhat new though already implied. There is nothing prohibiting only one cleanout installed in the middle of a 24 foot section of duct as the code is silent on minimum numbers. This text would require that two cleanouts be provided. In item # 5, although the National Standard calls for 1 1/2 inches, it is an arbitrary number. This 1 inch dimension will have no effect structurally on the door installation nor will it have an effect on the duct itself and as a result, will provide a little more flexibility. Item # 6 already provides for a minimum 12 X 12 door but some flexibility is required for smaller duct sizes, but in no case should one side be less than 12 inches. Item # 7 is new. This establishes that a cleanout needs to be installed at grease reservoir locations in order to properly inspect and maintain the reservoir.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-17-506.3.9

M55–09/10
506.3.10

Proponent: Tony Crimi, A.C. Consulting Solutions, Inc., representing the International Firestop Council

Revise as follows:

506.3.10 Grease duct enclosures. A grease duct serving a Type I hood that penetrates a ceiling, wall, ~~or~~ floor or any concealed spaces shall be enclosed from the point of penetration to the outlet terminal. A duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the *International Building Code*. The duct enclosure shall serve a single grease duct and shall not contain other ducts, piping or wiring systems. Duct enclosures shall be either field-applied or factory-built. Duct enclosures shall have a fire-resistance rating not less than that of the ~~floor~~ assembly penetrated and not less than 1 hour. ~~but need not exceed 2 hours~~. Duct enclosures shall be as prescribed by Section 506.3.10.1, 506.3.10.2 or 506.3.10.3.

Reason: To clarify the intent of the application of 506.3.10 in the IMC. In addition to the existing language, previous editions of National Codes and Installation Standards were more explicit in confirming that grease duct enclosures are also required where a grease duct passes through any concealed spaces. Further, the reference to the required fire resistance rating being related only to the "floor" assembly being penetrated was inadvertently added to the language in the 2009 IMC, and needs to also be corrected.

Justification: While the existing language in the IMC that describes "….Type I hood that penetrates a ceiling, wall or floor..." captures many concealed spaces (as well as other locations), it does not capture all of them. Section 717 of the IBC dealing with concealed spaces also capture areas such as concealed wall spaces of stud walls and partitions, including furred spaces, and parallel rows of studs or staggered studs, or sleeper spaces, Another area of concern relates to large open structures, where the duct does not penetrate any ceilings, walls, or floors for great distances, and may go either directly through a wall or ceiling to the outlet terminal, or to another compartment, having travelled through some concealed spaces.

In addition, the new reference to "Duct enclosures shall have a fire-resistance rating not less than that of the floor assembly penetrated, but need not exceed 2 hours" was added in the 2009 edition. The intent was to identify a trigger for the required rating. However, this language inadvertently omits the many cases were the grease ducts penetrate a fire resistance rated wall or other assembly. The Code needs to be corrected to be consistent with the original intent of this proposal, and previous editions of the IMC.

Grease ducts are clearly a building feature in which the potential hazards exist based on the function they are designed to perform. In contrast to conventional shaft requirements, the fire hazard from an operating grease duct occurs not only when the duct penetrates walls, floors, and ceilings, but also in the space between the Type 1 hood and the point of penetration. Any concealed spaces through which the grease duct travels, even within the compartment of origin, need to be protected.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRIMI-M-3-506.3.10

M56–09/10
506.3.10

Proponent: Vickie Lovell, InterCode, Inc., representing the 3M Company

Revise as follows:

506.3.10 Grease duct enclosures. A grease duct serving a Type I hood ~~that penetrates a ceiling, wall, or floor~~ shall be enclosed ~~from~~ in a continuous enclosure extending from the lowest point of the floor ceiling or floor above the hood, to the point of penetration to the outlet terminal. A duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the *International Building Code*. The duct enclosure shall serve a single grease duct and shall not contain other ducts, piping or wiring systems. Duct enclosures shall be either field-applied or factory-built. Duct enclosures shall have a fire-resistance rating not less than that of the floor assembly penetrated, but need not exceed 2 hours. Duct enclosures shall be as prescribed by Section 506.3.10.1, 506.3.10.2 or 506.3.10.3.

Reason: This change will clarify the intent of the application of 506.3.10 in the IMC. In addition to the existing language, previous editions of National Codes and Installation Standards were more explicit in confirming that grease duct enclosures are also required where a grease duct passes through any concealed space.

The 2009 Edition of NFPA 96 The standard "Ventilation Control and Fire Protection of Cooking Operations" defines a continuous enclosure in section 3.3.22 as "a recognized architectural or mechanical component of a building having a fire resistance rating as required for the structure and whose purpose is to enclose the vapor removal duct for its full length to its termination point outside the structure without any portion of the structure having a fire-resistance rating less than the required value."

Section 7.7.1.1 of NFPA 96 goes beyond that by stating that in "all buildings where vertical fire barriers (walls) are penetrated, the (grease) ducts shall be enclosed in a continuous enclosure extending from the first penetrated fire barrier and any other subsequent fire barriers or concealed spaces, to or through the exterior, to maintain the fire resistance rating of the highest fire barrier penetrated."

7.7.1.2 of NFPA 96 also states that in "all buildings more than one story in height, and in one story buildings where the roof ceiling assembly is required to have a fire resistance rating, the (grease) ducts shall be enclosed in a continuous enclosure extending from the lowest fire rated ceiling or floor above the hood through any concealed spaces, to or through the roof, to maintain the integrity of the fire separations required by the applicable building code provisions."

Grease ducts are unlike any other exhaust duct, in that they convey highly flammable material and are clearly a building feature in which the potential hazard exists based on their intended function – in other words, the duct itself is the hazard, and should be protected from its origination to where it exits the building.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LOVELL-M-2-506.3.10

M57–09/10
506.3.10.2

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

506.3.10.2 Field applied enclosure. Commercial kitchen grease ducts constructed in accordance with Section 506.3.1 shall be enclosed by field-applied grease duct enclosure that is a listed and labeled material, system, product, or method of construction specifically evaluated for such purpose in accordance with ASTM E2336. The surface of the duct shall be continuously covered on all sides from the point at which the duct originates to the outlet terminal. Duct penetrations shall be protected with a through-penetration fire-stop system classified in accordance with ASTM E814 or UL 1497 and having a "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated. Such systems shall be installed in accordance with the listing and the manufacturer's installation instructions. Partial application of a field-applied grease duct enclosure system shall not be installed for the sole purpose of reducing clearance to combustibles at isolated sections of grease duct except where specifically listed and labeled for such partial application. Exposed duct-wrap systems shall be protected where subject to physical damage.

Reason: The true intent of duct wrap systems is that they be applied to an *entire* system, not just a portion of one. This comes into play when Section 506.3.10.4 is employed. This section usually works up to the point where the roof must be penetrated. Most of these structures are wood construction or there is combustible material on decking and so forth, that the duct must get by. A practice has been to only wrap the duct from a point 18 inches from the bottom of the roof deck up through the curb. If this material was intended to be used this way, it would be found in Table 308.6. This material must meet all 5 tests of ASTM E 2336 which includes the internal fire test and the external full engulfment test. The material would never pass the test under partial application and has never been tested in this fashion, that is, to reduce clearances in small sections of duct. The manufacturers will be the first to explain that their product is not approved for this application. The code does not specifically address this poor practice. The intent of the exception is for the duct to be able to exit the structure on its own ability and to not come within 18 inches of combustible construction.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-28-506.3.10.2

M58–09/10
506.3.10.4

Proponent: Tony Crimi, A.C. Consulting Solutions, Inc., representing the International Firestop Council

Revise as follows:

506.3.10.4 Duct enclosure not required. A duct enclosure shall not be required for a grease duct that penetrates only a non fire-resistance-rated roof/ceiling assembly. Grease duct systems and exhaust *equipment* serving Type I hoods shall comply with the requirements of section 506.3.6.

Reason: The proposed change clarifies that while a duct enclosure is not required for a grease duct that penetrates only a non fire-resistance-rated roof/ceiling assembly, the clearances of grease duct systems and exhaust *equipment* serving a Type I hoods still need to comply with the requirements of section 506.3.6 to both combustible and non-combustible construction.

Justification: This proposal clarifies the need to apply the existing provision in 506.3.6 of the Code for a grease duct that penetrates a non-fire-resistance-rated roof/ceiling assembly.. The IMC differentiates between requirements for grease duct systems and exhaust equipment serving a Type I hoods to maintain clearances to combustible and non-combustible construction, and the requirements to provide a duct enclosure. Section 506.3.10 waives the requirement to provide a duct enclosure in this specific instance. However, it is important that users understand that the allowance to waive the enclosure does not also waive the need to maintain clearances between these grease ducts and combustible and non-combustible construction as specified in 506.3.6.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRIMI-M-2-506.3.10.4

M59–09/10
506.3.12.3

Proponent: John R. Addario, PE, New York State Department of State, Division of Code Enforcement and Administration

Revise as follows:

506.3.12.3 Termination location. Exhaust outlets shall be located not less than 10 feet (3048 mm) horizontally from parts of the same or contiguous buildings, adjacent buildings, adjacent property lines and shall be located not less than 10 feet (3048 mm) above the adjoining grade level. Exhaust outlets shall be located not less than 10 feet (3048 mm) horizontally from or not less than 3 feet (914 mm) above air intake openings into any building.

Exception: Exhaust outlets shall terminate not less than 5 feet (1524 mm) <u>horizontally</u> from parts of the same or contiguous building, an adjacent building, adjacent property line and air intake openings into a building where air from the exhaust outlet discharges away from such locations.

Reason: The code is very specific in that the 10 feet distance from exhaust outlets must be measured horizontally. This proposed change clarifies the intent of the code by including the horizontal requirement to the exception.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:A DDARIO-M-2-506.3.12.3

M60–09/10
506.3.12.3

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

506.3.12.3 Termination location. Exhaust outlets shall be located not less than 10 feet (3048 mm) horizontally from parts of the same or contiguous buildings, adjacent buildings and adjacent property lines and shall be located not less than 10 feet (3048 mm) above the adjoining grade level. Exhaust outlets shall be located not less than 10 feet (3048 mm) horizontally from or not less than 3 feet (914 mm) above air intake openings into any building.

Exception: Exhaust outlets shall terminate not less than 5 feet (1524 mm) <u>horizontally</u> from parts of the same or contiguous building, an adjacent building, adjacent property line and air intake openings into a building where ~~air from~~ the exhaust outlet discharge~~s away~~ <u>is not directed at any angle toward such points</u> ~~from such locations~~.

Reason: There is some confusion as to what exactly is meant by the term “away from the building” and what it actually permits. It would seem that the side of an up blast fan whether it is a utility set or centrifugal fan would be compliant with the 5-foot exception when the closest edge of the discharge is measured horizontally and no angle short of parallel would be compliant. This is a much needed clarification.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-20-506.3.12.3

M61–09/10
507.1

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or Type II and shall be designed to capture and confine cooking vapors and residues. Commercial kitchen exhaust hood systems shall operate during the cooking operation.

Exceptions:

1. Factory-built commercial exhaust hoods that are listed and labeled ~~which are tested~~ in accordance with UL 710, ~~listed,~~ ~~labeled~~ and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.5, 507.7, 507.11, 507.12, 507.13, 507.14, and 507.15.
2. Factory-built commercial cooking recirculating systems that are listed and labeled ~~which are tested~~ in accordance with UL 710B, ~~listed, labeled~~ and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.5, 507.7, 507.11, 507.12, 507.13, 507.14, and 507.15. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3. For the purpose of determining the floor area required to be ventilated, each individual appliance shall be considered as occupying not less than 100 square feet (9.3 m^2).
3. Net exhaust volumes for hoods shall be permitted to be reduced during part-load cooking conditions, where engineered or listed multispeed or variable-speed controls automatically operate the exhaust system to maintain capture and removal of cooking effluents as required by this section. Reduced volumes shall not be below that required to maintain capture and removal of effluents from the idle cooking appliances that are operating in a standby mode.

Reason: UL 710 addresses materials and thickness (IMC 507.5). UL 710B addresses grease filters (IMC 507.11).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-30-507.1

M62–09/10
507.1

Proponent: Jayendra S. Parikh, Compliance Solutions International Inc., representing North American Association of Food Equipment Manufacturers Technical Liaison Committee

Revise as follows:

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or II and shall be designed to capture and confine cooking vapors and residues. Commercial kitchen exhaust hood systems shall operate during the cooking operation.

Exceptions:

1. Factory-built commercial exhaust hoods which are tested in accordance with UL 710, *listed*, *labeled* and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.7, 507.11, 507.12, 507.13, 507.14 and 507.15.
2. Factory-built commercial cooking recirculating systems which are tested in accordance with UL 710B, *listed*, *labeled* and installed in accordance with Section 304.1 shall not be required to comply with Sections 507.4, 507.5, 507.7, 507.12, 507.13, 507.14 and 507.15. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3. ~~For the purpose of determining the floor area required to be ventilated, each individual *appliance* shall be considered as occupying not less than 100 square feet (9.3 m^2).~~

3. Net exhaust volumes for hoods shall be permitted to be reduced during part-load cooking conditions, where engineered or *listed* multispeed or variable-speed controls automatically operate the exhaust system to maintain capture and removal of cooking effluents as required by this section. Reduced volumes shall not be below that required to maintain capture and removal of effluents from the idle cooking appliances that are operating in a standby mode.

Reason: The sentence that is deleted:
(1) contains requirement that seems arbitrary,
(2) consists of inappropriate requirement for listed commercial cooking recirculating systems which occupy very small floor area,
(3) requires substantially higher ventilation rates for such appliances/systems based on the minimum 100 square feet floor area required for each such appliance vs their actual area on the floor, increasing energy and other costs of HVAC or other system used for ventilating such appliances, including the system's operation and maintenance costs. As an example, 8000 cfm of outdoor ventilation air was required for one restaurant where 57 induction cookers (each with about 2 sq. ft. floor area) were used using 100 square feet of floor area for each such appliance, while the whole restaurant actually required 4500 cfm, per IMC Section 403.3,
(4) may erroneously require much higher ventilation if someone interprets the ventilation for such appliances to be in addition to the required ventilation for that area (which, in the above example, would be 8000 + 4500 = 12,500 cfm), and (5) does not represent the intent of the author who had proposed this requirement, as I understand it, with respect to such appliances/systems.

Cost Impact: The code change proposal will not increase the cost of construction. On the contrary, this proposal will decrease the cost of construction, operation, and maintenance.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PARIKH-M-1-507.1

M63–09/10
507.2

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

507.2 Where required. A Type I or Type II hood shall be installed at or above all *commercial cooking appliances* in accordance with Sections 507.2.1 and 507.2.2. Where any cooking *appliance* under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed.

Exception: Where cooking appliances are equipped with integral down-draft exhaust systems and such appliances and exhaust systems are listed and labeled for the application, a hood shall not be required at or above them.

Reason: This is an effort to recognize hoodless griddle type cooking appliances which are becoming more popular. Sometimes they are referred to as Hibachi Tables where generally smaller amounts of food are prepared in front of the customers directly at their table. These cooking tables have built-in downdraft exhaust systems running between 800 and 1000 cfm designed with two fans, one to push and one to draw air across the table. The cooking vapors are captured and delivered to a grease duct attached at the bottom of the table. All current IMC grease duct requirements apply at this point.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-25-507.2

M64–09/10
507.2.1, 507.2.2

Proponent: Douglas J. Horton, D.J. HORTON and Associates, Inc., representing Commercial Kitchen Ventilation Technical Interest Group

Revise as follows:

507.2.1 Type I hoods. Type I hoods shall be installed where cooking *appliances* produce grease or smoke. Type I hoods shall be installed over *medium-duty*, *heavy-duty* and *extra-heavy-duty cooking appliances*. Type I hoods shall be installed over *light-duty cooking appliances* that produce grease or smoke.

Exception: A Type I hood shall not be required for an electric cooking appliance where an approved testing agency provides documentation that the appliance effluent contains 5 mg/m^3 or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m^3/s) in accordance with Section 17 of UL 710B.

507.2.2 Type II hoods. Type II hoods shall be installed above dishwashers and ~~*light-duty appliances*~~ appliances that produce heat or moisture and do not produce grease or smoke, except where the heat and moisture loads from such appliances are incorporated into the HVAC system design or into the design of a separate removal system. Type II hoods shall be installed above all ~~*light-duty appliances*~~ appliances that produce products of *combustion* and do not produce grease or smoke. Spaces containing cooking appliances that do not require Type II hoods shall be ventilated in accordance with Section 403.3. For the purpose of determining the floor area required to be ventilated, each individual *appliance* that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m^2).

Reason: A growing issue is the proliferation of small appliances and related cooking in which little or no grease is produced, such as in convenience stores and other venues. Thus, a minimum threshold should be provided in the IMC to eliminate the expense of first cost, and energy costs of fan energy and tempering makeup air, where grease emissions are minimal or nonexistent. Such a minimum threshold already exists in codes and standards, and this proposal is provided to harmonize the IMC with NFPA Standard 96 and UL Standard 710B. NFPA 96 contains the threshold requirement and UL 710B, Section 17, contains the applicable test procedure. NFPA 96, in sections 4.1.1.2 and 4.1.1.3, exempts from exhaust systems cooking equipment that has grease discharge that does not exceed 5 mg/m^3 when tested at an exhaust airflow rate of 500 cfm (0.236 m^3/s). Note that NFPA 96 is written entirely from a fire safety point of view, so only a Type I (in IMC terms) hood requirements are included in the standard.

State jurisdictions are beginning to pick up this exception in their adoptions of the IMC. For example, both Michigan and California mechanical codes either cite the grease test requirements explicitly or cite NFPA 96 for exhaust system requirements.

Editorial Note: The 2008 NFPA 96 cites UL 197 in sections 4.1.1.2 and 4.1.1.3, though the grease emissions test has been moved to Section 17 of UL 710B. Therefore, the proposed IMC exception should cite the actual grease emissions threshold requirement rather than citing NFPA 96, which contains the outdated reference.

In relation to Section 507.2.2, if a Type I hood is not required because of low grease emissions, per the first part of this proposal, the provisions of section 507.2.2 still apply, and a Type II hood may be required. This is problematic with the existing wording because Type II hoods are currently required only for dishwashers and light-duty appliances. Yet it is well known that appliances with duty ratings higher than light-duty produce heat and moisture while not producing grease or combustion products, such as electric ranges, electric pasta cookers, electricpizza ovens, and electric tilting skillets, for example. Accordingly, Type II hoods should be required for appliances based on their actual emissions of heat and moisture, regardless of duty. Of course, per current Section 507.2.2, additional HVAC capacity is still available as an alternative to use of a Type II hood.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HORTON-M-1-507.2

M65–09/10
507.2.1, 507.2.2

Proponent: Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

Revise as follows:

507.2.1 Type I hoods. Type I hoods shall be installed where cooking *appliances* produce grease or smoke as a result of the cooking process. Type I hoods shall be installed over *medium-duty*, *heavy-duty* and *extra-heavy-duty cooking appliances*. Type I hoods shall be installed over *light-duty cooking appliances* that produce grease or smoke.

507.2.2 Type II hoods. Type II hoods shall be installed above dishwashers and *light-duty appliances* that produce heat or moisture and do not produce grease or smoke as a result of the cooking process, except where the heat and moisture loads from such appliances are incorporated into the HVAC system design or into the design of a separate removal system. Type II hoods shall be installed above all *light-duty appliances* that produce products of *combustion* and do not produce grease or smoke as a result of the cooking process. Spaces containing cooking appliances that do not require Type II hoods shall be ventilated in accordance with Section 403.3. For the purpose of determining the floor area required to be ventilated, each individual *appliance* that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m2).

Reason: Words added for clarification. The requirement for hood installation should not be based on the possibility of food being burned and producing smoke. If that were the case, smoke being produced while burning toast would require a hood above a toaster.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-M-9-507.2.1-507.2.2

M66–09/10
507.2.1.1

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

507.2.1.1 Operation. Type I hood systems shall be designed and installed to automatically activate the exhaust fan whenever cooking operations occur. The activation of the exhaust fan shall occur through an interlock with the cooking appliances, by means of heat sensors or by means of other approved methods. A method of interlock between an exhaust hood system and appliances equipped with standing pilot burners shall not cause the pilot burners to be extinguished.

Reason: This is important information from the IFGC that needs to be part of this section as it directly affects how hoods are to operate. Having it here will keep the user from having to travel to another document to find it and will eliminate a possible oversight that could prove to be costly to correct at the end of an installation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-39-507.2.1.1

M67–09/10
507.2.1.2 (New)

Proponent: Mark Riley, City of Troy, MI, representing City of Troy and Mechanical Inspectors Association of Michigan

Add new text as follows:

507.2.1.2 Type I hoods shall bear a label indicating the minimum exhaust flow rate in CFM per linear foot of hood that provides for capture and containment of the exhaust effluent for the cooking appliances served by the hood, based on the cooking appliance duty classifications defined in this code.

Reason: There has been an enforcement nightmare with some hood companies not providing information on how many CFM is required per linear foot of hood for what type of cooking appliances. The hood manufacturer provides information based on temperature of cooking. This does not help the inspector determining compliance when the code references light, medium, heavy duty, and extra heavy duty cooking appliances. Why even have these terms for types of cooking, when the hood manufacturer's state CFM based on cooking temperature? Either rework the types of cooking to temperature or have the manufacturer state how many CFM is required per linear foot. Also note that the labeling of hoods for performance is already required for compensating hoods in Section 508.2.

Cost Impact: There may be an increase cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RILEY-M-1-507.2.1.2

M68–09/10
507.2.2

Proponent: Russell Payzant, Engineer, American Dish Service

Revise as follows:

507.2.2 Type II hoods. Type II hoods shall be installed above dishwashers and *light-duty appliances* that produce heat or moisture and do not produce grease or smoke, except where the heat and moisture loads from such appliances are incorporated into the HVAC system design or into the design of a separate removal system. Type II hoods shall be installed above all *light-duty appliances* that produce products of *combustion* and do not produce grease or smoke. Spaces containing cooking appliances that do not require Type II hoods shall be ventilated in accordance with Section 403.3. For the purpose of determining the floor area required to be ventilated, each individual *appliance* that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m^2).

Exception: A Type II hood is not required for chemically sanitizing commercial dishwashing machines that use hot water at a temperature of 120°F (48.8°C) or less. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC systems.

Reason: We request the vapor hood language be removed and relevant industry language be added to exception #2 of 507.2.2., until there is a standard for testing such vapor hoods. Section 507 of the IMC code requiring hooding or venting for all commercial dishwashing machines, which language began in 1994, does not consider the impact of a whole generation in dish machine design. The 1954 design of chemically sanitizing "Low-temp" dish machines uses building hot water supplies at 120F degrees for rinse water, then reuses that water for the wash, then is drained away at 110 to 100F degrees. Typical batches are from 1 to 3 gallons of water. The heat and moisture loads generated by such appliances are no more than that of a hand-washing sink, steam tables, or rice cookers—which are exempted in 507.2.2.

Providing hoods and venting for such machines have a costly impact for the owners and operators of commercial kitchens—often exceeding the cost of the entire ware washing system. These "low-temp" designs have successfully been employed to avoid additional venting needs for many years.

The hood language of IMC 2006 and adoption of the code by local jurisdictions has created costly hurdles for the industry with no measurable benefit. We have attempted to contact any state or national body who tests for heat and moisture loading of the dishroom. The problem is there are no written standards to which the code can be tested or certified, to show our machine is not loading the room beyond that of steam tables, rice cookers, or hand-washing sinks. The vapor hood language is ambiguous and there is no dishroom standard to certify to.

Cost Impact: The code change proposal will not increase the cost of construction. (The proposal will avoid impending high costs to existing and new owners and operators of commercial kitchens.)

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PAYZANT-M-1-507.2.2

M69–09/10
507.2.2

Proponent: John Wooden, VP ChefMaster Division of Mr. Bar-B-Q-Inc.

Revise as follows:

507.2.2 Type II hoods. Type II hoods shall be installed above dishwashers and *light-duty appliances* that produce heat or moisture and do not produce grease or smoke, except where the heat and moisture loads from such appliances are incorporated into the HVAC system design or into the design of a separate removal system. ~~Type II hoods shall be installed above all *light-duty appliances* that produce products of *combustion* and do not produce grease or smoke.~~ Spaces containing cooking appliances that do not require Type II hoods shall be ventilated in accordance with Section 403.3. For the purpose of determining the floor area required to be ventilated, each individual *appliance* that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m^2).

Reason: Products of combustion for portable butane burning appliances allowed for use in commercial restaurants under NFPA 58 Section 6.19.9.4 and tested and listed by UL 2191 and ANSI 21.72b with CSA 3-90 already have strict tolerances for CO/CO2 emissions to allow for tableside cooking without the use of hoods. There is a limitation of Btu/hr currently at 15,000 Btu/hr. ANSI Z83.11 is currently combining the UL and CSA standards to incorporate the tableside cooking appliances with limitations of CO/CO2 as part of a uniform standard.

Cost Impact: The code change makes it possible for appliances that use combustion as a heat source to continue in dessert carts and omelet stations which are currently the most economical and most often used method of tableside cooking. The cost impact not to make the changes to the proposal would be prohibitive.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WOODEN-M-1-507.2.2

M70–09/10
507.2.2

Proponent: Jayendra S. Parikh, Compliance Solutions International Inc., representing North American Association of Food Equipment Manufacturers Technical Liaison Committee

Revise as follows:

507.2.2 Type II hoods. Type II hoods shall be installed above dishwashers and *light-duty appliances* that produce heat or moisture and do not produce grease or smoke, except where the heat and moisture loads from such appliances are incorporated into the HVAC system design or into the design of a separate removal system. Type II

hoods shall be installed above all *light-duty appliances* that produce products of *combustion* and do not produce grease or smoke. ~~Spaces containing cooking appliances that do not require Type II hoods shall be ventilated in accordance with Section 403.3. For the purpose of determining the floor area required to be ventilated, each individual *appliance* that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m^2).~~

Reason: The first sentence that is deleted is redundant, since the requirements in Section 403.3 will obviously be used for ventilation design of the spaces containing cooking appliances that do not require Type II hoods. The second sentence that is deleted:

(1) contains requirement that seems arbitrary,
(2) consists of inappropriate requirement for small electrically heated appliances such as toasters, counter-top steamers and steam-tables, egg cookers, rice cookers, hot dog cookers, and induction cookers, which occupy about a maximum of 3 to 4 square feet of floor area and are not required to be installed under a Type II hood,
(3) requires substantially higher ventilation rates for such small appliances based on the minimum 100 square feet floor area required for each such appliance vs their actual area on the floor which is maximum of 3 to 4 square feet, increasing energy and other costs of HVAC or other system used for ventilating such appliances, including the system's operation and maintenance costs. As an example, 8000 cfm of outdoor ventilation air was required for one restaurant where 57 small induction cookers (each with about 2 sq. ft. floor area) were used using 100 square feet of floor area for each such appliance, while the whole restaurant actually required 4500 cfm, per IMC Section 403.3,
(4) may erroneously require much higher ventilation if someone interprets the ventilation for such appliances to be in addition to the required ventilation for that area (which, in the above example, would be 8000 + 4500 = 12,500 cfm), and
(5) does not represent the intent of the author who had proposed this requirement, as I understand it, with respect to such small electrically heated appliances.

Cost Impact: The code change proposal will not increase the cost of construction. On the contrary, this proposal will decrease the cost of construction, operation, and maintenance.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PARIKH-M-2-507.2.2

M71–09/10
507.2.2

Proponent: Sam Dardano, City of Boulder, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

507.2.2 Type II hoods Type II hoods shall be installed above dishwashers and light duty appliances that produce heat or moisture, except where the heat or moisture loads from such appliances are incorporated into the HVAC system design or into the design of a separate removal system. Type II hoods shall be installed above all light duty appliances that produce products of combustion and do not produce grease or smoke. Spaces containing cooking appliances that do not require type II hoods shall be ~~ventilated~~ <u>provided with exhaust at a rate of 0.70 cfm per square foot</u>. ~~in accordance with Section 403.3.~~ For the purpose of determining the floor area required to be ~~ventilated~~ exhausted, each individual appliance that is not required to be installed under a type II hood shall be considered as occupying not less than 100 square feet. <u>Such additional square footage shall be provided with exhaust at a rate of 0.70 cfm per square foot.</u>

Reason: This is an informative section but the word "ventilated" could be construed as referring to outside air ventilation in which Table 403.3 has no value for outside air in kitchens, only an exhaust rate. It's easier to simply state the exhaust rate instead of referring to the Table, saving the user a little time.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DARDANO (MCMANN) -M-10-507.2.2

M72–09/10
507.3

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

507.3 Fuel-burning appliances. ~~Where vented fuel-burning appliances are located in the same room or space as the hood, provisions shall be made to prevent the hood system from interfering with normal operation of the appliance vents.~~ Non-direct-vent appliances shall not be located in a room or space containing a Type I or Type II hood nor in a room or space that opens only into a room or space containing such hoods.

Exception: Non-direct-vent appliances shall be permitted in a room or space containing a Type I or Type II hood provided that the room or space is continuously maintained under positive pressure.

Reason: 507.3 only states that "provisions" need to be made when dealing with these types of appliances but provides no guidance as what is really required. This only creates confusion in the enforcement community as to what needs to occur. Non direct vent appliances and those with draft hoods are subject to many factors that could result in improper venting. Losses in building pressure will cause improper venting. It only takes 5 Pascal's to overcome a gravity vent. These appliances are also in competition for air with other appliances and are no match for powered exhaust equipment such as hoods. The kitchen environment lends itself to negative pressure either by design or by accident. A perfectly balanced system never lasts very long as every minute detail affects them. Even kitchens with slight positive pressure can be subject to negative building pressures simply by opening doors. If kitchen pressures are even negative in the slightest or cannot be verified, then the appliance should be isolated. This text will provide the user with guidance that is more concise.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-15-507.3

M73–09/10
507.10

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

507.10 Hoods penetrating a ceiling. Type I hoods or portions thereof penetrating a ceiling, wall or furred space shall comply with ~~all the requirements of~~ Section 506.3.10. Field-applied grease duct enclosure systems, as addressed in Section 506.3.10.2, shall not be utilized to satisfy the requirements of this section.

Reason: Hoods penetrating ceilings that are also required to have the associated ductwork protected, are required to be enclosed in a 1 or 2 hour enclosure. Field applied duct-wrap systems are listed for ducts only, not hoods. Hoods have never been tested or listed to have duct-wrap materials placed over the hood as a replacement for a 1 or 2 hour enclosure. There is no standard for installation of duct-wrap systems on hoods. Nor is there a method of fastening or method of providing access to services located on top of the hood such as lights, J-boxes etc. To permit this practice only creates a false sense of security and code compliance. The manufacturers are aware that some jurisdictions allow this application but they don't condone the practice or seek to market their product in this fashion. The best practice is to not have the hood penetrate the ceiling in the first place. As currently written, 507.10 says that **all** the requirements of 506.3.10 should be met. This is misleading because two of the exceptions cannot be applied although they are part of the section. This is a much needed clarification that will provide concise guidance as to what exactly needs to occur when hoods are required to be protected when ceilings are penetrated.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-5-507.10

M74–09/10
507.11, Chapter 15

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

507.11 Grease filters. Type I hoods shall be equipped with ~~listed~~ grease filters listed and labeled in accordance with UL 1046 and designed for the specific purpose. Grease-collecting equipment shall be provided with access for cleaning. The lowest edge of a grease filter located above the cooking surface shall be not less than the height specified in Table 507.11.

2. Add new standard to Chapter 15 as follows:

UL
1046-00 Grease Filters for Exhaust Ducts

Reason: UL 1046 includes a comprehensive set of construction and performance requirements that are used to evaluate and list grease filters. Over 20 companies currently have grease filters listed. Only listed products that are labeled have been subjected to periodic, unannounced inspections during production.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard, UL 1046-00, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-14-507.11-CH 15

M75–09/10
510.6, 510.6.1, 510.6.2, 510.6.3

Proponent: Vickie Lovell, InterCode, Inc., representing the 3M Company

Revise as follows:

510.6 Penetrations. Penetrations of structural elements or a fire resistance rated assembly by a hazardous exhaust system shall conform to Sections 510.6.1 through 510.6.4.

Exceptions:

1. Duct penetrations within H-5 occupancies as allowed by the *International Building Code*.
2. Where the interior of the duct is equipped with an approved automatic fire suppression system as required by Section 510.7.

510.6.1 Fire dampers and smoke dampers. Fire dampers and smoke dampers are prohibited in hazardous exhaust ducts.

510.6.2 Floors and Floor/Ceiling Assemblies. Hazardous exhaust ~~systems~~ ducts that penetrate a floor or floor/ceiling assembly shall be enclosed from the point at which the duct enclosure penetrates a ceiling or floor to the outlet terminal in a fire-resistance rated ~~shaft constructed in accordance with the *International Building Code*.~~ construction specifically evaluated for such purpose as follows:

1. A shaft constructed in accordance with International Building Code constructed with the same fire resistance rating as the assembly penetrated, or
2. A field-applied duct enclosure protected with a through penetration firestop system classified in accordance with ASTM E814 having an "F" and "T" rating equal to the fire resistance rating of the assembly penetrated. The enclosure shall be tested and listed in accordance with ASTM E 2336, and installed in accordance with the manufacturer's instructions .

510.6.3 Wall assemblies. Hazardous exhaust ducts ~~systems~~ that penetrate fire-resistance-rated wall assemblies shall be enclosed in fire-resistance-rated construction from the point of penetration to the outlet terminal ~~except where the interior of the duct is equipped with an approved automatic fire suppression system.~~ in a construction specifically evaluated for such purpose. ~~Ducts shall be enclosed in accordance with the *International Building Code* requirements for shaft construction and such enclosure shall have a minimum fire-resistance rating of not less than the highest fire-resistance-rated wall assembly penetrated.~~

1. A shaft constructed in accordance with International Building Code constructed with the same fire resistance rating as the assembly penetrated, or
2. A field-applied duct enclosure protected with a through penetration firestop system classified in accordance with ASTM E814 having an "F" and "T" rating equal to the fire resistance rating of the assembly penetrated. The enclosure shall be tested and listed in accordance with ASTM E 2336, and installed in accordance with the manufacturer's instructions .

Reason: Hazardous exhaust ducts convey materials that are classified as creating physical or health hazards. They include, but are not limited to:

1. dust or particles sufficiently light enough to float in the air in concentrations so as to be injurious to health or safety
2. heat, odors, fumes, spray, gas, or smoke in concentrations so as to be injurious to health or safety
3. grease from commercial kitchens
4. toxic, corrosive, flammable, or explosive materials.

The IBC does not make any distinction in the requirement for protection of ducts as being limited to only ducts penetrating structural elements. In all cases, any type of duct that penetrate fire rated assemblies are required to be protected with dampers or as penetrations. Historically a shaft is used to enclose such ducts where dampers are not permitted. Where appropriate, this method would still be allowed. However, job site conditions sometimes create the need for alternate methods permitted by the code. The scope of ASTM E 2336 (already required as a method of protection for grease ducts in the IMC) is being expanded to include all types of hazardous exhaust ducts.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:				
Committee:	AS	AM	D	
Assembly:	ASF	AMF	DF	

ICCFILENAME: LOVELL-M-5-510.6

M76–09/10
510.6.2, 510.6.3

Proponent: Tony Crimi, A.C. Consulting Solutions, Inc., representing the International Firestop Council

Revise as follows:

510.6.2 Floors. Hazardous exhaust systems that penetrate a floor/ceiling assembly shall be enclosed in a fire-resistance-rated shaft constructed in accordance with the *International Building Code* requirements for shaft construction*, or an approved* alternative duct enclosure that is a *listed* and *labeled* material, system, product or method of construction specifically evaluated for such purpose.

510.6.3 Wall assemblies. Hazardous exhaust duct systems that penetrate fire-resistance-rated wall assemblies shall be enclosed in fire-resistance-rated construction from the point of penetration to the outlet terminal, except where the interior of the duct is equipped with an approved automatic fire suppression system. Ducts shall be enclosed in accordance with the *International Building Code* requirements for shaft construction *or an approved* alternative duct enclosure that is a *listed* and *labeled* material, system, product or method of construction specifically evaluated for such purpose. ~~and~~ Such enclosures shall have a minimum fire-resistance-rating of not less than the highest fire-resistance-rated wall assembly penetrated.

Reason: To introduce alternative methods for protection of ducts used to convey hazardous exhaust as required in 510.6 of the IMC. The protection of these ducts can be accomplished using *approved* alternative duct enclosures that are *listed* and *labelled* systems or product specifically evaluated for such purpose. There are alternative methods available for providing protection for hazardous exhaust duct enclosures beyond the existing shaft provisions.

Substantiation: There are parallels between the level of performance required for hazardous exhaust ducts as compared to grease ducts and other fire-resistance rated duct enclosures. As an example, the ASTM E2336 standard evaluates enclosure materials and the duct enclosure systems using the following test methods: non-combustibility, full scale fire resistance, durability, internal fire, and fire-engulfment with a through-penetration fire stop.

As an example, enclosure systems which meet the ASTM E2336 criteria demonstrate the ability to resist the passage of flames and hot gases during a standardized fire resistance test and a standardized internal fire test, as well as an ability to resist transmission of heat through the duct and the enclosure material(s). The ability of a fire stop to meet the requirements of Test Method E 814 when used with the duct enclosure system is also evaluated. The test method prescribes an ASTM E119 fire exposure for both a fire engulfment and a fire resistance wall test. The fire resistance test illustrates the ability of the enclosure material to resist the effects of fire when applied in a vertical application (i.e. as a wall assembly tested in accordance with ASTM E119).

In addition, an internal fire test uses two standardized fire exposures occurring inside the protected duct itself. Both tests illustrate the enclosure material's ability to resist thermal transmission of heat to the unexposed side in a horizontal application. The first standardized fire exposure is intended to simulate long term exposure of the enclosure material to a standardized service condition. The test simulates an internal fire within the duct by maintaining a minimum 500°F (260°C) average interior temperature for at least 4 h. The second standardized fire exposure is intended to simulate a sudden rise in the exposure conditions within the duct. Within 15 min after the end of the 4-h period, increase the average interior temperature in the duct is increased to 2000°F (1093°C). This exposure is then maintained for 30 minutes, which simulates a large fire event within the duct. The current provisions of 5.10.8.2 do not explicitly take this into account. A durability test is included for the materials, which is intended to simulate the effects of long-term exposure of typical in-service conditions on the thermal transmission qualities of the enclosure materials when subjected to a modified version of Test Method C 518.

A fire-engulfment test uses a standardized fire exposure, the time temperature curve of Test Methods E 119, to simulate a fire occurring on the outside of the grease duct, and demonstrates the ability of the duct enclosure system to remain intact without a through opening. The fire-engulfment test also tests the fastening methods used to secure the enclosure material to the grease duct and the supporting system. The fire-engulfment test also provides a means to test a through-penetration fire stop to determine its compatibility with the duct enclosure system. The fire-engulfment and vertical fire resistance tests are followed by the application of a standardized hose stream test.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRIMI-M-4-510.6

M77–09/10
510.7

Proponent: Patrick A. McLaughlin, McLaughlin & Associates, representing the Semiconductor Industry Association

Revise as follows:

510.7 Suppression required. Ducts shall be protected with an approved automatic fire suppression system installed in accordance with the *International Building Code*.

Exceptions:

1. An approved automatic fire suppression system shall not be required in ducts conveying materials, fumes, mists and vapors that are nonflammable and noncombustible and where flammable contaminant are diluted to below 25% of their lower flammability limit ~~under all conditions and at any concentrations~~.
2. An *approved* automatic fire suppression system shall not be required in ducts where the largest cross-sectional diameter of the duct is less than 10 inches (254 mm).
3. For laboratories, as defined in Section 510.1, automatic fire protection systems shall not be required in laboratory hoods or exhaust systems.

Reason: To clarify that automatic fire suppression is not required for diluted flammable contaminants. IMC Section 510.3 require that flammable contaminants be diluted below 25% of the lower flammability limit therefore it is not a hazardous exhaust system under section 510.2 and a fire suppression system is not required. Even though a suppression system is not required, as presently written there has been misapplication of the provisions. The change to IFC 1803.10.4.1 is the corresponding Fire Code change.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCLAUGHLIN-M-1-510.7

M78–09/10
510.8.1

Proponent: Eli P. Howard, III, Sheet Metal and Air Conditioning Contractors National Association, Inc.

Revise as follows:

510.8.1 Duct joints. Ducts shall be made tight with lap joints having a minimum lap of 1 inch (25 mm). Joints used in ANSI/SMACNA Round Industrial Duct Construction Standards and ANSI/SMACNA Rectangular Industrial Duct Construction Standards are also acceptable.

Reason: The types of joints used in either of these manuals have been used in industrial exhaust and conveyance systems for years and provide acceptable alternatives to lap joints.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOWARD-M-7-510.8.1

M79–09/10
512.2

Proponent: Eli P. Howard, III, Sheet Metal and Air Conditioning Contractors National Association, Inc.

Revise as follows:

512.2 Materials. Subslab soil exhaust system duct material shall be air duct material *listed* and *labeled* to the requirements of UL 181 for Class 0 air ducts, or any of the following piping materials that comply with the *International Plumbing Code* as building sanitary drainage and vent pipe: cast iron; galvanized steel; brass or copper pipe; copper tube of a weight not less than that of copper drainage tube, Type DWV; and plastic piping. PVC coated steel with a minimum thickness of 4 ml on the surface in contact with the fill material, aluminized steel and FRP are acceptable duct materials.

Reason: These materials have been used for subslab applications for years and methods on construction and installation are covered via the SMACNA HVAC Duct Construction Standards, SMACNA Thermoplastic Duct (PVC) Construction Manual and Thermoset FRP Duct Construction Manual.

Cost Impact: The code change proposal will not increase the cost of construction. These materials are typically available at comparable or lower prices to those already listed.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOWARD-M-9-512.2

M80–09/10
513.10.2

Proponent: Eli P. Howard, III, Sheet Metal and Air Conditioning Contractors National Association, Inc.

Revise as follows:

[F] 513.10.2 Ducts. Duct materials and joints shall be capable of withstanding the probable temperatures and pressures to which they are exposed as determined in accordance with Section 513.10.1. Ducts shall be constructed and supported in accordance with Chapter 6. Ducts shall be leak tested to the construction pressure class ~~to 1.5 times the maximum design pressure~~ in accordance with SMACNA HVAC Air Duct Leakage Test Standard ~~nationally accepted practices. Measured leakage shall not exceed 5 percent of design flow~~. Results of such testing shall be a part of the documentation procedure. Ducts shall be supported directly from fire-resistance-rated structural elements of the building by substantial, noncombustible supports.

> **Exception:** Flexible connections, for the purpose of vibration isolation, that are constructed of *approved* fire-resistance-rated materials.

Reason: Testing ductwork beyond its design maximum pressure may cause permanent deformation. Leak testing ductwork beyond the maximum design static pressure does not provide accurate leakage rates under operating conditions. Additionally the new language is totally consistent with the ANSI/HVAC Duct Construction Standards required under the IMC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOWARD-M-3-513.10.2

M81–09/10
514.1, 927

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Delete without substitution:

~~**SECTION 927**~~
~~**HEAT RECOVERY VENTILATORS**~~

~~**927.1 Ducted heat recovery ventilators.** Ducted heat recovery ventilators shall be *listed* and *labeled* in accordance with UL 1812.~~

~~**927.2 Nonducted heat recovery ventilators.** Nonducted heat recovery ventilators shall be *listed* and *labeled* in accordance with UL 1815.~~

2. Revise as follows:

514.1 General. Energy recovery ventilation systems shall be installed in accordance with this section. Where required for purposes of energy conservation, energy recovery ventilation systems shall also comply with the *International Energy Conservation Code.* Ducted heat recovery ventilators shall be listed and labeled in accordance with UL 1812. Nonducted heat recovery ventilators shall be listed and labeled in accordance with UL 1815.

Reason: This proposal consolidates requirements for energy recovery ventilation systems into one location. UL 1812 and UL 1815 are currently referenced in Section 927.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-7-514.1

M82–09/10
514.4 (New)

Proponent: Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

Add new text as follows:

514.4 Recirculated air. Air conveyed within energy recovery systems shall not be considered as recirculated air where the energy recovery ventilation system is constructed to limit cross-leakage between air streams to less than 10% of the total airflow design capacity.

Reason: Currently the IMC provides guidance on the use of energy saving equipment such as heat/ entropy wheels. Unfortunately some interpret the sections that prohibit recirculation of air as prohibiting energy recovery equipment that merely attempts to harvest the heated or cooled elements from the exhausted airstream. Industry standards allow for up to 10% duct leakage in these type systems, so the 10% in the proposed wording supports the current technology utilized.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-M-12-514.4

M83–09/10
515 (New), 515.1 (New)

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Add new text as follows:

SECTION 515
COMMON MULTISTORY EXHAUST SYSTEMS

515.1 Common bathroom and toilet room exhaust in multistory buildings. Where a common shaft is designed and installed to convey bathroom or toilet room exhaust, or both, in multiple story buildings, the construction of such system shall be in accordance with all of the following:

1. The building shall be equipped with an automatic sprinkler system in accordance with Section 903.3.1.1 of the *International Building Code*.
2. Shaft construction shall conform to Section 708 of the *International Building Code*.
3. Volume dampers, fire dampers and smoke dampers shall be prohibited in the exhaust duct. Penetrations of the shaft be protected in accordance with Section 607.5.5, Exception 2.
4. The shaft shall be served by an exhaust fan located at the top of the shaft and such fan shall be specifically designed for the intended application.
5. The exhaust fan shall run continuously and maintain negative pressure in the shaft at all times.
6. The exhaust fan operation shall be monitored in an approved location and shall initiate an audible or visual signal when the fan is not in operation.
7. Makeup air shall be provided for the spaces served in accordance with Section 501.3.
8. A cleanout opening of an approved size shall be located at the base of the shaft to provide access for inspection.
9. Screens installed at termination points shall comply with Section 501.2.2.

Reason: This proposal provides guidance as to the correct way to construct a sub-duct system utilizing a shaft constructed in accordance with the building code as long as that building is sprinkled. This method has been around for years and is an economical way to provide a method of exhausting bathroom exhaust in multi-story buildings without having to install fire and smoke dampers in the shaft. Dryer and kitchen exhaust would be prohibited in this scenario. This method when installed correctly can be located in any occupancy. Normally this would be practical in buildings of 4 stories or more and most commonly be employed in hotels.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-26-515

M84–09/10
601.4

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

601.4 Contamination prevention. Exhaust ducts under positive pressure, chimneys and vents shall not extend into or pass through ducts or plenums.

Exceptions:

1. Exhaust systems located in ceiling return air plenums over spaces that are permitted to have 10 percent recirculation in accordance with Section 403.2.1, Item 4. The exhaust duct joints, seams and connections shall comply with Section 603.9.
2. This section shall not apply to chimneys and vents that pass through plenums where such venting systems comply with one of the following requirements:

2.1. The venting system shall be listed for positive pressure applications and shall be sealed in accordance with the vent manufacturer's installation instructions.

2.2. The venting system shall be installed such that fittings and joints between sections are not installed in the above ceiling space.

2.3. The venting system shall be installed in a conduit or enclosure with sealed joints separating the interior of the conduit or enclosure from the ceiling space.

Reason: The new exception provides the same options for vents passing through return air plenums that are found in Section 503.3.6 of the IFGC. There is no technical reason to not to allow these options for other fuel-fired appliances.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-18-601.4

M85–09/10
202, 602.1, 603.18 (New)

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

1. Delete and substitute as follows:

~~**602.1 General.** Supply, return, exhaust, relief and ventilation air plenums shall be limited to uninhabited crawl spaces, areas above a ceiling or below the floor, attic spaces and mechanical equipment rooms. Plenums shall be limited to one fire area. Fuel-fired appliances shall not be installed within a plenum.~~

602.1 General. The following shall be considered to be an air plenum:

1. Interstitial spaces above ceilings and below floors.
2. Stud wall cavities and spaces between solid floor joists utilized in accordance with Section 602.3
3. Boxes or chambers constructed to support air handlers and furnaces and to collect return air for such furnaces and air-handlers.
4. Mechanical room enclosures used to convey return air to air-handlers therein.

Plenums shall be limited to one fire area. Fuel-fired appliances shall not be installed in plenums.

2. Add new definition and text as follows:

DUCT PLENUM A box or chamber constructed of duct materials and used to collect air from or supply air to other ducts. Such plenums typically connect to the inlets and outlets of furnaces and air handlers.

603.18 Duct plenums. Duct plenums shall be constructed as required for ducts in accordance with Section 603.

Reason: This is only an attempt for the body of the code to recognize the use of various plenums found in most HVAC systems. Currently the code only speaks of plenums that take the form of structural components. The word “plenum” has been used in the trade for many years and can be most commonly found in residential applications but applies to many commercial systems as well. Sometimes large plenums are built as “fan houses” employing vane axial equipment. Plenums can be very big or small and never be part of the structure. Furnaces sometimes sit on top of plenum boxes. Many attic installations employ a plenum for flex duct distribution and so on. Using an attic or crawl space as a plenum makes little sense. Some of the problems associated with these types of designs are leakage, plenum heat loss, mold and moisture control, acceptable outlet performance, cleanliness and odor control. Verifying these issues would be very difficult for any inspector and the smallest oversight could wreak havoc for a jurisdiction. This text will solve the duct plenum recognition issue.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-34-202-602.1-603.18

M86–09/10
602.2.1

Proponent: Robert J Davidson, Code Consultant; Alan Shuman, President, representing the National Association of State Fire Marshals (NASFM)

Revise as follows:

602.2.1 Materials within plenums. Except as required by Sections 602.2.1.1 through 602.2.1.6, materials within plenums , and the exposed surfaces of the plenums containing the materials, shall be noncombustible or shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.

Exceptions:

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
3. This section shall not apply to materials exposed within plenums in one- and two-family dwellings.
4. This section shall not apply to smoke detectors.
5. Combustible materials fully enclosed within continuous noncombustible raceways or enclosures, *approved* gypsum board assemblies or within materials *listed* and *labeled* for such application.

Reason: The current wording of Section 602.2 allows the air handling plenum to be constructed of materials matching the type of construction. This allows exposed plenum surfaces to be constructed of combustible materials (wood).

To control the spread of flame and smoke within an air handling plenum we mandate that the materials meet the requirements of Section 602.2.1. The conflict is that the testing of the materials to attest to meeting the requirements of the referenced standards is done in test apparatus with non-combustible surfaces. The testing is not done in a mock up of the various configurations of exposed combustible surfaces that may be found in the field.

This negates the effectiveness of the listing for the material.

The proposal will correct that by specifying that when materials are placed within the plenum that must comply with the flame spread and smoke developed index, then the exposed surface of the plenum must comply as well to ensure the testing of the materials is relevant to the installation that occurs.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-SHUMAN-M-1-602.2.1

M87–09/10
602.2.1

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

602.2.1 Materials within plenums. Except as required by Sections 602.2.1.1through 602.2.1.6, materials within plenums shall be noncombustible or shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.

Exceptions:

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
3. This section shall not apply to materials exposed within plenums in one- and two-family dwellings.
4. This section shall not apply to smoke detectors.
5. Combustible materials fully enclosed within one of the following:
   - 5.1. continuous noncombustible raceways or enclosures
   - 5.2. approved gypsum board assemblies
   - 5.3. ~~or within~~ materials listed and labeled ~~for such application~~ as part of a tested assembly or system.

Reason: The issue of what materials are considered acceptable for exposure in a plenum is a life safety issue. The proposed change format of Exception 5 is to clarify that any one of these three options are only permitted when the combustible material is fully enclosed. The third option in Exception 5 is not clear as to what is meant by "for such application". This "protecting" material needs to provide sufficient protection of the combustible material during the event of a fire. Thus, to determine if the "protecting" material will remain in place during the event of a fire and not expose the combustible material to the fire, then the "protecting material" and the combustible material needs to be tested as an assembly or system.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-15-602.2.1

M88–09/10
602.2.1

Proponent: Marcelo M. Hirschler, GBH International, representing the American Fire Safety Council

Revise as follows:

602.2.1 Materials within plenums. Except as required by Sections 602.2.1.1 through 602.2.1.6, materials within plenums, and the exposed surfaces of the materials of construction of the plenums containing the materials, shall be noncombustible or shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.

Exceptions:

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
3. This section shall not apply to materials exposed within plenums in one- and two-family dwellings.
4. This section shall not apply to smoke detectors.
5. Combustible materials fully enclosed within continuous noncombustible raceways or enclosures, *approved* gypsum board assemblies or within materials *listed* and *labeled* for such application.

Reason: This code proposal is just clarification. Materials of construction of the plenum need to comply with the requirements to be noncombustible or to have a flame spread index of no more than 25 and a smoke developed index of no more than 50 when tested to ASTM E 84. Plenums cannot be constructed of combustible materials unless they comply with those requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-M-4-602.2.1

M89–09/10
602.2.1, 602.2.1.6

Proponent: Bob Eugene, representing Underwriter Laboratories, Inc.

1. Revise as follows:

602.2.1 Materials within plenums. Except as required by Sections 602.2.1.1through 602.2.1.~~6~~5, materials within plenums shall be noncombustible or shall be listed and labeled as having ~~have~~ a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.

Exceptions:

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
3. This section shall not apply to materials exposed within plenums in one- and two-family dwellings.
4. This section shall not apply to smoke detectors.
5. Combustible materials fully enclosed within continuous noncombustible raceways or enclosures, approved gypsum board assemblies or within materials listed and labeled for such application.
6. Materials in Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area.

2. Delete without substitution:

~~**602.2.1.6 Semiconductor fabrication areas.** Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area shall not be subject to the provisions of Section 602.2.1~~.

Reason: Section 602.2.1.6 is an exception to Section 602.2.1. The issue of what materials are considered acceptable for exposure in a plenum is a life safety issue. Other combustible products in the plenum, such as wiring, fire sprinkler piping, pneumatic tubing, and electrical equipment, are required to be listed and labeled. Only listing and labeling of a product can verify that the product installed at a jobsite is composed of the same material originally tested.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-3-602.2.1

M90–09/10
602.2.1, 602.2.1.7 (New)

Proponent: Michael Cudahy, Plastic Pipe and Fittings Association (PPFA)

1. Revise as follows:

602.2.1 Materials within plenums. Except as required by Sections 602.2.1.1 through 602.2.1.~~6~~7, materials within plenums shall be noncombustible or shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.

Exceptions:

1. Rigid and flexible ducts and connectors shall conform to Section 603.
2. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.
3. This section shall not apply to materials exposed within plenums in one- and two-family dwellings.
4. This section shall not apply to smoke detectors.
5. Combustible materials fully enclosed within continuous noncombustible raceways or enclosures, *approved* gypsum board assemblies or within materials *listed* and *labeled* for such application.

2. Add new text as follows:

602.2.1.7 Plastic plumbing pipe. Plastic drain, waste and vent piping exposed within a plenum shall comply with one or more of the following requirements:

1. The piping shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887.
2. The piping shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.

Reason: As many have noted, the current version of ASTM E-84, while having been used to evaluate plastic pipe fire related properties for use in plenums, is not an ideal test method for this use. Amongst the reasons for this are the contents of the current version of the E-84 standard which is vague as to mounting methods and other test conditions for evaluating such pipe. For that reason, UL 1887, an existing test method based on technology which has been evaluated with considerable scrutiny and was developed to test and rate combustible fire sprinkler piping systems for use in plenum spaces is recommended in this case by PPFA.

With regard to enhancing the ASTM E-84 language, the ASTM E-5 committee is currently voting on changes to the current standard which will clarify mounting methods for plastic pipe materials in the tunnel making its results more comparable between materials and from material to material within a generic group. PPFA is also supporting development of new text for the E-84 standard referring and recommending that flamespread properties of plastic pipe for plenum applications be tested according to UL – 1887. UL has been consulted on the proposed change and does not oppose it. UL 1887 is already referenced in the IMC and is not a new standard.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CUDAHY-M-2-602.2.1

M91–09/10
602.2.1.1, Chapter 15

Proponent: Marcelo M. Hirschler, GBH International, representing the American Fire Safety Council

1. Delete and substitute as follows:

602.2.1.1 Wiring. ~~Combustible electrical or electronic wiring methods and materials, optical fiber cable, and optical fiber raceway exposed within a *plenum* shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread not greater than 5 feet (1524 mm) when tested in accordance with NFPA 262. Only type OFNP (*plenum* rated nonconductive optical fiber cable) shall be installed in plenum-rated optical fiber raceways. Wiring, cable, and raceways addressed in this section shall be *listed* and *labeled* as *plenum* rated and shall be installed in accordance with NFPA 70.~~ Combustible electrical wires and cables and optical fiber cables exposed within a plenum shall be listed as having a maximum peak optical density of 0.50 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 5 feet (1524 mm) or less when tested in accordance with NFPA 262 or shall be installed in metal raceways or metal sheathed cable. Combustible optical fiber and communication raceways exposed within a plenum shall be listed as having a maximum peak optical density of 0.5 or less, an average optical density of 0.15 or less, and a maximum flame spread distance of 5 feet (1524 mm) or less when tested in accordance with ANSI/UL 2024. Only plenum-rated wires and cables shall be installed in plenum-rated raceways. Electrical wires and cables, optical fiber cables and raceways addressed in this section shall be listed and labeled and shall be installed in accordance with NFPA 70.

2. Add new standards as follows:

ANSI/UL 2024	Standard for Safety Optical-Fiber and Communications Cable Raceway
UL 2424	Outline of Investigation for Cable Marked Limited Combustible

Reason: This section needs some clarifications. The clarifications are based on the latest (2009) edition of NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, (which governs requirements for wiring in plenums in the NEC) and the requirements of NFPA 70 (NEC).

Combustible wires and cables in plenums (both electrical, optical fiber and mixed ones) must meet NFPA 262, with the pass/fail criteria of 0.50 maximum optical density, 0.50 average optical density and 5 ft maximum flame spread distance. Combustible raceways must meet UL 2024, with the same pass/fail criteria. Any plenum-rated wires and cables are permitted to be installed in plenum-rated raceways.

There is a general recognition that wires and cables marked limited combustible in accordance with UL Subject 2424, Outline of Investigation for Cable Marked Limited Combustible, will meet the requirements of wires and cables tested to NFPA 262 with the pass/fail criteria above. Therefore NFPA 90A has a provision in the annex that cables that meet UL 2424 can be used when cables that meet NFPA 262 with the pass/fail criteria above are called for. I interpret the ICC criteria on referenced standards as making UL Subject 2424, Outline of Investigation for Cable Marked Limited Combustible, a document not in compliance with the policy. For that reason, UL 2424 is not being added. If the committee believes that this can be added, for consistency with NFPA 90A, the proposal can be accepted as amended by adding the exception shown below.

Exception: Electrical wires and cables and optical fiber cables listed to UL Subject 2424, Outline of Investigation for Cable Marked Limited Combustible, are considered to be suitable for use wherever cables tested in accordance with NFPA 262 are required.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standards , UL 2024 and UL 2424, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:				
Committee:	AS	AM	D	
Assembly:	ASF	AMF	DF	

ICCFILENAME: HIRSCHLER-M-1-602.2.1.1

M92–09/10
602.2.1.1

Proponent: J. Philip Simmons, representing National Armored Cable Manufacturers Association

Revise as follows:

602.2.1.1 Wiring. Combustible electrical or electronic wiring methods and materials, optical fiber cable, and optical fiber raceway exposed within a plenum shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread not greater than 5 feet (1524 mm) when tested in accordance with NFPA 262. Only type OFNP (plenum rated nonconductive optical fiber cable) shall be installed in plenum-rated optical fiber raceways. Wiring, cable, and raceways addressed in this section shall be listed and labeled as plenum rated and shall be installed in accordance with NFPA 70. This section shall not apply to Type MC and Type AC cables without nonmetallic jackets.

Reason: The present text excludes a common wiring method recognized by the NEC and by the NFPA 90A Standard for Installation of Air-Conditioning and Ventilation Systems. The NEC has permitted the use of metal sheathed cables for power uses in ceiling cavity and raised floor plenums for over 30 years. NFPA 90A Section 4.3.11.2.6.1 also recognizes the use of metal sheath cable in ceiling cavity and raised floor plenums. Type MC and AC cables are installed and used in accordance with the National Electrical Code in defined quantities and for specific electrical power and lighting applications. They are not subject to technology upgrades, they are not typically abandoned, and there is no proliferation or accumulation of Type MC and AC cables in these spaces. The technical paper being provided to the committee in support of the proposal presents statistical data from NFPA indicating that Type MC and AC cable in concealed spaces are not responsible for any significant amount of fire losses. This conclusion is based on the statistics for a 24 year period showing that less than 1% of roof and floor concealed space fires involved the ignition of fixed wiring and a total of 7 fatalities and 31 injuries attributed to concealed space cable fires during the 24 year period. The NEC has permitted the use of metal sheathed cables for power uses in ceiling cavity and raised floor plenums for over 25 years. The statistics presented show that not only is there no significant amount of fire losses but that during the period of the study a three fold increase in installed metal sheathed cable was not accompanied by an increase in fire fatalities.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SIMMONS-M-1-602.2.1.1

M93–09/10
602.2.1.2

Proponent: Michael Cudahy, Plastic Pipe and Fittings Association (PPFA)

Revise as follows:

602.2.1.2 Fire sprinkler and water distribution piping. Plastic fire sprinkler piping and water distribution piping exposed within a *plenum* shall comply with one or more of the following requirements: ~~be used only in wet pipe systems and shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887. Piping shall be *listed* and *labeled*.~~

1. The piping shall have a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread of not greater than 5 feet (1524 mm) when tested in accordance with UL 1887.
2. The piping shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E 84 or UL 723.

Plastic fire sprinkler piping shall be listed and labeled. Plastic fire sprinkler piping exposed within a plenum shall be used only in wet pipe systems.

Reason: As many have noted, the current version of ASTM E-84, while having been used to evaluate plastic pipe fire related properties for use in plenums, is not an ideal test method for this use. This change addresses that situation and also extends the use of the test methods to other plastic piping materials that are currently being used in plenum spaces.

Amongst the reasons that ASTM E-84 has been criticized as a means to assess the fire performance of plastic pipe for plenum applications are the contents of the current version of the E-84 standard which are vague as to pipe mounting methods and amount of pipe exposed as well as other test conditions for evaluating plastic pipe. For that reason, UL 1887, an existing test method based on technology which has been evaluated with considerable scrutiny and was developed to test and rate combustible fire sprinkler piping systems for use in plenum spaces is recommended in this case by PPFA.

With regard to enhancing the ASTM E-84 language, the ASTM E-5 committee is currently voting on changes to the current standard which will clarify mounting methods for plastic pipe materials in the tunnel making its results more comparable between materials and from material to material within a generic group. PPFA is also supporting development of new text for the E-84 standard referring and recommending that flamespread properties of plastic pipe for plenum applications be tested according to UL – 1887. UL has been consulted on the proposed change and does not oppose it. UL 1887 is already referenced in the IMC and is not a new standard.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CUDAHY-M-3-602.2.1

M94–09/10
602.2.1.5, 602.2.1.5.1, 602.2.1.5.2, 602.2.1.5.3

Proponent: Jesse Beitel, Hughes Associates, Inc.

Revise as follows:

602.2.1.5 Foam plastic insulation. Foam plastic insulation used as wall or ceiling finish in plenums shall ~~exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 and shall also~~ comply with one or more of Sections 602.2.1.5.1, 602.2.1.5.2 ~~or~~ and 602.2.1.5.3.

602.2.1.5.1 Separation required. The foam plastic insulation shall be separated from the plenum by a thermal barrier complying with Section 2603.4 of the *International Building Code*~~.~~ and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.

602.2.1.5.2 Approval. The foam plastic insulation shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use and shall be tested in accordance with and meet the criteria of Section 803.1.2 of the *International Building Code*. ~~shall be approved based on tests conducted in accordance with Section 2603.9 of the International Building Code.~~

602.2.1.5.3 Covering. The foam plastic insulation shall be covered by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm) and shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.

Reason: This code proposal revises the requirements for use of foam plastics in plenums. The intent of the IMC has been to require that all materials used in plenums shall be noncombustible or exhibit a flame spread index of 25 or less and a smoke-developed index of 50. The same criteria should also be applied to foam plastics used as wall or ceiling finish in plenums. This proposal requires that if the foam plastic is left unprotected then it shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 and meet the requirements of a full-scale fire test (NFPA 286). Additionally, several alternatives are provided to protect foam plastics and thus allow them to have a greater flame spread index and smoke-developed index.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEITEL-M-1-602.2.1.5

M95–09/10
602.2.1.5, 602.2.1.5.1, 602.2.1.5.2, 602.2.1.5.3

Proponent: Marcelo M. Hirschler, GBH International, representing the American Fire Safety Council

Revise as follows:

602.2.1.5 Foam plastic insulation. Foam plastic insulation used as interior wall or ceiling finish, or as interior trim, in plenums shall exhibit a flame spread index of 75 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 and shall also comply with one or more of the following Sections: 602.2.1.5.1, 602.2.1.5.2 or 602.2.1.5.3.

602.2.1.5.1 Separation required. The foam plastic insulation shall be separated from the plenum by a thermal barrier complying with Section 2603.4 of the International Building Code. and shall exhibit a flame spread index of 75 or less and a smoke developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.

602.2.1.5.2 Approval. The foam plastic insulation shall exhibit a flame spread index of 25 or less and a smoke developed index of 50 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use and shall meet the acceptance criteria of Section 803.1.2 of the *International Building Code* when tested in accordance with NFPA 286.

The foam plastic insulation shall be approved based on tests conducted in accordance with Section 2603.9 of the *International Building Code*.

602.2.1.5.3 Covering. The foam plastic insulation shall be covered by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm) and shall exhibit a flame spread index of 75 or less and a smoke developed index of 450 or less when tested in accordance with ASTM E 84 or UL 723 at the thickness and density intended for use.

Reason: This code proposal revises the requirements for use of foam plastic insulation as interior wall and ceiling finish or as interior trim in plenums. The IBC and IMC requirements for materials in plenums has always been that they be noncombustible or exhibit a flame spread index of 25 or less and a smoke developed index of 50 when tested to ASTM E 84. As presently written there is some confusion because the foam plastic insulation could be approved based on tests using any of the standards from 2603.9 (and only NFPA 286 has pass/fail criteria for smoke). This proposal requires that exposed foam plastic insulation (i.e. foam plastic left unprotected), whether used as interior finish or as interior trim, shall exhibit a flame spread index of 25 or less and a smoke developed index of 50 and meet the requirements of the full scale room-corner fire test (NFPA 286) with requirements for flame spread, heat release, no flashover and smoke release. Additionally, two alternatives continue to be provided to protect foam plastics and thus allow them even when they have a higher flame spread index and smoke developed index, namely a thermal barrier and a corrosion-resistant steel barrier. This is also consistent with the requirements of NFPA 90A, which has the same requirements for foam plastic insulation used as interior finish in plenums.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-M-3-602.2.1.5

M96–09/10
602.2.1.7 (New)

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Add new text as follows:

602.2.1.7 Plumbing and mechanical equipment in plenums. Where discrete plumbing and mechanical equipment, appurtenances and appliances are located in a plenum and have exposed combustible material, they shall be listed and labeled for such use in accordance with UL 2043.

Reason: There are combustible plumbing and mechanical equipment, such as plumbing appurtenances, pipe and duct supports, grilles and registers that are used in plenums, that cannot be effectively tested in accordance with standards ASTM E84 or UL 723. The UL 2043 standard was developed to test products and materials not able to be tested in accordance with ASTM E84 or UL 723, and is currently adopted by reference in Section 602.2.1.4.2. These products are individual distinct pieces and non-continuous (i.e. “discrete”).
This proposal was presented last cycle and the Committee had questions about the term “discrete’. Per the dictionary, ‘discrete’ refers to products that are non-continuous, individual distinct pieces, as compared to non-discrete products such as cable or plastic pipe.
If adopted this proposal will provide consistency in how the ICC codes treat discrete components in plenums.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-11-602.2.1.7

M97–09/10
602.3; IRC M1601.1.1

Proponent: Mark Riley, City of Troy, MI, representing City of Troy and Mechanical Inspectors Association of Michigan

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

602.3 Stud cavity and joist space plenums. Stud wall cavities and the spaces between solid floor joists to be utilized as air plenums shall comply with the following conditions:

1. Such cavities or spaces shall not be utilized as a plenum for supply air.
2. Such cavities or spaces shall not be part of a required fire-resistance-rated assembly.

3. Stud wall cavities shall not convey air from more than one floor level.
4. Stud wall cavities and joist space plenums shall comply with the floor penetration protection requirements of the *International Building Code*.
5. Studwall cavities and joist space plenums shall be isolated from adjacent concealed spaces by approved fireblocking as required in the *International Building Code*.
6. Studwall cavities in outside walls of the building envelope shall not be utilized as air plenums.

PART II – IRC MECHANICAL

Revise as follows:

M1601.1.1 Above-ground duct systems. Above-ground *duct systems* shall conform to the following:

1. *Equipment* connected to *duct systems* shall be designed to limit discharge air temperature to a maximum of 250°F (121°C).
2. Factory-made air ducts shall be constructed of Class 0 or Class 1 materials as designated in Table M1601.1.1(1).
3. Fibrous duct construction shall conform to the SMACNA *Fibrous Glass Duct Construction Standards* or NAIMA *Fibrous Glass Duct Construction Standards*.
4. Minimum thickness of metal duct material shall be as listed in Table M1601.1.1(2). Galvanized steel shall conform to ASTM A 653.
5. Use of gypsum products to construct return air ducts or plenums is permitted, provided that the air temperature does not exceed 125°F (52°C) and exposed surfaces are not subject to condensation.
6. *Duct systems* shall be constructed of materials having a flame spread index not greater than 200.
7. Stud wall cavities and the spaces between solid floor joists to be used as air plenums shall comply with the following conditions:
   7.1. These cavities or spaces shall not be used as a plenum for supply air.
   7.2. These cavities or spaces shall not be part of a required fire-resistance-rated assembly.
   7.3. Stud wall cavities shall not convey air from more than one floor level.
   7.4. Stud wall cavities and joist-space plenums shall be isolated from adjacent concealed spaces by tight-fitting fire blocking in accordance with Section R602.8.
   7.5. Stud wall cavities in the outside walls of building envelope assemblies shall not be utilized as air plenums.

Reason: Using exterior walls for stud cavity for return air will cause several major problems in a duct system. The major concern is that it is very difficult if not impossible to seal the stud wall cavities to prevent outside air from infiltrating, which will put additional heating or cooling loads on the HVAC system.

It can also cause comfort and air quality problems, by bringing in contaminants, hot or cold air from outside into the wall stud space, and into the house.

If the installer has to run return air on an outside wall it can easily be done in sheet metal duct.

Cost Impact: The code change proposal may cause an increase in the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RILEY-M-2-602.3-RM-1-M1601.1.1

M98–09/10
Table 603.4; IRC Table M1601.1.1(2)

Proponent: Wesley R. Davis, Air Conditioning Contractors of America

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise table as follows:

TABLE 603.4
DUCT CONSTRUCTION MINIMUM SHEET METAL THICKNESSES FOR SINGLE DWELLING UNITS

DUCT SIZE	GALVANIZED		ALUMINUM
	Minimum thickness (in.)	Equivalent galvanized gage no.	MINIMUM THICKNESS (in.)
Round ducts and enclosed rectangular ducts			
14 inches or less	0.013 ~~0.0157~~	30 ~~28~~	~~0.0175~~
16 and 18 inches	0.0187	26	0.018
20 inches and over	0.0236	24	0.023
Exposed rectangular ducts			
14 inches or less	0.0157	28	0.0175
Over 14 inches[a]	0.0187	26	0.018

For SI: 1 inch = 25.4 mm, 1 inch water gage = 249 Pa.

a. For duct gages and reinforcement requirements at static pressures of 1/2-inch, 1-inch and 2-inch w.g., SMACNA *HVAC Duct Construction Standards*, Tables 2-1, 2-2 and 2-3, shall apply.

PART II – IRC MECHANICAL

Revise table as follows:

TABLE M1601.1.1(2)
GAGES OF METAL DUCTS AND PLENUMS USED FOR HEATING OR COOLING

DUCT SIZE	MINIMUM THICKNESS inches and (mm)	EQUIVALENT GALVANIZED SHEET NO.	MINIMUM THICKNESS (in.)
Round ducts and enclosed rectangular ducts 14 inches or less	0.013 ~~0.0157 (0.3950 mm)~~	30 ~~28~~	~~0.0175~~
16 and 18 inches	0.0187 (0.4712 mm)	26	0.018
20 inches and over	0.0236 (0.6010 mm)	24	0.023
Exposed rectangular ducts 14 inches or Over 14[a] inches	0.0157 (0.3950 mm)	28	0.0175
	0.0187 (0.4712 mm)	26	0.018

For SI: 1 inch = 25.4 mm.

a. For duct gages and reinforcement requirements at static pressures of 1/2 inch, 1 inch and 2 inches w.g., SMACNA *Duct Construction Standard*, Tables 2-1; 2-2 and 2-3 shall apply.

Reason: This unnecessary cost increase offers no justified benefit. 30 gage pipe is as structurally sound as a flexible duct and more durable. The code was modified with no substantiation.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIS-M-4-T. 603.4-RM-T. M1601.1.1(2)

M99–09/10
603.5

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

603.5 Nonmetallic ducts. Nonmetallic ducts shall be constructed with Class 0 or Class 1 duct material and shall comply ~~in accordance~~ with UL 181. Fibrous duct construction shall conform to the SMACNA *Fibrous Glass Duct Construction Standards* or NAIMA *Fibrous Glass Duct Construction Standards.* The maximum air temperature within nonmetallic ducts shall not exceed 250ºF (121ºC).

Reason: UL 181 is a testing standard, not a construction standard.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-8-603.5

M100–09/10
603.5.2 (New)

Proponent: James Karnes, representing Dura Tite Systems, LLC

Add new text as follows:

603.5.2 Nonmetallic duct fittings. Non metallic forced air duct fittings that are considered discrete shall pass testing in accordance with UL 2043.

Reason: Under the current code, duct fittings are not addressed. It is assumed in most jurisdictions that a fitting is part of the duct system, and therefore nonmetallic fittings should be addressed under section 603.5 Nonmetallic Ducts. Section 603.5 states requirements for nonmetallic ducts to be constructed with Class 0 or Class 1 material as tested under UL 723 using ASTM E-84 method. This section generally pertains to duct board products, and are considered continuous building products. Fittings are not addressed, and cannot be tested using UL 723 (ASTM E-84) due to the size limitations of the test chamber. Discrete products can be alternately tested using UL2043.

Discrete is identified as a non-continuous building product, and the definition has been accepted by the IMC in the past for electrical products such as speaker boxes. The UL 2043 utilizes a test chamber that is 24 inches cubed. UL 2043 is the alternate test method to UL 723, for discrete products.

This new sub-section will address nonmetallic fittings and clarify the standards for compliance within the code.

Toxicity of smoke is not tested for under UL 2043, nor under any other test method used in the codes. Toxicity of smoke is not a required test for any building product.

This section does not address plumbing fittings, which are generally solvent welded together, creating a continuous building product.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KARNES-M-1-603.5.2

M101–09/10
603.7

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

603.7 Rigid duct penetrations. Duct system penetrations of walls, floors, ceilings and roofs and air transfer openings in such building components shall be protected as required by Section 607~~. Ducts in a private garage and ducts~~ Ducts that penetrate~~ing the~~ a wall~~s~~ or ceiling~~s~~ that ~~separating~~ separates a dwelling from a private garage shall be continuous, ~~and~~ shall be constructed of sheet steel having a minimum thickness of ~~26 gage~~ 0.0187 inch (0.4712 mm)

(No.26 Gage) ~~galvanized sheet metal~~ and shall have no openings into the garage. Fire and smoke dampers are not required in such ducts passing through the wall or ceiling separating a dwelling from a private garage except where required by Chapter 7 of the *International Building Code*.

Reason: As currently written, this section literally says that there cannot be openings in any ducts that are located in a private garage, even those that do not penetrate walls or ceilings. Ducts that serve only the garage and do not pass through separation walls or ceilings need not be restricted to 26 gage and, of course, must have openings in order to serve their purpose. This is a simple fix that eliminates some unintended language.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-32-603.7

M102–09/10
603.7 (New); IRC M1601.1.2 (New)

Proponent: Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Add new text as follows:

603.7 Above ground plastic ducts. Plastic ducts and fittings not listed in compliance with UL 181 shall be prohibited above grade.

PART II – IRC MECHANICAL

Add new text as follows:

M1601.1.2 Prohibited ducts. Plastic ducts and fittings not listed as in compliance with UL 181 shall be prohibited above grade.

Reason: (**PART I**) Current code fails to say anything about the use of plastic ducts and fittings above grade. Section 603.8 is titled "underground ducts" and that's the only place that references an approved installation for plastic duct. Unfortunately, some believe that since they are not strictly prohibited they must be permitted, even absent code guidance for the installation. Until such time as industry comes out with an accepted standard and installation criteria similar to what is required for plumbing piping and fittings, the mechanical code needs to take a position on the use of the material.

(**PART II**) Current code fails to say anything about the use of plastic ducts and fittings above grade. The only reference is existing Section 1601.1.2 titled "underground ducts," and that's the only place that references an approved installation for plastic duct. Unfortunately, some believe that since they are not strictly prohibited they must be permitted, even absent code guidance for the installation. Until such time as industry comes out with an accepted standard and installation criteria similar to what is required for plumbing piping and fittings, the mechanical code needs to take a position on the use of the material.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:T OMBERLIN-M-10-603.7-RM-3-M1601.1.2

M103–09/10
603.8; IRC M1601.1.2

Proponent: Larry J. Larson, representing Wheeling Service and Supply, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

603.8 Underground ducts. Ducts shall be *approved* for underground installation. Metallic ducts not having an *approved* protective coating shall be completely encased in a minimum of 2 inches (51 mm) of concrete.

Factory-built PVC-coated metallic ducts constructed of hot dipped galvanized steel with a minimum coating weight of G-60 and with an exterior coating not less than 4 mils thick, shall not be required to be encased in concrete. The interior coating for PVC-coated ducts conveying corrosive fumes shall be not less than 4 mils thick. For PVC-coated ducts conveying non-corrosive fumes the interior coating shall be epoxy not less than 0.15 mils thick. PVC-coated ducts with diameters of 14 inches or larger shall be corrugated for additional strength. PVC-coated ducts shall be spirally wound with a continuous spiral lock seam joint. PVC-coated ducts shall be identified with the manufacturer's name, product name, and maximum rated positive and negative pressures. Fittings, sleeves, and connectors used with PVC-coated ducts shall be manufactured from the same material as the ducts.

PART II – IRC MECHANICAL

Revise as follows:

M1601.1.2 Underground duct systems. Underground *duct systems* shall be constructed of *approved* concrete, clay, metal or plastic. The maximum duct temperature for plastic ducts shall not be greater than 150°F (66°C). Metal ducts shall be protected from corrosion in an *approved* manner or shall be completely encased in concrete not less than 2 inches (51 mm) thick. Nonmetallic ducts shall be installed in accordance with the manufacturer's installation instructions. Plastic pipe and fitting materials shall conform to cell classification 12454-B of ASTM D 1248 or ASTM D 1784 and external loading properties of ASTM D 2412. All ducts shall slope to an accessible point for drainage. Where encased in concrete, ducts shall be sealed and secured prior to any concrete being poured. Metallic ducts having an *approved* protective coating and nonmetallic ducts shall be installed in accordance with the manufacturer's installation instructions.

Factory-built PVC-coated metallic ducts constructed of hot dipped galvanized steel with a minimum coating weight of G-60 and with an exterior coating not less than 4 mils thick, shall not be required to be encased in concrete. The interior coating for PVC-coated ducts conveying corrosive fumes shall be not less than 4 mils thick. For PVC-coated ducts conveying non-corrosive fumes the interior coating shall be epoxy not less than 0.15 mils thick. PVC-coated ducts with diameters of 14 inches or larger shall be corrugated for additional strength. PVC-coated ducts shall be spirally wound with a continuous spiral lock seam joint. PVC-coated ducts shall be identified with the manufacturer's name, product name, and maximum rated positive and negative pressures. Fittings, sleeves, and connectors used with PVC-coated ducts shall be manufactured from the same material as the ducts.

Reason: The purpose of this change is to clarify the code. Polyvinyl coated ducts have been used for underground installations for more than 40 years without concrete encasement. Solid PVC ducts and fittings are approved under 603.8.3. Metallic ducts with PVC fused to galvanized steel should also be accepted but without the need of concrete encasement. This change in the code would specify a metallic duct with an approved protective coating.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LARSON-M-1-603.8-M1601.1.2

M104–09/10
603.8.4 (New)

Proponent: Eli P. Howard, III, Sheet Metal and Air Conditioning Contractors National Association, Inc.

Add new text as follows:

603.8.4 Metal Ducts and fittings. Metal ducts and fittings made from the following materials are allowed for underground applications: Vinyl chloride coated steel (PVC, PVS) with a minimum thickness of 4 mils on the surface in contact with the soil or fill material, aluminized steel, stainless steel and FRP.

Reason: These types of materials have been used for years for underground ductwork and other underground applications such as culvert piping. SMACNA produces standards in HVAC, PVC and FRP for the construction and installation of these materials.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOWARD-M-5-603.8.4

M105 –09/10
603.9; IRC M1601.4.1

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

603.9 Joints, seams and connections. All longitudal and transverse joints, seams and connections in metallic and nonmetallic ducts shall be constructed as specified in SMACNA HVAC *Duct Construction Standards — Metal and Flexible* and NAIMA *Fibrous Glass Duct Construction Standards* . All joints, longitudinal and transverse seams, and connections in ductwork shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, liquid sealants or tapes. Closure systems used to seal ductwork listed and labeled in accordance with UL 181A shall be marked "181A-P" for pressure-sensitive tape, "181 A-M" for mastic or "181 A-H" for heat-sensitive tape. Closure systems used to seal flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181B-FX" for pressure-sensitive tape or "181B-M" for mastic. Duct connections to flanges of air distribution system equipment shall be sealed and mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked "181B-C". Closure systems used to seal metal ductwork shall be installed in accordance with the manufacturer's installation instructions. Unlisted duct tape is not permitted as a sealant on any ~~metal~~ duct~~s~~.

> **Exception**: Continuously welded and locking-type longitudinal joints and seams in ducts operating at static pressures less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems.

PART II – IRC MECHANICAL

Revise as follows:

M1601.4.1 Joints and seams. Joints of *duct systems* shall be made substantially airtight by means of tapes, mastics, liquid sealants, gasketing or other *approved* closure systems. Closure systems used with rigid fibrous glass ducts shall comply with UL181A and shall be marked 181A-P for pressure-sensitive tape, 181A-M for mastic or 181 A-H for heat-sensitive tape. Closure systems used with flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked 181B-FX for pressure-sensitive tape or 181B-M for mastic. Duct connections to flanges of air distribution system *equipment* or sheet metal fittings shall be mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked 181B-C. Crimp joints for round metal ducts shall have a contact lap of at least 11/2 inches (38 mm) and shall be mechanically fastened by means of at least three sheet-metal screws or rivets equally spaced around the joint. Closure systems used to seal metal ductwork shall be installed in accordance with the manufacturer's installation instructions. Unlisted duct tape is not permitted as a sealant on any duct.

Exceptions:

1. Spray polyurethane foam shall be permitted to be applied without additional joint seals.
2. Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion of the joint so as to prevent a hinge effect.
3. Continuously welded and locking type longitudinal joints and seams in ducts operating at static pressures less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems.

Reason: Unlisted duct tape should not be permitted as a sealant on any metallic or nonmetallic duct.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-12-603.9-RM-M1601.4.1

M106–09/10
603.10

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Delete and substitute as follows:

~~**603.10 Supports.** Ducts shall be supported with approved hangers at intervals not exceeding 10 feet (3048 mm) or by other approved duct support systems designed in accordance with the International Building Code. Flexible and other factory-made ducts shall be supported in accordance with the manufacturer's installation instructions~~.

603.10 Supports. Ducts shall be supported in accordance with Chapter 5 of the SMACNA HVAC Duct Construction Standards- Metal and Flexible or by other approved supporting systems. Flexible and other factory-made ducts shall be supported in accordance with the manufacturer's installation instructions.

Reason: The SMACNA Standard permits some sizes to be supported at intervals greater than 10 feet such as 4 inch. The IBC does not govern how ducts are to be supported, that's between the IMC and SMACNA. The code official can approve any engineered system with proper back-up.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-37-603.10

M107–09/10
603.14

Proponent: Jonathan C. Siu, City of Seattle, WA, Seattle Department of Planning & Development

Revise as follows:

603.14 Location. Ducts shall not be installed in or within 4 inches (102 mm) of the earth, except where such ducts comply with Section 603.8. Duct installations shall comply with the headroom requirements specified in the *International Building Code*.

Reason: The International Mechanical Code regulates ducts but is silent on the requirement to maintain minimum ceiling heights. This proposal adds a cross-reference to help ensure designs are compatible with the requirements of the International Building Code.

In our experience, this is mainly an issue in parking garages, where ducts may be installed across driving or walking aisles, without regard to the ceiling height requirements. As such, the proposal could be revised to more narrowly apply just to parking garages ("Duct installations in parking garages shall comply…"), but if that is done, it may imply that headroom requirements need not be met for occupied areas of a building.

Note that part of the problem may be the result of design sequencing—the building shell may be fully designed and actually under construction before the mechanical designer/contractor is brought on board. At that point, the ceiling heights have already been determined, and it may be difficult for the mechanical designer to work around them, if he/she is even aware of the requirements. While this proposal will not fix that issue, it will alert the mechanical designer that it is an issue that will need to be addressed.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SIU-M-2-603.14

M108–09/10
603.17.3 (New), Chapter 15

Proponent: Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

1. Add new text as follows:

603.17.Air dispersion systems. Air dispersion systems shall:

1. Be installed entirely in exposed locations.
2. Be utilized in systems under positive pressure.
3. Not pass through or penetrate fire–resistant rated construction.
4. Be listed and labeled in compliance with UL 2518.

2. Add new standard to Chapter 15 as follows:

UL
2518–02 Air Dispersion System Materials

Reason: This system was removed from the 09 IMC because of lack of a Standard reference. Instead of industry coming back with a Standard they let the section be removed from the code. I researched the original proposal from the 07 code development cycle and found the original proposal that included a reference to UL Standard 2518–02. It was removed because the Standard's text failed to meet ICC criteria Section 3.6. Even though, the 07 Supplement still permitted this technology to be installed and many of these systems are installed today and working effectively. My position is if it's out there with no related problems and no standard then why not incorporate the product into the code and utilize the industry standard that is currently in place to specifically address this application? The term is currently defined in Chapter 2 of the 2009 IMC

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard, UL 2518-02, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-M-16-603.17.3

M109–09/10
603.18 (New)

Proponent: Eli P. Howard, III, Sheet Metal and Air Conditioning Contractors National Association, Inc.

Add new text as follows:

603.18 Balancing. Duct systems shall be balanced as specified in SMACNA *HVAC Systems Testing, Adjusting & Balancing*. Such balancing shall verify that the duct system and its branches is capable of supplying the airflow rates required by Section 603.2.

Reason: The current balancing requirements in the IMC does not provide for clearly defined methods or procedures for testing, adjusting, and balancing of HVAC systems. SMACNA's *HVAC Systems Testing, Adjusting & Balancing* manual provides specific methods and procedures—a complete process—that ensures all HVAC systems have been properly adjusted and balanced.

Cost Impact: Using established, time-tested procedures to correctly balance HVAC airflows the first time should have no cost impact.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOWARD-M-4-603.18

M110–09/10
[E] 604.2 (New); IRC M1601.4 (New)

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Add new text as follows:

[E] 604.2 Duct and plenum insulation, where required. Supply and return air ducts and plenums shall be insulated with a minimum of R-5 insulation where located in unconditioned spaces and with a minimum of R-8 insulation where located outside of the building. Where located within a building envelope assembly, the duct or plenum shall be separated from the building exterior and unconditioned or exempt spaces by a minimum of R-8 insulation.

Exceptions:

1. Where located within equipment.
2. Where the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15°F (8°C).

PART II – IRC MECHANICAL

Add new text as follows:

M1601.4 Duct and plenum insulation. Supply and return air ducts and plenums shall be insulated with a minimum of R-5 insulation where located in unconditioned spaces and with a minimum of R-8 insulation where located outside of the building. Where located within a building envelope assembly, the duct or plenum shall be separated from the building exterior, unconditioned spaces and exempt spaces by a minimum of R-8 insulation.

Exceptions:

1. Where located within equipment.
2. Where the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15°F (8°C).

Reason: This is last cycles M-82, extracted from IECC Section 503.2.7 and needs to be included here in the IMC. Although this is located in the commercial chapter of the Energy Code, it will still apply to residential construction as well. The duct does not know if it's in a house or a mall. There will be no confusion as to what committee will have the maintenance responsibility as this is a simple extraction. Section 604 tells us everything except where insulation is required. It would be appropriate for inspectors and installers to have this information readily available in this document and not have to locate a second code to come up with the answer. There is no new language here and this added text would make 604 more convenient and complete**.**

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-6-604.2-RM-5-M1601.4

M111–09/10
604.3; IRC M1601.3

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

604.3 Coverings and linings. Coverings and linings, including adhesives when used, shall have a flame spread index not more than 25 and a smoke-developed index not more than 50, when tested in accordance with ASTM E 84 or UL 723, using the specimen preparation and mounting procedures of ASTM E 2231. Duct coverings and linings shall not flame, glow, smolder or smoke when tested in accordance with ASTM C 411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250ºF (121ºC). Coverings and linings shall be listed and labeled.

PART II – IRC MECHANICAL

Revise as follows:

M1601.3 Duct insulation materials. Duct insulation materials shall conform to the following requirements:

1. Duct coverings and linings, including adhesives where used, shall have a flame spread index not higher than 25, and a smoke-developed index not over 50 when tested in accordance with ASTM E 84 or UL 723, using ` the specimen preparation and mounting procedures of ASTM E 2231.

   Exception: Spray application of polyurethane foam to the exterior of ducts in *attics* and crawl spaces shall be permitted subject to all of the following:

   1. The flame spread index is not greater than 25 and the smoke-developed index is not greater than 450 at the specified installed thickness.
   2. The foam plastic is protected in accordance with the ignition barrier requirements of Sections R316.5.3 and R316.5.4.
   3. The foam plastic complies with the requirements of Section R316.

2. Duct coverings and linings shall not flame, glow, smolder or smoke when tested in accordance with ASTM C 411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C). Coverings and linings shall be listed and labeled.
3. External duct insulation and factory-insulated flexible ducts shall be legibly printed or identified at intervals not longer than 36 inches (914 mm) with the name of the manufacturer, the thermal resistance *R*-value at the specified installed thickness and the flame spread and smoke-developed indexes of the composite materials. Spray polyurethane foam manufacturers shall provide the same product information and properties, at the nominal installed thickness, to the customer in writing at the time of foam application. All duct insulation product *R*-values shall be based on insulation only, excluding air films, vapor retarders or other duct components, and shall be based on tested C-values at 75°F (24°C) mean temperature at the installed thickness, in accordance with recognized industry procedures. The installed thickness of duct insulation used to determine its *R*-value shall be determined as follows:
   3.1. For duct board, duct liner and factory-made rigid ducts not normally subjected to compression, the nominal insulation thickness shall be used.
   3.2. For ductwrap, the installed thickness shall be assumed to be 75 percent (25-percent compression) of nominal thickness.
   3.3. For factory-made flexible air ducts, The installed thickness shall be determined by dividing the difference between the actual outside diameter and nominal inside diameter by two.
   3.4. For spray polyurethane foam, the aged *R*-value per inch measured in accordance with recognized industry standards shall be provided to the customer in writing at the time of foam application. In addition, the total *R*-value for the nominal application thickness shall be provided.

Reason: Surface burning characteristics of coverings and linings is a life safety issue. Only listing and labeling of a product can verify that the product installed at a jobsite is composed of the same material originally tested.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:E UGENE-M-16-604.3-RM-M1601.3

M112–09/10
604.8.1 (New); IRC M1601.3

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Add new text as follows:

604.8.1 Liner prohibition. Duct lining insulation material shall be prohibited in ducts and plenums used exclusively for evaporative cooling systems.

PART II – IRC MECHANICAL

Revise as follows:

M1601.3 Duct insulation materials. Duct insulation materials shall conform to the following requirements:

1. Duct coverings and linings, including adhesives where used, shall have a flame spread index not higher than 25, and a smoke-developed index not over 50 when tested in accordance with ASTM E 84 or UL 723, using ` the specimen preparation and mounting procedures of ASTM E 2231.

   Exception: Spray application of polyurethane foam to the exterior of ducts in *attics* and crawl spaces shall be permitted subject to all of the following:

   1. The flame spread index is not greater than 25 and the smoke-developed index is not greater than 450 at the specified installed thickness.
   2. The foam plastic is protected in accordance with the ignition barrier requirements of Sections R316.5.3 and R316.5.4.
   3. The foam plastic complies with the requirements of Section R316.

2. Duct coverings and linings shall not flame, glow, smolder or smoke when tested in accordance with ASTM C 411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C). Duct lining insulation material shall be prohibited in ducts and plenums used exclusively for evaporative cooling systems.
3. External duct insulation and factory-insulated flexible ducts shall be legibly printed or identified at intervals not longer than 36 inches (914 mm) with the name of the manufacturer, the thermal resistance *R*-value at the specified installed thickness and the flame spread and smoke-developed indexes of the composite materials. Spray polyurethane foam manufacturers shall provide the same product information and properties, at the nominal installed thickness, to the customer in writing at the time of foam application. All duct insulation product *R*-values shall be based on insulation only, excluding air films, vapor retarders or other duct

components, and shall be based on tested C-values at 75°F (24°C) mean temperature at the installed thickness, in accordance with recognized industry procedures. The installed thickness of duct insulation used to determine its *R*-value shall be determined as follows:

3.1. For duct board, duct liner and factory-made rigid ducts not normally subjected to compression, the nominal insulation thickness shall be used.

3.2. For ductwrap, the installed thickness shall be assumed to be 75 percent (25-percent compression) of nominal thickness.

3.3. For factory-made flexible air ducts, The installed thickness shall be determined by dividing the difference between the actual outside diameter and nominal inside diameter by two.

3.4. For spray polyurethane foam, the aged *R*-value per inch measured in accordance with recognized industry standards shall be provided to the customer in writing at the time of foam application. In addition, the total *R*-value for the nominal application thickness shall be provided.

Reason: Installing liner in evaporative systems would result in a serious mold condition. This simply states the obvious, that this would not be a best practice.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-9-604.8.1-RM-M1601.3

M113–09/10
606.2.1

Proponent: Robert Adkins, Prince William, VA, representing the VA Plumbing & Mechanical Inspectors Association/VA Building and Code Officials Association

Revise as follows:

606.2.1 Return air systems. Smoke detectors shall be installed in return air systems with a ~~design~~ capacity greater than 2,000 cfm (0.9 m^3/s), in the return air duct or plenum upstream of any filters, exhaust air connections, outdoor air connections, or decontamination equipment and appliances.

Exception: Smoke detectors are not required in the return air system where all portions of the building served by the air distribution system are protected by area smoke detectors connected to a fire alarm system in accordance with the *International Fire Code*. The area smoke detection system shall comply with Section 606.4.

Reason: Most air moving appliances today has variable speed fan motors. If the smoke detectors are necessary @ 2000cfm and the appliance is capable of moving that amount of air, the detector should be installed. A simple wire change could create a non-compliant situation.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: A DKINS-M-1-606.2.1

M114–09/10
801.16.1; IRC R1003.11.1

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

801.16.1 Residential and low-heat appliances (general). Flue lining systems for use with residential-type and low-heat appliances shall be limited to the following:

1. Clay flue lining complying with the requirements of ASTM C 315 or equivalent. Clay flue lining shall be installed in accordance with the *International Building Code*.
2. Listed and labeled chimney lining systems complying with UL 1777.
3. Other approved materials that will resist, without cracking, softening or corrosion, flue gases and condensate at temperatures up to 1,800°F (982°C).

PART II – IRC MECHANICAL

Revise as follows:

R1003.11.1 Residential-type appliances (general). Flue lining systems shall comply with one of the following:

1. Clay flue lining complying with the requirements of ASTM C 315.
2. Listed and labeled chimney lining systems complying with UL 1777.
3. Factory-built chimneys or chimney units listed for installation within masonry chimneys.
4. Other *approved* materials that will resist corrosion, erosion, softening or cracking from flue gases and condensate at temperatures up to 1,800°F (982°C).

Reason: Only listed products that are labeled have been subjected to periodic, unannounced inspections during production.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-13-801.16.1-RB-R1003.11.1

M115–09/10
804.3, Chapter 15

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

804.3 Mechanical draft systems. Mechanical draft systems of either forced or induced draft design shall be listed and labeled in accordance with UL 378 and shall comply with Sections 804.3.1 through 804.3.7

2. Add new standard to Chapter 15 as follows:

UL
378-06 Draft Equipment

Reason: UL 378 includes a comprehensive set of construction and performance requirements that are used to evaluate and list draft equipment. Five companies currently have draft equipment listed. Only listed products that are labeled have been subjected to periodic, unannounced inspections during production.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard UL 378-06, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-5-804.3-CH 15

M116–09/10
804.3.8, Chapter 15

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

804.3.8 Mechanical draft systems for manually fired appliances and fireplaces. A mechanical draft system shall be permitted to be used with manually fired appliances and fireplaces where such system complies with all of the following requirements:

1. The mechanical draft device shall be listed and labeled in accordance with UL 378, and shall be installed in accordance with the manufacturer's installation instructions.
2. A device shall be installed that produces visible and audible warning upon failure of the mechanical draft device or loss of electrical power, at any time that the mechanical draft device is turned on. This device shall be equipped with a battery backup if it receives power from the building wiring.
3. A smoke detector shall be installed in the room with the appliance or fireplace. This device shall be equipped with a battery backup if it receives power from the building wiring.

2. Add new standard to Chapter 15 as follows:

UL
378-06 Draft Equipment

Reason: UL 378 includes a comprehensive set of construction and performance requirements that are used to evaluate and list draft equipment. Five companies currently have draft equipment listed. Only listed products that are labeled have been subjected to periodic, unannounced inspections during production. Only listed products that are labeled have been subjected to periodic, unannounced inspections during production.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard UL 378-06, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-17-804.3.8-CH 15

M117–09/10
805.3 (New); IRC R1005.7 (New)

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Add new text as follows:

805.3 Factory built chimney offsets. Where a factory-built chimney assembly incorporates offsets, no part of the chimney shall be at an angle of more than 30 degrees from vertical at any point in the assembly and the chimney assembly shall not include more than 4 elbows.

PART II – IRC MECHANICAL

Add new text as follows:

R1005.7 Factory built chimney offsets. Where a factory-built chimney assembly incorporates offsets, no part of the chimney shall be at an angle of more than 30 degrees from vertical at any point in the assembly and the chimney assembly shall not include more than 4 elbows.

Reason: This language comes directly from UL-103, Section 7.8. This is vital information the inspection community needs to properly inspect these installations. Some of the problems in quoting standards is the pertinent information in those standards are not printed in the code. Inspectors don't carry around UL-103 and as a result, would not have any clue that these requirements even exist, resulting in approving an installation incorrectly.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-13-805.3-RB-3-1005.7

M118–09/10
901.4, Chapter 15

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

901.4 Fireplace accessories. Listed and labeled fireplace accessories shall be installed in accordance with the conditions of the listing and the manufacturer's installation instructions. Fireplace accessories shall comply with UL 907.

2. Add new standard to Chapter 15 as follows:

UL
907-94 Fireplace Accessories – with revisions through July 2006

Reason: UL 907 includes a comprehensive set of construction and performance requirements that are used to evaluate and list fireplace accessories. Eight companies currently have fireplace accessories listed. Only listed products that are labeled have been subjected to periodic, unannounced inspections during production.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard UL 907-94, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-18-901.4-CH 15

M119–09/10
903.2, 905.3 (New), Chapter 15; IRC R1004.2, Chapter 44

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

1. Revise as follows:

903.2 Hearth extensions. Hearth extensions of approved factory-built fireplaces ~~and fireplace stoves~~ shall be installed in accordance with the listing of the fireplace. The hearth extension shall be readily distinguishable from the surrounding floor area. Listed and labeled hearth extensions shall comply with UL 1618.

2. Add new text as follows:

905.3 Hearth extensions. Hearth extensions for fireplace stoves shall be installed in accordance with the listing of the fireplace stove. The hearth extension shall be readily distinguishable from the surrounding floor area. Listed and labeled hearth extensions shall comply with UL 1618.

2. Add new standard to Chapter 15 as follows:

UL
1618-09 Wall Protectors, Floor Protectors, and Hearth Extensions

PART II – IRC BUILDING/ENERGY

1. Revise as follows:

R1004.2 Hearth extensions. Hearth extensions of *approved* factory-built fireplaces shall be installed in accordance with the *listing* of the fireplace. The hearth extension shall be readily distinguishable from the surrounding floor area. Listed and labeled hearth extensions shall comply with UL 1618.

2. Add new standard to Chapter 44 as follows:

UL
1618-09 Wall Protectors, Floor Protectors, and Hearth Extensions

Reason: The UL 1618 standard includes a comprehensive set of construction and performance requirements that are used to evaluate and list wall protectors, floor protectors, and hearth extensions that are intended for use with heat producing devices, such as fireplaces, fireplace stoves, fireplace inserts, and solid-fuel type room heaters. This proposal also provides an alternative for the use of listed hearth extensions instead of built on-site.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard UL 1619-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-20-903.2-CH 15-R1004.2-CH 44

M120–09/10
908.1

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

908.1 General. A cooling tower used in conjunction with an air-conditioning appliance shall be installed in accordance with the manufacturer's installation instructions. Cooling towers shall comply with UL 1995.

Reason: UL 1995 is already referenced in Chapter 15. UL 1995 includes a comprehensive set of construction and performance requirements that are used to evaluate and list cooling towers, and is already adopted by reference in other sections of the IMC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Eugene-M-22-908.1

M121–09/10
911.1, Chapter 15; IRC M1407.1, Chapter 44

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

1. Revise as follows:

911.1 General. Duct furnaces shall be installed in accordance with the manufacturer's installation instructions. Electric duct furnaces shall ~~be tested in accordance~~ comply with UL ~~1995~~ 1996.

2. Add new standard to Chapter 15 as follows:

UL
1996- 04 Electric Duct Heaters – with revisions through December 2006

PART II – IRC MECHANICAL

1. Revise as follows:

M1407.1 General. Electric duct heaters shall be installed in accordance with the manufacturer's installation instructions and Chapters 34 through 43 of this code. Electric ~~furnaces~~ duct heaters shall ~~be tested in accordance~~ comply with UL ~~1995~~. 1996.

2. Add new standard to Chapter 44 as follows:

UL
1996- 04 Electric Duct Heaters – with revisions through December 2006

Reason: This proposal changes the referenced standard from the standard for heating and cooling equipment, UL 1995, to the more appropriate standard for electric duct heaters, UL 1996. UL 1996 includes a comprehensive set of construction and performance requirements that are specifically used to evaluate and list electric duct furnaces. 15 companies currently have duct furnaces listed.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard UL 1996-04, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-24-911.1-CH 15-RM-9-M1407.1-CH 44

M122–09/10
912.1, Chapter 15

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

912.1 Support. Infrared radiant heaters shall be fixed in a position independent of fuel and electric supply lines. Hangers and brackets shall be noncombustible material. Electric infrared radiant heaters shall comply with UL 499.

2. Add new standard to Chapter 15 as follows:

UL
499-05 Electric Heating Appliances – with revisions through August 2008.

Reason: UL 499 includes a comprehensive set of construction and performance requirements that are specifically used to evaluate and list electric infrared radiant heaters.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard UL 499-06, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-26-912.1-CH 15

M123–09/10
922.1

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

922.1 General. Kerosene and oil-fired stoves shall be listed and labeled and shall be installed in accordance with the conditions of the listing and the manufacturer's installation instructions. Kerosene and oil-fired stoves shall comply with NFPA 31 and ~~Oil-fired stoves shall be tested in accordance with~~ UL 896.

Reason: UL 896 is the standard used for testing both oil-fired and kerosene-fired stoves.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-28-922.1

M124–09/10
923.1, Chapter 15

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

923.1 General. The provisions of this section shall apply to kilns that are used for ceramics, have a maximum interior volume of 20 cubic feet (0.566 m^3) and are used for hobby and noncommercial purposes. Electric kilns shall comply with UL 499.

2. Add new standard to Chapter 15 as follows:

UL
499- 05 Electric Heating Appliances – with revisions through August 2008.

Reason: UL 499 includes a comprehensive set of construction and performance requirements that are specifically used to evaluate and list electric kilns. Seven companies currently have electric kilns listed.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard UL 499-06, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-19-923.1-CH 15

M125–09/10
928 (New), Chapter 15

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Add new text as follows:

SECTION 928
RADIANT HEATING SYSTEMS

928.1 General. Electric radiant heating systems shall be installed in accordance with the manufacturer's installation instructions and shall be listed for the application. Electric radiant heating panels and heating panel sets shall comply with UL 1693. Electric space heating cables shall comply with UL 1673.

928.2 Clearances. Clearances for radiant heating panels or elements to any wiring, outlet boxes and junction boxes used for installing electrical devices or mounting luminaires shall be in accordance with NFPA 70.

928.3 Installation on wood or steel framing. Radiant panels installed on wood or steel framing shall conform to the following requirements:

1. Heating panels shall be installed parallel to framing members and secured to the surface of framing members or shall be mounted between framing members.
2. Mechanical fasteners shall penetrate only the unheated portions provided for this purpose. Panels shall not be fastened at any point closer than ¼ inch (7 mm) to an element. Other methods of attachment of the panels shall be in accordance with the panel installation instructions.
3. Unless listed and labeled for field cutting, heating panels shall be installed as complete units.

928.4 Installation in concrete or masonry. Radiant heating systems installed in concrete or masonry shall conform to the following requirements:

1. Radiant heating systems shall be identified as being suitable for the installation, and shall be secured in place as specified in the manufacturer's installation instructions.

2. Radiant heating panels and radiant heating panel sets shall not be installed where they bridge expansion joints unless protected from expansion and contraction.

928.5 Finish surfaces. Finish materials installed over radiant heating panels and systems shall be installed in accordance with the manufacturer's installation instructions. Surfaces shall be secured so that fasteners do not pierce the radiant heating elements.

2. Add new standards to Chapter 15 as follows:

UL

1673-96	Electric Space Heating Cables – with revisions through July 2003
1693-02	Electric Radiant Heating Panels and Heating Panel Sets

Reason: The requirements included in this new section cover the installation of radiant heating systems. They are based on requirements included in Section M1406 of the International Residential Code. UL 1673 and UL 1693 are the standards used to investigate and list electric space heating cables and electric radiant heating panels. Over 20 companies have listings for these products.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standards UL 1673-96 and UL 1693-02, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-21-928-CH 15

M126–09/10
928 (New), 928.1 (New); IRC M1413.1, M1413.2

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Add new text as follows:

SECTION 928
EVAPORATIVE COOLING EQUIPMENT

928.1 General. Evaporative cooling equipment shall:

1. Be installed in accordance with the manufacturer's installation instructions.
2. Be installed on level platforms in accordance with Section 304.10.
3. Have openings in exterior walls or roofs flashed in accordance with the *International Building Code*.
4. Be provided with potable water backflow protection in accordance with Section 608 of the *International Plumbing Code*.
5. Have air intake opening locations in accordance with Section 401.4.

Reason: Evaporative coolers are currently not addressed in the IMC and are notorious for being installed too close to contaminants such as water heater vents, plumbing vents, etc. When installed incorrectly, high costs are incurred to fix the problem. This added text will provide guidance currently not covered in this code.

Cost Impact: The code change proposal will not increase the cost of construction.

PART II – IRC MECHANICAL

Delete and substitute as follows:

~~**M1413.1 General**. Cooling equipment that uses evaporation of water for cooling shall be installed in accordance with the manufacturer's installation instructions. Evaporative coolers shall be installed on a level platform or base not less than 3 inches (76 mm) above the adjoining ground and secured to prevent displacement. Openings in exterior walls shall be flashed in accordance with Section R703.8.~~

~~**M1413.2 Protection of potable water**. The potable water system shall be protected from backflow in accordance with the provisions in Section P2902.~~

M1413.1 General. Evaporative cooling equipment shall be installed:

1. according to the manufacturer's installation instructions
2. on level platforms in accordance with Section M1305.1.4.1
3. so that openings in exterior walls are flashed in accordance with Section R703.8
4. so as to protect the potable water supply in accordance with Section P2902
5. so that air intake opening locations are in accordance with Section R303.4.1

Reason: Evaporative coolers are notorious for being installed too close to contaminants such as water heater vents, plumbing vents, etc. When installed incorrectly, high costs are incurred to fix the problem. These sections have been reorganized for ease of reading and # 5 has been added to point users to the correct intake section that will avoid these costly mistakes.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-4-928-RM-7-1413.1

M127–09/10
1002.1, Chapter 15; IRC M2005.1, Chapter 44

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

1. Revise as follows:

1002.1 General. Potable water heaters and hot water storage tanks shall be listed and labeled and installed in accordance with the manufacturer's installation instructions, the *International Plumbing Code* and this code. All water heaters shall be capable of being removed without first removing a permanent portion of the building structure. The potable water connections and relief valves for all water heaters shall conform to the requirements of the *International Plumbing Code* . Domestic electric water heaters shall comply with UL 174 or UL 1453. Commercial electric water heaters shall comply with UL 1453. Oil-fired water heaters shall comply with UL 732. Solid-fuel-fired water heaters shall comply with UL 2523. Thermal solar water heaters shall comply with Chapter 14 and UL 174 or UL 1453.

2. Add new standard to Chapter 15 as follows:

UL
2523-09 Outline of Investigation for Solid Fuel-Fired Water Heaters and Boilers

PART II – IRC MECHANICAL

1. Revise as follows:

M2005.1 General. Water heaters shall be installed in accordance with the manufacturer's installation instructions and the requirements of this code. Water heaters installed in an attic shall conform to the requirements of Section M1305.1.3. Gas-fired water heaters shall conform to the requirements in Chapter 24. Domestic electric water heaters shall conform to UL 174 or UL 1453. Commercial electric water heaters shall conform to UL 1453. Oiled-fired water heaters shall conform to UL 732. Thermal solar water heaters shall comply with Chapter 23 and UL 174. Solid-fuel-fired water heaters shall comply with UL 2523.

2. Add new standard to Chapter 44 as follows:

UL
2523-09 Outline of Investigation for Solid Fuel-Fired Water Heaters and Boilers

Reason: The UL Subject 2523 Outline of Investigation includes a comprehensive set of construction and performance requirements that are used to evaluate and list factory built manually and/or automatically fueled solid fuel-fired water heaters. UL 174 is the standard used to evaluate and list thermal solar water heaters.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard UL 2523-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-23-1002.1-CH 15-RM-21-M2005.1-CH 44

M128–09/10
1004.1, Chapter 15; IRC M2001.1.1, Chapter 44

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

1. Revise as follows:

1004.1 Standards. Oil-fired boilers and their control systems shall be listed and labeled in accordance with UL 726. Electric boilers and their control systems shall be listed and labeled in accordance with UL 834. Solid-fuel-fired boilers shall be listed and labeled in accordance with UL 2523. Boilers shall be designed and constructed in accordance with the requirements of ASME CSD-1 and as applicable, the ASME *Boiler and Pressure Vessel Code* , Sections I or IV; NFPA 8501; NFPA 8502 or NFPA 8504.

2. Add new standard to Chapter 15 as follows:

UL
2523-09 Outline of Investigation for Solid Fuel-Fired Water Heaters and Boilers

PART II – IRC MECHANICAL

1. Revise as follows:

M2001.1.1 Standards. Oil-fired boilers and their control systems shall be listed and *labeled* in accordance with UL 726. Electric boilers and their control systems shall be *listed* in accordance with UL 834. Solid-fuel-fired boilers shall be listed and labeled in accordance with UL 2523. Boilers shall be designed and constructed in accordance with the requirements of ASME CSD-1 and as applicable, the ASME *Boiler and Pressure Vessel Code*, Sections I and IV. Gas-fired boilers shall conform to the requirements listed in Chapter 24.

2. Add new standard to Chapter 44 as follows:

UL
2523-09 Outline of Investigation for Solid Fuel-Fired Water Heaters and Boilers

Reason: UL's Subject 2523 Outline of Investigation includes a comprehensive set of construction and performance requirements that are used to evaluate and list factory built manually and/or automatically fueled solid fuel-fired boilers.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard UL 2523-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-25-1004.1-CH 15

M129–09/10
1004.3.1, Table 1004.3.1 (New)

Proponent: John England, MCO, England Enterprises, Inc.

1. Delete and substitute follows:

~~**1004.3.1 Top clearance.** High-pressure steam boilers having a steam-generating capacity in excess of 5,000 pounds per hour (2268 kg/h) or having a heating surface in excess of 1,000 square feet (93 m2) or input in excess of 5,000,000 Btu/h (1465 kW) shall have a minimum clearance of 7 feet (2134 mm) from the top of the boiler to the ceiling. Steam-heating boilers and hot-water-heating boilers that exceed one of the following limits: 5,000,000 Btu/h input (1465 kW); 5,000 pounds of steam per hour (2268 kg/h) capacity or a 1,000-square-foot (93 m2) heating surface; and high-pressure steam boilers that do not exceed one of the following limits: 5,000,000 Btu/h input (1465 kW); 5,000 pounds of steam per hour (2268 kg/h) capacity or a 1,000-square-foot (93 m2) heating surface; and all boilers with manholes on top of the boiler, shall have a minimum clearance of 3 feet (914 mm) from the top of the boiler to the ceiling. Package boilers, steam-heating boilers and hot-water-heating boilers without manholes on top of the shell and not exceeding one of the limits of this section shall have a minimum clearance of 2 feet (610 mm) from the ceiling.~~ Clearances from the tops of boilers to the ceiling or other obstruction shall set out in table 1004.3.1

1004.3.1 Top clearance. Clearances from the tops of boilers to the ceiling or other overhead obstruction shall be in accordance with Table 1004.3.1.

2. Add new table as follows:

(Underlining omitted for clarity)

TABLE 1004.3.1
BOILER TOP CLEARANCES

BOILER TYPE	MINIMUM CLEARANCES FROM TOP OF BOILER TO CEILING OR OTHER OVERHEAD OBSTRUCTION (feet)
All boilers with manholes on top of the boiler except where a greater clearance is required in this table	3
All boilers without manholes on top of the boiler except high-pressure steam boilers and where a greater clearance is required in this table	2
High-pressure steam boilers with steam generating capacity not exceeding 5,000 pounds per hour	3
High-pressure steam boilers with steam generating capacity exceeding 5,000 pounds per hour	7
High-pressure steam boilers having heating surface not exceeding 1,000 square feet (93 m^2)	3
High-pressure steam boilers having heating surface in excess of 1,000 square feet (93 m^2)	7
High-pressure steam boilers with input not exceeding 5,000,000 Btu/h (1465 kW)	3
High-pressure steam boilers with input in excess of 5,000,000 Btu/h (1465 kW)	7
Steam-heating boilers and hot-water-heating boilers with input exceeding 5,000,000 Btu/h (1465 kW);	3
Steam-heating boilers exceeding 5,000 pounds of steam per hour (2268 kg/h)	3
Steam-heating boilers and hot-water-heating boilers having heating surface exceeding1,000-square-foot (93 m^2)	3

Reason: Text is converted to a table for ease of reading.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: ENGLAND-M-4-1004.3.1

M130–09/10
1101.10; IRC M1411.6

Proponent: Wesley R. Davis, Air Conditioning Contractors of America

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Delete without substitution:

~~**1101.10 Locking access port caps.** Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps.~~

PART II – IRC

Delete without substitution:

~~**M1411.6 Locking access port caps.** Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps.~~

Reason: The requirement for locking caps creates an unnecessary cost. It fails to prevent the release of refrigerant, leads to uncontrolled catastrophic refrigerant release, and causes harm to the occupants by removing a heating or cooling source.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Davis-M-3-1101.10-RM-M1411.6

M131–09/10
1101.10; IRC M1411.6

Proponent: Patrick A. McLaughlin, McLaughlin & Associates, representing the Air-Conditioning, Heating and Refrigeration Institute

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise as follows:

1101.10 Locking access port caps. Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps or shall be otherwise protected from unauthorized access in an approved manner.

PART II – IRC MECHANICAL

Revise as follows:

M1411.6 Locking access port caps. Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps or shall be otherwise protected from unauthorized access in an approved manner.

Reason: During the last code cycle, the provision requiring locking-type tamper-resistant caps to restrict access to refrigerants was approved at the Final Action Hearings. This proposal would expand the means of restricting access to other approved methods. An example would be the placement of the equipment in inaccessible locations. Also, we are aware of only one locking-type tamper-resistant cap.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCLAUGHLIN-M-2-1101.10-M1411.6

M132–09/10
1101.10

Proponent: Jeffrey M. Shapiro, PE, International Code Consultants, representing the International Institute of Ammonia Refrigeration

Revise as follows:

1101.10 Locking access port caps. Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps or shall be otherwise secured to prevent unauthorized access.

Reason: The intent of this change is not to diminish the barrier to "huffing" that was established by adding Section 1101.10 to the 2009 code. Instead, it is to recognize that there are other methods whereby access ports can be secured. For example, in a refrigerated warehouse, a valve inside of the building may block the flow of refrigerant to the access port located outside except when filling is taking place. With this arrangement, no refrigerant is released even when the cap is removed when the valve is closed. Likewise, ports may be located with rooftop equipment having no access except via a roof hatch from the inside. Locking, tamper-resistant caps tend to be a more suitable solution for residential-style equipment with small access ports, and the code needs to be more flexible to accommodate industrial equipment at commercial facilities.

Cost Impact: The code change proposal may increase or decrease the cost of construction depending on the selected method.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SHAPIRO-M-2-1101.10

M133–09/10
1101.11.1 (New); IRC M1411.6.1 (New)

Proponent: Mona Casey, United Parents to Restrict Open Access to Refrigerant

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Add new text as follows:

1101.11.1 Existing systems. Existing refrigerant circuit access ports that are located outdoors shall be retrofitted with locking-type tamper-resistant caps whenever the refrigerant system is modified, serviced, or repaired.

PART II – IRC MECHANICAL

Add new text as follows:

M1411.6.1 Existing HVAC systems. Existing refrigerant circuit access ports that are located outdoors shall be retrofitted with locking-type tamper-resistant caps whenever the refrigerant system is modified, serviced, or repaired.

Reason: The purpose of this code modification is to add new requirements to the Code. The existing code does not address the issue of accessibility to refrigerant from pre-existing units by unauthorized individuals. Refrigerant is extremely dangerous and potentially lethal.

Facts:

- Refrigerant "can cause death without warning".
- Refrigerant is considered a gateway drug because users often progress from refrigerant use to drug and alcohol abuse.
- Refrigerant is not a cumulative substance where chances of dying from it increase as the dosage and number of use increases. It can kill on the 1st, 10th, 100th, or any other time. 33 percent of deaths resulting from refrigerant huffing occurred on the 1st use.
- Refrigerant, like other poisons, must be kept out of reach of children.
- Refrigerant theft is increasing.
- According to Mike Opitz, Certification Manager, LEED for Existing Buildings, U.S. Green Building Council, chlorine in CFCs and HCFCs destroy the ozone and depletes the Earth's natural shield for incoming ultraviolet radiation and absorb outgoing infrared radiation from the earth, functioning as potent greenhouse gases.

National Statistics:

- The National Institute on Drug Abuse reports that one in five American teens have used Inhalants to get high.
- According to Stephen J. Pasierb, President and CEO of The Partnership for Drug-Free America, 22% of 6th and 8th graders admitted abusing inhalants and only 3% of parents think their child has ever abused inhalants.
- An analysis of 144 Texas death certificates by the Texas Commission on Alcohol and Drug Abuse involving misuse of inhalants found that the most frequently mentioned inhalant (35%) was Freon (51 deaths). Of the Freon deaths, 42 percent were students or youth with a mean age of 16.4 years.
- Suffocation, inhaling fluid or vomit into the lungs, and accidents each cause about 15% of deaths linked to inhalant abuse.
- National Institute on Drug Abuse's 'Monitoring the Future' study reveals that inhalant abuse among 8th graders is up 7.7% since 2002.
- 55% of deaths linked to inhalant abuse are caused by "Sudden Sniffing Death Syndrome." SSDS can occur on the first use or any use. The
  Inhalant causes the heart to beat rapidly and erratically, resulting in cardiac arrest.
- 22% of inhalant abusers who died of SSDS had no history of previous inhalant abuse. In other words, they were first-time users.

Collier County, FL Statistics:

- The use of inhalants in middle schools has doubled in two years
- The average age a child starts using drugs or alcohol is just 12½
- Every third day a child is taken to the hospital because of a drug overdose
- 85 percent of all juvenile criminal cases are substance related
- Deaths due solely to drug toxicity increased 76% between 1998 and 2005

The modification of this code will have an immense positive impact on the safety and health of our citizens, especially our youth. It will reduce the number of deaths associated with Inhalant abuse and the number of injuries associated with Freon accidents and leaks.

Cost Impact: The code change proposal will increase the cost of construction by $20-$25.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CASEY-M-1-1101.11.1-RM-1-M1411.6.1

M134–09/10
Table 1103.1

Proponent: Steve Ferguson, American Society of Heating, Refrigerating, and Air-Conditioning Engineers

Revise table as follows:

[F] TABLE 1103.1
REFRIGERANT CLASSIFICATION, Amount and OEL

Chemical Refrigerant	Formula	Chemical Name of Blend	Refrigerant Classification	Degrees of Hazard[a]	[M] Amount Of Refrigerant Per Occupied Space			
					Pound per 1,000 cubic feet	ppm	g/m^3	OEL[e]
R-E170	CH_3OCH_3	methoxymethane (dimethyl ether)	A3		1	8,500	16	1,000
R-403A	zeotrope	R-290/22/218 (5/75/20)	~~A1~~ A2	2-0-0	7.6	33,000	120	1,000
R-433B	zeotrope	R-1270/290 (5.0-95.0)	A3		0.51	4,500	8.1	950
R-433C	zeotrope	R-1270/290 (25.0/75.0)	A3		0.41	3,600	6.6	790
R-438A	zeotrope	R-32/125/134a/600/601a (8.5/45.0/44.2/1.7/0.6)	A1		4.9	19,000	79	990
R-600a	$CH(CH_3)_2$-CH_3	~~isobutane (2-methyl propane)~~ 2-methyl propane (isobutane)	A3	2-4-0	0.6	4,000	9.6	1,000
R-601a	$(CH_3)_2CHCH_2CH_3$	2-methylbutane (isopentane)	A3		0.2	1,000	2.9	600

(Portions of table and notes not shown remain unchanged)

Reason: R-433B, R-433C, R-438A were recently added to ASHRAE Standard 34.

The classification of R-403A has been changed from A1 to A2 based on data developed as part of an ASHRAE research project using the current method of measuring the LFL of refrigerants.

The chemical names of R-E170, R-600a and R-601a have been changed to be consistent with IUPAC rules for naming organic compounds. The common names are listed in parenthesis.

If approved for publication by ASHRAE prior to the code hearings, a floor modification will be brought forward to add R-1234yf to this table.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FERGUSON-M-2-T. 1103.1

M135-09/10

1105.6, 1105.6.3 (New), 1105.6.3.1, 1105.6.3.2

Proponent: Jeffrey M. Shapiro, PE, International Code Consultants, representing the International Institute of Ammonia Refrigeration

1. Revise as follows:

1105.6 Ventilation. Machinery rooms shall be mechanically ventilated to the outdoors. ~~Mechanical ventilation shall be capable of exhausting the minimum quantity of air both at normal operating and emergency conditions. Multiple fans or multispeed fans shall be allowed in order to produce the emergency ventilation rate and to obtain a reduced airflow for normal ventilation.~~

Exception: Where a refrigerating system is located outdoors more than 20 feet (6096 mm) from any building opening and is enclosed by a penthouse, lean-to or other open structure, natural or mechanical ventilation shall be provided. Location of the openings shall be based on the relative density of the refrigerant to air. The free-aperture cross section for the ventilation of the *machinery room* shall be not less than:

$$F = \sqrt{G}$$ **(Equation 11-1)**

For SI:

$$F = 0.138\sqrt{G}$$

where:

F = The free opening area in square feet (m^2).
G = The mass of refrigerant in pounds (kg) in the largest system, any part of which is located in the *machinery room*.

2. Add new text as follows:

1105.6.3 Ventilation rate. For other than ammonia systems, the mechanical ventilation systems shall be capable of exhausting the minimum quantity of air both at normal operating and emergency conditions, as required by Sections 1105.6.3.1 and 1105.6.3.2. The minimum required ventilation rate for ammonia shall be in accordance with IIAR 2.

Multiple fans or multispeed fans shall be allowed to produce the emergency ventilation rate and to obtain a reduced airflow for normal ventilation.

3. Revise as follows:

~~1105.6.3~~ 1105.6.3.1 Quantity—normal ventilation. During occupied conditions, the mechanical ventilation system shall exhaust the larger of the following:

1. Not less than 0.5 cfm per square foot (0.0025 $m^3/s \cdot m^2$) of *machinery room* area or 20 cfm (0.009 m^3/s) per person; or
2. A volume required to limit the room temperature rise to 18°F (10°C) taking into account the ambient heating effect of all machinery in the room.

~~1105.6.4~~ **1105.6.3.2 Quantity—emergency conditions.** Upon actuation of the refrigerant detector required in Section 1105.3, the mechanical ventilation system shall *exhaust air* from the *machinery room* in the following quantity:

$$Q = 100 \, x \sqrt{G}$$ **(Equation 11-2)**

For SI: $Q = 0.07 \, x \sqrt{G}$

Where:

Q = The airflow in cubic feet per minute (m^3/s).
G = The design mass of refrigerant in pounds (kg) in the largest system, any part of which is located in the *machinery room.*

Reason: The proposed change will defer the required ventilation rate for ammonia refrigeration machinery rooms to IIAR2, which is the ANSI accredited industry standard. IIAR 2 is in the process of being revised to change the basis of calculating required ventilation to an "air changes per minute/hour" basis. There is general agreement in the industry that the minimum ventilation rate for ammonia needs to be greater than the rate calculated using the current formula, and IIAR 2 is out for public comment so that a consensus rate that is unique based on the properties of ammonia can be established. It is anticipated that the public comment period for IIAR 2 will close prior to the ICC hearing in Baltimore, and additional information on the new calculation approach will be presented at that time to support this proposal.

As part of this change, requirements related to the required ventilation rate in Section 1105.6 have been moved to Section 1105.6.3 to create a single subsection on this topic rather than the current approach of splitting related requirements between two sections. This improves the usability of the code.

Cost Impact: Larger fans to be required by IIAR 2 will slightly increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SHAPIRO-M-1-1105.6

M136–09/10

[F] 1105.8.1 (New), [F] 1105.8.2 (New), [F] 1105.8.3 (New), [F] 1105.8.4 (New)

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Add new text as follows:

[F] 1105.8.1 Ammonia refrigerant. Systems containing ammonia refrigerant shall discharge vapor to the atmosphere through an approved treatment system in accordance with Section 1105.8.2, a flaring system in accordance with Section 1105.8.3 or through an approved ammonia diffusion system in accordance with Section1105.8.4, or by other approved means.

Exceptions:

1. Ammonia/water absorption systems containing less than 22 pounds (10 kg) of ammonia and for which the ammonia circuit is located entirely outdoors.
2. Where the fire code official determines, on review of an engineering analysis prepared in accordance with Section 104.7.2 of the *International Fire Code*, that a fire, health or environmental hazard would not result from discharging ammonia directly to the atmosphere.

[F] 1105.8.2 Treatment systems. Treatment systems shall be designed to reduce the allowable discharge concentration of the refrigerant gas to not more than 50 percent of the IDLH at the point of exhaust. Treatment systems shall be in accordance with Chapter 37 of the *International Fire Code*

[F] 1105.8.3 Flaring systems. Flaring systems for incineration of flammable refrigerants shall be designed to incinerate the entire discharge. The products of refrigerant incineration shall not pose health or environmental hazards. Incineration shall be automatic upon initiation of discharge, shall be designed to prevent blowback, and shall not expose structures or materials to threat of fire. Standby fuel, such as LP gas, and standby power shall have the capacity to operate for one and one-half the required time for complete incineration of refrigerant in the system.

[F] 1105.8.4 Ammonia diffusion systems. Ammonia diffusion systems shall include a tank containing 1 gallon of water for each pound of ammonia (4 L of water for each 1 kg of ammonia) that will be released in 1 hour from the largest relief device connected to the discharge pipe. The water shall be prevented from freezing. The discharge pipe from the pressure relief device shall distribute ammonia in the bottom of the tank, but not lower than 33 feet (10 058 mm) below the maximum liquid level. The tank shall contain the volume of water and ammonia without overflowing.

Reason: This is an effort to make Chapter 11 a little more complete. This language is extracted from The Fire Code. There have been complaints that the I-codes in general refer to too many standards requiring many different documents to accomplish one thing. Some of the complaints have merit. The reference to ASHRAE-15 is left in tact but the Fire Code requirements satisfy the issue. Why not just say what is required for ammonia discharge rather than referring to the standard or the Fire Code. This will aid in plan review as well as field inspection because the requirements will be right there in the chapter.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-M-7-1105.8

M137–09/10
1106.4

Proponent: Gary Kreutziger, City of San Antonio, TX, representing the Planning and Development Services Department

Revise as follows:

1106.4 Flammable refrigerants. Where refrigerants of Groups A2, A3, B2 and B3 are used, the *machinery room* shall conform to the Class 1, Division 2, *hazardous location* classification requirements of NFPA 70.

Exception: Ammonia machinery rooms that are provided with ventilation in accordance with section 1106.3.

Reason: The purpose of the proposed code change is to eliminate confusion and create consistency between the International Fire Code Section 606.16 Exception and the International Mechanical Code Section 1106.4 Exception, without changing the intent of either. Both code sections require electrical installations in refrigeration machinery rooms to conform with Class 1, Division 2 prescriptives as per NFPA 70, however, the IMC Exception does not explicitly explain that the ammonia machinery room be ventilated in accordance with IMC Section 1106.3 to qualify for the exception as does the IFC. The proposal is to insert the same additional language as in the IFC for consistency and clarification.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KREUTZIGER-M-1-1106.4

M138–09/10
1201 through 1203

Proponent: Walter Sperko, PE, Sperko Engineering, representing the Mechanical Contractors Association of America

1. Revise as follows:

1201.3 Standards. ~~As an alternative to the provisions of Sections 1202 and 1203, piping shall be designed, installed, inspected and tested in accordance with ASME B31.9.~~ Piping shall be designed, installed, inspected and tested in accordance with ASME B31.9 except as otherwise specified in this chapter.

SECTION 1202
MATERIAL

1202.1 Piping. Piping material shall conform to the standards ~~cited in this section.~~ listed in ASME B31.9.

Exception: Embedded piping regulated by Section 1209.

1202.2 Used materials. Reused pipe, fittings, valves or other materials shall be clean and free of foreign materials ~~and shall be approved by the code official for reuse~~. Reused piping components shall be identified to a specification, grade or manufacturer's identification suitable for use in the system into which they will be installed and shall be approved.

1202.3 Material rating. ~~Materials shall be rated for the operating temperature and pressure of the hydronic system.~~ Materials shall be suitable for the type of fluid in the hydronic system. The exterior of pipe shall be protected from corrosion and degradation.

1202.4 Piping materials standards. Hydronic pipe shall conform to the standards listed in Table 1202.4 in addition to those listed in ASME B31.9. ~~The exterior of the pipe shall be protected from corrosion and degradation.~~

2. Revise table as follows:

TABLE 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD (see Chapter 15)
~~Acrylonitrile butadiene styrene(ABS) plastic pipe~~	~~ASTM D 1527; ASTM D 2282~~
~~Brass pipe~~	~~ASTM B 43~~
~~Brass tubing~~	~~ASTM B 135~~
~~Copper or copper-alloy pipe~~	~~ASTM B 42; ASTM B 302~~
~~Copper or copper-alloy tube (Type K, L or M)~~	~~ASTM B 75; ASTM B 88; ASTM B 251~~
~~Chlorinated polyvinyl chloride (CPVC) plastic pipe~~	~~ASTM D 2846; ASTM F 441; ASTM F 442~~
Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe	~~ASTM F 1281~~; CSA CAN/CSA-B-137.10
~~Cross-linked polyethylene (PEX) tubing~~	~~ASTM F 876; ASTM F 877~~
Ductile iron pipe	AWWA ~~C151/A21.51; AWWA~~ C115/A21.15
Lead pipe	FS WW-P-325B
~~Polybutylene (PB) plastic pipe and tubing~~	~~ASTM D 3309~~
Polyethylene/aluminum/polyethylen (PE-AL-PE) pressure pipe	ASTM F 1282; CSA B137.9
~~Polyethylene (PE) pipe, tubing and fittings (for ground source heat pump loop systems)~~	~~ASTM D 2513; ASTM D 3035; ASTM D 2447; ASTM D 2683; ASTM F 1055; ASTM D 2837; ASTM D 3350; ASTM D 1693~~
Polypropylene (PP) plastic pipe	ASTM F 2389
~~Polyvinyl chloride (PVC) plastic pipe~~	~~ASTM D 1785; ASTM D 2241~~
~~Raised temperature polyethylene PE-RT)~~	~~ASTM F 2623~~
~~Steel pipe~~	~~ASTM A 53; ASTM A 106~~
~~Steel tubing~~	~~ASTM A 254~~

3. Delete without substitution:

~~**1202.5 Pipe fittings.** Hydronic pipe fittings shall be *approved* for installation with the piping materials to be installed, and shall conform to the respective pipe standards or to the standards listed in Table 1202.5.~~

~~**TABLE 1202.5**~~
~~**HYDRONIC PIPE FITTINGS**~~

~~MATERIAL~~	~~STANDARD (see Chapter 15)~~
~~Brass~~	~~ASTM F 1974~~
~~Bronze~~	~~ASME B16.24~~
~~Copper and copper alloys~~	~~ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29~~
~~Ductile iron and gray iron~~	~~ANSI/AWWA C110/A21.10~~
~~Ductile iron~~	~~ANSI/AWWA C153/A21.53~~
~~Gray iron~~	~~ASTM A 126~~
~~Malleable iron~~	~~ASME B16.3~~
~~Plastic~~	~~ASTM D 2466; ASTM D 2467; ASTM D 2468; ASTM F 438; ASTM F 439; ASTM F 877; ASTM F 2389~~
~~Steel~~	~~ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A 420~~

1202.6 Valves. Valves shall be constructed of materials that are compatible with the type of piping material and fluids in the system. Valves shall be rated for the temperatures and pressures of the systems in which the valves are installed.

SECTION 1203
JOINTS AND CONNECTIONS

1203.1 Approval. Joints and connections shall be of an *approved* type. Joints and connections shall be tight for the pressure of the hydronic system.

1203.2 Preparation of pipe ends. Pipe shall be cut square, reamed and chamfered, and shall be free of burrs and obstructions. Pipe ends shall have full-bore openings and shall not be undercut.

1203.3 Joint preparation and installation. When required by Sections 1203.4 through 1203.14, the preparation and installation of brazed, mechanical, soldered, solvent-cemented, threaded and welded joints shall comply with Sections 1203.3.1 through 1203.3.7.

1203.3.1 Brazed joints. Joint surfaces shall be cleaned. An *approved* flux shall be applied where required. The joint shall be brazed with a filler metal conforming to AWS A5.8.

1203.3.2 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

1203.3.3 Soldered joints. Joint surfaces shall be cleaned. A flux conforming to ASTM B 813 shall be applied. The joint shall be soldered with a solder conforming to ASTM B 32.

1203.3.4 Solvent-cemented joints. Joint surfaces shall be clean and free of moisture. An *approved* primer shall be applied to CPVC and PVC pipe-joint surfaces. Joints shall be made while the cement is wet. Solvent cement conforming to the following standards shall be applied to all joint surfaces:

1. ASTM D 2235 for ABS joints.
2. ASTM F 493 for CPVC joints.
3. ASTM D 2564 for PVC joints.

CPVC joints shall be made in accordance with ASTM D 2846.

1203.3.5 Threaded joints. Threads shall conform to ASME B1.20.1. Schedule 80 or heavier plastic pipe shall be threaded with dies specifically designed for plastic pipe. Thread lubricant, pipe-joint compound or tape shall be applied on the male threads only and shall be *approved* for application on the piping material.

1203.3.6 Welded joints. Joint surfaces shall be cleaned by an *approved* procedure. Joints shall be welded with an *approved* filler metal.

1203.3.7 Grooved and shouldered mechanical joints. Grooved and shouldered mechanical joints shall conform to the requirements of ASTM F 1476 and shall be installed in accordance with the manufacturer's installation instructions.

1203.3.8 Mechanically formed tee fittings. Mechanically extracted outlets shall have a height not less than three times the thickness of the branch tube wall.

1203.3.8.1 Full flow assurance. Branch tubes shall not restrict the flow in the run tube. A dimple/depth stop shall be formed in the branch tube to ensure that penetration into the outlet is of the correct depth. For inspection purposes, a second dimple shall be placed 1/4 inch (6.4 mm) above the first dimple. Dimples shall be aligned with the tube run.

1203.3.8.2 Brazed joints. Mechanically formed tee fittings shall be brazed in accordance with Section 1203.3.1.

1203.4 ABS plastic pipe. Joints between ABS plastic pipe or fittings shall be solvent-cemented or threaded joints conforming to Section 1203.3.

1203.5 Brass pipe. Joints between brass pipe or fittings shall be brazed, mechanical, threaded or welded joints conforming to Section 1203.3.

~~**1203.6 Brass tubing.** Joints between brass tubing or fittings shall be brazed, mechanical or soldered joints conforming to Section 1203.3.~~

~~**1203.7 Copper or copper-alloy pipe.** Joints between copper or copper-alloy pipe or fittings shall be brazed, mechanical, soldered, threaded or welded joints conforming to Section 1203.3.~~

~~**1203.8 Copper or copper-alloy tubing.** Joints between copper or copper-alloy tubing or fittings shall be brazed, mechanical or soldered joints conforming to Section 1203.3, flared joints conforming to Section 1203.8.1 or push-fit joints conforming to Section 1203.8.2.~~

~~**1203.8.1 Flared joints.** Flared joints shall be made by a tool designed for that operation.~~

~~**1203.8.2 Push-fit joints.** Push-fit joints shall be installed in accordance with the manufacturer's instructions.~~

~~**1203.9 CPVC plastic pipe.** Joints between CPVC plastic pipe or fittings shall be solvent-cemented or threaded joints conforming to Section 1203.3.~~

~~**1203.10 Polybutylene plastic pipe and tubing.** Joints between polybutylene plastic pipe and tubing or fittings shall be mechanical joints conforming to Section 1203.3 or heat-fusion joints conforming to Section 1203.10.1.~~

~~**1203.10.1 Heat-fusion joints.** Joints shall be of the socket fusion or butt-fusion type. Joint surfaces shall be clean and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM D 3309.~~

~~**1203.11 Cross-linked polyethylene (PEX) plastic tubing.** Joints between cross-linked polyethylene plastic tubing and fittings shall conform to Sections 1203.11.1 and 1203.11.2. Mechanical joints shall conform to Section 1203.3.~~

~~**1203.11.1 Compression-type fittings.** When compression-type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.~~

~~**1203.11.2 Plastic-to-metal connections.** Soldering on the metal portion of the system shall be performed at least 18 inches (457 mm) from a plastic-to-metal adapter in the same water line.~~

~~**1203.12 PVC plastic pipe.** Joints between PVC plastic pipe and fittings shall be solvent-cemented or threaded joints conforming to Section 1203.3.~~

~~**1203.13 Steel pipe.** Joints between steel pipe or fittings shall be mechanical joints that are made with an *approved* elastomeric seal, or shall be threaded or welded joints conforming to Section 1203.3.~~

~~**1203.14 Steel tubing.** Joints between steel tubing or fittings shall be mechanical or welded joints conforming to Section 1203.3.~~

(Remainder of Section 1203 unchanged)

Reason: While the current rules provide a respectable list of materials for hydronic piping, the design requirements are nonexistent. The present rules provide nothing that the code official can use to determine if any of the following are adequate:

1) The thickness of the pipe for the pressure and temperature; while some components are "pressure rated," ordinary pipe and fittings have no such ratings. Unless the engineer has established the minimum wall thickness of steel pipe by calculation, the code official has no way to determine if it is thick enough to sustain the pressure and temperature.
2) Thermal expansion effects: present rules provide nothing that requires the designer to consider the effects of fatigue on piping due to thermal expansion and contraction, or the effects of thermal expansion on loads on equipment or the supporting building
3) Supports; nothing in the rules gives the code official guidance on the proper distance between supports to avoid overstress.
4) Seismic: there are no provisions for support or restraint of piping due to seismic events.

B31.9 covers these shortcomings. All materials deleted by this action are permitted by B31.9 plus many other materials commonly found in hydronic piping systems (see appendix A) Some joining techniques for joining plastic and composite piping were not deleted as B31.9 only provides partial requirements for joining these materials.

Cost Impact: Reduced. Most designers of larger facilities specify ASME B31.1, *Power Piping*, rather than B31.9, *Building Services Piping*. B31.1 is written for steam piping operating at 1000F.and 3000 psi, imposing unnecessarily expensive requirements on hydronic piping systems.

Appendix 1
List of Materials permitted by in B31.9 and not in IMC Chapter 12

The American Society of Mechanical Engineers (ASME)	
Cast Iron Pipe Flanges and Flanged Fittings	B16.1
CI Thd Fittings, Classes 125 and 250	B16.4
Face-to-Face and End-to-End Dimensions of Ferrous Valves	B16.10
Ferrous Pipe Plugs, Bushings, and Locknuts With Pipe Threads	B16.14
Manually Operated Metallic Gas Valves for Use in Gas Piping Systems Up to 125 psig (Sizes 1/2 Through 2)	B16.33
Valves, Flanged, Threaded, and Welding End	B16.34
Orifice Flanges	B16.36
Malleable Iron Threaded Pipe Unions, Classes 150, 250, and 300	B16.39
Ductile Iron Pipe Flanges and Flanged Fittings, Classes 150 and 300	B16.42
Welded and Seamless Wrought Steel Pipe	B36.10M
Stainless Steel Pipe	B36.19M
American Society for Testing and Materials (ASTM)	
Ferritic Malleable Iron Castings	A 47
Gray Iron Castings	A 48
Forgings, Carbon Steel, for Piping Components	A 105
Electric-Resistance-Welded Steel Pipe	A 135
Forgings, Carbon Steel for General Purpose Piping	A 181/A 181M
Cupola Malleable Iron	A 197
Spiral-Welded Steel or Iron Pipe	A 211
Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures	A 234/A 234M
Gray Iron Castings for Pressure-Containing Parts for Temperatures up to 650°F (345°C)	A 278/A 278M
Seamless and Welded Austenitic Stainless Steel Pipes	A 312/A 312M
Ductile Iron Pressure Pipe	A 377
Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures	A 395/A 395M
Wrought Austenitic SS Piping Fittings	A 403/A 403M
Ductile Iron Castings	A 536
Electric-Resistance-Welded Coiled Steel Tubing for Gas and Fuel Oil Lines	A 539
Aluminum-Alloy Sand Castings	B 26/B 26M
Steam or Valve Bronze Castings	B 61
Composition Bronze or Ounce Metal Castings	B 62
Seamless Copper Tube, Bright Annealed	B 68/B 68M
Aluminum-Alloy Drawn Seamless Tubes	B 210/B 210M
Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube	B 241/B 241M
Aluminum and Aluminum-Alloy Die, Hand, and Rolled Ring Forgings	B 247/B 247M
Seamless Copper Tube for Air Conditioning and Refrigeration Field Service	B 280
Copper and Copper-Alloy Die Forgings (Hot-Pressed)	B 283
Factory-Made Wrought Aluminum and Aluminum-Alloy Welding Fittings	B 361
Aluminum-Alloy Formed and Arc Welded Round Tube	B 547
American Water Works Association (AWWA or ANSI/AWWA)	
Ductile Iron Pipe Centrifugally Cast in Metal Molds or Sand-Lines Molds, for Water and Other Liquids	C151/A21.51
Steel Pipe Flanges for Waterworks Service — Sizes 4 in. Through 144 in.	C207
Dimensions for Fabricated Steel Water Pipe Fittings	C208
Gate Valves for Water and Sewage Systems	C500
Grooved and Shouldered Type Joints	C606

Federal Government

Pipe, Cast Iron and Ductile Iron (Pressure, for Water and Other Liquids)	FS WW-P-421
Manufacturers Standardization Society of the Valve and Fittings Industry (MSS)	
Class 150 Corrosion Resistant Gate, Globe, Angle, and Check Valves With Flanged and Butt Weld Ends	SP-42
Wrought Stainless Steel Butt Weld Fittings	SP-43
By-Pass and Drain Connection Standard	SP-45
Class 150 LW Corrosion Resistant Cast Flanges and Flanged Fittings	SP-51
Butterfly Valves	SP-67
Cast Iron Gate Valves, Flanged and Threaded Ends	SP-70
Cast Iron Swing Check Valves, Flanged and Threaded Ends	SP-71
Ball Valves With Flanged or Butt Weld Ends for General Service	SP-72
Cast Iron Plug Valves, Flanged and Threaded Ends	SP-78
SW Reducer Inserts	SP-79
Bronze Gate, Angle, and Check Valves	SP-80
Carbon Steel Pipe Unions — SW and Thd	SP-83
Steel Valves — SW and Thd Ends	SP-84
Cast Iron Globe and Angle Valves, Flanged and Thd Ends	SP-85
Diaphragm Type Valves	SP-88
Pipe Hangers and Supports — Selection and Application	SP-69
Pipe Hangers and Supports — Fabrication and Installation Practices	SP-89
Guidelines on Terminology for Pipe Hangers and Supports	SP-90
American Society for Testing and Materials (ASTM) Nonferrous Materials	
Reinforced Concrete Low-Head Pressure Pipe	C 361/C 361M
Contact-Molded Reinforced Thermosetting Plastic (RTP) Laminants for Corrosion Resistant Equipment	C 582
PE Plastic Pipe, Schedule 40	D 2104
PE Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter	D 2239

Classification for Machine-Made RTR Pipe . . . . . D 2310
Threaded PVC Plastic Pipe Fittings, Schedule 80. . . . . D 2464
Reinforced Epoxy Resin Piping Gas Pressure Pipe and Fittings . . . . . D 2517
Plastic Insert Fittings for PE Plastic Pipe . . . . . D 2609
PB Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter . . . . . D 2662
PB Plastic Tubing . . . . . D 2666
Joints for IPS PVC Using Solvent Cement . . . . . D 2672
PE Plastic Tubing . . . . . D 2737
Filament-Wound RTR Pipe . . . . . D 2996
Centrifugally Cast Glass Fiber RTR Pipe . . . . . D 2997
PB Plastic Pipe (SDR-PR), Based on Outside Diameter . . . . . D 3000
Butt Heat Fusion PE Plastic Fittings for PE Plastic Pipe and Tubing . . . . . D 3261
Biaxially Oriented PE (PEO) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter . . . . . D 3287
Specification for "Fiberglass" (Glass-Fiber-Reinforced-Thermosetting Resin) Pressure Pipe . . . . . D 3517
Specification for Fiberglass Sewer and Industries Pressure Pipe. . . . . D 3754
Specification for Reinforced Plastic Mortar Pipe Fittings for Non-Pressure Applications . . . . . D 3840
Threaded CPVC Plastic Pipe Fittings, Schedule 80 . . . . . F 437
Standard Specification for Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure Pipe . . . . . .F 1282
Standard Specification for Pressure-Rated Composite Pipe for Elevated Temperature Service . . . . . F 1335

American Water Works Association (AWWA or ANSI/AWWA)

Reinforced Concrete Pressure Pipe, Steel Cylinder Type, for Water and Other Liquids C300
Prestressed Concrete Pressure Pipe, Steel Cylinder Type, for Water and Other Liquids C301
Reinforced Concrete Pressure Pipe, Noncylinder Type, for Water and Other Liquids C302
PVC Pressure Pipe, 4 in. Through 12 in., for Water C900

Miscellaneous Components

The American Society of Mechanical Engineers (ASME)

Unified Screw Threads B1.1
Pipe Threads (Except Dryseal) B1.20.1
Dryseal Pipe Threads. B1.20.3
Hose Coupling Screw Threads B1.20.7
Nonmetallic Flat Gaskets for Pipe Flanges B16.21
BW Ends for Pipe, Valves, Flanges, and Fittings B16.25
Square and Hex Bolts and Screws B18.2.1
Square and Hex Nuts B18.2.2

American Society for Testing and Materials (ASTM)

Structural Steel . . . . . A 36/A 36M
Carbon Steel Track Bolts and Nuts . . . . . A 183
Alloy-Steel and SS Bolting Materials for HT Service . . . . . A 193/A 193M
Carbon and Alloy Steel Nuts for Bolts for High Pressure and HT Service A 194/A 194M
Carbon Steel Bolts and Studs, 60,000 PSI Tensile. . . . . A 307
Solder Metal . . . . . B 32
Threads (60-Deg. Stud) for Glass RTR Pipe. . . . . D 1694
Solvent Cement for ABS Plastic Pipe and Fittings . . . . . D 2235
Solvent Cements for PVC Plastic Pipe and Fittings. . . . . D 2564
Solvent Cements for Transition Joints Between ABS and PVC Non-Pressure Piping Components . . . . . D 3138
Joints for Plastic Pressure Pipes Using Flexible Elastometric Seals . . . . . D 3139
Solvent Cements for CPVC Plastic Pipe and Fittings . . . . . F 493
Test Methods for Flash Point by Pensky-Martens Closed Tester . . . . . D 93
Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure . . . . . D 1598
Test Method for Cyclic Pressure Strength of RTP Pipe. . . . . D 2143
Practice for Heat Joining of Polyolefin Pipe and Fittings . . . . . D 2657
Practice for Underground Installation of Thermoplastic Pressure Piping . . . . . D 2774
Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials . . . . . D 2837
Practice for Making Solvent-Cemented Joints With PVC Pipe and Fittings . . . . . D 2855
Method for Obtaining Hydrostatic Design Basis for RTR Pipe and Fittings. . . . . D 2992
Practice for Flaring Polyolefin Pipe and Tubing . . . . . D 3140
Test Method for Strength of Anchors in Concrete and Masonry Elements . . . . . E 488
Practice for Safe Handling of Solvent Cements Used for Joining Thermoplastic Pipe and Fittings . . . . . F 402
Definition of Terms Relating to Plastic Piping Systems . . . . . F 412
Standard Specification for Non-Reinforced Extruded Tee Connections for Piping Applications. . . . . F 2014

American Water Works Association (AWWA or ANSI/AWWA)

Thickness Design of DI Pipe C150/A21.50
Installation of DI Water Mains and Other Appurtenances C600
Rubber-Gasket Joints for DI and Gray-Iron Pressure Pipe and Fittings C111/A21.11

Society of Automotive Engineers (SAE)

Refrigeration Tube Fittings J513
Hydraulic Tube Fittings. J514

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: SPERKO-M-1-1201-1203

M139–09/10

Table 1202.4, 1203.15, 1203.15.1, 1203.15.2, 1203.15.3, 1208.1, 1208.1.1, 1210 (New), Chapter 15

Proponent: Michael Cudahy, Plastic Pipe and Fittings Association (PPFA)

1. Revise table as follows:

TABLE 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD
~~Polyethylene (PE) pipe, tubing and fittings (for ground source heat pump loop systems)~~	~~ASTM D 2513; ASTM D 3035; ASTM D 2447; ASTM D 2683; ASTM F 1055; ASTM D 2837; ASTM D 3350; ASTM D 1693~~

(Portions of table not shown are unchanged)

2. Delete without substitution:

~~**1203.15 Polyethylene plastic pipe and tubing for ground source heat pump loop systems.** Joints between polyethylene plastic pipe and tubing or fittings for ground source heat pump loop systems shall be heat fusion joints conforming to Section 1203.15.1, electrofusion joints conforming to Section 1203.15.2, or stab-type insertion joints conforming to Section 1203.15.3.~~

~~**1203.15.1 Heat-fusion joints.** Joints shall be of the socket-fusion, saddle-fusion or butt-fusion type, joined in accordance with ASTM D 2657. Joint surfaces shall be clean and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM D 2683 or ASTM D 3261.~~

~~**1203.15.2 Electrofusion joints.** Joints shall be of the electrofusion type. Joint surfaces shall be clean and free of moisture, and scoured to expose virgin resin. Joint surfaces shall be heated to melt temperatures for the period of time specified by the manufacturer. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM F 1055.~~

~~**1203.15.3 Stab-type insert fittings.** Joint surfaces shall be clean and free of moisture. Pipe ends shall be chamfered and inserted into the fittings to full depth. Fittings shall be manufactured in accordance with ASTM F 1924.~~

3. Revise as follows:

SECTION 1208
TESTS

1208.1 General. Hydronic piping systems ~~other than ground source heat pump loop systems~~ shall be tested hydrostatically at one and one-half times the maximum system design pressure, but not less than 100 psi (689 kPa). The duration of each test shall be not less than 15 minutes. ~~Ground-source heat pump loop systems shall be tested in accordance with Section 1208.1.1.~~

4. Delete without substitution:

~~**1208.1.1 Ground source heat pump loop systems.** Before connection (header) trenches are backfilled, the assembled loop system shall be pressure tested with water at 100 psi (689 kPa) for 30 minutes with no observed leaks. Flow and pressure loss testing shall be performed and the actual flow rates and pressure drops shall be compared to the calculated design values. If actual flow rate or pressure drop values differ from calculated design values by more than 10 percent, the problem shall be identified and corrected.~~

5. Add new text as follows:

SECTION 1210
GROUND SOURCE HEAT PUMP LOOP SYSTEMS

1210.1 General. Ground-source heat pump loop systems shall comply with this section.

1210.2 Piping material. Ground-source heat pump loop system piping material for water-based systems shall comply with Sections 1210.2.1 through 1210.2.4.

1210.2.1 Used materials. Reused piping, fittings, valves, or other materials shall not be used in ground-source heat pump loop systems.

1210.2.2 Material rating. Piping shall be rated for the operating temperature and pressure of the ground-source heat pump loop systems. Fittings shall be approved for pressure applications and recommended by the manufacturer for installation with the piping material installed. Materials installed underground shall be suitable for burial.

1210.2.3 Piping and tubing materials standards. Ground source heat pump loop system piping shall conform to the standards listed in Table 1210.2.3.

TABLE 1210.2.3
GROUND SOURCE HEAT PUMP LOOP SYSTEM PIPING

MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC) plastic pipe	ASTM D 2846; ASTM F 441; ASTM F 442
Cross-linked polyethylene (PEX) tubing	ASTM F 876; ASTM F 877
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM F 1282; CSA B137.9
Polyethylene (PE) pipe, tubing and fittings	ASTM D 3035; ASTM D 2447; ASTM D 2737; ASTM F 714; AWWA C901; CSA CAN/CSA-B-137.1
Polypropylene (PP-R) pipe, tubing and fittings	ASTM F 2389
Polyvinyl chloride (PVC) plastic pipe	ASTM D 1785; ASTM D 2241
Raised temperature polyethylene (PE-RT)	ASTM F 2623

1210.2.4 Fittings. Geothermal pipe fittings shall be approved for installation with the piping materials to be installed, suitable for use underground if buried, and shall conform to the standards listed in Table 1210.2.4.

TABLE 1210.2.4
GROUND SOURCE HEAT PUMP LOOP SYSTEM FITTINGS

PIPE MATERIAL	STANDARD
Chlorinated polyvinyl chloride (CPVC) plastic pipe	ASTM D 2846; ASTM F 437; ASTM F 438; ASTM F 439; CSA B137.6
Cross-linked polyethylene (PEX) tubing	ASTM F 877; ASTM F 1807; ASTM F 1960; ASTM F 2080; ASTM F 2098; ASTM F 2159; ASTM F 2434; CSA B137.5
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	ASTM D 3261; ASTM F 877; ASTM F 1807; ASTM F 2098; ASTM F 2159; ASTM F 2434; CSA B137.5, B137.1
Polyethylene (PE) pipe, tubing and fittings	ASTM D 2609; ASTM D 2683; ASTM D 3261; ASTM F 1055; CSA B137.1
Polypropylene (PP-R) pipe, tubing and fittings	ASTM F 2389; CSA B137.11
Polyvinyl chloride (PVC) plastic pipe	ASTM D 2464; ASTM D 2466; ASTM D 2467; CSA B137.2; CSA B137.3
Raised temperature polyethylene (PE-RT)	ASTM D 3261; ASTM F 877; ASTM F 1807; ASTM F 2098; ASTM F 2159; ASTM F 2434; CSA B137.5, B137.1

1210.3 Joints and connections. Joints and connections in ground source heat pump loop systems shall be of an approved type and shall comply with Sections 1210.3.1 through 1210.3.9. Joints and connections shall be leak-free for the pressure of the ground source heat pump loop systems. Joints used underground shall be approved for buried applications.

1210.3.1 Joints between different piping materials. Joints between different piping materials shall be made with approved transition fittings.

1210.3.2 Preparation of pipe ends. Piping shall be cut square, reamed, and shall be free of burrs and obstructions. CPVC, PE, and PVC pipe shall be chamfered. Pipe ends shall have full-bore openings and shall not be undercut.

1210.3.3 Joint preparation and installation. Where required by Sections 1210.3.4 through 1210.3.6, the preparation and installation of mechanical and thermoplastic-welded joints shall comply with Sections 1210.3.3.1 and 1210.3.3.2 as applicable.

1210.3.3.1 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions.

1210.3.3.2 Thermoplastic-welded joints. Joint surfaces shall be cleaned by an approved procedure. Joints shall be welded according to the manufacturer's instructions.

1210.3.4 CPVC plastic pipe. Joints for CPVC plastic piping and fittings shall be solvent-cemented or threaded joints conforming to Section 1203.3.

1210.3.5 Cross-linked polyethylene (PEX) plastic tubing. Joints for cross-linked polyethylene plastic piping and fittings shall conform to Sections 1210.3.5.1 and 1210.3.5.2. Mechanical joints shall conform to Section 1210.3.3.

1210.3.5.1 Compression-type fittings. Where compression- type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

1210.3.5.2 Plastic-to-metal connections. Solder joints in a metal pipe shall not occur within 18 inches (457 mm) of a transition from such metal pipe to PEX pipe.

1210.3.6 Polyethylene plastic pipe and tubing for ground source heat pump loop systems. Joints for polyethylene plastic piping and fittings for ground source heat pump loop systems shall be heat-fusion joints conforming to Section 1210.3.6.1, electrofusion joints conforming to Section 1210.3.6.2, or stab-type insertion joints conforming to Section 1210.3.6.3.

1210.3.6.1 Heat-fusion joints. Joints shall be of the socket-fusion, saddle-fusion or butt-fusion type, joined in accordance with ASTM D 2657. Joint surfaces shall be clean and free of moisture. Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM D 2683 or ASTM D 3261.

1210.3.6.2 Electrofusion joints. Joints shall be of the electrofusion type. Joint surfaces shall be clean and free of moisture, and scoured to expose virgin resin. Joint surfaces shall be heated to melt temperatures for the period of time specified by the manufacturer. The joint shall be undisturbed until cool. Fittings shall be manufactured in accordance with ASTM F 1055.

1210.3.6.3 Stab-type insert fittings. Joint surfaces shall be clean and free of moisture. Pipe ends shall be chamfered and inserted into the fittings to full depth. Fittings shall be manufactured in accordance with ASTM F 1924.

1210.3.7 Polypropylene (PP) plastic. Joints for PP plastic piping and fittings shall comply with Sections 1210.3.7 and 1210.3.7.2.

1210.3.7.1 Heat-fusion joints. Heat-fusion joints for polypropylene (PP) piping joints shall be installed with socket-type heat-fused polypropylene fittings, electrofusion polypropylene fittings or by butt-fusion. Joint surfaces shall be clean and free from moisture. The joint shall be undisturbed until cool. Joints shall be made in accordance with ASTM F 2389.

1210.3.7.2 Mechanical and compression sleeve joints. Mechanical and compression sleeve joints shall be installed in accordance with the manufacturer's instructions.

1210.3.8 Raised temperature polyethylene (PE-RT) plastic tubing. Joints for raised temperature polyethylene piping and fittings shall conform to Sections 1210.3.8.1 and 1210.3.8.2. Mechanical joints shall conform to Section 1210.3.3.

1210.3.8.1 Compression-type fittings. Where compression-type fittings include inserts and ferrules or O-rings, the fittings shall be installed without omitting the inserts and ferrules or O-rings.

1210.3.8.2 PE-RT-to-metal connections. Solder joints in a metal pipe shall not occur within 18 inches (457 mm) of a transition from such metal pipe to PE-RT pipe.

1210.3.9 PVC plastic pipe. Joints for PVC plastic pipe and fittings shall be solvent-cemented or threaded joints conforming to Section 1203.3.

1210.4 Shutoff valves. Shutoff valves shall be installed in ground source heat pump loop systems in the locations indicated in Sections 1210.4.1 through 1210.4.6. Pressure relief valves shall be installed in accordance with Section 1210.4.7.

1210.4.1 Heat exchangers. Shutoff valves shall be installed on the supply and return side of a heat exchanger.

> **Exception:** Shutoff valves shall not be required where heat exchangers are integral with a boiler; or are a component of a manufacturer's boiler and heat exchanger packaged unit and are capable of being isolated from the hydronic system by the supply and return valves required by Section 1005.1.

1210.4.2 Central systems. Shutoff valves shall be installed on the building supply and return of a central utility system.

1210.4.3 Pressure vessels. Shutoff valves shall be installed on the connection to any pressure vessel.

1210.4.4 Pressure-reducing valves. Shutoff valves shall be installed on both sides of a pressure-reducing valve.

1210.4.5 Equipment and appliances. Shutoff valves shall be installed on connections to mechanical *equipment* and appliances. This requirement does not apply to components of a ground source heat pump loop system such as pumps, air separators, metering devices, and similar *equipment*.

1210.4.6 Expansion tanks. Shutoff valves shall be installed at connections to nondiaphragm-type expansion tanks.

1210.4.7 Reduced pressure. A pressure relief valve shall be installed on the low-pressure side of a hydronic piping system that has been reduced in pressure. The relief valve shall be set at the maximum pressure of the system design. The valve shall be installed in accordance with Section 1006.

1210.5 General. Piping, valves, fittings, and connections shall be installed in accordance with the conditions of approval and Sections 1210.5.1 through 1210.5.10.

1210.5.1 Protection of potable water. The potable water system shall be protected from backflow in accordance with the *International Plumbing Code*.

1210.5.2 Pipe penetrations. Openings for pipe penetrations in walls, floors and ceilings shall be larger than the penetrating pipe. Openings through concrete or masonry building elements shall be sleeved. The annular space surrounding pipe penetrations shall be protected in accordance with the *International Building Code*.

1210.5.3 Clearance to combustibles. Where the exterior temperature of piping in a geothermal piping system exceeds 250°F (121°C), such piping shall have a minimum *clearance* of 1 inch (25 mm) to combustible materials.

1210.5.4 Contact with building material. A ground source heat pump loop system shall not be in direct contact with building materials that cause the piping material to degrade or corrode, or that interfere with the operation of the system.

1210.5.5 Strains and stresses. Piping shall be installed so as to prevent detrimental strains and stresses in the pipe. Provisions shall be made to protect piping from damage resulting from expansion, contraction and structural settlement. Piping shall be installed so as to avoid structural stresses or strains within building components.

1210.5.6 Flood hazard. Piping located in a flood hazard area shall be capable of resisting hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the *design flood elevation*.

1210.5.7 Pipe support. Pipe shall be supported in accordance with Section 305.

1210.5.8 Velocities. Flow velocities in ground source heat pump loop systems shall be designed to not exceed the maximum flow velocity recommended by the pipe and fitting manufacturer and shall be controlled to reduce the possibility of water hammer.

1210.5.9 Labeling and marking. Ground source heat pump loop system piping shall be marked with tape, metal tags or other method where it enters a building indicating "GROUND SOURCE HEAT PUMP LOOP SYSTEM". The marking shall indicate any antifreeze used in the system by name and concentration.

1210.5.10 Chemical compatibility. Antifreeze and other materials used in a ground source heat pump loop system shall be chemically compatible with the pipe, tubing, fittings, and mechanical systems.

1210.6 Makeup water. The transfer fluid used in ground source heat pump loop systems shall be compatible with the makeup water supplied to the system.

1210.7 Ground source heat pump loop systems tests. Before connection (header) trenches are backfilled, the assembled loop system shall be pressure tested with water at 100 psi (689 kPa) for 30 minutes with no observed leaks. Flow and pressure loss testing shall be performed and the actual flow rates and pressure drops shall be compared to the calculated design values. If actual flow rate or pressure drop values differ from calculated design values by more than 10 percent, the cause shall be identified and corrective action taken.

1210.7.1 Pressurizing during installation. Ground source heat pump loop piping to be embedded in concrete shall be pressure tested prior to pouring concrete. During pouring, the pipe shall be maintained at the proposed operating pressure.

6. Add new standards to Chapter 15 as follows:

ASTM

D 2464-06	Standard Specification for Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
D 2466-06	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
D 2467-06	Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
D 2609-02	Standard Specification for Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe
D 2737-03	Standard Specification for Polyethylene (PE) Plastic Tubing
F 437-06	Standard Specification for Threaded Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
F 714-08	Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
F 1807-08	Standard Specification for Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing
F1960-08	Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing
F 2080-08	Standard Specification for Cold-Expansion Fittings with Metal Compression-Sleeves for Cross-Linked Polyethylene (PEX) Pipe
F 2098-08	Standard Specification for Stainless Steel Clamps for Securing SDR9 Cross-linked Polyethylene (PEX) Tubing to Metal Insert and Plastic Insert Fittings
F 2159-05	Standard Specification for Plastic Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing
F 2434-08	Standard Specification for Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Crosslinked Polyethylene/Aluminum/Cross-linked Polyethylene (PEX-AL-PEX) Tubing

AWWA

C901-08	Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13 mm) through 3 In. (76 mm), for Water Service

CSA

B137.1-02	Polyethylene Pipe, Tubing and Fittings for Cold Water Pressure Services
B137.2-02	PVC Injection-moulded Gasketed Fittings for Pressure Applications
B137.3-02	Rigid Poly (Vinyl Chloride) (PVC) Pipe for Pressure Applications

B137.5-02 Cross-linked Polyethylene (PEX) Tubing Systems for Pressure Applications— with Revisions through September 1992

B137.6-02 CPVC Pipe, Tubing and Fittings for Hot and Cold Water Distribution Systems— with Revisions through May 1986

B137.11-02 Polypropylene (PP-R) Pipe and Fittings for Pressure Applications

Reason: Water based ground-source heat pump loop PE piping is currently placed in the hydronics section where it doesn't quite fit. This special and growing application should have its own section, and it should cover other materials that could potentially be used. Green building rating systems are strongly promoting ground-source heat pump loop heating and cooling systems, and the code should have more information. I am introducing this proposal to accomplish that and would hope it would act to encourage further development. While HDPE dominates the technology with an expected 95% of the systems, other materials can and are be utilized in water based ground loop systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard AWWA C901-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009. All other standards proposed for inclusion are already referenced standards of the International Plumbing Code (IPC).

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CUDAHY-M-1-1202-1210

M140–09/10

Table 1202.4, Chapter 15; IRC Table M2101.1, Chapter 44

Proponent: Larry Gill, IPEX, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

1. Revise table as follows:

TABLE 1202.4
HYDRONIC PIPE

MATERIAL	STANDARD
Raised Temperature Polyethylene (PE-RT)	ASTM F2623; ASTM F 2769

(Portions of table not shown remain unchanged)

2. Add new standard to Chapter 15 as follows:

ASTM

F 2769-09 Polyethylene of Raised Temperature (PE-RT) Plastic Hot and Cold-Water Tubing and Distribution Systems

PART II – IRC MECHANICAL

1. Revise table as follows:

TABLE M2101.1
HYDRONIC PIPING MATERIALS

MATERIAL	USE CODE[a]	STANDARD[b]	JOINTS	NOTES
Raised temperature polyethylene (PE-RT)	1, 2, 3	ASTM F 2623 ASTM F 2769	Copper crimp/insert fitting stainless steel clamp, insert fittings	

(Portions of table not shown remain unchanged)

2. Add new standard to Chapter 44 as follows:

ASTM

F 2769-09	Polyethylene of Raised Temperature (PE-RT) Plastic Hot and Cold-Water Tubing and Distribution Systems

Reason: This change adds a new ASTM standard F2769 for Polyethylene of Raised Temperature (PE-RT) to the IMC. This will provide manufacturers and purchasers with additional options for PE-RT tubing.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard ASTM F 2769-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GILL-M-2-T. 1202.4-CH 15-RM-T. M2101.1-CH 44

M141–09/10

Table 1202.5; IRC Table M2101.1

Proponent: Andrew Granzow, Viega, LLC

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Revise table as follows:

1202.5 TABLE
HYDRONIC PIPE FITTINGS

MATERIAL	STANDARD (see Chapter 15)
Brass	ASTM F 1974
Bronze	ASME B16.24
Copper and copper alloys	ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.23; ASME B16.26; ASME B16.29; ASTM F 877 ; ASTM F 1807
Ductile iron and gray iron	ANSI/AWWA C110/A21.10
Ductile iron	ANSI/AWWA C153/A21.53;
Gray iron	ASTM A 126
Malleable iron	ASME B16.3;
Plastic	ASTM D 2466; ASTM D 2467; ASTM D 2468; ASTM F 438; ASTM F 439; ASTM F 877; ASTM F 2159; ASTM F 2389
Steel	ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28 ASTM A 420

Reason: To include nationally recognized standards for piping materials currently being used for hydronic applications.

Cost Impact: The code change proposal will not increase the cost of construction.

PART II – IRC MECHANICAL

Revise table as follows:

TABLE M2101.1
HYDRONIC PIPING MATERIALS

MATERIAL	USE CODE[a]	STANDARD[b]	JOINTS	NOTES
Brass pipe	1	ASTM B 43	Brazed, welded, threaded, mechanical and flanged fittings	
Brass tubing	1	ASTM B 135	Brazed, soldered and mechanical fittings	
Chlorinated poly (vinyl chloride) (CPVC) pipe and tubing	1, 2, 3	ASTM D 2846	Solvent cement joints, compression joints and threaded adapters	
Copper pipe	1	ASTM B 42, B 302	Brazed, soldered and mechanical fittings threaded, welded and flanged	
Copper tubing (type K, L or M)	1, 2	ASTM B 75, B 88, B 251, B 306	Brazed, soldered and flared mechanical fittings	Joints embedded in concrete
Cross-linked polyethylene (PEX)	1, 2, 3	ASTM F 876, F 877	(See PEX fittings)	Install in accordance with manufacturer's instructions.
Cross-linked polyethylene/aluminum/ cross-linked polyethylene-(PEX-AL-PEX) pressure pipe	1, 2	ASTM F 1281 or CAN/ CSA B137.10	Mechanical, crimp/insert	Install in accordance with manufacturer's instructions.
PEX Fittings		ASTM F 877 ASTM F 1807 ASTM F 1960 ASTM F 2098 ASTM F 2159	Copper-crimp/insert fittings, cold expansion fittings, stainless steel clamp, insert fittings, plastic-crimp/insert fittings	Install in accordance with manufacturer's instructions
~~Plastic fittings PEX~~		~~ASTM F 1807~~		
Polybutylene (PB) pipe and tubing	1, 2, 3	ASTM D 3309	Heat-fusion, crimp/insert and compression	Joints in concrete shall be heat-fused.
Polyethylene (PE) pipe, tubing and fittings (for ground source heat pump loop systems)	1, 2, 4	ASTM D 2513; ASTM D 3350; ASTM D 2513; ASTM D 3035; ASTM D 2447; ASTM D 2683; ASTM F 1055; ASTM D 2837; ASTM D 3350; ASTM D 1693	Heat-fusion	
Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe	1, 2, 3	ASTM F 1282 CSA B 137.9	Mechanical, crimp/insert	
Polyproplylene (PP)	1, 2, 3	ISO 15874 ASTM F 2389	Heat-fusion joints, mechanical fittings, threaded adapters, compression joints	
Raised temperature polyethylene (PE-RT)	1, 2, 3	ASTM F 2623	Copper crimp/insert fitting stainless steel clamp, insert fittings	
Soldering fluxes	1	ASTM B 813	Copper tube joints	
Steel pipe	1, 2	ASTM A 53, A 106	Brazed, welded, threaded, flanged and mechanical fittings	Joints in concrete shall be welded. Galvanized pipe shall not be welded or brazed.
Steel tubing	1	ASTM A 254	Mechanical fittings, welded	

For SI: ºC = [(ºF)-32]/1.8.

a. Use code:
   1. Above ground.
   2. Embedded in radiant systems.
   3. Temperatures below 180°F only.
   4. Low temperature (below 130°F) applications only.

b. Standards as listed in Chapter 44.

Reason: (Row #8-PEX Fittings-ASTM F877) The added standard reference clearly identifies a nationally recognized standard for PEX fittings and allows installers the option to utilize products under this standard for use in residential PEX hydronic applications.

"ASTM F877 - 07 Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems"

(Row #8-PEX Fittings-ASTM F2159) The added standard reference clearly identifies a nationally recognized standard for PEX fittings and allows installers the option to utilize products under this standard for use in residential PEX hydronic applications.

"ASTM F2159 - 05 Standard Specification for Plastic Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing"

(Row #9-Plastic Fittings PEX) The standard identified above makes no reference to plastic fittings and therefore the code reference is not consistent with the intent of the standard. This proposed code change has no impact on the use of product manufactured to this standard as this standard is already referenced in the appropriate section of the table under "PEX fittings". Below is the title and scope of F1807

"ASTM F1807 - 08 Standard Specification for Metal Insert Fittings Utilizing a Copper Crimp Ring for SDR9 Cross-linked Polyethylene (PEX) Tubing"

"1. Scope
1.1 This specification covers metal insert fittings and copper crimp rings for use with cross-linked polyethylene (PEX) tubing in $^{3}/_{8}$, ½, $^{5}/_{8}$, ¾, and 1 in. and 1 $^{1}/_{4}$ nominal diameters that meet the requirements for Specifications F 876 and F 877. These fittings are intended for use in 100 psi (689.5 kPa) cold- and hot-water distribution systems operating at temperatures up to, and including, 180°F (82°C). The requirements for materials, workmanship, dimensions, and markings to be used on the fittings and rings are also included.
1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are mathematical conversions to SI units which are provided for information only and are not considered the standard.
1.3 Compliance with this specification requires that these fittings be tested and certified to Specification F 877.
1.4 This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. "

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRANZOW-M-1-T. 1202.5-RM-T. M2101.1

M142–09/10
Table 1202.5, Chapter 15; Table M2101.1, Chapter 44

Proponent: Larry Gill, IPEX, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

1. Revise table as follows:

TABLE 1202.5
HYDRONIC PIPE FITTINGS

MATERIAL	STANDARD
Plastic	ASTM D2466; ASTM D2467; ASTM D2468; ASTM F438; ASTM F439; ASTM F877; ASTM F2389; <u>ASTM F2735</u>

(Portions of table not shown remain unchanged)

2. Add new standard to Chapter 15 as follows:

ASTM
F 2735-08a Standard Specification for SDR9 Cross-linked Polyethylene (PEX) and Raised Temperature (PE-RT) Tubing

PART II – IRC MECHANICAL

1. Revise table as follows:

TABLE M2101.1
HYDRONIC PIPING MATERIALS

MATERIAL	USE CODE[a]	STANDARD[b]	JOINTS	NOTES
Plastic Fittings PEX		ASTM F 1807 ASTM F 2735		

(Portions of table not shown remain unchanged)

2. Add new standard to Chapter 44 as follows:

ASTM
F 2735-08a Standard Specification for SDR9 Cross-linked Polyethylene (PEX) and Raised Temperature (PE-RT) Tubing

Reason: This Code change will add the new ASTM F 2735 standard as a new fittings standard for plastics to the IMC. This will provide manufacturers and purchasers with additional options for PEX and PE-RT fittings.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard ASTM F 2735-08a, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GILL-M-1-T. 1202.5-CH 15-RM-1-T. M2101.1

M143–09/10
1203.1.1

Proponent: Walter Sperko, PE, Sperko Engineering, representing the Mechanical Contractors Association of America

Delete without substitution:

~~**1203.1.1 Joints between different piping materials.** Joints between different piping materials shall be made with *approved* adapter fittings. Joints between different metallic piping materials shall be made with *approved* dielectric fittings or brass converter fittings.~~

Reason: When the chemical makeup of the water or steam in a hydronic system is controlled to minimize the corrosion of the materials in the piping system, that control also eliminates any selective corrosion of dissimilar metal connections. There are thousands of hydronic piping systems where copper, steel and aluminum are used successfully without dielectric fittings or brass converters, and they work fine. When failure does occur due to water chemistry excursions, failures are system-wide, not just at dissimilar metal joints.

Bibliography: "Dissimilar Metals in Heating and AC Piping" April, 2009 by Walter J. Sperko, P.E.

Cost Impact: The code change proposal will reduce construction costs by eliminating an unnecessary component and maintenance costs since dielectric couplings used in hot water systems (>170°F) will leak after several thermal cycles.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SPERKO-M-2-1203.1.1

M144–09/10
1203.1.1

Proponent: Andrew Granzow, Viega, LLC

Revise as follows:

1203.1.1 Joints between different piping materials. Joints between different piping materials shall be made with *approved* adapter fittings. Joints between different metallic piping materials shall be made with *approved* dielectric fittings ~~or~~ brass, or bronze converter fittings.

Reason: Bronze is a proven material the same as brass for converter fittings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRANZOW-M-2-1203.1.1

M145–09/10
1203.3.4

Proponent: David W. Ash, Lubrizol Advanced Materials, Inc.

Revise as follows:

1203.3.4 Solvent-cemented joints. Joint surfaces shall be clean and free of moisture. An approved primer shall be applied to CPVC and PVC pipe-joint surfaces. Joints shall be made while the cement is wet. Solvent cement conforming to the following standards shall be applied to all joint surfaces:

1. ASTM D 2235 for ABS joints.
2. ASTM F 493 for CPVC joints.
3. ASTM D 2564 for PVC joints.

CPVC joints shall be made in accordance with ASTM D 2846.

Exception: For CPVC pipe-joint connections, a primer is not required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM F 493.
2. The solvent cement used is yellow in color.
3. The solvent cement is used only for joining 1/2 inch (12.7 mm) through 2 inch (51 mm) diameter CPVC pipe and fittings.
4. The CPVC pipe and fittings are manufactured in accordance with ASTM D 2846.

Reason: One step CPVC solvent cement has been allowed by the International Plumbing Code for a number of years for water distribution systems. This is proven technology and should be recognized for hydronic applications as well.

There are existing one step solvent cements for CPVC that meet the requirements of ASTM D2846 and ASTM F493.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ASH-M-1-1203.3.4

M146–09/10
1203.8

Proponent: Andrew Granzow, Viega, LLC

Revise as follows:

1203.8 Copper or copper-alloy tubing. Joints between copper or copper-alloy tubing or fittings shall be brazed, mechanical or soldered joints conforming to Section 1203.3; flared joints conforming to Section 1203.8.1, ~~or~~ push fit joints conforming to Section 1203.8.2, or press type joints conforming to Section 1203.8.3.

Reason: This code change will clarify/ confirm press type joints are to be installed in accordance with the manufacturer's instructions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRANZOW-M-4-1203.8

M147–09/10
1203.8.3 (New)

Proponent: Andrew Granzow, Viega, LLC

Add new text as follows:

1203.8.3 Press joints. Press joints shall be installed in accordance with the manufacturer's installation instructions.

Reason: This code change will establish the installation requirements for press joints.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRANZOW-M-3-1203.8.3

M148–09/10
1203.20 (New); IRC M2104.5 (New)

Proponent: Julius Ballanco, P.E., JB Engineering and Code Consulting, P.C.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

Add new text as follows:

1203.20 Listed joints and connections. Joints and connections that are not otherwise addressed in Section 1203 shall be certified by a third party agency as acceptable for hydronic piping systems. The joints and connections shall be installed in accordance with their certification and manufacturer's installation instructions.

PART II – IRC MECHANICAL

Add new text as follows:

M2104.5 Listed joints and connections. Joints and connections that are not otherwise addressed in Section 2104 of the *International Mechanical Code* shall be certified by a third party agency as acceptable for hydronic piping systems. The joints and connections shall be installed in accordance with their certification and manufacturer's installation instructions.

Reason: There are various types of joints and connections utilized in water distribution and water supply systems that are not listed in Section 605. However, these joints or connections are listed by a third party agency as being acceptable for water distributions systems. This new section will indicate that such joints and connections are acceptable. Some examples of these types of joints and connections are unions, rolled groove fittings, and cut groove fittings.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BALLANCO-M-2-1203.20-M1204.5

M149–09/10
Table 1302.3, Chapter 15

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise table as follows:

TABLE 1302.3
FUEL OIL PIPING

PIPE OR TUBING TYPE ~~MATERIAL~~	STANDARD (see Chapter 15)
Brass pipe	ASTM B43
Brass tubing	ASTM B135
Copper or copper-alloy pipe	ASTM B42; ASTM B302
Copper or copper-alloy tubing (Type K, L or M)	ASTM B75; ASTM B88; ASTM B280
~~Labeled~~ Nonmetallic pipe	(See Section 1302.4)
~~Nonmetallic pipe~~	~~ASTM D2996~~
Steel pipe	ASTM A53; ASTM A106
Steel tubing	ASTM A254; ~~ASTM A539~~
Metallic Underground Fuel Pipe	UL 971A
Nonmetallic Underground Fuel Pipe	UL 971

2. Add new standards to Chapter 15 as follows:

UL
971-95 Nonmetallic Underground Piping For Flammable Liquids – with revisions through March 2006
971A-06 Outline of Investigation for Metallic Underground Fuel Pipe

Reason: This proposal accomplishes the following:

1. The first column of the table is not material, but specific pipe and tubing types.
2. The reference to “Labeled pipe” requirements in the table applies to ‘Nonmetallic pipe’, the title of section 1302.4.
3. ASTM D2996 is limited to only FRP pipe, so it does not reflect other forms of ‘nonmetallic pipes’ used in fuel applications today. In addition this standard does not contain any physical assembly, use/misuse tests or fuel compatibility tests, such as those found in UL971, which would make it suitable for use in fuel oil piping applications.
4. ASTM A539 was withdrawn without replacement in 1999.
5. The proposed new standard (UL 971) for nonmetallic underground fuel pipe and the Outline of Investigation (UL 971A) for metallic underground fuel pipe include a comprehensive set of construction and performance requirements, including tests to address physical abuse and misuse, and long-term compatibility with fuels and fluids.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standards, UL 971-95 and UL 971A-06, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-31-T. 1302.3-CH 15

M150–09/10
1302.4, Chapter 15

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

1302.4 Nonmetallic pipe. All nonmetallic pipe and connectors shall be *listed* and *labeled* as being acceptable for the intended application for flammable and combustible liquids. Nonmetallic pipe shall be installed only ~~outside~~ outdoors, underground.

Exception: Nonmetallic flexible connectors listed and labeled for aboveground use in accordance with UL 2039 shall be permitted to be installed aboveground.

2. Add new standard to Chapter 15 as follows:

UL
2039-02 Outline of Investigation for Flexible Connectors for Flammable Liquids

Reason: This proposal clarifies that both nonmetallic pipe and connectors need to be listed and labeled. In addition it allows flexible nonmetallic connectors listed in accordance with UL 2039 to be installed aboveground.

The Subject 2039 Outline of Investigation includes a comprehensive set of performance requirements for evaluating metallic and nonmetallic connectors for aboveground and underground transfer of noncorrosive, stable, flammable and combustible liquids. The connectors have a maximum length of eight feet.

Connectors listed in accordance with 2039 are fabricated, inspected, and tested for leakage before shipment from the factory as completely assembled vessels.

The intended use of these connectors is for the transfer of flammable and combustible liquids in, among other applications, underground carrier piping to a dispenser, carrier piping in an open dispenser sump to a dispenser, carrier piping in an open tank sump to a tank pump, and aboveground carrier piping to an aboveground tank.

Six companies currently have listings for these products.

In the second sentence, the intent is “outdoors” and the word “outside” does not necessarily mean outdoors.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard UL 22039-02, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-32-1302.4-CH 15

M151–09/10
1306.4, Chapter 15; IRC M2201.5, Chapter 44

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC MECHANICAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

1. Revise as follows:

1306.4 Gauging devices. Gauging devices such as liquid level indicators or signals shall be designed and installed so that oil vapor will not be discharged into a building from the liquid fuel supply system. Liquid-level indicating gauges shall comply with UL 180.

2. Add new standard to Chapter 15 as follows:

UL
180-03 Liquid-Level Indicating Gauges for Oil Burner Fuels – with revisions through March 2007

PART II – IRC MECHANICAL

1. Revise as follows:

M2201.5 Oil gauges. Inside tanks shall be provided with a device to indicate when the oil in the tank has reached a predetermined safe level. Glass gauges or a gauge subject to breakage that could result in the escape of oil from the tank shall not be used. Liquid-level indicating gauges shall comply with UL 180.

2. Add new standard to Chapter 44 as follows:

UL
180-03 Liquid-Level Indicating Gauges for Oil Burner Fuels – with revisions through March 2007

Reason: UL 180 includes a comprehensive set of construction and performance requirements that are specifically used to evaluate and list liquid level indicating gauges for oil burner fuels. Three companies currently have burner-fuel liquid level gauges listed.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard UL 180-03, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-27-1306.4-CH 15-RM-M2201.5-CH 44

M152–09/10
1307.1, Chapter 15; IRC M2204.2, Chapter 44

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IMC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IMC

1. Revise as follows:

1307.1 Building shutoff. A shutoff valve shall be installed on the fuel-oil supply line at the entrance to the building. Inside or above-ground tanks are permitted to have valves installed at the tank. The valve shall be capable of stopping the flow of fuel oil to the building or to the appliance served where the valve is installed at a tank inside the building. Valves shall comply with UL 842.

2. Add new standard to Chapter 15 as follows:

UL
842-07 Valves for Flammable Fluids

PART II – IRC MECHANICAL

1. Revise as follows:

M2204.2 Shutoff valves. A *readily accessible* manual shutoff valve shall be installed between the oil supply tank and the burner. Where the shutoff valve is installed in the discharge line of an oil pump, a pressure-relief valve shall be incorporated to bypass or return surplus oil. Valves shall comply with UL 842.

2. Add new standard to Chapter 44 as follows:

UL
842-07 Valves for Flammable Fluids

Reason: UL 842 includes a comprehensive set of construction and performance requirements that are specifically used to evaluate and list valves that are intended to be used for the control of flammable fluids, commonly used in piping systems and in the assembly of fuel burning equipment. These valves are of the manually operated, pressure operated, or temperature operated types, or combinations of such to the exclusion of types operated wholly or partially by electricity.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard ASTM F 842-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IMC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC MECHANICAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-M-29-1307.1-CH 15-RM-M2204.2

M153–09/10
Chapter 15

Proponent: Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

Revise standard reference in Chapter 15 as follows:

UL

2043-~~2008~~ 96 Fire Test for Heat and Visible Smoke Release for Discrete Products and their Accessories Installed in Air-handling Spaces

Reason: This change was not just an update of the standard. The title and scope were completely overhauled and expanded to incorporate many more products than the 1996 edition addressed. The new scope expansion now incorporates plumbing and mechanical products, not just electrical, which would allow many more products to be installed within a plenum space that do not meet flame spread and smoke developed ratings of 25/50 when tested in accordance with ASTM E 84. This new edition of this Standard virtually makes ASTM E 84 void and null. ASTM E 84 has been the industry standard for many years and has assured safe plenum spaces with limited allowance for many plumbing and mechanical products that simply cannot meet its provisions by producing the results of 25/50 ratings. But now, many of these products will be acceptable in plenum spaces because they can otherwise meet the provisions of the UL 2043, 2008 edition. During the Final Action Hearings in MN, M 72 was disapproved. This was the proposal to the IMC text that would have incorporated the new provisions and the reference to this new Standard that would have allowed the expanded testing provisions of UL 2043 for plumbing and mechanical products to be installed within plenum spaces. For informational purposes, it is important to be aware that the IMC Code Development Committee disapproved the same change during the Public Comment Hearings in the first half of the last code change cycle. Based on the disapproval action of M 72 the proponent should have withdrawn their proposed reference to this new edition. Unfortunately, now we have a Standard in the 2009 IMC that includes many allowances that the code text itself does not contain provisions for. This leads to misapplication of the code provisions. Uniformity, ease of use and consistent application of the code has been the primary focus of Virginia's participation in the code development process over the years and this situation falls well beyond that philosophy.

If you look in the 2009 edition of the IMC you will find the only location that references UL 2043, is Section 602.2.1.4.2. This Section is specific to "electrical" *equipment in combustible enclosures*.

Just a side note, you will also notice that the reference to UL 2043–2008 was inadvertently omitted in the first print edition of the 2009 IMC Chapter 15 Reference Standards, altogether .

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: It is the opinion of staff that the 1996 Edition of UL 2043 does not comply with Sections 3.6.3.1 and 3.6.3.2 of CP #28 as it is no longer readily available and no longer maintained. Staff was not required to evaluate the 2008 edition of UL 2043 for compliance with CP #28 because the standard was a currently referenced standard at the time it was updated from the 1996 to 2008 edition.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-M-17-CHAPTER 15

M154–09/10
Appendix A

Proponent: Sam Dardano, City of Boulder, CO, representing CO Association of Plumbing and Mechanical Officials (CAPMO)

Delete without substitution:

~~Figures A-1 through A-4 are illustrations of appliances located in confined spaces.~~

~~For SI: 1 square inch = 645 mm2, 1 British thermal unit per hour = 0.2931 W.~~

~~FIGURE A-1~~
~~ALL AIR FROM INSIDE THE BUILDING~~

~~NOTE: Each opening shall have a free area of not less than 1 square inch per 1,000 Btu per hour of the total input rating of all appliances in the enclosure and not less than 100 square inches.~~

~~For SI: 1 square inch = 645 mm2, 1 British thermal unit per hour = 0.2931 W.~~

~~FIGURE A-2~~
~~ALL AIR FROM OUTDOORS—INLET AIR FROM VENTILATED CRAWL SPACE AND OUTLET AIR TO VENTILATED ATTIC~~

~~NOTE: The inlet and outlet air openings shall each have a free area of not less than 1 square inch per 4,000 Btu per hour of the total input rating of all appliances in the enclosure.~~

~~For SI: 1 foot = 304.8 mm, 1 square inch = 645 mm2, 1 British thermal unit per hour = 0.2931 W.~~

~~FIGURE A-3~~
~~ALL AIR FROM OUTDOORS THROUGH VENTILATED ATTIC~~

~~NOTE: The inlet and outlet air openings shall each have a free area of not less than 1 square inch per 4,000 Btu per hour of the total input rating of all appliances in the enclosure.~~

~~For SI: 1 foot = 304.8 mm, 1 square inch = 645 mm2, 1 British thermal unit per hour = 0.2931 W.~~

~~FIGURE A-4~~
~~ALL AIR FROM OUTDOORS THROUGH HORIZONTAL DUCTS OR DIRECT OPENINGS~~

~~NOTE: Each air duct opening shall have a free area of not less than 1 square inch per 2,000 Btu per hour of the total input rating of all appliances in the enclosure. If the appliance room is located against an outside wall and the air openings communicate directly with the outdoors, each opening shall have a free area of not less than 1 square inch per 4,000 Btu per hour or the total input rating of all appliances in the enclosure.~~

(Portions of Appendix not shown remain unchanged)

Reason: As a result of Chapter 7 being re-written, there is no need for the illustrations pertaining to combustion air in Appendix-A, as it is covered under the Standard.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DARDANO-M-8-APPENDIX A

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL PLUMBING/PRIVATE SEWAGE DISPOSAL CODE

PLUMBING/PRIVATE SEWAGE DISPOSAL CODE COMMITTEE

Ray Moore, PE - *Chair*
Principal: Mechanical/Plumbing Engineer
Spectrum Engineers
Salt Lake City, UT

Ronald Braun II, CBO - *Vice Chair*
Plans Examiner
City of Woodinville
Woodinville, WA

Paul Bladdick
Master Plumber
The LPB Co. Inc.
White Lake, MI

Jeremy Brown
Codes & Regulatory Manager
NSF International
Ann Arbor, MI

William Chapin
Product Compliance Administrator
Cash Acme
Cullman, AL

Lonnie Erwin, Jr.
Chief Plumbing and Mechanical Inspector
City of Dallas
Dallas, TX

Gregory Farmer, PE
Rep: American Society of Plumbing Engineers
Hodge Associates, Inc.
Knoxville, TN

James Finley, PE
Rep: Plumbing Heating and Cooling Contractors
President
C.N. Finley
New Orleans, LA

McKenzie James
Senior Plumbing Inspector
City of Portland
Portland, OR

Robert Konyndyk
Chief, Plumbing Division, Dept of Labor
State of Michigan
Ada, MI

Daryl Kuiper
Plumbing Inspector Supervisor
State of Colorado
Denver, CO

Randy Lee
Code Official
City of Decatur Building Department
Decatur, AL

Shawn Martin
Technical Director
Plumbing Manufacturers Institute
Rolling Meadows, IL

Louis Pody
Business Representative
Plumbers Local 75
Beloit, WI

Guy Tomberlin
Code Specialist III
Fairfax County
Fairfax, VA

Staff Secretariat:
Fred Grable, PE
Staff Engineer - Plumbing
International Code Council

TENTATIVE ORDER OF DISCUSSION

2009-2010 PROPOSED CHANGES TO THE INTERNATIONAL PLUMBING/PRIVATE SEWAGE DISPOSAL CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation **does not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair.

P = *International Plumbing Code*
PSD = *International Private Sewage Disposal Code*

PLUMBING

P1-09/10 Part I
P1-09/10 Part II
P2-09/10
P3-09/10
P4-09/10
P5-09/10
P6-09/10
P7-09/10 , Part I
P8-09/10 , Part I
P9-09/10
P10-09/10, Part I
P11-09/10
P155-09/10
P12-09/10
P13-09/10
P14-09/10
P15-09/10
P16-09/10
P161-09/10
P17-09/10
P18-09/10, Part I
P156-09/10, Part I
P19-09/10, Part I
P20-09/10
P21-09/10
P22-09/10
P23-09/10
P24-09/10
P25-09/10
P26-09/10
P27-09/10
P162-09/10
P28-09/10
P29-09/10
P30-09/10
P31-09/10
P32-09/10
P33-09/10
P34-09/10
P35-09/10
P36-09/10, Part I
P37-09/10, Part I
P38-09/10
P39-09/10
P40-09/10, Part I
P41-09/10, Part I
P42-09/10, Part I
P43-09/10
P44-09/10
P45-09/10
P46-09/10
P47-09/10
P48-09/10
P49-09/10
P50-09/10
P51-09/10
P52-09/10, Part I
P53-09/10, Part I
P54-09/10, Part I
P55-09/10, Part I
P56-09/10
P57-09/10
P58-09/10
P59-09/10
P60-09/10
P61-09/10
P62-09/10
P63-09/10
P64-09/10
P65-09/10
P66-09/10
P56-09/10
P57-09/10
P58-09/10
P59-09/10, Part I
P60-09/10, Part I
P61-09/10, Part I
P62-09/10, Part I
P63-09/10, Part I
P64-09/10
P65-09/10, Part I
P66-09/10, Part I
P67-09/10, Part I
P157-09/10, Part I
P158-09/10, Part I
P68-09/10
P69-09/10
P70-09/10
P71-09/10
P72-09/10
P73-09/10
P74-09/10
P75-09/10
P76-09/10
P77-09/10
PM12-09/10
P78-09/10
P79-09/10
P80-09/10
P81-09/10
P82-09/10
P83-09/10
P84-09/10, Part I
P85-09/10, Part I
P86-09/10, Part I
P87-09/10, Part I
P88-09/10
P89-09/10
P90-09/10, Part I
P154-09/10, Part I
P91-09/10
P92-09/10, Part I
P93-09/10, Part I
P94-09/10, Part I
P95-09/10, Part I
P96-09/10, Part I
P97-09/10
P98-09/10
P99-09/10, Part I
P100-09/10, Part I
P101-09/10
P102-09/10, Part I
P103-09/10, Part I
P104-09/10, Part I
P105-09/10
P106-09/10, Part I
P107-09/10
P108-09/10, Part I
P109-09/10, Part I
P110-09/10, Part I
P111-09/10, Part I
P111-09/10
P112-13/10
P113-09/10
P114-09/10, Part I
P115-09/10, Part I
P116-09/10, Part I
P160-09/10, Part I
P117-09/10
P118-09/10
P119-09/10
P120-09/10
P121-09/10, Part I
P122-09/10
P163-09/10
P164-09/10
P123-09/10
P124-09/10, Part I
P159-09/10, Part I
P125-09/10
P126-09/10
P127--09/10, Part I
P128-09/10, Part I
P129-09/10
P130-09/10
P131-09/10, Part I
P132-09/10
P133-09/10
P134-09/10
P135-09/10, Part I
P136-09/10, Part I
P137-09/10
P138-13/10
P139-09/10
P140-09/10
P141-09/10
P142-09/10
PM13-09/10
P143-09/10
P144-09/10
P145-09/10
P146-09/10
P147-09/10
P148-09/10
P149-09/10
P150-09/10
S2-09/10, Part I
S2-09/10, Part II
P151-09/10
P152-09/10
P153-09/10, Part I

P1–09/10

105.4, 105.4.1, 105.4.2, 105.4.3, 105.4.4, 105.4.5, 105.6, Section 315 (New); IPSDC 105.4, 105.4.1, 105.4.2, 105.4.3, 105.4.4, 105.4.5, 105.4.6, Section 304 (New)

Proponent: Lawrence Brown, CBO representing the National Association of Home Builders (NAHB)

THIS IS A 2 PART CODE CHANGE. BOTH PARTS WILL BE HEARD BY THE IPC COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THE IPC COMMITTEE.

PART I - IPC

1. Add new section as follow:

SECTION 315
ALTERNATE ENGINEERED DESIGN

2. Revise as follows:

315.1 ~~105.4~~ Alternative engineered design. The design, documentation, inspection, testing and approval of an *alternative engineered design* plumbing system shall comply with Sections ~~105.4.1~~ 315.1 through 315.6 ~~105.4.6~~.

.

315.1.1 ~~105.4.1~~ Design criteria. An *alternative engineered design* shall conform to the intent of the provisions of this code and shall provide an equivalent level of quality, strength, effectiveness, fire resistance, durability and safety. Material, equipment or components shall be designed and installed in accordance with the manufacturer's installation instructions.

315.2 ~~105.4.2~~ Submittal. The registered design professional shall indicate on the permit application that the plumbing system is an *alternative engineered design*. The permit and permanent permit records shall indicate that an *alternative engineered design* was part of the *approved* installation.

315.3 ~~105.4.3~~ Technical data. The registered design professional shall submit sufficient technical data to substantiate the proposed *alternative engineered design* and to prove that the performance meets the intent of this code.

315.4 ~~105.4.4~~ Construction documents. The registered design professional shall submit to the code official two complete sets of signed and sealed construction documents for the shall include floor plans and a riser diagram of the work. Where appropriate, the construction documents shall indicate the direction of flow, all pipe sizes, grade of horizontal piping, loading, and location of fixtures and appliances.

315.5 ~~105.4.5~~ Design approval. Where the code official determines that the *alternative engineered design* conforms to the intent of this code, the plumbing system shall be *approved*. If the *alternative engineered design* is not *approved*, the code official shall notify the registered design professional in writing, stating the reasons thereof.

315.6 ~~105.4.6~~ Inspection and testing. The *alternative engineered design* shall be tested and inspected in accordance with the requirements of Sections 107 and 312.

PART II – IPSDC

1. Add new section as follow:

SECTION 304
ALTERNATE ENGINEERED DESIGN

2. Revise as follows:

304.1 ~~105.4~~ Alternative engineered design. The design, documentation, inspection, testing and approval of an *alternative engineered design* plumbing system shall comply with Sections ~~105.4.1~~ 304.1 through 304.6 ~~105.4.6~~.

304.1.1 ~~105.4.1~~ Design criteria. An *alternative engineered design* shall conform to the intent of the provisions of this code and shall provide an equivalent level of quality, strength, effectiveness, fire resistance, durability and safety.

Material, equipment or components shall be designed and installed in accordance with the manufacturer's installation instructions.

304.2 ~~105.4.2~~ Submittal. The registered design professional shall indicate on the permit application that the plumbing system is an *alternative engineered design*. The permit and permanent permit records shall indicate that an *alternative engineered design* was part of the *approved* installation.

304.3 ~~105.4.3~~ Technical data. The registered design professional shall submit sufficient technical data to substantiate the proposed *alternative engineered design* and to prove that the performance meets the intent of this code.

304.4 ~~105.4.4~~ Construction documents. The registered design professional shall submit to the code official two complete sets of signed and sealed construction documents for the shall include floor plans and a riser diagram of the work. Where appropriate, the construction documents shall indicate the direction of flow, all pipe sizes, grade of horizontal piping, loading, and location of fixtures and appliances.

304.5 ~~105.4.5~~ Design approval. Where the code official determines that the *alternative engineered design* conforms to
the intent of this code, the plumbing system shall be *approved*. If the *alternative engineered design* is not *approved*, the code official shall notify the registered design professional in writing, stating the reasons thereof.

304.6 ~~105.4.6~~ Inspection and testing. The *alternative engineered design* shall be tested and inspected in accordance with the requirements of Sections 107 and 312.

Reason : This proposal is a companion of other proposals that coordinate the administrative provisions of Chapter 1 of all I-Codes. The provisions show above for an "alternate engineered design" are currently located in Chapter 1 of both the IPC and IPSDC. This "alternate engineered design" is a specific engineering requirement and is not an administrative-type provision. This requirement is better suited to be located in Chapter Three – General.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IPSDC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Brown-P1-105.4

P2–09/10
202; IRC 202

Proponent: James Anjam, Arlington County, Virginia Plumbing and Mechanical Inspectors Association (VPMIA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

PLUMBING FIXTURE. A receptacle or device that is ~~either permanently or temporarily~~ directly or indirectly connected to the ~~water distribution system~~ building drainage system. Such receptacles or devices typically, but do not always require a connection to a supply of water. ~~of the premises and demands a supply of water therefrom; discharges wastewater, liquid-borne waste materials or sewage either directly or indirectly to the drainage system of the premises; or requires both a water supply connection and a discharge to the drainage system of the premises~~.

PART II – IRC

Delete and substitute as follows:

~~**PLUMBING FIXTURE.** A receptor or device that requires both a water supply connection and a discharge to the drainage system, such as water closets, lavatories, bathtubs and sinks. Plumbing *appliances* as a special class of fixture are further defined.~~

PLUMBING FIXTURE. A receptacle or device that is directly or indirectly connected to the building drainage system. Such receptacles or devices typically, but do not always require a connection to a supply of water.

Reason: The current plumbing fixture definition is confusing and out of date. According to the current code, waterless urinals and floor drains are not considered to be plumbing fixtures. This proposal updates and simplifies the code.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ANJAM-P1-202

P3–09/10
202

Proponent: Robert Burke, University of Colorado representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

PLUMBING APPLIANCE. ~~Any one of a special class of plumbing fixtures~~ Water-connected or drain-connected devices intended to perform a special function. ~~Included are fixtures having the~~ These devices have their operation or control dependent on one or more energized components, such as motors, controls, or heating elements ~~or pressure or temperature sensing elements~~. Such ~~fixtures~~ devices are manually adjusted or controlled by the owner or operator, or are operated automatically through one or more of the following actions; a time cycle, a temperature range, a pressure range, a measured volume or weight.

Reason: We need clear distinctions between appliances and fixtures since the code responds to these two classes differently.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Burke-P4-202

P4–09/10
202

Proponent: Judson Collins, JULYCO, representing self

Revise definition as follows:

COMBINATION WASTE AND VENT SYSTEM. A specially designed system of waste piping embodying the horizontal wet venting of one or more sinks, lavatories, drinking fountains or floor drains by means of a common waste and vent pipe adequately sized to provide free movement of air above the flow line of the drain.

Reason: The title of Section 912 is "COMBINATION DRAIN AND VENT SYSTEM. The text in the sections in 912 use the term "combination drain and vent" throughout. The term "combination waste and vent system" is not used in Section 912. The definition should define the term used in 912. The current definition only identifies sinks and floor drains as fixtures that are allowed to be vented by this method. The text in 912 also allows lavatories and drinking fountains to be vented by this method. This proposal modifies the definition to properly identify the fixtures allowed to be vented by a combination drain and vent system.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COLLINS-P5-202

P5–09/10
202

Proponent: Andrew Granzow, Viega LLC

Revise as follows:

MECHANICAL JOINT. A connection between pipes, fittings, or pipes and fittings <u>such as flanged, pressed, flared, compression, and push-fit joining systems</u> that ~~is~~ <u>are</u> not screwed, caulked, threaded, soldered, solvent cemented, brazed or welded. A joint in which compression is applied along the centerline of the pieces being joined. In some applications, the joint is a part of a coupling, fitting or adapter.

Reason: The proposed change includes text to identify types of mechanical joints.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRANZOW-P1-202

P6 –09/10
202 (New)

Proponent: Cort Strain, University of Colorado representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Add new definition as follows:

<u>**DEVICE.** A piece of equipment or a mechanism designed to serve a special purpose or perform a special function.</u>

Reason: Device is a code term that should be defined.

Cost Impact: There will be no cost impact to construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Strain-P5-202 DEVICE

P7–09/10
303.1, 303.4, Table 303.4; IRC P2608.1, P2608.4, Table P2608.4

Proponent: Becky Baker, Jefferson County Colorado, representing the Colorado Association of Plumbing Mechanical Officials

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

1. Revise as follows:

303.1 Identification. Each length of pipe and each pipe fitting, trap, fixture, material and device utilized in a plumbing system shall bear the identification of the manufacturer and any markings required by the applicable referenced standards.

303.4 Third-party ~~testing and~~ certification. All plumbing products and materials shall ~~comply~~ be listed by a third-party certification agency as complying with the referenced standards, specifications and performance criteria of this code. ~~and shall be identified in accordance with Section 303.1. When required by Table 303.4, plumbing products and materials shall either be tested by an approved third – party testing agency or certified by an approved third – party certification agency.~~ Products and materials shall be identified in accordance with Section 303.1.

2. Delete table without substitution:

~~**TABLE 303.4**~~
~~**PRODUCTS AND MATERIALS REQUIRING THIRD-PARTY TESTING AND THIRD-PARTY CERTIFICATION**~~

~~PRODUCT OR MATERIAL~~	~~THIRD-PARTY CERTIFIED~~	~~THIRD-PARTY TESTED~~
~~Potable water supply system components and potable water fixture fittings~~	~~Required~~	~~-~~
~~Sanitary drainage and vent system components~~	~~Plastic pipe, fittings and pipe-related components~~	~~All others~~
~~Waste fixture fittings~~	~~Plastic pipe, fittings and pipe-related components~~	~~All others~~
~~Storm drainage system components~~	~~Plastic pipe, fittings and pipe-related components~~	~~All others~~
~~Plumbing fixtures~~	~~-~~	~~Required~~
~~Plumbing appliances~~	~~Required~~	~~-~~
~~Backflow prevention devices~~	~~Required~~	~~-~~
~~Water distribution system safety devices~~	~~Required~~	~~-~~
~~Special waste system components~~	~~-~~	~~Required~~
~~Subsoil drainage system components~~	~~-~~	~~Required~~

PART II - IRC

1. Revise as follows:

P2608.1 Identification. Each length of pipe and each pipe fitting, trap, fixture, material and device utilized in a plumbing system shall bear the identification of the manufacturer and any markings required by the applicable referenced standards.

P2608.4 Third-party ~~testing and~~ certification. All plumbing products and materials shall ~~comply~~ be listed by a third-party certification agency as complying with the referenced standards, specifications and performance criteria of this code. ~~and shall be identified in accordance with Section P2608.1. When required by Table P2608.4, plumbing products and materials shall either be tested by an approved third – party testing agency or certified by an approved third – party certification agency.~~ Products and materials shall be identified in accordance with Section P2608.1.

2. Delete table without substitution:

~~**TABLE P2608.4**~~
~~**PRODUCTS AND MATERIALS REQUIRING THIRD-PARTY TESTING AND THIRD-PARTY CERTIFICATION**~~

~~PRODUCT OR MATERIAL~~	~~THIRD-PARTY CERTIFIED~~	~~THIRD-PARTY TESTED~~
~~Potable water supply system components and~~	~~Required~~	~~-~~

~~potable water fixture fittings~~		
~~Sanitary drainage and vent system components~~	~~Plastic pipe, fittings and pipe-related components~~	~~All others~~
~~Waste fixture fittings~~	~~Plastic pipe, fittings and pipe-related components~~	~~All others~~
~~Storm drainage system components~~	~~Plastic pipe, fittings and pipe-related components~~	~~All others~~
~~Plumbing fixtures~~	~~-~~	~~Required~~
~~Plumbing appliances~~	~~Required~~	~~-~~
~~Backflow prevention devices~~	~~Required~~	~~-~~
~~Water distribution system safety devices~~	~~Required~~	~~-~~
~~Special waste system components~~	~~-~~	~~Required~~
~~Subsoil drainage system components~~	~~-~~	~~Required~~

Reason: The revision to IPC Section 303.1 (IRC Section P2608.1)
1. To make it clear that the code intends that the identification requirements in any referenced standard(s) be met.
2. To require that the mark of the third-party certification agencies be applied to listed products. This is needed so that the inspector knows that the product has been certified by a third party agency.

The revision to IPC Section 303.4 (IRC Section P22608.4) and the deletion of IPC Table 303.4 (IRC Table P2608.1)
1. To make the job of the easier since inspectors don't have time to review test reports and
2. To create a more uniform means to enforce code requirements among the various products governed by the code.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BAKER-P1-303.1

P8–09/10
305.2; IRC P2603.3

Proponent: Shawn Strausbaugh, Arlington County, VA representing Virginia Plumbing and Mechanical Inspectors Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Delete without substitution:

~~305.2 Breakage. Pipes passing through or under walls shall be protected from breakage.~~

(Renumber subsequent sections)

PART II - IRC

Revise as follows:

P2603.3 Breakage and corrosion. ~~Pipes passing through or under walls shall be protected from breakage.~~ Pipes passing through concrete or cinder walls and floors, cold-formed steel framing or other corrosive material shall be

protected against external corrosion by a protective sheathing or wrapping or other means that will withstand any reaction from lime and acid of concrete, cinder or other corrosive material. Sheathing or wrapping shall allow for for movement including expansion and contraction of piping. Minimum wall thickness of material shall be 0.025 inch (0.64mm).

Reason
(PART I) This section appears to be unenforceable. The installation of piping per the manufacturer's installation instructions and per the code sections that follow this section such as 305.3 through 305.9 clearly state the means of protecting piping from breakage.
(PART II) The portion of the section removed appears to be unenforceable. The installation of piping per the manufacturer's installation instructions and per the code sections that follow this section such as the remainder of P2603.3 through P2603.6 clearly state the means of protecting piping from breakage. This change is also similar to the proposed change to the IPC.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: STRAUSBAUGH-P3-305.2

P9–09/10
305.3.1 (New)

Proponent: Ronald L, George, CIPE, CPD, President of Ron George Design & Consulting Services representing himself

Add new text as follows:

305.3.1 Thermal expansion calculations. Where a piping system design has straight runs of piping exceeding 100 feet in length, the designer shall submit calculations and design drawings to the code official indicating the changes in pipe length due to the difference between installation temperatures and the anticipated hot and cold service temperature extremes. The drawings shall indicate how the changes in pipe length will be accommodated.

Reason: Thermal expansion occurred in a high rise building where the contractor made a material substitution the riser grew significantly and ripped apart several joints when the system was brought up to temperature. This code change is intended to assure that thermal expansion issues have been properly addressed by the designer and system installer.

Cost Impact: Minimal.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GEORGE-P2-305.3.1 NEW

P10–09/10
305.5; IRC P2603.5

Proponent: Shawn Strausbaugh, Arlington County, VA representing Virginia Plumbing and Mechanical Inspectors Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

305.5 Pipes through ~~or under footings or~~ foundation walls. Any pipe that passes ~~under a footing or~~ through a foundation wall shall be provided with a relieving arch, or a pipe sleeve pipe shall be built into the foundation wall. The sleeve shall be two pipe sizes greater than the pipe passing through the wall.

PART II - IRC

Revise as follows:

P2603.5 Pipes through ~~footings or~~ foundation walls. Any pipe that passes ~~under a footing or~~ through a foundation wall shall be provided with a relieving arch, or a pipe sleeve shall be built into the foundation wall. The sleeve shall be two pipe sizes greater than the pipe passing through the wall.

Reason: A sleeve should not be required where a pipe passes under a footing as the footing acts as a relieving arch.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: STRAUSBAUGH-P5-305.5

P11–09/10
308.9

Proponent: Gregory A. Farmer, PE representing ASPE Legislative Committee, ASPE

Revise as follows:

308.9 Parallel water distribution systems. Piping bundles for manifold systems shall be supported in accordance with Table 308.5. Support at changes in direction shall be in accordance with the manufacturer's installation instructions. ~~Hot and c~~Cold water and uninsulated hot water piping shall not be grouped in the same bundle.

Reason: The purpose of separation between the hot water and cold water piping is to prevent heat transfer. Insulation on the hot water piping accomplishes the same objective. Allowing the insulated piping to be in the same pipe bundle will reduce labor and material costs.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FARMER-P1-308.9

P12–09/10
310.4 (New)

Proponent: Marcelo M. Hirschler (GBH International) representing the American Fire Safety Council

Add new text as follows:

310.4 Exposed insulation. Where insulating materials are installed on exposed elements within toilet rooms, the materials shall comply with Section 719 of the International Building Code.

(Renumber subsequent sections)

Reason: This proposal appears to state the obvious but there has been some discussion as to whether the IBC applies when it is not explicitly referenced in the IPC and this language will help clarify. This proposal is intended to build on the language in existing Section 310.3 of the IPC. **"310.3 Interior finish.** Interior finish surfaces of toilet rooms shall comply with the *International Building Code*."

It is my belief that Section 310.3, although it contains vague code language, is important because it directs the IPC code user to the appropriate requirements for interior finish in the IBC. This includes not only the information on the requirements in Section 1210 of the IBC (related to the use of impervious floors, walls, caulking, etc. so that sanitation can be maintained) but also the information on the fire properties of interior finish in the IBC. For example it is essential that the users of the IPC be aware that toilet partitions (or other interior finish) made of some smooth and impervious surfaces that potentially have very poor fire performance, such as HDPE (high density polyethylene), must comply with the fire safety requirements of Chapter 8 of the IBC. I have also made a proposal to the IBC in this cycle to upgrade the fire safety requirements for another material used as interior finish (often via toilet partitions) for bathrooms: polypropylene. Both HDPE and polypropylene ignite easily and generate very high heat release when they burn.

In the same way as 310.3 appropriately directs the IPC code user to the requirements of Sections 1210 and Chapter 8 of the IBC, this proposal is intended to direct the IPC code user to Section 719 of the IBC, on thermal and sound insulating materials. In particular, my concern is fire safety and the compliance with Section 719.7, to ensure that exposed insulating materials exhibit adequate fire properties.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-P4-310.4

P13–09/10
416.6 (New), 418.4 (New)

Proponent: Marcelo M. Hirschler (GBH International) representing American Fire Safety Council

Add new text as follows:

416.6 Protective Insulation and Coverings. Where protective insulation or protective coverings are installed on exposed water and drain piping, valves, fittings and tubing located beneath lavatories required to be accessible, the materials shall comply with the flame spread index and smoke-developed index requirements of Section 719 of the International Building Code.

418.4 Protective Insulation and Coverings. Where protective insulation or protective coverings are installed on exposed water and drain piping, valves, fittings and tubing located beneath sinks required to be accessible, the materials shall comply with the flame spread index and smoke-developed index requirements of Section 719 of the International Building Code.

Reason: Compliance with ADA requires that "insulation covers" be placed under lavatories and sinks surrounding water supply and drainpipes. These products are clearly both "pipe insulation" and "thermal insulation" products and, therefore, need to comply with the requirements for insulation in the IBC. The ADA requires that exposed hot water and drainpipes under lavatories and sinks be insulated (sections 4.19.4 and 4.24.6). The ICC/ANSI A117.1/2003 Standard (Accessible and Usable Buildings and Facilities 606.6 Exposed Pipes and Surfaces) states that: "Water supply and drainpipes under lavatories and sinks shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories and sinks." This indicates that we are dealing with an exposed insulation product or material.
ASTM C 168 – Standard Terminology Relating to Thermal Insulating Materials, defines as follows:

pipe insulation, n — insulation in a form suitable for application to cylindrical surfaces.

thermal insulation, n — a material or assembly of materials used to provide resistance to heat flow.

Consequently "insulation covers" are insulation and must comply with insulation requirements. Furthermore, the IBC describes, in section 603.1, the combustible materials allowed in buildings of Type I and Type II construction. These materials include "thermal and acoustic insulation" (item 2) as well as 24 other types of materials, as shown below. Section 603 of the IBC clearly states that exposed thermal and acoustic insulation shall have a flame spread index of not more than 25. Section 719 of the IBC is the section that includes all details of the requirements for "Thermal and Sound Insulating Materials".

Within 719, section 719.3 states as follows: "**719.3 Exposed installation.** Insulating materials, where exposed as installed in buildings of any type of construction, shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450.

Exception: Cellulose loose-fill insulation that is not spray applied complying with the requirements of Section 719.6 shall only be required to meet the smoke-developed index of not more than 450."

This indicates that "exposed insulating materials" must have a flame spread index of not more than 25 and a smoke developed index of not more than 450 (in accordance with ASTM E 84) unless they are cellulose loose fill insulation.

Continuing, the IBC describes the requirements for "insulation and covering on pipe and tubing" materials in section 719.7, which reads as follows: "**719.7 Insulation and covering on pipe and tubing.** Insulation and covering on pipe and tubing shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450.

Exception: Insulation and covering on pipe and tubing installed in plenums shall comply with the International Mechanical Code."

This indicates that "insulation and covering on pipe and tubing" materials must have a flame spread index of not more than 25 and a smoke developed index of not more than 450 (in accordance with ASTM E 84) unless they are installed in plenums.

This code proposal simply presents clarification, which is needed because there have been statements that these “insulation covers” either do not require to meet any fire testing or that they need to meet the requirements of ASTM D 635 instead of those of ASTM E 84.

There are no references to ASTM D 635 in the IFC, IPC or IMC. The only reference to ASTM D 635 in the IBC is in the section 2606.4 addressing light transmitting plastics, as shown below.

“2606.4 Specifications. Light-transmitting plastics, including thermoplastic, thermosetting or reinforced thermosetting plastic material, shall have a self-ignition temperature of 650°F (343°C) or greater where tested in accordance with ASTM D 1929; a smoke-developed index not greater than 450 where tested in the manner intended for use in accordance with ASTM E84, or not greater than 75 where tested in the thickness intended for use in accordance with ASTM D 2843 and shall conform to one of the following combustibility classifications:

Class CC1: Plastic materials that have a burning extent of 1 inch (25 mm) or less where tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use, in accordance with ASTM D 635,

Class CC2: Plastic materials that have a burning rate of 2.5 inches per minute (1.06 mm/s) or less where tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use, in accordance with ASTM D 635.”

It is clear that “insulation covers” are not made of “light transmitting plastics”. In the application of “light transmitting plastics” the fire tests (ASTM D 1929, ASTM D 2843 and ASTM D 635) are basically used as quality control tests since there is an understanding of the fire performance of these materials. Thus it does not make sense for “insulation covers”, or any insulation, to have fire safety associated with a very mild test for plastics, in devices or appliances) such as the ASTM D 635 (scope follows).

Appendix:
IBC section 603.1

603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or Type II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. Fire-retardant treated wood ...
2. Thermal and acoustical insulation, other than foam plastics, having a flame spread index of not more than 25.
   Exceptions:
   1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a flame spread index of not more than 100.
   2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a flame spread index of not more than 200.
3. Foam plastics in accordance with Chapter 26.
4. Roof coverings ...
5. Interior floor finish and floor covering materials ...
6. Millwork, such as doors ...
7. Interior wall and ceiling finishes ...
8. Trim ...
9. Where not installed over 15 feet (4572 mm) above grade, show windows ...
10. Finish flooring ...
11. Partitions dividing portions of stores ...
12. Stages and platforms ...
13. Combustible exterior wall coverings, balconies ...
14. Blocking such as for handrails, millwork ...
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials ...
17. Exterior plastic veneer ...
18. Nailing or furring strips as permitted by Section 803.4.
19. Heavy timber ...
20. Aggregates, component materials and admixtures ...
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, ...
22. Materials used to protect penetrations in fire-resistance-rated assemblies ...
23. Materials used to protect joints in fire-resistance-rated assemblies ...
24. Materials allowed in the concealed spaces ...
25. Materials exposed within plenums ...

“ASTM D 635: “Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position”

1. Scope*

1.1 This fire-test-response test method covers a small-scale laboratory screening procedure for comparing the relative linear rate of burning or extent and time of burning, or both, of plastics in the form of bars, molded or cut from sheets, plates, or panels, and tested in the horizontal position.

NOTE 1—This test method, and test method A of IEC 60695-11-10 are technically equivalent.

NOTE 2—For additional information on materials which do not burn to the first reference mark by this test, see Test Method D 3801.

1.2 This test method was developed for polymeric materials used for parts in devices and appliances. The results are intended to serve as a preliminary indication of their acceptability with respect to flammability for a particular application. The final acceptance of the material is dependent upon its use in complete equipment that conforms with the standard applicable to such equipment.

1.3 The classification system described in Appendix X1 is intended for quality assurance and the preselection of component materials for products.

1.4 This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire hazards or fire risk assessment of materials, products, or assemblies under actual fire conditions.

1.5 This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. For specific hazards statements, see 9.2.”

Cost Impact: None, because this is normal practice.

Analysis: See companion proposal PX-09/10 (by Hirschler for Section 605.25)

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-P1-416.6 NEW

P14–09/10
605.25 (New), 702.7 (New)

Proponent: Marcelo M. Hirschler (GBH International) representing the American Fire Safety Council

Add new text as follows:

605.25 Protective Insulation and Coverings. Where protective insulation or protective coverings are installed on exposed water supply piping, valves and fittings located beneath lavatories and sinks required to be accessible, the materials shall comply with the flame spread index and smoke-developed index requirements of Section 719 of the International Building Code.

702.7 Protective Insulation and Coverings. Where protective insulation or protective coverings are installed on exposed drain fittings, tubing and piping located beneath lavatories and sinks required to be accessible, the materials shall comply with the flame spread index and smoke-developed index requirements of Section 719 of the International Building Code.

Reason: Compliance with ADA requires that "insulation covers" be placed under lavatories and sinks surrounding water supply and drainpipes. These products are clearly both "pipe insulation" and "thermal insulation" products and, therefore, need to comply with the requirements for insulation in the IBC.

The ADA requires that exposed hot water and drainpipes under lavatories and sinks be insulated (sections 4.19.4 and 4.24.6). The ICC/ANSI A117.1/2003 Standard (Accessible and Usable Buildings and Facilities 606.6 Exposed Pipes and Surfaces) states that: "Water supply and drainpipes under lavatories and sinks shall be insulated or otherwise configured to protect against contact. There shall be no sharp or abrasive surfaces under lavatories and sinks." This indicates that we are dealing with an exposed insulation product or material.

ASTM C 168 – Standard Terminology Relating to Thermal Insulating Materials, defines as follows:

pipe insulation, n — insulation in a form suitable for application to cylindrical surfaces.

thermal insulation, n — a material or assembly of materials used to provide resistance to heat flow.

Consequently "insulation covers" are insulation and must comply with insulation requirements. Furthermore, the IBC describes, in section 603.1, the combustible materials allowed in buildings of Type I and Type II construction. These materials include "thermal and acoustic insulation" (item 2) as well as 24 other types of materials, as shown below. Section 603 of the IBC clearly states that exposed thermal and acoustic insulation shall have a flame spread index of not more than 25. Section 719 of the IBC is the section that includes all details of the requirements for "Thermal and Sound Insulating Materials". Within 719, section 719.3 states as follows:

"**719.3 Exposed installation.** Insulating materials, where exposed as installed in buildings of any type of construction, shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450.

Exception: Cellulose loose-fill insulation that is not spray applied complying with the requirements of Section 719.6 shall only be required to meet the smoke-developed index of not more than 450."

This indicates that "exposed insulating materials" must have a flame spread index of not more than 25 and a smoke developed index of not more than 450 (in accordance with ASTM E 84) unless they are cellulose loose fill insulation. Continuing, the IBC describes the requirements for "insulation and covering on pipe and tubing" materials in section 719.7, which reads as follows:

"**719.7 Insulation and covering on pipe and tubing.** Insulation and covering on pipe and tubing shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 450.

Exception: Insulation and covering on pipe and tubing installed in plenums shall comply with the International Mechanical Code."

This indicates that "insulation and covering on pipe and tubing" materials must have a flame spread index of not more than 25 and a smoke developed index of not more than 450 (in accordance with ASTM E 84) unless they are installed in plenums.

This code proposal simply presents clarification, which is needed because there have been statements that these "insulation covers" either do not require to meet any fire testing or that they need to meet the requirements of ASTM D 635 instead of those of ASTM E 84.

There are no references to ASTM D 635 in the IFC, IPC or IMC. The only reference to ASTM D 635 in the IBC is in the section 2606.4 addressing light transmitting plastics, as shown below.

"2606.4 Specifications. Light-transmitting plastics, including thermoplastic, thermosetting or reinforced thermosetting plastic material, shall have a self-ignition temperature of 650°F (343°C) or greater where tested in accordance with ASTM D 1929; a smoke-developed index not greater than 450 where tested in the manner intended for use in accordance with ASTM E84, or not greater than 75 where tested in the thickness intended for use in accordance with ASTM D 2843 and shall conform to one of the following combustibility classifications:

Class CC1: Plastic materials that have a burning extent of 1 inch (25 mm) or less where tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use, in accordance with ASTM D 635,

Class CC2: Plastic materials that have a burning rate of 2.5 inches per minute (1.06 mm/s) or less where tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use, in accordance with ASTM D 635."

It is clear that "insulation covers" are not made of "light transmitting plastics". In the application of "light transmitting plastics" the fire tests (ASTM D 1929, ASTM D 2843 and ASTM D 635) are basically used as quality control tests since there is an understanding of the fire performance of these materials. Thus it does not make sense for "insulation covers", or any insulation, to have fire safety associated with a very mild test for plastics, in devices or appliances) such as the ASTM D 635 (scope follows).

Appendix:
IBC section 603.1
603.1 Allowable materials. Combustible materials shall be permitted in buildings of Type I or Type II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:
1. Fire-retardant treated wood ...
2. Thermal and acoustical insulation, other than foam plastics, having a flame spread index of not more than 25.
   Exceptions:
   1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a flame spread index of not more than 100.
   2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a flame spread index of not more than 200.
3. Foam plastics in accordance with Chapter 26.
4. Roof coverings ...
5. Interior floor finish and floor covering materials ...
6. Millwork, such as doors ...
7. Interior wall and ceiling finishes ...
8. Trim ...
9. Where not installed over 15 feet (4572 mm) above grade, show windows ...
10. Finish flooring ...
11. Partitions dividing portions of stores ...
12. Stages and platforms ...
13. Combustible exterior wall coverings, balconies ...
14. Blocking such as for handrails, millwork ...
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials ...
17. Exterior plastic veneer ...
18. Nailing or furring strips as permitted by Section 803.4.
19. Heavy timber ...
20. Aggregates, component materials and admixtures ...
21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, ...
22. Materials used to protect penetrations in fire-resistance-rated assemblies ...
23. Materials used to protect joints in fire-resistance-rated assemblies ...
24. Materials allowed in the concealed spaces ...
25. Materials exposed within plenums ...

"ASTM D 635: "Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position"

1. Scope*
1.1 This fire-test-response test method covers a small-scale laboratory screening procedure for comparing the relative linear rate of burning or extent and time of burning, or both, of plastics in the form of bars, molded or cut from sheets, plates, or panels, and tested in the horizontal position.
NOTE 1—This test method, and test method A of IEC 60695-11-10 are technically equivalent.
NOTE 2—For additional information on materials which do not burn to the first reference mark by this test, see Test Method D 3801.
1.2 This test method was developed for polymeric materials used for parts in devices and appliances. The results are intended to serve as a preliminary indication of their acceptability with respect to flammability for a particular application. The final acceptance of the material is dependent upon its use in complete equipment that conforms with the standard applicable to such equipment.
1.3 The classification system described in Appendix X1 is intended for quality assurance and the preselection of component materials for products.
1.4 This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire hazards or fire risk assessment of materials, products, or assemblies under actual fire conditions.
1.5 This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. For specific hazards statements, see 9.2."

C**ost Impact:** The code change proposal will not increase the cost of construction.

Analysis: Consideration should be given to the outcome of PX-09/10. (Hirschler proposal for Section 416.6)

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-P3-605.25 NEW

P15–09/10
404.2 (New), Chapter 13

Proponent: Sid Cavanaugh, Cavanaugh Consulting representing Truebro/IPS Corporation

1. Add new text as follows:

404.2 Waste and supply pipe protective covers. Where the waste piping and water supply piping beneath accessible lavatories and sinks are required by ICC A117.1 to be fitted with protective coverings, the products shall be

in compliance to ASME A112.18.9.

2. Add standard to Chapter 13 as follows:

ASME

A112.18.9-2010 Barrier Free Insulated Protectors for Exposed Waste and Supplies

Reason: Item #1: The code needs clarification regarding accessible fixtures which are under the jurisdiction of the plumbing code and proper protection of exposed waste and supplies that are covered under the new ANSI/ASME standard under development which should be finished by early 2010. This code change will clear up confusion over enforcement of appropriate requirements for exposed waste and supplies used with accessible fixtures.

Item #2: It is important to add this new standard for proper protection of exposed waste and supplies that are covered under the new ANSI/ASME standard under development which should be finished by early 2010. This code change will clear up confusion over enforcement of appropriate requirements for exposed waste and supplies used with accessible fixtures.

Cost Impact: None, because the code currently requires both accessible fixtures and waste/supply pipe protection for users of such fixtures.

Analysis: Review of proposed new standard, ASME A112.18.9-2010, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CAVANAUGH-P2-404.2 NEW

P16–09/10
305.4; IRC P2603.4

Proponent: Shawn Strausbaugh, Arlington County, VA representing Virginia Plumbing and Mechanical Inspectors Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

305.4 ~~Sleeves~~ Sealing of annular spaces. The annular space~~s~~ between the outside of a pipe and the inside of a pipe sleeve~~s~~, ~~and pipes~~ or between the outside of a pipe and an opening in a building envelope wall, floor, or ceiling assembly penetrated by a pipe shall be ~~filled or tightly caulked in an approved manner~~ sealed with caulking material or closed with a gasketing system. The caulking material or gasketing system shall be suitable for the conditions at the penetration location and shall be compatible with the pipe, sleeve and building materials in contact with the sealing materials. Annular spaces ~~between~~ created by pipes penetrating ~~sleeves and pipes in~~ fire resistance-rated assemblies or membranes of such assemblies shall be ~~filled or tightly caulked~~ sealed or closed in accordance with Section 713 of the *International Building Code*.

PART II – IRC

Revise as follows:

P2603.4 ~~Sleeves~~ Sealing of annular spaces. The annular space~~s~~ between the outside of a pipe and the inside of a pipe sleeve~~s~~, ~~and pipes~~ or between the outside of a pipe and an opening in a building envelope wall, floor, or ceiling assembly penetrated by a pipe shall be ~~filled or tightly caulked as approved by the building official.~~ sealed with caulking material or closed with a gasketing system. The caulking material or gasketing system shall be suitable for the conditions at the penetration location and shall be compatible with the pipe, sleeve and building materials in contact with the sealing materials. Annular spaces ~~between~~ created by pipes penetrating ~~sleeves and pipes in~~ fire resistance-rated assemblies or membranes of such assemblies shall be ~~filled or tightly caulked~~ sealed or closed in accordance with the building portion of this code.

Reason: This proposal addresses a number of shortcomings of the existing old and vague text. This change also better aligns the IPC with the intent of IECC Section 504.3 Sealing of building envelope, and the IRC plumbing section with IRC N1102.4.1 Air leakage.

The reasons for the changes in the first sentence of this section are: 1) Clarifies that only the ends annular spaces need to be sealed or closed. Filling of the entire annular space cavity is pointless. 2) Eliminates the term 'tightly caulked' as it is archaic language from the era of "packing and pouring" lead joints. It would be a rare situation where it would be desired to have a pipe so rigidly fixed in a through-penetration. 3) Clarifies what "sleeves" are to be considered by adding the word "pipe" in reference to the pipe sleeves as required by IPC Section 305.5 (IRC Section P2603.5) . Some inspectors have mistaken the existing language to require sealing between pipe and flexible plastic sleeving used for corrosion protection. 4) Adds the requirement that pipe penetrations of building envelope wall, floor or ceiling assemblies (as some penetrations might not require pipe sleeves) must also be sealed to reduce the loss of conditioned air as required by International Energy Conservation Code. Although this sealing requirement is energy related, it is important to have this text in this section because piping installers typically are the ones who cut holes in the building envelope for the passage of pipes and as such they should be the ones responsible for sealing or closing off annular spaces. They are already familiar with the requirement for sealing pipes in pipe sleeves. All trades must do their part for energy conservation. Otherwise, the sealing just doesn't get accomplished resulting in more leakage paths through the building envelope.

The reasons for the changes in the second sentence of this section are to add the requirements for sealing material compatibility to all items that the sealing material contacts and that the material is suitable for the weather and temperature conditions of the application. While this seems like something that should be obvious, there have been instances where solvent based caulking has affected plastic piping and where a caulking material was inappropriate for wet (outdoor) conditions resulting is rainwater damage to the building.

The last sentence was changed to stress and clarify the importance of making sure that where fire resistance rated assemblies are being penetrated by pipes, specific materials and methods in accordance with the IBC (or building portion of the IRC) must be used. Proper fire stopping methods are critical for fire safety.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: STRAUSBAUGH-P4-305.4

P17–09/10
312.2, 312.3, 702.5

Proponent: Robert Burke, University of Colorado representing (CAPMO) Colorado Association of Plumbing and Mechanical Officials

1. Delete and substitute as follows:

~~**312.2 Drainage, waste and vent water test.** A water test shall be applied to the drainage system either in its entirety or in sections. If applied to the entire system, all openings in the piping shall be tightly closed, except the highest opening, and the system shall be filled with water to the point of overflow. If the system is tested in sections, each opening shall be tightly plugged except the highest openings of the section under test, and each section shall be filled with water, but no section shall be tested with less than a 10-foot (3048 mm) head of water. In testing successive sections, at least the upper 10 feet (3048 mm) of the next preceding section shall be tested so that no joint or pipe in the building, except the uppermost 10 feet (3048 mm) of the system, shall have been submitted to a test of less than a 10-foot (3048 mm) head of water. This pressure shall be held for at least 15 minutes. The system shall then be tight at all points.~~

~~**312.3 Drainage and vent air test.** An air test shall be made by forcing air into the system until there is a uniform gauge pressure of 5 psi (34.5 kPa) or sufficient to balance a 10-inch (254 mm) column of mercury. This pressure shall be held for a test period of at least 15 minutes. Any adjustments to the test pressure required because of changes in ambient temperature or the seating of gaskets shall be made prior to the beginning of the test period.~~

312.2 Water testing of drain, waste and vent piping. The design of test setups for leak testing of drain and waste piping systems shall consider the pressure requirements and limitations of Section 702.5. The test pressure for drain and waste piping systems, or portions thereof, shall not be less than the greatest possible in-service pressure or 10 feet (3048 mm) of water head (4.33 psi) (29.9 kPa), whichever is greater. Vent piping shall be tested at a pressure not less than 10 feet (3048 mm) of water head (4.33 psi) (29.9 kPa), except for vent piping sections that are within 10 feet of elevation below a vent system's final outdoor termination point. The upper 10 feet of a vent system terminating to the outdoors shall be permitted to be tested by a pressure ranging from 10 feet (3048 mm) of water head (4.33 psi) (29.9 kPa) at a point 10 feet in elevation below the outdoor termination point to zero pressure at the elevation of the outdoor termination point. Test pressures shall be developed by filling the closed piping system (or portion thereof)

completely with water and pressurizing the system to the required test pressure using a water pump or applying the required head of water above the highest elevation of the system (or portion thereof) under test. Where piping systems are tested in sections, the joints between tested sections shall be tested at a pressure not less than the required test pressures for the sections on either side of the joint. The test pressure in the system, as evidenced by a test gauge connected to the system, shall hold steady for not less than 15 minutes, without any addition of water to the system. Where the entire piping section under test can be visually observed for water leaks and the required test pressure is developed by the required head of water above the section under test, connection of a test gauge to the system shall not be required.

312.3 Air testing of drain, waste and vent piping. The design of test setups for leak testing of drain and waste piping systems shall consider the pressure requirements and limitations of Section 702.5. The test pressure for drain, waste and vent piping systems, or portions thereof, shall not be less than the greatest possible in-service pressure or 5 psi (34.5 kPa), whichever is greater. Test pressures shall be developed by forcing air into the closed piping system (or portion thereof). Where piping systems are tested in sections, the joints between tested sections shall be tested at a pressure not less than the required test pressures for the sections on either side of the joint. The test pressure in the system, as evidenced by a test gauge connected to the system, shall hold steady for not less than 15 minutes, without any addition of air to the system.

2. Add new text:

702.5 Pipe, fitting and joint selection for pressure conditions. The selection of pipe, fittings and joints of drain, waste and sewer systems shall consider the greatest internal pressure that could occur during testing or service. The allowable pressure in drain, waste and sewer piping systems that are pressurized in service by pumps or ejectors shall be the pressure rating of the system component having the lowest pressure rating. Where system pressure is created by liquid-filled vertical sections of pipe, system components shall be pressure-rated for not less than the system pressure at the component's installed elevation.

(Renumber subsequent sections)

Reason: This code change proposal was prompted by the failure of a roof drain conductor (piping) system inside of a basketball arena building here at the University of Colorado. Many 100s of thousands of dollars of water damage occurred and we were lucky that no one was hurt. An 8 inch cast iron no-hub elbow blew off the piping system due to the pressure caused by a blockage in the storm drain system outside the building. In evaluating why this particular event happened, I realized that the existing code sections concerning testing of drain and waste piping fail to properly consider building designs having drain piping systems that do not have any fixture connections for many consecutive stories in a row. Consider the following arrangement: A sports arena with sky box toilet facilities. The drain piping system serving those toilet facilities is many "stories" tall without any fixture connections between the sky box elevation and the elevation of the building drain (or the nearest level down where fixtures are connected) to relieve pressure should the system become clogged at a lower elevation. The existing code section for testing allows for such a piping system to be tested in sections as short as every 10 feet as the building construction rises from the ground. If there is a clog in the system well below sky box elevation, the drainage system could fill up to the point of overflow at the fixtures in the skybox. This creates a pressure in the lower sections of the system that is many times greater than what the piping system was tested for when 10 foot sections are tested.

Since then, I have made numerous evaluations of the drain piping systems in several multi-story buildings here at the University of Colorado and discovered that the real problem is not just in the testing but in the proper selection of piping system components for these multi-story systems that do not have fixture connections for many consecutive stories. One example of improper component selection for this type of "tall system" application could be the use of shielded couplings for no-hub cast iron pipe. ASTM standards C1540 and C1277 cover these couplings and indicate the allowable pressure ratings for different sizes. The unrestrained hydrostatic pressure for standard shielded couplings is 20 psi (46 foot of head) for 1 ½ thru 5 inch, 18 psi (42 foot of head) for 6 inch, 10 psi (23 foot of head) for 8 inch, 6 psi (14 foot of head) for 12 inch. It is obvious that the larger coupling sizes would be unsuitable for systems that are over two stories of normal height, let alone structures with tall stories. Because plastic drain, waste and vent fittings as well as "not for pressure" plastic pipe is not "pressure rated", these components could also prove to be problematic in certain applications where either testing or service conditions create pressures in excess of the component ratings.

Code officials should not have to become expert in evaluating the pressure capabilities of individual components of the drain and waste systems. This is the designer's or engineer's responsibility. However, the code requirements for design and test procedures should reflect what could be the expected actual in-service or test condition pressure, whichever is greater, in order to verify that the system has been designed properly for the intended conditions. Therefore, I have submitted new section 702.5 and re-written sections 312.2 and 312.3 to eliminate any confusion as to the pressure requirements for system components as well as the requirements for testing. The existing test sections are outdated for the type of large buildings being built today and need these changes.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Burke-P1-312.2

P18–09/10
312.9, 417.5.2; IRC P2503.6

Proponent: Don Surrena, National Association of Home Builders (NAHB)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

1. Delete without substitution:

~~**312.9 Shower liner test.** Where shower floors and receptors are made water tight by the application of materials required by Section 417.5.2, the completed liner installation shall be tested. The pipe from the shower drain shall be plugged water tight for the test. The floor and receptor area shall be filled with potable water to a depth of not less than 2 inches measured at the threshold. Where a threshold of at least 2 inches high does not exist, a temporary threshold shall be constructed to retain the test water in the lined floor or receptor area to a level not less than 2 inches deep measured at the threshold. The water shall be retained for a test period of not less than 15 minutes and there shall not be evidence of leakage.~~

(Renumber subsequent sections)

2. Revise as follows:

417.5.2 Shower lining. Floors under shower compartments, except where prefabricated receptors have been provided, shall be lined and made water tight utilizing material complying with Sections 417.5.2.1 through 417.5.2.4. Such liners shall turn up on all sides at least 2 inches (51 mm) above the finished threshold level. Liners shall be recessed and fastened to an approved backing so as not to occupy the space required for wall covering, and shall not be nailed or perforated at any point less than 1 inch (25 mm) above the finished threshold. Liners shall be pitched one-fourth unit vertical in 12 units horizontal (2-percent slope) and shall be sloped toward the fixture drains and be securely fastened to the waste outlet at the seepage entrance, making a water-tight joint between the liner and the outlet. ~~The completed liner shall be tested in accordance with Section 312.9.~~

> **Exception:** Floor surfaces under shower heads provided for rinsing laid directly on the ground are not required to comply with this section.

PART II - IRC

Delete without substitution as follows:

~~**P2503.6 Shower liner test.** Where shower floors and receptors are made water tight by the application of materials required by Section P709.2, the completed liner installation shall be tested. The pipe from the shower drain shall be plugged water tight for the test. The floor and receptor area shall be filled with potable water to a depth of not less than 2 inches measured at the threshold. Where a threshold of at least 2 inches high does not exist, a temporary threshold shall be constructed to retain the test water in the lined floor or receptor area to a level not less than 2 inches deep measured at the threshold. The water shall be retained for a test period of not less than 15 minutes and there shall not be evidence of leakage.~~

(Renumber subsequent sections)

Reason: Among the problems with the current change is mandating that potable water be used to fill a reservoir to test for leaks. Any available water would serve the same purpose, especially during the rough-in phase where potable water to the building may not be available. Another problem is why is there a need to construct a "temporary threshold" to construct a reservoir when the ponding effect of the reservoir will not be present during everyday use, as with an accessible shower. From past experience, leaks from the roof and flashing occur more frequently that any leaks from shower pans. Though, there is no required leak test for roof and building flashing. If the leak is discovered it is repaired. Also, the drain in a shower acts the same as a floor drain, especially is an accessible shower. Yet, there is no required test to see if the floor leaks. As was stated at the previous code hearings *"leaks from poorly constructed liners go unnoticed for long periods of time"*…A tested liner may not show any leaks at all and can leak later after it has been inspected and approved. Though there have been minor problems in the past in these application, there is no one simple solution. And, the test is not the solution. This is a feel good test that will discover the obvious and not the minor problems. The test is an inconclusive test and only gives a false sense of security.

Cost Impact: The code change proposal will not increase the cost of construction

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Surrena-P2-312.9

P19–09/10
312.10.2; IRC P2503.8.2

Proponent: Matthew Kapcia, Michigan Code Study and Development Committee

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

312.10.2 Testing. Reduced pressure principle ~~backflow preventer assemblies~~, double check ~~valve assemblies~~, pressure vacuum breaker ~~assemblies~~, reduced pressure detector fire protection ~~backflow prevention assemblies~~, double check detector fire protection ~~backflow preventer assemblies~~, and spill-resistant vacuum breaker backflow preventer assemblies and hose connection backflow preventers~~, and spill-proof vacuum breakers~~ shall be tested at the time of installation, immediately after repairs or relocation and at least annually. The testing procedure shall be performed in accordance with one of the following standards: ASSE 5013, ASSE 5015, ASSE 5020, ASSE 5047, ASSE 5048, ASSE 5052, ASSE 5056, CSA B64.10 or CSA B64.10.1.

PART II – IRC

Revise as follows:

P2503.8.2 Testing. Reduced pressure principle ~~backflow preventers~~, double check ~~valve assemblies~~, double ~~detector~~ check detector ~~valve assemblies~~ and pressure vacuum breaker backflow preventer assemblies shall be tested at the time of installation, immediately after repairs or relocation and at least annually.

Reason
(PART I): To maintain consistency, all assemblies should either be referred to as "backflow preventer assemblies" or just use this term once at the end of the description sentence as in this proposal. "Spill-resistant vacuum breaker" is the correct term. A spill-resistant vacuum breaker assembly is not spill proof.
(PART II): To maintain consistency, all assemblies should either be referred to as "backflow preventer assemblies" or just use this term once at the end of the description sentence as in this proposal. "Double check detector" and "Spill-resistant vacuum breaker" are the correct terms. Spill-resistant vacuum breaker assemblies are not spill proof.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KAPCIA-P1-312.10.2

P20–09/10
403.1 (IBC [P] 2902.1)

Proponent: Dwight Haldeman/Gilbert Architects Inc, representing himself

Revise as follows:

403.1 (IBC [P] 2902.1) Minimum number of fixtures. Plumbing fixtures shall be provided for the type of *occupancy* and in the minimum number shown in Table 403.1. Types of occupancies not shown in Table 403.1 shall be considered individually by the code official. The number of occupants to be used for calculating the number of plumbing fixtures shall be 60 percent of that determined by the *International Building Code. Occupancy* classification shall be determined in accordance with the *International Building Code.*

Reason: It is reasonable and prudent to calculate a "maximum" occupant load to determine means of egress capacities. To use this same occupant calculation to derive and size the number of toilet fixtures results in excesses that are expensive, not-"green" and unnecessary. As an Architect, it is possible to offer explanation to a school district (and to rationalize) why a building expected to educate 600 students has the capacity to egress 1500 but far more difficult to ask for an investment in plumbing fixtures based on the remote possibility that the maximum capacity of the building could sometime be reached. . IMC 403.1 already has divorced itself from the egress capacities in order to size the required ventilation. Any consequences of an incorrectly sized plumbing system would indeed be serious, but they do not rise to a level that could impact life safety. Using an occupant load calculation developed to promote life safety is inconsistent with determining the number of plumbing fixtures for a given occupancy The 60% reduction factor is adjustable at the discretion of the committee.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HALDEMAN-P1-403.1

P21–09/10
Table 403.1 (IBC [P] Table 2902.1), 410.1, 419.2

Proponent: Logan G Sauter representing Salt Lake City, Utah

1. Revise table as follows:

TABLE 403.1 (IBC [P] Table 2902.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS[g] ~~SEE SECTION 419.2~~)				~~DRINKING~~ FOUNTAINS[e,f,h,i] (~~SEE SECTION 410.1~~)	OTHER
				MALE	FEMALE				

(Portions of table not shown remain unchanged)

a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by the *International Building Code*.
b. Toilet facilities for employees shall be separate from facilities for inmates or patients.
c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted where such room is provided with direct access from each patient sleeping unit and with provisions for privacy.
d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.
e. The minimum number of required drinking fountains shall comply with Table 403.1 and Chapter 11 of the *International Building Code*.
f. Drinking fountains are not required for an occupant load of 15 or fewer.
g. In each bathroom or toilet room, urinals shall not be substituted for more than 67 percent of the required water closets in assembly and educational occupancies. Urinals shall not be substituted for more than 50 percent of the required water closets in all other occupancies.
h. Where drinking fountains are required, water coolers and bottled water dispensers shall be permitted to be substituted for not more than 50 percent of the required fountains.
i. Where water is served in restaurants, drinking fountains shall not be required.

2. Delete without substitution as follows:

~~**419.2 Substitution for water closets.** In each bathroom or toilet room, urinals shall not be substituted for more than 67 percent of the required water closets in assembly and educational *occupancies*. Urinals shall not be substituted for more than 50 percent of the required water closets in all other *occupancies*.~~

(Renumber subsequent sections)

3. Revise as follows:

410.1 Approval. Drinking fountains shall conform to ASME A112.19.1M, ASME A112.19.2M or ASME A112.19.9M and water coolers shall conform to ARI 1010. Drinking fountains and water coolers shall conform to NSF 61, Section 9. ~~Where water is served in restaurants, drinking fountains shall not be required. In other occupancies, where drinking fountains are required, water coolers or bottled water dispensers shall be permitted to be substituted for not more than 50 percent of the required drinking fountains.~~

Reason: Table heading: "DRINKING FOUNTAIN": should be plural to be consistent with the other column headings and with IBC Table 2902.1. When small amounts of additional information are necessary for tables, footnotes are a quicker and much more efficient method for providing that information than directing the reader to other codes or code sections

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: SAUTER-P3-TABLE 403.1

P22–09/10
Table 403.1 (IBC [P] Table 2902.1)

Proponent: Eirene Oliphant, MCP, Building Official, City of Leawood, KS

Revise table as follows:

Table 403.1 (IBC [P] Table 2902.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 419.2)	
				MALE	FEMALE
2	Business	B	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, light industrial and similar uses	1 per 25 for the first 50 and 1 per 50 <u>100</u> for the remainder exceeding 50	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 419.2) MALE	WATER CLOSETS (URINALS SEE SECTION 419.2) FEMALE	LAVATORIES MALE	LAVATORIES FEMALE
6	Mercantile	M	Retail stores, service stations, shops, salesroom, markets and shopping centers	1 per ~~500~~ 25 for the first 50 and 1 per 600 for the remainder exceeding 50	1 per ~~500~~ 25 for the first 50 and 1 per 400 for the remainder exceeding 50	1 per ~~750~~ 200 for the first 400 and 1 per 750 for the remainder exceeding 400	

(Portions of table note shown remain unchanged)

Reason: The purpose of the change is to substitute revised material for current provisions of the code. The IPC requires 1 WC per sex for mercantile occupancies between 51-1000. The UPC[1] requires between 2 to 6 WC per sex between 51 – 800. Based on an American Restroom Association (ARA)/Wall Street Journal investigation[2], this low IPC minimum has not caused problems because a majority of the public is not aware that they are allowed to use sanitation facilities in small to midsize mercantile establishments. Media awareness campaigns like the Wall Street Journal story and Section 403.5.1 Directional Signs (P34-06/07) will change the public's awareness.

Unlike multi-stalled toilets, single WC toilets are typically user locked and the WC is not available to the next patron until the toilet door is unlocked. While studies such as the Cohen report[4,5] have shown that the average user typically needs less then 2 minutes to use a WC, there appears to be no studies of the impact of single WC, user lockable toilets. Information is available, however, via the experience of those American cities that have installed automated public toilets (APT). Every municipality has found that for legitimate reasons (wheel chair, express breast milk, change colostomy bag, absorbent pads or a child's diaper) users occasionally have a legitimate need to be in the toilet for at least 15 minutes and at least one city now allows more then 20 minutes before an alarm sounds. This same 'occasional long use' problem occurs in buildings with user lockable toilets and the problem is exacerbated because these user lockable toilets also accommodate activities not related to sanitation. A retail store with 1000 people will sometimes include more then 15 employees. OHSA requires 2 WC for 16 on site employees[3]. It is likely that those 16 employees competing with 984 other occupants does not satisfy the intent of the OSHA requirement. In the process of reviewing the requirement for M it was noted that if adjusted for gender the increase in toilet fixtures slope for males in B (Business) could be reduced.

Bibliography:

[1]2006 Uniform Plumbing Code Table 4.1 'Retail or Wholesale Stores
[2]Wall Street Journal 'Bathroom Backlash Arrives on Main Street ' July 26, 2005
[3]29CFR1910.141(c)(1)(i) Table J-1
[4]ASPE report 95-01 Cohen 'Queuing theory approach to plumbing design research'
[5]ASPE report 92-02 Cohen 'Plumbing fixture requirements for office buildings research report'

Cost Impact: The code change proposal will increase the cost of construction at lower occupancies but may reduce cost for larger occupant loads.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Oliphant-P1-T403.1

P23–09/10
Table 403.1 (IBC Table [P]2902.1)

Proponent: Robert J. Heil, Code Inspections, Inc. representing the Pennsylvania Association of Building Code Officials, Inc.

Revise table as follows:

TABLE 403.1 (IBC Table [P]2902.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]
(See Sections 403.2 and 403.3)

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	OTHER
2	Business	B	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, light industrial and similar uses	1 service sink[h]
6	Mercantile	M	Retail stores, service stations, shops, salesrooms, markets and shopping centers	1 service sink [h]

h. For business and mercantile occupancies an occupant load of 15 or fewer, service sinks shall not be required.

(Portions of table and footnotes not shown remain unchanged.)

Reason: In a small facility with limited occupancy, such as a retail store with a size of less than 450 square feet or an office with less than 1,500 square feet, a service sink and the associated closet occupy a disproportionate amount of floor space, with rare requirements for use by the occupants.

Note: A similar exception was added in the 2009 Code for drinking fountains, with occupancies of 15 persons or less, under Footnote "f" of the "drinking fountain" column in Table 403.1.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Heil-P2-403.1

P24–09/10
Table 403.1 (IBC [P] Table 2902.1)

Proponent: Eirene Oliphant, MCP, Building Official, City of Leawood, KS

Revise table as follows:

Table 403.1 (IBC [P] Table 2902.1)
MINIMUM NUMBER OF REQUIRED PLUMBING FIXTURES[a]

NO.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 419.2)		LAVATORIES	
				MALE	FEMALE	MALE	FEMALE
1	Assembly	A-2[d]	Nightclubs, bars, taverns, dance halls and buildings for similar purposes	1 per ~~40~~ 25 for the first 25 and 1 per 90 for the remainder exceeding 25	1 per ~~40~~ 25 for the first 25 and 1 per 75 for the remainder exceeding 25	1 per ~~75~~ 40 for the first 40 and 1 per 200 for the remainder exceeding 40	
			Restaurants, banquet halls and food courts	1 per ~~75~~ 25 for the first 25 and 1 per 100 for the remainder exceeding 25	1 per ~~75~~ 25 for the first 25 and 1 per 80 for the remainder exceeding 25	1 per ~~200~~ 40 for the first 40 and 1 per 200 for the remainder exceeding 40	

(Portions of table not shown remain unchanged)

Reason: The purpose of the change is to substitute revised material for current provisions of the code. The American Restroom Association (ARA) is often questioned by the public and by reporters doing stories about the problems people face finding proper toilet facilities when away from home. One of the problems relates to having to wait too long for a restaurant toilet to free. To the degree that respondent recall details and also based on informal observation by ARA advocates, when more then 50 people are in a restaurant one will begin to see occasional toilet queuing when only 1 single occupant per sex toilet is available. Above 100, multiple person lines will appear. This problem is addressed in the UPC[1], which requires between 2 & 3 WC per sex between 15 – 150 occupants. The IPC requires only 1 WC per sex for A-2 restaurant occupancies between 16-150 occupants. This problem is particularly onerous in venues where people handle food. While those with an urgent need to void bowel or bladder will queue, those needing to wash their hands before eating may defer.

The low IPC A-2 minimum is made worse by the typical no-stall implementation of a single WC toilet. Unlike multi-stalled toilets, single WC toilets are typically user locked and the WC is not available to the next patron until the toilet door is unlocked. While studies such as the APSE Cohen reports[2,3] have shown that the average user typically needs less than 2 minutes to use a WC, there appears to be no studies of the impact of single WC, user lockable toilets. Information is available, however, via the logs generated by automated public toilets (APT). Every American municipality, that has installed single occupant APT's has found that for legitimate reasons (wheel chair, express breast milk, change colostomy bag, absorbent pads or a child's diaper) users occasionally have a legitimate need to be in the toilet for at least 15 minutes and one city now allows more then 20 minutes before a misuse alarm sounds. This same 'occasional long use' problem occurs in buildings with user lockable toilets and the problem is exacerbated because these lockable toilets also facilitate activities not related to sanitation. A-2 Pubs and Lounges suffers the same 1 locked toilet at lower occupancies but the attempt to address the problem by requiring 1 toilet per 40 results in excessive minimums at higher occupancies.

Bibliography:
[1]2006 Uniform Plumbing Code Table 4.1 'Retail or Wholesale Stores
[2]ASPE report 95-01 Cohen 'Queuing theory approach to plumbing design research'
[3]ASPE report 92-02 Cohen 'Plumbing fixture requirements for office buildings research report'

Cost Impact: The code change proposal will increase the cost of construction at lower occupancies but may reduce cost for larger occupant

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Oliphant-P4-T403.1

P25–09/10
403.2 (IBC [P]2902.2)

Proponent: Cindy Harvey, Kephart Community-Planning-Architecture representing herself

Revise as follows:

403.2 (IBC [P]2902.2) Separate facilities. Where plumbing fixtures are required, separate facilities shall be provided for each sex

Exceptions:

1. Separate facilities shall not be required for dwelling units and sleeping units.
2. Separate facilities shall not be required in structures or tenant spaces with a total occupant load, including both employees and customers, of 15 or less.
3. Separate facilities shall not be required in mercantile occupancies in which the maximum occupant load is ~~50~~ 100 or less.

Reason: In recent years, the industry has seen an increase in mixed-use buildings that are predominantly residential in use with a small, secondary retail component. Often, the use for this retail space is developed into neighborhood retail that is boutique in nature and classified as a Group M occupancy. The optimum size and area of the retail bays are 30 feet x 80 feet and 2,400 sf, respectively. Refer to Table IV-4A following this reason statement for a U.S. Department of Labor, Bureau of Labor Statistics summary of small retail space sizes and note the hand marked rows. Based on IBC Table 1004.1.1, and 30 sf per occupant, this 2,400 sf space at grade would have an occupant load of 80 persons. Consequently, the space does not qualify for exception number 3 of IPC Section 403.5 (IBC Section [P] 2902.2) that allows for one toilet facility to serve up to 50 occupants and therefore, the space requires separate toilet facilities for male and females. This places an undue burden on these smaller retail occupancies and often leads to the manipulation of occupancy calculation for the purpose of avoiding the additional toilet facility. Because an M use requires a second exit where the occupant load exceeds 49, the manipulation of occupant load subsequently adversely impacts the egress requirements for the space leading to compromised life/safety for the occupants.

An alternative approach is the exception in IBC Section 1004.1.1 which allows the building official to approve a smaller occupant load based on the actual number of occupants versus the design occupant load. In the example cited, it would be unrealistic to expect 80 occupants in a florist shop, dry cleaners, jewelry store, or liquor store of 2400 sf. A burden then falls on the building official to review these on a case-by-case basis for what is considered by many to be an excessive and unnecessary number of toilet rooms. Note that in IPC Table 403.1 (IBC Table [P]2902.1), M use, one water closet can serve up to 500 occupants and one lavatory can serve up to 750 occupants.

A cleaner way of resolving this disconnect is to increase the occupant load threshold in exception no. 3 to 100 persons. This proposed modification relieves the undue burden placed on the small retail space having an area within the range of 1500 sf and 3000 sf. Two accessible single user toilet facilities in a 1500 sf space occupies approximately 80 sf which is more than 5% of the total space. An increase in the occupant load threshold in exception 3 of this section would allow for the industry norm in boutique retail bay size to be accommodated with one single user toilet facility. Given that it is unlikely or at least rare that these small retail spaces would be occupied by the number persons equal to the design occupant load and that IPC Table 403.1 (IBC Table [P]2902.1) indicates that 2 water closets can serve up to 1000 persons; the provision of a single toilet facility appears to be more than adequate for the size of space and function that the proposed occupant load threshold increase would allow. The area of the space that the proposed occupant load threshold accommodates (3000 sf) would be such that neither a 500 or 300 ft travel distance limitation as required IPC Section 403.3 (IBC Section [P] 2902.3) would ever be exceeded because of the contrived dimensions this would necessitate. And finally, this change would significantly differentiate mercantile occupancy plumbing requirements (which are based primarily on convenience) from the egress requirements which are based on life/safety needs.

Table IV-4A: Characteristics of Selected Store Types Found in Neighborhood Shopping Centers (PTA Employees)

Store Type	Median Household Expenditure	Sales Per Square Foot GLA	Median Store Size (Sq. Ft.)	Threshold Household Support	Minimum Expenditure Support
Hardware and Building Materials					
Building Materials and Supplies	$411	$228.43	65,000	36,110	$14,847,950
Hardware	$293	$166.59	20,000	11,364	$3,331,800
Food Stores					
Grocery/Convenience	$5,087	$371.39	10,000	730	$3,713,900
Automotive					
Tire, Battery and Accessory	$506	$159.81	6,000	1,894	$958,860
Apparel and Accessory					
Men's Clothing	$447	$203.31	15,000	6,823	$3,049,650
Women's Clothing	$626	$177.46	20,000	5,672	$3,549,200
Children's Clothing	$415	$246.71	15,000	8,909	$3,700,650
Shoes	$391	$241.56	5,000	3,091	$1,207,800
Other Apparel & Accessories	$82	$225.00	5,000	13,798	$1,125,000
Furniture and Equipment					
Furniture	$489	$215.26	20,000	8,800	$4,305,200
Home Furnishings & Accessories	$820	$169.36	25,000	5,164	$4,234,000
Household Appliances	$354	$237.49	15,000	10,068	$3,562,350
Radio, Television, Stereo, Computer	$645	$297.28	5,000	2,306	$1,486,400
CDs & Music	$108	$197.21	4,500	8,241	$887,445
Eating and Drinking Places					
Restaurant	$2,612	$298.72	3,500	400	$1,045,520
Drug and Proprietary					
Drug / Cosmetics	$592	$366.73	12,000	7,430	$4,400,760
Other Retail and Personal Services					
Liquor / Wine & Spirits	$428	$363.50	2,956	2,427	$1,088,156
Sporting Goods & Bicycle	$349	$212.47	6,000	3,651	$1,274,828
Books & Stationary	$349	$138.03	4,500	1,811	$621,135
Jewelry	$158	$418.12	1,200	3,166	$501,744
Hobby & Specialty	$122	$187.72	5,000	7,723	$938,600
Florist	$75	$169.80	1,500	3,379	$254,700
Miscellaneous Retail	$1,080	$201.00	2,000	372	$402,000
DVD / Video Tape Rental	$68	$107.58	6,000	9,536	$645,480
Personal Care Products & Services	$457	$147.29	1,200	387	$176,748
Dry Cleaner / Coin Laundry	$166	$143.24	1,600	1,379	$229,184
Misc. Personal Services	$754	$158.59	1,200	252	$190,308
Total Retail	$17,878				

Source: U.S. Department of Labor, Bureau of Labor Statistics; and THK Associates, Inc.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: HARVEY-P1-403.2

P26–09/10
403.2.1 (IBC [P] 2902.2.1) (New)

Proponent: Eirene Oliphant, MCP, Building Official, City of Leawood, KS

Add new text as follows:

403.2.1 (IBC [P]2902.2.1) Family or assisted-use toilet facilities serving as separate facilities. Where a building or tenant space requires a separate toilet facility for each sex and each toilet facility is required to have only one water closet, two family/assisted-use toilet facilities shall be permitted to serve as the required separate facilities. Family or assisted-use toilet facilities shall not be required to be identified for exclusive use by either sex as required by Section 403.4.

Reason: Family/assisted-use toilets provide inherent potty parity. Two Family/assisted-use toilets increase overall availability. A single gender based toilet can be unavailable for periods of up to 15 minutes when, for example, the current occupant is using it for companion care, to change diapers, or to change a colostomy bag. Less need for gender based cleaning staff. Less impact when one toilet room is being cleaned or serviced. For decades, males and females have used the same toilet facility on airliners.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Oliphant-P2-403.2.1 NEW

P27–09/10
403.3 (IBC [P]2902.3)

Proponents: Robert J. Heil, Code Inspections, Inc. representing the Pennsylvania Association of Building Code Officials, Inc.
Kelly P. Reynolds, representing Little Caesar's Enterprises, Inc

Revise as follows:

403.3 (IBC [P]2902.3) Required public toilet facilities. Customers, patrons and visitors shall be provided with public toilet facilities in structures and tenant spaces intended for public utilization except where the area devoted to customers, patrons and visitors is less than 300 ft^2 (27.9m^2). The number of plumbing fixtures located within the required toilet facilities shall be provided in accordance with Section 403 for all users. Employees shall be provided with toilet facilities in all occupancies. Employee toilet facilities shall be either separate or combined employee and public toilet facilities.

Reason
(Heil) It is impractical to provide toilet rooms for public access for small public spaces such as the lobby for a secure ATM machine, customer pick up area at a dry cleaners, customer pick up area at a small service establishment, counter, etc. Additionally, creating a path in a small facility to a toilet room that is traditionally at the rear is impractical.
(Reynolds) Pick-up and delivery only-type food establishments are becoming more prevalent. This type of business is distinguished from restaurants in that they do not normally have provisions for patron dining. The sole intent is to prepare food on-site for consumption off-site. Depending upon the particular business, there may be a delivery service, or customers may be expected to come and pick up their food, usually pre-ordered. Customer waiting times are typically kept to less than one minute (call-aheads), and never more than 12 minutes (walk-ins). Call-ahead orders typically comprise about 85% of total business. Interior "public" areas are generally limited to small spaces where the transaction is completed at a service/cashier counter. These same conditions appear in a dry cleaners service lobby, florist shop, bank ATM lobby and similar occupancies.

Drive-in fast-food establishments of the sort where no interior public building access is anticipated or allowed have been around for decades. Publicly-available restrooms are not normally provided.

Generally, it is expected that the patrons will leave once they have completed their transaction; however, there is no mandate for them to do so many chose to eat in their automobiles, or to use one of other increasingly available picnic tables once they receive their food. It is widely held that, once the business transaction has taken place, the patron has the option to leave or stay. Given the quick transaction turn-around time, they are not "held hostage" while waiting on their food order as in a conventional restaurant scenario. As such, the need for public restrooms has not been that prevalent, as long as the relative volume of "sit-down" customers is fairly low.

Table 403.1 (IBC Table [P]2902.1) sets forth minimum requirements for plumbing fixtures (including restrooms) based on business type and occupant load, does not contain specific provisions for these relatively unique food establishments. Given established standards in the IPC, we typically try to treat these facilities as restaurant uses of less than 50 occupant load (Group **"B),** but it does not seem to be in keeping with the spirit of the code to do so. Owners of these businesses contend that providing public restroom facilities in addition to employee facilities is unnecessary and wasteful, in that the public facilities are not usually needed. Based on the metrics and statistical data provided, the owners' position makes sense.

The elimination of patron restrooms in these small public areas has been accepted by the following municipalities: Los, Angeles, CA; Detroit, MI; Chicago, IL; Houston, TX; Phoenix, AZ; Tucson, AZ; Lubbock, TX and San Jose, CA.

Cost Impact: This code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Heil_REYNOLDS-P1-403.3

P28–09/10
403.3.2 (IBC [P] 2902.4.1)

Proponent: Tim Pate, City and County of Broomfield, representing the Colorado Chapter ICC Code Change Committee

Revise as follows:

403.3.2 (IBC [P] 2902.4.1) Location of toilet facilities in occupancies other than covered malls. In occupancies other than covered malls, the require public and employee toilet facilities shall be located not more than one story above or below the space required to be provided with toilet facilities and the path of travel to such facilities shall not exceed a distance of 500 feet (152 m).

Exceptions:

1. The location and maximum travel distances to required employee facilities in factory and industrial occupancies are permitted to exceed that required by this section, provided that the location and maximum travel distance are approved.
2. Toilet facilities in structures and buildings under the same ownership, lease or control, shall not be prohibited from serving as the required toilet facilities for the employees located in the storage structures or kiosks provided that the travel distance limited by this section is not exceeded.

Reason: This code change will add back in an exception that was in the 2003 IBC. The code change proponent who modified section 2902 for the 2006 IBC did not intend to lose this exception which would deal with detached structures such as toll booths, photo processing booths, kiosks, and parking lot booths. It is not reasonable to require the one bathroom (sized for handicap accessible requirements) for these small structures.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Pate-P1-403.3.2

P 29–09/10
403.3.1 (New)

Proponent: Judson Collins, JULYCO, representing himself.

Add new text as follows:

[B] 403.3.1 Toilet room ingress and egress. Toilet rooms shall not open directly into a room used for the preparation of food for service to the public.

(Renumber subsequent sections)

Reason: This language is from Section 1210.5 of the IBC. Plumbing designers, installers and inspectors should not have to go to the building code to find this provision. Duplicating the provision from the IBC into the IPC is efficient and helpful to those mentioned previously.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COLLINS-P8-403.3.1

P30–09/10
403.3.5 (IBC [P] 2902.3.5) (New)

Proponent: Eirene Oliphant, MCP, Building Official, City of Leawood, KS

Add new text as follows:

403.3.5 ([P]2902.3.5) Door locking. Where a toilet room is designed for multiple occupants, the egress door for the room shall not be lockable from the inside of the room. This section does not apply to family or assisted-use toilet rooms.

Reason: To prevent a toilet user from restricting access to a toilet facility intended to satisfy the sanitation needs of multiple persons. To also reduce misuse such as employee smoke breaks, drug dealing or other inappropriate activities that are more likely when an occupant can lock entry to the toilet.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Oliphant-P3-403.3.5

P31–09/10
403.5 (IBC [P]2902.5) (New)

Proponent: Don Davies representing the Utah Chapter of ICC

Add new text as follows:

403.5 (IBC [P]2902.5) Required drinking fountains. A required drinking fountain for a tenant space shall be located in the tenant space or external to the tenant space provided that the travel distance from the most remote point in the tenant space to the drinking fountain is within 500 feet or for covered malls, within 300 feet.

Reason: The sharing of public restroom facilities is currently allowed in the code in Section 403.3 (IBC Section 2902.3) but the code is silent on sharing of drinking fountains even though that is what is generally done. If employees and the public can share restroom facilities then they can certainly share drinking fountains when located within the prescribed travel distances.

Cost Impact: There will be a cost savings with shared drinking fountains.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Davies-P1-403.5 NEW

P32–09/10
405.3.1

Proponent: Robert G. Konyndyk, Chief, Plumbing Division, Bureau of Construction Codes, State of Michigan

1. Revise as follows:

405.3.1 Water closets, urinals, lavatories and bidets. A water closet, urinal, lavatory or bidet shall not be set closer than 15 inches (381 mm) from its center to any side wall, partition, vanity or other obstruction, or closer than 30 inches (762 mm) center-to-center between adjacent fixtures. There shall be at least a 21-inch (533 mm) clearance in front of the water closet, urinal, lavatory or bidet to any wall, fixture or door. Water closet compartments shall not be less than 30 inches (762 mm) wide and 60 inches (1524 mm)deep ~~(see Figure 405.3.1)~~.

2. Delete Figure 405.3.1 without substitution:

Reason: The figure which has been in the code for many years is inaccurate and misleading. For example, partitions required to ensure privacy as referenced in Section 310 of the code are nonexistent (urinals) or inconsistent (water closets). The code Commentary is an excellent place for fixture clearance information.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KONYNDYK-P1-405.3.1

P33–09/10
405.3.1

Proponent: John T.E. Walters, Prince William County, VA, representing the Virginia Plumbing and Mechanical Inspectors Association (VPMIA)

Revise as follows:

405.3.1 Water closets, urinals lavatories and bidets. ~~A~~ Water closets, urinals, lavator~~y~~ies ~~or~~ and bidets shall ~~not~~ be set not closer than 15 inches (381 mm) from ~~its~~ their centerline to a~~ny~~ ~~side~~ wall, partition, vanity or ~~other~~ obstruction other than an adjacent water closet, urinal, lavatory or bidet. ~~, or~~ Adjacent fixtures not separated by a partition or wall shall be set not closer than 30 inches (762 mm) centerline to centerline ~~between adjacent fixtures~~. There shall be at least 21 inches (533 mm) clearance in front of ~~the~~ a water closet, urinal, lavatory or bidet to a~~ny~~ wall, fixture or door. Water closet compartments shall be not less than 30 inches (762 mm) wide and 60 inches (1524 mm) deep (see Figure 405.3.1). Where fixtures are required to be accessible, the requirements of Section 404 apply.

Reason: The current language does not reflect the requirement for privacy walls or partitions or separate water closet compartments or rooms or can be misleading for accessibility requirements. Language is added to maintain required clearances within these areas and refer the user to proper sections.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WALTERS-P3-405.3.1

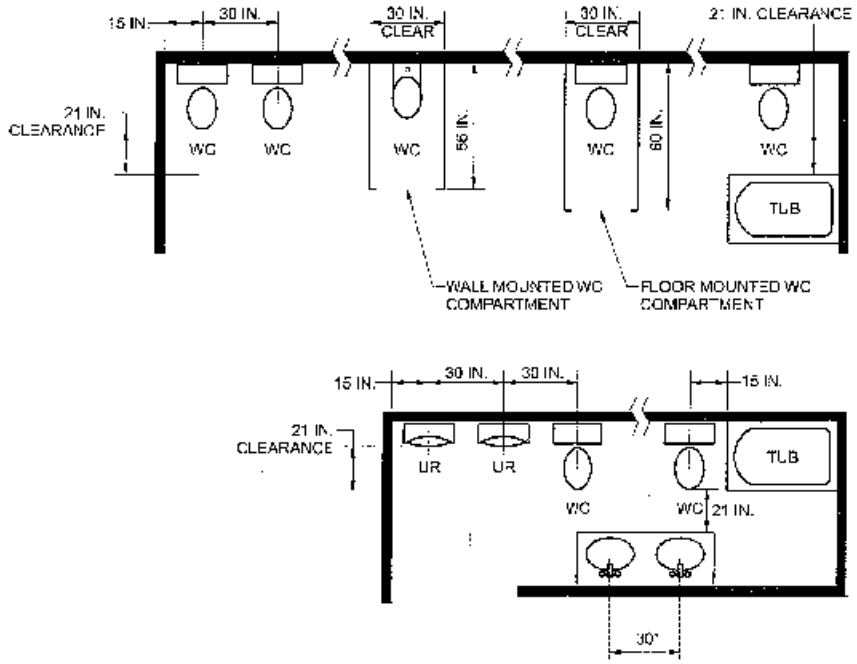
P34–09/10
405.3.1, Figure 405.3.1

Proponent: Shawn Strausbaugh – Arlington County, VA representing Virginia Plumbing and Mechanical Inspectors Association

1. Revise as follows:

405.3.1 Water closets, urinals, lavatories and bidets. A water closet, urinal, lavatory or bidet shall not be set closer than 15 inches (381 mm) from its center to any side wall, partition, vanity or other obstruction, or closer than 30 inches (762 mm) center to center between adjacent fixtures. There shall be at least a 21 – inch (533 mm) clearance in front of the water closet, urinal, lavatory or bidet to any wall, fixture or door. Water closet compartments shall be not less than 30 inches (762 mm) wide and 60 inches (1524 mm) deep <u>for floor mounted water closets and not less than 30 inches (762 mm) wide and 56 inches (1422 mm) deep for wall hung water closets</u> (see Figure 405.3.1).

2. Revise Figure 405.3.1 as follows:



For SI: 1 inch = 25.4 mm.

Reason: This compartment size is already permitted by Section 604.8.2 of ICC/ANSI A117.1-2003 for wall hung water closets in accessible water closet compartments. If an accessible wall hung water closet compartment is acceptable for accessibility at 56 inches minimum in depth, then the IPC should also allow the compartment to be no less than 56 inches in depth.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: STRAUSBAUGH-P6-405.3.1

P35–09/10
403.3.2 (IBC [P] 2902.3.2)

Proponent: Patrick Vandergriff*,* Vandergriff Code Consulting Services representing himself.

Revise as follows:

403.3.2 (IBC [P]2902.3.2) Location of toilet facilities in occupancies other than covered mall buildings. In occupancies other than *covered mall buildings,* the required public and employee toilet facilities shall be located not more than one *story* above or below the space required to be provided with toilet facilities and the path of travel to such facilities shall not exceed a distance of 500 feet (152 400 mm). Where multiple buildings on a single lot are under the same control, public and employee toilet facilities shall not be required to be located in each building provided that all other requirements of this section are met, the total number of plumbing fixtures within such buildings complies with the aggregate number of fixtures required for all buildings and the toilet facilities are available for use when any one building on the lot is occupied.

> **Exception:** The location and maximum travel distances to required employee facilities in factory and industrial occupancies are permitted to exceed that required by this section, provided that the location and maximum travel distance are *approved*.

Reason: Although this proposal is aimed at allowing the toilet facilities in a permanent school building to serve as the required toilet facilities for semi-permanent portable classroom buildings adjacent to the school but on the same property (lot), the allowance provides for reasonable accommodations at shopping centers, strip centers and individual commercial properties having multiple buildings under the same control. For example, consider a small business offices building with several separate buildings serving as warehouses for the business, all of which are on the same lot. If the travel and elevation location requirements are met, what is the harm in all of the required toilet facilities being located in the business office building? Other examples widely exist across the country as it is commonplace for strip centers and outdoor shopping centers to have central toilet facilities for the entire center. For schools that need fast expansion of classroom space, portable buildings are often brought in and used for several years or more until funds are available to build larger permanent buildings or additions. The decision to add these semi-permanent class room modules should not be required to be burdened by the expense of installing toilet facilities in each classroom module, especially where adequate toilet facilities exist within the required travel distance and elevation.

Cost Impact: Cost savings in some areas of the country.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: VANDERGRIFF-P1-403.3.2

P36–09/10
405.4; IRC P3003.19

Proponent: Shawn Martin, Plumbing Manufacturers Institute, representing the Plumbing Manufacturers Institute

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART – IPC

Revise as follows:

405.4 Floor and wall drainage connections. Connections between the drain and floor outlet plumbing fixtures shall be made with a floor flange or a waste connector and sealing gasket. The waste connector and sealing gasket joint shall comply with the joint tightness test of ASME A112.4.4 and shall be installed in accordance with the manufacturer's installation instructions. The flange shall be attached to the drain and anchored to the structure. Connections between the drain and wall-hung water closets shall be made with an *approved* extension nipple or horn adaptor. The water closet shall be bolted to the hanger with corrosion-resistant bolts or screws. Joints shall be sealed with an *approved* elastomeric gasket, flange-to-fixture connection complying with ASME A112.4.3 or an *approved* setting compound.

PART II - IRC

Revise as follows:

P3003.19 Joints between drainage piping and water closets. Joints between drainage piping and water closets or similar fixtures shall be made by means of a closet flange or a waste connector and sealing gasket compatible with the drainage system material, securely fastened to a structurally firm base. The inside diameter of the drainage pipe shall not be used as a socket fitting for a four by three closet flange. The joint shall be bolted, with an *approved* gasket flange to fixture connection complying with ASME A112.4.3 or setting compound between the fixture and the closet flange or waste connector and sealing gasket. The waste connector and sealing gasket joint shall comply with the joint tightness test of ASME A112.4.4 and shall be installed in accordance with the manufacturer's installation instructions.

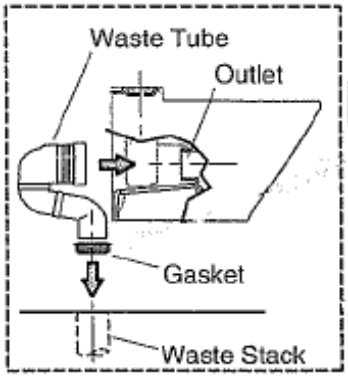
Reason: This code section currently provides for only a "flanged" outlet connection for floor-mounted water closets. These types of connections are typical of water closets designed for the North American market. However, in the global market, there are many water closet designs that use a different type of outlet connection to the sanitary drainage system. These connection arrangements consist of a waste tube connector on the water closet which is inserted into an elastomeric gasket. The waste tube and gasket are then inserted into the drain pipe opening at the floor line, and the gasket provides the seal between the water closet's waste tube and the drain pipe. See Figure 405.4 for an example. The water closet fixture is then anchored directly to the floor using mounting brackets or fasteners. These anchors are often concealed to allow for a smooth, sanitary exterior interface to the floor.

This design is used almost exclusively in Europe and other locations worldwide, and offers many advantages over wax-ring flange seals. ASME A112.4.3, a standard already referenced in the IPC and IRC, requires that the connection be leak-tight to pressures up to 10 psi. Such water closet designs are available in a wide range of rough-in dimensions.

This code change is needed because there is an increasing number of consumer and architectural demands in the North American market for European-styled water closet designs that are only available with the gasketed waste tube outlet connection. This code section must be changed to explicitly allow these types of water closets to be installed and to clearly establish standards for their performance. As the IPC becomes more globally accepted and adopted, this revised section will be ready to accommodate this internationally accepted method of drainage system connection. European styled water closets with gasketed connections to drainage pipes are designed to meet the same performance requirements of the applicable ASME standards listed in the IPC as traditional flange-mounted designs.

Cost impact: This code change proposal will not increase the cost of construction.

FIGURE 405.4
GASKETED WASTE TUBE CONNECTION
FOR WATER CLOSETS



PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MARTIN-P2-405.4

P37–09/10
406.1, 406.2, 409.1; IRC Table P2701.1

Proponent: Judson Collins, JULYCO, representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

1. Delete without substitution:

~~**406.1 Approval.** Domestic automatic clothes washers shall conform to ASSE 1007.~~

(Renumber subsequent sections)

2. Revise as follows:

406.2 Water connection. The water supply to an automatic clothes washer shall be protected against backflow by an air gap installed integrally within the machine ~~conforming to ASSE 1007~~ or with the installation of a backflow preventer in accordance with Section 608.

409.1 Approval. ~~Domestic dishwashing machines shall conform to ASSE 1006.~~ Commercial dishwashing machines shall conform to ASSE 1004 and NSF 3.

PART II – IRC

Revise table as follows:

TABLE P2701.1
PLUMBING FIXTURES, FAUCETS AND FIXTURE FITTINGS

MATERIAL	STANDARD
~~Home laundry equipment~~	~~ASSE 1007~~
~~Household dishwashing machines~~	~~ASSE 1008~~

(Portions of table not shown remain unchanged)

Reason: For the last ?? years, there have not been any domestic clothes washers listed to ASSE 1007 and there have not been any domestic dishwashing machines listed to ASSE 1008. ASSE is in the process of putting these standards on inactive status because of that.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

PART II – IRC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: COLLINS-P9-406.1

P38–09/10
406.3

Proponent: James Anjam / Arlington County/ Virginia Plumbing and Mechanical Inspectors Association (VPMIA)

Revise as follows:

406.3 Waste connection. The waste from an automatic clothes washer shall discharge through an air break into a standpipe in accordance with Section 802.4 or into a laundry sink. The trap and fixture drain for an automatic clothes washer standpipe shall be a minimum of 2 inches (51 mm) in diameter. An ~~The~~ automatic clothes washer fixture drain ~~shall connect to a branch drain or drainage stack~~ shall increase in size to at least 3 inches (76 mm) before connection to any drain pipe, other than a laundry tray fixture drain. ~~a minimum of 3 inches (76 mm) in diameter.~~ Automatic clothes washers that discharge by gravity shall be permitted to drain to a waste receptor or an approved trench drain.

Reason: The proposed change clarifies the requirement for increasing the drain pipe size to at least 3 inch where a clothes washer fixture drain connects to another drain. The 3 inch requirement was added in the 2003 plumbing code to resolve detergent suds backup problems in fixtures such as bathtubs and showers that were connected to the 2 inch drain piping in the vicinity of a clothes washer fixture drain. However, in residential applications prior to the 2003 IPC, it was common for a laundry tray to be connected to the 2 inch fixture drain piping from the clothes washer without increasing the drain size to at least 3 inch. There didn't seem to be any problems with this arrangement. Even if suds did back up in a laundry tray, what did it matter as the laundry tray is an acceptable waste receptor for a clothes washer discharge anyhow? Requiring the drain pipe size to increase to 3 inch where a laundry tray connects to the clothes washer fixture drain is just too stringent and unnecessary. We have not seen or heard of any problems with this particular connection arrangement.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ANJAM-P2-406.3

P39–09/10
406.3

Proponent: Dustin Mclehaney, Plumbing, Mechanical Plans Review Engineer; Curt Campbell, Plumbing, Mechanical, Gas, Residential Supervisor, Virginia Plumbing and Mechanical Inspectors Association.

Revise as follows:

406.3 Waste Connection. The waste from an automatic clothes washer shall discharge through an air break into a standpipe in accordance with Section 802.4 or into a laundry sink. The ~~trap and~~ fixture drain for a standpipe serving an automatic clothes washer ~~standpipe~~ shall connect to a 3 inch or larger diameter ~~branch drain~~ fixture branch or ~~drainage~~ stack. ~~a minimum of 3 inches (76mm) in diameter~~. Automatic clothes washers that discharge by gravity shall be permitted to drain to a waste receptor or an approved trench drain.

Reason: This change is to clarify some confusion of the written code text. The term "branch drain" needs to be removed and replaced with "fixture branch" because Chapter 2 provides no straight forward definition of "branch drain". Using a term in this section that is not defined in Chapter 2 creates confusion, which is evident based on the number of questions we receive on this issue. The confusion for the contractors is "How far can I run the 2 inch fixture drain, and where do I need to transition to 3 inch?" By replacing the term "branch drain" with "fixture branch" the contractor now knows that the fixture drain can remain 2 inch until it becomes a fixture branch (defined as "A drain serving two or more fixtures that discharges to another drain or stack) or is connected to a stack. The word "trap" was removed because a trap does not connect to fixture branches or stacks; there is always a section of fixture drain downstream of the trap. The wording "minimum of" is poor code language.

Cost Impact: There would be no cost to the contractors or customers is this code change is approved

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCLEHANEY-CAMPBELL-P1-406.3

P40–09/10
407.2; IRC P2713.1

Proponent: Pat Clark, Colorado Association of Plumbing and Mechanical Officials (CAPMO)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

407.2 Bathtub waste outlets. Bathtubs shall ~~have~~ be provided with at least one drain outlet and one waste overflow outlet~~s~~. Piping and tubing waste assemblies used to connect such outlets to drainage systems shall be not less than ~~a minimum of~~ $1^1/_2$ inches (38 mm) in diameter. ~~The waste~~ Drain outlets shall be ~~equipped~~ provided with an approved ~~stopper~~ mechanism or device to close the drain outlet.

PART II – IRC

Delete and substitute as follows:

~~**P2713.1 Bathtub waste outlets and overflows.** Bathtubs shall have outlets and overflows at least 11/2 inches (38 mm) in diameter, and the waste outlet shall be equipped with an *approved* stopper.~~

P2713.1 Bathtub waste outlets. Bathtubs shall be provided with at least one drain outlet and one waste overflow outlet~~s~~. Piping and tubing waste assemblies used to connect such outlets to drainage systems shall be not less than $1^1/_2$ inches (38 mm) in diameter. Drain outlets shall be provided with an approved mechanism or device to close the drain outlet.

Reason
(PART I) The main purpose of this proposal is to require an overflow waste outlet for a bathtub. The current code is silent on bathub overflow outlets. However, a recent Committee Interpretation (#52-08) for IRC Section P2713.1 concluded that for 1 and 2 family residential dwellings, bathtub waste overflow outlets are required to prevent accidental flooding. If the interpretation committee determined that waste overflow outlets are necessary for IRC buildings, it certainly seems logical that multi-story and multi-family structures covered by the IPC would benefit even more so by bathtubs having waste overflow outlets in order to provide the same level of protection against structural damage.
(PART II) The language of the current section was not absolutely clear about whether bathtubs required a waste overflow outlet. A recent Committee Interpretation (#52-08) for the current section concluded that bathtubs do require waste overflow outlets. In order to make the intent of this section clear and aligned with the recent committee interpretation, I am proposing the same language proposed for the corresponding section in the IPC.

Cost Impact: This code change proposal may increase the cost of construction

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CLARK-P1-407.2

P41–09/10
407.2: IRC P2713.1

Proponent: Richard Grace/Fairfax County/ VA Plumbing and Mechanical Inspectors/VA Building and Code Officials

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

407.2 Bathtub waste outlets and overflows. Bathtubs shall ~~have~~ be equipped with a waste outlet~~s~~ and an overflow outlet. The ~~minimum~~ outlets shall ~~of~~ be connected to waste tubing or piping not less than 1 ½ inches (38 mm) in diameter. ~~, and~~ ~~t~~The waste outlet shall be equipped with a~~n approved~~ watertight stopper.

PART II - IRC

Delete and substitute as follows:

~~**P2713.1 Bathtub waste outlets and overflows.** Bathtubs shall have outlets and overflows at least 1½ inches (38 mm) in diameter and the waste outlet shall be equipped with an *approved* stopper.~~

P2713.1 Bathtub waste outlets and overflows. Bathtubs shall be equipped with a waste outlet and an overflow outlet. The outlets shall be connected to waste tubing or piping not less than 1 ½ inches (38 mm) in diameter. The waste outlet shall be equipped with a watertight stopper.

Reason
(PART I): Current text is not clear on exactly if an overflow is required to be installed or not. This proposal breaks the text up into 3 clear concise sentences with 3 separate thoughts: 1. waste and overflows are required. 2. the minimum size is 1 ½ inches. And, 3. the waste outlet must be provided with a stopper. Also, by striking the term "approved" makes this issue not subject to the code official's interpretation as to what type stopper is permitted. By inserting the term "watertight" clarifies the intent is that the "stopper" allow the tub to be filled with water and hold the water in place. This is consistent with the IRC requirements for bathtubs in which it is clear that overflows are required.
(PART II): The IRC will benefit from having clearer language for this section as some believe that the current language does not require an overflow outlet.

Cost Impact: The code change proposal will not impact the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRACE-P7-407.2

P42–09/10
408.3; IRC P2721.2

Proponent: Sally Remedios, Delta Faucet Company, representing the Delta Faucet Company.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

408.3 Bidet water temperature. The discharge water temperature from a bidet fitting shall be limited to a maximum temperature of 110°F (43°C) by a water temperature limiting device conforming to ASSE 1070 or CSA B125.3

PART II – IRC

Revise as follows:

P2721.2 Bidet water temperature. The discharge water temperature from a bidet fitting shall be limited to a maximum temperature of 110°F (43°C) by a water temperature limiting device conforming to ASSE 1070 or CSA B125.3.

Reason: The same alternate standard is presently referenced in the IPC Section 424.5 and IPC Section 416.5 for limiting the discharge temperature in bathtubs and public lavatories respectively, by the use of a device complying with either of these two standards. The standard is already in the referenced standards chapter.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: REMEDIOS-P8-408.3

P43–09/10
410.1

Proponent: Jerry L. Bowen, AIA, CP, Jerry L. Bowen -Architect, representing self

Revise follows:

410.1 Approval. Drinking fountains shall conform to ASME A112.19.1M, ASME Al12.19.2M or ASME A112.19.9M and water coolers shall conform to ARI 1010. Drinking fountains and water cooler shall conform to NSF 61, Section 9. ~~Where water is served in restaurants, drinking fountains shall not be required.~~ Restaurants and similar establishments that prepare food for consumption on site are not required to have drinking fountains provided that, upon request, both a sanitary cup of not less than eight (8) ounces liquid capacity and drinking water are provided at no cost to the person requesting it. In other occupancies, where drinking fountains are required, water coolers or bottled water dispensers shall be permitted to be substituted for not more than 50 percent of the required drinking fountains.

Reason: Around my local area and in my limited travels to other areas and states, it has become a problem in acquiring free drinking water from restaurants and fast food places of business. These places are on the increase in charging for water when they have elected not to provide drinking fountains. Charges have been for the drinking cups anywhere from 10-cents to the price of a soft drink. The intent of the code was to require free water to the customers and workers in these establishments. They do not have to provide ice or large cups for the consumer's water but they should provide the container for free and the water. I have been in larger cities where restaurants have stated they only have bottle water for the customer. Fast foods want to charge the customer for water. The problem is the Code is not specific enough to make these establishments provide water and the container free of charge. Within a year or two these establishments make enough money when charging for water to have paid for the required drinking fountain. Also, if they were required to provide the drinking fountain then they would have to provide two drinking fountains (high & low) to comply with accessibility requirements. I have had several Building Officials state to me that the businesses are out to make money and can charge for the water. That is all well and good but they elected not to provide the drinking fountain in the business but that did not mean the Code's intent was to allow them to charge for the water; after all the drinking fountain would have dispensed free water.

Cost Impact: The code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Bowen-P1-410.1

P44–09/10
410.1

Proponent: Ronald B Hall, Lexington, SC, representing himself

Revise as follows:

410.1 Approval. Drinking fountains shall conform to ASME A112.19.1M, ASME A112.19.2M or ASME A112.19.9M and water coolers shall conform to ARI 1010. Drinking fountains and water coolers shall conform to NSF 61, Section 9. ~~Where water is served in~~ R~~r~~estaurants~~, drinking fountains~~ shall not be required to have drinking fountains installed provided that upon customer request, drinking water and a cup are supplied to the customer at no charge. In other occupancies, where drinking fountains are required, water coolers or bottled water dispensers shall be permitted to be substituted for not more than 50 percent of the required drinking fountains.

Reason: Many building officials I have spoken with including the S.C. Building Code Council Administrator interpret "serve" not to be free. Many restaurants do not have fountains and are charging customers for a cup to get water from a fountain (soft drink/water) machine or dispenser.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Hall-P1-410.1

P45–09/10
410.1, 410.2 (IBC 1109.5.1)(New), 410.3 (New)

Proponent: John T.E. Walters, Prince William County. VA. representing the Virginia Plumbing and Mechanical Inspectors Association (VPMIA)

1. Revise as follows:

410.1 Approval. Drinking fountains shall conform to ASME A112.19.M, ASME A112.19.2M or ASME A112.19M and water coolers shall conform to ARI 1010. Drinking fountains and water coolers shall conform to NSF 61, Section 9. ~~Where water is served in restaurants, drinking fountains shall not be required. In other occupancies, where drinking fountains are required, water coolers or bottled water dispensers shall be permitted to be substituted for not more than 50 percent of the required drinking fountains.~~

2. Add new text as follows:

[B]410.2 (IBC 1109.5.1) Minimum number. Not fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons.

> **Exception:** A single drinking fountain that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains.

410.3 Substitution. Where restaurants provide drinking water in a container free of charge, drinking fountains shall not be required in those restaurants. In other occupancies, where drinking fountains are required, water coolers or bottled water dispensers shall be permitted to be substituted for not more than 50 percent of the required number of drinking fountains.

Reason: Adding requirement per IBC Section 1109.5.1 Minimum number. IBC requires a minimum of two drinking fountains and IPC should reflect that requirement.

Also addressing that establishment serving water could charge a fee for the water or a cup to serve it in. Where drinking fountains are required it is impermissible to charge for the use of the drinking fountain.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Section [B]410.2 is being heard by the IPC committee only for the purposes of deciding whether the section needs to be added to the IPC. Because this section is controlled by the IBC, no changes to the text can made.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WALTERS-P4-410.1

P46–09/10
410.1, 410.2 (IBC [P]2902.1.3) (New)

Proponent: James W. McCall, AIA, Slonaker McCall Architects, representing himself

1. Revise as follows:

410.1 Approval. Drinking fountains shall conform to ASME A112.19.1M, ASME A112.19.2M or ASME A112.19.9M and water coolers shall conform to ARI 1010. Drinking fountains and water coolers shall conform to NSF 61, Section 9. ~~Where water is served in restaurants, drinking fountains shall not be required. In other occupancies, where drinking fountains are required water coolers or bottled water dispensers shall be permitted to be substituted for not more than 50 percent of the required drinking fountains.~~

2. Add new text as follows:

410.2 ([P]2902.1.3) Substitutions for drinking fountains. For an occupant load greater than 100 persons, water coolers or bottled water dispensers shall be permitted to be substituted for not more than 50 percent of the number of required drinking fountains. For an occupant load of 100 or fewer persons, or where the building water supply is considered to be undrinkable by the local inhabitants of the area, bottled water coolers or bottled water dispensers shall be permitted to be substituted for100 percent of the number of required drinking fountains. Where water is served in restaurants, drinking fountains shall not be required.

Reason: This proposal concerns 1) the code requirements for providing drinking fountains in occupancies with small occupant loads and 2) the code requirements for drinking fountains where the local residents of a community will not drink the well or public water supplies.

For occupancies other than R-1, R-2 Apartment House, R-3, restaurants that serve water, Section 410.1 currently requires at least one drinking fountain for a building or tenant space. Code enforcement is mandatory, not optional.

Drinking water delivered by drinking fountains is nearly universally considered by the public to be insanitary. In many areas, drinking well or public water is unhealthy. Small businesses and other occupancies with a minimum numbers of occupants are being forced to install unnecessary drinking fountains/electric water coolers to satisfy this requirement. Many provide bottled water in addition to drinking fountains. A recent health issue example in our area involved a municipality where a water problem occurred and the water was considered unsafe to drink. A day had passed before the public was notified and a boil water advisory issued. In the meantime, the water was dispensed in water fountains in schools, etc. that were served by the particular municipal water authority.

We believe that the requirement for providing drinking water to the public creates an unnecessary liability to most building owners. If a person becomes ill because of the water, legal action will result.

We also believe that facilities with an occupant load of 100 persons should be exempt from a requirement to provide drinking water and, that those that are required to provide drinking water for 100 or less persons, should have the option of providing bottled water. This requirement should be modified or made optional, and building owners allowed to decide for themselves whether water fountains will be used. The liability and financial burden on small facilities is not warranted.

Cost Impact: The code change proposal will not increase the cost of construction. (It will decrease for small projects.)

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: McCall-P1-410.1

P 47–09/10
413.1

Proponent: Judson Collins, JULYCO, representing himself.

Revise as follows:

413.1 Approval. Domestic food waste grinders shall conform to ASSE 1008. ~~Commercial food waste grinders shall conform to ASSE 1009.~~ Food waste grinders shall not increase the drainage fixture unit load on the sanitary drainage system.

Reason: For the last ?? years, there have not been any commercial food waste grinders listed to ASSE 1007. ASSE is in the process of putting the standard on inactive status because of that.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: COLLINS-P3-413.1

P48–09/10
412.4

Proponent: Edward L Paxton representing the Utah Chapter of ICC

Revise as follows:

412.4 Laundry room floor drain. ~~Public laundries and central washing facilities~~ . In public coin-operated laundries, ~~and~~ in central washing facilities and individual dwelling units of multiple-family dwellings, rooms containing automatic clothes washers shall be provided with floor drains located to readily drain the entire floor area. Such drains shall have an ~~minimum~~ outlet diameter ~~of~~ not less than 3 inches (76 mm) ~~diameter~~. Floors in such rooms shall slope towards the floor drain.

Reason: In a single family dwelling, the damage caused by the washer leak or hose failure is limited to one owner. In multi-family, multi story buildings, the damage that may result from a single washer leak inside an individual dwelling unit often exceeds several tens of thousands of dollars in each of the many units that may be located below the failure.

Cost Impact: The code change proposal will increase the cost of construction, however the damage that may be prevented far exceeds the minimal cost.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: PAXTON-P1-412.4

P49–09/10
413.3

Proponent: Sid Cavanaugh, Cavanaugh Consulting representing In Sink Erator

Revise as follows:

413.3 Commercial food waste grinder outlets. Commercial food waste grinders shall be connected to a drain not less than 1 ½ inches (38mm) in diameter. Commercial food waste grinders shall be connected and trapped separately from any other fixtures or sink compartments. The connection of a commercial food waste grinder to the sanitary drainage system shall be downstream of all grease interceptors unless the code official approves or requires food waste grinders to discharge into a grease interceptor.

Reason: This code change will clarify the intent of the code regarding commercial food waste grinders. Code officials have in the past and continue to allow food waste grinders to connect directly to the sanitary drainage system of buildings. Research has shown that food waste does not cause build up or blockage of sewer lines. Food waste has the same specific gravity as fecal matter and behaves similarly in the sewer system. Finally, while this code change will allow most installations to by-pass an interceptor it will still recognize Section 1003.3.2 where it can be required/allowed by a jurisdiction to connect to an interceptor.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CAVANAUGH-P8-413.3

P50–09/10
416.5

Proponent: Judson Collins, JULYCO, representing himself.

Revise as follows:

416.5 Tempered water for public hand-washing facilities. *Tempered water* shall be delivered from *public* hand-washing facilities. *Tempered water* shall be delivered through an *approved* water-temperature limiting device that conforms to ASSE 1070 or CSA B125.3. For the purposes of this section, a public hand-washing facility shall be a plumbing fixture installation provided primarily for the purpose of washing one's hands and located in other than hotel/motel guest rooms, dwelling units, prison cells, and other private toilet rooms and bathrooms.

Reason: The existing section begs for a definition of what a public hand washing facility is. Rather than make a new definition, the intent of the section is explained by the addition of the proposed text.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COLLINS-P6-416.5

P51–09/10
416.5

Proponent: Guy Tomberlin of Virginia representing himself.

Revise as follows:

416.5 Tempered water for public hand-washing facilities. *Tempered water* shall be delivered from lavatories and group wash fixtures located in public toilet facilities provided for customers, patrons and visitors. ~~*public* hand-washing facilities.~~ *Tempered water* shall be delivered through an *approved* water-temperature limiting device that conforms to ASSE 1070 or CSA B125.3.

Reason: This is an attempt to clarify that employee or private toilet rooms, not for public use, are not required to be supplied with tempered water. Section 403.3 clearly mandates where "public toilet facilities" are to be installed. This new definition specifically works in conjunction with the provisions of 403, so wherever facilities are installed for "public utilization" the hand washing fixtures are required to be provided with tempered water.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-P1-416.5

P52–09/10
417.4.2; IRC P2708.1.1

Proponent: Christopher Birch, Executive Vice President, Bath Enclosure Manufacturers Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

417.4.2 Access. The shower compartment access and egress opening shall have a ~~minimum~~ clear and unobstructed width of not less than ~~22~~ 18 inches (~~559~~ 457 mm).

PART II - IRC

Revise as follows:

P2708.1.1 Access. The shower compartment access and egress opening shall have a ~~minimum~~ clear and unobstructed width of not less than ~~22~~ 18 inches (~~559~~ 457 mm).

Reason: In writing safety standards for the shower enclosure industry the Bath Enclosure Manufacturers Association determined that the minimum access width for shower enclosures should be 18" to accommodate shower enclosure units being manufactured. This will allow the standard bases to be fit with enclosures that are not allowed by the current code. For example, the current code does not consider overlap and jamb width in a 42 inch slider or a neo angle base with a 24 inch centerline. The 22 inch minimum has led to arbitrary and inconsistent enforcement. The industry's association has determined that 18 inches allows for functional accessibility, service and maintenance, emergency egress and response and rescue. The 18 inch minimum will be consistent with the safety and installation standards being developed by ASTM.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BIRCH-P1-417.4.2

P53–09/10
417.5 (New), 417.6 (New); IRC P2708.4 (New)

Proponent: Thomas Pape, Best Management Partners, representing Alliance for Water Efficiency

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Add new text as follows:

417.5 Gang shower user area. The floor area for each user of a gang shower arrangement shall be not less than 1300 square inches (0.838 m^2). For a rectangular floor area, the least dimension of the user area shall be not less than 36 inches (914mm). A wall-mounted showerhead for a rectangular user area shall be located at not less than 18 inches horizontally from any other side of the user area. For wedge-shaped floor areas, as are created by arrangements having shower head columns with 3 or more equally-spaced shower heads around the column, there shall be not greater than 5 such user areas around each column. Each wedge-shaped area shall be not less than 1300 square inches (0.838 m^2) in area nor shall the horizontal distance measured perpendicular to and from the face of the column to the outer limit of the area be less than 25 inches (635mm).

417.6 Multiple water discharge devices. The maximum allowable water flow from any combination of water outlets capable of discharging simultaneously into a shower compartment shall be 2.5 gpm (9.463 l/m) for floor areas of 2600 in^2 (1.677 m^2) or less. Where a shower compartment area is greater than 2600 in^2 (1.677 m^2), the maximum allowable water flow shall be increased 2.5 gpm (9.463 l/m) for each additional 2600 in^2 (1.677 m^2) of area or portion thereof. The maximum allowable water flow from any combination of water outlets capable of discharging simultaneously into a user area of a gang shower shall be 2.5 gpm (9.463 l/m).

(Renumber subsequent sections)

PART II – IRC

Add new text as follows:

P2708.4 Multiple water discharge devices. The maximum allowable water flow from any combination of water outlets capable of discharging simultaneously into a shower compartment shall be 2.5 gpm (9.463 l/m) for floor areas of 2600 in^2 (1.677 m^2) or less. Where a shower compartment area is greater than 2600 in^2 (1.677 m^2), the maximum allowable water flow shall be increased 2.5 gpm (9.463 l/m) for each additional 2600 in^2 (1.677 m^2) of area or portion thereof.

(Renumber subsequent sections)

Reason
(Part I): This revision is necessary to clarify and improve the code regarding maintaining hygienic conditions in multiple user (gang) shower rooms and to specify a water flow rate limitations for shower compartments and gang shower user areas. This revision aligns the IPC with Federal and State health codes and water efficiency regulations.

As the Commentary of the IPC 2006 explains, a minimum of 30 inches of horizontal shower space is required to bend over and clean ones lower extremities. This minimal space very often results in body contact with shower walls of a single user in a shower compartment. In multiple user (gang) shower rooms, allotting only 900 square inches per shower results in probable body-to body contact. While it may be acceptable for body-to-wall contact in a shower compartment intended only for a single user, body-to-body contact in a gang shower environment is certainly not hygienic. The IPC already includes floor drain requirements to prevent water of one shower user from flowing across the floor area of other shower users. This proposed amendment is needed to provide adequate cross-sectional space and assures the showerheads are far enough apart to maintain hygiene in multiple user (gang) shower rooms.

Most multiple user (gang) shower rooms do not clearly define individual shower spaces. The 1300 square inches of required minimum space is not arbitrary; based on health code requirements of 36"x36" = 1296". The 1296 square inches is rounded up to 1300 for simplicity. It is consistent with the existing code language regarding irregular shaped shower compartments. Therefore, the 1300 square inches is a reasonable requirement for one user; the space is not suitable for two users unless it is 2600 sq. inches or greater.

The shower head distance requirement of at least 18" as measured to the side of a rectangular user area in a gang shower is consistent the 36" minimum shower head spacing dictated by all known public health codes regarding multiple (gang) showers; including Federal and State regulations for schools, public housing, student dormitories, worker housing, detention centers and prisons. Because shower columns are often used in gang showers, a new section defines the acceptable minimum sized user areas in those applications.

The proposal also supports the Federal mandate for shower heads to flow at rates no greater than 2.5 gpm. The advent of new water emitters for showering has caused some confusion on adherence to this Federal mandate. This proposal does not attempt to reduce shower flows; it only provides clarification and support for existing laws.
(Part II): This revision is necessary to specify a water flow rate limitations for shower compartments. This revision aligns the IPC with Federal and State water efficiency regulations for shower heads to flow at rates no greater than 2.5 gpm. The advent of new water emitters for showering has caused some confusion on adherence to this Federal mandate. This proposal does not attempt to reduce shower flows; it only provides clarification and support for existing laws.

Cost Impact: This code change proposal is concurrence to public health codes and Federal shower flow requirements; thus, will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PAPE-P1-417.5 NEW

P54–09/10
417.5.2.1, 417.5.2.2; IRC P2709.2.1, P2709.2.2

Proponent: Julius Ballanco, PE, CPD, FASPE, JB Engineering and Code Consulting, PC representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

417.5.2.1 PVC sheets. Plasticized polyvinyl chloride (PVC) sheets ~~shall be a minimum of 0.040 inch (1.02 mm) thick, and~~ shall meet the requirements of ASTM D 4551. Sheets shall be joined by solvent welding in accordance with the manufacturer's installation instructions.

417.5.2.2 Chlorinated polyethylene (CPE) sheets. Nonplasticized chlorinated polyethylene sheet ~~shall be a minimum 0.040 inch (1.02mm) thick, and~~ shall meet the requirements of ASTM D 4068. The liner shall be joined in accordance with the manufacturer's installation instructions.

PART II – IRC

Revise as follows:

P2709.2.1 PVC sheets. Plasticized polyvinyl chloride (PVC) sheets ~~shall be a minimum of 0.040 inch (1.02 mm) thick, and~~ shall meet the requirements of ASTM D 4551. Sheets shall be joined by solvent welding in accordance with the manufacturer's installation instructions.

2709.2.2 Chlorinated polyethylene (CPE) sheets. Nonplasticized chlorinated polyethylene sheet ~~shall be a minimum 0.040 inch (1.02mm) thick, and~~ shall meet the requirements of ASTM D 4068. The liner shall be joined in accordance with the manufacturer's installation instructions.

Reason: The original concept behind specifying a minimum thickness was to prevent puncturing the shower pan during construction. With the addition of referenced standards, specifying the minimum thickness is no longer necessary. Both ASTM D4551 and D4068 have puncture test requirements. The puncture test requires a dart of a specified weight to be dropped on the membrane. If the dart impact allows water to pass through, the membrane fails.

It was originally believed that only a 40 mil thickness would prevent puncture. However, many 30 mil membranes pass the puncture test. It should be noted that not all 30 mil membranes can pass the test. It is more appropriate to allow the standard to regulate the material requirements than including an arbitrary thickness requirement.

Cost Impact: This will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BALLANCO-P6-417.5.2.1

P55–09/10
417.5.2.6 (New); IRC P2709.2.4 (New)

Proponent: Richard Grace, Fairfax County, VA Plumbing and Mechanical Inspectors, VA Building and Code Officials
Guy Tomberlin, Fairfax County, Virginia representing the Virginia Plumbing and Mechanical Inspectors Association (VPMIA) and the Virginia Building and Code Officials Association (VBCOA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Add new text as follows:

417.5.2.6 Liquid type, load bearing, bonded waterproof materials. Liquid applied, load bearing, bonded waterproof materials shall meet the requirements of ANSI A118.10 and shall be applied in accordance with the manufacturer's installation instructions.

PART II- IRC

Add new text as follows:

P2709.2.4 Liquid type, load bearing, bonded waterproof materials. Liquid applied, load bearing, bonded waterproof materials shall meet the requirements of ANSI A118.10 and shall be applied in accordance with the manufacturer's installation instructions.

Reason (Grace and Tomberlin): These products are available today for creating a water proof shower pan liner. The manufacturer must provide installation instructions on how to install the product to serve as a shower pan liner. In addition, the product must meet the third party certification as complying with ANSI A118.10.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRACE_Tomberlin-P8-417.5.2.6 NEW

P56–09/10
419.1

Proponent: Judson Collins, JULYCO, representing self

Revise as follows:

419.1 Approval. Urinals shall conform to ANSI Z124.9, ASME A112.19.2M, CSA B45.1 or CSA B45.5. Urinals shall conform to the water consumption requirements of Section 604.4. Water supplied urinals shall conform to the hydraulic performance requirements of ASME ~~A112.19.6~~ A112.19.2 , CSA B45.1 or CSA B45.5.

Reason: ASME A112.19.6 has been discontinued and has been replaced by ASME A112.19.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COLLINS-P4-419.1

P57–09/10
419.1, Chapter 13

Proponent: John M. Halliwill, Halliwill and Associates, representing Caroma

1. Revise as follows:

419.1 Approval. Urinals shall conform to ANSI Z124.9, ASME A112.19.2M, ASME A112.19.19, CSA B45.1, ~~or~~ CSA 45.5 or IAPMO IGC 161. Urinals shall conform to the water consumption requirements of Section 604.4. Water-

supplied urinals shall conform to the hydraulic performance requirements of ASME A112.19.6, CSA 45.1 or CSA B45.5.

2. Add standard to Chapter 13 as follows:

International Association of Plumbing and Mechanical Inspectors
5001 E. Philadelphia St.
Ontario, CA 91761

IAPMO

IGC 161-2007 Guide Criteria for Waterless Urinals

Reason: The proposed IAPMO IGC (standard) provides for materials and testing requirements for waterless urinals that are not covered in the current standards. One of which is stainless steel. The purpose statement in the proposed IGC states in part "The purpose of this standard is to provide the minimum design and performance criteria for waterless urinals. This standard is not intended to be a specification guide nor is it intended to restrict design. Its purpose is to serve as a guide for producers, distributors, architects, engineers, contractors, inspectors, and users; to promote understanding regarding materials, manufacture and installation; and to provide for identifying waterless urinals that conform with this standard."

Urinals that have been evaluated to this standard are currently in use using the Waterless Urinal with Liquid Trap technology.

This standard contains requirements for a new trap sealing method that has been evaluated and products listed for use in jurisdictions around the world. Products using this technology are currently manufactured by a number of manufacturers in this and other countries around the world. Additionally, it was noted while testing products using this new technology that should a negative pressure develop in the DWV system. Air will be introduced through the device until equilibrium is established. This feature will help maintain the trap seals of liquid seal traps so that odors, vapors and possibly injurious materials will not enter the building.

Cost Impact: This code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard, IAPMO IGC 161-2007, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HALLIWILL-P1-419.1

P58–09/10
425.2

Proponent: Sally Remedios, Delta Faucet Company, representing Delta Faucet Company.

Revise as follows:

425.2 Flushometer valves and tanks. Flushometer valves and tanks shall comply with ASSE 1037 or CSA B125.3. Vacuum breakers on flushometer valves shall conform to the performance requirements of ASSE 1001 or CAN/CSA B64.1.1. *Access* shall be provided to vacuum breakers. Flushometer valves shall be of the water conservation type and shall not be used where the water pressure is lower than the minimum required for normal operation. When operated the valve shall automatically complete the cycle of operation, opening fully and closing positively under the water supply pressure. Each flushometer valve shall be provided with a means for regulating the flow through the valve. The trap seal to the fixture shall be automatically refilled after each flushing cycle.

Reason: The CSA B125.3 standard has technically equivalent requirements to ASSE 1037 for flushometer valves, except it includes longer life cycle requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: REMEDIOS-P3-425.2

P59–09/10
425.4

Proponent: Abraham I. Murra, Canadian Standards Association, representing the Canadian Standards Association

Revise as follows:

425.4 Flush pipes and fittings. Flush pipes and fittings shall be of nonferrous material and shall conform to ASME A112.19.5 or CSA B125.3.

Reason: CSA B125-01, Plumbing Fittings, which is currently referenced in the Code, was replaced by ASME A112.18.1/ CSA B125.1-05, Plumbing Supply Fittings, ASME A112.18.2/CSA B125.2-05, Plumbing Waste Fittings, and CSA B125.3-05, Plumbing Fittings. The requirements for flush pipes and fittings are in CSA B125.3.

Cost Impact: The code change proposal will not increase the cost of production.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: 2009-2010-ccboilerplate

P60–09/10
424.9 (New), Chapter 13; IRC P2722.5 (New), Chapter 44

Proponent: Shawn Martin, Plumbing Manufacturers Institute, representing the Plumbing Manufacturers Institute

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART - IPC

1. Add new text as follows:

424.9 Water closet personal hygiene devices. Personal hygiene devices integral to water closets or water closet seats shall conform to the requirements of ASME A112.4.2.

2. Add standard to Chapter 13 as follows:

ASME
A112.4.2-2003 (R2008) Water Closet Personal Hygiene Devices

PART II – IRC

1. Add new text as follows:

P2722.5 Water closet personal hygiene devices. Personal hygiene devices integral to water closets or water closet seats shall conform to the requirements of ASME A112.4.2.

2. Add standard to Chapter 44 as follows:

ASME
A112.4.2-2003 (R2008) Water Closet Personal Hygiene Devices

Reason: The ASME A112.4.2 standard establishes general and performance requirements, test methods, and marking requirements for bidet sprays and other optional features as applied to water closets, water closet seats, and other retrofit devices. Requiring this standard will ensure protection of plumbing systems from backflow, and protect public safety by limiting the temperature of the water dispensed.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard, ASME A112.4.2-2003 (R2008), for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MARTIN-P1-424.9 NEW

P61–09/10
613.1; IRC P2724.1 (New)

Proponent: Sally Remedios, Delta Faucet Company, representing Delta Faucet Company.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

613.1 Temperature-actuated mixing valves. Temperature-actuated mixing valves, which are installed to reduce water temperatures to defined limits, shall comply with ASSE 1017. Such valves shall be installed at the hot water source.

PART II – IRC

Add new text as follows:

P2724.1 Temperature-actuated mixing valves. Temperature-actuated mixing valves, which are installed to reduce water temperatures to defined limits, shall comply with ASSE 1017. Such valves shall be installed at the hot water source.

(Renumber subsequent section)

Reason: The title of ASSE 1017 is Performance Requirements for Temperature Actuated Mixing Valves for Hot Water Distribution Systems. These valves are not intended to be used for point of use temperature control mixing valves. As the title suggests they supply temperature reduced water to the hot water system.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: REMEDIOS-P6-613.1

P62–09/10
504.4.1; IRC P2803.6

Proponent: Robert G. Konyndyk, Chief, Plumbing Division, Bureau of Construction Codes, State of Michigan

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

504.4.1 Installation. Such valves shall be installed in the shell of the water heater tank. Temperature relief valves shall be so located in the tank as to be actuated by the water in the top 6 inches (152 mm) of the tank served. For installations with separate storage tanks, the approved, self-closing (levered) pressure relief valve and temperature relief valve or combination thereof conforming to ANSI Z21.22 valves shall be installed on ~~the tank and there shall not be any type of valve installed between the water heater and the storage tank.~~ both the storage water heater and storage tank. There shall not be a check valve or shutoff valve between a relief valve and the heater or tank served**.**

PART II– IRC

Revise as follows:

P2803.6 Installation of relief valves. For installations with separate storage tanks, the approved, self-closing (levered) pressure relief valve and temperature relief valve or combination thereof conforming to ANSI Z21.22 valves shall be installed on both the storage water heater and storage tank. A check or shutoff valve shall not be installed in the following locations:

1. Between a relief valve and the termination point of the relief valve discharge pipe;
2. Between a relief valve and a tank; or
3. Between a relief valve and heating appliances or equipment.

Reason
(PART I): This proposed revision seeks to address two concerns. First, clarification is necessary that a water heater utilizing a storage tank shall have temperature and pressure protection for both the storage water heater and separate storage tank/s. Second, previous code text implied that a storage water heater having a separate storage tank could not have a valve isolating one from another. Now both devices are clarified to have the necessary safety protection and may have a valve between the units to aid in servicing for maintenance or replacement purposes.
(PART II): Clarification is necessary to indicate that a water heater utilizing a storage tank must have temperature and pressure protection for both the storage water heater and separate storage tank/s.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KONYNDYK-P4-504.4.1

P63–09/10
504.6 (New); IRC P2803.6 (New)

Proponent: Larry Dulac, Dulac Plumbing Innovations LLC, representing himself

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

1. Add new text as follows:

504.6 Relief valve breakaway fitting. Pressure, temperature, or combination pressure-temperature relief valves with a threaded discharge port of 3/4 inch [19.1 mm] shall be equipped with a full size, tamperproof, break-away fitting installed in the discharge port of the valve. The break-away fitting shall comply with CSA 1-06 US.

(Renumber subsequent sections)

2. Add standard to Chapter 13 as follows:

CSA
1-06 US Safety Plug Relief Valve for use on Hot Water Supply Systems

PART II – IRC

1. Add new text as follows:

P2803.6 Relief valve breakaway fitting. Pressure, temperature, or combination pressure-temperature relief valves with a threaded discharge port of 3/4 inch [19.1 mm] shall be equipped with a full size, tamperproof, break-away fitting installed in the discharge port of the valve. The break-away fitting shall comply with CSA 1-06 US.

(Renumber subsequent sections)

2. Add standard to Chapter 44 as follows:

CSA
1-06 US Safety Plug Relief Valve for use on Hot Water Supply Systems

Reason: CSA 1-06 US was developed to address pressure relief valve and temperature relief valve (or combination thereof) discharge pipe tampering, such as improper installation, restrictions, or intentionally or accidentally plugged, causing personal injury and structural damage, which is directly contrary to this section. The addition of a CSA 1-06 US device would prevent tampered drain lines (including vertical piping and plugged relief valves) from affecting the relief valve function. When the relief valve is free to discharge, water heaters will be less likely to explode. The tamperproof feature is important to further safeguarding the water heater and relief valve. The T&P valve was invented in the 1920's and reduced water heater explosions, but inspections, warnings and education have not eliminated the dangers of tampered discharge pipes, and continue to put life and property at risk. The addition of the CSA-06-US device to the code will improve plumbing system safety by reducing personal injuries and structural damage, and ultimately, save lives. Only valves with a ¾ inch discharge are addressed as the industry has not come forth with designs for other sizes as the ¾ inch valve size is the most widely used.

The purpose of this code change is to add new requirements.

1. The justification is based on a new product standard, CSA-1-6 US, which will further reduce explosions associated with tampered relief valve drain lines.
2. This change is substantiated with the following technical information and articles:
   a. Watts Industries Five-Year Highlight Review
   b. 2001 DE Magazine article (Spokane WA survey)
   c. 2001 National Board Bulletin www.nationalboard.org
   d. Web sites & articles
      i. Spencer OK
      http://74.125.47.132/search?q=cache;ul94g7XlaPoJ:www.sfpe.org/upload/fl0812.pdf+star+elementary+school+water+heater+explosion+spencer+ok+1982&hl=en&ct=clnk&cd=3&gl=us
      ii. Avon MA
      http://www.masterplumbers.com/plumbnews/2001/dec/avon.asp
      iii. Phoenix AZ
      http://www.kpho.com/news/17189420/detail.html
      iv. Mifflinburg PA
      http://news.mifflinburgtelegraph.com/Archive/House_Explosion_Caused_by_Faulty_Water_Heater_printer.shtml
      v. Kannapolis NC
      http://www.wsoctv.com/news/14480623/detail.html
      vii. Burien WA
      http://seattlepi.nwsource.com/local/33094_boom28.shtml

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: Review of the proposed new requirement CSA 1-06 US indicated that, in the opinion of ICC staff, the requirement did not comply with ICC standards criteria.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: 2009-2010-ccboilerplate

P64–09/10
504.6; IRC P2803.6.1

Proponent: Tom Hedges, representing the Arizona Building Officials

Part I - IPC

Revise as follows:

504.6 Requirements for discharge piping. The discharge piping serving a pressure relief valve, temperature relief valve or combination thereof shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air gap located in the same room as the water heater <u>except where the discharge is to the outdoors, not subject to freezing and the piping terminates not less than 6 inches (152mm) and not more than 12 inches (305mm) above grade.</u>
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air gap.
4. Serve a single relief device and shall not connect to piping serving any other relief device or equipment.
5. Discharge to the floor, to the pan serving the water heater or storage tank, to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. Discharge to a termination point that is readily observable by the building occupants.
8. Not be trapped.
9. Be installed so as to flow by gravity.
10. Not terminate more than 6 inches (152 mm) above the floor or waste receptor.
11. Not have a threaded connection at the end of such piping
12. Not have valves or tee fittings.
13. Be constructed of those materials listed in Section 605.4 or materials tested, rated and approved for such use in accordance with ASME A112.4.1.
14. <u>Direct the discharge in a downward direction.</u>

Part II – IRC

Revise as follows:

P2803.6.1 Requirements for discharge piping. The discharge piping serving a pressure relief valve, temperature relief valve or combination thereof shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air gap located in the same room as the water heater <u>except where the discharge is to the outdoors, not subject to freezing and the piping terminates not less than 6 inches (152mm) and not more than 12 inches (305mm) above grade.</u>

   3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air gap.
4. Serve a single relief device and shall not connect to piping serving any other relief device or equipment.
5. Discharge to the floor, to the pan serving the water heater or storage tank, to a waste receptor or to the outdoors.
6. Discharge in a manner that does not cause personal injury or structural damage.
7. Discharge to a termination point that is readily observable by the building occupants.
8. Not be trapped.
9. Be installed so as to flow by gravity.
10. Not terminate more than 6 inches (152 mm) above the floor or waste receptor.
11. Not have a threaded connection at the end of such piping
12. Not have valves or tee fittings.

13. Be constructed of those materials listed in Section P2904.5 or materials tested, rated and approved for such use in accordance with ASME A112.4.1.
14. Direct the discharge in a downward direction.

Reason: This change will allow the P & T relief drain pipe to extend direct from the water heater to an exterior location where no freeze potential exists. This is consistent with the IPC Section 504.6 (IRC Section P2803.6.1), Item no. 5 which allows the discharge to go to the outdoors. The 6" minimum termination height provides the required air gap. This proposed change also establishes a maximum termination height of 12" for outdoor termination. This method of drainage and termination is very common in locations that have previously utilized the Uniform Plumbing Code for over 50 years. No data exists to suggest this method has created unsafe conditions. The Committee reason for disapproval of Item P50-07/08 clarifies that the code allows a discharge pipe to terminate over a water heater drip pan. The code currently establishes drip pan drain terminations at 6" minimum and 24" maximum termination heights in IPC Section 504.7.2 (IRC Section P2801.5.2). If it's safe to drain a discharge pipe from a drip pan using these heights, then it certainly would be no more harmful to use the similar heights for an outdoors termination.

This proposal improves the termination requirements.

This method is also more energy efficient by not creating a direct open pipe for air flow from and to the out doors as will occur where an untrapped waste receptor for the P & T relief valve discharge drains to the outdoors.

In many commercial tenant spaces it is common practice to locate a water heater above the lay-in ceiling in an attic or interstitial space. Many times these locations are above a restroom or storage room. IPC Section 802.3 prohibits a waste receptor in such locations. A drain pipe needs to extend beyond the room or space containing the water heater.

Also, IPC 802.3 prohibits waste receptors in rest rooms and IPC Section 504.6 Item no. 2 requires an air gap in the same room as the water heater, thereby prohibiting water heaters in rest rooms. This change would allow a reasonable option where the need exists.

Cost Impact: The code change proposal will not increase the cost of construction and may decrease cost.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HEDGES-P1-504.6

P65–09/10
504.7; IRC P2801.5

Proponent: Shawn Strausbaugh–Arlington County, VA representing Virginia Plumbing and Mechanical Inspectors Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

504.7 Required pan. Where a storage tank-type water heater~~s~~ or a hot water storage tank~~s~~ ~~are~~ is installed in a location~~s~~ where water leakage from ~~of~~ the tank~~s~~ ~~or connections will~~ could cause damage, the tank ~~or water heater~~ shall be installed in a galvanized steel pan having a material thickness of not less than 0.236 inch (0.6010mm) (No. 24 gage), or other pans approved for such use.

PART II – IRC

Revise as follows:

P2801.5 Required pan. Where a storage tank-type water heater~~s~~ or a hot water storage tank~~s~~ ~~are~~ is installed in a location~~s~~ where water leakage from ~~of~~ the tank~~s~~ ~~or connections will~~ could cause damage, the tank ~~or water heater~~ shall be installed in a galvanized steel pan having a material thickness of not less than 0.236 inch (0.6010mm) (No. 24 gage), or other pans approved for such use.

Reason: The existing text is not clear about whether tankless-type water heaters require a pan. A tankless water heater does not have a storage tank and does not present any greater risk of water leakage than a water distribution piping system that has been installed and pressure tested in accordance with this code. This proposal changes the text to make the pan requirement specific to storage tank water heaters and hot water storage

tanks. This section is in the code because it is a well known fact that the majority of storage-type water heater tanks and hot water storage tanks have a relatively short life span that often ends in causing catastrophic damage to the building. Tankless water heaters are constructed of materials that are much more corrosion resistant than the materials (glass-lined carbon steel) of most water heater tanks and hot water tanks. Tankless water heaters should not be required to have drip pans installed.

The language concerning connections was removed because connections made in accordance with this code have no greater risk of leakage than any other connection in the water distribution system. Finally, the language of this section has been cleaned up to read better.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: STRAUSBAUGH-P1-504.7

P66–09/10
504.7; IRC P2801.5

Proponent: Pat Clark, Colorado Association of Plumbing and Mechanical Officials (CAPMO)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

504.7 Required pan. Where water heaters or hot water storage tanks are installed in locations where leakage of the tanks or connections will cause damage, the tank or water heater shall be installed in a galvanized steel pan having a material thickness of not less than 0.0236 inch (0.6010 mm) (No 24 gage), or other pans approved for such use.

Exception: This section shall not apply to tankless water heaters.

PART II – IRC

Revise as follows:

P2801.5 Required pan. Where water heaters or hot water storage tanks are installed in locations where leakage of the tanks or connections will cause damage, the tank or water heater shall be installed in a galvanized steel pan having a material thickness of not less than 0.0236 inch (0.6010 mm) (No 24 gage), or other pans for such use. Listed pans shall comply with CSA LC3.

Exception: This section shall not apply to tankless water heaters.

Reason: It doesn't make sense to require a pan under a tankless water heater. First of all there is no storage of water. Would the pan need to be fastened to the wall in a way that would be liquid tight? Would the intent be to catch a leak? If so, all piping should have pans under them to catch a possible leak.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CLARK-P2-504.7

P67–09/10
504.7, 504.7.1; IRC P2801.5, P2801.5.1

Proponent: Jim Whitehead, IPS Corporation, representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

504.7 Required pan. Where water heaters or hot water storage tanks are installed in locations where leakage of the tanks or connections will cause damage, the tanks or water heaters shall be installed in a galvanized steel pan having a thickness of not less than 0.0236 inch (0.6010mm) No. 24 gage, an aluminum pan having a thickness of not less than 0.030 inch (0.8mm), a plastic pan having a bottom thickness of not less than 0.036 inch (0.9mm) or ~~other~~ pans of other materials approved for such use.

504.7.1 Pan size and drain. The pan shall be not less than 1 ½ inches (38 mm) deep and shall be ~~of sufficient size and shape to receive all dripping or condensate from the tank or water heater,~~ at least 2 inches (51mm) larger in diameter than the water heater or hot water storage tank. The pan shall be drained by an indirect waste pipe having a ~~minimum~~ diameter of not less than 3/4 inch (19 mm). Piping for safety pan drains shall be of those listed in Table 605.4.

PART II – IRC

Revise as follows:

P2801.5 Required pan. Where water heaters or hot water storage tanks are installed in locations where leakage of the tanks or connections will cause damage, the tanks or water heaters shall be installed in a galvanized steel pan having a thickness of not less than 0.0236 inch (0.6010mm) No. 24 gage, an aluminum pan having a thickness of not less than 0.030 inch (0.8mm), a plastic pan having a bottom thickness of not less than 0.036 inch (0.9mm) or ~~other~~ pans of other materials approved for such use. Listed pans shall comply with CSA LC3.

P2801.5.1 Pan size and drain. The pan shall be not less than 1 ½ inches (38 mm) deep and shall be ~~of sufficient size and shape to receive all dripping or condensate from the tank or water heater,~~ at least 2 inches (51mm) larger in diameter than the water heater or hot water storage tank. The pan shall be drained by an indirect waste pipe having a ~~minimum~~ diameter of not less than 3/4 inch (19 mm). Piping for safety pan drains shall be of those listed in Table P2905.5.

Reason: The standard materials used in construction of pans are galvanized steel, aluminum and plastic. Each of these standard materials should have a minimum thickness requirement to prevent substandard pans from being installed and causing possible damages and losses due to failure. Most water heater installation instructions require pans to be at least 2 inches in diameter larger than the tank diameter. The code should include this requirement so that it is clear that safety pans must be larger than the tank that rests in the pan.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

PART II – IRC

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: WHITEHEAD-P1-504.7

P68–09/10
Table 605.3, Chapter 13; IRC Table P2905.4, Chapter 44

Proponent: Michael Cudahy, Plastic Pipe and Fittings Association (PPFA) for the Plastic Pipe and Fittings Association (PPFA).

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

1. Revise table as follows:

TABLE 605.3
WATER SERVICE PIPE

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe	ASTM D 2239; ASTM D 3035; AWWA C901; CSA-B137.1
Polyethylene (PE) plastic tubing	ASTM D 2737; AWWA C901; CSA B137.1

(Portions of table not shown remain unchanged)

2. Add standard to Chapter 13 as follows:

AWWA
C901-08 Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13 mm) Through 3 In. (76 mm), for Water Service

PART II – IRC

1. Revise table as follows:

TABLE P2905.4
WATER SERVICE PIPE

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe	ASTM D 2104; ASTM D 2239; AWWA C901; CSA-B137.1
Polyethylene (PE) plastic tubing	ASTM D 2737; AWWA C901; CSA B137.1

(Portions of table not shown remain unchanged)

2. Add standard to Chapter 44 as follows:

AWWA
C901-08 Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13 mm) Through 3 In. (76 mm), for Water Service

Reason: To add AWWA C901, "Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13 mm) Through 3 In. (76 mm), for Water Service", to the PE service pipe and tubing sections of IPC Table 605.3 (IRC Table P2905.4). AWWA C901 describes polyethylene (PE) pressure pipe and tubing for use primarily as service lines in the construction of underground water distribution systems for use in potable water, reclaimed water, and wastewater service.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard, AWWA C901-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CUDAHY-P3-Table 605.3

P69–09/10
Table 605.3, Chapter 13; IRC Table P2905.4, Chapter 44

Proponent: Michael Cudahy, Plastic Pipe and Fittings Association (PPFA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

1. Revise table as follows:

TABLE 605.3
WATER SERVICE PIPE

MATERIAL	STANDARD
Cross-linked polyethylene (PEX) plastic <u>pipe and</u> tubing	ASTM F 876; ASTM F 877; <u>AWWA C904;</u> CSA B137.5

(Portions of table not shown remain unchanged)

2. Add standard to Chapter 13 as follows:

AWWA
<u>C904-06</u> <u>Cross-Linked Polyethylene (PEX) Pressure Pipe, ½ In. (12 mm) Through 3 In. (76 mm) for Water Service</u>

PART II – IRC

1. Revise as follows:

TABLE P2905.4
WATER SERVICE PIPE

MATERIAL	STANDARD
Cross-linked polyethylene (PEX) plastic <u>pipe and</u> tubing	ASTM F 876; ASTM F 877; <u>AWWA C904;</u> CSA B137.5

(Portions of table not shown remain unchanged)

2. Add standard to Chapter 44 as follows:

AWWA
<u>C904-06</u> <u>Cross-Linked Polyethylene (PEX) Pressure Pipe, ½ In. (12 mm) Through 3 In. (76 mm) for Water Service</u>

Reason
(PART I): This proposal adds another applicable standard to the code for PEX water service piping. The standard added describes cross-linked polyethylene (PEX) pressure pipe for use primarily as service lines in the construction of underground water distribution systems. This standard describes pipe and tubing made with a materials designation code of PEX 1006 in ASTM F876. This standard describes pipe in sizes ½ in. through 3 in. (12 mm through 76 mm) with a standard dimension ratio of 9 (SDR9) and pressure class of 160 psi.
(PART II): To add AWWA C904, "Cross-Linked Polyethylene (PEX) Pressure Pipe, ½ in. (12 mm) Through 3 In. (76 mm), for Water Service", to the PEX sections of Table P2905.4 of the IRC-P. This standard describes cross-linked polyethylene (PEX) pressure pipe for use primarily as service lines in the construction of underground water distribution systems. This standard describes pipe and tubing made with a materials designation code of PEX 1006 in ASTM F876. This standard describes pipe in sizes ½ in. through 3 in. (12 mm through 76 mm) with a standard dimension ratio of 9 (SDR9) and pressure class of 160 psi.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard, AWWA C904-06, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CUDAHY-P2-TABLE 605.3

P70–09/10

Table 308.5, Table 605.3, Table 605.4, Table 605.5, 605.25 (New), 605.25.1 (New), 605.25.2 (New), Chapter 13; IRC P2904.3.1, Table P2605.1, Table P2904.6.2(8), Table P2904.6.2(9),Table P2905.4, Table P2905.5, Table P2905.6, P2905.19 (New), P2905.19.1(New), P2905.19.2 (New), Chapter 44

Proponent: Larry Gill, IPEX Inc. representing IPEX Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART - IPC

1. Revise tables as follows:

TABLE 308.5
HANGER SPACING

PIPING MATERIAL	MAXIMUM HORIZONTAL SPACING (feet)	MAXIMUM VERTICAL SPACING (feet)
Polyethylene of Raised Temperature (PE-RT) pipe	2.67 (32 inches)	10[b]

(Portions of table not shown remain unchanged)

TABLE 605.3
WATER SERVICE PIPE

MATERIAL	STANDARD
Polyethylene of raised temperature (PE-RT) plastic tubing	ASTM F 2769

(Portions of table not shown remain unchanged)

TABLE 605.4
WATER DISTRIBUTION PIPE

MATERIAL	STANDARD
Polyethylene of raised temperature (PE-RT) plastic tubing	ASTM F 2769

(Portions of table not shown remain unchanged)

TABLE 605.5
PIPE FITTINGS

MATERIAL	STANDARD
Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASSE 1061; ASTM F 877; ASTM F 1807; ASTM F 2080; ASTM F2098; ASTM F 2159; ASTM F2434; ASTM F 2735; CSA B137.5

Fittings for cross-linked polyethylene (PEX) plastic tubing	ASSE 1061, ASTM F 877; ASTM F 1807; ASTM F 1960; ASTM F 2080; ASTMF2098, ASTM F 2159; ASTM F2434; ASTM F 2735; CSA B137.5

(Portions of table not shown remain unchanged)

2. Add new text as follows:

605.25 Polyethylene of raised temperature plastic. Joints between polyethylene of raised temperature plastic tubing and fittings shall be in accordance with Section 605.25.1 and Section 605.25.2

605.25.1 Flared joints. Flared pipe ends shall be made by a tool designed for that operation.

605.25.2 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions. Fittings for polyethylene of raised temperature plastic tubing shall comply with the applicable standards listed in Table 605.5 and shall be installed in accordance with the manufacturer's installation instructions. Polyethylene of raised temperature plastic tubing shall be factory marked with the applicable standards for the fittings that the manufacturer of the tubing specifies for use with the tubing.

3. Add standards to Chapter 13 as follows:

ASTM

F 2735-09 Standard Specification for SDR9 Cross-linked Polyethylene (PEX) and Raised Temperature (PE-RT) Tubing

F 2769-09 Polyethylene of Raised Temperature (PE-RT) Plastic Hot and cold-Water Tubing and Distribution Systems

PART II - IRC

1. Revise tables as follows:

TABLE P2605.1
PIPING SUPPORT

PIPING MATERIAL	MAXIMUM HORIZONTAL SPACING (feet)	MAXIMUM VERTICAL SPACING (feet)
Polyethylene of Raised Temperature (PE-RT) pipe	2.67 (32 inches)	10[b]

(Portions of table not shown remain unchanged)

TABLE P2904.6.2(8)
ALLOWABLE PIPE LENGTH FOR $^{3}/_{4}$-INCH PEX AND PE-RT TUBING
(Portions of table not shown remain unchanged)

TABLE P2904.6.2(9)
ALLOWABLE PIPE LENGTH FOR 1-INCH PEX AND PE-RT TUBING
(Portions of table not shown remain unchanged)

TABLE P2905.4
WATER SERVICE PIPE

MATERIAL	STANDARD
Polyethylene of raised temperature (PE-RT) plastic tubing	ASTM F 2769

(Portions of table not shown remain unchanged)

TABLE P2905.5
WATER DISTRIBUTION PIPE

MATERIAL	STANDARD
Polyethylene of raised temperature (PE-RT) plastic tubing	ASTM F 2769

(Portions of table not shown remain unchanged)

TABLE P2905.6
PIPE FITTINGS

MATERIAL	STANDARD
Fittings for polyethylene of raised temperature (PE-RT) plastic tubing	ASSE 1061; ASTM F 877; ASTM F 1807; ASTM F 2080; ASTM F2098; ASTM F 2159; ASTM F2434; ASTM F 2735; CSA B137.5
Fittings for cross-linked polyethylene (PEX) plastic tubing	ASSE 1061, ASTM F 877; ASTM F 1807; ASTM F 1960; ASTM F 2080; ASTMF2098, ASTM F 2159; ASTM F2434; ASTM F 2735; CSA B137.5

(Portions of table not shown remain unchanged)

2. Revise as follows:

P2904.3.1 Nonmetallic pipe and tubing. Nonmetallic pipe and tubing, such as CPVC, ~~and~~ PEX, and PE-RT shall be listed for use in residential fire sprinkler systems.

3. Add new text as follows:

P2905.19 Polyethylene of raised temperature plastic. Joints between polyethylene of raised temperature plastic tubing and fittings shall be in accordance with Section P2905.19.1 and Section P2905.19.2

P2905.19.1 Flared joints. Flared pipe ends shall be made by a tool designed for that operation.

P2905.19.2 Mechanical joints. Mechanical joints shall be installed in accordance with the manufacturer's instructions. Fittings for polyethylene of raised temperature plastic tubing shall comply with the applicable standards listed in Table P2905.6 and shall be installed in accordance with the manufacturer's installation instructions. Polyethylene of raised temperature plastic tubing shall be factory marked with the applicable standards for the fittings that the manufacturer of the tubing specifies for use with the tubing.

3. Add standards to Chapter 44 as follows:

ASTM

F 2735-09 Standard Specification for SDR9 Cross-linked Polyethylene (PEX) and Raised Temperature (PE-RT) Tubing

F 2769-09 Polyethylene of Raised Temperature (PE-RT) Plastic Hot and cold-Water Tubing and Distribution Systems

Reason: This change adds a new standard ASTM F2769 for Polyethylene of Raised Temperature (PE-RT) Plastic Hot and Cold-Water Tubing and Distribution Systems to the IPC for water service and water distribution. The change also adds fittings for this product similar to PEX fittings standards currently listed in the Code and also adds a new fittings standard ASTM F2735 to the code. The pipe support table is amended to provide the maximum spacing for Polyethylene of Raised Temperature (PE-RT) pipe.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standards, ASTM F 2735-09 and ASTM F2769-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Gill-P2-T308.5

P71–09/10
Table 605.4, Chapter 13; IRC Table P2905.5, Chapter 44

Proponent: Mark Kuykendall, Easyflex, representing Kofulso, Co. LTD

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

1. Revise as follows:

TABLE 605.4
WATER DISTRIBUTION PIPE

MATERIAL	STANDARD
Stainless steel pipe (type 304/304L)	ASTM A 312; ASTM A 778; ASTM A 240
Stainless steel pipe (type 316/316L)	ASTM A 312; ASTM A 778; ASTM A 240

(Portions of table not shown do not change)

2. Add standard to Chapter 13 as follows:

ASTM

A 240/A 240M-08a Chromium-Nickel Stainless Steel Plate. Sheet, and Strip for Pressure Vessels and for General Applications.

PART II – IRC

1. Revise as follows:

TABLE P2905.5
WATER DISTRIBUTION PIPE

MATERIAL	STANDARD
Stainless steel pipe (type 304/304L)	ASTM A 312; ASTM A 778; ASTM A 240
Stainless steel pipe (type 316/316L)	ASTM A 312; ASTM A 778; ASTM A 240

(Portions of table not shown do not change)

2. Add standard to Chapter 44 as follows:

ASTM

A 240/A 240M-08a Chromium-Nickel Stainless Steel Plate. Sheet, and Strip for Pressure Vessels and for General Applications.

Reason: The inclusion of this material standard will provide another option for an engineered system for hot-cold, potable water distribution. This standard has been applied to approve the system under NSF/ANSI 61 and IAPMO IGC 233 testing, and meets the requirements specified in 605.4 (committee has been sent test reports).

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard, ASTM A240/A240M-08a, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KUYKENDALL-P1-TABLE 605.4

P72–09/10
604.9; IRC P2903.5

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

Proponent: Rand Ackroyd, Rand Technical Consulting, representing The Plumbing and Drainage Institute

Part I - IPC

1. Revise as follows:

604.9 Water hammer. The velocity of the water distribution system shall be controlled to reduce the possibility of water hammer. A water-hammer arrestor shall be installed where quick-closing valves are utilized. Water hammer arrestors shall be installed in accordance with the manufacturer's specifications. Water-hammer arrestors shall conform to ASSE1010 or PDI WH201.

2. Add standard to Chapter 13 as follows:

PDI
WH201-2006 Water Hammer Arrestors

PART II – IPC

1. Revise as follows:

P2903.5 Water hammer. The flow velocity of the water distribution system shall be controlled to reduce the possibility of water hammer. Water-hammer arrestors shall be installed in accordance with the manufacturer's installation instructions. Water hammer arrestors shall conform to ASSE 1010 or PDI WH201.

2. Add standard to Chapter 44 as follows:

PDI
WH201-2006 Water Hammer Arrestors

Reason: PDI WH201 is the original US standard for water hammer arrestors first published over 40 ago. With copywriter permission the PDI performance requirements were allowed to be duplicated in the equivalent standard that is currently referenced in the Code, ASSE standard 1010. PDI WH201 was updated in 2006. This standard PDI WH201 is available to the public at no cost on www.pdionline.org .

Cost Impact: The code change will not increase the cost of construction.

Analysis: Review of proposed new standard, PDI WHI201-2006, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Ackroyd-P5-604.9

P73–09/10
605.5 (New), Chapter 13; IRC P2905.19 (New), Chapter 44

Proponent: Sid Cavanaugh, Cavanaugh Consulting representing Cohesant, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

1. Add new text as follows:

605.5 Epoxy coating. Epoxy coating used on existing water service or water distribution piping systems shall comply with NSF 61 and shall comply with ASTM F???? or AWWA C210.

(Renumber subsequent sections)

2. Add standards to Chapter 13 as follows:

ASTM
F????-?? Epoxy Lining Systems for Water Piping

AWWA
C210-03 Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines

PART II - IRC

1. Add new text as follows:

P2905.19 Epoxy coating. Epoxy coating used on existing water service or water distribution piping systems shall comply to NSF 61 and shall comply to ASTM F???? or AWWA C210.

(Renumber subsequent sections)

2. Add standards to Chapter 44 as follows:

ASTM
F????-?? Epoxy Lining Systems for Water Piping

AWWA
C210-03 Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines

Reason: While the technology is allowed by the code and various jurisdictions it needs to be recognized and accepted in the body of the code with appropriate requirements and standards to assure proper approved installation in the field.

Cost Impact: None. It will probably save money for the user in many cases.

Analysis: Review of proposed new standards, ASTM F????-?? and AWWA C210-03, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:CAVANAUGH-P4-605.5

P74–09/10
606.7 (New)

Proponent: Gregory A. Farmer, PE, Vice President, Legislative representing ASPE

Add new text as follows:

606.7 Labeling of water distribution pipes in bundles. Where water distribution piping is bundled at installation, each pipe in the bundle shall be indentified using stenciling or commercially available pipe labels. The identification shall indicate the pipe contents and the direction of flow in the pipe. The interval of the identification markings on the pipe shall not exceed 25 feet. There shall be not less than one identification label on each pipe in each room, space or story.

Reason: Bundled piping can causes confusion as to what the content of the individual pipes. Tracing them back to the source is often difficult and time consuming. Marking piping with the identification of the content and the direction of flow will help eliminate cross connection when repairing or renovating these plumbing systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FARMER-P4-606.7 NEW

P75–09/10
607.1.1 (New); IRC P2903.11 (New)

Proponent: Ronald L, George, CIPE, CPD, President of Ron George Design & Consulting Services representing himself

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Add new text as follows:

607.1.1 Temperature limiting means. A thermostat control for a water heater shall not serve as the temperature limiting means for the purposes of complying with the requirements of this code for maximum allowable hot or tempered water delivery temperatures at fixtures.

PART II – IRC

Add new text as follows:

P2903.11 Temperature limiting means. A thermostat control for a water heater shall not serve as the temperature limiting means for the purposes of complying with the requirements of this code for maximum allowable hot or tempered water delivery temperatures at fixtures.

Reason: Water Heater Thermostats: I cringe every time I hear someone tell people to turn the water heater thermostat down to prevent scalding. I see the same misguided advice dispensed in newspaper columns and safety brochures or websites. Water heater thermostats cannot be relied upon to control the outlet hot water temperature of a water heater. The reason this burner “on” and Burner “off” control is being used to control how water system temperatures is there is nothing mandating thermostatic controls to be installed on hot water systems. Although water heater manufacturers are recommending that installers set thermostats at 120 to 125 degrees F, and most of them ship the water heaters at lower temperature settings.
Plumbing engineers continue to recommend hot water systems be designed with the intended storage temperatures for several reasons.
1. The water heater is sized based on 140 degrees Fahrenheit so if you turn down the temperature you will most likely run out of hot water during peak periods.
2. Higher temperatures reduce the threat of Legionellae bacteria growth in the water heater tank.
3. Using 140 degree hot water and mixing down to a safe delivery temperature around 120-125 degrees Fahrenheit allows a constant hot water delivery temperature.
4. If a water heater burner control thermostat is turned down to a lower temperature, the water heater has a reduced capacity to deliver hot water.

When users run out of hot water and the water heater thermostat is readjusted, it is often adjusted to an even higher temperature. Even if the fixtures are protected with compensating type anti-scald shower valves the maximum temperature limit stop on every valve must be readjusted. The failure to re-adjust these valves often leads to scalding incidents. When there is a master thermostatic mixing valve the hot water will be delivered at a relatively constant temperature to the fixtures.

Water Heater Burner Control Accuracy

Water heater thermostats were never intended to provide precise temperature controls for hot water system temperatures. For example: The thermostat dial calibration test of ANSI Z21.10.1-1998, which is the applicable standard for gas-fired water heaters, allows the temperature to vary 10 degrees above or below the thermostat setting. I have talked to water heater manufacturers that have indicated the controls can vary as much as 15 to 18 degrees Fahrenheit above or below the set point. The thermostat is inserted into the lower portion of a water heater tank and turns the fuel supply to the water heater “on” and “off” . There is no way to know what the temperature in the tank is with most water heater thermostat dials.

Theoretically, if the water heater thermostatic element is set at 120 degrees Fahrenheit, the burner would come on when the temperature at the thermostat reaches about 105 degrees Fahrenheit. The burner stays on until the water around the thermostatic element (near the bottom of the heater) reaches about 135 degrees Fahrenheit then it turns the fuel supply to the burner or heating element off. (15 degrees F above the set-point of the thermostat). The maximum temperature limit test of ANSI Z21.10.1 gas water heater standard allows the outlet water temperature of the water heater to rise about 30 degrees F above the thermostat setting. This provision accounts for the phenomenon known as "stacking" or "layering” of hot water in the top of a water heater. Stacking or layering occurs when hot water rises to the top of the water heater due to recurring short duration heating cycles caused by a frequent number of small quantity hot water uses which draws cold water into the bottom of the heater. Although the above example addresses gas water heaters, this phenomenon can also occur in other types of storage water heaters. So at the top of a water heater that is theoretically set for 120 degrees Fahrenheit, the outlet hot water temperatures can easily reach 165 degrees Fahrenheit.

This is why we should mandate a thermostatic mixing valve conforming to ASSE 1017 or CSA B-125.3 on the outlet piping of a water heater to limit the hot water distribution temperatures to a maximum safe delivery temperature of 120 to 125 degrees Fahrenheit. If high temperature hot water uses are required for a process application a thermostatic mixing valve conforming to ASSE 1070 can be installed on the local branch piping serving a fixture or group of fixtures. Additional supporting information is shown on my website at: www.rongeorgedesign.com

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GEORGE-P5-607.1.3 NEW

P76–09/10
607.1, 607.1.1(New)

Proponent: Ronald L, George, CIPE, CPD, President of Ron George Design & Consulting Services representing himself

Revise as follows:

607.1 Where required. In residential *occupancies*, *hot water* shall be supplied to all plumbing fixtures and equipment utilized for bathing, washing, culinary purposes, cleansing, laundry or building maintenance. In nonresidential *occupancies*, *hot water* shall be supplied for culinary purposes, cleansing, laundry or building maintenance purposes. In nonresidential *occupancies*, *hot water* or *tempered water* shall be supplied for bathing and washing purposes. ~~*Tempered water* shall be supplied through a water temperature limiting device that conforms to ASSE 1070 and shall limit the *tempered water* to a maximum of 110ºF (43ºC). This provision shall not supersede the requirement for protective shower valves in accordance with Section 424.3.~~

Add new text as follows:

607.1.1 Tempered water temperature control. *Tempered water* shall be supplied through a water temperature limiting device that conforms to ASSE 1070 and shall limit the *tempered water* to a maximum of 110ºF (43ºC). This provision shall not supersede the requirement for protective shower valves in accordance with Section 424.3.

Reason: Water heater thermostats cannot be relied upon to accurately control the hot water temperature to a hot water distribution system. All water heater thermostats have an allowable tolerance plus or minus 11 to 15 degrees Fahrenheit that allows

temperature swings in the hot water distribution system of up to 30 degrees from the burner or heating element “on” temperature setting to the burner or heating element “off” temperature setting. Coupled with thermal layering (“stacking”) in un-circulated storage type water heaters, the temperature variation can be as much as 50 degrees in an un-circulated storage type heater. Instantaneous heaters have temperature fluctuations as the flow changes. A thermostatic mixing valve installed in the hot water piping downstream of the water heater will mix cold water with the varying hot water temperatures to deliver a relatively constant and safe temperature of hot water to the domestic hot water system.

Cost Impact: Minimal

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GEORGE-P8-607.1

P77–09/10
607.1.1(New)

Proponent: Ronald L, George, CIPE, CPD, President of Ron George Design & Consulting Services representing himself

Add new text as follows:

607.1.1 Hot water temperature control. *Hot water* shall be supplied to systems utilized for bathing or washing purposes through a temperature actuated mixing valve conforming to ASSE 1017 or CSA B-125.1 for master mixing valve applications or through a device conforming to ASSE 1069 for gang showers or a device conforming to ASSE 1070 for point-of-use mixing valve applications. Master thermostatic mixing valves shall be adjusted to deliver hot water at a temperature not to exceed 120ºF (49ºC).

Reason: Water heater thermostats cannot be relied upon to accurately control the hot water temperature to a hot water distribution system. All water heater thermostats have an allowable tolerance plus or minus 11 to 15 degrees Fahrenheit that allows temperature swings in the hot water distribution system of up to 30 degrees from the burner or heating element “on” temperature setting to the burner or heating element “off” temperature setting. Coupled with thermal layering (“stacking”) in un-circulated storage type water heaters, the temperature variation can be as much as 50 degrees in an un-circulated storage type heater. Instantaneous heaters have temperature fluctuations as the flow changes. A thermostatic mixing valve installed in the hot water piping downstream of the water heater will mix cold water with the varying hot water temperatures to deliver a relatively constant and safe temperature of hot water to the domestic hot water system.

Cost Impact: Minimal

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GEORGE-P7-607.1.1 NEW

P78–09/10
607.2

Proponent: Guy Tomberlin of Virginia representing himself.

Revise as follows:

607.2 Hot water supply temperature maintenance. Where the developed length of hot water piping from the source of hot water supply to the furthest fixture exceeds 100 feet (30 480 mm), the hot water supply system shall be provided with a method of maintaining the temperature of hot water to within 100 feet (30 480 mm) of the fixtures. The methods of maintaining energy efficiency shall be in accordance with the International Energy Conservation Code.

Reason: This text was contained in the 2000 IPC and stated that where the furthest fixture was 100 feet away from the hot water source, a method for maintaining hot water to the furthest fixture must be provided and then it went on to list the two options I have presented. Unfortunately, the current section no longer states the maximum distance that the hot water is required to be located within the water distribution system when you have exceeded the 100 feet. It also fails to provide the methods to maintain the hot water within a system. Now it sends you to the International Energy Conservation Code which unfortunately does not provide any methods for maintaining the hot water temperature. This has created a deadend and failed to require anything if the 100 foot distance is exceeded. The proposed change is correct these issues and re–instate the two

commonly used methods for maintaining hot water temperature back into the IPC. The IECC does not need to be mentioned in this section as the Energy Code always applies**.**

This is in attempt to provide the information on maintaining hot water in a system and delivering it to the fixtures. Energy conservation must be observed in the IPC. Hot water supply is an area where design is critical to enable huge energy and water savings. Either locate the water heating source near the utilization point, the fixtures, or install a circulating system or heat trace.

Cost Impact: This proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-P2-607.2

P79–09/10
607.2

Proponent: Guy Tomberlin of Virginia representing himself.

Revise as follows:

607.2 Hot or tempered water supply to fixtures ~~supply temperature maintenance~~. ~~Where the developed length of hot water piping from the source of hot water supply to the furthest fixture exceeds 100 feet (30 480 mm), the hot water supply system shall be provided with a method of maintaining the temperature in accordance with the International Energy Conservation Code.~~ The developed length of hot or tempered water piping, from the source of hot water to the fixtures that require hot or tempered water, shall not exceed 40 feet (12192mm). Recirculating system piping and heat traced piping shall be considered to be sources of hot or tempered water.

Reason: Energy conservation needs to be observed in the IPC. Hot water supply is an area where design is critical. Either locate the water heating source near the fixtures or install a circulating system or heat trace system. This is in attempt to minimize the time it takes to get hot water to a fixture. I believe that 100 feet is entirely too much distance between the fixture and the water heating source. A huge amount of water and energy is wasted while running the water and waiting for the heated water to get to the outlet.

Current text in the IPC is easily manipulated to permit unwanted systems, that comply with the language as written, but that fail to serve the intended purpose. This proposal changes the text to say what it means, and maintain the original intent which is to get hot water to the fixture without wasting unnecessary energy and water.

In essence, this is in attempt to minimize the time it takes to get hot water to a fixture. Energy conservation must be observed in the IPC/IRC. Hot water supply is an area where design is critical to enable huge energy and water savings.

Cost Impact: This proposal may increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-P3-607.2

P80–09/10
607.2

Proponent: Ronald L, George, CIPE, CPD, President of Ron George Design & Consulting Services representing himself

607.2 Hot water supply temperature maintenance. Where the *developed length* of hot water piping from the source of hot water supply to the farthest fixture exceeds ~~100~~ 50 feet (15 240mm), the hot water supply system shall be provided with a method of maintaining the temperature in accordance with the *International Energy Conservation Code*.

Reason: This proposed change is intended to address the waste of water and energy associated with systems with up to 100 feet of HW piping from the water heater to the farthest fixture. The *Domestic Water Heating Design Manual* Published by the American Society of Plumbing Engineers addresses hot water temperature maintenance in the book. Chapter 10 and 11 of the manual describes how to promptly deliver hot water to all fixtures, depending on the type of facility. The *Domestic Water Heating Design Manual* recommends a maximum of 25 feet of un-circulated pipe or 30 seconds as minimally acceptable.

The code currently states, when the distance from the water heater to the farthest outlet exceeds 100 feet, the water should be circulated. The 100-foot recommendation is subjective, as was pointed out by an engineer from ASHRAE who selected this distance many years ago when fixtures flow far more water than they do now. When the 100-foot criteria the code is followed, it creates considerable problems, such as lack of hot water at fixtures, insufficient water heater capacity and thermal temperature escalation in showers when heated hot water finally arrives many minutes after the shower comes on.

The 100-foot length criterion was developed in 1973 after the Middle East oil embargo, when energy costs were more important than water conservation. Since the energy codes now require significant insulation on circulated hot water piping the circulation of hot water causes a very minor loss of energy due to radiation and convection. In fact this heat loss into the building actually helps the building heating load in the winter months. With a timer on the circulated loop, coupled with the added insulation, the energy loss is minor when compared to the energy loss of water that was heated and poured down the drain and the lack of hot any hot water at fixtures nearly 100 feet from the water heater, especially the intermittent use fixtures such as lavatories. The previous code language arbitrarily picked the 100-foot maximum length criterion and with lower flow fixtures we may as well not have recirculation. The ultimate goal is to have hot water at the sink in a timely fashion.

Length and Time Criteria

In the latest publication of the *Domestic Water Heating Design Manual*, it recommends changes to the 100-foot length criteria. Water that is wasted because of the long delay in obtaining hot water at the fixtures has become more critical of an issue than the energy losses caused by hot water temperature maintenance systems. To significantly reduce the wasting of cooled hot water, I reevaluated the permissible distances for un-circulated, dead-end branches to periodically used plumbing fixtures. The existing 100-foot allowable distances for un-circulated, dead-end branches represent a trade-off between the energy utilized by the hot water temperature maintenance system and the cost of the insulation, on the one hand. On the other hand, with long dead end branches there is the cost of energy to heat the excess cold water makeup, the cost of wasted potable water, decreased capacity of the water heater, extra sewer surcharges added to the water meter and the loss of valuable water down the drain waiting for the hot water branch piping to drain ambient temperature water in order to get useable hot water. The International Energy Code required a timer to shut off the circulator during off hours so there would be no nighttime energy losses, when the energy to the self-regulating heater cable or circulating pump is turned off during night time hours.

Reasonable Delays

What are reasonable delays in obtaining hot water at a fixture? The *Domestic Water Heating Design Manual* describes it as follows; For anything beside very infrequently used fixtures (such as those in industrial facilities or certain fixtures in office buildings), a delay of 0 to 10 seconds is normally considered acceptable for most residential occupancies and public fixtures in office buildings. A delay of 11 to 30 seconds is marginal but possibly acceptable, and a time delay longer than 31 seconds is normally considered unacceptable and a significant waste of time, water and energy. Therefore, when designing hot water systems, it is prudent for the codes to provide some means of getting hot water to the fixtures closer to or within these acceptable time limits during peak hours. This means that there should be a maximum distance of approximately 25 feet (7.6 meters) between the hot water maintenance system and each of the plumbing fixtures requiring hot water. The distance should depend on the water flow rate of the plumbing fixture at the end of the line and the size of the line. (See Tables 3, 4, and 5.) Additional delays in getting hot water to the fixture may be caused by the rerouting of the pipes for structural conditions or other flow related problems. The tables support the 25-foot distance, although past experience shows the industry may resist such a drastic change. Therefore the I am suggesting a maximum of 50 feet because it would be a vast improvement and most homes and small businesses can deliver hot water from a centrally located water heater without having a temperature maintenance system. (See table 5)

New Low Flow Fixtures are Required by Energy Policy Act and ASHRAE 90.1

With the advent of low fixture discharge rates mandated by the Energy Policy act of 1992, a federal law, it takes considerably longer to obtain hot water from fixtures that are close to 100 feet from the hot water source. For example, a public lavatory with a half gallon per minute or a metering faucet with 0.25 gallons per minute maximum discharge rate would take an excessive amount of time to obtain hot water from 100 feet of un-circulated, un-insulated hot water branch and main piping. (See Tables 1 through 7.) These tables give conservative approximations of the amount of time it takes to obtain hot water at a fixture. The times are based on the size of the line, the fixture flow rate, and the times required to replace the cooled-off hot water, to heat the pipe, and to offset the convection energy lost by the insulated hot water line.

Table 1 Water Contents and Weight of Tube or Piping per Linear Foot (English Units)

Nominal Diameter	Copper Pipe Type L		Copper Pipe Type M		Steel Pipe Schedule 40		CPVC Pipe Schedule 40	
(in.)	Water (gal/ft)	Wgt. (lb/ft)	Water (gal/ft)	Wgt. (lb/ft)	Water (gal/ft)	Wgt. (lb/ft)	Water (gal/ft)	Wgt. (lb/ft)
½	.012	.285	.013	.204	0.016	.860	0.016	.210
¾	.025	.445	.027	.328	0.028	1.140	0.028	.290
1	.043	.655	.045	.465	0.045	1.680	0.045	.420
1 ¼	.065	.884	.068	.682	0.077	2.280	0.078	.590
1 ½	.093	1.14	.100	.940	0.106	2.720	0.106	.710

Table 2 Water Contents and Weight of Tube or Piping per Meter (Metric Units)

Nominal Diameter	Copper Pipe Type L		Copper Pipe Type M		Steel Pipe Schedule 40		CPVC Pipe Schedule 40	
(mm)[a]	Water (L)	Wgt. (kg)	Water (L)	Wgt. (kg)	Water (L)	Wgt. (kg)	Water (L)	Wgt. (kg)
DN15	0.045	0.129	0.049	0.204	0.061	0.390	0.061	0.099
DN20	0.095	0.202	0.102	0.328	0.106	0.517	0.106	0.132
DN25	0.163	0.297	0.170	0.465	0.170	0.762	0.170	0.191
DN32	0.246	0.401	0.257	0.682	0.291	1.034	0.295	0.268
DN40	0.352	0.517	0.379	0.940	0.401	1.233	0.401	0.322

a. Pipe sizes are indicated for mild steel pipe sizing.

Table 3 Approximate Fixture and Appliance Water Flow Rates

	Maximum Flow Rates [a]	
Fittings	GPM	L/Sec
Lavatory faucet Public non-metering Public metering	2.0 0.5 0.25 gal/cycle	1.3 0.03 0.946 L/cycle
Sink faucet	2.5	0.16
Shower head	2.5	0.16
Bathtub faucets Single-handle Two-handle	 2.4 minimum 4.0 minimum	 0.15 minimum 0.25 minimum
Service sink faucet	4.0 minimum	0.25 minimum
Laundry tray faucet	4.0 minimum	0.25 minimum
Residential dishwasher	1.87 average	0.12 average
Residential washing machine	7.5 average	0.47 average

a. Unless otherwise noted.

Table 4 Approximate Time Required to Get Hot Water to a Fixture

		Delivery Time (sec)							
Fixture Flow Rate (gpm)	Pipe Size	0.5 GPM		1.5 GPM		2.5 GPM		4.0 GPM	
Piping Length (ft)		10	25	10	25	10	25	10	25
Copper Pipe	½ in. ¾ in.	25 48[a]	63[a] 119[a]	8 16	21 40[a]	5 10	13 24	3 6	8 15
Galv. Stl. Pipe Sched. 40	½ in. ¾ in.	63[a] 91[a]	157[a] 228[a]	21 30[a]	52[a] 76[a]	13 18	31[a] 46[a]	8 11	20 28[a]
CPVC Pipe Sched. 40	½ in. ¾ in.	64[a] 95[a]	159[a] 238[a]	21 32[a]	53[a] 79[a]	13 19	32[a] 48[a]	8 12	20 30[a]

Note: Table based on various fixture flow rates, piping materials, and dead-end branch lengths. Calculations are based on the amount of heat required to heat the piping, the water in the piping, and the heat loss from the piping.

a. Delays longer than 30 seconds are not acceptable according to the *Domestic Water Heating Design Manual.*

Table 5 Approximate Time Required to Get Hot Water to a Fixture

		Delivery Time (sec)							
Fixture Flow Rate (gpm)	Pipe Size	0.5 GPM		1.5 GPM		2.5 GPM		4.0 GPM	
Piping Length (ft)		10	50	10	50	10	50	10	50
Copper Pipe	½ in. ¾ in.	25 48[a]	125[a] 238[a]	8 16	42 160[a]	5 10	26 48	3 6	16 30
Galv. Stl. Pipe Sched. 40	½ in. ¾ in.	63[a] 91[a]	314[a] 456[a]	21 30[a]	104[a] 152[a]	13 18	62[a] 92[a]	8 11	40 56[a]
CPVC Pipe	½ in.	64[a]	318[a]	21	106[a]	13	64[a]	8	40

Sched. 40	¾ in.	95[a]	476[a]	32[a]	158[a]	19	96[a]	12	60[a]

Note: Table based on various fixture flow rates, piping materials, and dead-end branch lengths. Calculations are based on the amount of heat required to heat the piping, the water in the piping, and the heat loss from the piping.

a. Delays longer than 30 seconds are not acceptable according to the *Domestic Water Heating Design Manual.*

Table 6 Comparison of Time Delays for Current Code Text of 100 Feet vs Proposed Code Text of 50 feet.

		Approximate Time Required to Get Hot Water to a Fixture Delivery Time (sec)							
Fixture Flow Rate (gpm)	Pipe Size	0.5 GPM		1.5 GPM		2.5 GPM		4.0 GPM	
Piping Length (ft)		100[b]	50	100	50	100	50	100	50
Copper Pipe	½ in. ¾ in.	250[a] (4.1 min.) 480[a] (8.0 min.)	125[a] 238[a]	80[a] 160[a]	40 80[a]	50[a] 100[a]	26 48	30[a] 60[a]	16 30
Galv. Stl. Pipe Sched. 40	½ in. ¾ in.	630[a] (10.5 min.) 910[a] (15.1 min.)	314[a] 456[a]	210[a] 300[a]	104[a] 152[a]	130[a] 180[a]	62[a] 92[a]	80[a] 110[a]	40 56[a]
CPVC Pipe Sched. 40	½ in. ¾ in.	640[a] (10.6 min.) 950[a] (15.8 min.)	318[a] 476[a]	210[a] 320[a]	106[a] 158[a]	130[a] 190[a]	64[a] 96[a]	80[a] 120[a]	40 60[a]

Note: Table based on various fixture flow rates, piping materials, and dead-end branch lengths of 50 and 100 feet. Calculations are based on the amount of heat required to heat the piping, the water in the piping, and the heat loss from the piping.

a. Delays longer than 30 seconds are not acceptable according to the *Domestic Water Heating Design Manual*.
b . Current code text allows 100 feet from hot water source. Delay in seconds (minutes) are listed in this column. This is the time you would have to wait at a sink for hot water to arrive. Try counting two 250 and then to see how ridiculously long this is.

Table 7 Approximate Time Required to Get Hot Water to a Fixture (Metric)

		Delivery Time (sec)							
Fixture Flow Rate (L/sec)		0.03 LPS		0.10 LPS		0.16 LPS		0.25 LPS	
Piping Length (m)		3.1	7.6	3.1	7.6	3.1	7.6	3.1	7.6
Copper Pipe	DN15 DN22	25 48[a]	63[a] 119[a]	8 16	21 40[a]	5 10	13 24	3 6	8 15
Galv. Stl. Pipe Sched. 40	DN15 DN20	63[a] 91[a]	157[a] 228[a]	21 30	52[a] 76[a]	13 18	31[a] 46[a]	8 11	20 28
CPVC Pipe Sched. 40	DN15 DN20	64[a] 95[a]	159[a] 238[a]	21 32	53[a] 79[a]	13 19	32[a] 48[a]	8 12	20 30

Note: Table based on various fixture flow rates, piping materials, and dead-end branch lengths. Calculations are based on the amount of heat required to heat the piping, the water in the piping, and the heat loss from the piping.

a. Delays longer than 30 seconds are not acceptable according to the *Domestic Water Heating Design Manual*

Results of Delays in Delivering Hot Water to Fixtures

As shown in table 6 above, when there is a long delay in obtaining hot water at the fixture, there is significant waste of potable water as the cooled hot water supply is simply discharged down the drain unused. Concerns about total life cycle costs have realized that the total cost of this previously heated water includes:

1. The original cost for obtaining potable water
2. The cost of fuel used to previously heat the water
3. The final cost of the waste treatment of this excess potable water, which results in larger sewer surcharges
4. The cost of heating the incoming cold that is replacing the wasted water to bring it up to the required temperature.
5. Increased municipal water booster pumping costs.
6. Increased wastewater treatment pumping and processing costs.

Loss of Water Heater Capacity

When there is a long delay in obtaining hot water at the fixtures, the faucets are turned on for long periods of time to draw the hot water from the water heater to the fixture to get the hot water up to the desired temperature. This is allowing cold water to flow into the water heater during this several minute delay and can cause the water heater burner to cycle longer and in some cases can cause hot water shortages. The water heater will have to heat the extra cold water brought into the system in a short period of time.

Methods of Delivering a Reasonably Prompt Hot Water Supply

Hot water maintenance systems are varied. They can be grouped into three basic categories, though any actual installation may be a combination of more than one of these types of system. The three basic categories are

1. Circulation systems.
2. Self-regulating heat trace systems.
3. Point of use water heaters (locating the water heater close to the fixtures).

Cost Impact: Minimal

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: GEORGE-P4-607.2

P81–09/10
607.2.1, 607.5 (New)

Proponent: Guy Tomberlin of Virginia representing himself.

1. Delete without substitution as follows:

~~**607.2.1 Piping insulation**. Circulating hot water system piping shall be insulated in accordance with the International Energy Conservation Code.~~

(Renumber subsequent sections)

2. Add new text as follows:

[E] 607.5 Pipe insulation. Automatic-circulating hot water system piping shall be insulated with 1 inch (25 mm) of insulation having a conductivity not exceeding 0.27 Btu per inch/h · ft^2 · °F (1.53 W per 25 mm/m^2 · K). The first 8 feet (2438 mm) of hot water piping from a hot water source that does not have heat traps shall be insulated with 0.5 inch (12.7mm) of material having a conductivity not exceeding 0.27 Btu per inch/h · ft^2 · °F (1.53 W per 25 mm/m^2 · K).

Reason: This is a simple helpful piece of information to prevent a plumbing contractor from having to purchase another document besides the IPC just to figure out what type insulation is required on a hot water piping system

Cost Impact: The proposal will increase the cost of construction.

Analysis: The new text proposed to be added is an extract word-for-word from the IECC. This proposal is being put before the IPC committee with the intent to place the section in the code without modification.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: TOMBERLIN-P4-607.2.1

P82–09/10
607.2.1

Proponent: John R. Addario, P.E., New York State Department of State - Division of Code Enforcement and Administration

Revise as follows:

607.2.1 Piping insulation. ~~Circulating~~ Hot water piping in temperature maintenance systems ~~piping that is required to have the water temperature maintained~~ shall be insulated in accordance with the *International Energy Conservation Code*.

Reason: The intent of this section is to require systems that maintain system hot water temperature to be properly insulated. Heat traced systems, like circulating systems, should be required to limit the amount of energy they consume by requiring a minimum amount of insulation. This proposed change includes heat trace systems within the intent of this section.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Addario-P2-607.2.1

P83–09/10
608.13.8, Chapter 13; IRC Table P2902.3, Chapter 44

Proponent: Abraham I. Murra, Canadian Standards Association, representing the Canadian Standards Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

1. Revise as follows:

608.13.8 Spill~~-proof~~ resistant pressure vacuum breakers. Spill~~proof~~ resistant pressure vacuum breakers ~~(SVB)~~ shall conform to ASSE 1056 or CSA B64.1.3. These devices are designed for installation under continuous-pressure conditions when the critical level is installed at the required height.

2. Add standard to Chapter 13 as follows:

CSA
B64.1.3-07 Spill resistant pressure vacuum breakers (SRPVB)

PART II – IRC

1. Revise as follows:

TABLE P2902.3
APPLICATION FOR BACKFLOW PREVENTERS

DEVICE			APPLICABLE STANDARDS
Spill~~proof~~ resistant pressure vacuum breaker			ASSE 1056, CSA B64.1.3

(Portions of table not shown remain unchanged)

2. Add standard to Chapter 44 as follows:

CSA
B64.1.3-07 Spill resistant pressure vacuum breakers (SRPVB)

Reason: The acceptance of the proposed change will enable manufacturers with products certified to CSA B64.1.3 to have their products used as options to products that meet the requirements of ASSE 1056. This change will also allow the authorities having jurisdiction to allow the use of products that meet either CSA B64.1.3 or ASSE 1056.

Cost Impact: The code change proposal will not increase the cost of production.

Analysis: Review of proposed new standard, CSA B64.1.3-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Murra-P4-608.13.8

P84–09/10
605.16.2; IRC P2905.9.1.2

Proponent: Paul Coble, Lewis Pipe Company, Ardmore, TN

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

605.16.2 Solvent cementing. Joint surfaces shall be clean and free from moisture, and an approved primer shall be applied. Solvent cement, orange in color and conforming to ASTM F 493, shall be applied to all joint surfaces. The joint shall be made while the cement is wet, and in accordance with ASTM D 2846 or ASTM F 493. Solvent-cement joints shall be permitted above or below ground.

Exception: A primer is not required where all of the conditions apply:

1. The solvent cement is third party certified as conforming to ASTM F-493.
2. The solvent cement used is yellow or blue in color.
3. The solvent cement is used only for joining ½ (12.7 mm) inch through 2 inch (51 mm) diameter pipe and fittings.
4. The CPVC pipe and fittings are manufactured in accordance with ASTM D2846.

PART II - IRC

Revise as follows:

P2905.9 Solvent cementing. Joint surfaces shall be clean and free from moisture, and an approved primer shall be applied. Solvent cement, orange in color and conforming to ASTM F 493, shall be applied to all joint surfaces. The joint shall be made while the cement is wet, and in accordance with ASTM D 2846 or ASTM F 493. Solvent-cement joints shall be permitted above or below ground.

Exception: A primer is not required where all of the conditions apply:

1. The solvent cement is third party certified as conforming to ASTM F-493.
2. The solvent cement used is yellow or blue in color.
3. The solvent cement is used only for joining ½ (12.7 mm) inch through 2 inch (51 mm) diameter pipe and fittings.
4. The CPVC pipe and fittings are manufactured in accordance with ASTM D2846.

Reason: The yellow color indicated matches a competitor products trademark color. The blue indicated would match our trademark color. This is the only code which gives a single company or product a competitive advantage in the market. This color has actually been used against our product in the market with representatives from our competitor in at least 5 states claiming yellow one step cement would not work with a blue pipe system. The products in question are FLOWGUARD GOLD marketed by Lubrizol and Lewis Blue marketed by Lewis Pipe Company. We have developed a blue one step and would like to market this accordingly. The same standards for the cement would still apply.

Cost Impact: There will be no cost impact to builders, plumbers, or home buyers as the products will be virtually the same price and represent a very small portion of the building process.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Coble-P1-605.16.2

P85–09/10
711.2, 711.3.1

Proponent: Julius Ballanco, P.E., CPD, FASPE/JB Engineering and Code Consulting, P.C. representing himself

1. Delete without substitution:

~~**711.2 Horizontal branch connections to horizontal stack offsets.** Where a horizontal stack offset is located more than four branch intervals below the top of the stack, a Horizontal branch connections shall not connect within the horizontal stack offset or within 2 feet (610 mm) above or below such offset.~~

(Renumber subsequent sections)

2. Revise as follows:

704.3 Connections to offsets and bases of stacks. Horizontal branches shall connect to the bases of stacks at a point located not less than 10 times the diameter of the drainage *stack* downstream from the *stack*. ~~Except as prohibited by Section 711.2, h~~ Horizontal branches shall connect to horizontal *stack* offsets at a point located not less than 10 times the diameter of the drainage *stack* downstream from the upper *stack*.

711.3.1 Omission of vents for horizontal stack offsets. Vents for horizontal stack offsets required by Section 711.3 shall not be required where the stack and its offset are one pipe size larger than required for a building drain [see Table 710.1(1)] and the entire stack and offset are not less in cross-sectional area than that required for a straight stack plus the area of an offset vent as provided for in Section 915. ~~Omission of offset vents in accordance with this section shall not constitute approval of horizontal branch connections within the offset or within 2 feet (610 mm) above or below the offset.~~

Reason: The current requirement connection limitations in these sections are archaic and unfounded. Research has shown that the turbulent flow in the horizontal offset occurs within the first 10 pipe (stack) diameters downstream of the stack. This is the same condition that occurs in a building drain, downstream of the base of a stack. Beyond the ten pipe diameters point downstream of a stack , the flow in the horizontal pipe becomes nonturbulent open channel flow. Any connection downstream of where turbulent action is known to occur should be permitted. The allowance for horizontal connections to a horizontal offset should mirror the requirements at the base of the stack because the concerns for avoiding connections in a turbulent zone are identical.

This modification is consistent with one of the legacy codes, See Section 604.3 of the 1993 BOCA National Plumbing Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BALLANCO-P4-711.2

P86–09/10
608.7, 608.15.4.2; IRC P2902.4.3, P2903.9.5

Proponent: Judson Collins, JULYCO, representing Woodford Manufacturing Co.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

608.7 Valves and outlets prohibited below grade. Potable water out lets and combination stop-and-waste valves shall not be installed underground or below grade. Freezeproof yard hydrants that drain the riser into the ground are considered to be stop-and-waste valves.

> **Exception:** Freezeproof yard hydrants that drain the riser into the ground shall be permitted to be installed, provided that the potable water supply to such hydrants is protected upstream of the hydrants with a field

testable backflow preventer assembly in accordance with Section 608 and the hydrants are permanently identified as nonpotable outlets by approved signage that reads as follows: “Caution, Nonpotable Water. Do Not Drink.”

608.15.4.2 Hose connections. Sillcocks, hose bibs, wall hydrants and other openings with a hose connection shall be protected by an atmospheric-type vacuum breaker, a pressure-type vacuum breaker, a two-check type backflow preventer or a permanently attached hose connection vacuum breaker. All devices used for such protection shall be field testable.

PART II – IRC

Revise as follows:

P2902.4.3 Hose connection. Sillcocks, hose bibbs, wall hydrants and other openings with a hose connection shall be protected by an atmospheric-type ~~or~~ vacuum breaker, a pressure-type vacuum breaker , a two-check type backflow preventer or a permanently attached hose connection vacuum breaker. All devices used for such protection shall be field testable.

Exceptions:

1. This section shall not apply to water heater and boiler drain valves that are provided with hose connection threads and that are intended only for tank or vessel draining.
2. This section shall not apply to water supply valves intended for connection of clothes washing machines where backflow prevention is otherwise provided or is integral with the machine.

P2903.9.5 Valves and outlets prohibited below grade. Potable water outlets and combination stop-and-waste valves shall not be installed underground or below grade. Freezeproof yard hydrants that drain the riser into the ground are considered to be stop-and-waste valves.

Exception: Installation of freezeproof yard hydrants that drain the riser into the ground shall be permitted if the potable water supply to such hydrants is protected upstream of the hydrants with a field testable backflow preventer assembly in accordance with Section P2902 and the hydrants are permanently identified as nonpotable outlets by *approved* signage that reads as follows: “Caution, Nonpotable Water. Do Not Drink.”

Reason: A study that evaluated vacuum breakers after they were installed found that the frost proof sillcocks, conforming to ASSE 1019 that had been installed for 5 or more years, have a high probability of failure of the vacuum breaker. Therefore, property owners have no guarantee of backflow protection from ASSE 1019 devices and no way of testing to determine if the devices are working properly. Requiring a field testable backflow preventer, other than atmospheric-type vacuum breakers, for protection of hose connections will allow owners to determine if proper protection is being provided.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COLLINS-P10-608.7

P87–09/10
608.8; IRC P2901.1

Proponent: Gary Kreutziger, City of San Antonio, TX, representing the Planning and Development Services Department

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

608.8 Identification of nonpotable water. ~~In buildings~~ ~~w~~Where nonpotable water systems are installed, the piping conveying the nonpotable water shall be identified either by color marking or metal tags in accordance with Sections 608.8.1 through 608.8.3. All nonpotable water outlets such as hose connections, open ended pipes, and faucets shall be identified at the point of use for each outlet with the words, "Nonpotable-not safe for drinking." The words shall be indelibly printed on a tag or sign constructed of corrosion-resistant waterproof material or shall be indelibly printed on the fixture. The letters of the words shall be not less than 0.5 inches in height and in colors in contrast to the background on which they are applied.

PART II – IRC

Revise as follows:

P2901.1 Potable water required. *Dwelling units* shall be supplied with potable water in the amounts and pressures specified in this chapter. ~~In a building~~ Where a nonpotable water-distribution system is installed, the nonpotable system shall be identified by color marking, metal tags or other appropriate method. Where color is used for marking, purple shall be used to identify municipally reclaimed water, rainwater and graywater distribution systems. Any nonpotable outlet that could inadvertently be used for drinking or domestic purposes shall be posted.

Reason: The purpose of the proposed code change is to require all nonpotable water systems to be identified, not just the systems "in buildings". As currently written section 608.8 limits the identification of nonpotable water systems to systems installed "in buildings" and creates confusion as to whether or not outlets not in buildings need to be identified. All systems and outlets for nonpotable water should be identified regardless of location. The change will provide a cost effective, minimum level of protection for the health and welfare of the public with minimal change to the code or its intent.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KREUTZIGER-P1-608.8

P88–09/10
608.14

Proponent: Guy McMann, Jefferson County Colorado, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

608.14 Location of backflow preventers. Access shall be provided to backflow preventers as specified by the ~~installation instructions of the approved~~ manufacturer's installation instructions.

Reason: This is a simple cleanup**.** Code officials approve products and methods, not manufacturers.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-P2-608.14

P89–09/10
608.14

Proponent: Richard Grace, Fairfax County, VA Plumbing and Mechanical Inspectors, VA Building and Code Officials

Revise as follows:

608.14 Location of backflow preventers. Access shall be provided to backflow preventers as specified by the installation instructions of the ~~approved~~ manufacturer.

Reason: The code official or AHJ does not approve or disapprove manufacturers.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRACE-P2-608.14

P90–09/10
608.14; IRC P2902.6

Proponent: Matthew Kapcia, Michigan Code Study and Development Committee

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

608.14 Location of backflow preventers. ~~*Access* shall be provided to~~ Backflow preventers shall be installed only in locations where access for testing and maintenance does not require the use of a portable ladder, step stool, or similar device. Clearances around backflow preventers shall be in accordance with the manufacturer's ~~as specified by the~~ installation instructions ~~of the *approved* manufacturer~~.

PART II – IRC

Revise as follows:

P2902.6 Location of backflow preventers. ~~*Access* shall be provided to~~ Backflow preventers shall be installed only in locations where access for testing and maintenance does not the require use of a portable ladder, step stool, or similar device. Clearances around backflow preventers shall be in accordance with ~~as specified by the~~ manufacturer's installation instructions.

Reason: Backflow preventers are required to be maintained and tested at least annually, and are routinely installed in locations that pose a hazard to test personnel as well as maintenance personnel. Such locations include ceilings, mid-air in high locations, and over equipment requiring the use of a ladder while trying to use tools and gauges. Such locations often have improper access to enable a person lift components of test equipment. This is a health and safety issue for maintenance personnel. Code officials can always grant modifications under code section 105.1 Modifications.

Cost Impact: The code change proposal will increase the cost of construction and will decrease the cost of maintenance, equipment, lost work time, and medical expenses.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KAPCIA-P2-608.14

P91–09/10
608.16.6

Proponent: Dave Watson, Dave Watson Associates representing himself

Revise as follows:

608.16.6 Connections subject to backpressure. Where a potable water connection is made to a non-potable line, fixture, tank, vat, pump or other equipment subject to high hazard back-pressure, the potable water connection shall be protected by a reduced pressure principle backflow preventer.

Reason: Section as written is vague- it could (and is) interpreted as also applying to low hazard cross connections. Table 608.1 lists numerous air gaps and backflow prevention devices for low hazard back pressure. These devices are not reduced pressure principle backflow preventers as existing 608.16.6 appears to require. Therefore, adding "high hazard" to 608.16.6 clarifies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:WATSON-P1-608.16.6

P92–09/10
202; IRC 202

Proponent: Michael S. Moss, American Backflow Prevention Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

1. Revise as follows:

BACKFLOW PREVENTER. A backflow prevention assembly, a device or other ~~means~~ methods to prevent backflow into the potable water supply.

CONTAMINATION. An impairment of the quality of potable water that creates a~~n actual hazard to the~~ public health risk through poisoning, ~~or through~~ the spread of disease ~~by~~ or contact with sewage, industrial fluids, ~~or~~ waste or radioactivity. See "*Pollution*".

POLLUTION. An impairment of the quality of potable water ~~to a degree~~ that does not create a ~~hazard to the~~ public health risk but that does adversely and unreasonably affect the aesthetic qualities of ~~such~~ potable water intended for ~~domestic use~~ drinking, bathing or culinary purposes. See "*Contamination*".

REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENT~~ER~~ION ASSEMBLY. A backflow prevention ~~device~~ assembly consisting of two independently acting check valves, internally ~~force~~ loaded to a normally closed position and separated by an intermediate chamber with a ~~(or~~ zone~~)~~ of reduced pressure. ~~in which there is~~ The reduced pressure zone is provided with an automatic ~~relief~~ means of venting to the atmosphere, internally loaded to a normally

open position between two tightly closing shutoff valves and with a means for testing for tightness of the checks and opening of the relief means.

2. Add new definitions as follows:

HAZARD, DEGREE OF

High or Health. A condition or arrangement that could cause contamination of a potable water supply or system supply. See "*Contamination*".

Low or Non-health. A condition or arrangement that could cause pollution of a potable water supply or system supply. See "*Pollution*".

PART II – IRC

1. Revise as follows:

BACKFLOW PREVENTER. A backflow prevention assembly, a device or other ~~means~~ methods to prevent backflow into the potable water supply.

CONTAMINATION. An impairment of the quality of potable water that creates a~~n actual hazard to the~~ public health risk through poisoning, ~~or through~~ the spread of disease ~~by~~ or contact with sewage, industrial fluids, ~~or~~ waste or radioactivity. See "*Pollution*".

POLLUTION. An impairment of the quality of potable water ~~to a degree~~ that does not create a ~~hazard to the~~ public health risk but that does adversely and unreasonably affect the aesthetic qualities of ~~such~~ potable water intended for ~~domestic use~~ drinking, bathing or culinary purposes. See "*Contamination*".

REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENT~~ER~~ION ASSEMBLY. A backflow prevention ~~device~~ assembly consisting of two independently acting check valves, internally ~~force-~~loaded to a normally closed position and separated by an intermediate chamber with a ~~(or~~ zone~~)~~ of reduced pressure. ~~in which there is~~ The reduced pressure zone is provided with an automatic ~~relief~~ means of venting to the atmosphere, internally loaded to a normally open position between two tightly closing shutoff valves and with a means for testing for tightness of the checks and opening of the relief means.

2. Add new definitions as follows:

HAZARD, DEGREE OF

High or Health. A condition or arrangement that could cause contamination of a potable water supply or system supply. See "*Contamination*".

Low or Non-health. A condition or arrangement that could cause pollution of a potable water supply or system supply. See "*Pollution*".

Reason: BACKFLOW PREVENTER: The change in this term's definition is necessary to better understand the use of Table 608.1(IRC Table P2902.3) APPLICATION OF BACKFLOW PREVENTERS. I have submitted a companion proposal for rearranging the information in Table 608.1 to show that BACKFLOW PREVENTERS are categorized in three groups: Backflow Prevention Assemblies, Backflow Devices, and Other Methods. The purpose of the three groupings is to illustrate that Backflow Prevention Assemblies are field testable (having shutoff valves and test cock fittings), Backflow Devices are not field testable; and Other Methods are not field testable but by observation, can be determined that proper backflow protection exists.

CONTAMINATION and POLLUTION: Table 608.1 (IRC Table P2902.3) has a footnote concerning the relationship between the terms "high" and "low" hazard and the defined terms of CONTAMINATION and POLLUTION, respectively. The backflow prevention community also uses the terms "health hazard" and "non-health hazard" in describing applications and connections. The proposed amendments to these definitions are necessary so that code officials, backflow prevention specialists, plumbers and plumbing system designers clearly understand the relationships between these terms and are able to properly select appropriate backflow preventers in accordance with the table.

REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY: This definition needs changed to be in alignment with the 3 groups of Backflow Preventers that are identified in the proposed amended definition of BACKFLOW PREVENTER and the proposed rearrangement of Table 608.1. For the IRC, the term "REDUCED PRESSURE-ZONE BACKFLOW PREVENTER" is not found in the IRC text, therefore, the term is being corrected to match terminology corrections that are being proposed by companion proposals for numerous code sections.

All proposed changes in the above definitions have no technical impact. These changes, along with other proposed companion changes are necessary to provide meaningful and consistent terminology throughout the code for better understanding of the application of backflow preventers.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Moss-P1-202

P93–09/10

Table 608.1, 608.13.6; IRC Table P2902.3, P2902.3.2

Proponent: Michael S. Moss of the American Backflow Prevention Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

1. Revise table as follows:

TABLE 608.1
APPLICATION OF BACKFLOW PREVENTERS

BACKFLOW PREVENTION ASSEMBLIES			
DEVICE	**DEGREE OF HAZARD[a]**		**APPLICABLE STANDARDS**
Double check backflow prevention assembly ~~and~~ Double check fire protection backflow prevention assembly	Low hazard		ASSE 1015, AWWA C510, CSA B64.5, CSA B64.5.1
Double check detector fire protection backflow prevention assembl~~ies~~y	Low hazard		ASSE 1048
Pressure vacuum breaker assembly	High or low hazard		ASSE 1020, CSA B64.1.2
Reduced pressure principle backflow prevent~~er~~ion assembly ~~and~~ Reduced pressure principle fire protection backflow prevent~~er~~ion assembly	High or low hazard		ASSE 1013, AWWA C511, CAN/CSA B64.4, CSA B64.4.1
Reduced pressure detector fire protection backflow prevention assembly	High or low hazard		ASSE 1047
Spill~~proof~~ –resistant vacuum breaker assembly	High or low hazard		ASSE 1056
BACKFLOW PREVENTER DEVICES			
DEVICE	**DEGREE OF HAZARD[a]**		**APPLICABLE STANDARDS**

Antisiphon~~-type~~ fill valve~~s~~ for gravity water closet flush tanks	High hazard		ASSE 1002, CSA B125.3
~~Pipe-applied~~ Atmospheric vacuum breaker	High or low hazard		ASSE 1001, CAN/CSA B64.1.1
Backflow preventer for ~~carbonated~~ beverage dispensing equipment ~~machines~~	Low hazard		ASSE 1022
Backflow preventer with intermediate atmospheric vents	Low hazard		ASSE 1012, CAN/CSA B64.3
Dual check valve type backflow preventer	Low hazard		ASSE 1024, CSA B64.6
Hose connection backflow preventer	~~High or~~ Low hazard		ASSE 1052, CSA B64.2.1.1
Hose connection vacuum breaker	~~High or~~ Low hazard		ASSE 1011, CAN/CSA B64.2, CSA B64.2.1
Laboratory faucet backflow preventer	~~High or~~ Low hazard		ASSE 1035, CSA B64.7
Vacuum breaker wall hydrant~~s~~, ~~frost~~ freeze-resistant, automatic draining type	~~High or~~ Low hazard		ASSE 1019, CAN/CSA B64.2.2
OTHER METHODS			
DEVICE	**DEGREE OF HAZARD[a]**		**APPLICABLE STANDARDS**
Air gap	High or low hazard		ASME A112.1.2
Air gap fitting~~s~~ for use with plumbing fixtures, appliances and appurtenances	High or low hazard		ASME A112.1.3
Barometric loop	High or low hazard		(See Section 608.13.4)

(Portions of table not shown remain unchanged)

2. Revise as follows:

608.13.6 Atmospheric~~-type~~ vacuum breakers. ~~Pipe-applied~~ Atmospheric~~-type~~ vacuum breakers shall conform to ASSE 1001 or CAN/CSA B64.1.1. Hose-connection vacuum breakers shall conform to ASSE 1011, ASSE 1019, ASSE 1035, ASSE 1052, CAN/CSA B64.2, CSA B64.2.1, CSA B64.2.1.1, CAN/CSA B64.2.2 or CSA B64.7. These devices shall operate under normal atmospheric pressure when the critical level is installed at the required height.

PART II – IRC

1. Revise table as follows:

TABLE P2902.3
APPLICATION OF BACKFLOW PREVENTERS

BACKFLOW PREVENTION ASSEMBLIES			
DEVICE	**DEGREE OF HAZARD[a]**		**APPLICABLE STANDARDS**
Double check backflow prevention assembly ~~and~~ Double check fire protection backflow prevention assembly	Low hazard		ASSE 1015, AWWA C510, CSA B64.5, CSA B64.5.1
Double check detector fire protection backflow prevention assembli~~es~~y	Low hazard		ASSE 1048
Pressure vacuum breaker assembly	High or low hazard		ASSE 1020, CSA B64.1.2
Reduced pressure principle backflow preventer~~er~~ion assembly ~~and~~ Reduced pressure principle fire protection backflow preventer~~er~~ion assembly	High or low hazard		ASSE 1013, AWWA C511, CAN/CSA B64.4, CSA B64.4.1

Reduced pressure detector fire protection backflow prevention assembly	High or low hazard		ASSE 1047
Spill~~proof~~ –resistant vacuum breaker assembly	High or low hazard		ASSE 1056
BACKFLOW PREVENTER DEVICES			
DEVICE	**DEGREE OF HAZARD[a]**		**APPLICABLE STANDARDS**
Antisiphon~~-type~~ fill valve~~s~~ for gravity water closet flush tanks	High hazard		ASSE 1002, CSA B125.3
~~Pipe-applied~~ Atmospheric vacuum breaker	High or low hazard		ASSE 1001, CAN/CSA B64.1.1
Backflow preventer with intermediate atmospheric vents	Low hazard		ASSE 1012, CAN/CSA B64.3
Dual check valve type backflow preventer	Low hazard		ASSE 1024, CSA B64.6
Hose connection backflow preventer	~~High or~~ Low hazard		ASSE 1052, CSA B64.2.1.1
Hose connection vacuum breaker	~~High or~~ Low hazard		ASSE 1011, CAN/CSA B64.2, CSA B64.2.1
Laboratory faucet backflow preventer	~~High or~~ Low hazard		ASSE 1035, CSA B64.7
OTHER METHODS			
DEVICE	**DEGREE OF HAZARD[a]**		**APPLICABLE STANDARDS**
Air gap	High or low hazard		ASME A112.1.2
Air gap fitting~~s~~ for use with plumbing fixtures, appliances and appurtenances	High or low hazard		ASME A112.1.3

(Portions of table not shown remain unchanged)

2. Revise as follows:

P2902.3.2 Atmospheric~~-type~~ vacuum breakers. ~~Pipe-applied~~ Atmospheric~~-type~~ vacuum breakers shall conform to ASSE 1001 or CSA B64.1.1. Hose-connection vacuum breakers shall conform to ASSE 1011, ASSE 1019, ASSE 1035, ASSE 1052, CSA B64.2, CSA B64.2.1, CSA B64.2.1.1, CSA B64.2.2 or CSA B64.7. These devices shall operate under normal atmospheric pressure when the critical level is installed at the required height.

Reason: There is much confusion concerning protection provided by any 'backflow preventer'. This table would better identify proper and correct applications by identifying the different protection methods: assemblies, plumbing devices and other methods. The existing table gives the mistaken understanding that "any of the above provides adequate protection for any job". This is not true. Adequate protection is based on hazard classification, application and proper installation. Backflow prevention assemblies are specifically recognized and accepted as separate and distinct units based on Section 312.10.2 because of their requirement for periodic testing to ensure proper and reliable operation in order to protect public health. Titles are in accordance with ASSE Standards listing from Plumbing Standards magazine January-March 2009.

No new assemblies, devices or means have been added to Table 608.1 and none have been deleted. The assemblies, devices and methods are simply grouped in 3 categories for simplicity and better understanding as to how they are to be applied. The HIGH hazard was taken off the hose connection backflow preventer, the hose connection vacuum breaker and the laboratory faucet vacuum breaker as these devices are never suitable for high hazard applications. Section 608.13.6 (IRC Section P2902.3.2) was revised to align the terminology to the standards and Table 608.1 (IRC Table P2902.3) as well as eliminate the confusing term "pipe-applied".

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MOSS-P18-605.3.1

P94–09/10
608.13.7, 608.15.4.1, 608.15.4.2; IRC P2902.3.6, P2902.4, P2902.4.2, P2904.4.3, P2902.5.5

Proponent: Michael S. Moss of the American Backflow Prevention Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

608.13.7 Double check ~~-valve~~ backflow prevention assemblies. Double check ~~-valve~~ backflow prevention assemblies shall conform to ASSE 1015, CSA B64.5, CSA B64.5.1 or AWWA C510. Double ~~-detector~~ check ~~-valve~~ detector backflow prevention assemblies shall conform to ASSE 1048. These devices shall be capable of operating under continuous pressure conditions.

608.15.4.1 Deck-mounted and integral vacuum breakers. *Approved* deck-mounted or equipment-mounted vacuum breakers and faucets with integral atmospheric vacuum breakers or integral spill ~~proof~~ –resistant vacuum breaker ~~s~~ assemblies shall be installed in accordance with the manufacturer's instructions and the requirements for labeling. ~~with~~ The critical level of the breakers and assemblies shall be located at not less than 1 inch (25 mm) above the *flood level rim*.

608.15.4.2 Hose connections. Sillcocks, hose bibbs, wall hydrants and other openings with a hose connection shall be protected by an atmospheric ~~-type~~ vacuum breaker, ~~or~~ a pressure ~~-type~~ vacuum breaker assembly or a permanently attached hose connection vacuum breaker.

Exceptions:

1. This section shall not apply to water heater and boiler drain valves that are provided with hose connection threads and that are intended only for tank or vessel draining.
2. This section shall not apply to water supply valves intended for connection of clothes washing machines where backflow prevention is otherwise provided or is integral with the machine.

PART II – IRC

Revise as follows:

P2902.3.6 Double check ~~-valve~~ backflow prevention assemblies. Double check ~~-valve~~ backflow prevention assemblies shall conform to ASSE 1015, CSA B64.5, CSA B64.5.1 or AWWA C510. Double ~~-detector~~ check ~~-valve~~ detector backflow prevention assemblies shall conform to ASSE 1048. These devices shall be capable of operating under continuous pressure conditions.

P2902.4 Protection of potable water outlets. Potable water openings and outlets shall be protected by an air gap, a reduced pressure principle backflow prevent ~~er~~ion assembly ~~with atmospheric vent~~, an atmospheric ~~-type~~ vacuum breaker, a pressure ~~-type~~ vacuum breaker assembly or a hose connection backflow preventer.

P2902.4.2 Deck-mounted and integral vacuum breakers. *Approved* deck-mounted or equipment-mounted vacuum breakers and faucets with integral atmospheric vacuum breakers or integral spill ~~proof~~ –resistant vacuum breaker ~~s~~ assemblies shall be installed in accordance with the manufacturer's instructions and the requirements for labeling. ~~with~~ The critical level of the breakers and assemblies shall be located at not less than 1 inch (25 mm) above the *flood level rim*.

P2902.4.3 Hose connection s. Sillcocks, hose bibbs, wall hydrants and other openings with a hose connection threads shall be protected by an atmospheric ~~-type~~ vacuum breaker, ~~or~~ a pressure ~~-type~~ vacuum breaker assembly or a permanently attached hose connection vacuum breaker.

Exceptions:

1. This section shall not apply to water heater and boiler drain valves that are provided with hose connection threads and that are intended only for tank or vessel draining.
2. This section shall not apply to water supply valves intended for connection of clothes washing machines where backflow prevention is otherwise provided or is integral with the machine.

P2902.5.5 Solar systems. The potable water supply to a solar system shall be equipped with a backflow preventer with intermediate atmospheric vents complying with ASSE 1012 or a reduced pressure principle backflow prevent~~er~~ion assembly complying with ASSE 1013. Where chemicals are used, the potable water supply shall be protected by a reduced pressure principle backflow prevent~~er~~ion assembly.

Exception: Where all solar system piping is a part of the potable water distribution system, in accordance with the requirements of the *International Plumbing Code*, and all components of the piping system are listed for potable water use, ~~cross-connection protection measures~~ backflow protection shall not be required.

Reason: To provide consistent terminology throughout the code for reference and comparison.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MOSS-P19-608.13.7

P95–09/10
608.13.2; IPC P2902.3.5

Proponent: Michael S. Moss of the American Backflow Prevention Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

608.13.2 Reduced pressure principle backflow prevent~~ers~~ion assemblies. Reduced pressure principle backflow prevent~~ers~~ion assemblies and reduced pressure principle fire protection backflow prevent~~ers~~ion assemblies shall conform to ASSE 1013, AWWA C511, CSA B64.4 or CSA B64.4.1. Reduced pressure detector fire protection ~~assembly~~ backflow prevent~~ers~~ion assemblies shall conform to ASSE 1047. These devices shall be permitted to be installed where subject to continuous pressure conditions. The relief opening shall discharge by air gap and shall be prevented from being submerged.

PART II – IRC

Revise as follows:

P2902.3.5 Reduced pressure principle backflow prevent~~ers~~ion assemblies. Reduced pressure principle backflow prevent~~ers~~ion assemblies and reduced pressure principle fire protection backflow prevent~~ers~~ion assemblies shall conform to ASSE 1013, AWWA C511, CSA B64.4 or CSA B64.4.1. Reduced pressure detector fire protection ~~assembly~~ backflow prevent~~ers~~ion assemblies shall conform to ASSE 1047. These devices shall be permitted to be installed where subject to continuous pressure conditions. The relief opening shall discharge by air gap and shall be prevented from being submerged.

Reason: To provide consistent terminology throughout the code for reference and comparison.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Moss-P7-608.13.2

P96–09/10
608.13.5; IRC P2902.3.4

Proponent: Michael S. Moss of the American Backflow Prevention Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

608.13.5 Pressure ~~-type~~ vacuum breaker~~s~~ assemblies. Pressure~~-type~~ vacuum breaker~~s~~ assemblies shall conform to ASSE 1020 or CSA B64.1.2. ~~and~~ Spill~~proof~~-resistant vacuum breaker assemblies shall comply with ASSE 1056. These ~~devices~~ assemblies are designed for installation under continuous pressure conditions whe~~n~~re the critical level is installed at the required height. Pressure~~-type~~ vacuum breaker~~s~~ assemblies shall not be installed in locations where spillage could cause damage to the structure.

PART II – IRC

Revise as follows:

P2902.3.4 Pressure ~~-type~~ vacuum breaker~~s~~ assemblies. Pressure~~-type~~ vacuum breaker~~s~~ assemblies shall conform to ASSE 1020 or CSA B64.1.2. ~~and~~ Spill~~proof~~-resistant vacuum breaker~~s~~ assemblies shall comply with ASSE 1056. These ~~devices~~ assemblies are designed for installation under continuous pressure conditions whe~~n~~re the critical level is installed at the required height. Pressure~~-type~~ vacuum breaker~~s~~ assemblies shall not be installed in locations where spillage could cause damage to the structure.

Reason: The purpose of this proposal is to provide consistent terminology throughout the code for reference and comparison. Reference to 608.15.4, Manufacturer's installation instructions require that the critical level of pressure vacuum breaker assemblies and spill-resistant vacuum breaker assemblies be at least 12 inches above downstream openings and outlets. Because atmospheric vacuum breakers are required to have their critical level installed at least 6 inches above downstream outlets, installers as well as code officials mistakenly assumed that PVBs and SVBs required the same installation height because these assemblies are also named "vacuum breakers". This is incorrect.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Moss-P8-608.13.5

P97–09/10
608.13.8

Proponent: Michael S. Moss of the American Backflow Prevention Association

Revise as follows:

608.13.8 Spill~~proof~~ -resistant vacuum breaker~~s~~ assemblies. Spill~~proof~~ -resistant vacuum breaker~~s~~ assemblies (~~SVB~~) shall conform to ASSE 1056. These ~~devices~~ assemblies are designed for installation under continuous-pressure conditions when~~n~~re the critical level is installed at the required height.

Reason: To provide consistent terminology throughout the code for reference and comparison. The removal of the term "(SVB)" is editorial as the use of abbreviations and acronyms do not comply with ICC rules for code language and other code sections concerning backflow protection assemblies. Reference to 608.15.4, Manufacturer's installation instructions require that the critical level of pressure vacuum breaker assemblies and spill-resistant vacuum breaker assemblies be at least 12 inches above downstream openings and outlets. Because atmospheric vacuum breakers are required to have their critical level installed at least 6 inches above downstream outlets, installers as well as code officials mistakenly assumed that PVBs and SVBs required the same installation height because these assemblies are also named "vacuum breakers". This is incorrect.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Moss-P9-608.13.8

P98–09/10
608.3.1

Proponent: Michael S. Moss of the American Backflow Prevention Association

Revise as follows:

608.3.1 Special equipment, water supply protection. The water supply for hospital fixtures shall be protected against backflow with a reduced pressure principle backflow prevent~~er~~ion assembly, an atmospheric or spill-~~proof~~ resistant vacuum breaker assembly, or an air gap. Vacuum breakers for bedpan washer hoses shall not be located less than 5 feet (1524 mm) above the floor. Vacuum breakers for hose connections in health care or laboratory areas shall not be less than 6 feet (1829 mm) above the floor.

Reason: To provide consistent terminology throughout the code for reference and comparison.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Moss-P13-608.3.1

P99–09/10
608.16.4, 608.16.4.1; IRC P2902.5.4, P2902.5.4.1

Proponent: Michael S. Moss of the American Backflow Prevention Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

608.16.4 Connections to automatic fire sprinkler systems and standpipe systems. The potable water supply to automatic fire sprinkler and standpipe systems shall be protected against backflow by a double check ~~valve~~ fire protection backflow prevention assembly or a reduced pressure principle fire protection backflow prevent~~er~~ion assembly.

Exceptions:

1. Where systems are installed as a portion of the water distribution system in accordance with the requirements of this code and are not provided with a fire department connection, isolation of the water supply system shall not be required.
2. Isolation of the water distribution system is not required for deluge, pre-reaction or dry pipe systems.

608.16.4.1 Additives or nonpotable source. Where systems under continuous pressure contain chemical additives or antifreeze, or where systems are connected to a nonpotable secondary water supply, the potable water supply shall be protected against backflow by a reduced pressure principle fire protection backflow prevent~~er~~ion assembly. Where chemical additives or antifreeze are added to only a portion of an automatic fire sprinkler or standpipe system, the reduced pressure principle fire protection backflow prevent~~er~~ion assembly shall be permitted to be located so as to isolate that portion of the system. Where systems are not under continuous pressure, the potable water supply shall be protected against backflow by an air gap or an ~~pipe applied~~ atmospheric vacuum breaker conforming to ASSE 1001 or CSA B64.1.1.

PART II – IRC

Revise as follows:

P2902.5.4 Connections to automatic fire sprinkler systems. The potable water supply to automatic fire sprinkler shall be protected against backflow by a double check ~~valve~~ fire protection backflow prevention assembly or a reduced pressure principle fire protection backflow prevent~~er~~ion assembly.

Exception: Where systems are installed as a portion of the water distribution system in accordance with the requirements of this code and are not provided with a fire department connection, ~~isolation~~ backflow protection ~~of~~ for the water supply system shall not be required.

P2902.5.4.1 Additives or nonpotable source. Where systems contain chemical additives or antifreeze, or where systems are connected to a nonpotable secondary water supply, the potable water supply shall be protected against backflow by a reduced pressure principle fire protection backflow prevent~~er~~ion assembly. Where chemical additives or antifreeze is added to only a portion of an automatic fire sprinkler or standpipe system, the reduced pressure principle fire protection backflow preventer shall be permitted to be located so as to isolate that portion of the system.

Reason: To provide consistent terminology throughout the code for reference and comparison.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Moss-P15-608.16.4

P100–09/10
608.16.5; IRC P2902.5.3

Proponent: Michael S. Moss of the American Backflow Prevention Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

608.16.5 Connections to lawn irrigation systems. The potable water supply to lawn irrigation systems shall be protected against backflow by an atmospheric~~-type~~ vacuum breaker, a pressure~~-type~~ vacuum breaker assembly or a reduced pressure principle backflow prevent~~er~~ion assembly. ~~A~~ Valves shall not be installed downstream from an atmospheric vacuum breaker. Where chemicals are introduced into the system, the potable water supply shall be protected against backflow by a reduced pressure principle backflow prevent~~er~~ion assembly.

PART II – IRC

Revise as follows:

P2902.5.3 Lawn irrigation systems. The potable water supply to lawn irrigation systems shall be protected against backflow by an atmospheric~~-type~~ vacuum breaker, a pressure~~-type~~ vacuum breaker assembly or a reduced pressure principle backflow prevent~~er~~ion assembly. ~~A~~ Valves shall not be installed downstream from an atmospheric vacuum breaker. Where chemicals are introduced into the system, the potable water supply shall be protected against backflow by a reduced pressure principle backflow prevent~~er~~ion assembly.

Reason: To provide consistent terminology throughout the code for reference and comparison.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Moss-P16-608.16.5

P101–09/10
608.16.6

Proponent: Michael S. Moss of the American Backflow Prevention Association

Revise as follows:

608.16.6 Connections subject to backpressure. Where a potable water connection is made to a nonpotable line, fixture, tank, vat, pump or other equipment subject to back-pressure, the potable water connection shall be protected by a reduced pressure principle backflow prevent~~er~~ion assembly.

Reason: To provide consistent terminology throughout the code for reference and comparison.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Moss-P17-608.16.6

P102–09/10
608.6; IRC P2902.1

Proponent: Michael S. Moss of the American Backflow Prevention Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

608.6 Cross-connection control. Cross connections shall be prohibited, except where approved ~~protective~~ backflow preventers ~~devices~~ are installed to protect the potable water supply.

PART II - IRC

Revise as follows:

P2902.1 General. A potable water supply system shall be designed and installed as to prevent contamination from nonpotable liquids, solids or gases being introduced into the potable water supply. Connections shall not be made to a potable water supply in a manner that could contaminate the water supply or provide a cross-connection between the supply and a source of contamination ~~unless an *approved* backflow prevention device~~ except where approved backflow preventers are installed to protect the potable water supply. ~~is provided.~~ Cross-connections between an individual water supply and a potable public water supply shall be prohibited.

Reason: Because the term “Protective devices” is not included in the definitions, this change clarifies the intent of Section 608.6. The change for the definition of “Backflow preventer” makes the definition more descriptive and precise.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Moss-P2-608.6

P103–09/10
608.13.3, 608.16.2; IRC P2902.3.3, P2902.5.1

Proponent: Michael S. Moss of the American Backflow Prevention Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

608.13.3 Backflow preventer with intermediate atmospheric vent. Backflow preventers with intermediate atmospheric vents shall conform to ASSE 1012 or CAN/CSA B64.3. These devices shall be permitted to be installed where subject to continuous pressure conditions. The relief opening shall discharge by air gap and shall be prevented from being submerged. Backflow preventers with intermediate atmospheric vents shall be prohibited as a means of protection for potable water connections to boilers or where chemicals are introduced downstream of the device.

608.16.2 Connections to boilers. ~~The potable supply to a boiler shall be equipped with a backflow preventer with an intermediate atmospheric vent complying with ASSE 1012 or CSA B64.3~~. ~~Where conditioning chemicals are introduced into the system,~~ The potable water connection to a boiler shall be protected by an air gap or a reduced pressure principle backflow preven~~ter~~ion assembly, complying with ASSE 1013, CSA B64.4 or AWWA C511. The use of a backflow preventer with atmospheric vents for potable water connections to a boiler shall be prohibited.

PART II – IRC

P2902.3.3 Backflow preventer with intermediate atmospheric vent. Backflow preventers with intermediate atmospheric vents shall conform to ASSE 1012 or CAN/CSA B64.3. These devices shall be permitted to be installed where subject to continuous pressure conditions. The relief opening shall discharge by air gap and shall be prevented from being submerged. Installation of this type of backflow preventer shall be prohibited where chemicals are introduced downstream of the device.

P2902.5.1 Connections to boilers. The potable water supply to the boiler shall be equipped with a backflow preventer with an intermediate atmospheric vent complying with ASSE 1012 or CSA B64.3. Where conditioning chemicals are introduced into the boiler ~~system~~, the potable water connection shall be protected by an air gap or a reduced pressure principle backflow preven~~ter~~ion assembly, complying with ASSE 1013, CSA B64.4 or AWWA C511

Reason
(Part I) These devices are designed for low or non-health hazard installations according to manufacturer specification sheets. They are inadequate for protection against chemical additions or injections downstream of the device. Buildings covered by the IPC are mostly "commercial" in nature and as such, it is difficult to know whether chemicals will be used to clean the boilers at some point during the life of the boiler unit. Based upon our experience, there is a high probability that chemical addition or injection will occur. This poses a significant risk to the building's inhabitants as well as to the public water supply. Although we have found that most boiler installers "do the right thing" and install reduced pressure principle backflow protection assemblies on these "commercial" boilers, some installers take the code minimum approach by indicating that no chemicals will be added and thus, by code, are permitted to install a backflow preventer with intermediate atmospheric vents. Unfortunately, code officials have no alterative other than to accept the installation based upon the word of the installer that chemicals will not be added. In a commercial environment, this poses a significant risk to public health. Note that the addition of the "prohibition against installation where chemicals are involved" language to this section does not introduce a new requirement. Section 608.16.2 currently requires a different type of backflow protection for boilers where chemicals are involved.
(Part II) These devices are designed for low or non-health hazard installations according to manufacturer specification sheets. They are inadequate for protection against chemical additions or injections downstream of the device. In 1 and 2 family dwellings, backflow preventers with atmospheric vents are primarily used for connecting the potable water supply to a boiler. Chemical additions or injections into the boiler are rarely, if ever, performed. These "residential" boiler systems simply do not require the cleaning or conditioning that is often necessary for a boiler in a "commercial" environment. However, in the rare event that chemicals are added to the boiler system and the backflow preventer with atmospheric vents fail is inoperative or is malfunctioning, the event would directly affect only the limited number of inhabitants usually in 1 or 2 family dwellings. Given that most boilers in one or two family dwellings operate at low pressures (15 psi or less), that the potable water system pressure is usually at least 40 psi, and that the occurrence of a complete loss of water supply pressure during a chemical cleaning event would be extremely rare, the probability of a contamination event is extremely low. Therefore, for one and two family dwellings, requiring greater protection than that provided by a backflow preventer with atmospheric vents is not required unless it evident that chemical addition or injection downstream of the device will occur. Note that the addition of language to this section does not introduce a new requirement but is only a reminder of the limits of these devices. Section P2902.5.1 currently requires a different type of backflow protection for boilers where chemicals are involved.

Cost Impact: NONE because the majority of the time, installers are doing the right thing.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Moss-P3-608.13.3

P104–09/10
608.15.4; IRC P2902.3.4

Proponent: Michael S. Moss of the American Backflow Prevention Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

608.15.4 Protection by a vacuum breaker or vacuum breaker assembly. Openings and outlets shall be protected by atmospheric-type vacuum breakers or pressure-type vacuum breakers assemblies. Vacuum breakers and vacuum breaker assemblies shall not be installed under exhaust hoods or in similar locations that will contain toxic fumes or vapors. The critical level of the an atmospheric vacuum breaker shall be not less than set a minimum of 6 inches (152 mm) above the flood level rim of the fixture, receptor or device served. Fill valves shall be set in accordance with Section 425.3.1. Pipe-applied vacuum breakers shall be installed not less than 6 inches (152 mm) above the flood level rim of the fixture, receptor or device served. The critical level of a pressure vacuum breaker assembly or spill-resistant vacuum breaker assembly shall be not less than 12 inches (304 mm) above the flood level rim of the fixture, receptor or device served. The critical level of anti-siphon fill valves shall be in accordance with Section 425.3.1.

PART II – IRC

Revise as follows:

P2902.3.4 Pressure-type vacuum breakers assemblies. Pressure-type vacuum breakers assemblies shall conform to ASSE 1020 or CSA B64.1.2. and Spillproof –resistant vacuum breakers assemblies shall comply with ASSE 1056. The critical level of a pressure vacuum breaker assembly or spill-resistant vacuum breaker assembly shall be not less than 12 inches (304 mm) above the flood level rim of the fixture, receptor or device served.These devices are designed for installation under continuous pressure conditions whenre the critical level is installed at the required height. Pressure-type vacuum breakers assemblies shall not be installed in locations where spillage could cause damage to the structure.

Reason
(Part I): This proposal changes terminology to align with that used by those in backflow industry, with the referenced standards and with other proposed changes to code sections concerning backflow protection. The changes help make a clear distinction between vacuum breakers and vacuum breaker assemblies so that they are installed with the critical height at the proper elevation above openings and outlets. This proposal also resolves a conflict between the code and manufacturer's installation instructions concerning the required critical level installation height for pressure vacuum breaker assemblies and spill-resistant vacuum breaker assemblies. The critical level of pressure vacuum breaker assemblies and spill-resistant vacuum breaker assemblies must be at least 12 inches above openings and outlets. The current code language implied that the critical level only needed to be 6 inches above. Installers as well as code officials are often not aware of the critical height requirements for PVBs and SVBs because installation instructions are lost or not at the jobsite. Inclusion of the critical height installation requirement(s) in the code for PVBs and SVBs will guarantee the level of backflow protection that these devices are designed to provide and to ensure protection of public health. Other changes in this section are editorial to align the language with ICC format.
(Part II): This proposal changes terminology to align with that used by those in backflow industry, with the referenced standards and with other proposed changes to code sections concerning backflow protection. Manufacturer's installation instructions require that the critical level of pressure vacuum breaker assemblies and spill-resistant vacuum breaker assemblies be at least 12 inches above downstream openings and outlets. Because atmospheric vacuum breakers are required to have their critical level installed at least 6 inches above downstream outlets, installers as well as code officials mistakenly assumed that PVBs and SVBs required the same installation height because these assemblies are also named "vacuum breakers". This is incorrect. Installers as well as code officials are typically not aware of the critical height requirements for PVBs and SVBs because installation instructions are lost or not at the jobsite. Inclusion of the critical height installation requirement(s) in the code for PVBs and SVBs will guarantee the level of backflow protection that these devices are designed to provide and to ensure protection of public health.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MOSS-P6-608.15.4

P105–09/10
608.15.2

Proponent: Michael S. Moss of the American Backflow Prevention Association

Revise as follows:

608.15.2 Protection by ~~a~~ reduced pressure principle backflow preventer~~er~~ion assembly. Openings and outlets shall be protected by a reduced pressure principle backflow preventer~~er~~ion assembly on potable water supplies or by a reduced pressure principle fire protection backflow prevention assembly on dedicated fire line water supplies.

Reason: To provide consistent terminology throughout the code for reference and comparison.

Cost Impact: NONE

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Moss-P10-608.15.2

P106–09/10
312.10.2, Chapter 13; IRC P2503.8.2, Chapter 44

Proponent: Michael S. Moss of the American Backflow Prevention Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

1. Revise as follows:

312.10.2 Testing of Backflow Prevention Assemblies. Reduced pressure principle backflow preventer~~er~~ion assemblies, reduced pressure principle fire protection backflow prevention assemblies, double check ~~valve~~ backflow prevention assemblies, double check fire protection backflow prevention assemblies, pressure vacuum breaker assemblies, reduced pressure detector fire protection backflow prevention assemblies, double check detector fire protection backflow prevention assemblies, ~~hose connection backflow preventers,~~ and spill-~~proof~~ resistant vacuum breaker~~s~~ assemblies shall be tested at the time of installation, immediately after repairs or relocation and at least annually. The testing procedure shall be performed in accordance with one of the following standards: ASSE 5013, ASSE 5015, ASSE 5020, ASSE 5047, ASSE 5048, ~~ASSE 5052,~~ ASSE 5056, CSA B64.10, ~~or~~ CSA B64.10.1 or ABPA Field Test Procedures for Backflow Prevention Assemblies.

2. Add standard to Chapter 13 as follows:

American Backflow Prevention Association
P.O. Box 3051
Bryan, TX 77805-3051

ABPA
Field Test Procedures for Backflow Prevention Assemblies dated 2-24-98

PART II – IRC

1. Revise as follows:

P2503.8.2 Testing of Backflow Prevention Assemblies. Reduced pressure principle backflow preventer~~er~~ion assemblies, reduced pressure principle fire protection backflow prevention assemblies, double check ~~valve~~ backflow prevention assemblies, double ~~detector~~ check ~~valve~~ fire protection backflow prevention assemblies, reduced pressure detector fire protection backflow prevention assemblies, double check detector fire protection backflow prevention assemblies, ~~and~~ pressure vacuum breaker assemblies and spill-resistant vacuum breaker assemblies shall be tested at the time of installation, immediately after repairs or relocation and at least annually. The testing procedure shall be performed in accordance with one of the following standards:

ASSE 5013, ASSE 5015, ASSE 5020, ASSE 5047, ASSE 5048, ASSE 5056, CSA B64.10,-CSA B64.10.1 or ABPA Field Test Procedures for Backflow Prevention Assemblies.

2. Add standard to Chapter 44 as follows:

American Backflow Prevention Association
P.O. Box 3051
Bryan, TX 77805-3051

ABPA
Field Test Procedures for Backflow Prevention Assemblies dated 2-24-98

Reason
(Part I) : The proposed changes correct the terminology for the backflow protection assemblies listed so that they are in alignment with the titles of the ASSE standards, the backflow industry terminology and the terminology changes proposed in companion proposals for various code sections. The list of assemblies in the current section is incomplete as compared those listed in Table 608.1 and therefore, additional terminology is proposed for consistency. Because a hose connection vacuum breaker is not a backflow protection assembly, the term was removed from the list and ASSE 5052 was removed from the list of procedures. The ABPA Field Test Procedures for Backflow Prevention Assemblies was added to the list of procedures because the Field Test Procedures are excerpted from The Manual of Cross-Connection Control, 9th edition published by the Foundation for Cross-Connection Control and Hydraulic Research published by the University of Southern California. Many jurisdictions have used the procedures in the Manual of Cross-Connection Control since it was first published and have established those procedures as the foundation of their cross-connection control programs. The ABPA Field Test Procedures is an abbreviated form of the Manual's procedures and is frequently used in the field to meet a jurisdiction's mandate for using the Manual's procedures instead of the ASSE procedures. The addition of the ABPA Field Test Procedures will allow those jurisdictions mandating use of the Manual's procedures to be in compliance with the code.
(Part II): The proposed changes are to align the IRC text with the proposed text for the IPC. Although it might be rare for some of the assemblies listed to be used for a 1 and 2 family residential dwelling, this section covers all possible assemblies that could be used. Aligning this sections text with that used in the IPC will make it easier to maintain. Note that the changes do not require that any of the added backflow assemblies be installed. This section only requires that if those assemblies are installed for whatever reason, testing is required as indicated.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard ABPA Field Test Procedures for Backflow Prevention Assemblies dated 2-24-98 indicated that, in the opinion of ICC staff, the standard did not comply with ICC standards criteria.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Moss-P12-312.10.2

P107–09/10
608.18 (New)

Proponent: Robert Burke University of Colorado representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Add new text as follows:

608.18 Dead ends. Dead ends exceeding 4 feet in developed length shall be prohibited unless protected by an approved backflow preventer .

Reason: Stagnant water is unhealthy and a prime cause of Legionella disease. ASHRAE Standard 12-200 addresses this issue; minimizing the risk of Legionellosis associated with building water system.

Cost Impact: The cost impact to construction will be minimal.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Burke-P3-608.18

P108–09/10
611.1, 611.2, Chapter 13; IRC P2908.1, P2908.2, Chapter 44

Proponent: Abraham I. Murra, Canadian Standards Association, representing the Canadian Standards Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

1. Revise as follows:

611.1 Design. Drinking water treatment units shall meet the requirements of NSF42, NSF 44, NSF 53, ~~or~~ NSF 60 or CSA B483.1.

611.2 Reverse osmosis systems. The discharge from a reverse osmosis drinking water treatment unit shall enter the drainage system through an *air gap* or an *air gap* device that meets the requirements of NSF 58 or CSA B438.1.

2. Add standard to Chapter 13 as follows:

CSA
B483.1-07 Drinking water treatment systems

PART II – IRC

1. Revise as follows:

P2908.1 Design. Drinking water treatment units shall meet the requirements of NSF42, NSF 44, NSF 53, ~~or~~ NSF 60 or CSA B483.1.

P2908.2 Reverse osmosis drinking water treatment units. Point-of-use reverse osmosis drinking water treatment units, designed for residential use, shall meet the requirements of NSF 58 or CSA B438.1. Waste or discharge from reverse osmosis drinking water treatment units shall enter the drainage system through an air gap or an air gap device that meets the requirements of NSF 58.

2. Add standard to Chapter 44 as follows:

CSA
B483.1-07 Drinking water treatment systems

Reason: Although a drinking water treatment system might comply with or be certified to the applicable NSF standard, plumbing, mechanical, and electrical requirements for components used for the installation of drinking water treatment systems are generally not covered by existing standards. CSA B483.1, which was developed to complement NSF standards, addresses such plumbing, mechanical, and electrical requirements.

Cost Impact: The code change proposal will not increase the cost of production.

Analysis: Review of proposed new standard, CSA B483.1-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Murra-P1-611.1

P109–09/10
703.6 (New); IRC P3001.4 (New)

Proponent: James Ranfone, American Gas Association, American Gas Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Add next text as follows:

703.6 Tracer wire required. An electrically continuous corrosion-resistant tracer tape or wire shall be buried with building sewer pipes of plastic material. One end of the tracer tape or wire shall be brought above ground at a building wall or at a cleanout. Where tracer wire is used, the wire size shall be not smaller than 14 AWG.

PART II – IRC

Add next text as follows:

P3001.4 Tracer wire required. An electrically continuous corrosion-resistant tracer tape or wire shall be buried with building sewer pipes of plastic material. One end of the tracer tape or wire shall be brought above ground at a building wall or at a cleanout. Where tracer wire is used, the wire diameter shall be not smaller than 14 AWG.

Reason: Installing underground utilities includes a method known as directional boring. The use of directional boring equipment eliminates the need for open trench or ditch work but may have some uncertainty concerning the location of existing underground utilities. The new section will provide a method to locate building sewer and drain pipes that will help reduce the damage to such underground facilities. A similar proposal has been submitted to the IRC to add Section P3001.3 with the same language.

Cost Impact: This code change proposal will Increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RANFONE-P1-703.6

P110–09/10
705.8.2, 705.14; IRC P3003.9.2, P3003.14.2

Proponent: Michael Cudahy, Plastic Pipe and Fittings Association (PPFA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

705.8.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A purple primer that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTM D2564, CSA B137.3, CSA B181.2 or CSA B182.1 shall be applied to all joint surfaces. The joint shall be made while the cement is wet and shall be in accordance with ASTM D 2855. Solvent-cement joints shall be permitted above or below ground.

Exception: A primer is not required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM D 2564.
2. The materials joined are drain, waste and vent pipe and fittings installed in non-pressure service applications.
3. The pipe and fitting size does not exceed 4 inches (100 mm) in diameter.

705.14.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A purple primer that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTM D2564, CSA B137.3, CSA B181.2 or CSA B182.1 shall be applied to all joint surfaces. The joint shall be made while the cement is wet and shall be in accordance with ASTM D 2855. Solvent-cement joints shall be permitted above or below ground.

Exception: A primer is not required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM D 2564.
2. The materials joined are drain, waste and vent pipe and fittings installed in non-pressure service applications.
3. The pipe and fitting size does not exceed 4 inches (100 mm) in diameter.

PART II – IRC

Revise as follows:

P3003.9.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A purple primer that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTM D 2564, CSA B137.3 or CSA B181.2 shall be applied to all joint surfaces. The joint shall be made while the cement is wet, and shall be in accordance with ASTM D 2855. Solvent-cement joints shall be permitted above or below ground.

Exception: A primer is not required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM D 2564.
2. The materials joined are drain, waste and vent pipe and fittings installed in non-pressure service applications.
3. The pipe and fitting size does not exceed 4 inches (100 mm) in diameter.

P3003.14.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A purple primer that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTM D 2564, CSA B137.3 or CSA B181.2 shall be applied to all joint surfaces. The joint shall be made while the cement is wet, and shall be in accordance with ASTM D 2855. Solvent-cement joints shall be permitted above or below ground.

Exception: A primer is not required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM D 2564.
2. The materials joined are drain, waste and vent pipe and fittings installed in non-pressure service applications.
3. The pipe and fitting size does not exceed 4 inches (100 mm) in diameter.

Reason: To introduce an exception in IPC Chapter 7 (IRC Chapter 30), Sanitary Drainage, allowing for the practice of one-step solvent cementing of non-pressure DWV systems 4" and under.

This exception allows for an optional one-step procedure for joining non-pressure DWV PVC piping systems 4" in diameter and below with solvent cement conforming to ASTM D 2564. This method is practiced, and the code should include specific language to indicate when it is acceptable.

Pressure testing completed by NSF International has shown that solvent cement conforming to ASTM D 2564, when used without primer on PVC DWV pipe and fittings, both solid wall and cell core, generates bonding forces well in excess of what is required for these systems. The strength of the joint often exceeds the pipe and fitting pressure capacity.

Bibliography: NSF International report J-00036842.can be found on the PPFA website, www.ppfahome.org//ICC09/PPFA_NSF_J-00036842.pdf

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CUDAHY-P1-705.8.2

P111–09/10
706.2; IRC P3002.3.1

Proponent: Brian D. Havens, Front Range Refrigeration, Co., Inc., representing himself

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

706.2 Obstructions. The fittings shall not have ledges, shoulders or reductions capable of retarding or obstructing flow in the piping. Threaded drainage pipe fittings shall be of the recessed drainage type. <u>This section shall not be applicable to tubular waste fittings used to convey vertical flow upstream of the trap seal liquid level of a fixture trap.</u>

PART II – IRC

Revise as follows:

P3002.3.1 Drainage. Drainage fittings shall have a smooth interior waterway of the same diameter as the piping served. All fittings shall conform to the type of pipe used. Drainage fittings shall have no ledges, shoulders or reductions which can retard or obstruct drainage flow in the piping. Threaded drainage pipe fittings shall be of the recessed drainage type, black or galvanized. Drainage fittings shall be designed to maintain one-fourth unit vertical in 12 units horizontal (2-percent slope) grade. <u>This section shall not be applicable to tubular waste fittings used to convey vertical flow upstream of the trap seal liquid level of a fixture trap.</u>

Reason: The proposed change clears up a conflict between the code and the accepted practices for tubular waste piping installations. The current language literally prohibits the installation of tubular “baffle tees” (needed for double bowl kitchen sink disposal installations) as well pop-drain drain assemblies and other specialized tubular fittings. This is because the internal components such as baffles, the pop-up rods, pop up stopper and internal guides could all be considered “reductions capable of retarding flow”. Where these types of tubular waste fittings have been commonly used to convey vertical waste flow, the reduced internal flow area due to baffles or other internal protrusions has not created any significant flow retarding problems. The added text in this section will allow the code to be in alignment with commonly accepted and approved practices.

The inclusion of the term “tubular waste fittings” in this section also confirms that the first two sentences of this section do apply to tubular waste fitting installations. This is valuable for enforcement by the code official where tubular waste fittings having internal components are improperly installed. For example, use of a baffle tee on its back or side would significantly restrict horizontal flow and would be an unacceptable installation practice, although currently, the code does not prohibit this.

Cost Impact: The code change will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Havens-P1-706.2

P112–09/10
Table 709.1

Proponent: Richard Grace, Fairfax County, VA Plumbing and Mechanical Inspectors, VA Building and Code Officials

Revise table as follows:

TABLE 709.1
DRAINAGE FIXTURE UNITS FOR FIXTURES AND GROUPS

FIXTURE TYPE	DRAINAGE FIXTURE UNIT VALUE AS LOAD FACTORS	MINIMUM SIZE OF TRAP (inches)
Bathroom group as defined in Section 202 (1.6 gpf water closet)[f]	5	—
Bathroom group as defined in Section 202 (water closet flushing greater than 1.6 gpf)[f]	6	—

(Portions of table not shown remain unchanged)

a. For traps larger than 3 inches, use Table 709.2.
b. A showerhead over a bathtub or whirlpool bathtub attachment does not increase the drainage fixture unit value.
c. See Sections 709.2 through 709.4.1 for methods of computing unit value of fixtures not listed in this table or for rating of devices with intermittent flows.
d. Trap size shall be consistent with the fixture outlet size.
e. For the purpose of computing loads on building drains and sewers, water closets and urinals shall not be rated at a lower drainage fixture unit unless the lower values are confirmed by testing.
f. For fixtures added to a dwelling unit bathroom group, add the dfu value of those additional fixtures to the bathroom group fixture count.
g. See Section 406.3 for sizing requirements for fixture drain, branch drain, and drainage stack for an automatic clothes washer standpipe.
h. See Sections 709.4 and 709.4.1.

Reason: Bathroom groups can be found in any type of building, not just in a dwelling unit, and the footnote should not be restricted to just dwelling units.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRACE-P1-TABLE 709.1

P113–09/10
711.2, 711.3.1

Proponent: Julius Ballanco, P.E., CPD, FASPE/JB Engineering and Code Consulting, P.C. representing himself

1. Delete without substitution:

~~**711.2 Horizontal branch connections to horizontal stack offsets.** Where a horizontal stack offset is located more than four branch intervals below the top of the stack, a Horizontal branch connections shall not connect within the horizontal stack offset or within 2 feet (610 mm) above or below such offset.~~

(Renumber subsequent sections)

2. Revise as follows:

704.3 Connections to offsets and bases of stacks. Horizontal branches shall connect to the bases of stacks at a point located not less than 10 times the diameter of the drainage *stack* downstream from the *stack*. ~~Except as prohibited by Section 711.2, h~~ Horizontal branches shall connect to horizontal *stack* offsets at a point located not less than 10 times the diameter of the drainage *stack* downstream from the upper *stack*.

711.3.1 Omission of vents for horizontal stack offsets. Vents for horizontal stack offsets required by Section 711.3 shall not be required where the stack and its offset are one pipe size larger than required for a building drain [see Table 710.1(1)] and the entire stack and offset are not less in cross-sectional area than that required for a straight stack plus the area of an offset vent as provided for in Section 915. ~~Omission of offset vents in accordance with this section shall not constitute approval of horizontal branch connections within the offset or within 2 feet (610 mm) above or below the offset.~~

Reason: The current requirement connection limitations in these sections are archaic and unfounded. Research has shown that the turbulent flow in the horizontal offset occurs within the first 10 pipe (stack) diameters downstream of the stack. This is the same condition that occurs in a building drain, downstream of the base of a stack. Beyond the ten pipe diameters point downstream of a stack , the flow in the horizontal pipe becomes nonturbulent open channel flow. Any connection downstream of where turbulent action is known to occur should be permitted. The allowance for horizontal connections to a horizontal offset should mirror the requirements at the base of the stack because the concerns for avoiding connections in a turbulent zone are identical.

This modification is consistent with one of the legacy codes, See Section 604.3 of the 1993 BOCA National Plumbing Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BALLANCO-P4-711.2

P114–09/10
712.3.2.1 (New); IRC P3007.3.2.1 (New)

Proponent: Ronald L, George, CIPE, CPD, President of Ron George Design & Consulting Services representing himself

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Add new text as follows:

712.3.2.1 Sump pit cover. Sump pit covers shall be pedestrian traffic rated to support a live load of 300 lbs/ft^2 (14.4 kPa) with a maximum deflection of 1/150th of the largest span dimension.

PART II – IRC

Add new text as follows:

P3007.3.2.1 Sump pit cover. Sump pit covers shall be pedestrian traffic rated to support a live load of 300 lbs/ft^2 (14.4 kPa) with a maximum deflection of 1/150th of the largest span dimension.

Reason: This proposal is a result of a recent failure of a thin wooden sump cover where a child was severely burned when he fell through the lid into heated water because the sump pump was stuck in the “on” position and had heated the water in the sump pit. The boy basically fell into a boiling sump of wastewater. The incident brought to light the fact there are no code requirements for sump basin lid material or structural requirements. Currently you can use cardboard as a sump pit cover and it would not be a code violation. The proposed code language requires the sump pit cover to be capable of handling pedestrian traffic. The weight and deflection requirements come from specifications for access hatches in floors or on roofs.

Cost Impact: Minimal

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GEORGE-P1-712.3.2.1 NEW

P115–09/10

712.3.3, 712.3.3.1 (New), 712.3.3.2 (New); IRC P3007.3.3 (New), P3007.3.3.1 (New), P3007.3.3.2 (New)

Proponent: Michael Cudahy, Plastic Pipe and Fittings Association (PPFA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

712.3.3 Discharge pip~~inge~~ and fittings. Discharge pipe and fittings serving sump pumps and ejectors shall be constructed of ~~*approved*~~ materials in accordance with Sections 712.3.3.1 and 712.3.3.2 and shall be *approved*.

712.3.3.1 Materials. Pipe and fitting materials shall be constructed of brass, copper, CPVC, ductile iron, PE, or PVC.

712.3.3.2 Ratings. Pipe and fittings shall be rated for the maximum system operating pressure and temperature. Pipe fitting materials shall be compatible with the pipe material. Where pipe and fittings are buried in the earth, they shall be approved for burial.

PART II – IRC

Revise as follows:

P3007.3.3 Discharge pip~~inge~~ and fittings. Discharge pipe and fittings serving sump pumps and ejectors shall be constructed of ~~*approved*~~ materials in accordance with Sections P3007.3.3.1 and P3007.3.3.2 and shall be *approved*.

P3007.3.3.1 Materials. Pipe and fitting materials shall be constructed of brass, copper, CPVC, ductile iron, PE, or PVC.

P3007.3.3.2 Ratings. Pipe and fittings shall be rated for the maximum system operating pressure and temperature. Pipe fitting materials shall be compatible with the pipe material. Where pipe and fittings are buried in the earth, they shall be approved for burial.

Reason: PPFA is submitting this language to expand on what materials are suitable for pressurized sewage discharge (forced main) applications.

An attempt was made to develop a table of materials by ASTM designation, size, pressure rating and other parameters, but it became overly complex. A simple listing of materials by type seems acceptable and would improve the code. Currently, there is little guidance.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CUDAHY-P4-712.3.3

P116–09/10
712.3.5; IRC P3007.3.5

Proponent: John T.E. Walters, Prince William County, VA., representing the Virginia Plumbing and Mechanical Inspectors Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

712.3.5 Ejector connection to the drainage system. Pumps connected to the drainage system shall connect to ~~the~~ a *building sewer*, ~~or shall connect to a wye fitting in the~~ *building drain*, soil stack, waste stack or horizontal branch drain. ~~a minimum of 10 feet (3048 mm) from the base of any soil *stack*, waste *stack* or *fixture drain*.~~ Where the discharge line connects into horizontal drainage piping, the connect~~or~~ion shall be made through a wye fitting into the top of the drainage piping and such wye fitting shall be located not less than 10 feet (3048 mm) from the base of any soil stack, waste stack or fixture drain.

PART II- IRC

Revise as follows:

P3007.3.5 Ejector connection to the drainage system. Pumps connected to the drainage system shall connect to ~~the~~ a *building sewer*, ~~or shall connect to a wye fitting in the~~ *building drain*, soil stack, waste stack or horizontal branch drain. ~~a minimum of 10 feet (3048 mm) from the base of any soil *stack*, waste *stack* or *fixture drain*.~~ Where the discharge line connects into horizontal drainage piping, the connect~~or~~ion shall be made through a wye fitting into the top of the drainage piping and such wye fitting shall be located not less than 10 feet (3048 mm) from the base of any soil stack, waste stack or fixture drain.

Reason: In addition to building sewers and building drains, soil stacks, waste stacks and horizontal branch drains are acceptable points of termination for ejector discharge lines. Fittings acceptable for changes of direction are already addressed in Table 706.3.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WALTERS-P1-712.3.5

P117–09/10
802.1.3

Proponent: Cort Strain University of Colorado representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

802.1.3 Potable clear-water waste. Where ~~devices and equipment~~ plumbing appliances and appurtenances such as sterilizers, and relief valves, discharge potable water to the building drainage system, the discharge shall be through an indirect waste pipe by means of an air gap.

Reason: The intent is to use clearly defined terms to improve code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Strain-P4-802.1.3

P118–09/10
802.1.5

Proponent: Cort Strain University of Colorado representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

802.1.5 Non-potable clear-water waste. Where ~~devices and equipment~~ plumbing or mechanical appliances such as process tanks, filters, drips, and boilers discharge non-potable water to the building drainage system, the discharge shall be through an indirect waste pipe by means of an air break or an air gap.

Reason: The intent is to use clearly defined terms to improve code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Strain-P3-802.1.5

P119–09/10
802.1.8

Proponent: Robert G. Konyndyk, Chief, Plumbing Division, Bureau of Construction Codes, State of Michigan

Revise as follows:

802.1.8 Food utensils, dishes, pots and pans sinks. Sinks used for the washing, rinsing or sanitizing of utensils, dishes, pots, pans or service ware used in the preparation, serving or eating of food shall discharge indirectly through an air gap or an air break ~~or directly connect~~ to the drainage system.

Reason: The insertion of the new section into the 09 edition of the code attempted to list the three options for connections of the named fixtures. While any one of the three options may be accepted in different jurisdictions, the lead in clarification of "indirectly" obviates the direct connection choice. If a code change was to be submitted removing the directive "indirectly" the choice of three methods would be merely a laundry list which is contrary to modern code text processes.

Cost Impact: The clarification will not increase the cost of construction from that of the present language.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KONYNDYK-P2-802.1.8

P120–09/10
802.2

Proponent: Cort Strain University of Colorado representing (CAPMO) Colorado Association of Plumbing and Mechanical Officials

Revise as follows:

802.2 Installation. All indirect waste piping shall discharge through an air gap or air break into a waste receptor ~~or standpipe~~. Waste receptors and standpipes shall be trapped and vented and shall connect to the building drainage system. All indirect waste piping that exceeds ~~2 feet~~ 30 inches (762mm) in developed length measured horizontally, or ~~4 feet~~ 54 inches (1372mm) in total developed length, shall be trapped.

Exception: Where a waste receptor receives only clear water waste and does not directly connect to a sanitary drainage system, the receptor shall not require a trap.

Reason: Because the IPC allows 30 inches center-to-center for a combination fixture (see Section 1002.1 exception 2), horizontal continuous waste tubing of up to 30 inches in length is allowed by the code. Therefore, a horizontal indirect waste pipe should be allowed to be 30 inches long elsewhere, so as to be consistent. The 54 inch total developed length allowance is simply the 30 inches horizontal length allowance plus the 24 inches vertical distance allowed from a fixture to it's trap (see Section 1002.1) The proposed lengths seem to make a lot more sense and will be consistent with other allowances in the code. The added exception should be self evident; no traps are necessary with clear water waste in an indirect piping system.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Strain-P1-802.2

P121–09/10
802.3; IRC P2706.1

Proponent: Guy McMann, Jefferson County Colorado, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

802.3 Waste receptors. Every waste receptor shall be of an approved type. A removable strainer or basket shall cover the waste outlet of waste receptors. Waste receptors shall be installed in ventilated spaces. Waste receptors shall not be installed in bathrooms, ~~or~~ toilet rooms, plenums, crawl spaces, attics, interstitial spaces above ceilings and below floors or in any inaccessible or unventilated space such as a closet or storeroom. Ready access shall be provided to waste receptors.

PART II - IRC

Revise as follows:

P2706.1 General. Every waste receptor shall be of an approved type. Plumbing fixtures or other receptors receiving the discharge of indirect waste pipes shall be shaped and have a capacity to prevent splashing or flooding and shall be readily accessible for inspection and cleaning. Waste receptors and standpipes shall be trapped and vented and shall connect to the building drainage system. A removable strainer or basket shall cover the waste outlet of waste receptors. Waste receptors shall be installed in ventilated spaces. Waste receptors shall not be installed in bathrooms, attics, crawl spaces, interstitial spaces above ceilings and below floors or in any inaccessible or unventilated space such as a closet. Ready access shall be provided to waste receptors.

Reason: An open unattended trap located in a crawl space, attic or other unobservable location is problematic at best. This is a common practice when looking for a place to park a condensate drain. These fixtures are prone to flooding such that they are not noticed for extended periods of time resulting in damage and a severe insanitary condition. Back water valves are also problematic. They are prone to tampering and in some cases removal for maintenance operations and never reinstalled. It doesn't take much to break a backwater valve and the smallest amount of debris stops the valve from fully closing. Traps in plenums may run dry even if primers are installed as trap primers are mechanical devices that will eventually fail in time. Traps in attics are subject to freezing. Currently, the code is silent on this matter but common sense would tell us that interceptors including standpipes should not be located in these areas.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-P3-802.3

P122–09/10
901.2.1

Proponent: Gregory A Farmer, PE, representing ASPE Legislative Committee

Revise as follows:

901.2.1 Venting Required. Every trap and trapped fixture <u>except emergency floor drains connected to a branch drain six feet or more from a building drain</u> shall be vented in accordance with one of the venting methods specified in this chapter.

Reason: These drains are installed as a convenience in case of accidental spills, overflows, snow melt, or wash down. The slated purpose of venting per 901.2 is to "…permit the admission or emission of air so that the seal of any fixture trap shall not be subjected to a pneumatic pressure differential of more than 1 inch of water column". When the drain is more than 6 feet away from the source of reduced pressure, the trap seal is not affected and therefore a vent is not necessary. Vents close to a floor drain trap increase the evaporation rate of the trap seal and degrade effectiveness by allowing lower humidity air to be introduced to the outlet side of the trap.

Introduction of water from normal activities such as mopping the floor, hose stream or from snow melt is not sufficient to fill the horizontal pipe so venting occurs in the same manner as any horizontal vent. IN the case of accidental flooding in the area, the trap seal will remain when the area is drained.

Requiring a vent in branch piping forces the piping to be installed deeper than necessary to allow for the slope of the vent piping. Increasing the depth of the drain piping sometimes forces a sump pit and pump to be installed that otherwise would not be needed.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FARMER-P2-901.2.1

P123–09/10
901.3, 917.8, Chapter 13

Proponent: Jack Beuschel, Studor, Inc. representing himself.

1. Revise as follows:

901.3 Chemical waste vent systems. The vent system for a chemical waste system shall be independent of the sanitary vent system and shall terminate separately through the roof to the ~~open air~~ <u>outdoors or to an air admittance valve that complies with ASSE 1049. Air admittance valves for chemical waste systems shall be constructed of materials approved in accordance with Section 702.5 and shall be tested for chemical resistance in accordance with ASTM F1412.</u>

917.8 Prohibited installations. Air admittance valves shall not be installed in non-neutralized special waste systems as described in Chapter 8 except where such valves are in compliance with ASSE 1049, are constructed of materials approved in accordance with Section 702.5 and are tested for chemical resistance in accordance with ASTM F1412. Air admittance valves shall not be located in spaces utilized as supply or return air plenums.

2. Add standards to Chapter 13 as follows:

ASSE

1049-2009	Performance Requirements for Individual and Branch Type Air Admittances Valves for Chemical Waste Systems.

ASTM

F1412-01	Standard Specification for Polyolefin Pipe and Fittings for Corrosive Waste Drainage Systems.

Reason: The purpose of this code change is to add new provisions to the code to allow air admittance valves that are chemically-resistant (AAVCs) to serve as vents for a chemical waste system as an option to chemical waste vent piping terminating outdoors.

Laboratory sinks into which acids and chemicals are dumped are usually located in islands in the middle of rooms. To vent the traps for these sinks using vent piping that can only terminate outdoors requires extensive labor and material. Because acid- and chemically-resistant pipe and fittings are very costly (as compared to materials used in sanitary drainage systems), allowing the use of AAVCs will significantly reduce material costs for installing chemical waste systems. A reduction in the amount of required material vent piping material will result in reduced labor costs for installing chemical waste systems.

ASSE has recently developed ANSI/ASSE Standard 1049 - *Performance Requirements for Individual and Branch Type Air Admittance Valves for Chemical Waste Systems*. Section 702.5 of the IPC requires that drainage systems for chemical wastes and vent pipes shall be of an approved material that is resistant to corrosion and degradation for the concentrations of chemicals involved. Therefore, AAVs that comply with ANSI/ASSE 1049 and are manufactured from materials that meet recognized industry standards for chemical and acid resistant material in compliance with Section 702.5 and tested to ASTM F1412 for chemical resistance must be permitted to serve as the vent for nonneutralized special waste systems.

Referenced Standards:

ASSE 1049
ASTM F1412-01
ASTM D4104-05

Cost Impact: This code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standards, ASSE 1049-2009 and ASTM F1412-01, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEUSCHEL-P1-901.3

P124–09/10
904.4; IRC P3103.4

Proponent: John T,E. Walters, Prince William County, VA., representing the Virginia Plumbing and Mechanical Inspectors Association (VPMIA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

904.4 Prohibited use. A vent terminal shall not be used for any purpose other than a vent terminal. ~~as a flag pole or to support flag poles, television serials or similar items, except when the piping has been anchored in an approved manner.~~

PART II - IRC

Revise as follows:

P3103.4 Prohibited use. A vent terminal shall not be used for any purpose other than a vent terminal. ~~as a flag pole or to support flag poles, television serials or similar items, except when the piping has been anchored in an approved manner.~~

Reason: The vent terminal should only be used for that purpose alone. There are no “approved anchoring” methods for the vent terminal to support anything.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WALTERS-P2-904.4

P125–09/10
906.2

Proponent: Gregory A Farmer, PE, representing ASPE Legislative Committee

Revise as follows:

906.2 Venting of fixture drains. ~~The total fall in a fixture drain due to pipe slope shall not exceed the diameter of the fixture drain, nor shall the t~~The vent connection to ~~the~~ a fixture drain, except for water closets, shall be ~~below~~ above the weir of the trap.

Reason: The removed verbiage refers to sanitary drainage piping and therefore is in the wrong code section. It also limits the length of a 2” branch pipe to a maximum of eight feet, a 3“ pipe to 24 feet, and a 4” pipe to 48 feet. These limitations are not in the sanitary drainage section and there is no viable reason why they should be included in the vent section.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FARMER-P6-906.2

P126–09/10
912.1

Proponent: Robert Burke, University of Colorado representing Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

912.1 Type of fixtures. A combination drain and vent system shall not serve fixtures other than floor drains, sinks, lavatories, and drinking fountains. Combination drain and vent systems shall not receive ~~discharge from a food waste grinder or clinical sink~~ grease laden waste or solid waste.

Reason: By design, combination drain and vent systems are intended for clear and gray water waste. See 2006 IPC code commentary.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Burke-P2-912.1

P127–09/10
912.3; IRC P3111.3

Proponent: John R. Addario, P.E., New York State Department of State - Division of Code Enforcement and Administration

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

912.3 Size. The minimum size of a combination drain and vent pipe shall be in accordance with Table 912.3. The horizontal length of a combination drain and vent system shall be unlimited.

PART II- IRC

Revise as follows:

P3111.3 Size. The minimum size of a combination drain and vent pipe shall be in accordance with Table 3111.3. The horizontal length of a combination drain and vent system shall be unlimited.

Reason: This proposed change clarifies the intent of the code by adding that a combination drain and vent system, sized per code, shall be unlimited in horizontal length. Combination drain and vent systems are critical when used in piping systems serving floor drains, especially in large commercial kitchens. It is a source of confusion as to whether the length of the combination drain and vent is limited in length; this proposed change clarifies the intent of the code.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Addario-P1-912.3

P128–09/10
202, 912, 912.1, 912.2, 912.2.1, 912.2.2, 912.2.4, 912.3, Table 912.3; IRC R202, P3111.2

Proponents: Richard Grace, Fairfax County, VA Plumbing and Mechanical Inspectors, VA Building and Code Officials
Logan G. Sauter – Salt Lake City, Utah representing Utah Chapter of ICC

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

1. Revise definition as follows:

COMBINATION WASTE AND VENT SYSTEM. A specially designed system of waste piping embodying the horizontal wet venting of one or more sinks, lavatories, drinking fountains, or floor drains by means of a common waste and vent pipe adequately sized to provide free movement of air above the flow line of the drain.

2. Revise as follows:

SECTION 912
COMBINATION ~~DRAIN~~ WASTE AND VENT SYSTEM

912.1 Type of fixtures. A combination ~~drain~~ waste and vent system shall not serve fixtures other than floor drains, sinks, lavatories and drinking fountains. Combination ~~drain~~ waste and vent systems shall not receive the discharge from a food waste grinder or clinical sink.

912.2 Installation. The only vertical pipe of a combination ~~drain~~ waste and vent system shall be the connection between the fixture drain and the horizontal combination ~~drain~~ waste and vent pipe. The maximum vertical distance shall be 8 feet (2438 mm).

912.2.1 Slope. The horizontal combination ~~drain~~ waste and vent pipe shall have a maximum slope of one-half unit vertical in 12 units horizontal (4-percent slope). The minimum slope shall be in accordance with Table 704.1.

912.2.2 Connection. The combination ~~drain~~ waste and vent system shall be provided with a dry vent connected at any point within the system or the system shall connect to a horizontal drain that is vented in accordance with one of the venting methods specified in this chapter. Combination ~~drain~~ waste and vent systems connecting to building drains receiving only the discharge from a stack or stacks shall be provided with a dry vent. The vent connection to the combination ~~drain~~ waste and vent pipe shall extend vertically a minimum of 6 inches (152 mm) above the flood level rim of the highest fixture being vented before offsetting horizontally.

912.2.4 Fixture branch or drain. The fixture branch or fixture drain shall connect to the combination ~~drain~~ waste and vent within a distance specified in Table 906.1. The combination ~~drain~~ waste and vent pipe shall be considered the vent for the fixture.

912.3 Size. The minimum size of a combination ~~drain~~ waste and vent pipe shall be in accordance with Table 912.3.

TABLE 912.3
SIZE OF COMBINATION ~~DRAIN~~ WASTE AND VENT PIPE
(Portions of table not shown remain unchanged)

PART II – IRC

1. Revise definition as follows:

COMBINATION WASTE AND VENT SYSTEM. A specially designed system of waste piping embodying the horizontal wet venting of one or more sinks, lavatories or floor drains by means of a common waste and vent pipe adequately sized to provide free movement of air above the flow line of the drain.

2. Revise as follows:

P3111.2 Installation. The only vertical pipe of a combination ~~drain~~ waste and vent system shall be the connection between the fixture drain and the horizontal combination waste and vent pipe. The maximum vertical distance shall be 8 feet (2438 mm).

Reason
Part I
(Grace) The definition of “drain” per chapter 2 - “Any pipe that carries wastewater or water-borne wastes in a building drainage system.” The definition of “waste” per chapter 2 - “The discharge from any fixture, appliance, area or appurtenance that does not contain fecal matter.” Section 912 specifically states that only floor drains, sinks, lavatories and drinking fountain are to be served on a combination drain and vent system. These fixtures, as specifically listed, will not have fecal matter discharged to them thus section 912 should reflect this with the correctly defined terms. Additionally, the IRC currently uses the term “combination waste and vent pipe” in all but one location of Section P3111 (there is a proposed change to correct that one location as well). This will promote consistency between the IPC and the IRC.
(Sauter) Section 202 has a definition for a Combination Waste and Vent System, not a Combination Drain and Vent System. Also, the IRC uses the term “Combination Waste and Vent System” in both Section R202 Definitions and in Section P3111. This change would bring terminology uniformity to the IPC and IRC. By definition, a “waste” pipe never carries fecal matter, where as some “drains”, such as building drains, do carry fecal matter. The intended application of a combination waste and vent system does not include fixtures handling fecal matter. The title change from “drain” to “waste” would help reinforce this application limitation.
Part II
(Grace)-The phrase “combination drain and vent” is found only once in Section P3111. All other language is “combination waste and vent”. It is my belief that this was simply an editorial error**Cost Impact:** The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRACE-P4-912.1

P129–09/10
914 (New)

Proponent: Robert Evans, CPD/ASPE Legislative Committee/ASPE

Add new section as follows:

SECTION 914
SINGLE STACK VENT SYSTEM

914.1 Where permitted. A drainage stack shall serve as a single stack vent system where sized and installed in accordance with Sections 914.2 through 914.9. The drainage stack and branch piping shall be the vents for the drainage system. The drainage stack shall have a stack vent.

914.2 Stack size. Drainage stacks shall be sized in accordance with Table 914.2. Stacks shall be uniformly sized based on the total connected drainage fixture unit load. The stack vent shall be the same size as the drainage stack. A 3-inch stack shall serve not more than two water closets.

TABLE 914.2
SINGLE STACK SIZE

STACK SIZE (inches)	MAXIMUM CONNECTED DRAINAGE FIXTURE UNITS		
	Stacks less than 75 feet in height	Stacks 75 feet to less than 160 feet in height	Stacks 160 feet and greater in height
3	24	NP	NP
4	225	24	NP
5	480	225	24
6	1,015	480	225
8	2,320	1,015	480
10	4,500	2,320	1,015
12	8,100	4,500	2,320
15	13,600	8,100	4,500

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

914.3 Branch size. Horizontal branches connecting to a single stack vent system shall be sized in accordance with Table 710.1(2). Not more than one water closet shall discharge into a 3 inch (76.2 mm) horizontal branch at a point within a developed length of 18 inches (457.2 mm) measured horizontally from the stack.

Where a water closet is within 18 inches (457.2 mm) measured horizontally from the stack and not more than one fixture with a drain size of not more than 1-1/2 inch (38.1 mm) connects to a 3 inch (76.2 mm) horizontal branch, the branch drain connection to the stack shall be made with a sanitary tee.

914.4 Length of horizontal branches. The length of horizontal branches shall conform to the requirements of Sections 914.4.1 through 914.4.3.

914.4.1 Water closet connection. Water closet connections shall be not greater than 4 feet (1219 mm) in developed length measured horizontally from the stack.

Exception: Where the connection is made with a sanitary tee, the maximum developed length shall be 8 feet (2438 mm).

914.4.2 Fixture connections. Fixtures other than water closets shall be located not greater than 12 feet (3657 mm) in developed length measured horizontally from the stack.

914.4.3 Vertical piping in branch. The length of vertical piping in a fixture drain connecting to a horizontal branch shall not be considered in computing the fixture's distance in developed length measured horizontally from the stack.

914.5 Minimum vertical piping size from fixture. The vertical portion of piping in a fixture drain to a horizontal branch shall be 2 inches (50.8 mm). The minimum size of the vertical portion of piping for a water supplied urinal or standpipe shall be 3 inches (76.2 mm). The maximum vertical drop shall be 4 feet. Fixture drains that are not increased in size, or have a vertical drop in excess of 4 feet shall be individually vented.

914.6 Additional venting required. Additional venting shall be provided where more than one water closet discharges to a horizontal branch and where the distance from a fixture trap to the stack exceeds the limits in Section 914.4. Where additional venting is required, the fixture(s) shall be vented by individual vents, common vents, wet vents, circuit vents, or a combination waste and vent pipe. The dry vent extensions for the additional venting shall connect to a branch vent, vent stack, stack vent, air admittance valve, or shall terminate outdoors.

914.7 Stack offsets. Where fixture drains are not connected below a horizontal offset in a stack, a horizontal offset shall not be required to be vented. Where horizontal branches or fixture drains are connected below a horizontal offset in a stack, the offset shall be vented in accordance with Section 915. Fixture connections shall not be made to a stack within 2 feet (609.6 mm) above or below a horizontal offset.

914.8 Prohibited lower connections. Stacks greater than 2 branch intervals in height shall not receive the discharge of horizontal branches on the lower two floors. Where a separate stack is provided for the lower two floors, There shall be no connections to the stack between the lower two floors and shall connect to the building drain at a distance of not less than 10 pipe diameters downstream from the base of the connection of any single stack vented system.

914.9 Sizing building drains and sewers. The building drain and building sewer receiving the discharge of a single stack vent system shall be sized in accordance with Table 710.1(1).

Reason: Last cycle, the Plumbing Code Change Committee approved this code change. It failed at the final hearing before a small crowd at a very late hour. ASPE has long recognized this form of venting. The details are addressed in the ASPE Plumbing Engineering Design Handbook. Single stack venting is currently permitted in the UPC and NSPC. The IPC is the only model plumbing code that does not have provisions for the single stack venting system. There is no justification for not including this type of venting system.

There is over 100 years of experience with single stack venting systems. If the stack is large enough, additional venting is not required provided that the fixtures are within a limited distance to the stack. It should be noted that the single stack system is one without long horizontal branches, nor drops in piping. By limiting the length of the branch and the vertical drops into the branch, you can control the pressure excursions in the piping system.

In addition to the more than 100 years of field experience, there are computer models that verify the performance of the single stack system. If the IPC is to be an all inclusive code, then single stack venting should be a part of the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: In Section 914.8, it is not clear which pipe is referred to relative to the "10 pipe diameters." (The stack or the building drain diameter?)

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EVANS-P2-914 NEW

P130 –09/10
916.4.1

Proponent: James R. (Bob) Glaze, Instructor/Advisor Chief Plumbing, Gas and Mechanical Inspector (Retired), City of Birmingham, Alabama, representing self

Delete without substitution:

~~**916.4.1 Branch vents exceeding 40 feet in developed length.** Branch vents exceeding 40 feet (12 192 mm) in developed length shall be increased by one nominal size for the entire developed length of the vent pipe.~~

Reason: This very requirement is included in Section 916.2. Vent Other Than Stack Vents or Vent Stacks. This is an unnecessary section and is repetitious.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GLAZE-P1-916.4.1

P131–09/10
916.5.1; IRC P3113.4.1

Proponent: James R. (Bob) Glaze, Instructor/Advisor Chief Plumbing, Gas and Mechanical Inspector (Retired), City of Birmingham, Alabama, representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

916.5.1 Sewage pumps and sewage ejectors other than pneumatic. Drainage piping below sewer level shall be vented in ~~a similar~~ the same manner ~~to~~ as that of a gravity system. Building sump vent sizes for sumps with sewage pumps or sewage ejectors, other than pneumatic, shall be determined in accordance with Table 916.5.1.

PART II – IRC

Revise as follows:

P3113.4.1 Sewage pumps and sewage ejectors other than pneumatic. Drainage piping below sewer level shall be vented in ~~a similar~~ the same manner ~~to~~ as that of a gravity system. Building sump vent sizes for sumps with sewage pumps or sewage ejectors, other than pneumatic, shall be determined in accordance with Table P3113.4.1.

Reason: The definition of **similar:** "Related in appearance or nature; alike though not identical". This change will make it a requirement that the drainage below sewer level to be vented as a gravity system, which it is until it gets to the sump.

Cost Impact: The code change will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GLAZE-P2-916.5.1

P132 –09/10
917.3.1

Proponent: Richard Grace/Fairfax County/Virginia Plumbing and Mechanical Inspectors Association /VA Building and Code Officials

Delete without substitution:

~~**917.3.1 Location of branch.** The horizontal branch drain shall connect to the drainage stack or building drain a maximum of four branch intervals from the top of the stack.~~

(Renumber subsequent sections)

Reason: Section 917.3.1 says nothing because you don't have to be a maximum of 4 branch intervals from the top of a stack. You can comply with 917.3.2 instead. Current 917.3.1 says you must do something and then 917.3.2 tells you what to do when you violate 917.3.1? This is not typical format within the I codes. The main section 917.3, says you have a choice but the first choice is just the flip side of the second choice. If the branch is more than 4 branch intervals from the top, you have to install a relief vent, but if you are NOT more than 4 branch intervals from the top, nothing needs to be said.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRACE-P9-917.3.1

P133–09/10
917.3, 917.3.1, 917.3.2, 917.3.3

Proponent: Judson Collins, JULYCO, representing self

1. Delete and substitute as follows:

~~**917.3 Where permitted.** Individual, branch and circuit vents shall be permitted to terminate with a connection to an individual or branch-type air admittance valve. Stack vents and vent stacks shall be permitted to terminate to stack-type air admittance valves. Individual and branch-type air admittance valves shall vent only fixtures that are on the same floor level and connect to a horizontal branch drain. The horizontal branch drain having individual and branch-type air admittance valves shall conform to Section 917.3.1 or 917.3.2. Stack-type air admittance valves shall conform to Section 917.3.3.~~

~~**917.3.1 Location of branch.** The horizontal branch drain shall connect to the drainage stack or building drain a maximum of four branch intervals from the top of the stack.~~

~~**917.3.2 Relief vent.** Where the horizontal branch is located more than four branch intervals from the top of the stack, the horizontal branch shall be provided with a relief vent that shall connect to a vent stack or stack vent, or extend outdoors to the open air. The relief vent shall connect to the horizontal branch drain between the stack and the most downstream fixture drain connected to the horizontal branch drain. The relief vent shall be sized in accordance with Section 916.2 and installed in accordance with Section 905. The relief vent shall be permitted to serve as the vent for other fixtures.~~

917.3 Where permitted. Individual, branch and circuit vents shall be permitted to terminate with a connection to an individual or branch-type air admittance valve in accordance with Section 917.3.1. Stack vents and vent stacks shall be permitted to terminate to stack-type air admittance valves in accordance with 917.3.2.

917.3.1 Horizontal branches. Individual and branch-type air admittance valves shall vent only fixtures that are on the same floor level and connect to a horizontal branch drain. Where the horizontal branch is located more than four branch intervals from the top of the stack, the horizontal branch shall be provided with a relief vent that shall connect to a vent stack or stack vent, or extend outdoors to the open air. The relief vent shall connect to the horizontal branch drain between the stack and the most downstream fixture drain connected to the horizontal branch drain. The relief vent shall be sized in accordance with Section 916.2 and installed in accordance with Section 905. The relief vent shall be permitted to serve as the vent for other fixtures.

(Renumber subsequent sections)

2. Revise as follows:

917.3.3 Stack. Stack-type air admittance valves shall be prohibited from serve~~e~~ing as the vent terminal for vent stacks or stack vents that serve drainage stacks exceeding six branch intervals.

Reason: There are no technical changes to the sections involved. The proposed language clarifies the intent of the current language and makes it easier to read and understand.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: COLLINS-P1-917.3

P134–09/10
1002.1

Proponent: Donald R. Monahan, PE, Walker Parking Consultants, representing the National Parking Association and the Automated & Mechanical Parking Association

Revise as follows:

1002.1 Fixture traps. Each plumbing fixture shall be separately trapped by a liquid-seal trap, except as otherwise permitted by this code. The vertical distance from the fixture outlet to the trap weir shall not exceed 24 inches (610 mm), and the horizontal distance shall not exceed 30 inches (610 mm) measured from the centerline of the fixture outlet to the centerline of the inlet of the trap. The height of a clothes washer standpipe above a trap shall conform to Section 802.4. A fixture shall not be double trapped.

Exceptions:

1. This section shall not apply to fixtures with integral traps.
2. A combination plumbing fixture is permitted to be installed on one trap, provided that one compartment is not more than 6 inches (152 mm) deeper than the other compartment and the waste outlets are not more than 30 inches (762 mm) apart.
3. A grease interceptor intended to serve as a fixture trap in accordance with the manufacturer's installation instructions shall be permitted to serve as the trap for a single fixture or a combination sink of not more than three compartments where the vertical distance from the fixture outlet to the inlet of the interceptor does not exceed 30 inches (762 mm) and the *developed length* of the waste pipe from the most upstream fixture outlet to the inlet of the interceptor does not exceed 60 inches (1524 mm).
4. Where floor drains in multi-level parking structures are required to discharge to a combined building sewer system, the floor drains shall not be required to be individually trapped provided that they are connected to a main trap in accordance with Section 1103.1.

Reason: Floor drain traps in unheated multi-level parking structures are problematic because the traps can be damaged during freezing conditions. The liquid in traps for floor drains in covered parking levels usually evaporates as there is little, if any, water runoff on the covered levels. Heat tracing and insulation are not reliable in these locations. A main trap for the parking structure floor drain system is typically required as many jurisdictions require a sand/oil separator prior to discharge to the sanitary sewer.

Cost Impact: The code change will not increase the cost of construction. There will be a construction cost savings to install only a main trap at the lowest level as opposed to traps at all floor drains on the upper levels.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: MONAHAN-P1-1002.1

P135–09/10
1002.3, Chapter 13; IRC P3201.5, Chapter 44

Proponent: Gary S. Duren, President, Code Compliance, Inc representing Code Compliance, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

1. Revise as follows:

1002.3 Prohibited traps. The following types of traps are prohibited:

1. Traps that depend on moving parts to maintain the seal.

   Exception: A sanitary waste valve conforming to ASME A112.18.8, installed as a substitute for 1 ¼ inch (32mm) and 1 ½ inch (38mm) tubular traps. Such valves shall be provided with ready access.

2. Bell traps.
3. Crown-vented traps.
4. Traps not integral with a fixture and that depend on interior partitions for the seal, except those traps constructed of an approved material that is resistant to corrosion and degradation.
5. "S" traps.
6. Drum traps.

   Exception: Drum traps used as solids interceptors and drum traps serving chemical waste systems shall not be prohibited.

2. Add a new standard to Chapter 13 as follows:

ASME
A112.18.8-09, In-line Sanitary Waste Valves for Plumbing Drainage Systems

PART II – IRC

1. Revise as follows:

P3201.5 Prohibited traps. The following types of traps are prohibited:

1. Traps that depend on moving parts to maintain the seal.

   Exception: A sanitary waste valve conforming to ASME A112.18.8, installed as a substitute for 1 ¼ inch (32mm) and 1 ½ inch (38mm) tubular traps. Such valves shall be provided with ready access.

2. Bell traps.
3. Crown-vented traps.
4. Traps not integral with a fixture and that depend on interior partitions for the seal, except those traps constructed of an approved material that is resistant to corrosion and degradation.
5. "S" traps.
6. Drum traps.

   Exception: Drum traps used as solids interceptors and drum traps serving chemical waste systems shall not be prohibited.

2. Add a new standard to Chapter 44 as follows:

ASME
A112.18.8-09 In-line Sanitary Waste Valves for Plumbing Drainage Systems

Reason: To add the appropriate verbiage to permit the use of sanitary waste valves and to add the appropriate new standard to specify sanitary waste valves.

Cost Impact: The adoption of this proposal will not increase costs.

Analysis: Review of proposed new standard, ASME A112.18.8-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Duren-P1-1002.3

P136–09/10
1002.4, Chapter 13; IRC P3201.2, Chapter 44

Proponent: Julius Ballanco, P.E./JB Engineering and Code Consulting,P.C. representing Sure Seal

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

1. Revise as follows:

1002.4 Trap seals. Each fixture trap shall have a liquid seal of not less than 2 inches (51 mm) and not more than 4 inches (102 mm), or deeper for special designs relating to accessible fixtures. Where a trap seal is subject to loss by evaporation, a trap seal primer shall be connected to the trap ~~valve~~ or a trap seal protection device shall be installed. The discharge pipe from a trap seal primer ~~valves~~ shall connect to the trap at a point above the level of the trap seal. Trap seal protection devices shall be installed in accordance with the manufacturer's installation instructions. ~~A~~ Potable water-type trap seal primers ~~valve~~ shall conform to ASSE 1018. ~~or~~ Drainage waste-type and nonpotable water-type trap seal primers shall conform to ASSE 1044. Trap seal protection devices shall conform to ASSE 1072.

2. Add standard to Chapter 13 as follows:

ASSE
1072-06 Performance Requirements for Barrier Type Floor Drain Trap Seal Protection Devices.

PART II - IRC

1. Revise as follows:

P3201.2 Trap seals and trap seal protection. Traps shall have a liquid seal of not less than 2 inches (51 mm) and not more than 4 inches (102 mm). Traps for floor drains shall be ~~fitted with~~ connected to a trap seal primer, fitted with a trap seal protection device or be of deep seal design. The discharge pipe from a trap seal primer ~~valves~~ shall connect to the trap at a point above the level of the trap seal. Trap seal protection devices shall be installed in accordance with the manufacturer's installation instructions. Trap seal protection devices shall conform to ASSE 1072.

2. Add standard to Chapter 44 as follows:

ASSE
1072-06 Performance Requirements for Barrier Type Floor Drain Trap Seal Protection Devices.

Reason:
Part I- The current code text does not distinguish between nonpotable water-type/ waste-type trap seal primers and potable water-type trap seal primers. This change will make that distinction clear. This is necessary for where municipal-reclaimed water will be used for trap seal priming. The proposed text also includes the standard for trap seal protection devices. This standard regulates a new form of trap seal protection that does not rely on water or drainage waste-type primers. Trap seal protection devices are a green design concept that provides an effective means of preventing evaporation of the trap seal without the use of water.

Part II- The proposed text includes trap seal protection devices as a means to prevent trap evaporation. The added standard regulates this new form of trap seal protection that does not rely on water or drainage waste-type primers. Trap seal protection devices are a green design concept that provides an effective means of preventing evaporation of the trap seal without the use of water.
Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard ASSE 1072-06 indicated that, in the opinion of ICC staff, the standard did comply with ICC standards criteria.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BALLANCO-P1-1002.4

P137–09/10
1003.1

Proponent: Judson Collins, JULYCO, representing himself.

Delete and substitute as follows:

~~**1003.1 Where required.** Interceptors and separators shall be provided to prevent the discharge of oil, grease, sand and other substances harmful or hazardous to the building drainage system, the public sewer, the private sewage disposal system or the sewage treatment plant or processes.~~

1003.1 Where required. Interceptors shall be provided and installed as required by Sections 1003.3, 1003.4, 1003.6, 1003.7 and 1003.8. In other occupancies or locations where fixtures discharge substances that could be detrimental to the drainage system, the sewer system or wastewater treatment processes, an approved interceptor shall be provided and installed.

Reason: The current text says "provide interceptors and separators to prevent discharge." It does not say where the discharge is to go. The intent of the text is to keep waste that is harmful to drainage systems, sewer systems or wastewater treatment processes from reaching them. Revising the section as proposed will clarify the intent of the section, give reference to the appropriate sections and reiterate that approved interceptors are required. The word "separators" is not used in the proposed text since the definition of the word is the same as that for "interceptor". Since the two words are used interchangeably and the code only defines "interceptor", "separators" was deleted.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COLLINS-P11-1003.1

P138–09/10
1003.1

Proponent: Richard Grace/Fairfax County/ VA Plumbing and Mechanical Inspectors/VA Building and Code Officials

Revise as follows:

1003.1 Where required. Interceptors and separators shall be provided to prevent the discharge of oil, grease, sand and other substances harmful or hazardous to the ~~building drainage system,~~ the public sewer, the private sewage system or the sewage treatment plant or processes.

Reason: With the incorporation of the new exception to Section 1003.3.4 it is abundantly clear that waste is permitted to flow within the building drainage system. This concept has always been the intent because in almost every application the waste must travel through some portion of the building drainage system in order to get to the interceptor. If the actual code text were applied literally the interceptors would need to attach directly to fixture outlets. That is not the intent. Striking this text will remove the misconception that a device is required to install adjacent to each and every fixture that discharges any liquid that may need to be separated prior to entering the public or private systems.

Cost Impact: None. There will be a cost savings.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GRACE-P6-1003.1

P139–09/10
1003.3.1

Proponent: Sid Cavanaugh, Cavanaugh Consulting representing Thermaco

Revise as follows:

1003.3.1 Grease interceptors and automatic grease removal devices required. A grease interceptor or automatic grease removal device shall be required to receive the drainage from fixtures and equipment with grease-laden waste located in food preparation areas, such as in restaurants, hotel kitchens, hospitals, school kitchens, bars, factory cafeterias and clubs. Fixtures and equipment shall include pot sinks, prerinse sinks; soup kettles or similar devices; wok stations; floor drains or sinks into which kettles are drained; automatic hood wash units and dishwashers without prerinse sinks. Grease interceptors and automatic grease removal devices shall receive waste only from fixtures and equipment that allow fats, oils or grease to be discharged. Commercial food waste grinders shall connect to the sanitary drainage system at a point that is downstream of all grease interceptors unless the code official requires the connection point to be upstream of a grease interceptor.

Reason: This proposal addresses the issues raised by the IPC Committee during the last code cycle. This code change is important and recognizes the need for combinations of grease interceptors for renovation projects (change of occupancy) involving existing buildings where there is insufficient space or it is cost prohibitive to install a large enough in-ground interceptor (usually a gravity type) to meet local sewer ordinance requirements.

Cost Impact: None. It will probably save money for the user in many cases.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CAVANAUGH-P1-1003.3.1

P140–09/10
1003.3.2

Proponent: Sid Cavanaugh, Cavanaugh Consulting representing In Sink Erator

Revise as follows:

1003.3.2 Food Waste Grinders. Where food waste grinders connect to grease interceptors, ~~a solids interceptor shall separate the discharge before connecting to the grease interceptor. Solids interceptor and~~ the grease interceptor shall be sized for the discharge of the food waste grinder. Emulsifiers, chemicals, enzymes and bacteria shall not discharge into the food waste grinder.

Reason: Current language implies solids interceptors are used in conjunction with the installation of all food waste grinders, but food waste grinders are connected to grease interceptors only when required by the authority having jurisdiction, and this should be the exception not the rule. Data indicates it is impractical to discharge food waste grinders into interceptors. Language that specifies using a solids interceptor upstream of all grease interceptors is illogical since none are manufactured large enough to accommodate food waste grinder

The intent of grease interceptors is to reduce the introduction of fats, oils and greases (FOG) into sewers. Sewer clogs associated with FOG are well documented, and results from a collaborative research project undertaken by the Water Environment Research Foundation published in the fall 2008 characterized the composition of sewer deposits and provided much insight on these blockages.[1] The data revealed that 84% of the FOG deposit samples analyzed contained high concentrations of saturated fatty acids and calcium, higher than normal background levels, and appeared to be metallic salts of fatty acids. One of the researchers, Dr. Kevin Keener, has reported that no food waste particles were evident in these deposits. The report suggests a chemical reaction is occurring in the sewers, saponification, with calcium chemically selected over sodium. These insoluble deposits are difficult to remove and provide significant challenges for sewage collection system managers and plumbers as well. A supplemental report to the FROG study provided additional insight on the effluent of grease interceptors. 90% of flows though interceptors are on average 1/3 the peak design flow, which equates to detention times in the order of hours, not minutes, interceptors are mainly acidic, with pH's in the range of 4-8, and dissolved oxygen concentrations are less than 0.5 mg/L.

Together, the information provided in these studies suggests FOG deposits may indeed be the result of free fatty acids from the effluent of grease interceptors reacting with calcium. If pumped and maintained infrequently, or retained solids digest anaerobically, or if interceptors are improperly sized, conditions are conducive for promoting the formation of FOG deposits. While it is inappropriate to introduce grease into sewers

without remediation through such devices as interceptors, ground food waste should only be discharged directly to sanitary sewers, bypassing interceptors.

[1] Ducoste, Joel J., Kevin M. Keener, John W. Groninger, Leon M. Holt. "Fats, Roots, Oils and Grease (FROG) in Centralized and Decentralized Systems." WERF. 2008

Cost Impact: Minimal.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CAVANAUGH-P7-1003.3.2

P141–09/10
202 (New), 1003.3.4, Chapter 13

Proponent: Rand Ackroyd, Rand Technical Consulting, representing The Plumbing and Drainage Institute

1. Delete and substitute as follows:

~~**GREASE INTERCEPTOR.** A plumbing appurtenance that is installed in a sanitary drainage system to intercept oily and greasy wastes from a wastewater discharge. Such device has the ability to intercept free-floating fats and oils.~~

GREASE INTERCEPTOR.

HYDRO-MECHANICAL. Plumbing appurtenances that are installed in the sanitary drainage system to intercept free-floating fats, oils and grease from wastewater discharge. Continuous separation is accomplished by air entrainment, buoyancy and interior baffling.

GRAVITY. Plumbing appurtenances of not less than 500 gallons (1893 L) capacity that are installed in the sanitary drainage system to intercept free-floating fats, oils and grease from wastewater discharge. Separation is accomplished by gravity during a retention time of not less than 30 minutes.

2. Revise as follows:

1**003.3.4 Hydromechanical grease interceptors and automatic grease removal devices.** Hydromechanical grease interceptors and automatic grease removal devices shall be sized in accordance with PDI G101, ASME.14.3 Appendix A or ASME A112.14.4. Hydromechanical grease interceptors and automatic grease removal devices shall be designed and tested in accordance with PDI G101, PDI G102, ASME.14.3 Appendix A or ASME A112.14.4. Hydromechanical grease interceptors and automatic grease removal devices shall be installed in accordance with the manufacturer's instructions. The section shall not apply to gravity grease interceptors.

~~**Exception:** Interceptors that have a volume of not less than 500 gallons (1893 L) and that are located outdoors shall not be required to meet the requirements of this section.~~

3. Add standard to Chapter 13 as follows:

PDI
G102 Testing and Certification for Grease Interceptors with FOG Sensing and Alarm Devices

Reason: The industry has standardized on the terms "Hydro-Mechanical" and "Gravity" for the two general types of grease interceptors in the plumbing industry. The requirements in Section 1003.3.4 and its subsections were never intended to apply to gravity grease interceptors. The new terminology makes a clear distinction between the two types in order for the code to be clear about which type of grease interceptor the requirements apply to.

PDI G102 covers the Testing and Certification for Grease Interceptors with FOG Sensing and Alarm Devices. This standard expands on the already recognized PDI G101 by including testing and certification of alarm devices that can be provided on interceptors already complying with PDI G101. The alarm device on a hydromechanical grease interceptor monitors the level of the grease captured in the unit and provides both a loud audible signal and a visible signal when the accumulated grease (FOG) in the interceptor needs to be removed. Standard PDI G102 is available for free downloading from the PDI website www.pdionline.org.

The exception to this section that was put in last cycle by another proponent was an attempt to distinguish between the two general types of grease interceptors in order to clarity that Section 1003.3.4 did not apply to gravity grease interceptors. The new proposed terminology provides the necessary clarification and thus, the exception is no longer needed. However, in the spirit of the exception, the last line of text was added to reinforce that the reader should not try to apply the requirements of this section (including the subsections that follow) to gravity grease interceptors.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard PDI-G102 indicated, that in the opinion of ICC staff, the standard did not comply with the ICC standards criteria (Section 3.6.2.1).

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Ackroyd-P3-1003.3.4

P142–09/10
1003.3.4, Chapter 13

Proponent: Abraham I. Murra, Canadian Standards Association, representing the Canadian Standards Association

1. Revise as follows:

1003.3.4 Grease interceptors and automatic grease removal devices. Grease interceptors and automatic grease removal devices shall be sized in accordance with PDI G101, ASME 112.14.3 Appendix A, ASME 112.14.4, or CSA B481.3. Grease interceptors and automatic grease removal devices shall be designed and tested in accordance with PDI G101, ASME A112.14.3, ~~or~~ or ASME 112.14.4 or CSA B481.1. Grease interceptors and automatic grease removal devices shall be installed in accordance with the manufacturer's installation instructions. Where manufacturer's installation instructions are not provided, grease interceptors and grease removal devices shall be installed in compliance with CSA B481.3.

2. Add standards to Chapter 13 as follows:

CSA

B481.1-07 Testing and Rating of Grease Interceptors Using Lard

B481.3-07 Sizing, Selection, Location, and Installation of Grease Interceptors

Reason: CSA B481.1 covers performance of grease interceptors in accordance with ASME A112.14.3, but it also covers other very important aspects such as materials, design, and construction requirements as well as structural integrity tests for such devices.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard, CSA B481.1-07 and CSA B481.3-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Murra-P5-1003.3.4

P143–09/10
1003.4.2

Proponent: Bob Eugene/Underwriters Laboratories Inc/Underwriters Laboratories Inc

1. Revise as follows:

1003.4.2 Oil separator design. Oil separators shall be listed and labeled in accordance with UL 2215, or designed in accordance with Sections 1003.4.2.1 and 1003.4.2.2.

2. Add standards to Chapter 13 as follows:

UL

2215-00 Outline of Investigation for Oil/Water Separators

Reason: This proposal provides an alternative for the use of listed oil/water separators that are built on-site. UL's Outline of Investigation includes a comprehensive set of construction and performance requirements that are used to evaluate and list oil/water separators used in garages and service stations. These requirements cover stationary gravity or pump fed aboveground and underground, atmospheric type oil/water separator systems intended to remove oil suspended in water from rainwater runoff or normal washdown of streets, highways, and parking lots at an inlet rate not exceeding the marked maximum influent concentration and flow rate. Oil/water separator systems covered by these requirements are fabricated,

inspected, and tested for leakage before shipment from the factory as completely assembled units, or with instructions for field assembly of minor components. Over 20 companies currently have oil/water separators listed.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of the proposed new requirement UL 2215-00 indicated that, in the opinion of ICC staff, the requirement did not comply with ICC standards criteria.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-P1-1003.4.2

P144–09/10
1003.9, 1003.10 (New)

Proponent: Cort Strain University of Colorado representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO).

1. Revise as follows:

1003.9 Venting of interceptors and separators. Interceptors and separators shall be designed so as not to become air bound where tight covers are utilized. ~~Each interceptor or separator shall be vented where subject to a loss of trap seal.~~ The pipe connected to the outlet of an interceptor or separator shall be vented in accordance with the fixture trap venting requirements of Chapter 9. The invert of the outlet fitting of the interceptor or separator shall be considered as the trap weir elevation for the purposes of determining the maximum allowable distance from the outlet to the vent connection to the outlet pipe.

2. Add new text as follows:

1003.10 Cleanout for outlet pipe of interceptors or separators. A two-way cleanout arrangement shall be installed on the outlet pipe of interceptors and separators. The cleanout arrangement shall enable rodding of the outlet pipe in both the upstream and downstream directions.

(Renumber subsequent sections)

Reason: Although interceptor or separator manufacturer's installation instructions might state that a vent is not required on outlet pipe of the unit, the fact is that most instructions are silent on the issue. So how is the code official supposed to know if a particular unit in a specific installation arrangement could develop siphon action? The truth is, no one really knows. Therefore, the words in Section 1003.9 are deleted because there really isn't any way to know if siphonage will occur. In our experience, a fair number of interceptors and separators do develop siphons which result in the discharge of collected contents into drain and sewer systems. The outlet pipes of interceptors and separators should be vented to prevent siphoning from occurring. The need for outlet pipe venting is supported by Section 10.3 of standard PDI-101 (a code referenced standard) that states: "Grease interceptors shall have a vented waste on the outlet side, sized in accordance with code requirements for venting traps to retain water seal and prevent siphoning". The text added to Section 1003.9 brings this requirement to light and provides the details for properly locating and sizing the vent.

Unlike a fixture trap that can be easily removed for access to rod a fixture drain, interceptors and separators are not easily removed and rarely have the provisions necessary to gain adequate access for rodding of the pipe connected to the outlet. This is a location that can require frequent rodding especially if the interceptor or separator is not cleaned at the necessary intervals. In many cases, as a necessity, cleanouts are often added after installation. Unfortunately, many of these after-the-fact cleanout installations do not get permitted or inspected resulting problems. The new section 1003.10 adds text to require a two way cleanout arrangement on the outlet pipe of interceptors and separators.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Strain-P2-1003.9

P145–09/10
1003.9 (New)

Proponent: Bob Gardner, City of Thornton, Colorado, representing the Colorado Association of Plumbing and Mechanical Officials

Add new text as follows:

1003.9 Hair interceptors required. A fixture intended to be used exclusively for the washing or rinsing of human or animal hair shall be provided with a hair interceptor installed downstream of the fixture outlet. Hair interceptors shall be equipped with a removable wire basket or other approved device to facilitate the removal of hair from the interceptor.

(Renumber subsequent sections)

Reason: Currently the only way for a code official to enforce the use of a hair trap for businesses that deal with large amount of cut or loose hair is by referring to IPC Section 302.1 which is generic and more generally defines hazardous materials than insoluble materials that obstruct a buildings sewer or drainage system. Large amounts of hair can and do obstruct the drainage system requiring the removal of the drainage components or mechanical auguring of the system to remove these obstructions. Adding this section will eliminate the obstructions associated with large quantities of loose hair in commercial establishments.

Cost Impact: This code change will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Gardner-P1-1003.9

P146–09/10
1003.10, Chapter 13

Proponent: Abraham I. Murra, Canadian Standards Association, representing the Canadian Standards Association

1. Revise as follows:

Section 1003.10 Access and maintenance of interceptors and separators. *Access* shall be provided to each interceptor and separator for service and maintenance. Interceptors and separators shall be maintained by periodic removal of accumulated grease, scum, oil, or other floating substances and solids deposited in the interceptor or separator. Maintenance shall be performed in accordance with CSA B481.4.

2. Add standard to Chapter 13 as follows:

CSA	
B481.4-07	Maintenance of Grease Interceptors.

Reason: CSA B481.4 covers the maintenance requirements for grease interceptors and separators.

Cost Impact: The code change proposal will not increase the cost of production.

Analysis: Review of proposed new standard, CSA B481.4-07, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Murra-P7-1003.10

P147–09/10
1102.6, Chapter 13

Proponent: Julius Ballanco, PE, CPD, FASPE, JB Engineering and Code Consulting, PC representing Froet Industries.

1. Revise as follows:

1102.6 Roof drains. Roof drains shall conform to ASME ~~A112.21.2M~~ A112.6.4, ASME A112.6.9 or ASME A112.3.1.

2. Add standards to Chapter 13 as follows:

ASME

A112.6.4—2003	Roof, Deck, and Balcony Drains
A112.6.9—2005	Siphonic Roof Drains

Reason: ASME A112.21.2M was withdrawn in 1995. The standard was replaced with ASME A112.6.4. This new standard includes roof drains, deck drains and balcony drains. The other standard referenced is for siphonic roof drains. These standards regulate the dimensional requirements of roof drains, the dome free area, the grate free area, the material requirements, and the rating of the drains. This change will update the code to the current standards for roof drains.

Cost Impact: The code change proposal will not increase the cost of construction

Analysis: Review of proposed new standards, ASME A112.6.4-2003 and A112.6.9-2005, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BALLANCO-P2-1102.6 AS

P148–09/10
1102.6, Chapter 13

Proponent: Guy Tomberlin, Fairfax County, Virginia representing himself.

1. Revise as follows:

1102.6 Roof Drains. Roof drains shall conform to ASME ~~A112.21.2M~~ A112.6.4 or ASME A112.3.1.

2. Add standard to Chapter 13 as follows:

ASME

A112.6.4-2003 (R2008)	Roof, Deck and Balcony Drains

Reason: The reference to A112.21.2M is obsolete. The standard no longer exists nor is it in print circulation. The last print edition was 1983. The A112.6.4 2003 edition is titled: Roof, Deck and Balcony Drains and it is the most current applicable ASME printed standard to cover the roof drain application as referenced in Section 1106.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard, ASME A112.6.4-2003 (R2008), for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-P6-1102.6

P149–09/10
1105.1, 1105.2

Proponent: Julius Ballanco, P.E., CPD, FASPE/JB Engineering and Code Consulting, P.C. representing Froet Industries

1. Delete without substitution:

~~**1105.1 Strainers.** Roof drains shall have strainers extending not less than 4 inches (102 mm) above the surface of the roof immediately adjacent to the roof drain. Strainers shall have an available inlet area, above roof level, of not less than one and one-half times the area of the conductor or leader to which the drain is connected.~~

~~**1105.2 Flat decks.** Roof drain strainers for use on sun decks, parking decks and similar areas that are normally serviced and maintained shall comply with Section 1105.1 or shall be of the flat-surface type, installed level with the deck, with an availableinlet area not less than two times the area of the conductor or leader to which the drain is connected.~~

2. Add new text as follows:

1105.1 General. Roof drains shall be installed in accordance with the manufacturer's installation instructions. The inside opening for the roof drain shall not be obstructed by the roofing membrane material.

(Renumber subsequent sections)

Reason: The two sections proposed for deletion predate the roof drain standard. These requirements originally appeared in the ANSI A40.8-1955 standard. This was the basis of the legacy codes. With the reference to the roof drain standard, the sizing and design of the roof drain is regulated by the standard. The following table provides a comparison of the sizing of current Section 1105.1 to the ASME standard. Obviously, the existing code language does not require nearly the flow area of the strainer as compared to what the current standards require.

Pipe Size	Inside Diameter	Inside Area	Min. Dome Area Per ASME A112.6.4	IPC Minimum Dome Area
(inches)	(inches)	(sq inches)	(sq inches)	(sq inches)
2	1.96	3.02	18	4.53
3	2.96	6.88	25	10.32
4	3.94	12.19	36	18.29
5	4.94	19.17	50	28.75
6	5.94	27.71	70	41.57

With a reference to the roof drain standard in Section 1102.6, the roof drain section only has to reference the installation instructions of the manufacturer for regulating the installation. One of the common errors in a roof drain is the overlapping of the roof membrane into the roof drain. Contractors have been known to cut a smaller opening in the roof membrane than the size of the roof drain. The addition of the language in Section 1105.1 will emphasize that after installation, the inside opening of the roof drain outlet must not be blocked by roofing membrane materials.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: BALLANCO-P3-1105.1

150–09/10
1106.5

Proponent: Don Surrena, National Association of Home Builders (NAHB)

Revise as follows:

1106.5 Parapet wall scupper location. Parapet wall roof drainage scupper and overflow scupper location shall comply with the requirements of Section 1503.4 of the *International Building Code*.

Reason: The purpose of this proposal is to clarify the requirements for roof drains and the requirements for secondary emergency overflow drains, their sizing, location and quantity as well as their section reference in the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Surrena-P3-1106.5

P151-09/10
1107 (New), 1107.1 (New), Chapter 13

Proponent: Robert Evans, CPD/ASPE Legislative Committee/ASPE

1. Add a new section as follows:

Section 1107
Siphonic Roof Drainage Systems

1107.1 General. Siphonic roof drainage systems shall be designed in accordance with ASPE 45.

2. Add standard to Chapter 13 as follows:

American Society of Plumbing Engineers
8614 Catalpa Avenue, Suite 1007
Chicago, IL 60656-1116

ASPE
45-2007 Siphonic Roof Drainage Systems

Reason: This section will add requirements for the design of siphonic roof drainage systems. ASPE developed a standard for the plumbing engineers to use when designing these systems. This is a complex design that needs to be properly addressed in the code. Without the reference to the proper standard, the plumbing official has no requirements by which to evaluate siphonic roof drainage systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard, ASPE 45-2007, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EVANS-P1-1107 NEW

P152–09/10
202 (New), 301.3, Chapter 13 (New), Appendix C; IRC R202, P2601.2, Section P3009 (New), Appendix O

Proponent: Guy Tomberlin of Fairfax County, Virginia, Virginia Plumbing and Mechanical Inspectors, Virginia Building and Code Officials and ICC Region 7.

PART I – IPC

1. Add definition as follows:

GRAY WATER. Waste discharged from lavatories, bathtubs, showers, clothes washers and laundry trays.

2. Revise as follows:

301.3 Connections to drainage system. ~~All~~ Plumbing fixtures, drains, appurtenances and appliances used to receive or discharge liquid wastes or sewage shall be directly connected to the sanitary drainage system of the building or premises, in accordance with the requirements of this code. This section shall not be construed to prevent indirect waste systems required by Chapter 8.

Exception: Bathtubs, showers, lavatories, clothes washers and laundry trays shall not be required to discharge to the sanitary drainage system where such fixtures discharge to an approved gray water system for flushing of water closets and urinals or for subsurface landscape irrigation.

3. Delete Appendix C in its entirety without substitution

(Renumber subsequent appendices)

4. Add new chapter and text as follows:

Chapter 13
Gray Water Recycling Systems

SECTION 1301
GENERAL

1301.1 Scope. The provisions of Chapter 13 shall govern the materials, design, construction and installation of gray water systems for flushing of water closets and urinals and for subsurface landscape irrigation. See Figures 1301.1(1) and 1301.1(2).

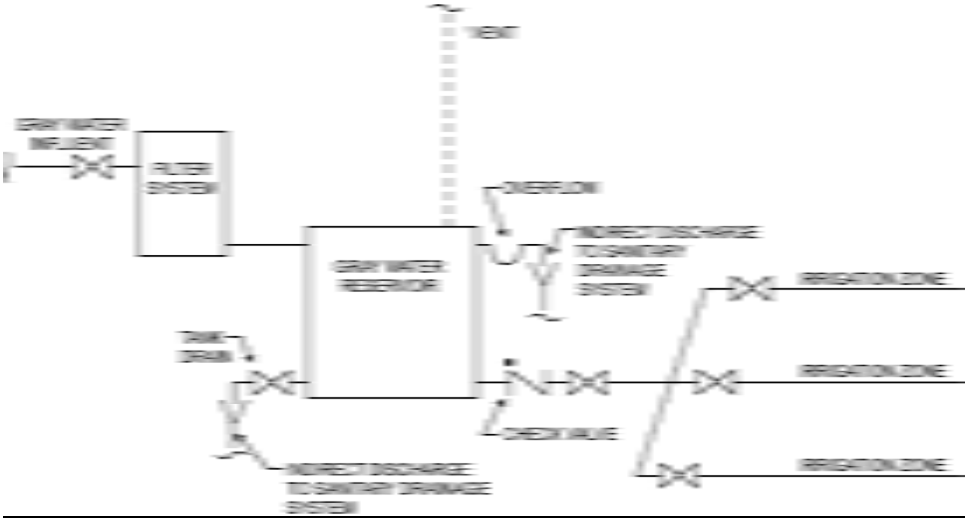


FIGURE 1301.1 (1)
GRAY WATER RECYCLING SYSTEM FOR
SUBSURFACE LANDSCAPE IRRIGATION

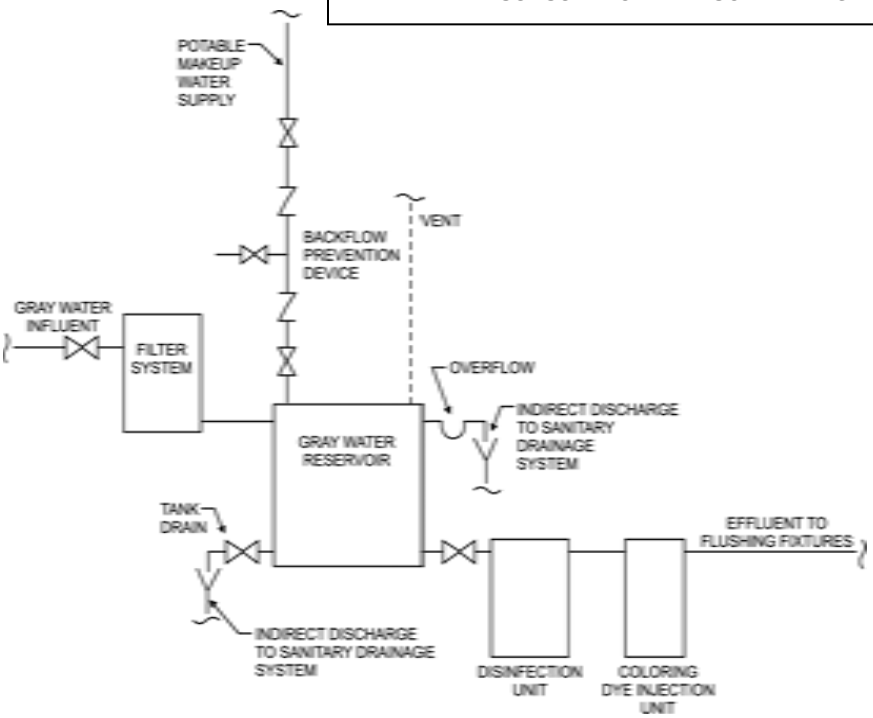


FIGURE 1301.1(2)
GRAY WATER RECYCLING SYSTEM FOR
FLUSHING WATER CLOSETS AND URINALS

1301.2 Installation. In addition to the provisions of Section 1301, systems for flushing of water closets and urinals shall comply with Section 1302 and systems for subsurface landscape irrigation shall comply with Section 1303. Except as provided for in this chapter, all systems shall comply with the provisions of the other chapters of this code.

1301.3 Materials. Above-ground drain, waste and vent piping for gray water systems shall conform to one of the standards listed in Table 702.1. Gray water underground building drainage and vent pipe shall conform to one of the standards listed in Table 702.2.

1301.4 Tests. Drain, waste and vent piping for gray water systems shall be tested in accordance with Section 312.

1301.5 Inspections. Gray water systems shall be inspected in accordance with Section 107.

1301.6 Potable water connections. Only connections in accordance with Section 1302.3 shall be made between a gray water recycling system and a potable water system.

1301.7 Waste water connections. Gray water recycling systems shall receive only the waste discharge of bathtubs, showers, lavatories, clothes washers or laundry trays.

1301.8 Collection reservoir. Gray water shall be collected in an approved reservoir constructed of durable, nonabsorbent and corrosion-resistant materials. The reservoir shall be a closed and gas-tight vessel. Access openings shall be provided to allow inspection and cleaning of the reservoir interior.

1301.9 Filtration. Gray water entering the reservoir shall pass through an approved filter such as a media, sand or diatomaceous earth filter.

1301.9.1 Required valve. A full-open valve shall be installed downstream of the last fixture connection to the gray water discharge pipe before entering the required filter.

1301.10 Overflow. The collection reservoir shall be equipped with an overflow pipe having the same or larger diameter as the influent pipe for the gray water. The overflow pipe shall be trapped and shall be indirectly connected to the sanitary drainage system.

1301.11 Drain. A drain shall be located at the lowest point of the collection reservoir and shall be indirectly connected to the sanitary drainage system. The drain shall be the same diameter as the overflow pipe required in Section 1301.10.

1301.12 Vent required. The reservoir shall be provided with a vent sized in accordance with Chapter 9 and based on the diameter of the reservoir influent pipe.

SECTION 13 02
SYSTEMS FOR FLUSHING WATER CLOSETS AND URINALS

1302.1 Collection reservoir. The holding capacity of the reservoir shall be a minimum of twice the volume of water required to meet the daily flushing requirements of the fixtures supplied with gray water, but not less than 50 gallons (189 L). The reservoir shall be sized to limit the retention time of gray water to a maximum of 72 hours.

1302.2 Disinfection. Gray water shall be disinfected by an approved method that employs one or more disinfectants such as chlorine, iodine or ozone that are recommended for use with the pipes, fittings and equipment by the manufacturer of the pipes, fittings and equipment.

1302.3 Makeup water. Potable water shall be supplied as a source of makeup water for the gray water system. The potable water supply shall be protected against backflow in accordance with Section 608. There shall be a full-open valve located on the makeup water supply line to the collection reservoir.

1302.4 Coloring. The gray water shall be dyed blue or green with a food grade vegetable dye before such water is supplied to the fixtures.

1302.5 Materials. Distribution piping shall conform to one of the standards listed in Table 605.4.

1302.6 Identification. Distribution piping and reservoirs shall be identified as containing nonpotable water. Piping identification shall be in accordance with Section 608.8.

SECTION 1303
SUBSURFACE LANDSCAPE IRRIGATION SYSTEMS

1303.1 Collection reservoir. Reservoirs shall be sized to limit the retention time of gray water to a maximum of 24 hours.

1303.1.1 Identification. The reservoir shall be identified as containing nonpotable water.

1303.2 Valves required. A check valve and a full-open valve located on the discharge side of the check valve shall be installed on the effluent pipe of the collection reservoir.

1303.3 Makeup water. Makeup water shall not be required for subsurface landscape irrigation systems. Where makeup water is provided, the installation shall be in accordance with Section 1302.3.

1303.4 Disinfection. Disinfection shall not be required for gray water used or subsurface landscape irrigation systems.

1303.5 Coloring. Gray water used for subsurface landscape irrigation systems shall not be required to be dyed.

1303.6 Estimating gray water discharge. The system shall be sized in accordance with the gallons-per-day-per-occupant number based on the type of fixtures connected to the gray water system. The discharge shall be calculated by the following equation:

$C = A \times B$

A = Number of occupants:
Residential–Number of occupants shall be determined by the actual number of occupants, but not less than two occupants for one bedroom and one occupant for each additional bedroom.
Commercial–Number of occupants shall be determined by the *International Building Code®*.

B = Estimated flow demands for each occupant:
Residential–25 gallons per day (94.6 lpd) per occupant for showers, bathtubs and lavatories and 15 gallons per day (56.7 lpd) per occupant for clothes washers or laundry trays.
Commercial–Based on type of fixture or water use records minus the discharge of fixtures other than those discharging gray water.

C = Estimated gray water discharge based on the total number of occupants.

1303.7 Percolation tests. The permeability of the soil in the proposed absorption system shall be determined by percolation tests or permeability evaluation.

1303.7.1 Percolation tests and procedures. At least three percolation tests in each system area shall be conducted. The holes shall be spaced uniformly in relation to the bottom depth of the proposed absorption system. More percolation tests shall be made where necessary, depending on system design.

1303.7.1.1 Percolation test hole. The test hole shall be dug or bored. The test hole shall have vertical sides and a horizontal dimension of 4 inches to 8 inches (102 mm to 203 mm). The bottom and sides of the hole shall be scratched with a sharp-pointed instrument to expose the natural soil. All loose material shall be removed from the hole and the bottom shall be covered with 2 inches (51 mm) of gravel or coarse sand.

1303.7.1.2 Test procedure, sandy soils. The hole shall be filled with clear water to a minimum of 12 inches (305 mm) above the bottom of the hole for tests in sandy soils. The time for this amount of water to seep away shall be determined, and this procedure shall be repeated if the water from the second filling of the hole seeps away in 10 minutes or less. The test shall proceed as follows: Water shall be added to a point not more than 6 inches (152 mm) above the gravel or coarse sand. Thereupon, from a fixed reference point, water levels shall be measured at 10-minute intervals for a period of 1 hour. Where 6 inches (152mm) of water seeps away in less than 10 minutes, a shorter interval between measurements shall be used, but in no case shall the water depth exceed 6 inches (152 mm). Where 6 inches (152 mm) of water seeps away in less than 2 minutes, the test shall be stopped and a rate of less than 3 minutes per inch (7.2 s/mm) shall be reported. The final water level drop shall be used to calculate the percolation rate. Soils not meeting the above requirements shall be tested in accordance with Section 1303.7.1.3.

1303.7.1.3 Test procedure, other soils. The hole shall be filled with clear water, and a minimum water depth of 12 inches (305mm) shall be maintained above the bottom of the hole for a 4-hour period by refilling whenever necessary or by use of an automatic siphon. Water remaining in the hole after 4 hours shall not be removed. Thereafter, the soil shall be allowed to swell not less than 16 hours or more than 30 hours. Immediately after the soil swelling period, the

measurements for determining the percolation rate shall be made as follows: Any soil sloughed into the hole shall be removed and the water level shall be adjusted to 6 inches (152 mm) above the gravel or coarse sand. Thereupon, from a fixed reference point, the water level shall be measured at 30-minute intervals for a period of 4 hours, unless two successive water level drops do not vary by more than $^{1}/_{16}$ inch (1.59 mm). At least three water level drops shall be observed and recorded. The hole shall be filled with clear water to a point not more than 6 inches (152 mm) above the gravel or coarse sand whenever it becomes nearly empty. Adjustments of the water level shall not be made during the three measurement periods except to the limits of the last measured water level drop. When the first 6 inches (152 mm) of water seeps away in less than 30 minutes, the time interval between measurements shall be 10 minutes and the test run for 1 hour. The water depth shall not exceed 5 inches (127 mm) at any time during the measurement period. The drop that occurs during the final measurement period shall be used in calculating the percolation rate.

1303.7.1.4 Mechanical test equipment. Mechanical percolation test equipment shall be of an approved type.

1303.7.2 Permeability evaluation. Soil shall be evaluated for estimated percolation based on structure and texture in accordance with accepted soil evaluation practices. Borings shall be made in accordance with Section 1303.7.1 for evaluating the soil.

1303.8 Subsurface landscape irrigation site location. The surface grade of all soil absorption systems shall be located at a point lower than the surface grade of any water well or reservoir on the same or adjoining property. Where this is not possible, the site shall be located so surface water drainage from the site is not directed toward a well or reservoir. The soil absorption system shall be located with a minimum horizontal distance between various elements as indicated in Table 1303.8. Private sewage disposal systems in compacted areas, such as parking lots and driveways, are prohibited. Surface water shall be diverted away from any soil absorption site on the same or neighboring lots.

TABLE 1303.8
LOCATION OF GRAY WATER SYSTEM

ELEMENT	MINIMUM HORIZONTAL DISTANCE	
	HOLDING TANK (feet)	IRRIGATION DISPOSAL FIELD (feet)
Buildings	5	2
Property line adjoining private property	5	5
Water wells	50	100
Streams and lakes	50	50
Seepage pits	5	5
Septic tanks	0	5
Water service	5	5
Public water main	10	10

For SI: 1 foot = 304.8 mm.

1303.9 Installation. Absorption systems shall be installed in accordance with Sections 1303.9.1 through 1303.9.5 to provide landscape irrigation without surfacing of gray water.

1303.9.1 Absorption area. The total absorption area required shall be computed from the estimated daily gray water discharge and the design-loading rate based on the percolation rate for the site. The required absorption area equals the estimated gray water discharge divided by the design-loading rate from Table 1303.9.1.

TABLE 1303.9.1
DESIGN LOADING RATE

PERCOLATION RATE (minutes per inch)	DESIGN LOADING FACTOR (gallons per square foot per day)
0 to less than 10	1.2
10 to less than 30	0.8
30 to less than 45	0.72
45 to 60	0.4

For SI: 1 minute per inch = min/25.4 mm,
1 gallon per square foot = 40.7 L/m^2.

1303.9.2 Seepage trench excavations. Seepage trench excavations shall be a minimum of 1 foot (304 mm) to a maximum of 5 feet (1524 mm) wide. Trench excavations shall be spaced a minimum of 2 feet (610 mm) apart. The soil absorption area of a seepage trench shall be computed by using the bottom of the trench area (width) multiplied by the length of pipe. Individual seepage trenches shall be a maximum of 100 feet (30 480 mm) in developed length.

1303.9.3 Seepage bed excavations. Seepage bed excavations shall be a minimum of 5 feet (1524 mm) wide and have more than one distribution pipe. The absorption area of a seepage bed shall be computed by using the bottom of the trench area. Distribution piping in a seepage bed shall be uniformly spaced a maximum of 5 feet (1524mm) and a minimum of 3 feet (914 mm) apart, and a maximum of 3 feet (914mm) and a minimum of 1 foot (305 mm) from the sidewall or headwall.

1303.9.4 Excavation and construction. The bottom of a trench or bed excavation shall be level. Seepage trenches or beds shall not be excavated where the soil is so wet that such material rolled between the hands forms a soil wire. All smeared or compacted soil surfaces in the sidewalls or bottom of seepage trench or bed excavations shall be scarified to the depth of smearing or compaction and the loose material removed. Where rain falls on an open excavation, the soil shall be left until sufficiently dry so a soil wire will not form when soil from the excavation bottom is rolled between the hands. The bottom area shall then be scarified and loose material removed.

1303.9.5 Aggregate and backfill. A minimum of 6 inches of aggregate ranging in size from $^1/_2$ to $2^1/_2$ inches (12.7 mm to 64 mm) shall be laid into the trench below the distribution piping elevation. The aggregate shall be evenly distributed a minimum of 2 inches (51 mm) over the top of the distribution pipe. The aggregate shall be covered with approved synthetic materials or 9 inches (229mm) of uncompacted marsh hay or straw. Building paper shall not be used to cover the aggregate. A minimum of 9 inches (229 mm) of soil backfill shall be provided above the covering.

1303.10 Distribution piping. Distribution piping shall be not less than 3 inches (76mm) in diameter. Materials shall comply with Table 1303.10. The top of the distribution pipe shall be not less than 8 inches (203mm) below the original surface. The slope of the distribution pipes shall be a minimum of 2 inches (51 mm) andamaximumof4inches (102 mm) per 100 feet (30 480 mm).

TABLE 1303.10
DISTRIBUTION PIPE

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe	ASTM F 405
Polyvinyl chloride (PVC) plastic pipe	ASTM D 2729
Polyvinyl chloride (PVC) plastic pipe with a 3.5 inch O.D. and solid celluar core or composite wall.	ASTM F 1488

1303.11 Joints. Joints in distribution pipe shall be made in accordance with Section 705 of this code.

(Renumber subsequent chapters and sections)

PART II - IRC

1. Add definition as follows:

GRAY WATER. Waste discharged from lavatories, bathtubs, showers, clothes washers and laundry trays.

2. Revise as follows:

P2601.2 Connections to drainage system. Plumbing fixtures, drains, appurtenances and appliances used to receive or discharge liquid wastes or sewage shall be directly connected to the sanitary drainage system of the building or premises, in accordance with the requirements of this code. This section shall not be construed to prevent indirect waste systems.

> **Exception:** Bathtubs, showers, lavatories, clothes washers and laundry trays shall not be required to discharge to the sanitary drainage system where such fixtures discharge to an approved gray water system for flushing of water closets and urinals or for subsurface landscape irrigation.

3. Delete Appendix O in its entirety without substitution

(Renumber subsequent appendices)

4. Add new section and text as follows:

SECTION P3009
GRAY WATER RECYCLING SYSTEMS

P3009.1 Scope. The provisions of Section P3009 shall govern the materials, design, construction and installation of gray water systems for flushing of water closets and urinals and for subsurface landscape irrigation. See Figures P3009.1(1) and P3009.1(2).

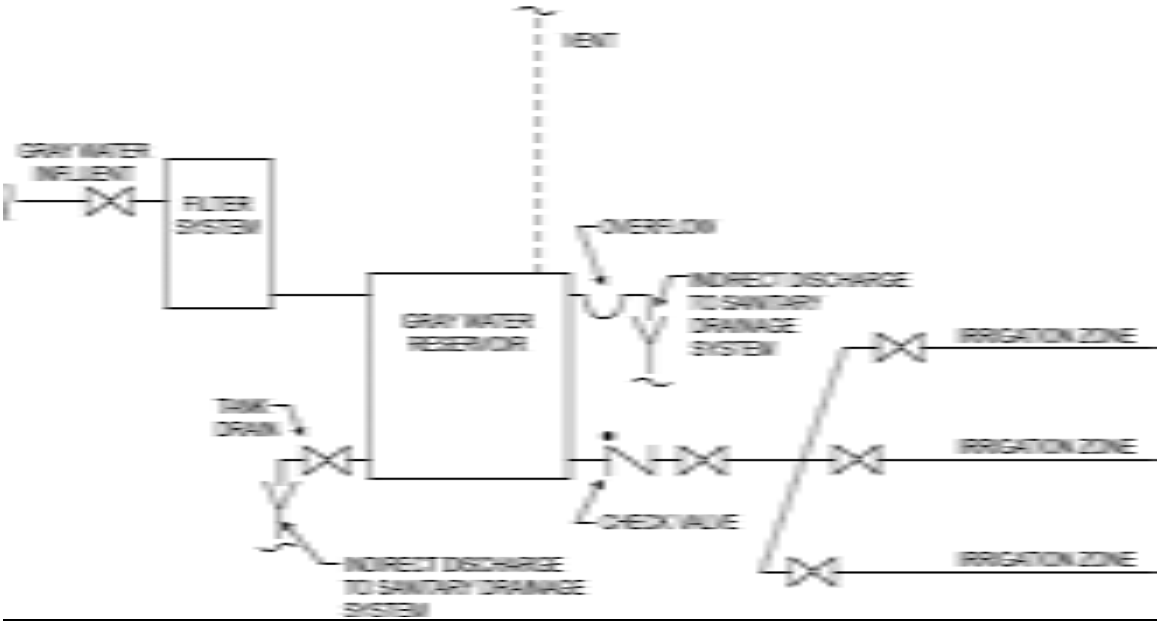


FIGURE P3009.1(1)
GRAY WATER RECYCLING SYSTEM FOR SUBSURFACE LANDSCAPE IRRIGATION

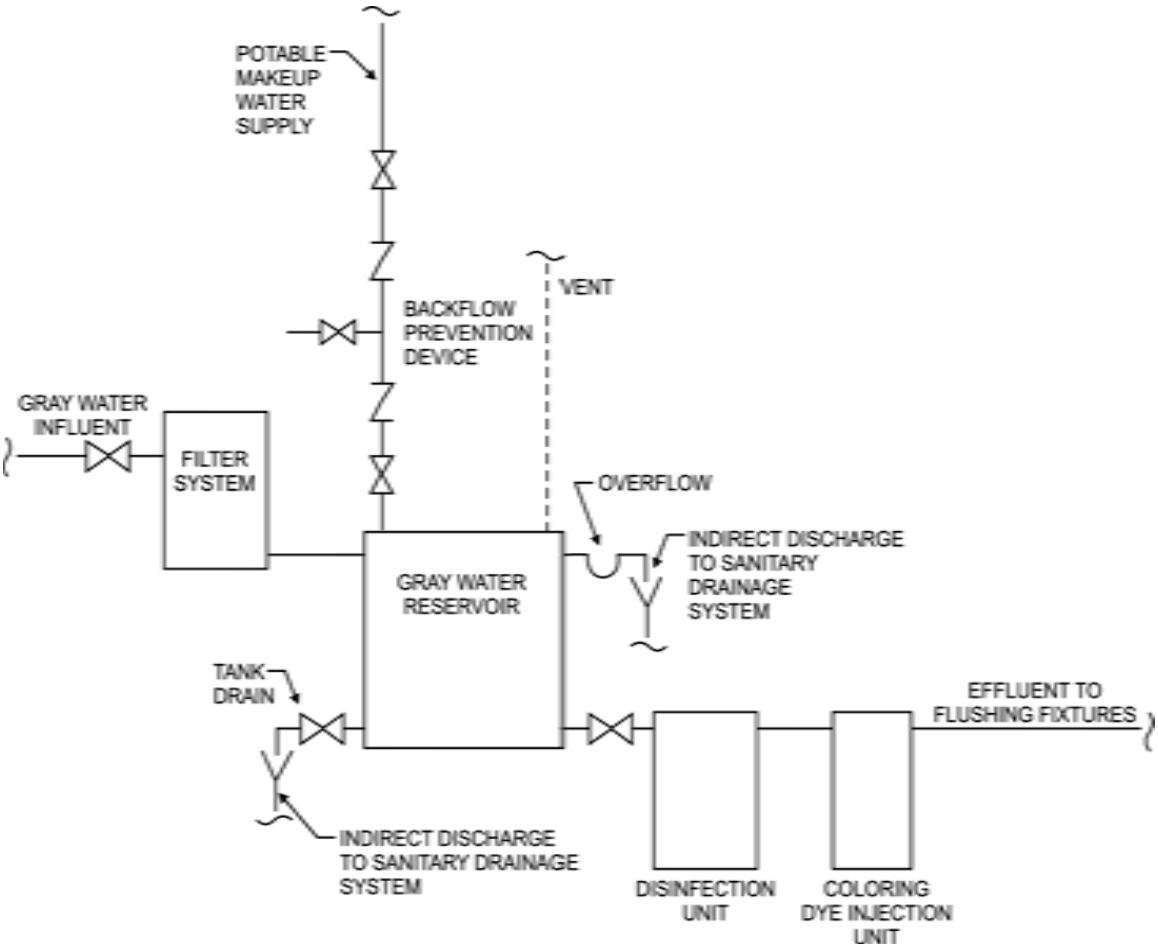


FIGURE P3009.1(2)
GRAY WATER RECYCLING SYSTEM FOR FLUSHING WATER CLOSETS AND URINALS

P3009.2 Installation. In addition to the provisions of Section P3009, systems for flushing of water closets and urinals shall comply with Section P3009.13 and systems for subsurface landscape irrigation shall comply with Section P3009.14. Except as provided for in Section P3009, all systems shall comply with the provisions of the other sections of this code.

P3009.3 Materials. Above-ground drain, waste and vent piping for gray water systems shall conform to one of the standards listed in Table P3002.1(1). Gray water underground building drainage and vent pipe shall conform to one of the standards listed in Table P3002.1(2).

P3009.4 Tests. Drain, waste and vent piping for gray water systems shall be tested in accordance with Section P2503.

P3009.5 Inspections. Gray water systems shall be inspected in accordance with Section P2503.

P3009.6 Potable water connections. Only connections in accordance with Section 3009.13.1 shall be made between a gray water recycling system and a potable water system.

P3009.7 Waste water connections. Gray water recycling systems shall receive only the waste discharge of bathtubs, showers, lavatories, clothes washers or laundry trays.

P3009.8 Collection reservoir. Gray water shall be collected in an approved reservoir constructed of durable, nonabsorbent and corrosion-resistant materials. The reservoir shall be a closed and gas-tight vessel. Access openings shall be provided to allow inspection and cleaning of the reservoir interior.

P3009.9 Filtration. Gray water entering the reservoir shall pass through an approved filter such as a media, sand or diatomaceous earth filter.

P3009.9.1 Required valve. A full-open valve shall be installed downstream of the last fixture connection to the gray water discharge pipe before entering the required filter.

P3009.10 Overflow. The collection reservoir shall be equipped with an overflow pipe having the same or larger diameter as the influent pipe for the gray water. The overflow pipe shall be trapped and shall be indirectly connected to the sanitary drainage system.

P3009.11 Drain. A drain shall be located at the lowest point of the collection reservoir and shall be indirectly connected to the sanitary drainage system. The drain shall be the same diameter as the overflow pipe required in Section P3009.10.

P3009.12 Vent required. The reservoir shall be provided with a vent sized in accordance with Chapter 31 and based on the diameter of the reservoir influent pipe.

P3009.13 Flushing water systems. Systems for flushing water closets and urinals shall comply with Sections P3009.13.1 through P3009.13.6

P3009.13.1 Collection reservoir. The holding capacity of the reservoir shall be a minimum of twice the volume of water required to meet the daily flushing requirements of the fixtures supplied with gray water, but not less than 50 gallons (189 L). The reservoir shall be sized to limit the retention time of gray water to a maximum of 72 hours.

P3009.13.2 Disinfection. Gray water shall be disinfected by an approved method that employs one or more disinfectants such as chlorine, iodine or ozone that are recommended for use with the pipes, fittings and equipment by the manufacturer of the pipes, fittings and equipment.

P3009.13.3 Makeup water. Potable water shall be supplied as a source of makeup water for the gray water system. The potable water supply shall be protected against backflow in accordance with Section P2902. There shall be a full-open valve located on the makeup water supply line to the collection reservoir.

P3009.13.4 Coloring. The gray water shall be dyed blue or green with a food grade vegetable dye before such water is supplied to the fixtures.

P3009.13.5 Materials. Distribution piping shall conform to one of the standards listed in Table P2905.4.

P3009.13.6 Identification. Distribution piping and reservoirs shall be identified as containing nonpotable water. Piping identification shall be in accordance with Section P2901.1.

P3009.14 Landscape irrigation systems. Subsurface landscape irrigation systems shall comply with Sections P3009.14.1 through P3009.14.11

P3009.14.1 Collection reservoir. Reservoirs shall be sized to limit the retention time of gray water to a maximum of 24 hours.

P3009.14.1.1 Identification. The reservoir shall be identified as containing nonpotable water.

P3009.14.2 Valves required. A check valve and a full-open valve located on the discharge side of the check valve shall be installed on the effluent pipe of the collection reservoir.

P3009.14.3 Makeup water. Makeup water shall not be required for subsurface landscape irrigation systems. Where makeup water is provided, the installation shall be in accordance with Section 3009.13.3.

P3009.14.4 Disinfection. Disinfection shall not be required for gray water used or subsurface landscape irrigation systems.

P3009.14.5 Coloring. Gray water used for subsurface landscape irrigation systems shall not be required to be dyed.

P3009.14.6 Estimating gray water discharge. The system shall be sized in accordance with the gallons-per-day-per-occupant number based on the type of fixtures connected to the gray water system. The discharge shall be calculated by the following equation:

$C = A \times B$

A = Number of occupants:

Number of occupants shall be determined by the actual number of occupants, but not less than two occupants for one bedroom and one occupant for each additional bedroom.

B = Estimated flow demands for each occupant:
Residential–25 gallons per day (94.6 lpd) per occupant for showers, bathtubs and lavatories and 15 gallons per day (56.7 lpd) per occupant for clothes washers or laundry trays.

C = Estimated gray water discharge based on the total number of occupants.

P3009.14.7 Percolation tests. The permeability of the soil in the proposed absorption system shall be determined by percolation tests or permeability evaluation.

P3009.14.7.1 Percolation tests and procedures. At least three percolation tests in each system area shall be conducted. The holes shall be spaced uniformly in relation to the bottom depth of the proposed absorption system. More percolation tests shall be made where necessary, depending on system design.

P3009.14.7.1.1 Percolation test hole. The test hole shall be dug or bored. The test hole shall have vertical sides and a horizontal dimension of 4 inches to 8 inches (102 mm to 203 mm). The bottom and sides of the hole shall be scratched with a sharp-pointed instrument to expose the natural soil. All loose material shall be removed from the hole and the bottom shall be covered with 2 inches (51 mm) of gravel or coarse sand.

P3009.14.7.1.2 Test procedure, sandy soils. The hole shall be filled with clear water to a minimum of 12 inches (305 mm) above the bottom of the hole for tests in sandy soils. The time for this amount of water to seep away shall be determined, and this procedure shall be repeated if the water from the second filling of the hole seeps away in 10 minutes or less. The test shall proceed as follows: Water shall be added to a point not more than 6 inches (152 mm) above the gravel or coarse sand. Thereupon, from a fixed reference point, water levels shall be measured at 10-minute intervals for a period of 1 hour. Where 6 inches (152mm) of water seeps away in less than 10 minutes, a shorter interval between measurements shall be used, but in no case shall the water depth exceed 6 inches (152 mm). Where 6 inches (152 mm) of water seeps away in less than 2 minutes, the test shall be stopped and a rate of less than 3 minutes per inch (7.2 s/mm) shall be reported. The final water level drop shall be used to calculate the percolation rate. Soils not meeting the above requirements shall be tested in accordance with Section 3009.14.7.1.3.

P3009.14.7.1.3 Test procedure, other soils. The hole shall be filled with clear water, and a minimum water depth of 12 inches (305mm) shall be maintained above the bottom of the hole for a 4-hour period by refilling whenever necessary or by use of an automatic siphon. Water remaining in the hole after 4 hours shall not be removed. Thereafter, the soil shall be allowed to swell not less than 16 hours or more than 30 hours. Immediately after the soil swelling period, the measurements for determining the percolation rate shall be made as follows: Any soil sloughed into the hole shall be removed and the water level shall be adjusted to 6 inches (152 mm) above the gravel or coarse sand. Thereupon, from a fixed reference point, the water level shall be measured at 30-minute intervals for a period of 4 hours, unless two successive water level drops do not vary by more than $^{1}/_{16}$ inch (1.59 mm). At least three water level drops shall be observed and recorded. The hole shall be filled with clear water to a point not more than 6 inches (152 mm) above the gravel or coarse sand whenever it becomes nearly empty. Adjustments of the water level shall not be made during the three measurement periods except to the limits of the last measured water level drop. When the first 6 inches (152 mm) of water seeps away in less than 30 minutes, the time interval between measurements shall be 10 minutes and the test run for 1 hour. The water depth shall not exceed 5 inches (127 mm) at any time during the measurement period. The drop that occurs during the final measurement period shall be used in calculating the percolation rate.

P3009.14.7.1.4 Mechanical test equipment. Mechanical percolation test equipment shall be of an approved type.

P3009.14.7.2 Permeability evaluation. Soil shall be evaluated for estimated percolation based on structure and texture in accordance with accepted soil evaluation practices. Borings shall be made in accordance with Section P3009.14.7.1 for evaluating the soil.

P3009.14.8 Subsurface landscape irrigation site location. The surface grade of all soil absorption systems shall be located at a point lower than the surface grade of any water well or reservoir on the same or adjoining property. Where this is not possible, the site shall be located so surface water drainage from the site is not directed toward a well or reservoir. The soil absorption system shall be located with a minimum horizontal distance between various elements as indicated in Table P3009.14.8. Private sewage disposal systems in compacted areas, such as parking lots and driveways, are prohibited. Surface water shall be diverted away from any soil absorption site on the same or neighboring lots.

TABLE P3009.14.8
LOCATION OF GRAY WATER SYSTEM

ELEMENT	MINIMUM HORIZONTAL DISTANCE	
	HOLDING TANK (feet)	IRRIGATION DISPOSAL FIELD (feet)
Buildings	5	2
Property line adjoining private property	5	5
Water wells	50	100
Streams and lakes	50	50
Seepage pits	5	5
Septic tanks	0	5
Water service	5	5
Public water main	10	10

For SI: 1 foot = 304.8 mm.

P3009.14.9 Installation. Absorption systems shall be installed in accordance with Sections P3009.14.9.1 through P3009.14.9.5 to provide landscape irrigation without surfacing of gray water.

P3009.14.9.1 Absorption area. The total absorption area required shall be computed from the estimated daily gray water discharge and the design-loading rate based on the percolation rate for the site. The required absorption area equals the estimated gray water discharge divided by the design-loading rate from Table P3009.14.9.1.

TABLE P3009.14.9.1
DESIGN LOADING RATE

PERCOLATION RATE (minutes per inch)	DESIGN LOADING FACTOR (gallons per square foot per day)
0 to less than 10	1.2
10 to less than 30	0.8
30 to less than 45	0.72
45 to 60	0.4

For SI: 1 minute per inch = min/25.4 mm,
1 gallon per square foot = 40.7 L/m^2.

P3009.14.9.2 Seepage trench excavations. Seepage trench excavations shall be a minimum of 1 foot (304 mm) to a maximum of 5 feet (1524 mm) wide. Trench excavations shall be spaced a minimum of 2 feet (610 mm) apart. The soil absorption area of a seepage trench shall be computed by using the bottom of the trench area (width) multiplied by the length of pipe. Individual seepage trenches shall be a maximum of 100 feet (30 480 mm) in developed length.

P3009.14.9.3 Seepage bed excavations. Seepage bed excavations shall be a minimum of 5 feet (1524 mm) wide and have more than one distribution pipe. The absorption area of a seepage bed shall be computed by using the bottom of the trench area. Distribution piping in a seepage bed shall be uniformly spaced a maximum of 5 feet (1524mm) and a minimum of 3 feet (914 mm) apart, and a maximum of 3 feet (914mm) and a minimum of 1 foot (305 mm) from the sidewall or headwall.

P3009.14.9.4 Excavation and construction. The bottom of a trench or bed excavation shall be level. Seepage trenches or beds shall not be excavated where the soil is so wet that such material rolled between the hands forms a soil wire. All smeared or compacted soil surfaces in the sidewalls or bottom of seepage trench or bed excavations shall be scarified to the depth of smearing or compaction and the loose material removed. Where rain falls on an open excavation, the

soil shall be left until sufficiently dry so a soil wire will not form when soil from the excavation bottom is rolled between the hands. The bottom area shall then be scarified and loose material removed.

P3009.14.9.5 Aggregate and backfill. A minimum of 6 inches of aggregate ranging in size from $^1/_2$ to $2^1/_2$ inches (12.7 mm to 64 mm) shall be laid into the trench below the distribution piping elevation. The aggregate shall be evenly distributed a minimum of 2 inches (51 mm) over the top of the distribution pipe. The aggregate shall be covered with approved synthetic materials or 9 inches (229mm) of uncompacted marsh hay or straw. Building paper shall not be used to cover the aggregate. A minimum of 9 inches (229 mm) of soil backfill shall be provided above the covering.

P3009.14.10 Distribution piping. Distribution piping shall be not less than 3 inches (76mm) in diameter. Materials shall comply with Table P3009.14.10. The top of the distribution pipe shall be not less than 8 inches (203mm) below the original surface. The slope of the distribution pipes shall be a minimum of 2 inches (51 mm) andamaximumof4inches (102 mm) per 100 feet (30 480 mm).

TABLE P3009.14.10
DISTRIBUTION PIPE

MATERIAL	STANDARD
Polyethylene (PE) plastic pipe	ASTM F 405
Polyvinyl chloride (PVC) plastic pipe	ASTM D 2729
Polyvinyl chloride (PVC) plastic pipe with a 3.5 inch O.D. and solid celluar core or composite wall.	ASTM F 1488

P3009.14.11 Joints. Joints in distribution pipe shall be made in accordance with Section P3003.

(Renumber subsequent chapters and sections)

Reason: The purpose of this proposal is to bring the gray water recycling systems information in the appendix of the code out of obscurity so the technology can be implemented. The use of gray water as an alternative water source is becoming highly desirable and popular due to the water huge water savings and the shortage of potable water supplies in some areas of the country. This new chapter will promote the reuse of gray water for subsurface irrigation use and the flushing of water closets and urinals. Utilizing the provisions contained within this new chapter will advance the LEED point system for the owners benefit. The unfortunate reality is where provisions are located within an Appendix they are typically subject to adoption at the local level. Moving the current provisions to be included in the body of the code will eliminate the undesirable situation where a locality my not promote this “Green” concept based on the fact that is not code, only an Appendix.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-P5-Chapter 13 NEW

P153–09/10
Table E103.3(3); IRC Table P2903.6(1)

Proponent: Logan G. Sauter – Salt Lake City, Utah representing the Utah Chapter of ICC

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

TABLE E103.3(3)
TABLE FOR ESTIMATING DEMAND

SUPPLY SYSTEMS PREDOMINANTLY FOR FLUSH TANKS			SUPPLY SYSTEM<u>S</u> PREDOMINANTLY FOR FLUSH<u>OMETER</u> VALVES		
Load	**Demand**		**Load**	**Demand**	

(Portions of table not shown remain unchanged)

PART II - IRC

Revise as follows:

TABLE P2903.6(1)
CONVERSIONS FROM WATER SUPPLY FIXTURE UNIT TO GALLON PER MINUTE FLOW RATES

SUPPLY SYSTEMS PREDOMINANTLY FOR FLUSH TANKS			SUPPLY SYSTEM<u>S</u> PREDOMINANTLY FOR FLUSH<u>OMETER</u> VALVES		
Load	**Demand**		**Load**	**Demand**	

(Portions of table not shown remain unchanged)

Reason: "SYSTEM" should be plural to match the title of the left side of the table. A flush valve and a flushometer valve are not the same plumbing device. A flush valve (Douglas valve) is located in the bottom of a flush tank and, when actuated by the tank trip lever, controls the flushing action of that tank. A flushometer valve, on the other hand, is a valve that, when activated, dispenses a predetermined amount of water to flush a water closet, urinal, bedpan washer, and other fixtures designed for flushometer controlled flushing. Please note IRC R202 definition for a flush valve, "A device located at the bottom of a flush tank that is operated to flush water closets". Note also IPC 202 definition for a flush tank, "A tank designed with a fill valve and <u>flush valve</u> to flush the contents of the bowl or usable portion of the fixture".

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Sauter-P4-TE103.3(3)

P154–09/10
608.16.3; IRC P2902.5.2

Proponent: Gary Kreutziger, City of San Antonio, Tx. representing the Planning and Development Services Department

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

608.16.3 Heat exchangers. Heat exchangers ~~using an essentially toxic transfer fluid~~ in a potable water system shall be separated from the potable water by double-wall construction. An *air gap* open to the atmosphere shall be provided between the two walls. Heat exchangers ~~utilizing an essentiallly nontoxic transfer fluid~~ in a nonpotable water system shall be permitted to be of single-wall construction.

PART II – IRC

Revise as follows:

P2902.5.2 Heat exchangers. Heat exchangers ~~using an essentially toxic transfer fluid~~ in a potable water system shall be separated from the potable water by double-wall construction. An *air gap* open to the atmosphere shall be provided between the two walls. Heat exchangers ~~utilizing an essentiallly nontoxic transfer fluid~~ in a nonpotable water system shall be permitted to be of single-wall construction.

Reason: The purpose of the proposed code change is to provide clarification of Section 608.16.3 (IRC P2902.5.2) with out changing the intent. By eliminating the ambiguous language in this section such as "essentially non toxic" clarity and intent are achieved. The extra protection provided by a heat exchanger of double wall construction should be provided for all potable water systems regardless of the level of toxicity of the heat-transfer medium. The level of protection provided by a double wall heat exchanger is a cost effective method of ensuring that the publics water quality expectations are met, by reducing the possibility of introducing even "essentially nontoxic transfer fluid" into the potable water.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Kreutziger-P2-608.16.3

P155–09/10
310.2 (New), 310.4, 310.5, 405.3.2 (New), 405.3.3 (New), 405.3.4 (New)

Proponent: John T.E. Walters, Prince William County. VA., representing the Virginia Plumbing and Mechanical Inspectors Association (VPMIA)

1. Revise as follows:

~~**310.2**~~ **405.3.2 Location of fixtures and piping.** Piping, fixtures or equipment shall not be located in such a manner as to interfere with the normal operation of windows, doors or other means of egress openings.

~~**310.4**~~ **405.3.3 Water closet compartment.** Each water closet utilized by the *public* or employees shall occupy a separate compartment with walls or partitions and a door enclosing the fixtures to ensure privacy.

Exceptions:

1. Water closet compartments shall not be required in a single-occupant toilet room with a lockable door.
2. Toilet rooms located in day care and child-care facilities and containing two or more water closets shall be permitted to have one water closet without an enclosing compartment.
3. This provision is not applicable to toilet areas located within Group I-3 housing areas.

~~**310.5**~~ **405.3.4 Urinal partitions.** Each urinal utilized by the *public* or employees shall occupy a separate area with walls or partitions to provide privacy. The walls or partitions shall begin at a height not more than 12 inches (305 mm) from and extend not less than 60 inches (1524 mm) above the finished floor surface. The walls or partitions shall extend from the wall surface at each side of the urinal a minimum of 18 inches (457 mm) or to a point not less than 6

inches (152 mm) beyond the outermost front lip of the urinal measured from the finished backwall surface, whichever is greater.

Exceptions:

1. Urinal partitions shall not be required in a single occupant or family/assisted-use toilet room with a lockable door.
2. Toilet rooms located in day-care and child-care facilities and containing two or more urinals shall be permitted to have one urinal without partitions.

(Renumber subsequent sections)

2. Add new text as follows:

310.2 Location of fixtures and compartments. Plumbing fixture location and the requirements for compartments and partitions shall be in accordance with Section 405.3.

(Renumber subsequent sections)

Reason: By moving these sections, it will make it easier for the reader to find the necessary information and be closer to where it is really needed. Because the current Section 405 does not contain requirements for separate compartments or privacy (urinal partitions), the reader can easily forget or be unaware that partitions/compartments are required. This affects the layout of the fixtures covered in section 405.3.1. The knowledge concerning compartments/partitions is critical to the proper fixture location and needs to be in the same related section as the fixture clearance dimension. The new section 310.2 serves as a pointer for the reader to not miss the requirements of Section 405.3.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WALTERS-P5-310.2

P156–09/10
312.3; IRC P2503.5.1

Proponent: Judson Collins, JULYCO, representing himself.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

312.3 Drainage and vent air test. Plastic piping shall not be tested using air. An air test shall be made by forcing air into the system until there is a uniform gauge pressure of 5 psi (34.5 kPa) or sufficient to balance a 10-inch (254 mm) column of mercury. This pressure shall be held for a test period of at least 15 minutes. Any adjustments to the test pressure required because of changes in ambient temperatures or the seating of gaskets shall be made prior to the beginning of the test period.

PART II – IRC

P2503.5.1 Rough plumbing. DWV systems shall be tested on completion of the rough piping installation by water or air with no evidence of leakage. Either test shall be applied to the drainage system in its entirety or in sections after rough piping has been installed, as follows:

1. Water test. Each section shall be filled with water to a point not less than 10 feet (3048 mm) above the highest fitting connection in that section, or to the highest point in the completed system. Water shall be held in the section under test for a period of 15 minutes. The system shall prove leak free by visual inspection.
2. Air test. Plastic piping shall not be tested using air. The portion under test shall be maintained at a gauge pressure of 5 pounds per square inch (psi) (34kPa) or 10 inches of mercury column (34 kPa). This pressure shall be held without introduction of additional air for a period of 15 minutes.

Reason:
PART I- Section 312.1 does not allow air to be used for testing any plastic piping plumbing system. Section 312.5 repeats the prohibition for water system testing. Section 312.3 does not. This proposal will identify the prohibition in Section 312.3.
PART II- The IRC should reflect the same concern for safety during testing as does the IPC.

Cost Impact: None

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

COLLINS-P7-312.3

P157–09/10
604.8, Chapter 13; IRC P2903.3.1, Chapter 44

Proponent: Abraham I. Murra, Canadian Standards Association, representing the Canadian Standards Association

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

1. Revise as follows:

604.8 Water pressure reducing valve or regulator. Where water pressure within a building exceeds 80 psi (552 kPa) static, an *approved* water-pressure reducing valve conforming to ASSE 1003 or CSA B356 with strainer shall be installed to reduce the pressure in the building water distribution piping to 80 psi (552 kPa) static or less.

2. Add standard to Chapter 13 as follows:

CSA
B356-00(2005) Water Pressure Reducing Valves for Domestic Water Supply Systems

PART II - IRC

1. Revise as follows:

P2903.3.1 Maximum pressure. Maximum static pressure shall be 80 psi (551 kPa). When main pressure exceeds 80 psi (551 kPa), an approved pressure-reducing valve conforming to ASSE 1003 or CSA B356 shall be installed on the domestic water branch main or riser at the connection to the water-service pipe.

2. Add standard to Chapter 44 as follows:

CSA
B356-00(2005) Water Pressure Reducing Valves for Domestic Water Supply Systems

Reason: The acceptance of the proposed change will enable manufacturers with products certified to CSA B356 to have their products used as options to products that meet the requirements of ASSE 1003. This change will also allow the authorities having jurisdiction to allow the use of products that meet either CSA B356 or ASSE 1003.

Cost Impact: The code change proposal will not increase the cost of production.

Analysis: Review of proposed new standard, CSA B356-00(2005), for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Murra-P3-604.8

P158–09/10
504.7.3 (New); IRC P2801.5.3 (New)

Proponent: Douglas Sabbag, Resource Conservation Technologies, Inc.

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

504.8 Leak detector required. Upon water heater installation, an alarm device shall be installed in the drain pan. The alarm shall sense when the water level in the drain pan exceeds ½ inch in depth and shall produce an audible alert.

PART II – IRC

Revise as follows:

P2801.5.3 Leak detector required. Upon water heater installation, an alarm device shall be installed in the drain pan. The alarm shall sense when the water level in the drain pan exceeds ½ inch in depth and shall produce an audible alert.

Reason: Water Heaters are generally considered a maintenance-free appliance, but they are also one of the single most damaging appliances in the home. Because water heaters are continually under pressure, even small pressurized leaks can quickly flood and devastate a home. Whether at home or at work, these flooding events can go undetected for hours or even days.

It is a common occurrence that water heaters leak, especially near the end of their standard or expected life cycle. Leaking water heaters are usually found months or years after their initial installation with their associated damages. One common cause of leaking is when the first two to three courses of galvanized threads begin to deteriorate since water is in contact with the copper and galvanized piping. This corrosion at the connections into the water heater, eventually lead to leaks.

A slow leak can cause a water heater to rust and the surrounding floors and walls to decay. The price tag from such damage can be significant: water heater failures cost an average of more than $4,444 per incident. (http://www.disastersafety.org/text.asp?id=water_heaters)

Besides the frequently extensive damages to the surrounding building materials caused from the leaking water, there is also a very substantial loss of water occurring nationally and internationally from leaking hot water tanks. In just one county in Florida, i.e., Manatee County, it is estimated that there are currently 1,282 leaking water heaters, with a conservative water loss, (at one drop per second), of 2,700 gallons per year, per leaking water heater, or a total of 3,461,400 gallons of wasted water per year. At the ¼ GPM of loss rate, which given the pressurized water condition is frequently the case, the same number of leaking water heaters: (1,282) cause 572,351 gallons of lost water in one day; which extends to 208,908,229 gallons in a year.

On a national level, it is estimated that there are 957,788 leaking hot water heaters. At the ¼ GPM rate of leakage, that equals 156,058,166,261 gallons wasted in a year. One hundred and fifty six BILLION GALLONS of WASTED WATER.

The associated energy which was required to provide that wasted potable water is likewise, extensive.

Cost Impact: A simple to install audible alarm costs under $30.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SABBAAG-P1-504.7.3 NEW

P159–09/10
904.5; IRC P3103.5

Proponent: Guy McMann, Jefferson County Colorado, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I - IPC

Revise as follows:

904.5 Location of vent terminal. An open vent terminal from a drainage system shall not be located directly beneath any door, openable window, or other air intake opening of the building or of an adjacent building, and any such vent terminal shall not be within 10 feet (3048 mm) horizontally of such an opening unless it is at least ~~2 feet (610 mm)~~ 3 feet (914 mm) above the top of such opening.

PART II - IRC

Revise as follows:

P3103.5 Location of vent terminal. An open vent terminal from a drainage system shall not be located less than 4 feet (1219 mm) directly beneath any door, openable window, or other air intake opening of the building or of an adjacent building, nor shall any such vent terminal be within 10 feet (3048 mm) horizontally of such an opening unless it is at least ~~2 feet (610 mm)~~ 3 feet (914 mm) above the top of such opening

Reason: This dimension is inconsistent with many of the other code books such as IMC-401.4 #3; IRC-G2427.6.6 and G2427.8 #1; IFGC-503.6.7; IFGC-618.5 and IFGC-503.8 #1. This 3-foot dimension has been around for years and was also found in the legacy codes. It's very important that the entire family of codes is consistent. It's important that sources of contamination don't make their way into building openings and 3 feet will best accomplish this.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCMANN-P1-904.5

P160–09/10
608.16.3; IRC P2902.5.2

Proponent: Gary Kreutziger, City of San Antonio, Tx. representing the Planning and Development Services Department

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IPC COMMITTEE. PART II WILL BE HEARD BY THE IRC PLUMBING COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IPC

Revise as follows:

715.1 Sewage backflow. Where ~~the flood level rims of~~ plumbing fixtures are installed on a floor with a finished floor elevation below the elevation of the manhole cover of the next upstream manhole in the *public sewer,* such fixtures shall be protected by a backwater valve installed in the *building drain*, or horizontal *branch* serving such fixtures. Plumbing fixtures ~~having flood level rims~~ installed on a floor with a finished floor elevation above the elevation of the manhole cover of the next upstream manhole in the *public sewer* shall not discharge through a backwater valve.

PART II – IRC

Revise as follows:

P3008.1 Sewage backflow. Where ~~the flood level rims of~~ plumbing fixtures are installed on a floor with a finished floor elevation below the elevation of the manhole cover of the next upstream manhole in the *public sewer,* such fixtures shall be protected by a backwater valve installed in the *building drain*, or horizontal *branch* serving such fixtures. Plumbing fixtures ~~having flood level rims~~ installed on a floor with a finished floor elevation above the elevation of the manhole cover of the next upstream manhole in the *public sewer* shall not discharge through a backwater valve.

Reason: The purpose of the proposed code change is to provide one consistent elevation for all fixtures on a floor that has an elevation less than the manhole cover of the next upstream manhole. This change will provide a substantial increase in the level of protection for some fixtures such as lavatories while having only a small increase in the level of protection a shower pan, floor drain, mop sink, but yet an overall increase in protection for the structure. The use of the finished floor elevation will eliminate the reliance on the seal between a floor flange and wax ring of a water closet to maintain a seal in a pressure situation in the direction of flow for which it is not intended. In an installation where a wax seal with the rubber boot is installed a backwater situation will force sewage between the boot and drain pipe and out through the floor flange. The cost will save on labor for installation due to only having to determine one elevation versus many.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IPC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IRC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Kreutziger-P3-715.1

P161–09/10
304.4

Proponent: Shawn Strausbaugh – Arlington County, VA representing Virginia Plumbing and Mechanical Inspectors Association

Revise as follows:

304.4 Openings for pipes. In or on structures where openings have been made in walls, floors or ceilings for the passage of pipes, ~~such openings~~ the annular space between the pipe and the sides of the opening shall be ~~closed and protected by the installation of approved metal collars that are securely fastened to the adjoining structure~~. sealed with caulking materials or closed with gasketing systems compatible with the piping materials and locations.

Reason: The new wording is the same as the requirements of the International Energy Conservation Code section 502.4.3 and coordinates this section with similar language. What is an approved metal collar and how do you securely fasten this to the adjoining structure. Is the intent of the code as written to require an escutcheon type metal collar at every piping penetration? How do you address the dissimilar materials when piping is touching the metal collar. If the collar is not touching the piping materials, how is it going to protect against the passage of rodents or vermin?

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: STRAUSBAUGH-P2-304.4

P162–09/10
403.3 (IBC [P]2902.3)

Proponent: Donald R. Monahan, PE, Walker Parking Consultants, representing the National Parking Association and the Automated & Mechanical Parking Association

Add new text as follows:

403.3 (IBC [P] 2902.3) Required public toilet facilities. Customers, patrons and visitors shall be provided with public toilet facilities in structures and tenant spaces intended for public utilization. The number of plumbing fixtures located within the required toilet facilities shall be provided in accordance with Section 2902.1 for all users. Employees shall be provided with toilet facilities in all occupancies. Employee toilet facilities shall either be separate or combined employee and public toilet facilities.

> **Exception:** Public toilet facilities shall not be required in open or enclosed parking garages. Toilet facilities shall not be required in parking garages where there are no parking attendants. Toilet facilities in buildings adjacent to parking garages shall be permitted to serve parking garage attendants provided that the location of the toilet facilities complies with Section 403.3.2.

Reason: Parking garages are not considered to be occupied buildings. Toilet facilities are generally provided in an adjacent building served by the parking garage. Public toilet facilities in particular can be a security and maintenance concern in parking garages as they are often vandalized during periods of low activity.

Cost Impact: There will be a significant cost savings not to install toilet facilities in parking garages as well as minimizing security concerns and potential vandalism.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MONAHAN-P2-403.3

P163–09/10
911.3

Proponent: Richard Grace/Fairfax County/Virginia VA Plumbing and Mechanical Inspectors/VA Building and Code Officials

Revise as follows:

911.3 Slope and size of horizontal branch. The maximum slope of the vent section of the horizontal branch drain shall be one unit vertical in 12 units horizontal (8.3-percent slope). The entire length of the vent section of the horizontal branch drain shall be sized for the total drainage discharge to the branch.

Reason: The slope percent for 1 in 12 is 8.3, not 8. This correction provides consistency throughout all codes that reference this slope.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICC FILENAME:GRACE-P3-911.3 CCC

P164–09/10
903, 904, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916

Proponent: Robert G. Konyndyk, Chief, Plumbing Division, Bureau of Construction Codes, State of Michigan

Revise as follows:

SECTION ~~903~~ 904
OUTDOOR VENT EXTENSIONS
(Renumber sections not shown)

SECTION ~~904~~ 903
VENT TERMINALS
(Renumber sections not shown)

SECTION ~~906~~ 909
FIXTURE VENTS
(Renumber sections not shown)

SECTION ~~907~~ 910
INDIVIDUAL VENTS
(Renumber sections not shown)

SECTION ~~908~~ 911
COMMON VENTS
(Renumber sections not shown)

SECTION ~~909~~ 912
WET VENTING
(Renumber sections not shown)

SECTION ~~910~~ 913
WASTE STACK VENT
(Renumber sections not shown)

SECTION ~~911~~ 914
CIRCUIT VENTING
(Renumber sections not shown)

SECTION ~~912~~ 915
COMBINATION DRAIN AND VENT SYSTEM
(Renumber sections not shown)

SECTION ~~913~~ 916
ISLAND FIXTURE VENTING
(Renumber sections not shown

SECTION ~~914~~ 908
RELIEF VENTS--STACKS OF MORE THAN 10 BRANCH INTERVALS
(Renumber sections not shown)

SECTION ~~915~~ 907
VENTS FOR STACK OFFSETS
(Renumber sections not shown)

SECTION ~~916~~ 906
VENT PIPE SIZING
(Renumber sections not shown)

Reason: This proposal changes the order of the subject matter to read in an orderly, systematic manner. No changes are being made to the technical content within the sections Even though this seems like a bold move, the new order will make a great deal of sense to the design community. This is a similar to the reorganization of the legacy codes into the common code format that occurred several years ago. The resulting new order of Chapter 9 will be as follows:

SECTION 901
GENERAL

SECTION 902
MATERIALS

SECTION 903
VENT TERMINALS

SECTION 904
OUTDOOR VENT EXTENSIONS

SECTION 905
VENT CONNECTIONS AND GRADES

SECTION 906
VENT PIPE SIZING

SECTION 907
VENTS FOR STACK OFFSETS

SECTION 908
RELIEF VENTS STACKS OF MORE THAN 10 BRANCH INTERVALS

SECTION 910
INDIVIDUAL VENTS

SECTION 911
COMMON VENTS

SECTION 911 COMMON VENTS

SECTION 912
WET VENTING

SECTION 913
WASTE STACK VENT

SECTION 914
CIRCUIT VENTING

SECTION 915
COMBINATION DRAIN AND VENT SYSTEM

SECTION 916
ISLAND FIXTURE VENTING

SECTION 917
AIR ADMITTANCE VALVES

SECTION 918
ENGINEERED VENT SYSTEMS

SECTION 919
COMPUTERIZED VENT DESIGN

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The proposal does not change the technical content of the chapter.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:KONYNDYK-P3-CHAPTER 9 CCC

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL PROPERTY MAINTENANCE/ZONING CODE COMMITTEE

PROPERTY MAINTENTANCE/ ZONING CODE COMMITTEE

Thomas Hall, CBO - *Chair*
Code Administrator
City of Wauseon, Ohio
Wauseon, OH

Richard Lambert – *Vice Chair*
Building Inspector
City of Saco
Saco, ME

Richard Crawford
President
Mercer Sign Consultants
Doylestown, PA

Dr. Thomas Culp
President
Birch Point Consulting LLC
La Crosse, WI

Teresa Deitz
Property Maintenance Inspector
City of Columbus
Columbus, GA

Sean Farrell
Chief Property Code Enforcement Inspector
Prince William county
Woodbridge, VA

Roy Fyffe
Chief Building Official
City of Burnet
Burnet, TX

Kirk Nagle
Permit Coordinator
City of Arvada
Arvada, CO

Brant Pitchford
Housing Supervisor
City of Tulsa
Tulsa, OK

Ronald Reynolds, CBO, CFO
Chief Deputy, VA State Fire Marshal's Office
Virginia State Fire Marshal's Office
Glen Allen, VA

Peter Tantala, PE
Principal
Tantala Associates
Philadelphia, PA

Jeffrey Tennill
Building Official/Chief Code Enforcement Officer
City of Shelbyville
Shelbyville, KY

Staff Secretariat:
Ed Wirtschoreck, LA
Manager, Standards
International Code Council

TENTATIVE ORDER OF DISCUSSION

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL PROPERTY MAINTENANCE/ZONING CODE

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does **not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair.

IPMC

ADM38-09/10
PM1-09/10
PM2-09/10
PM3-09/10
PM4-09/10
PM5-09/10
PM6-09/10
PM7-09/10
PM8-09/10
PM9-09/10
PM10-09/10
PM11-09/10
PM14-09/10
PM15-09/10
PM16-09/10
PM17-09/10
PM18-09/10

ZONING

Z1-09/10
Z2-09/10

PM1–09/10
201.3

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

201.3 Terms defined in other codes. Where terms are not defined in this code and are defined in the *International Building Code, International Fire Code,* International Residential Code, International Fuel Gas Code, *International Zoning Code, International Plumbing Code, International Mechanical Code* or NFPA 70, such terms shall have the meanings ascribed to them as stated in those codes.

Reason: The *International Property Maintenance Code* covers installations also addressed by the International Residential Code and the International Fuel Gas Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-PM1-201.3.DOC

PM2–09/10
202, 302.10, Chapter 8

Proponent: Mike Ennis, Single Ply Roofing Industry (SPRI), representing the Single Ply Roofing Industry (SPRI)

1. Add new text as follows:

SECTION 202
DEFINITIONS

VEGETATIVE ROOF SYSTEM: A Vegetative Roof System consists of vegetation, growth media, drainage system, and waterproofing over a roof deck.

302.10 Vegetative roof system maintenance. Vegetative Roof Systems shall be maintained to:

1. Provide vegetation that nominally covers the visible surface of the growth media as described in ANSI/SPRI RP-14;
2. Sustain the system keeping vegetative roof plants healthy; and
3. Keep dry foliage to a minimum.

Such maintenance includes, but is not limited to irrigation, fertilization, and weeding. Excess biomass shall be removed at regular intervals not less than two times per year. Provision shall be made to provide access to water for permanent or temporary irrigation. When wind scour occurs to an existing vegetative roof system and the scour is less than 50 square feet, the growth media and plants shall be replaced. For scour areas greater than 50 square feet, the vegetative roof design shall be upgraded a minimum of one system design level in accordance with Section 4.0 of ANSI/SPRI RP-14.

2. Add new standard to Chapter 8 as follows:

ANSI/SPRI
RP-14- 2009 Wind Design Standard for Vegetative Roofing Systems

Reason: The International Building Code added requirements (Section 1507.16) that include fire and wind resistance for vegetative roof systems. Proper maintenance of vegetative roof systems is important to ensure acceptable fire and wind performance of these systems. For this reason maintenance requirements for these systems are being proposed for addition to the IPMC. To support these requirements a definition for a vegetative roof system is being proposed.

Further, the International Building Code added a new section (Section 1507.16) that mandates performance requirements for vegetative roof systems, including fire and wind performance. The maintenance of the vegetation on these roofs is an important factor for the long-term wind and fire performance of these systems. Properly maintained vegetative roof systems have a long history of excellent performance with respect to fire and wind resistance. Keeping the plants alive and healthy and removing dead foliage will ensure the acceptable fire performance of these roof systems.

Healthy plants are also an important factor with respect to wind resistance because the root system of the plants acts to bind the system together preventing damage during high wind events. Another important key to maintaining the wind resistance of these systems is to inspect the roof periodically for signs of wind scour. If found these areas need to be corrected per the requirements of ANSI/SPRI RP-14.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard(s) proposed for inclusion in the code, ANSI/SPRI RP-14-2009, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENNIS-PM1 PM2-202 302.10.DOC

PM3–09/10
302.7

Proponent: Joseph R. Hetzel, Thomas Associates, Inc., representing the Door & Access Systems Manufacturers Association (DASMA)

Revise as follows:

302.7 Accessory structures. All accessory structures, including detached garages, fences and walls, shall be maintained structurally sound and in good repair. Doors and gates, including operator systems if provided, shall be maintained in proper operating condition.

Reason: The purpose of the proposed code change is to address maintenance of operational aspects of accessory structures not made clear in the first sentence under Section 302.7, to draw attention to such operational aspects such that they could continue to perform their intended functions while checking on the presence of any automated door/gate safety functions and whether they are working.

The current provisions are inadequate because they do not consider the increased positive effect on public safety by effectively maintaining large moving objects, i.e. doors and gates, versus stationary objects, i.e. garages, fences, walls. The proposed language fills this need, with code and legislative precedence for automated doors and gates helping define an effective evaluation for maintenance purposes. Automated garage doors are required to comply with UL 325 per the IBC, the IRC, and (for residential) Federal law. Automated vehicular gates are required to comply with UL 325 and ASTM F2200 per the IBC and the IFC, and a proposed code change has been submitted to incorporate provisions into the IRC.

Death and injury statistics are well established for individuals that have been entrapped by automated garage doors and automated vehicular gates not in compliance with the UL 325 and ASTM F2200 safety standards. The new provisions will be a preventive measure toward a reduction of death and injuries by encouraging regular inspecting of the door and gate systems particularly those that are automated.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HETZEL-PM1-302.7.DOC

PM4–09/10
304.15

Proponent: Joseph R. Hetzel, Thomas Associates, Inc., representing the Door & Access Systems Manufacturers Association (DASMA)

Revise as follows:

304.15 Doors. All exterior doors, door assemblies, operator systems if provided, and hardware shall be maintained in good condition. Locks at all entrances to dwelling units and sleeping units shall tightly secure the door. Locks on means of egress doors shall be in accordance with Section 702.3.

Reason: The purpose of the proposed code change is to address maintenance of automated aspects of doors not made clear in the first sentence under Section 304.15. The phrase “operator systems if provided” draws attention to automated doors, for checking on the performance to their intended functions while checking on the presence of any automated door safety functions and whether they are working.

The current provisions are inadequate because they do not consider the increased positive effect on public safety by effectively maintaining automated door systems. The proposed language fills this need, with code and legislative precedence for automated doors helping define an effective evaluation for maintenance purposes. As an example, automated garage doors are required to comply with UL 325 per the IBC, the IRC, and (for residential) Federal law.

Death and injury statistics are well established for individuals that have been entrapped by automated garage doors not in compliance with the UL 325 safety standard. The new language will be a preventive measure toward a reduction of death and injuries by requiring regular inspecting of automated door systems including automated garage doors.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HETZEL-PM1-302.7.DOC

PM5–09/10
304.19 (New)

Proponent: Joseph R. Hetzel, Thomas Associates, Inc., representing the Door & Access Systems Manufacturers Association (DASMA)

Add new text as follows:

304.19 Gates. All exterior gates, gate assemblies, operator systems if provided, and hardware shall be maintained in good condition. Locks at all entrances shall tightly secure the gates.

Reason: The purpose of the proposed code change is to address maintenance aspects of gates, and is patterned after Section 304.15. The phrase "operator systems if provided" draws attention to automated gates, for checking on the performance to their intended functions while checking on the presence of any automated gate safety functions and whether they are working.

The current provisions are inadequate because they do not consider the increased positive effect on public safety by effectively maintaining automated gate systems. The proposed language fills this need, with code precedence for automated gates helping define an effective evaluation for maintenance purposes. As an example, automated gates are required to comply with UL 325 and ASTM F 2200 per the IBC and the IFC.

Death and injury statistics are well established for individuals that have been entrapped by automated gates not in compliance with the UL 325 and ASTM F2200 safety standards. The new provisions will be a preventive measure toward a reduction of death and injuries by encouraging regular inspecting of automated gate systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HETZEL-PM3-304.19.DOC

PM6–09/10
305.3

Proponent: Thomas P. Mahar, New York State Department of State – Codes Division

Revise as follows:

305.3 Interior surfaces. All interior surfaces, including windows and doors, shall be maintained in good, clean and sanitary condition. Peeling, chipping, flaking or abraded paint shall be repaired, removed or covered. Deteriorated lead-based paint shall be controlled using approved lead-safe working practices. Cracked or loose plaster, decayed wood and other defective surface conditions shall be corrected.

Reason: The basic IPMC document, in Section 305.3, devoted one sentence to "peeling, chipping, flaking or abraded paint shall be repaired, removed or covered." This section does not mention lead-based paint; however, the accompanying IPMC Commentary devotes well over a half-page of text on the hazards of lead-based paint. Because the commentary is not the official code text and also because many code officials do not obtain a copy of this document, they may not be aware of the significant threats posed by lead-based paint. The purpose of this code change is to add language which alerts the code official of the danger and also direct the code official to other areas where additional assistance is available.

The proposal is superior to the current provision because it provides some helpful information while the current code provision offers no information on the dangers associated with lead-based paint. The reason for including the helpful information here in this particular code section is that lead-based paint is and continues to be the most significant source of high-lead exposure for children in the United States. While the highest risk is for pre-1946 housing, there is continued high risk for all housing built before the federal ban on high-lead paint in 1977. Nationally, tens of millions of existing housing units were built prior to the ban and many of these units are in increasingly dilapidated condition. Exposure to lead is associated with a range of serious health effects on children, including detrimental effects on cognitive and behavioral development with serious personal and social consequences that may persist throughout their lifetime. Lead poisoning is a completely preventable condition. The proposed addition to this code section will alter the code official that older housing stock is a big potential source of lead and to educate the code official in considering effective solutions by coordinating efforts with other agencies.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAHAR-PM1-305.3.DOC

PM7–09/10
308

Proponent: Robert F. Hale, Jr., Town of Warrenton, VA, representing Virginia Building Code Officials Association

1. Revise section title as follows:

SECTION 308
RUBBISH AND GARBAGE AND OTHER MATERIALS

2. Add new text as follows:

308.4 Accumulation of other materials. Materials of any type shall not be accumulated within a structure so as to impede upon the safe occupancy or egress from the space or significantly alter its intended use.

When materials of any type are gathered together within a room or space so as to limit the space within the room anywhere between 2' and 6' above the finished floor to less than the required square footage specified in Section 404 of this code, then the room or space in question shall then be considered a storage area as defined in Section 311.2 or 311.3 of the *International Building Code* and subsequently a change of occupancy as specified in Section 3408 of the *International Building Code*.

If the materials stored within a room or space exceed the permitted floor loading, then the room or space in question shall then be considered a storage area as defined in Section 311.2 or 311.3 of the *International Building Code* and subsequently a change of occupancy as specified in Section 3408 of the *International Building Code*.

Reason: The accumulation of materials within dwelling units and other spaces is an unsafe practice that leads to blocked egress, super-imposed loads, non-functional spaces as well as being a potentially deadly fire hazard. This proposed code section permits the code official enforcement option where none existed before to deal with conversions of use to storage.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HALE-PM1-308

PM8–09/10
404

Proponent: Jeffrey N. Gentile, PE, Upper Darby Township, representing Pennsylvania Association of Building Code Officials, Inc.

1. Revise as follows:

404.4 Bedroom ~~and living room~~ requirements. Every *bedroom* ~~and living room~~ shall comply with the requirements of Sections 404.4.1 through 404.4.5.

~~**404.4.1 Room area. Area** Every living room shall contain at least 120 square feet (11.2m^2) and every bedroom shall contain at least 70 square feet (6.5m^2).~~

404.4.1 Area for sleeping purposes. Every bedroom occupied by one person shall contain at least 70 square feet (6.5m^2) of floor area, and every bedroom occupied by more than one person shall contain at least 50 square feet (4.6m^2) of floor area for each occupant thereof.

404.5 Overcrowding. ~~The number of persons occupying a *dwelling unit* shall not create conditions that, in the opinion of the *code official*, endanger the life, health, safety or welfare of the *occupants*.~~ Dwelling units shall not be occupied by more occupants than permitted by the minimum area requirements of Table 404.5.

2. Add new text as follows:

404.5.1 Sleeping area. The minimum occupancy area required by Table 404.5 shall not be included as a sleeping area in determining the minimum occupancy area for sleeping purposes. All sleeping areas shall comply with Section 404.4.

404.5.2 Combined spaces. Combined living room and dining room spaces shall comply with the requirements of Table 404.5 if the total area is equal to that required for separate rooms and if the space is located so as to function as a combination living room/dining room.

TABLE 404.5
MINIMUM AREA REQUIREMENTS

SPACE	MINIMUM AREA IN SQUARE FEET		
	1-2 occupants	3-5 occupants	6 or more Occupants
Living room [a,b]	No requirements	120	150
Dining room [a,b]	No requirements	80	100
Bedrooms	Shall comply with Section 404.4		

For SI: 1 square foot = 0.929 m^2

a. See Section 404.5.2 for combined living room/dining room spaces.
b. See Section 404.5.1 for limitations on determining the minimum occupancy area for sleeping purposes.

Reason: This change puts specific occupancy numbers back into the property maintenance code as were outlined in the 2003 IPMC. These requirements were eliminated in the 2006 IPMC and this proposal puts them back in. The current wording puts too much onus on the code official to prove overcrowding and leaves the determination wide open to interpretation. Being able to determine specific occupancy limits makes it easier for the code official to determine whether a dwelling unit violates the overcrowding provisions of the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposals PM8, PM9 and PM10 deal with minimum room area requirements. PM10 proposes placing minimum area requirements in an appendix. The committee needs to make its intent clear with respect to the location of these requirements, if approved.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GENTILE-PM1-404.4.DOC

PM9–09/10

404.4.1, 404.5, Table 404.5 (New), 404.5.1 (New), 404.5.2 (New)

Proponent: Sean P. Farrell, Prince William County Virginia, representing Virginia Building and Code Officials Association

1. Revise as follows:

404.4.1 Room area. Every living room shall contain at least 120 square feet (11.2 m^2) and every bedroom shall contain at least 70 square feet (6.5 m^2) and every bedroom occupied by more than one person shall contain at least 50 square feet (4.6 m^2) of floor area for each occupant thereof.

404.5 Overcrowding. ~~The number of persons occupying a dwelling unit shall not create conditions that, in the opinion of the code official, endanger the life, health, safety or welfare of the occupants.~~ Dwelling units shall not be occupied by more occupants than permitted by the minimum area requirements of Table 404.5.

2. Add new table and text as follows:

TABLE 404.5
MINIMUM AREA REQUIREMENTS

SPACE	MINIMUM AREA IN SQUARE FEET		
	1-2 occupants	3-5 occupants	6 or more occupants
Living room[a, b]	120	120	150
Dining room[a, b]	No requirement	80	100
Bedrooms	Shall comply with Section 404.4.1		

For SI: 1 square foot = 0.093 m^2

a. See Section 404.5.2 for combined living room/dining room spaces.
b. See Section 404.5.1 for limitations on determining the minimum occupancy area for sleeping purposes.

404.5.1 Sleeping area. The minimum occupancy area required by Table 404.5 shall not be included as a sleeping area in determining the minimum occupancy area for sleeping purposes. All sleeping areas shall comply with Section 404.4.

404.5.2 Combined spaces. Combined living room and dining room spaces shall comply with the requirements of Table 404.5 if the total area is equal to that required for separate rooms and if the space is located so as to function as a combination living room/dining room.

Reason: Code officials need objective criteria in which to draw conclusions and make educated and calculated decisions. The current code language "in the opinion of" is as subjective as language and text can be. By adding the square footage table back into the code, the official has objective criteria based upon reasonable and normal household conditions that account for live and dead loading. In most cases, the numbers in the table are very liberal but are effective at dealing with true overcrowded rooms and structures. The reason the language was stricken from the code several years ago was to allow for a couple and their small child(ren) to occupy a single room less than 150 square feet. This option is still afforded to the code official by way of code modification. Additionally, a strict interpretation of the current language does not allow for individual overcrowded room situations, the code official must take the entire unit into consideration even when the occupants may not have rights to the entire unit. We feel that is an unnecessary limitation imposed on the code official trying to ensure the safety of the occupants.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposals PM8, PM9 and PM10 deal with minimum room area requirements. PM10 proposes placing minimum area requirements in an appendix. The committee needs to make its intent clear with respect to the location of these requirements, if approved.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FARRELL-PM1-404.4.1.DOC

PM10–09/10
Appendix B (New)

Proponent: John Morgan, City of Frontenac, MO, representing Missouri Association of Building Officials and Inspectors

Add new appendix as follows:

APPENDIX B
DWELLING UNIT OVERCROWDING

SECTION B101
OVERCROWDING

B101.1 Overcrowding. Dwelling units shall not be occupied by more occupants than permitted by the minimum area requirements of Table B101.1:

TABLE B101.1
MINIMUM AREA REQUIREMENTS

SPACE	MINIMUM AREA IN SQUARE FEET		
	1-2 occupants	3-5 occupants	6 or more occupants
Living rooms[a]	No requirements	120	150
Dining rooms[a]	No requirements	80	100
Bedrooms	Every bedroom occupied by one person shall contain at least 70 square feet (6.5 m^2) of floor area, and every bedroom occupied by more than one person shall contain at least 50 square feet (4.6 m^2) of floor area for each occupant thereof.		

a. Combined spaces: A dining room and living room may be combined if so designed to function as a combination space and if the total area is the combined area for the separate rooms from the above table.

Reason: The property maintenance code was changed in 2003 to remove an overcrowding requirement with relation to bedroom sizes. This has been a long standing requirement in at least one of the legacy property maintenance codes. The current wording is very subjective. A code official or fire official can determine if there is a structural hazard or fire hazard but how does one arbitrarily determine that there are too many people occupying a dwelling unit. In fact, section 404.6 of the code seems to contradict the very reasoning of section 404.5. How is it that an efficiency unit requires minimum occupancy requirements but other dwelling units do not? One could argue that the fuel load in an efficiency unit is less than that in other dwelling units and that there is safer egress from an efficiency unit. With regard to dwelling units; is a bedroom that is 15 feet by 10 feet with six bunk beds sufficient or is it overcrowding? Also, if a dwelling was constructed to an adopted code and the bedrooms meet the egress requirements and notification requirements of that code, based on the current wording of the property maintenance code a large number of people could technically sleep in the bedroom and there can be little to no legal argument otherwise. Is that what the maintenance code was intended to do? Some officials may want to take on that kind of liability, however we believe there needs to be some guidance for the code official and therefore we are recommending that an appendix A be added to the IPMC utilizing a long standing and well tested method of determining the occupant load for a single family dwelling. This way a jurisdiction could adopt the appendix or decide to make arbitrary decisions on occupancy limits as allowed in section 404.5. This appendix will provide the code official with the intent of preventing overcrowding utilizing a standard measurement.

After talking with the fair housing investigation unit in St. Louis, Missouri it was concluded that an arbitrary decision by a code official could in fact be considered discrimination in certain cases and that some type of standard measure is needed and that when discrimination cases have been investigated the bedroom square footage limits were considered reasonable, this is based partially on the Keating (HUD general counsel) memo of 1991 and subsequent court cases.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Code change proposals PM8, PM9 and PM10 deal with minimum room area requirements. PM10 proposes placing minimum area requirements in an appendix. The committee needs to make its intent clear with respect to the location of these requirements, if approved.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MORGAN-PM1-APPENDIX B.DOC

PM11–09/10
404.6

Proponent: Charles B. Campbell, Faulkner University, Jones School of Law, representing self

Add as follows:

404.6 Efficiency unit. Nothing in this section shall prohibit an efficiency living unit from meeting the following requirements:

1. A unit occupied by not more than one occupant shall have a clear floor area of not less than 120 square feet (11.2 m^2). A unit occupied by not more than two occupants shall have a clear floor area of not less than 220 square feet (20.4 m^2). A unit occupied by three occupants shall have a clear floor area of not less than 320 square feet (29.7 m^2). These required areas shall be exclusive of the areas required by Items 2 and 3.
2. The unit shall be provided with a kitchen sink, cooking appliance and refrigeration facilities, each having a clear working space of not less than 30 inches (762 mm) in front. Light and *ventilation* conforming to this code shall be provided.
3. The unit shall be provided with a separate *bathroom* containing a water closet, lavatory and bathtub or shower.
4. The maximum number of *occupants* shall be three.

Reason: The proposal would add a new sentence to IPMC § 404.6(1) relating to single-resident occupancy (SRO) in efficiency units. Current IPMC § 404.6(1) defines minimum square footage in efficiency units based upon an occupancy limit of either two or three. As such, the minimum clear floor area is based on an occupancy limit of two and requires 220 square feet (20.4 m^2).The section does not explicitly provide for single-resident occupancy, which should require less space.

Moreover, the 220-square-foot minimum (which excludes the kitchen and bath areas in § 404.6(2) & (3)) exceeds the 150-square-foot minimum gross floor area recommended for SROs by the *APHA-CDC Recommended Minimum Housing Standards*. If the kitchen and bath areas occupy only another 100 square feet, IPMC § 404.6 effectively requires a minimum of 320 square feet for single-resident occupancy.

A minimum of 120 square feet in § 404.6(1), plus the kitchen and bath areas, would ensure that SROs exceed the 150 square feet of gross floor area recommended by the APHA and CDC. Given the negative impact excessive minimum square footage requirements can have on affordable housing, IPMC § 404.6(1) should be amended to permit a smaller clear floor area for SROs.

Bibliography:

Eric W. Mood ed., *Housing and Health: APHA-CDC Recommended Minimum Housing Standards* § 9.02.01 (1986).
Cal. Health & Safety Code § 17958.1 (West 2006) (“a city or county may, by ordinance, permit efficiency units for occupancy by no more than two persons which have a minimum floor area of 150 square feet”).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CAMPBELL-PM1-404.6.DOC

PM12 –09/10
504.3, 504.4 (New)

Proponent: Ronald L. George, Ron George Design & Consulting Services, representing self

THIS PROPOSAL IS ON THE AGENDA OF THE IPC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IPC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

504.3 Plumbing system hazards. Where it is found that a plumbing system in a structure constitutes a hazard to the occupants or the structure by reason of inadequate service, inadequate venting, cross connection, backsiphonage, improper installation, scald hazard. deterioration or damage or for similar reasons, the *code official* shall require the defects to be corrected to eliminate the hazard.

504.4 Scalding hazards. Every shower, bathtub or combination tub/shower shall be equipped with a temperature or pressure compensation shower valve conforming to ASSE 1016 or CSA B-125.1 with a maximum temperature limit stop adjustable to limit hot water temperatures to a maximum of 120 degrees F.

Exceptions:

1. A compensating type shower valve is not required if a properly sized master thermostatic mixing valve is installed at the hot water source conforming to ASSE 1017 or ASME A112.18.1/CSA B-125.1 and set to limit the hot water distribution temperature to a maximum of 120 degrees F.
2. A compensating type shower valve is not required if a properly sized thermostatic mixing valve conforming to ASSE 1070 or CSA B-125.3 is installed near the fixtures and set to limit the hot water distribution temperature to a maximum of 120 degrees F.
3. A compensating type shower valve is not required if a temperature actuated flow reduction device conforming to ASSE 1062 is installed on the shower arm and the tub fill spout.

Reason: Currently there is not any specific language guiding inspectors for safety hazards associated with plumbing and scalding hazards in older buildings. Scalding hazards are one of the most painful and most common injuries in older apartments, and rental properties with two-handled non-compensating type shower valves.

The proposed language is intended to address these life altering and very painful injuries which commonly occur in older buildings and apartments. The property maintenance code allows inspectors to correct hazardous conditions but does not specifically address one of the biggest hazards in a home, scalding.

Cost Impact: The code change proposal will cause a minimal cost increase.

Analysis: All standards referenced in this proposal are currently referenced in other I-Codes.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GEORGE-PM1-504.4.DOC

PM13–09/10
506.3

Proponent: Sean P. Farrell, Prince William County Virginia, representing Virginia Building and Code Officials Association

THIS PROPOSAL IS ON THE AGENDA OF THE IPC CODE DEVELOPMENT COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THE IPC CODE DEVELOPMENT COMMITTEE.

Revise as follows:

506.3 Grease interceptors. ~~Where it has been determined that a grease interceptor is not being maintained and serviced as intended by this code and the manufacturer's instructions, an *approved* interceptor monitoring system shall be provided or a maintenance program shall be established with documentation submitted to the *code official*~~. Grease interceptors, grease traps and automatic grease removal devices shall be maintained in accordance with this code and the manufacturer's installation instructions. Grease interceptors, grease traps and automatic grease removal devices

shall be regularly serviced and cleaned to prevent the discharge of oil, grease, and other substances harmful or hazardous to the building drainage system, the public sewer, the private sewage disposal system or the sewage treatment plant or processes. All records of maintenance, cleaning and repairs shall be available for inspection by the code official.

Reason: The 2009 IPMC only requires a routine maintenance program after the code official determines that the grease interceptor is not being maintained. The revised text clarifies that grease interceptors, grease traps and automatic grease removal devices require on-going routine maintenance in order to perform their intended function. Any such maintenance should be in accord with the manufacturer's maintenance criteria. The proposed language is coordinated with the provisions of Section 1003.1 of the IPC which establishes when these devices are required to be installed. Failure to maintain these devices results in public health risks via sanitary sewer overflows into buildings, roads and streams and premature deterioration and failure of public and private sewage systems.

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FARRELL-PM2-506.3.DOC

PM14–09/10
603.7 (New)

Proponent: Mona Casey, United Parents to Restrict Open Access to Refrigerant

Add new text as follows:

603.7 Existing HVAC systems. Refrigerant circuit access ports located outdoors shall be provided with locking-type tamper-resistant caps whenever the system is modified, serviced, or repaired.

Reason: The purpose of this code modification is to add new requirements to the Code. The existing code does not address the issue of accessibility to refrigerant by unauthorized individuals. Refrigerant is extremely dangerous and potentially lethal.

Facts:

- Refrigerant "can cause death without warning".
- Refrigerant is considered a gateway drug because users often progress from refrigerant use to drug and alcohol abuse.
- Refrigerant is not a cumulative substance where chances of dying from it increase as the dosage and number of use increases. It can kill on the 1st, 10th, 100th, or any other time. 33 percent of deaths resulting from refrigerant huffing occurred on the 1st use.
- Refrigerant, like other poisons, must be kept out of reach of children.
- Refrigerant theft is increasing.
- According to Mike Opitz, Certification Manager, LEED for Existing Buildings, U.S. Green Building Council, chlorine in CFCs and HCFCs destroy the ozone and depletes the Earth's natural shield for incoming ultraviolet radiation and absorb outgoing infrared radiation from the earth, functioning as potent greenhouse gases.

National Statistics:

- The National Institute on Drug Abuse reports that one in five American teens have used Inhalants to get high.
- According to Stephen J. Pasierb, President and CEO of The Partnership for Drug-Free America, 22% of 6th and 8th graders admitted abusing inhalants and only 3% of parents think their child has ever abused inhalants.
- An analysis of 144 Texas death certificates by the Texas Commission on Alcohol and Drug Abuse involving misuse of inhalants found that the most frequently mentioned inhalant (35%) was Freon (51 deaths). Of the Freon deaths, 42 percent were students or youth with a mean age of 16.4 years.
- Suffocation, inhaling fluid or vomit into the lungs, and accidents each cause about 15% of deaths linked to inhalant abuse.
- National Institute on Drug Abuse's 'Monitoring the Future' study reveals that inhalant abuse among 8th graders is up 7.7% since 2002.
- 55% of deaths linked to inhalant abuse are caused by "Sudden Sniffing Death Syndrome." SSDS can occur on the first use or any use. The

Inhalant causes the heart to beat rapidly and erratically, resulting in cardiac arrest.

- 22% of inhalant abusers who died of SSDS had no history of previous inhalant abuse. In other words, they were first-time users.

Collier County, FL Statistics:

- The use of inhalants in middle schools has doubled in two years
- The average age a child starts using drugs or alcohol is just 12½
- Every third day a child is taken to the hospital because of a drug overdose
- 85 percent of all juvenile criminal cases are substance related
- Deaths due solely to drug toxicity increased 76% between 1998 and 2005
- The modification of this code will have an immense positive impact on the safety and health of our citizens, especially our youth. It will reduce the number of deaths associated with Inhalant abuse and the number of injuries associated with Freon accidents and leaks.

Cost Impact: The code change proposal will increase the cost of construction by $25-$30.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CASEY-PM1-603.7.DOC

PM15–09/10
604.3.1.1

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

604.3.1.1 Electrical equipment. Electrical distribution equipment, motor circuits, power equipment, transformers, wire, cable, flexible cords, wiring devices, ground-fault circuit interrupters, surge protectors, molded case circuit breakers, low-voltage fuses, luminaires, ballasts, water heaters, appliances, electronic equipment, motors and electronic control, signaling and communication equipment that have been exposed to water shall be replaced in accordance with the provisions of the *International Building Code*.

Exception: The following equipment shall be allowed to be repaired where an inspection report from the equipment manufacturer or *approved* manufacturer's representative indicates that the equipment has not sustained damage that requires replacement:

1. Enclosed switches, rated 600 volts or less;
2. Busway, rated 600 volts or less;
3. Panelboards, rated 600 volts or less;
4. Switchboards, rated 600 volts or less;
5. Fire pump controllers, rated 600 volts or less;
6. Manual and magnetic motor controllers;
7. Motor control centers;
8. Alternating current high-voltage circuit breakers;
9. Low-voltage power circuit breakers;
10. Protective relays, meters and current transformers;
11. Low- and medium-voltage switchgear;
12. Liquid-filled transformers;
13. Cast-resin transformers;
14. Wire or cable that is suitable for wet locations and whose ends have not been exposed to water;
15. Wire or cable, not containing fillers, that is suitable for wet locations and whose ends have not been exposed to water;
16. Luminaires that are listed as submersible;
17. Motors;
18. Electronic control, signaling and communication equipment.

Reason: These additional items need to be replaced when exposed to water. Floodwater contaminants can create serious fire hazards if electrical wiring and equipment have been submerged in water. Even with professional cleaning and drying, sediments and toxins are difficult to remove. Corrosion and insulation damage can occur when water and silt get inside electrical devices and products. Water can also damage the motors in electrical appliances.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-PM2-604.3.1.1.DOC

PM16–09/10
605.2, 605.3, 605.4 (New)

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

605.2 Receptacles. Every habitable space in a dwelling shall contain at least two separate and remote receptacle outlets. Every laundry area shall contain at least one grounded-type receptacle or a receptacle with a ground fault circuit interrupter. Every bathroom shall contain at least one receptacle. Any new bathroom receptacle outlet shall have ground fault circuit interrupter protection. All receptacle outlets shall have the appropriate faceplate cover for the location.

605.3 Luminaires. Every public hall, interior stairway, toilet room, kitchen, bathroom, laundry room, boiler room and furnace room shall contain at least one electric luminaire. Pool and spa luminaries over 15 V shall have ground fault circuit interrupter protection.

605.4 Wiring. Flexible cords shall not be used for permanent wiring, or for running through doors, windows, or cabinets, or concealed within walls, floors, or ceilings.

Reason: Missing or broken receptacle outlet covers should be replaced to prevent inadvertent contact with live parts within the outlet. Flexible cords are not evaluated for use as permanent wiring in a building and are not allowed by the IFC. GFCI protection of pool and spa luminaires is critical for the safety of the users.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-PM3-605.2.DOC

PM17–09/10
702 (New)

Proponent: Gregory J. Cahanin, Cahanin Fire & Code Consulting, representing the Michael Minger Foundation

1. Revise as follows:

Reorder the Sections in Chapter 7 to the same order found in the IFC for requirements covered.

Section 701 General
Section 702 Emergency Planning and Preparedness (New)
Section 703 Fire Resistance Ratings
Section 704 Fire Protection Systems
Section 705 Means of Egress

2. Add new section as follows:

SECTION 702
EMERGENCY PLANNING AND PREPAREDNESS

702.1 Fire safety and evacuation plans. Fire safety and evacuation plans shall comply with the provisions of Sections 702.1.1 through 702.1.4.

702.1.1 Where required. An approved fire safety and evacuation plan shall be prepared and maintained for the following occupancies and buildings.

1. Group A, other than Group A occupancies used exclusively for purposes of religious worship that have an occupant load less than 2,000.
2. Group B buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.
3. Group E.
4. Group F buildings having an *occupant load* of 500 or more *persons* or more than 100 *persons* above or below the lowest *level of exit discharge*.
5. Group H.
6. Group I.
7. Group R-1.
8. Group R-2 college and university buildings.
9. Group R-4.
10. High-rise buildings.
11. Group M buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.
12. Covered malls exceeding 50,000 square feet (4645 m^2) in aggregate floor area.
13. Underground buildings.
14. Buildings with an atrium and having an occupancy in Group A, E or M.

702.1.2 Contents. Fire safety and evacuation plan contents shall be in accordance with Sections 702.1.2.1 and 702.1.2.2.

702.1.2.1 Fire evacuation plans. Fire evacuation plans shall include the following:

1. Emergency egress or escape routes and whether evacuation of the building is to be complete or, where approved, by selected floors or areas only.
2. Procedures for employees who must remain to operate critical equipment before evacuating.
3. Procedures for assisted rescue for *persons* unable to use the general *means of egress* unassisted.
4. Procedures for accounting for employees and occupants after evacuation has been completed.
5. Identification and assignment of personnel responsible for rescue or emergency medical aid.
6. The preferred and any alternative means of notifying occupants of a fire or emergency.
7. The preferred and any alternative means of reporting fires and other emergencies to the fire department or designated emergency response organization.
8. Identification and assignment of personnel who can be contacted for further information or explanation of duties under the plan.
9. A description of the emergency voice/alarm communication system alert tone and preprogrammed voice messages, where provided.

702.1.2.2 Fire safety plans. Fire safety plans shall include the following:

1. The procedure for reporting a fire or other emergency.
2. The life safety strategy and procedures for notifying, relocating, or evacuating occupants, including occupants who need assistance.
3. Site plans indicating the following:
   - 3.1. The occupancy assembly point.
   - 3.2. The locations of fire hydrants.
   - 3.3. The normal routes of fire department vehicle access.
4. Floor plans identifying the locations of the following:
   - 4.1. Exits.
   - 4.2. Primary evacuation routes.
   - 4.3. Secondary evacuation routes.
   - 4.4. Accessible egress routes.
   - 4.5. Areas of refuge.
   - 4.6. Exterior areas of assisted rescue.
   - 4.7. Manual fire alarm boxes.
   - 4.8. Portable fire extinguishers.
   - 4.9. Occupant-use hose stations.
   - 4.10. Fire alarm annunciators and controls.
5. A list of major fire hazards associated with the normal use and occupancy of the premises, including maintenance and housekeeping procedures.
6. Identification and assignment of personnel responsible for maintenance of systems and equipment installed to prevent or control fires.
7. Identification and assignment of personnel responsible for maintenance, housekeeping and controlling fuel hazard sources.

702.1. 3 Availability. Fire safety and evacuation plans shall be available in the workplace for reference and review by employees, and copies shall be furnished to the fire code official for review upon request.

702.1.4 Posting of evacuation plan. A posted evacuation plan consisting of an actual floor plan layout identifying the available evacuation routes with room and space identifications such as areas of rescue assistance shall be provided within the hotel guest room or a resident room in dormitories in the proximity of the room entrance door.

702.3 Emergency evacuation drills. Emergency evacuation drills complying with the provisions of this section shall be conducted at least annually in the occupancies listed in Section 702.1.1 or when required by the fire code official. Drills shall be designed in cooperation with the local authorities.

702.3.1 Frequency. Required emergency evacuation drills shall be held at the intervals specified in Table 702.3.1 or more frequently where necessary to familiarize all occupants with the drill procedure.

TABLE702.3.1
FIRE AND EVACUATION DRILL FREQUENCY AND PARTICIPATION

GROUP OR OCCUPANCY	FREQUENCY	PARTICIPATION
Group A	Quarterly	Employees
Group B[c]	Annually	Employees
Group E	Monthly[a]	All occupants
Group F	Annually	Employees
Group I	Quarterly on each shift	Employees[b]
Group R-1	Quarterly on each shift	Employees
Group R-2[d]	Four annually	All occupants
Group R-4	Quarterly on each shift	Employees[b]
High-rise buildings	Annually	Employees

a. The frequency shall be allowed to be modified in accordance with Section 702.3.1.
b. Fire and evacuation drills in residential care assisted living facilities shall include complete evacuation of the premises to a selected assembly point. Where occupants receive habitation or rehabilitation training, fire prevention and fire safety practices shall be included as part of the training program.
c. Group B buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.
d. Applicable to Group R-2 college and university buildings in accordance with Section 702.1.

702.3.2 Time. Drills shall be held at unexpected times and under varying conditions to simulate the unusual conditions that occur in case of fire.

702.4 Employee training and response procedures. Employees in the occupancies listed in Section 702.1 shall be trained in the fire emergency procedures described in their fire evacuation and fire safety plans. Training shall be based on these plans and as described in Section 702.1.2.1.

702.4.1 Frequency. Employees shall receive training in the contents of fire safety and evacuation plans and their duties as part of new employee orientation and at least annually thereafter. Records shall be kept and made available to the fire code official upon request.

702.4.2 Evacuation training. Employees shall be familiarized with the fire alarm and evacuation signals, their assigned duties in the event of an alarm or emergency, evacuation routes, areas of refuge, exterior assembly areas, and procedures for evacuation.

702.4.3 Maintenance. Fire safety and evacuation plans shall be reviewed or updated annually or as necessitated by changes in staff assignments, occupancy, or the physical arrangement of the building.

702.5 Use and occupancy-related requirements. Sections 702.5.1 through 702.5.2.3 shall apply to the specific occupancies contained therein.

702.5.1 General. An approved fire safety and evacuation plan shall be prepared and maintained for Group R-2 college and university buildings as noted in 702.1.2.1 and 702.1.2.2.

702.5.2 Group R-2. Group R-2 college and university buildings shall comply with the requirements of Sections 702.5.2.1 and 702.5.2.3.

702.5.2.1 Time of day. Emergency evacuation drills shall be conducted at different hours of the day or evening, during the changing of classes, when the school is at assembly, during the recess or gymnastic periods, or during other times to avoid distinction between drills and actual fires. In Group R-2 college and university buildings, one required drill shall be held during hours after sunset or before sunrise.

702.5.2.2 Emergency guide. A fire emergency guide shall be provided which describes the location, function and use of fire protection equipment and appliances accessible to residents, including fire alarm systems, smoke alarms, and portable fire extinguishers. The guide shall also include an emergency evacuation plan for each dwelling unit or sleeping unit.

702.5.2.3 Distribution. A copy of the emergency guide shall be given to each tenant prior to initial occupancy.

Reason: The initial change is to reorder the Chapter 7 Sections in the same order as the Chapter order in the International Fire Code (IFC) where most of the material is derived.

A new Section 702.1.4 on posting an evacuation plan near dorm room entrance doors is to be coordinated with an identical IFC proposal. The posting of a plan in a room will assist all occupants in an emergency, but in may be of particular assistance to individuals with special cognitive needs in determining alternative egress paths in an emergency.

The new text proposed is extracted from the IFC (404.3.1, 404.3.2,404.4, and 408) is proposed for inclusion in the IPMC in concert with the IPMC scope and intent. It is recognized that the provisions found within the IPMC are extracts from other international codes. The scope of the IPMC notes that these provisions shall apply to all existing residential and nonresidential structures and all existing premises and constitute minimum requirements and standards for premises, structures, equipment and facilities for light, ventilation, space, heating, sanitation, protection from the elements, life safety, safety from fire and other hazards, and for safe and sanitary maintenance; the responsibility of owners, operators and occupants; the occupancy of existing structures and premises, and for administration, enforcement and penalties. The intent of the IPMC is construed to secure its expressed intent, which is to ensure public health, safety and welfare in so far as they are affected by the continued occupancy and maintenance of structures and premises.

The IPMC when adopted by a community becomes a handbook of sorts for property owners in defining requirements they must adhere to for the safety of residents or occupants. Existing structures and premises that do not comply with these provisions shall be altered or repaired to provide a minimum level of health and safety as required herein. The proposed extracted text from the IFC addresses emergency planning and response requirements for occupants in the event of an emergency to ensure their safety. This inclusion in the IPMC document provides for additional means to define for the general population and building owner's requirements associated with occupants egress involved with fire evacuation plans and fire safety plans.

The submittal of this proposal and several others with the ICC is part of the work of the Michael H. Minger Foundation, as a result of a Department of Homeland Security Fire Prevention and Safety Grant to study how colleges and universities respond to and provide for students with physical and learning disabilities in a fire event. The study identified model practices being used by campuses regarding fire safety, housing and evacuation policies and procedures. The proposed changes to the IPMC lay the foundation for uniform fire safety planning in the campus environment in a nationally recognized document while also establishing a clear base for egress planning and performance in all types of occupancies.

The Michael H. Minger Foundation was established in 2005. The purpose of the Foundation is to improve fire safety standards and enhance fire safety systems on college and university campuses and to educate parents and students and raise awareness of the reality and risk of campus fires. This non-profit organization was founded to honor the life of Michael H. Minger, an outstanding young man, who lost his life in a college dormitory fire. The Michael Minger Act in Kentucky established a requirement for fire sprinklers in college housing. A governor's task force focusing on campus safety in Kentucky was lead by Gail Minger, the director of the Michael H. Minger Foundation.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The maintenance of the technical content of proposed Section 702 will be the responsibility of the International Fire Code Development Committee. The need for and suitability of having the new section within the IPMC is a matter to be determined by the International Property Maintenance Code Development Committee.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CAHANIN-PM1-702.DOC

PM18–09/10
Chapter 8 (New)

Proponent: Howard Asch, City of East Lansing, representing Michigan Association of Housing Officials

Add new chapter as follows:

CHAPTER 8
HEALTH

801
GENERAL

801.1 Scope. The provisions of this chapter shall govern the minimum conditions and standards for the health of persons at a premises.

801.2 Responsibility. The owner of the premises shall maintain the premises in compliance with these requirements, except as provided for in this code. A person shall not occupy as owner-occupant or permit another person to occupy or allow the public to use any premises which does not comply with the requirements of this chapter. Occupants of a dwelling unit, rooming unit or housekeeping unit or persons in control of any space are responsible for keeping the areas they occupy or control free from hazards to health.

801.3 Approved agency. An approved agency is an established and recognized agency regularly engaged in conducting tests or furnishing inspections services, when such agency has been approved by the code official. The code official shall accept a report from an approved agency as basis upon which to determine compliance in accordance with this chapter.

801.4 Testing. The code official is authorized to require the owner or occupant responsible for maintenance to provide findings from an approved agency when, in the opinion of the code official, it is likely that there exists a hazard to health in violation of the requirements of this chapter. The report of an approved agency shall be deemed sufficient to establish whether a premise is in compliance with the requirements of this chapter. The building owner or occupant responsible as set forth in section 801.2 shall pay the cost of inspection and testing by an approved agency.

801. Vacating. When an area is required to be vacated by this chapter, occupancy shall be prohibited except by persons actively engaged in removing a hazard to health. The code official shall order the area to be vacated in accordance with section 108 of this code.

802
EXCREMENT

802.1 Exterior accumulations. Excrement shall not accumulate in any yard area and shall be contained and disposed of in a safe and sanitary manner so as to control insects, vermin, odor and the spread of disease.

> **Exception:** Waste from animals raised for commercial purposes that is contained and safely disposed of in a manner consistent with general agricultural practices shall not be regulated.

802.2 Interior accumulation. Excrement shall not be allowed to accumulate in any dwelling unit except in an approved device which is properly maintained to contain excrement and control odor.

803
FRIABLE HAZARDOUS MATERIALS

803.1 Maintenance. Materials containing friable hazardous particles including but not limited to asbestos, lead, arsenic or crystalline silica shall be maintained in such a manner as to prevent friable particles from becoming airborne or ingestible.

803.2 Abatement. When exposed friable particles are determined by an approved agency to be present in hazardous quantities, the condition causing the material to become friable shall be abated and the exposed area shall be cleared of hazardous particles. The code official is authorized to order occupancy of the affected space to be prohibited until the contaminated area has been certified by an approved agency as safe for normal occupancy, and the cause of the material becoming friable has been abated or the friable material has been removed.

804
HAZARDOUS GASEOUS MATERIALS

804.1 Allowable levels. The following gaseous hazardous substances shall not exceed allowable specified levels within a dwelling unit:

> Carbon monoxide--35 PPM 8 hour time weighted average; 200 PPM maximum concentration
> Formaldehyde-- 0.5 PPM based on a 30 minute sampling period
> Radon-- 4 picocuries/liter

When another adopted standard conflicts with these allowable levels, the more restrictive shall apply.

804.2 Abatement. Gaseous hazardous substances determined by an approved testing agency to exceed the levels provided in section 804.1 shall be abated. The code official is authorized to order the affected area to be vacated until testing by an approved agency finds the area to be in compliance with section 804.1.

805
PESTICIDES

805.1 Storage. Pesticides shall be stored in the manner prescribed by the manufacturer and shall be used in areas and at concentrations in compliance with the labeling of the manufacturer.

805.2 Abatement. When a pesticide is determined by an approved agency to be in a location or at a concentration dangerous to human health and/or contrary to manufacturer labeling the code official is authorized to order the area containing such pesticide to be vacated until the hazard has been abated.

806
CHEMICAL CONTAMINATION

806.1 Vacating. When determined by an approved agency that a dwelling unit is contaminated by a chemical at a concentration and in such a condition as to be hazardous to human health after short term exposure the code official is authorized to order the dwelling unit to be vacated and remain vacated until the hazard has been abated.

806.2 Illegal Methamphetamine manufacturing sites. A dwelling unit declared by a law enforcement agency or health official to be a site of illegal Methamphetamine manufacture shall be vacated and shall not be occupied until certified by an approved agency as safe from hazardous materials related to the Methamphetamine manufacturing process.

807
BIOLOGICAL HAZARDS

807.1 Waterborne organisms. When determined by testing of an approved agency that the domestic water supply of a dwelling unit is contaminated with toxin producing bacteria, human parasite, or other organism deemed by an approved agency as dangerous to human health, the water supply shall be made safe. The code official is authorized to order the dwelling unit to be vacated until such time as the water supply is safe as determined by an approved agency. The code official is authorized to permit use of a water purification system capable of removing organisms or use of an alternative water supply on a temporary basis provided the water so supplied is safe for drinking and bathing.

807.2 Airborne organisms. Heating, air conditioning and ventilation systems shall be kept clean and maintained so as to prevent the growth of harmful organisms within the system.

808
AIR-BORNE CONTAMINATES

808.1 Air-borne contaminates. Spaces in which air borne contaminates are generated shall comply with the International Mechanical Code requirements for hazardous exhaust systems. Contaminated air shall not be circulated between tenant spaces or dwelling units. Tobacco smoke shall be considered a hazardous contaminate for purposes of this section. Air may be circulated between tenant spaces or dwelling units when properly installed and maintained equipment first removes any contaminate.

809
SANITARY CLEANUP

809.1 Sanitary cleanup. When an event occurs that makes occupancy of a space unsafe or unhealthful, the space shall not be occupied unless the unsafe conditions are removed in accordance with this section. Sewage spills and flooding shall be considered to make a space unsafe.

809.2 Approved agency. The code official may accept a report from an approved agency that certifies an unsafe or unhealthful condition has been eliminated as a basis for approving occupancy of a space.

809.3 Prescriptive methods. When the prescriptive methods contained in section 809.3.1 through 809.3.2 are used the hazard shall be deemed to have been abated.

809.3.1 Sewage spills. All water containing sewage and all sewage solids shall be removed and disposed of in a safe and sanitary manner. Every absorbent material in contact with sewage or water which contains sewage shall be removed. Every non-absorbent material in contact with sewage or water which contains sewage shall be cleaned with detergent and disinfected with a 10% solution of household bleach in water.

809.3.2 Flood damage. Any material that has been damaged or weakened by water shall be removed. Material saturated by water, such as insulation or gypsum board, shall be removed. All surfaces that support mold growth which have come in contact with water shall be removed or thoroughly dried and treated with a fungicide. All materials and systems required by this code and the International Building Code or the International Residential Code shall be replaced or restored to a dry condition and capable of performing the intended purpose. When flood water is known to be contaminated with harmful chemical compounds, the contamination shall be removed and the area shall be tested and found safe by an approved agency in addition to the other requirements of this section.

810
FOOD PREPARATION AREAS

810.1 Responsibility. The occupant of each space with a food preparation or storage area shall be responsible to maintain that area in accordance with this section.

810.2 Food preparation areas. Food preparation areas shall be maintained free of spoiled or rotting foodstuffs. Grease shall not be allowed to accumulate on surfaces in food preparation areas, including counters, walls, floors, ceilings, appliances and storage areas.

Reason: The code does not presently address health related concerns very well. The proposal clearly enumerates various health issues and describes minimum standards to enable the code official to have a more solid legal standing to address those issues.

There are no universally accepted standards for carbon monoxide, formaldehyde or radon in a dwelling unit. Standards have been proposed for work places and the proposed standards for exposure to these gasses are taken from NIOSH HSM 73-11000 for carbon monoxide, NIOSH DHEW 77-126 for formaldehyde, and the U. S. Environmental Protection Agency for radon. The code official is authorized to accept documentation from an approved agency to establish compliance with other hazards where technical knowledge is required, much in the fashion an engineer's report would be accepted for a structural concern in a building. A clear basis for a decision strengthens the code official's position when challenged on appeal or in court.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ASCH-PM1-CH 8 NEW

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL RESIDENTIAL CODE – BUILDING & ENERGY

IRC –BUILDING & ENERGY CODE COMMITTEE

Thomas Meyers, CBO - *Chair*
Building Official
City of Central, CO
Berthoud, CO

Donald LeBrun, CBO – *Vice Chair*
Assistant Director, Code Enforcement;
State of Indiana-Indiana Dept. of
Homeland Security
Indianapolis, IN

Eric Borsting
Rep: National Association of Home
Builders
President
ESB Professional Consulting
Stockton, CA

Anthony Bumbalis, PE
President
Anthony Bumbalis
Cleveland, OH

Michael Christoffersen, CPBD
Rep: National Association of Home
Builders
President
Architectural Designs, Inc.
Fort Wayne, IN

Chip Dence
Rep: National Association of Home
Builders
East End Builders
Victoria, TX

Helen Kessler DiFate, AIA
President
DIFATE GROUP, PC
St. Louis, MO

Robert Eugene
Senior Staff Engineeer
Underwriters Laboratories Inc.
Lynnwood, WA

Kathleen Osmonson
Building Official/Fire Marshal
City of Mounds View
Mounds View, MN

Roger Robertson
Chief of Inspections
Chesterfield County Department of
Building Inspections
Chesterfield, VA

Alan Steinle, PE
Rep: National Council of Structural
Engineering Associations
President
Steinle Construction Engineers Inc.
Wilmington, DE

Jim Zengel
Rep: National Association of Home
Builders
President
Zengel Construction Co.
Dayton, OH

Staff Secretariats:
Larry Franks, P.E., CBO
Senior Staff Engineer
International Code Council

David Bowman, PE
Manager of Codes
International Code Council

TENTATIVE ORDER OF DISCUSSION

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL RESIDENTIAL CODE BUILDING & ENERGY

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation does **not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair.

IRC ENERGY

RE1-09/10
RE2-09/10
RE3-09/10
RE4-09/10
EC1-09/10, Part II
EC2-09/10, Part II
EC4-09/10, Part II
EC13-09/10, Part II
    EC19-09/10, Part II
    EC25-09/10, Part II
    EC16-09/10, Part II
    EC11-09/10, Part II
EC17-09/10, Part II
EC18-09/10, Part II
EC21-09/10, Part II
EC22-09/10, Part II
EC23-09/10, Part II
EC26-09/10, Part II
EC27-09/10, Part II
EC28-09/10, Part II
EC29-09/10, Part II
EC30-09/10, Part II
EC31-09/10, Part II
EC32-09/10, Part II
EC34-09/10, Part II
EC35-09/10, Part II
EC36-09/10, Part II
EC38-09/10, Part II
EC39-09/10, Part II
EC40-09/10, Part II
EC41-09/10, Part II
EC42-09/10, Part II
EC43-09/10, Part II
EC45-09/10, Part II
EC46-09/10, Part II
EC47-09/10, Part II
EC48-09/10, Part II
EC50-09/10, Part II
EC53-09/10, Part II
EC54-09/10, Part II
EC55-09/10, Part II
EC56-09/10, Part II
EC57-09/10, Part II
EC58-09/10, Part II
EC59-09/10, Part II
EC60-09/10, Part II
EC63-09/10, Part II
EC64-09/10, Part II
EC66-09/10, Part II
EC68-09/10, Part II
EC69-09/10, Part II
EC71-09/10, Part II
EC72-09/10, Part II
EC73-09/10, Part II
EC74-09/10, Part II
EC76-09/10, Part II
EC77-09/10, Part II
EC78-09/10, Part II
EC79-09/10, Part II
EC80-09/10, Part II
EC81-09/10, Part II
EC82-09/10, Part II
EC83-09/10, Part II
EC84-09/10, Part II
EC86-09/10, Part II
EC87-09/10, Part II
EC89-09/10, Part II
EC90-09/10, Part II
EC91-09/10, Part II
EC92-09/10, Part II
RE6-09/10
EC96-09/10, Part II
RE5-09/10
EC98-09/10, Part II
EC99-09/10, Part II
EC100-09/10, Part II
EC101-09/10, Part II
EC102-09/10, Part II
EC103-09/10, Part II
EC104-09/10, Part II
EC106-09/10, Part II
EC107-09/10, Part II
EC109-09/10, Part II
RE7-09/10
EC112-09/10, Part II
EC114-09/10, Part II
EC115-09/10, Part II
EC116-09/10, Part II
EC117-09/10, Part II
EC118-09/10, Part II
EC119-09/10, Part II
EC120-09/10, Part II
EC121-09/10, Part II
EC122-09/10, Part II
EC123-09/10, Part II
EC124-09/10, Part II
EC125-09/10, Part II
EC126-09/10, Part II
EC127-09/10, Part II
EC129-09/10, Part II
EC130-09/10, Part II
EC131-09/10, Part II

IRC BUILDING

    G28-09/10, Part II
RB1-09/10
RB4-09/10
RB7-09/10
    S87-09/10, Part II
RB8-09/10
RB9-09/10, Part I
    RB31-09/10
    RB84-09/10
    RB85-09/10
    RB86-09/10
    RB87-09/10
    RB88-09/10
RB10-09/10
    RB2-09/10
    RB3-09/10
    RB76-09/10
    RB130-09/10
    G2-09/10, Part II
RB11-09/10
RB12-09/10
RB13-09/10
RB14-09/10
RB15-09/10
    S97-09/10, Part II
RB16-09/10
RB17-09/10
    S57-09/10, Part II
    S61-09/10, Part II
    S62-09/10, Part II
    S66-09/10, Part II
RB18-09/10
RB19-09/10
RB20-09/10
RB21-09/10
    FS155-09/10, Part II
    RB5-09/10
RB22-09/10
RB23-09/10
    S1-09/10, Part II
RB24-09/10
RB25-09/10
RB26-09/10
    G56-09/10, Part II
RB27-09/10
RB28-09/10
RB29-09/10
RB30-09/10
RB32-09/10
RB33-09/10
FS124-09/10, Part II

G5-09/10, Part II
RB34-09/10
RB35-09/10
FS118-09/10, Part II
RB36-09/10
RB37-09/10
RB38-09/10
S219-09/10, Part II
RB39-09/10
RB40-09/10
S218-09/10, Part II
S144-09/10, Part II
RB41-09/10
E150-09/10, Part II
RB42-09/10
RB43-09/10
E60-09/10, Part III
E194-09/10, Part II
E8-09/10, Part II
RB44-09/10
E58-09/10, Part II
RB45-09/10
E122-09/10, Part II
E70-09/10, Part II
E71-09/10, Part II
E72-09/10, Part II
RB46-09/10
E74-09/10, Part II
E75-09/10, Part II
RB47-09/10
RB48-09/10
RB49-09/10
E97-09/10, Part II
RB50-09/10
E100-09/10, Part II
RB51-09/10
RB52-09/10
RB53-09/10
RB54-09/10
RB55-09/10
RB56-09/10
RB57-09/10
RB58-09/10
RB59-09/10
F108-09/10, Part II
F112-09/10, Part II
F115-09/10, Part II
F116-09/10, Part II
F132-09/10, Part II
RB60-09/10
RB61-09/10
FS160-09/10, Part II
RB62-09/10
FS168-09/10, Part II
FS169-09/10, Part II
FS171-09/10, Part II
FS176-09/10, Part II
S203-09/10, Part II
S207-09/10, Part II
RB6-09/10
RB63-09/10
RB64-09/10
RB65-09/10
E156-09/10, Part III
RB66-09/10
RB67-09/10
RB68-09/10
RB69-09/10
RB149-09/10
S162-09/10, Part II
RB70-09/10
RB71-09/10
RB72-09/10
RB73-09/10
RB74-09/10
RB75-09/10
RB77-09/10
RB78-09/10
RB79-09/10
RB80-09/10
RB81-09/10
RB82-09/10
RB83-09/10
RB89-09/10
RB90-09/10
RB91-09/10
RB92-09/10
RB93-09/10
RB94-09/10
RB95-09/10
RB96-09/10
S200-09/10, Part II
RB97-09/10
RB98-09/10
RB99-09/10
RB100-09/10
FS147-09/10, Part II
RB101-09/10
RB102-09/10
RB103-09/10
RB104-09/10
RB105-09/10
RB106-09/10
S214-09/10, Part II
RB107-09/10
RB108-09/10
RB109-09/10
RB110-09/10
RB111-09/10
RB112-09/10
RB113-09/10
S199-09/10, Part II
S171-09/10, Part II
RB114-09/10
RB115-09/10
RB116-09/10
RB117-09/10
RB118-09/10
RB119-09/10
RB120-09/10, Part I
RB121-09/10
RB122-09/10, Part I
RB123-09/10, Part I
RB124-09/10
RB125-09/10, Part I
RB126-09/10, Part I
RB127-09/10
RB128-09/10
RB129-09/10
RB131-09/10
RB132-09/10
S222-09/10, Part II
RB133-09/10
S224-09/10, Part II
FS140-09/10, Part II
RB134-09/10
S225-09/10, Part II
FS156-09/10, Part II
RB135-09/10
RB136-09/10
RB137-09/10
RB138-09/10
RB139-09/10
RB140-09/10
RB141-09/10
RB142-09/10
RB143-09/10
RB144-09/10
RB145-09/10
RB146-09/10
RB147-09/10
FS150-09/10, Part II
FS151-09/10, Part II
RB148-09/10
S201-09/10, Part II
RB150-09/10
RB151-09/10
RB152-09/10
RB153-09/10
RB154-09/10
RB155-09/10
RB156-09/10
G146-09/10, Part II
G145-09/10, Part II
RB157-09/10
RB158-09/10
RB159-09/10
RB160-09/10
RB161-09/10
RB162-09/10
S3-09/10, Part II
RB163-09/10
RB164-09/10
RB165-09/10
RB166-09/10
RB167-09/10
S14-09/10, Part II
S15-09/10, Part II
RB168-09/10
RB169-09/10, Part I
RB170-09/10
S16-09/10, Part II
S17-09/10, Part II
S18-09/10, Part II
S20-09/10, Part II
S21-09/10, Part II
S22-09/10, Part III
S23-09/10, Part II
RB171-09/10
S30-09/10, Part II
RB172-09/10
S182-09/10, Part II
RB173-09/10
RB174-09/10
RB175-09/10
RB176-09/10, Part I
RB177-09/10, Part I
RB178-09/10
RB179-09/10
RB180-09/10
RB181-09/10
G147-09/10, Part II
G204-09/10, Part II
RB182-09/10
RB183-09/10
ADM1-09/10, Part XII
ADM3-09/10, Part II
ADM4-09/10, Part II
ADM6-09/10, Part II
ADM7-09/10, Part II
ADM8-09/10, Part III
ADM9-09/10, Part II
ADM14-09/10, Part II
ADM15-09/10, Part II
ADM16-09/10, Part II

RB1–09/10
R202

Proponent: Maureen Traxler, City of Seattle, WA, representing the Department of Planning & Development

Revise definition as follows:

BASEMENT. ~~That portion of a building~~ A *story* that is ~~partly or completely below *grade*~~ not a *story above grade plane* (see "*Story above grade plane*").

Reason: This definition of "Basement" has been modified to be consistent with the 2009 IBC definition of "Basement." The reference to "Story above grade" has been replaced with "Story above grade plane" to be consistent with the updated definition in the 2009 IRC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TRAXLER-RB-3-R202

RB2–09/10
R202

Proponent: Diana M. Hanson, representing North American Deck and Railing Association, Inc.

Add new definition as follows:

PATIO. An exterior walking surface typically made of concrete, stone, slab, brick, or other masonry product laid over a base, supported directly by the grade beneath and located at grade level.

Reason: To distinguish a patio from a deck. Where both decks and patios are both considered walking surfaces, patios are typically supported by grade, while decks are supported by an elevated frame structure with a load path through various structural components.

We feel that an IRC definition of "patio" will greatly assist in making the distinction between decks and patios. The term "patio" is referenced several times in the IRC*, yet nowhere is it defined. Further, we are seeing jurisdictional instruction that refer to patios, when in actuality, they mean decks. An IRC definition of the term will be helpful to code officials and builders, as well as, clarify the difference between "deck" and "patio" for the general public.

**Instances of the term "patio" in IRC:*
(R506 Concrete Floors on Ground) Section R506.2.3 Vapor retarder.
(Chapter 24 Fuel Gas) G2415.14 (404.14) Location of Outlets
(Chapter 24 Fuel Gas) G2415.15.1 (404.15.1) Limitations
(Appendix H Patio Covers) AH105 Light and Ventilation/Emergency Egress (3 instances)

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HANSON-RB-3-R202

RB3–09/10
R202

Proponent: Daniel J. Walker, PE, Thomas Associates, Inc., representing the National Sunroom Association

Add new definition as follows:

PATIO COVER. A one story structure not exceeding 12 feet (3657 mm) in height used for recreational, outdoor living purposes and not as carports, garages, storage rooms or habitable rooms. Enclosure walls shall be permitted to be of any configuration, provided the open or glazed area of the longer wall and one additional wall is equal to at least 65 percent of the area below a minimum of 6 feet 8 inches (2032 mm) of each wall, measured from the floor.

Reason: This information has long been included in Appendix H of the code. Although the term is defined in the Appendix, this information is not a mandatorily adopted part of the code. Because the term is used in the body of the code and no ordinarily accepted meaning exists, a specific definition is necessary.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: WALKER-RB-1-R202

RB4–09/10
R202

Proponent: Maureen Traxler, City of Seattle, WA, representing the Seattle Department of Planning & Development

Revise definition as follows:

STORY ABOVE GRADE PLANE. Any *story* having its finished floor surface entirely above *grade plane*, ~~except that a *basement* shall be considered as a *story above grade plane*~~ or in which ~~where~~ the finished surface of the floor next above ~~the *basement* meets any one of the following~~ is:

1. ~~Is~~ More than 6 feet (1829 mm) *above grade plane*.~~;~~ or
2. ~~Is more than 6 feet (1829 mm) above the finished ground level for more than 50 percent of the total building perimeter.~~
2~~3~~. ~~Is~~ More than 12 feet (3658 mm) above the finished ground level at any point.

Reason: The IRC and the IBC currently have different definitions of “story above grade plane.” These changes are intended to have the IRC definition match that of the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: TRAXLER-RB-2-R202

RB5–09/10
R202

Proponent: James Ranfone, American Gas Association

Revise definition as follows:

TOWNHOUSE. A separately owned single-family dwelling unit constructed in a group of three or more attached units in which each unit extends from foundation to roof and with open space on at least two sides.

Reason: To eliminate any potential misinterpretation that the townhouse definition is not to be applied to multifamily townhouse-like construction or developments. The States of Florida and Georgia are in the process of amending their adopted IRC in a similar manner.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: RANFONE-RB-1-R202

RB6–09/10
R202

Proponent: Dennis Pitts, American Forest & Paper Association

Revise definition as follows:

WOOD/PLASTIC COMPOSITE. A composite material made primarily from wood or cellulose-based materials ~~and~~ in combination with a smaller fraction of plastic(s) by weight.

Reason: This change is being put forward to coordinate the IRC definition with revisions under consideration for ASTM D 7032. The revision clarifies that the “primary” material in the composite is wood or other cellulose-based material with plastic(s) representing a smaller fraction of material.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: PITTS-RB-9-R202

RB7–09/10
R301.1.1, Chapter 44 (New)

Proponent: Julie Ruth, PE, JRuth Code Consulting, representing the American Architectural Manufacturers Association

1. Revise as follows:

R301.1.1 Alternative provisions. As an alternative to the requirements in Section R301.1 the following standards are permitted subject to the limitations of this code and the limitations therein. Where engineered design is used in conjunction with these standards, the design shall comply with the *International Building Code*.

1. American Forest and Paper Association (AF&PA) *Wood Frame Construction Manual* (WFCM).
2. American Iron and Steel Institute (AISI) *Standard for Cold-Formed Steel Framing—Prescriptive Method for One- and Two-Family Dwellings* (AISI S230).
3. ICC-400 *Standard on the Design and Construction of Log Structures*.
4. American Architectural Manufacturers Association/National Sunroom Association (AAMA) 2100 – *Specification for Sunrooms* for the construction of sunroom additions in areas of Seismic Design Category A and B only.

2. Add new standard to Chapter 44 as follows:

AAMA
2100-10 Specification for Sunrooms

Reason: The 2009 *International Residential Code* defines a sunroom as "A one-story structure attached to a *dwelling* with a *glazing area* in excess of 40 percent of the gross area of the structure's *exterior walls* and roof." These structures are typically constructed in one of two manners: 1) using typical wood framing techniques, or 2) using a stick system that consists of prefabricated framing of aluminum, fiberglass, wood or other materials, with glass or opaque wall or roof panels, and steel or aluminum connections.

The first technique can be done in accordance with the current provisions of the IRC for wood framed construction. There are not now, however, any provisions in the IRC for the second method of constructing a sunroom other than by engineering analysis or demonstrating equivalence to the current provisions of the *International Residential Code* by some other means. This proposal seeks to add testing of sunrooms to the provisions of AAMA/NSA 2100 - 10 *Specification for Sunrooms* to the available options for approval of sunroom construction in the IRC.

In 2002 the American Architectural Manufacturers Association, the National Sunroom Association and the National Patio Association published the first U.S. standard for the construction of sunroom – AAMA/NPEA/NSA 2100 – 02. The standard established five different categories of sunrooms based upon the intended use of the space, and established specific design criteria for them, based upon those same categories and intended end use. The document establishes specific parameters for a test structure, including minimum depth, width, slope of roof, etc., while relying upon documents such as the local building code and ASCE 7 to determine the minimum design loads that the testing is to be based upon.

As the document began to be used and proposed for inclusion in various codes (it is now referenced in the 2007 Florida Building Code) the members of the AAMA Sunroom Council became aware of improvements that were needed. These improvements included revisions that would bring the document more tightly in line with the requirements of AAMA/WDMA/CSA 101/I.S.2/A440 for the design, testing and labeling of windows, glass doors and skylights, and revisions that would bring the foundation requirements more closely in line with the requirements of the *International Residential Code*. AAMA/WDMA/CSA 101/I.S.2/A440 – 08 is referenced in the 2009 edition of the International Residential Code, International Building Code and International Energy Conservation Code for these products.

The standard is currently undergoing revision to incorporate the improvements mentioned above. If the revision is completed by the Code Development Hearings in Baltimore, we will ask the IRC Building and Energy Committee to approve it at that time. If not, we will have the revision complete and the next edition of the standard published and readily available before the 2010 Final Action Hearings for the 2012 International Residential Code for consideration by the active members of the ICC at that time.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, AAMA 2100, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: RUTH-RB-3-R301.1.1-CH 44

RB8–09/10

R301.1.4 (New), R301.1.4.1 (New), R301.1.4.2 (New), R301.1.4.3 (New), Figure R301.1.4 (New)

Proponent: Larry Wainright, Qualtim, Inc., representing the Structural Building components Industry

Add new text as follows:

R301.1.4 Building information sign. New buildings shall have a building information sign that shall comply with Sections R301.1.4.1 through R301.1.4.3.

R301.1.4.1 Sign location. The building information sign shall be required to be placed on each outside electrical meter box serving the structure. The sign shall be 3 ½ inches by 2 ½ inches and be made of reflective material.

R301.1.4.2 Sign shape. The sign shall consist of a symbol identifying three sections in a gable roof home. The top area shall indicate the construction type of the attic space while the bottom area shall indicate ceiling construction of the basement area. Multiple designations may be placed in each building information sign area, if applicable. Other designations may be used provided they are defined on the sign. See Figure R301.1.4.

R301.1.4.3 Sign designations. Designations shall be made based upon the construction type, and installed fire protection systems. The fire protection system installed in a building shall be designated in the center section of the sign as follows:

AS – Automated Fire Sprinkler System installed throughout
PS – Partial Automatic Fire Sprinkler System, and designate floor
NS – No system installed

T= Truss construction
E= Engineered lumber
C=Conventional Framing

FIGURE R301.1.4.
EXAMPLE OF BUILDING INFORMATION SIGN. (Labels may vary).

Reason: The purpose of this code change is to provide first responders with the information necessary to help facilitate fighting a residential fire. Information gleaned from this structural identification symbol will help first responders evaluate the construction of the building to determine how best to approach it. It is important that any labeling requirement assigned to residential structures be addressed in a manner that treats all construction methods equally, giving the firefighters the best information available.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WAINRIGHT-RB-7-R301.1.4

RB9–09/10

R301.1.4 (New), R301.1.4.1 (New), R301.1.4.2 (New), Figure R301.1.4.2 (New); IFC 316.6 (New), 316.6.1 (New), 316.6.2 (New), Figure 316.6.2 (New)

Proponent: Sean DeCrane, Cleveland, OH Fire Department, representing the Cleveland Fire Department and the International Association of Fire Fighters

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. PART II WILL BE HEARD BY THE IFC COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IRC BUILDING/ENERGY

Add new text as follows:

R301.1.4 Structural identification marking. One and two-family homes utilizing light-frame construction, in structural components, shall be required to place an identification label on each outside electrical meter box serving the structure, or other conspicuous location as approved by the building official.

R301.1.4.1 Label form and content. The label shall be 3 ½ inches by 2 ½ inches and be made of reflective material. Each label shall include the following abbreviations, as applicable:

1. T to indicate Truss Construction
2. E to indicate Engineered Components
3. P to indicate the structural components are protected with a fire-resistant products
4. U to indicate the structural components are not protected by fire resistant products

R301.1.4.2 Label symbol and content. The label shall consist of a symbol identifying three sections in a gable roof home. The top shall indicate an attic space while the bottom third shall indicate basement area.

The abbreviations required by Section R301.1.4.1 indicating construction components shall be placed in the designated floor plan area, (i.e. T in the attic for Truss Roof, E in the basement to indicate Engineered Floors). Utilization of the middle area shall be approved by the local building official. See Figure R301.1.4.2.

FIGURE R301.1.4.2
EXAMPLE STRUCTURAL IDENTIFICATION LABEL

PART II – IFC

Add new text as follows:

316.6 Structural identification marking. One and two-family homes utilizing light-frame construction in structural components shall be required to place an identification label on each outside electrical meter box serving the structure, or other conspicuous location as approved by the fire chief.

316.6.1 Label form and content. The label shall be 3 ½ inches by 2 ½ inches and be made of reflective material. Each label shall include the following abbreviations, as applicable:

1. T to indicate Truss Construction
2. E to indicate Engineered Components
3. P to indicate the structural components are protected with a fire-resistant products
4. U to indicate the structural components are not protected by fire resistant products

316.6.2 Label symbol and content. The label shall consist of a symbol identifying three sections in a gable roof home. The top shall indicate an attic space while the bottom third shall indicate basement area

The abbreviations required by Section 316.6.1 indicating construction components shall be placed in the designated floor plan area, (i.e. T in the attic for Truss Roof, E in the basement to indicate Engineered Floors). Utilization of the middle area shall be approved by the fire code official. See Figure 316.6.2.

FIGURE 316.6.2
EXAMPLE STRUCTURAL IDENTIFICATION LABEL

Reason: On August 13, 2006 a Wisconsin fire fighter was killed, and a second fire fighter injured, when the floor they were operating on collapsed sending them into the basement. One fire fighter fell directly into the room of origin and was killed, the second fire fighter landed on the opposite side of a block wall and survived by shielding herself and making an escape through a rear window. They checked the floor to ensure it was safe and solid, just prior to collapse they heard a loud crack.

The floor they were operating on was unprotected lightweight construction that collapsed without warning. In the ensuing investigation, the National Institute for Occupational Safety and Health released report F2006-26[1]. One of the recommendations is to "modify current building codes to require that lightweight trusses be protected with a fire barrier". This should not only pertain to truss construction. There are additional forms of construction that can be determined to be lightweight, cold form steel, bar joists, wooden engineered I-beam, etc., the recent trend in residential construction is to use products that are financially beneficial. It is the belief of many of us in the fire service that as the industry engineers products to a more finite point we are losing our safety factors.

In their report 2007-12 released May 16, 2008, NIOSH[2] recommended "Ensure fire fighters are trained for extreme conditions such as high winds and rapid fire progression associated with lightweight construction". They further stated, "In this era of new lightweight construction, training procedures covering strategy and tactics in extreme operations conditions, such as high winds and lightweight building construction (i.e. materials and design) are needed for all levels of fire fighters. Lightweight constructed buildings fail rapidly with little warning, complicating rescue efforts. The potential for fire fighters to become trapped or involved in a collapse may be increased. There are twenty-nine actions for fire fighters can take to protect themselves when confronted with buildings utilizing lightweight building components as structural members. They range from looking for signs or indicators that these materials are used in buildings (such as, newer structures, large unsupported spans, and heavy black smoke being generated) to getting involved in newer building code development".

On September 27, 2007 NIOSH released report 2006-24[3]. The first recommendation of the report read "Ensure that fire fighters and incident commanders are aware unprotected pre-engineered I-joist floor systems may fail at a faster rate than solid wood joists when exposed to direct fire impingement, and they should plan interior operations accordingly". The discussion of the recommendation is quite lengthy but identifies the advantages of the construction industry using this type of construction but also relates the dangers to fire fighters, "The Illinois Fire Service Institute, at the University of Illinois, conducted tests to help determine the structural stability of sample floor systems. These studies suggest that engineered wooden I-beams can fail in as little as 4 minutes and 40 seconds under controlled test conditions". The report also states that weakened floors are difficult to detect from above as the floor surface may appear intact.

On November 16, 2007, NIOSH released report F2007-07[4]. In this Fire Fighter Death in the Line-of-Duty report, NIOSH recommends "building code officials and local authorities having jurisdiction should consider modifying the current codes to require that lightweight trusses are protected with a fire barrier on both the top and the bottom". The report further states "In this incident, the floor trusses for the first floor did not have any protection on the bottom cord, which immediately exposed the trusses to fire in the basement. Unfinished basements are very common throughout the country. Basements typically house additional fire exposures such as alternative heating sources, hot water heaters, clothes dryers, etc.. It is critical for trusses and lightweight engineered wood I-beams that are used in a load-bearing assembly to be protected with a thermal barrier such as gypsum wallboard. The function of the thermal barrier is a critical factor in the fire performance of the assembly".

In April, 2005, NIOSH released their report "Preventing Injuries and Deaths of Fire Fighters due to Truss System Failures"[5]. In their release they recommended the placement of a labeling system on buildings to indicate the type of construction. While this recommendation will probably not be acceptable to residents of a one or two family home, we can mandate that they increase the protection of the construction type to provide increased safety to the residents and the responding fire fighters.

In fact, NIOSH has been concerned enough with the performance of lightweight floors in fire conditions they released a Workplace Solutions report in February, 2009, *Preventing Deaths and Injuries of Fire Fighters Working Above Fire-Damaged Floors*[6]. Authors of the report recommend; "Builders, contractors, and owners should consider protecting all floor systems, including engineered wood I-joists, by covering the underside with fire-resistant materials".

Many of the opponents of this requirement have made claims that the fire service has failed to provide technical data to support our real world experiences with the lightweight products. Since the previous ICC code cycle there have been three specific reports released by three separate test groups performing tests for different reasons. I have included their results below.

The National Research Council Canada performed a series of tests in creating their report Fire Performance of Houses, Phase I: Study of Unprotected Floor Assemblies in Basement Fire Scenarios, released December 18, 2008. The goal of the report was "With the advent of new materials and innovative construction products and systems for use in construction of houses, there is a need to understand what impacts these materials and products will have on occupant life safety under fire conditions and a need to develop a technical basis for the evaluation of their fire performance"[7]. These tests were not intentionally conducted for fire fighter safety but rather to identify the dangers to the civilian occupants and their ability to self evacuate. The report states "With the relatively severe fire scenarios used in the experiments, the times to reach structural failure for the wood I-joist, steel C-joist, metal plate and metal wood truss assemblies were 35-60% shorter than that for the solid wood joist assembly". Additionally, "For the solid wood joist assemblies, the structural failure occurred after deflection of the floor, mainly in the form of OSB subfloor failure (burn through). For all other floor assemblies, after deflection of the floor, the structural failure occurred either in the form of complete collapse into the basement or in the form of a "V" shaped collapse due to joist or truss failure". In keeping with the intent of occupant safety the report also found "One engineered floor assembly, which gave the shortest time to reach structural failure in the open basement scenario, failed structurally in the closed basement doorway scenario before the tenability limits were reached for healthy adults of average susceptibility". This calls into question, if it can not give the occupant time to self evacuate how will it perform when a fire fighter is performing Search and Rescue for that specific occupant. In summarizing the various test results the report found "The time gap between the onset of untenable conditions and the structural failure of the floor assembly was smaller for the engineered floor assemblies than for the solid wood joist assembly used in the experiments". This is very serious for the responding fire fighter performing life saving Search and Rescue for occupants who have lost consciousness due to the untenable conditions. These victims may still be savable but, the performances of the lightweight assemblies indicate that, savable victims may not be reached due to floor compromise.

In 2008 Tyco Fire Suppression & Building Products performed a series of fire tests. The intent of these tests was to demonstrate the impact residential sprinklers will have in improving fire safety in one and two-family occupancies when lightweight construction is present. The results of these tests were released in 2008 as A Technical Analysis: The Performance of Composite Wood Joists Under Realistic Fire Conditions[8]. In the introduction of the report the author states, "One example of the difference in fire performance of a lightweight structural member compared to solid sawn lumber is the behavior of composite wood joists. When a composite wood joist is exposed to fire, the thin oriented strand board used as the web in the joist is quickly consumed, which results in an inability of the joist to carry the load and ultimately a failure of the supported floor assembly". Later in the introduction the report continues "Due to the greater mass per unit of surface area of the solid wood joist, it will support the floor assembly for much longer than its lightweight alternative when exposed to equivalent fire conditions". The first test involving an unsprinklered room fire led to flashover in 7:09 from ignition and floor assembly collapse at the 11:30 mark from ignition. That is roughly four minutes from flashover we had a collapse of almost the entire 16' x 16' floor area. The second test results reached flashover in only 5:15 from ignition, collapse in this test occurred at 8:34 from ignition, a stunning three minutes after flashover. This would be the time the fire fighters are entering the structure for suppression and Search and Rescue efforts.

These reports are still not enough for some critics so I am referencing a third report. Underwriters Laboratories, The Chicago Fire Department and the International Association of Fire Chiefs received a grant from the Department of Homeland Security to conduct a number of tests on various topics but the main issue was to conduct tests, and report the findings, to evaluate the performance of lightweight structural components when exposed to fire and if the components can be protected. They recently issued the subsequent report *Structural Stability of Engineered Lumber in Fire Conditions*[9]. Tests assemblies were subjected to the standards of the ASTM E119 Test Standard. Two assemblies did not include a ceiling, six of the assemblies included a ceiling consisting of ½ inch thick gypsum board and one assembly included a ¾ inch plaster ceiling. A load of 40 psf was placed along two of the four edges and two 300 lb fire fighter mannequins were applied to the floor assembly. Results from the tests indicated that unprotected 12" wooden I-joist reached structural failure at the 5:58 mark in the tests. The resulting failure covered a large area of the floor. The unprotected 2" x 10" wooden I-beams reached structural collapse at the 18:45 mark in the test, a difference of over twelve minutes. These twelve minutes are critical in Search and Rescue. Further tests demonstrated that when ½ inch gypsum was placed on the 12" I-joists the collapse did not occur until the 26:45 mark in the test. Just a simple ½ covering extended the collapse time approximately twenty minutes. When the ½ inch covering was applied to the wooden I-beams the collapse time was extended to 44:45 mark in the test. One important factor to point out regarding these tests is that the fire fighters are a dead load and not a live load. Would a simulated live load of fire fighters transferring additional psi with each step or crawl have contributed to an earlier collapse? When we review the Wisconsin fire where Engineer Arnie Wolf was killed, the fire fighters stated the floor felt solid but suffered a catastrophic collapse when they began their search pattern. These tests clearly outline the performances of the various construction practices and the dangers these performances present to fire fighters. Underwriters Laboratories and the Chicago Fire Department followed these tests with an online educational program, to view go to http://www.uluniversity.us/home.aspx, in an attempt to educate the nation's fire service on the hazards of operating in these environments.

This code change proposal is an attempt to provide a responsible means on residential construction. I have provided examples of fire fighters being killed in occupancies utilizing lightweight construction practices and the subsequent reports detailing the need to protect lightweight construction. I have also provided two reports generated by a neutral governmental agency recommending protection requirements for lightweight construction. These incidents, and others like them, have produced great hardships on the people involved, they have created widows, fatherless children, injured fire fighters and many who bear the pain of fatalities that could have been prevented. I strongly urge your support for this proposed code change.

While we are attempting to protect the structural elements of lightweight construction information is still critical to the Incident Commander and responding fire fighters. Identifying potential life threatening situations in a non-invading manner is a big step forward and can provide valuable and potentially lifesaving information.

1. National Institute for Occupational Safety and Health Report F206-26. July, 2007.
2. National Institute for Occupational Safety and Health Report F2007-12, May, 2008.
3. National Institute for Occupational Safety and Health Report F206-24, September, 2007.
4. National Institute for Occupational Safety and Health Report F2007-07, November, 2007.
5. National Institute for Occupational Safety and Health Alert, "Preventing Injuries and Deaths of Fire Fighters due to Truss System Failures".
6. National Institute for Occupational Safety and Health Workplace Solutions, *Preventing Deaths and Injuries of Fire Fighters Working Above Fire-Damaged Floors*, February, 2009.
7. National Research of Canada, Institute for Research in Construction; Fire performance of Houses, Phase I, Study of Unprotected Floor Assemblies in Basement Fire Scenarios, December, 2008.
8. Tyco Industries, *A Technical Analysis: The Performance of Composite Wood Joists Under Realistic Fire Conditions*, September 2008.
9. Underwriters Laboratories, *Structural Stability of Engineered Lumber in Fire Conditions*, September 30, 2008

Floor assembly where Fire Engineer Arnie Wolf was killed

Residential use of cold form steel with penetrations and 24" on center

Even lighterweight materials – Georgia Pacific XJ-85

Cost Impact: The code change proposal will minimally increase construction costs.

PART I – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IFC

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DECRANE-RB-2-R301.1.4-F2-316.6

RB10–09/10
R301.1.4 (New)

Proponent: Daniel J. Walker, PE, Thomas Associates, Inc., representing the National Sunroom Association

Add new text as follows:

R301.1.4 Patio covers. Patio covers shall be designed and constructed to sustain, within the stress limits of this code, all dead loads plus a minimum vertical live load of 10 pounds per square foot (0.48 kN/m^2) except that snow loads shall be used where such snow loads exceed this minimum. Such covers shall be designed to resist the minimum wind loads set forth in Section R301.2.1.

Reason: This language has long been included in Appendix H of the code. The requirements are specific to this section and therefore should be included here.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: WALKER-RB-3-R301.1.4

RB11–09/10

R202 (New), R301.1.5 (New), R301.1.5.1 (New), R301.1.5.2 (New), R301.1.5.3 (New), R301.1.5.4 (New), Table R301.1.5(1) (New), Table R301.1.5(2) (New)

Proponent: Daniel J. Walker, PE, Thomas Associates, Inc., representing the National Sunroom Association

Add new text as follows:

SCREEN ENCLOSURE. A building or part thereof, in whole or in part self-supporting, and having walls of insect screening and a roof of insect screening, plastic, aluminum, or similar light-weight material.

R301.1.5 Special provisions for aluminum screen enclosures in hurricane-prone regions. Aluminum screen enclosures in hurricane-prone regions shall comply with Sections R301.1.5.1 through R301.1.5.4.

R301.1.5.1 Wind load. Structural members supporting screen enclosures shall be designed to support minimum wind loads given in Table R301.1.5(1) and R301.1.5(2). Where any value is less than 10 psf (0.479 kN/m^2) use 10 psf (0.0479 kN/m^2).

R301.1.5.2 Deflection Limit. For members supporting screen surfaces only, the total load deflection shall not exceed //60. Screen surfaces shall be permitted to include a maximum of 25 percent solid flexible finishes.

R301.1.5.3 Importance factor. The wind factor for screen enclosures shall be 0.77 in accordance with Section 6.5.5 of ASCE 7.

R301.1.5.4 Roof live load. The minimum roof live load shall be 10 psf (0.479 kN/m^2).

TABLE R301.1.5(1)
DESIGN WIND PRESSURES FOR ALUMINUM SCREEN ENCLOSURE FRAMING WITH AN IMPORTANCE FACTOR OF 0.77 [a, b, c]

LOAD CASE	WALL	Basic Wind Speed (mph)											
		100		110		120		130		140		150	
		Exposure Category Design Pressure (psf)											
		C	B	C	B	C	B	C	B	C	B	C	B
A[d]	Windward and leeward walls (flow thru) and windward wall (non-flow thru) L/W = 0-1	12	8	14	10	17	12	19	14	23	16	26	18
A[d]	Windward and leeward walls (flow thru) and windward wall (non-flow thru) L/W = 2	13	9	16	11	19	14	22	16	26	18	30	21
B[e]	Windward: Non-gable roof	16	12	20	14	24	17	28	20	32	23	37	26
B[e]	Windward: Gable roof	22	16	27	19	32	23	38	27	44	31	50	36
	ROOF												
All[f]	Roof-screen	4	3	5	4	6	4	7	5	8	6	9	7
All[f]	Roof-solid	12	9	15	11	18	13	21	15	24	17	28	20

For SI: 1 mile per hour = 0.44 m/s, 1 pound per square foot = 0.0479kPa, 1 foot = 304.8 mm.

a. Values have been reduced for 0.77 Importance Factor in accordance with Section R301.1.5.3.
b. Minimum design pressure shall be 10 psf in accordance with Section R301.1.5.1.
c. Loads are applicable to screen enclosures with a mean roof height of 30 feet or less. For screen enclosures of different heights the pressures given shall be adjusted by multiplying the table pressure by the adjustment factor given in Table R301.1.5(2).

d. For Load Case A flow thru condition the pressure given shall be applied simultaneously to both the upwind and downwind screen walls acting in the same direction as the wind. The structure shall also be analyzed for wind coming from the opposite direction. For the non-flow thru condition the screen enclosure wall shall be analyzed for the load applied acting toward the interior of the enclosure.
e. For Load Case B the table pressure multiplied by the projected frontal area of the screen enclosure is the total drag force, including drag on screen surfaces parallel to the wind, which must be transmitted to the ground. Use Load Case A for members directly supporting the screen surface perpendicular to the wind. Load Case B loads shall be applied only to structural members which carry wind loads from more than one surface.
f. The roof structure shall be analyzed for the pressure given occurring both upward and downward.

TABLE R301.1.5(2)
HEIGHT ADJUSTMENT FACTORS

MEAN	EXPOSURE	
Roof Height (ft)	B	C
15	1	0.86
20	1	0.92
25	1	0.96
30	1	1.00
35	1.05	1.03
40	1.09	1.06
45	1.12	1.09
50	1.16	1.11
55	1.19	1.14
60	1.22	1.16

For SI: 1 foot = 304.8 mm.

Reason: This language has long been included in Appendix H of the code. The requirements are specific to this section and therefore should be included here.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: WALKER-RB-6-RB-2-R202-R301.1.5

RB12–09/10
R301.2.1, R301.2.1.1, R301.2.2.2.5, R301.2.2.4, R301.3

Proponent: Gary Ehrlich, PE, National Association of Home Builders (NAHB)

Revise as follows:

R301.2.1 Wind design criteria ~~limitations~~. Buildings, and portions thereof, shall be constructed in accordance with the wind provisions of this code using the basic ~~limited by~~ wind speed~~, as defined~~ in Table R301.2(1)~~ and construction methods in accordance with this code. Basic wind speeds shall be~~ as determined from Figure R301.2(4). Where different construction methods and structural materials are used for various portions of a building, the applicable requirements of this section for each portion shall apply. Where ~~loads for wall coverings, curtain walls, roof coverings, exterior windows, skylights, garage doors and exterior doors are~~ not otherwise specified, the wind loads listed in Table R301.2(2) adjusted for height and exposure using Table R301.2(3) shall be used to determine design load performance requirements for wall coverings, curtain walls, roof coverings, exterior windows, skylights, garage doors and exterior doors. Asphalt shingles shall be designed for wind speeds in accordance with Section R905.2.6.

R301.2.1.1 Wind limitations ~~Design criteria~~. ~~In~~ The wind provisions of this code shall apply to the design of buildings ~~regions~~ where the basic wind speed~~s~~ from Figure R301.2(4) is less than ~~equal or exceed~~ 100 miles per hour (45 m/s) in *hurricane-prone regions*, or 110 miles per hour (49 m/s) elsewhere~~, the design of buildings shall be in accordance with one of the following methods. The elements of design not addressed by those documents in Items 1 through 4 shall be in accordance with this code~~.

Exceptions:

1. For concrete construction, the wind provisions of this code shall apply in accordance with the limitations of Sections R404 and R611.
2. For structural insulated panels, the wind provisions of this code shall apply in accordance with the limitations of Section R614.

Where the basic wind speed exceeds the limitations above, the design of buildings for wind resistance shall be in accordance with one or more of the following methods:

1. American Forest and Paper Association (AF&PA) *Wood Frame Construction Manual for One- and Two-Family Dwellings* (WFCM); ~~or~~
2. International Code Council (ICC) *Standard for Residential Construction in High-Wind Regions* (ICC-600); ~~or~~
3. *Minimum Design Loads for Buildings and Other Structures* (ASCE-7); ~~or~~
4. American Iron and Steel Institute (AISI), *Standard for Cold-Formed Steel Framing—Prescriptive Method For One- and Two-Family Dwellings (AISI 230).*
5. ~~Concrete construction shall be designed in accordance with the provisions of this code.~~
6. ~~Structural insulated panel (SIP) walls shall be designed in accordance with the provisions of this code.~~

The elements of design not addressed by the methods in Items 1 through 4 shall be in accordance with the provisions of this code.

R301.2.2.2.5 Irregular buildings. The seismic provisions of ~~Prescriptive construction as regulated by~~ this code shall not be used for irregular structures located in Seismic Design Categories C, D0, D1 and D2. Irregular portions of structures shall be designed in accordance with accepted engineering practice to the extent the irregular features affect the performance of the remaining structural system. When the forces associated with the irregularity are resisted by a structural system designed in accordance with accepted engineering practice, design of the remainder of the building shall be permitted using the provisions of this code. A building or portion of a building shall be considered to be irregular when one or more of the following conditions occur:

1. When exterior shear wall lines or *braced wall panels* are not in one plane vertically from the foundation to the uppermost *story* in which they are required.

   Exception: For wood light-frame construction, floors with cantilevers or setbacks not exceeding four times the nominal depth of the wood floor joists are permitted to support *braced wall panels* that are out of plane with *braced wall panels* below provided that:

   1. Floor joists are nominal 2 inches by 10 inches (51 mm by 254 mm) or larger and spaced not more than 16 inches (406 mm) on center.
   2. The ratio of the back span to the cantilever is at least 2 to 1.
   3. Floor joists at ends of *braced wall panels* are doubled.
   4. For wood-frame construction, a continuous rim joist is connected to ends of all cantilever joists. When spliced, the rim joists shall be spliced using a galvanized metal tie not less than 0.058 inch (1.5 mm) (16 gage) and 11/2 inches (38 mm) wide fastened with six 16d nails on each side of the splice or a block of the same size as the rim joist of sufficient length to fit securely between the joist space at which the splice occurs fastened with eight 16d nails on each side of the splice; and
   5. Gravity loads carried at the end of cantilevered joists are limited to uniform wall and roof loads and the reactions from headers having a span of 8 feet (2438 mm) or less.
2. When a section of floor or roof is not laterally supported by shear walls or *braced wall lines* on all edges.

   Exception: Portions of floors that do not support shear walls or *braced wall panels* above, or roofs, shall be permitted to extend no more than 6 feet (1829 mm) beyond a shear wall or *braced wall line*.

3. When the end of a *braced wall panel* occurs over an opening in the wall below and ends at a horizontal distance greater than 1 foot (305 mm) from the edge of the opening. This provision is applicable to shear walls and *braced wall panels* offset in plane and to *braced wall panels* offset out of plane as permitted by the exception to Item 1 above.

   Exception: For wood light-frame wall construction, one end of a *braced wall panel* shall be permitted to extend more than 1 foot (305 mm) over an opening not more than 8 feet (2438 mm) wide in the wall below provided that the opening includes a header in accordance with the following:

1. The building width, loading condition and framing member species limitations of Table R502.5(1) shall apply; and
2. Not less than one 2 × 12 or two 2 × 10 for an opening not more than 4 feet (1219 mm) wide; or
3. Not less than two 2 × 12 or three 2 × 10 for an opening not more than 6 feet (1829 mm) wide; or
4. Not less than three 2 × 12 or four 2 × 10 for an opening not more than 8 feet (2438 mm) wide; and
5. The entire length of the *braced wall panel* does not occur over an opening in the wall below.

4. When an opening in a floor or roof exceeds the lesser of 12 feet (3658 mm) or 50 percent of the least floor or roof dimension.
5. When portions of a floor level are vertically offset.

Exceptions:

1. Framing supported directly by continuous foundations at the perimeter of the building.
2. For wood light-frame construction, floors shall be permitted to be vertically offset when the floor framing is lapped or tied together as required by Section R502.6.1.

6. When shear walls and *braced wall lines* do not occur in two perpendicular directions.
7. When stories above-*grade* partially or completely braced by wood wall framing in accordance with Section R602 or steel wall framing in accordance with Section R603 include masonry or concrete construction.

Exception: Fireplaces, chimneys and masonry veneer as permitted by this code. When this irregularity applies, the entire *story* shall be designed in accordance withaccepted engineering practice.

R301.2.2.4 Seismic Design Category E. Buildings in Seismic Design Category E shall be designed to resist seismic loads in accordance with the *International Building Code*, except when the seismic design category is reclassified to a lower seismic design category in accordance with Section R301.2.2.1. Components of buildings not required to be designed to resist seismic loads shall be constructed in accordance with the provisions of this code.

R301.3 Story height. The wind and seismic provisions of this code shall apply to buildings with story heights not exceeding the following: ~~Buildings constructed in accordance with these provisions shall be limited to story heights of not more than the following:~~

1. For wood wall framing, the laterally unsupported bearing wall stud height permitted by Table R602.3(5) plus a height of floor framing not to exceed 16 inches (406 mm).

   Exception: For wood framed wall buildings with bracing in accordance with Tables R602.10.1.2(1) and R602.10.1.2(2), the wall stud clear height used to determine the maximum permitted *story height* may be increased to 12 feet (3658 mm) without requiring an engineered design for the building wind and seismic force resisting systems provided that the length of bracing required by Table R602.10.1.2(1) is increased by multiplying by a factor of 1.10 and the length of bracing required by Table R602.10.1.2(2) is increased by multiplying by a factor of 1.20. Wall studs are still subject to the requirements of this section.

2. For steel wall framing, a stud height of 10 feet (3048 mm), plus a height of floor framing not to exceed 16 inches (406 mm).
3. For masonry walls, a maximum bearing wall clear height of 12 feet (3658 mm) plus a height of floor framing not to exceed 16 inches (406 mm).

   Exception: An additional 8 feet (2438 mm) is permitted for gable end walls.

4. For insulating concrete form walls, the maximum bearing wall height per *story* as permitted by Section R611 tables plus a height of floor framing not to exceed 16 inches (406 mm).
5. For structural insulated panel (SIP) walls, the maximum bearing wall height per *story* as permitted by Section 614 tables shall not exceed 10 feet (3048 mm) plus a height of floor framing not to exceed 16 inches (406 mm).

Individual walls or walls studs shall be permitted to exceed these limits as permitted by Chapter 6 provisions, provided story heights are not exceeded. Floor framing height shall be permitted to exceed these limits provided the story height does not exceed 11 feet 7 inches (3531 mm). An engineered design shall be provided for the wall or wall framing members when they exceed the limits of Chapter 6. Where the story height limits of this section are exceeded, the design of the building, or the non-compliant portions thereof, to resist wind and seismic loads ~~an engineered design~~ shall be ~~provided~~ in accordance with the *International Building Code* ~~for the overall wind and seismic force resisting systems~~.

Reason: The purpose of this code proposal is to clarify the IRC limitations for wind and seismic design. Code users have expressed confusion over the current language of the wind limitations and other code limits on structural elements. Some builders and code officials believe that if a dwelling exceeds the wind limits of R301.2.1.1, the seismic limits of R301.2.2, or the story height limits of R301.3, the entire dwelling must be designed in accordance with the IBC, including the HVAC, electrical and plumbing systems and the provisions of the IBC for egress, fire rating, and other architectural elements.

This code proposal clarifies that it is only the structural design of the dwelling to resist wind loads or seismic loads, and the selection of certain critical components such as windows or roofing that is prone to wind damage, which must be performed in accordance with the IBC or the other alternate standards (e.g. the WFCM or the AISI standards). The remaining architectural, mechanical, electrical and plumbing provisions of the IRC still apply to the dwelling.

Section R301.2.1.1 is reorganized for better readability and flow. Its title is swapped with R301.2.1, since it is the larger paragraph above that actually provides design criteria and Section R301.2.1.1 that actually provides wind limitations. Section R301.3 is also revised as noted above to clarify it is the structural portions exceeding the story height limits that require an engineering design.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EHRLICH-RB-1-R301.2.1

RB13–09/10
R301.2.1.1

Proponent: Gary Ehrlich, PE, National Association of Home Builders (NAHB)

Revise as follows:

R301.2.1.1 Design criteria. In regions where the basic wind speeds from Figure R301.2(4) equal or exceed ~~100 miles per hour (45 m/s) in *hurricane-prone regions*, or~~ 110 miles per hour (49m/s) ~~elsewhere~~, the design of buildings shall be in accordance with one of the following methods. The elements of design not addressed by those documents in Items 1 through 4 shall be in accordance with this code.

1. American Forest and Paper Association (AF&PA) *Wood Frame Construction Manual for One- and Two-Family Dwellings* (WFCM); or
2. International Code Council (ICC) *Standard for Residential Construction in High-Wind Regions* (ICC-600); or
3. *Minimum Design Loads for Buildings and Other Structures* (ASCE-7); or
4. American Iron and Steel Institute (AISI), *Standard for Cold-Formed Steel Framing—Prescriptive Method For One- and Two-Family Dwellings (AISI 230).*
5. Concrete construction shall be designed in accordance with the provisions of this code.
6. Structural insulated panel (SIP) walls shall be designed in accordance with the provisions of this code.

Reason: The purpose of this proposal is to restore the IRC scope limit for construction in high-wind areas to the original 110 miles per hour for all areas of the country. Without this revision, houses in areas along the Atlantic and Gulf coasts where the basic wind speed is 100 or 105 miles per hour will need to be engineered or designed to prescriptive requirements intended for areas at risk for Category 4 and 5 hurricanes.

As justification for the original code change made during the 2004-2005 Code Development Cycle (RB31-04/05) the Institute for Building and Home Safety (IBHS) cited four issues: roof sheathing nails, wind bracing requirements, toe-nailed uplift connections, and wall-to-wall connections at the floor line. In lieu of pursuing individual modifications to resolve these issues within the IRC, the proponent simply lowered the ceiling for using prescriptive design provisions along the Atlantic & Gulf coasts. We believe this is excessive and not supported by the observed performance of housing properly constructed to previous editions of the IRC in extreme wind events (hurricanes). At no time did the proponents ever provide documented evidence of failures of structures constructed to the previous IRC provisions. Nor did they provide technical justification in the form of engineering calculations or structural research to support their contentions. However, the 2004-2005 Code Development Cycle coincided with the four 2004 Florida hurricanes (Wilma, Ivan, Charley and Frances) and with Katrina and Rita in 2005. This led to significant political and emotional pressure on the code development community to increase the stringency of building codes, whether or not they were technically justified or appropriately targeted to the risk of severe wind events in those areas subject to the new provisions.

In the subsequent code development cycles, individual changes have been made to address all four issues raised by IBHS. The 2006 IRC increased the minimum roof sheathing nail size from 6d to 8d common nails for all roofs, and the gable and eave end zone nail spacing was tightened for dwellings in the 100mph region. The wall bracing provisions in the 2009 IRC have been reorganized, improved, and clarified and many new construction details provided. Most importantly, a new wind bracing table is provided which ties the required wall bracing for wind resistance to the wind loads determined using ASCE 7-05. Finally, a requirement for a continuous load path at the roof-to-wall, floor-to-floor, and floor-to-foundation connections at braced wall panels was added.

The 2009 IRC also provides requirements for wind resistance of exterior wood sheathing and for the installation of vinyl siding and foam sheathing. These new requirements further increase the resistance of structures built under the IRC to wind damage.

We question the age of the damaged structures used for justifying the code change reducing the IRC scope. The Federal Emergency Management Agency Summary Reports on Building Performance from the 2004 hurricane season and from Hurricane Katrina in 2005 indicated that structures built to the 2000 and 2003 IRC performed extremely well. The 2004 hurricane report stated (p.13), “no structural failures were observed to structures designed and constructed to the wind design requirements of…the 2000 IBC/IRC…” The Hurricane Katrina report stated (p.4-8), “Most structural failures observed…appeared to be the result of inadequate design and construction methods commonly used before IBC 2000 and IRC 2000 were adopted and enforced.” Finally, a study conducted by the Texas Windstorm Insurance Association after Hurricane Rita showed there was substantially less damage and substantially fewer insurance claims in those areas where the 2000 or 2003 IBC and IRC were adopted and enforced.

NAHB estimates show that complying with the ICC-600 Standard for Residential Construction in High Wind Regions or the AF&PA Wood Frame Construction Manual where required by the IRC can add as much as $10,000 to the cost of a home. We believe these additional requirements make it extremely difficult to construct affordable housing along the Atlantic and Gulf coasts and place an onerous burden on builders and homeowners, and particularly on first-time home buyers. This added cost of construction will have the effect of keeping residents of these areas in older homes which do not have the robust construction provided by the IRC prescriptive provisions and which will be substantially more susceptible to structural failures, water infiltration and damage to personal property in high wind events.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EHRLICH-RB-2-R301.2.1.1

RB14–09/10

R202, R301.2.1, Figure R301.2(4), Figure R301.2(4)A (New), R301.2.1.1, Figure R301.2(4)B (New), R301.2.1.2, Figure R301.2(4)C, R301.2.1.4

Proponent: James Rossberg, Structural Engineering Institute of ASCE

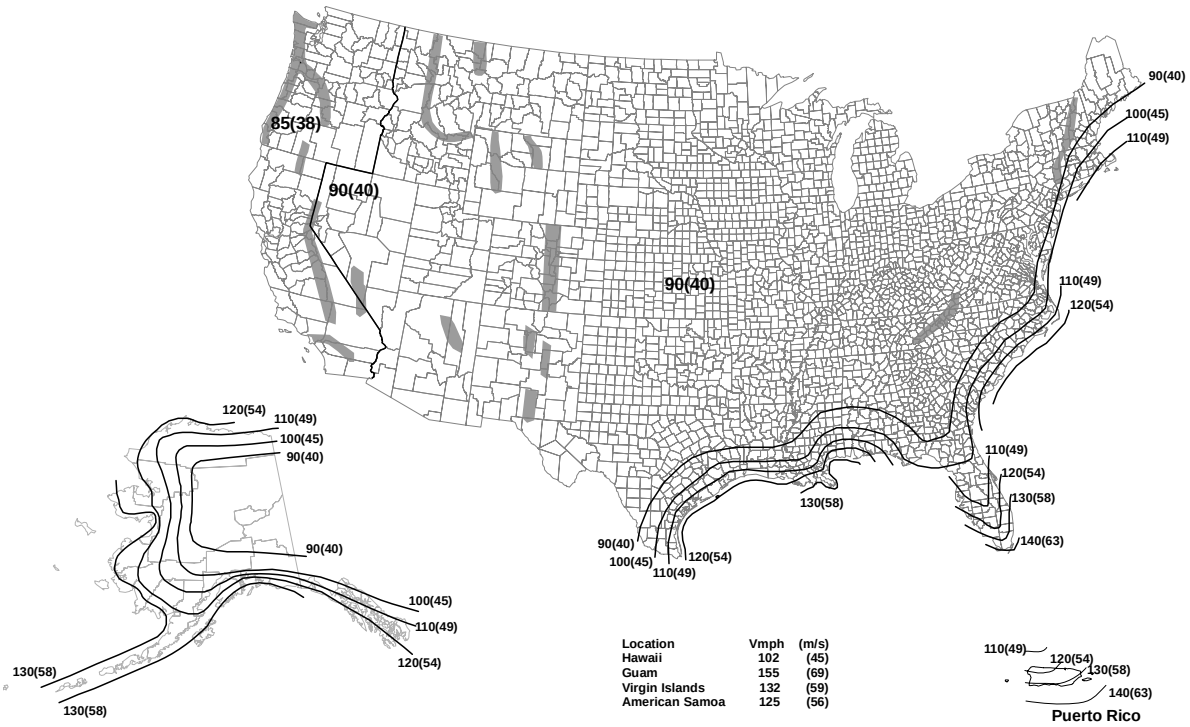
1. Revise as follows:

BASIC WIND SPEED. Three-second gust speed at 33 feet (10 058 mm) above the ground in Exposure C (see Section R301.2.1) as given in Figure R301.2(4)A.

WIND BORNE DEBRIS REGION. Areas within hurricane-prone regions as designated in accordance with Figure R302.1(4)C ~~within one mile of the coastal mean high water line where the basic wind speed is 110 miles per hour (49 m/s) or greater; or where the basic wind speed is equal to or greater than 120 miles per hour (54 m/s); or Hawaii~~.

R301.2.1 Wind limitations. Buildings and portions thereof shall be limited by wind speed, as defined in TableR301.2(1) and construction methods in accordance with this code. Basic wind speeds shall be determined from Figure R301.2(4)A. The structural provisions of this code for wind loads are not permitted where wind design is required as specified in Section R301.2.1.1. Where different construction methods and structural materials are used for various portions of a building, the applicable requirements of this section for each portion shall apply. Where loads for wall coverings, curtain walls, roof coverings, exterior windows, skylights, garage doors and exterior doors are not otherwise specified, the loads listed in Table R301.2(2) adjusted for height and exposure using Table R301.2(3) shall be used to determine design load performance requirements for wall coverings, curtain walls, roof coverings, exterior windows, skylights, garage doors and exterior doors. Asphalt shingles shall be designed for wind speeds in accordance with Section R905.2.6.

2. Delete Figure R301.2(4) and replace as follows:



Notes:
1. Values are nominal design 3-second gust wind speeds in miles per hour (m/s) at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation between contours is permitted.
3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
4. Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

FIGURE R301.2(4)A
BASIC WIND SPEEDS

3. Revise as follows:

R301.2.1.1 Wind design required ~~Design criteria~~. In regions where wind design is required in accordance with ~~the basic wind speeds from~~ Figure R301.2(4)B ~~equal or exceed 100 miles per hour (45 m/s) in *hurricane-prone regions*, or 110 miles per hour (49 m/s) elsewhere~~, the design of buildings for wind loads shall be in accordance with one of the following methods. The elements of design not addressed by those documents in Items 1 through 4 shall be in accordance with this code.

1. American Forest and Paper Association (AF&PA) *Wood Frame Construction Manual for One- and Two-Family Dwellings* (WFCM); or
2. International Code Council (ICC) *Standard for Residential Construction in High Wind Regions* (ICC-600); or
3. *Minimum Design Loads for Buildings and Other Structures* (ASCE-7); or
4. American Iron and Steel Institute (AISI), *Standard for Cold-Formed Steel Framing—Prescriptive Method For One- and Two-Family Dwellings* (AISI S230).
5. Concrete construction shall be designed in accordance with the provisions of this code.
6. Structural insulated panel (SIP) walls shall be designed in accordance with the provisions of this code.
7. *International Building Code*

When ASCE 7 or the *International Building Code* is used for the design of the building, the wind speed map and exposure category requirements as specified in ASCE 7 and the *International Building Code* shall be used.

4. Add new figure as follows:

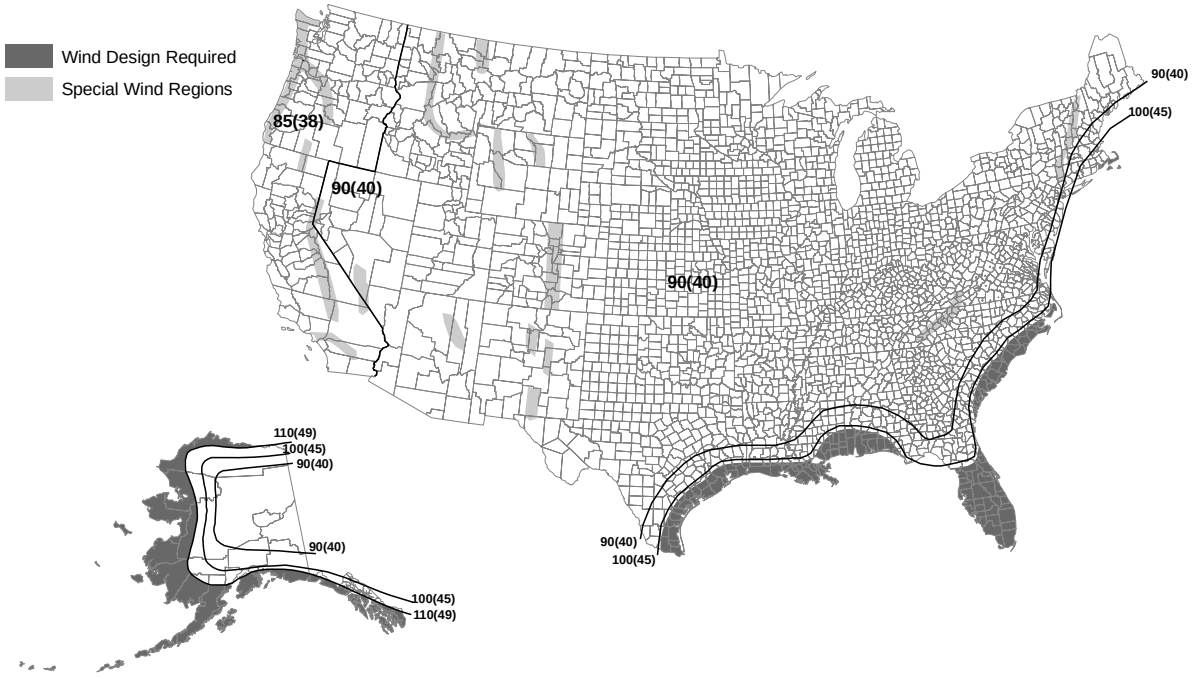


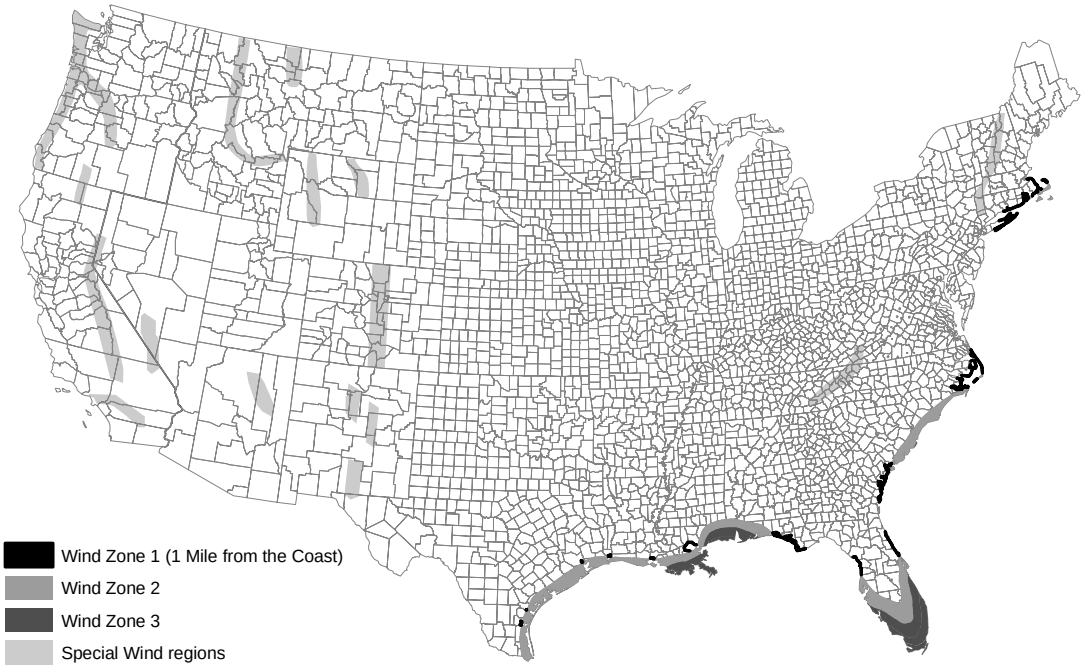
FIGURE R301.2(4)B
REGIONS WHERE WIND DESIGN IS REQUIRED

5. Revise as follows:

R301.2.1.2 Protection of openings. Glazing ~~Windows~~ in buildings located in windborne debris regions shall be ~~have glazed openings~~ protected from windborne debris. Glazed opening protection for windborne debris shall meet the requirements of the Large Missile Test of ASTM E 1996 and ASTM E 1886 referenced therein. The applicable wind zones for establishing missile types in ASTM E 1996 are shown on Figure R301.2(4)C. Garage door glazed opening protection for windborne debris shall meet the requirements of an *approved* impact resisting standard or ANSI/DASMA 115.

Exception: Wood structural panels with a minimum thickness of 7/16 inch (11 mm) and a maximum span of 8 feet (2438 mm) shall be permitted for opening protection in one- and two-story buildings. Panels shall be precut and attached to the framing surrounding the opening containing the product with the glazed opening. Panels shall be predrilled as required for the anchorage method and shall be secured with the attachment hardware provided. Attachments shall be designed to resist the component and cladding loads determined in accordance with either Table R301.2(2) or ASCE 7, with the permanent corrosion resistant attachment hardware provided and anchors permanently installed on the building. Attachment in accordance with Table R301.2.1.2 is permitted for buildings with a mean roof height of 33 feet (10 058 mm) or less where located in Wind Zones 1 and 2 in accordance with Figure R301.2(4)C ~~wind speeds do not exceed 130 miles per hour (58 m/s)~~.

5. Add new figure as follows:



Note:
Wind Zone 3 applies for:
Guam
Virgin Islands
American Samoa
Puerto Rico

Note: Wind Zone 3 applies in Wind Zone 2 areas that are within a mile of the coast

Note: Wind Zone 1 applies in Hawaii - Special Wind Regions

FIGURE R301.2(4)C
WIND-BORNE DEBRIS REGIONS

6. Revise as follows:

R301.2.1.4 Exposure category. For each wind direction considered, an exposure category that adequately reflects the characteristics of ground surface irregularities shall be determined for the site at which the building or structure is to be constructed. For a site located in the transition zone between categories, the category resulting in the largest wind forces shall apply. Account shall be taken of variations in ground surface roughness that arise from natural topography and vegetation as well as from constructed features. For a site where multiple detached one- and two-family dwellings, *townhouses* or other structures are to be constructed as part of a subdivision, master-planned community, or otherwise designated as a developed area by the authority having jurisdiction, the exposure category for an individual structure shall be based upon the site conditions that will exist at the time when all adjacent structures on the site have been constructed, provided their construction is expected to begin within one year of the start of construction for the structure for which the exposure category is determined. For any given wind direction, the exposure in which a specific building or other structure is sited shall be assessed as being one of the following categories:

1. Exposure A. Large city centers with at least 50 percent of the buildings having a height in excess of 70 feet (21 336 mm). Use of this exposure category shall be limited to those areas for which terrain representative of Exposure A prevails in the upwind direction for a distance of at least 0.5 mile (0.8 km) or 10 times the height of the building or other structure, whichever is greater. Possible channeling effects or increased velocity

pressures due to the building or structure being located in the wake of adjacent buildings shall be taken into account.

2. Exposure B. Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger. Exposure B shall be assumed unless the site meets the definition of another type exposure.
3. Exposure C. Open terrain with scattered obstructions, including surface undulations or other irregularities, having heights generally less than 30 feet (9144 mm) extending more than 1500 feet (457 m) from the building site in any quadrant. This exposure shall also apply to any building located within Exposure B type terrain where the building is directly adjacent to open areas of Exposure C type terrain in any quadrant for a distance of more than 600 feet (183 m). This category includes flat open country~~,~~ and grasslands ~~and shorelines in hurricane prone regions~~.
4. Exposure D. Flat, unobstructed areas exposed to wind flowing over open water ~~(excluding shorelines in hurricane prone regions)~~ for a distance of at least 1 mile (1.61 km). Shorelines in Exposure D include inland waterways, the Great Lakes, and coastal areas of California, Oregon, Washington and Alaska. This exposure shall apply only to those buildings and other structures exposed to the wind coming from over the water. Exposure D extends inland from the shoreline a distance of 1500 feet (457 m) or 10 times the height of the building or structure, whichever is greater.

Reason: The purpose of this proposal is to update and coordinate the provisions of the 2012 IRC with those of the 2010 edition of ASCE 7 for the determination of wind loads, specifically to incorporate the effect of the new wind speed maps that have been adopted into ASCE 7.

Over the past 10 years, new data and research has been performed that indicates that the hurricane wind speeds provided in the current maps of the IBC-09 and ASCE-05 are too conservative and needed to be adjusted downward. Significantly more hurricane data have become available thereby allowing for substantial improvements in the hurricane simulation model that is used to create the wind speed maps.

These new data have resulted in an improved representation of the hurricane wind field, including the modeling of the sea-land transition and the hurricane boundary layer height; new models for hurricane weakening after landfall; and an improved statistical model for the Holland *B* parameter which controls the wind pressure relationship. The new hurricane hazard model yields hurricane wind speeds that are lower than those given in ASCE 7-05 and IBC-09 even though the overall rate of intense storms (as defined by central pressure) produced by the new model is increased compared to those produced by the hurricane simulation model used to develop previous maps.

In preparing the new maps, the ASCE 7 standards committee decided to use multiple ultimate event or strength design maps, based on the different Occupancy Categories in conjunction with a wind load factor of 1.0 for strength design – for allowable stress design, the factor was reduced from 1.0 to 0.6. Several factors that are important to an accurate wind load standard led to this decision:

(i) An ultimate event or strength design wind speed map makes the overall approach consistent with that used in seismic design in that they both map ultimate events and use a load factor of 1.0 for strength design.
(ii) Utilizing different maps for the different Occupancy Categories eliminates the problems associated with using “importance factors” that vary with category. The difference in the importance factors in hurricane prone and non-hurricane prone regions for Category I structures prompted many questions and have been removed from ASCE 7-10.
(iii) The use of multiple maps eliminates the confusion associated with the recurrence interval associated with the existing map - the map was not a uniform fifty year return period map. This therefore created a situation where the level of safety provided for within the overall design was not consistent along the hurricane coast.

Because of the prescriptive nature of the IRC and the considerable number of embedded wind speed triggers throughout the code, integrating the new wind speed map into the IRC necessitated a different approach than the change proposed for the IBC. For ease of the users of the IRC, it was decided to scale down the ultimate map or strength design map to a nominal or design level basic wind speed map. This proposed new map, Figure R301.2(4)A is the ultimate map in the proposed new edition of ASCE 7 with the wind speeds divided by the square root of the load factor ($V/\sqrt{1.6}$) with contours corresponding to whole numbers. The use of a scaled down map was necessary due to the significant number of wind speed triggers embedded throughout that IRC that are based on the old nominal or design level map. This map is offered as an easy means to transition the triggers in the IRC to the new ultimate maps during the next code change cycle. Another new map, Figure R301.2(4)B is introduced which indicates where wind design is required. This map replaces the 100 mph limit specified in Section R301.2.1.1 in the 2009 IRC and corresponds to 130 mph on the ultimate map for most of the hurricane prone region. Because the locations of wind-borne debris regions are tied to the ultimate maps in the proposed new edition of ASCE 7, a new map (Figure R301.2(4)C has been introduced to delineate the various wind borne debris regions for use with ASTM E1996 and E1886.

ASCE/SEI 7 has been a referenced standard of the IBC since its inception and as such it is well known to the building community. ASCE/SEI 7 is published and maintained by the Structural Engineering Institute of the American Society of Civil Engineers (SEI/ASCE). The document is a nationally recognized consensus standard developed in full compliance with the ASCE *Rules for Standards Committees*. The ASCE standards process is fully accredited by the American National Standards Institute (ANSI).

As of the submission date of this code change, the ASCE 7 Standards Committee is completing the committee balloting portion of the 2010 edition of ASCE/SEI 7. The document is designated ASCE/SEI 7-10 *Minimum Design Loads for Buildings and Other Structures* and it is expected that it will be completed and available for purchase prior to the ICC Final Action Hearings in May of 2010 . Any person interested in obtaining a public comment copy of ASCE/SEI 7-10 may do so by contacting the proponent at jrossberg@asce.org .

Cost Impact: The overall, national cost impact is believed to be neutral.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROSSBERG-RB-1-R202-R301-F. R301.2.4

RB15–09/10
R301.2.2

Proponent: John England, MCO, England Enterprises, Inc.

Delete and substitute as follows:

~~**R301.2.2 Seismic provisions.** The seismic provisions of this code shall apply to buildings constructed in Seismic Design Categories C, D_0, D_1 and D_2, as determined in accordance with this section.~~

> ~~**Exception:** Detached one- and two-family *dwellings* located in Seismic Design Category C are exempt from the seismic requirements of this code.~~

R301.2.2 Seismic Provisions The seismic provisions of this code shall apply as follows:

1. Townhouses in seismic design categories C, D_0, D_1 and D_2 .
2. Detached one and two family dwelling in seismic design categories, D_0, D_1 and D_2.

Reason: The rule and exception was confusing.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENGLAND-RB-2-R301.2.2

RB16–09/10
R301.2.2.2.6 (New), R1001.3, R1001.4, R1003.3, R1003.4, Table R1001.1

Proponent: Homer Maiel, PE, CBO, City of San Jose, CA, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay Chapters)

1. Add new text as follows:

R301.2.2.2.6 Masonry or concrete chimneys. Masonry or concrete chimneys shall be reinforced and anchored to the building in accordance with Sections R1001.3, R1001.4, R1003.3 and R1003.4

2. Revise as follows:

R1001.3 Seismic reinforcing. Masonry or concrete chimneys in Seismic Design ~~Category~~ Categories C, D_0, D_1 or D_2 shall be reinforced. Reinforcing shall conform to the requirements set forth in Table R1001.1 and Section R609, Grouted Masonry.

R1001.4 Seismic anchorage. Masonry or concrete chimneys in Seismic Design Categories C, D_0, D_1 or D_2 shall be anchored at each floor, ceiling or roof line more than 6 feet (1829 mm) above *grade*, except where constructed completely within the exterior walls. Anchorage shall conform to the requirements of Section R1001.4.1.

R1003.3 Seismic reinforcing. Masonry or concrete chimneys shall be constructed, anchored, supported and reinforced as required by this chapter. In Seismic Design ~~Category~~ Categories C, D_0, D_1 or D_2 masonry and concrete chimneys shall be reinforced and anchored as detailed in Section R1003.3.1, R1003.3.2 and R1003.4. In Seismic Design ~~Category~~ Categories A and B ~~or C~~, reinforcement and seismic anchorage is not required.

R1003.4 Seismic anchorage. Masonry ~~and~~ or concrete chimneys and foundations in Seismic Design ~~Category~~ Categories C, D_0, D_1 or D_2 shall be anchored at each floor, ceiling or roof line more than 6 feet (1829 mm) above *grade*, except where constructed completely within the exterior walls. Anchorage shall conform to the requirements of Section R1003.4.1.

TABLE R1001.1
SUMMARY OF REQUIREMENTS FOR MASONRY FIREPLACES AND CHIMNEYS

(Portions of table not shown remain unchanged)

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square foot = 0.0929m^2.

NOTE: This table provides a summary of major requirements for the construction of masonry chimneys and fireplaces. Letter references are to Figure R1001.1 which shows examples of typical construction. This table does not cover all requirements, nor does it cover all aspects of the indicated requirements. For the actual mandatory requirements of the code, see the indicated section of text.

a. The letters refer to Figure R1001.1.
b. Not required in Seismic Design ~~Category~~ Categories A and B ~~or C~~.

Reason: The IBC Chapter 21 requirements for reinforcing and anchorage of masonry and concrete chimneys were extended to Seismic Design Category C by code change S193-07/08. That change appears in 2009 IBC Sections 2111.3 and 2111.4. This proposal intends to make the IRC minimum requirements for reinforcing and anchorage match the IBC because the effects of earthquakes and the risks to life safety from chimney collapse are independent of the code under which the chimney is permitted and constructed. Seismic Design Category C is defined in IRC Table R301.2.2.1.1 as the range of $0.33g < S_{DS} \leq 0.50g$ for soil Site Class D. Assuming soil Site Class D, this S_{DS} range represents a mapped short period (S_S) spectral response acceleration range of $0.32g < S_S \leq 0.55g$. Earthquakes generating these moderate levels of short period ground motion (e.g., Nisqually Washington Earthquake (2001), Napa California Earthquake (2000), Coalinga California Earthquake (1983) have repeatedly caused collapse or partial collapse of large numbers of unreinforced or unanchored masonry chimneys. In at least two earthquakes, Borah Peak Idaho (1983) and Landers California Earthquake (1992), masonry chimney and fireplace collapses have resulted in fatalities.

To accomplish this change, a new section R301.2.2.2.6 is added to specify that the masonry or concrete chimneys in Seismic Design Category C must comply with sections R1001.3, R1001.4, R1003.3 and R1003.4. In each of those four sections, Category C is added to the list of Seismic Design Categories where chimney reinforcing and anchorage is necessary.

In R1003.3, Category C is deleted from the list of Seismic Design Categories where chimney reinforcement and anchorage are not required.

In Table R1001.1, footnote "b" is revised to delete Seismic Design Category C to be consistent with the changes to sections R1001.3, R1001.4, R1003.3 and R1003.4. Footnote "b" is used at two locations in Table R1001.1, in item H (vertical reinforcing) and in item S (anchorage).

In R1001.3, R1003.3, and R1003.4 and Table R1001.1 footnote "b" an editorial change is made to correct the word "Category" to the plural "Categories" as is currently used in section R1001.4 when more than one category is listed. Another editorial change occurs in R1003.4 where the word "and" between the words "masonry" and "concrete" is changed to "or" to match the wording used in the other three sections.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Maiel-RB-3-R301.2.2.2.6-Ch 10

RB17–09/10
R301.2.4.1, R322.1.1

Proponent: Rebecca C. Quinn, RCQuinn Consulting, Inc., representing the Department of Homeland Security, Federal Emergency Management Agency

Revise as follows:

R301.2.4.1 Alternative provisions. As an alternative to the requirements in Section R322.3 for buildings and structures located in whole or in part in coastal high-hazard areas (V Zones) and Coastal A Zones, if delineated, ASCE 24 is permitted subject to the limitations of this code and the limitations therein.

R322.1.1 Alternative provisions. As an alternative to the requirements in Section R322.3 for buildings and structures located in whole or in part in coastal high-hazard areas (V Zones) and Coastal A Zones, if delineated, ASCE 24 is permitted subject to the limitations of this code and the limitations therein.

Reason: The IRC recognizes the Coastal A Zone as "flood hazard areas that have been delineated as subject to wave heights between 1.5 feet and 3 feet shall be designated as Coastal A Zones" (see R322.2). These conditions may be present immediately inland of coastal high hazard areas (V Zones) shown on Flood Insurance Rate Maps. Field research after numerous hurricanes and coastal storms indicates that waves in this range contribute to erosion and scour, and also damage conventional construction. The inland extent of the 1.5-ft wave may be delineated on FEMA's revised maps as the Limit of Moderate Wave Action.

This code change provides an alternative for buildings and structures in the Coastal A Zone, if delineated, to be designed and constructed according to the standard ASCE 24 *Flood Resistant Design and Construction*.

Cost Impact: The added cost, if any, of having a foundation designed according to ASCE 24 is offset by minimizing damage associated with scour and wave impacts in areas where wave heights between 1.5 feet and 3 feet are anticipated.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: QUINN-RB-4-R301.2.4.1

RB18–09/10
Table R301.7

Proponent: Stephen Kerr, PE, SE, Josephson Werdowatz and Associates

Revise table as follows:

TABLE R301.7
ALLOWABLE DEFLECTION OF STRUCTURAL MEMBERS ~~a, b, c, d, e~~

STRUCTURAL MEMBER	ALLOWABLE DEFLECTION
Rafters having slopes greater than 3:12 with no finished ceiling attached to rafters	L / 180
Interior walls and partitions	H / 180
Floors ~~and plastered ceilings~~ Ceilings with plaster or stucco finish	L / 360
All other structural members	L / 240
Exterior walls – wind loads [a] with plaster or stucco finish	H / 360
Exterior walls – wind loads [a] with other brittle finishes	H / 240
Exterior walls – wind loads [a] with flexible finishes	~~L~~ H / 120[d]
Lintels supporting masonry veneer walls [e]	L / 600

Note: L = span length, H = span height.

a. The wind load shall be permitted to be taken as 0.7 times the Component and Cladding loads for the purpose of the determining deflection limits herein.
b. For cantilever members, *L* shall be taken as twice the length of the cantilever.
c. For aluminum structural members or panels used in roofs or walls of sunroom additions or patio covers, not supporting edge of glass or sandwich panels, the total load deflection shall not exceed L/60. For continuous aluminum structural members supporting edge of glass, the total load deflection shall not exceed L/175 for each glass lite or L/60 for the entire length of the member, whichever is more stringent. For sandwich panels used in roofs or walls of sunroom additions or patio covers, the total load deflection shall not exceed L/120.
d. Deflection for exterior walls with interior gypsum board finish shall be limited to an allowable deflection of H/180.
e. Refer to Section R703.7.2.

Reason: This proposal contains several minor editorial changes to help clarify the information presented within the Table. These changes are intended to unify the Table. The proposed changes include the following:

- Footnote callouts a, d and e were removed from the title of the table to avoid confusion because they only apply to a sub-set of the entire table.
- The 'L' in the Exterior walls – wind loads with flexible finishes is changed to 'H' for consistency with the other wall structural members shown in this table.
- The word 'other' is added to Exterior walls – wind loads with brittle finishes to separate the plaster and stucco, which are brittle finish materials, from other brittle finish material which do not need the more restrictive deflection limitation.
- Stucco ceilings are added to the Floor and plastered ceilings category so that wording for the ceilings is consent with the wording of Exterior Walls. In addition, the referenced standard ASTM C926-98a Standard Specification for Application of Portland Cement-Based Plaster section Annex A2.1.6 states "Maximum allowable deflection for vertical or horizontal framing for plaster, not including cladding, shall be L/360."

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: KERR-RB-2-T. R301.7

RB19–09/10
Table R302.1

Proponent: Steven Orlowski, National Association of Home Builders (NAHB)

Revise table as follows:

TABLE R302.1
EXTERIOR WALLS

EXTERIOR WALL ELEMENT		MINIMUM FIRE-RESISTANCE RATING	MINIMUM FIRE SEPARATION DISTANCE
Walls	(Fire-resistance rated)	1 hour-tested in accordance with ASTM E 119 or UL 263 with exposure to both sides	<u>≤3</u> ~~5~~ Feet
	(Not fire-resistance rated)	0-Hours	<u>≥3</u> ~~5~~ Feet
Projections	(Fire-resistance rated)	1-Hour on the underside	<u>≤2</u> ~~4~~ Feet
	(Not fire-resistance rated)	0-Hours	<u>≥3</u> ~~5~~ Feet
Openings	Not Allowed	N/A	< 3 Feet
	25% Maximum of Wall Area	0-Hours	3 Feet
	Unlimited	0-Hours	5 Feet
Penetrations	All	Comply with Section R302.4	< 5 Feet
		None Required	5 Feet

Reason: The purpose of this proposed change is to retain the original fire separation distances to the dimensions used in *2003 International Residential Code*. During the 2004/2005 Code Development Cycle, the Code Committee disapproved this change given that the proponent failed to provide supporting evidence or data to sustain the increase in the fire separation distance. The committee's decision was overturned at the final action hearings without any additional substantiation being brought forth by the proponent. To this day, there are no known reports or studies that demonstrate the previously allowed 3 foot separation distance from the property line and 6 foot separation between structures failed to provide the minimum required safe distance for fire separation.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ORLOWSKI-RB-4-T. R302.1

RB20–09/10
R302.1

Proponent: Don Davies, Salt Lake City Corporation, representing the Utah Chapter of ICC

Revise as follows:

R302.1 Exterior walls. Construction, projections, openings and penetrations of *exterior walls* of *dwellings* and accessory buildings shall comply with Table R302.1. <u>Structures without exterior walls at adjoining lot lines shall not have roof projections within 5'-0" of the lot line.</u>

Exceptions:

1. Walls, projections, openings or penetrations in walls perpendicular to the line used to determine the *fire separation distance*.
2. Walls of *dwellings* and *accessory structures* located on the same *lot*.
3. Detached tool sheds and storage sheds, playhouses and similar structures exempted from permits are not required to provide wall protection based on location on the *lot*. Projections beyond the *exterior wall* shall not extend over the *lot line*.

4. Detached garages accessory to a *dwelling* located within 2 feet (610 mm) of a *lot line* are permitted to have roof eave projections not exceeding 4 inches (102 mm).
5. Foundation vents installed in compliance with this code are permitted.

Reason: There are currently no provisions in the residential code to limit the roof projection for carports and patio covers where there is no exterior wall adjoining the lot line. Since carports and patio covers have openings exceeding 25% they must be placed at least 5 feet from the lot line as required in I.R.C. Table R302.1. Fire-resistance rating of the projections beyond the exterior walls is addressed in I.R.C. Table R302.1; but in the instance where there is no wall, rating a portion of the roof covering serves no useful purpose and is not addressed by Table R302.1 which deals with exterior walls.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIES-RB-1-R302.1

RB21–09/10
R302.1

Proponent: Maureen Traxler, City of Seattle, WA, representing the Seattle Department of Planning & Development

Revise as follows:

R302.1 Exterior walls. Construction, projections, openings and penetrations of *exterior walls* of *dwellings* and accessory buildings shall comply with Table R302.1.

Exceptions:

1. Walls, projections, openings or penetrations in walls perpendicular to the line used to determine the *fire separation distance*.
2. No protection is required for walls, projections, openings or penetrations in walls of structures located on the same lot where the *fire separation distance* is measured between a dwelling and a structure accessory to it. Garages shall comply with Section R302.6, ~~Walls of *dwellings* and *accessory structures* located on the same *lot*.~~
3. Detached tool sheds and storage sheds, playhouses and similar structures exempted from permits are not required to provide wall protection based on location on the *lot*. Projections beyond the *exterior wall* shall not extend over the *lot line*.
4. Detached garages accessory to a *dwelling* located within 2 feet (610 mm) of a *lot line* are permitted to have roof eave projections not exceeding 4 inches (102 mm).
5. Foundation vents installed in compliance with this code are permitted.

Reason: As written, exception #2 does not clearly indicate which walls are exempt from the requirements of Table R302.1, or whether it applies to penetrations or openings in the walls. For example, a large shed (which is not exempt from a permit) that is accessory to a dwelling may be within 3' of the lot line, but according to exception #2 the shed wall nearest the property line does not need to be protected, because it is on the same lot as the dwelling. That does not meet the intent of the code. This proposal better indicates which walls and wall elements the exception applies to, and provides a cross reference to the section that has requirements specific to garages, since garages requirements differ from those of Table R302.1.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TRAXLER-RB-4-R302.1

RB22–09/10
R302.2, R302.2.4

Proponent: Michael Gardner, representing the Gypsum Association; Jason Thompson, PE, National Concrete Masonry Association (NCMA), representing the Masonry Alliance for Codes and Standards (MACS)

Revise as follows:

R 302.2 Townhouses. Each townhouse shall be considered a separate building and shall be separated by fire-resistance-rated wall assemblies meeting the requirements of Section R302.1 for exterior walls.

Exception: A common ~~1-hour~~ 2-hour fire-resistance-rated wall assembly tested in accordance with ASTM E 119 or UL 263 is permitted for townhouses if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations shall be installed in accordance with Chapters 34 through 43. Penetrations of electrical outlet boxes shall be in accordance with Section R302.4.

R 302.2.4. Structural independence. Each individual townhouse shall be structurally independent.

Exceptions:

1. Foundations supporting *exterior walls* or common walls.
2. Structural roof and wall sheathing from each unit may fasten to the common wall framing.
3. Nonstructural wall and roof coverings.
4. Flashing at termination of roof covering over common wall.
5. Townhouses separated by a common 1~~-hour~~ 2-hour fire-resistance-rated wall as provided in Section R302.2.

Reason: (Gardner) Lost in the outcome of last fall's debate on residential sprinklers was the impact it made on the common walls that are often used to separate townhouse units. One of the approved proposals that incorporated sprinkler systems into townhouses reduced the rating on the common wall that can be used between townhouse units from two hours to one hour. This proposal is intended to restore the two hour rating to the common wall.

The 2009 IRC permits townhouses a structural independence exemption if they are separated by a common one-hour rated wall that complies with Section 302.2. The 2009 IRC also contains no mandatory sound transmission requirements for common walls. As a consequence, the 2009 IRC will permit two adjacent three story townhouse units to be separated by a common wall that displays no structural independence characteristics and has an STC rating of approximately 33.

Because of the reduced rating, a fire that overwhelms the sprinkler system in a room abutting the common wall will display an increased potential to adversely impact the structural integrity of the common wall and the adjacent townhouse units. In addition, the lack of a robust sound barrier between units creates the potential for a less than acceptable living environment.

The 2006 IRC required the common wall to maintain a two-hour rating. While the 2006 IRC also contained a structural independence exemption, the common two-hour wall required by the code provided an obvious level of increased fire protection not evidenced in the 2009 IRC. The 2006 code, by mandating a two-hour rating, also required the use of a wall that would automatically display a minimum STC rating almost 10 points higher than the minimum wall required by the 2009 code.

The code has never permitted the common wall that may be constructed by the exception to R 302.2 to display a rating that is lower than the rating that would be achieved by the standard charging language in R302.2. That section has historically required townhouses to be evaluated as separate buildings and to be constructed with separate and parallel exterior walls that separate the two adjacent units. The 2009 IRC now permits the common wall to have a lower rating than the basic walls prescribed by the code and also permits the common wall to be constructed without the structural independence characteristics required by R302.2.

Reason: (Thompson) Code change RB66-07/08 required townhouses constructed in accordance with the International Residential Code to be provided with automatic sprinkler protection. While this new requirement added a fire safety feature to townhouses the code change also reduced the level of fire safety that existed in the code by reducing the fire resistance rating required for the common wall separating dwelling units in townhouses. This code change will restore the previous IRC code requirement that the common wall separating dwelling units in townhouses to have a minimum fire resistance rating of 2-hours. There are several reasons why the common wall fire resistance rating needs to be returned to 2-hours.

First, Code Change RB66-07/08 justified the addition of mandatory sprinkler protection for townhouses based on sprinklers being the best tool for providing additional fire safety in residential occupancies. Given that the 2006 IRC already had an established level of fire safety for residential occupancies utilizing townhouse construction with 2-hour fire rated construction for the common wall, the goal for improving fire safety with the addition of sprinkler protection was not fully achieved. The existing level of fire safety was diminished by the reduction in the fire resistance rating of the common wall from 2-hours to 1-hour.

Second, Code Change RB66-07/08 created an inconsistency in the IRC. If two separate one and two family dwellings are constructed on individual lots and each built at the property line, Section R302.1 and Table R302.1 will require the exterior wall of each structure to be built with a 1-hour fire resistance rating using a fire exposure from both sides. The net result is that both dwellings are separated from the other adjacent, closely located dwelling by wall construction with a total cumulative fire resistance of 2-hours. Yet, if these same two individual structures are physically connected at the property line by a common wall the code permits the fire resistance rating between townhouse units to be reduced to 1-hour. The level of fire safety for these two dwelling configurations is not consistent

This code change achieves the full level of fire safety provided for in residential occupancies through the use of sprinkler protection and built-in fire resistant construction. It also will eliminate the fire safety inconsistency in the IRC between dwelling units built at property lines and dwelling units constructed as townhouses and connected at property lines by a common wall.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GARDNER-RB-3-THOMPSON-RB-1-R302.2

RB23–09/10
R302.2.1, Figures R302.2.1(1)-R302.2.1(2)-R302.2.1(3) (New)

Proponent: Larry Wainright, Qualtim, Inc., representing the Structural Building Components Association (SBCA)

1. Revise as follows:

R302.2.1 Continuity. The fire-resistance-rated wall or assembly separating *townhouses* shall have a fire-resistance rating that is ~~be~~ continuous from the foundation to the underside of the roof sheathing, deck or slab. The fire-resistance rating shall extend the full length of the wall or assembly, including wall extensions through and separating attached enclosed *accessory structures*. Where the fire-resistance-rated wall or assembly is not continuous, the fire resistance rating shall be deemed continuous provided one of the following conditions is met:

1. A minimum one hour fire-resistance rating is provided on the floor or roof assembly that interrupts the fire-resistance rated wall. Fireblocking shall be provided per Section R302.11 (see Figure R302.2.1(1)). Or
2. Where an unrated floor or roof assembly interrupts the fire-resistance rated wall, the fire-resistance rating shall be deemed continuous provided:
   2.1. Where two one-hour walls are provided, a minimum of one 2x full height fireblock shall be installed in each of the one-hour walls as shown in Figure R302.2.1(2).
   2.2. Where one two-hour wall is provided, a minimum of two 2x full height fireblocks shall be installed on each side of the two-hour walls as shown in Figure R302.2.1(3).

2. Add new figures as follows:

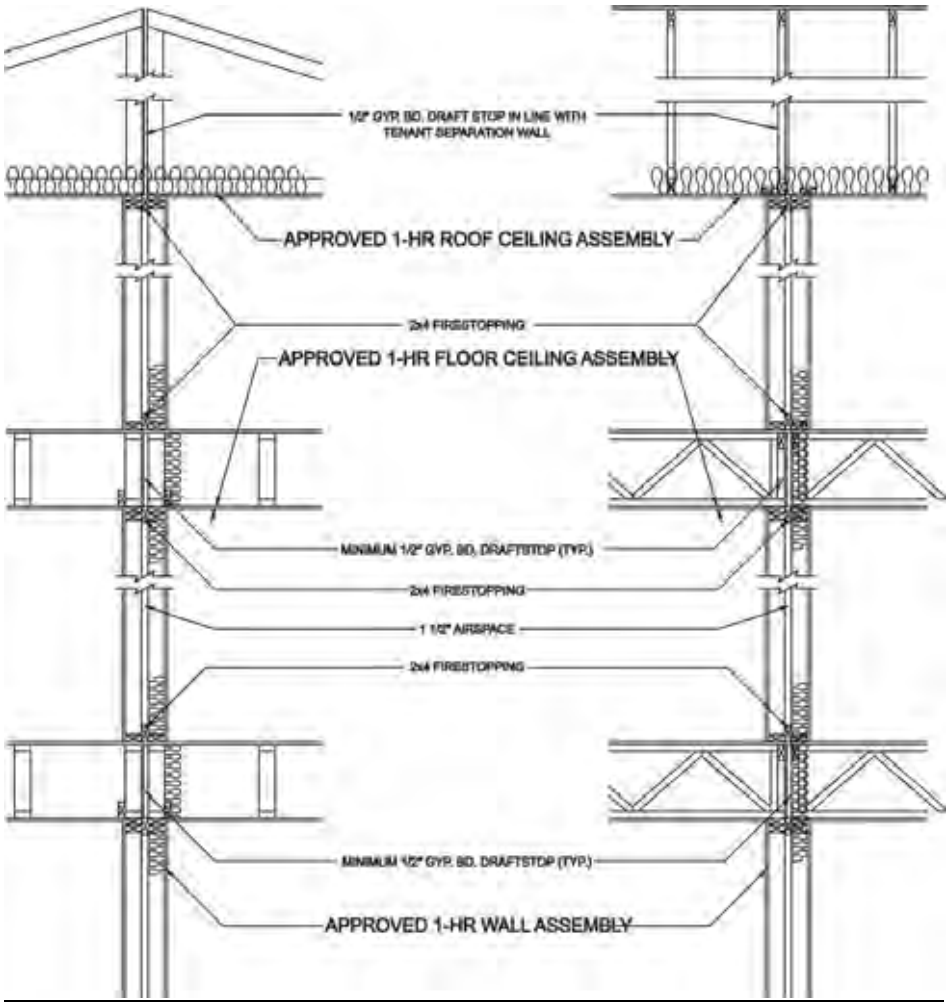


FIGURE R302.2.1(1)
Example assemblies that can be used to make up a one-hour rated system for separation between occupancies

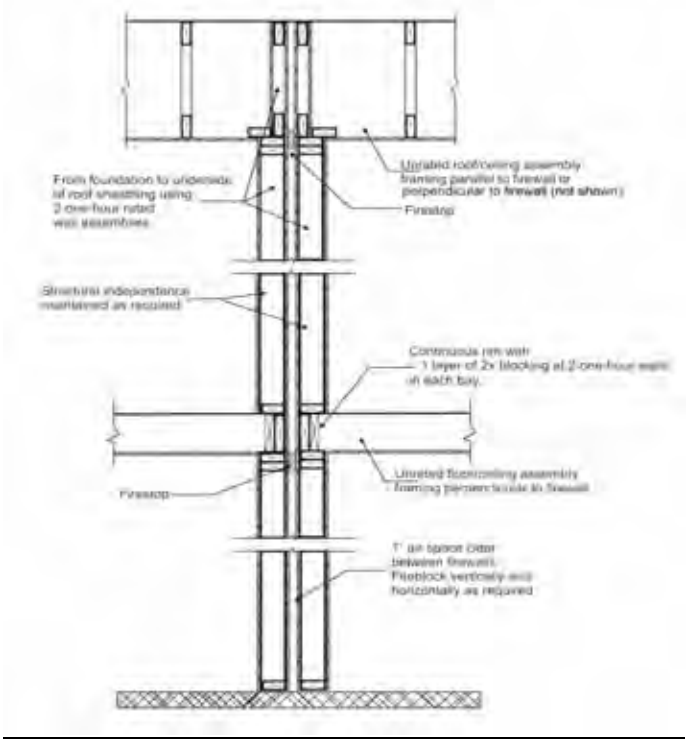


FIGURE R302.2.1(2)

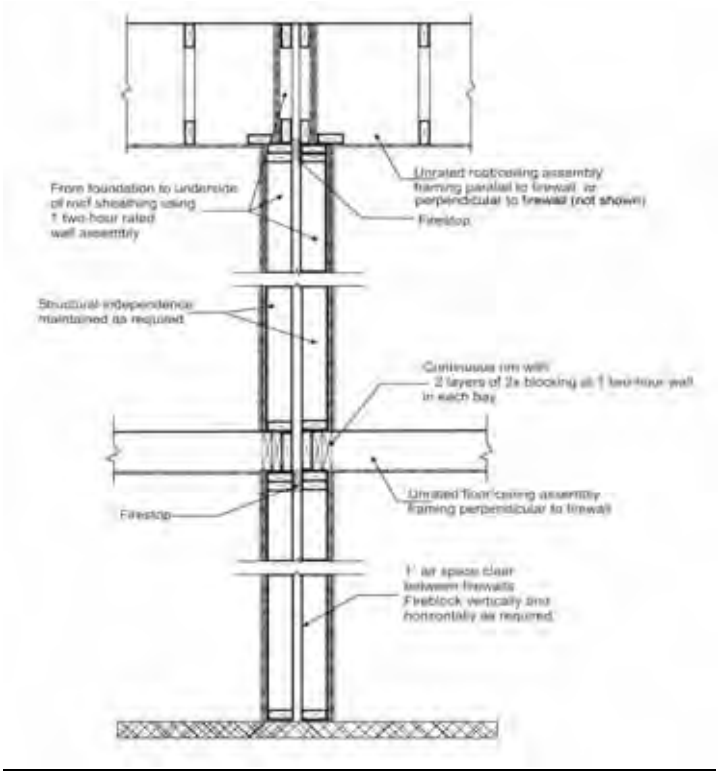


FIGURE R302.2.1(3)

Reason: The purpose of this code change is to clarify an existing provision within the code and to provide a prescriptive solution to that provision. First, it is necessary to clarify that is the fire-resistance rating of the wall assembly that needs to be continuous from the foundation to the underside of the roof sheathing, not necessarily the framing itself. Second, the prescriptive solution gives some guidance on one way the fire-resistance rating can be maintained, while allowing for framing members to bear on the wall. The use of full height blocking to attain the required fire-resistance rating is based on the use of sacrificial material and char rates based on ASTM E119 testing. Under ASTM E119 test conditions, lumber will char at a rate of 1 inch per 30-40 minutes. Therefore, at least 2 inches of sacrificial material is required to achieve the one hour rating. Likewise, 4 inches is required to achieve a 2 hour rating. Further information can be found in an article published and located at the following link: www.sbcmag.info/Archive/2006/sep/0609_code.pdf

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WAINRIGHT-RB-3-R302.2.1

RB24–09/10
R302.2.2

Proponent: Jeffrey Anderson, representing the Chesterfield County Department of Building Inspections, Chesterfield, VA

Revise as follows:

R302.2.2 Parapets. Parapets constructed in accordance with Section R302.2.3 shall be constructed for *townhouses* as an extension of exterior walls or common walls in accordance with the following:

1. Where roof surfaces adjacent to the wall or walls are at the same elevation, the parapet shall extend not less than 30 inches (762 mm) above the roof surfaces.
2. Where roof surfaces adjacent to the wall or walls are at different elevations and the higher roof is not more than 30 inches (762 mm) above the lower roof, the parapet shall extend not less than 30 inches (762 mm) above the lower roof surface.

Exception: A parapet is not required in the two cases above when the roof is covered with a minimum class C roof covering, and the roof decking or sheathing is of noncombustible materials or *approved* fire-retardant-treated wood for a distance of 4 feet (1219 mm) on each side of the wall or walls, or one layer of 5/8-inch (15.9 mm) Type X gypsum board is installed directly beneath the roof decking or sheathing, supported by a minimum of nominal 2-inch (51 mm) ledgers attached to the sides of the roof framing members, for a minimum distance of 4 feet (1219 mm) on each side of the wall or walls and there are no openings or penetrations in the roof within 4 feet (1219 mm) of the exterior or common walls.

3. A parapet is not required where roof surfaces adjacent to the wall or walls are at different elevations and the higher roof is more than 30 inches (762 mm) above the lower roof. The common wall construction from the lower roof to the underside of the higher roof deck shall have not less than a 1-hour fire-resistance rating. The wall shall be rated for exposure from both sides.

Reason: This change is proposed to provide consistency between the IRC and the IBC. Specifically, to make IRC Section R302.2.2 consistent with IBC Section 705.11(4). This change would make townhouse construction consistent between both the IRC and the IBC for this type construction.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ANDERSON-RB-1-R302.2.2

RB25–09/10
R302.3

Proponent: Steven Orlowski, National Association of Home Builders (NAHB)

Revise as follows:

R302.3 Two-family dwellings. *Dwelling units* in two-family dwellings shall be separated from each other by wall and/or floor assemblies having not less than a 1-hour fire-resistance rating when tested in accordance with ASTM E 119 or UL 263. Fire-resistance-rated floor-ceiling and wall assemblies shall extend to and be tight against the *exterior wall*, and wall assemblies shall extend from the foundation to the underside of the roof sheathing.

Exceptions:

1. A fire-resistance rating of 1/2 hour shall be permitted in buildings equipped throughout with an automatic sprinkler system installed in accordance with NFPA 13D or Section P2904.
2. Wall assemblies need not extend through *attic* spaces when the ceiling is protected by not less than 5/8-inch (15.9 mm) Type X gypsum board and an *attic* draft stop constructed as specified in Section R302.12.1 is provided above and along the wall assembly separating the *dwellings*. The structural framing supporting the ceiling shall also be protected by not less than 1/2-inch (12.7 mm) gypsum board or equivalent.

Reason: The purpose of this proposal is to reference the applicable residential fire sprinkler standard for one- and two- family dwellings, along with the relevant provisions within the *International Residential Code* regarding the installation of a plumbing based fire suppression system as referenced in Section P2904.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ORLOWSKI-RB-5-R302.3

RB26–09/10
R302.5.1

Proponent: Sean DeCrane, Cleveland, OH Fire Department, representing the Cleveland Fire Department and the International Association of Fire Fighters

Revise as follows:

R302.5.1 Opening protection. Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Other openings between the garage and residence shall be equipped with solid wood doors not less than 13/8 inches (35 mm) in thickness, solid or honeycomb core steel doors not less than 13/8 inches (35 mm) thick, or 20-minute fire-rated doors equipped with a self-closing device.

Reason: There are times when proposed code submittals require a very lengthy substantiation, and then there are times when code change proposals just make sense. I would believe this is one of those times where a code change proposal makes a lot of sense. We are seeking a requirement to install items for very minimal costs yet great life saving potentials.

As we place greater amounts of thermoplastics in our homes and garages, especially kids' toys, we are increasing the fuel load and toxic by-products. The most obvious by-product of incomplete combustion is carbon monoxide. We know how deadly carbon monoxide is to the occupants of homes. Carbon monoxide is also a by-product of the internal combustion engine. Especially during the winter months the fire service responds to numerous cases of potential carbon monoxide incidents. With an open door between the living quarters and the garage, where the car is warming up for the trip to work, we are allowing the free flow of carbon monoxide from the garage into the home. Some may not believe there is a concern with this situation and may also point out some difficulty in reporting the data of exactly how many individuals were killed by these incidents. Creating and submitting code proposals is about the present but also the future. With the reversal of the code requirement of a self closing door we are allowing millions of homes to be built with a potential safety hazard. Carbon monoxide is a silent and deadly killer and in many incidents the victims do not realize they are slowly being exposed to potentially life threatening levels of carbon monoxide. This is one of the reasons the ICC membership voted to require the installation of carbon monoxide detectors.

We know that requirement of carbon monoxide detectors will save lives. In fact, I have seen numerous responses where a detector alerted an occupant to the presence of dangerous amounts of carbon monoxide, which in turn, allowed them to notify the fire department. With a lack of a requirement of a self closing door we have the potential of creating a Peter Cried wolf situation that will be played out across the country. A self closing door helps to protect the occupants of a home from the dangers in the garage. During the fall and winter months many occupants warm their car before leaving for work or to run an errand. With the increase use of remote starters many of these individuals are engaging their vehicle without visual contact. This creates a potential for the migration of carbon monoxide to the living quarters, even if this amount is not in a lethal range it will be in range to initiate a response from the CO detector, thereby, requiring a response from the local fire department. A response to requires fire fighters and equipment and incurs costs. It also places a responding company in emergency mode while responding increasing the risks to those fire fighters and other drivers at an increased risk. If the fire service downgrades responses to CO alarms then we risk the potential of placing citizens at risk who are truly experiencing a CO emergency. The argument is not to remove the detectors but to place an added protection of a self closing door between the living quarters and the garage.

Even if an individual does not believe that Carbon Monoxide is a true threat there are additional products of combustion that are far deadlier than CO. Hydrogen Cyanide is increasingly being identified as a potential life hazard in fire incidents. In a report published by the Cyanide Poisoning Treatment Coalition, it is reported when the National Institute of Occupational Safety and Health completed their studies of the tragic Station Night Club fire in Warick, RI they found "Within seconds of the ignition of the fire, concentrations of the toxic products carbon monoxide and hydrogen cyanide soared and oxygen levels plummeted to create conditions incompatible with sustaining life"[1]. The report noted "that hydrogen cyanide is approximately 35 times more toxic than carbon monoxide during acute exposure". In tests conducted and referenced by the report, "a series of experiments the Swedish National Testing and Research Institute (SNTRI), assessed the emission of hydrogen cyanide and carbon monoxide under both non-flaming (i.e. pyrolizing) and flaming (i.e. fire) conditions during burning of wool, nylon, synthetic rubber, melamine, and polyurethane foam. The results show that all of these substances liberated high quantities of cyanide when burned-particularly under pyrolizing conditions characterized by low oxygen". If we take a step back and look at most garages, when the garage door is closed, they are box structures that will allow smoke and the by-products of a fire to travel in the least restrictive path, the open door. An open door between the garage and living quarters allows the easy access for the highly toxic by-products of combustion.

To summarize, deadly by-products of combustion, accidental carbon monoxide poisonings from vehicles and needless nuisance alarms are strong, and compelling, arguments to support this code change proposal requiring self closing doors between the garage and living areas in one and two-family homes.

[1] *Smoke Perceptions, Myths and Misunderstandings*, Cyanide Poisoning Treatment Coalition

Cost Impact: The code change proposal will minimally increase costs of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DECRANE-RB-3-R302.5.1

RB27–09/10
R309.4

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

R309.4 Automatic garage door openers. Automatic garage door openers, if provided, shall be listed and labeled in accordance with UL 325.

Reason: Only listed products that are labeled have been subjected to periodic, unannounced inspections during production.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-RB-7-R309.4

RB28–09/10
R302.4 (New)

Proponent: Daniel J. Kress, Town of Irondequoit, NY, representing Finger Lakes Building Officials Association

Add new text as follows:

R302.4 Decks. Except as required by Section R302.2.1, decks shall be permitted to be constructed without meeting the requirements of Sections R302.1, R302.2 and R302.3.

Reason: The purpose of this proposed code change is not to change, but rather to clarify, the existing provisions of this section of the IRC, which do not specifically mention decks or in any way differentiate between a deck and the exterior walls of a house. At present it is therefore not clear whether decks are subject to the same requirements for their location on the lot, or whether they are not subject to said requirements due to the fact that decks do not have walls. Such a requirement is already implied by Section R302.2.1 which presently requires common walls to be continuous "…including walls extending through and separating attached accessory structures." While decks are generally constructed of combustible materials, they do not present the same fire load as a structure with walls; therefore, proximity to the property line does not present the same potential fire hazard as a structure with walls. Where fire-rated construction is presently required, as in the case of townhouses and attached two-family dwellings, minimum distance separation or fire-rated construction will still be required. Clarification of this requirement will better enable consistent enforcement of these provisions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KRESS-RB-2-R302.4

RB29–09/10
R302.4 (New)

Proponent: Daniel J. Kress, Town of Irondequoit, NY, representing Finger Lakes Building Officials Association

Add new text as follows:

R302.4 Decks. Decks shall be constructed in accordance with Sections R302.1, R302.2 and R302.3.

Reason: The purpose of this proposed code change is not to change, but rather to clarify, the existing provisions of this section of the IRC, which do not specifically mention decks or in any way differentiate between a deck and the exterior walls of a house. At present it is therefore not clear whether decks are subject to the same requirements for their location on the lot, or whether they are not subject to said requirements due to the fact that decks do not have walls. Such a requirement is already implied by Section R302.2.1 which presently requires common walls to be continuous "…including walls extending through and separating attached accessory structures." While decks are generally constructed of combustible materials, they do not present the same fire load as a structure with walls; therefore, proximity to the property line does not present the same potential fire hazard as a structure with walls. Where fire-rated construction is presently required, as in the case of townhouses and attached two-family dwellings, minimum distance separation or fire-rated construction will still be required. Clarification of this requirement will better enable consistent enforcement of these provisions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KRESS-RB-1-R302.4

RB30–09/10
Table R302.6

Proponent: Joe Holland and Dave Bueche, Hoover Treated Wood Products

Revise table as follows:

TABLE R302.6
DWELLING/GARAGE SEPARATION

SEPARATION	MATERIAL
From the residence and attics.	Not less than ½ inch gypsum board or 5/8-inch fire-retardant-treated plywood or equivalent applied to the garage side.
From all habitable rooms above the garage.	Not less than 5/8-inch Type X gypsum board or equivalent
Structure(s) supporting floor/ceiling assemblies used for separation required by this section.	Not less than ½ inch gypsum board or 5/8-inch fire-retardant-treated plywood or equivalent applied to the garage side.
Garages located less than 3 feet from a dwelling unit on the same lot.	Not less than ½ inch gypsum board or 5/8-inch fire-retardant-treated plywood or equivalent applied to the ~~interior side of exterior walls that are within this area~~ garage side.

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

Reason: The building code does not give any indication as to why the gypsum board is necessary. One could assume that fire protection is an area of concern. The code currently states one can use an equivalent material. Table 721.6.2(1) contains the time in minutes that a material will contribute to the fire resistance of a floor/ceiling, roof/ceiling, and wall assembly. Listed are both ½ inch gypsum board and 5/8 inch wood structural panel. Their contribution to the fire resistance rating is identical: 15 minutes. Therefore from a fire rating perspective they are equivalent. Another reason for the requirement could be structural. Structurally, FRTW has the ability to resist a larger load than gypsum board. By providing a provision for FRTW it gives a user the ability to use another material.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOLLAND-BUECHE-RB-3-T. R302.6

RB31–09/10
R302.7 (New), R502.14 (New), Table R502.14 (New)

Proponent: Dennis Pitts, American Forest and Paper Association

Add new text and table as follows:

R302.7 Floors. Floor assemblies, not required elsewhere in this code to be fire resistance rated, shall be provided with a ½ inch (12.7 mm) gypsum wallboard ceiling membrane.

Exception:

1. Floor assemblies protected by an automatic sprinkler system in accordance with NFPA13, NFPA 13R, NFPA13D, or Section R313.
2. Floor assemblies having a minimum fire resistance of 15 minutes, supporting at least 50% of the full design load, and complying with one of the following:
   - 2.1. Tested in accordance with ASTM E119 or UL 263, or;
   - 2.2. Determined in accordance with *International Building Code* Section 721.
3. Floor assemblies located directly over a crawl space.
4. Floor assemblies complying with Section R502.14.
5. A portion of a floor assembly area not greater than 100 square feet per story.

R502.14 Fire resistant assemblies. Wood floor assemblies shall comply with the provisions of Section R302.7 or any one of the following:

1. Wood floor assemblies using dimension lumber equal to or greater than 2 inches in thickness by 8 inches in width, nominal.
2. Wood floor assemblies using structural composite lumber, complying with ASTM D5456, equal to or greater than 1 ½" in thickness by 7 ¼" in width.
3. Wood floor assemblies having a minimum fire resistance time of 15 minutes determined from any of the following options or the sum of the times from any combination thereof:
   - 3.1. Time assigned to a ceiling membrane or membranes in Table 502.14.
   - 3.2. Finish rating time for a ceiling membrane not listed in 502.14.
   - 3.3. Time to structural failure of framing members, supporting at least 50% of the full design load, and complying with one of the following:
     - 3.3.1. Tested in accordance with ASTM E119 or UL 263, or;
     - 3.3.2. Determined in accordance with *International Building Code* Section 721.

TABLE R502.14
TIME ASSIGNED TO CEILING MEMBRANES

DESCRIPTION OF FINISH	TIME (MINUTES)[A]
3/8" gypsum *board*	*10*
½" gypsum board	*15*
5/8" gypsum board	20
½" Type X gypsum board	25
5/8" Type X gypsum board	40
Double 3/8" gypsum board	25
3/8" wood structural panel	5
½" wood structural panel	10
5/8" wood structural panel	15

a. Times for individual membranes are additive.

Reason: The fire service has asked for minimum fire resistance of floor/ceiling systems equivalent to 2x lumber floor construction. The basis of the requirements assume that a floor/ceiling assembly constructed using 2x lumber and loaded to 50% of full design load will provide 15 minutes of structural fire resistance as confirmed by recent UL testing reported in *Structural Stability of Engineered Lumber in Fire Conditions*.

The proposed R302.7 provides a simple method of meeting this 15 minute requirement for all floor assemblies by requiring ½" gypsum wallboard as a protective ceiling membrane. Exceptions to this requirement are provided.

The proposed R502.14 provides additional methods of meeting this 15 minute requirement for wood floor framing, including different options for ceiling membrane protection recognized in IBC 721.6, finish ratings from approved ASTM E119 test reports, fire test results from ASTM E119 tests, structural fire resistance calculations per IBC 721.1, or any combination of these provisions.

The proposed Table R502.14 is taken from IBC Table 721.6.2(1).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: PITTS-RB-3-R302.7-R502.14

RB32–09/10
R302.9, R302.9.1

Proponent: Joe Holland and Dave Bueche, Hoover Treated Wood Products

Revise as follows:

R302.9 Flame spread index and smoke-developed index for wall and ceiling finishes. Flame spread and smoke-developed index for wall and ceiling finishes shall be in accordance with Sections 302.9.1 through 302.9.4.

R302.9.1 Wall and ceiling finishes shall have a flame-spread index of not greater than 200. For new construction reduction of the flame-spread index shall not be permitted after installation of the material. For existing construction wall and ceiling finish shall be permitted to be treated with an approved fire-retardant coating in accordance with the manufacturer's instructions.

Exception: Flame spread index requirements for finishes shall not apply to trim defined as picture molds, chair rails, baseboards and handrails; to doors and windows or their frames; or to materials that are less than 1/28 inch (0.91 mm) in thickness cemented to the surface of walls or ceilings if these materials exhibit flame spread index values no greater than those of paper of this thickness cemented to a noncombustible backing.

Reason: To correlate the IRC with the IBC. There is concern with this class of products being used in inappropriate applications in new residential construction.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HOLLAND-BUECHE-RB-1-R302.9

RB33–09/10
R302.9.4

Proponent: Marcelo M. Hirschler, GBH International, representing the American Fire Safety Council

Revise as follows:

R302.9.4 Alternate test method. As an alternate to having a flame-spread index of not greater than 200 and a smoke developed index of not greater than 450 when tested in accordance with ASTM E 84 or UL 723, wall and ceiling finishes~~, other than textiles,~~ shall be permitted to be tested in accordance with NFPA 286. Materials tested in accordance with NFPA 286 shall meet the following criteria:

~~During the 40 kW exposure, the interior finish shall comply with Item 1. During the 160 kW exposure, the interior finish shall comply with Item 2. During the entire test, the interior finish shall comply with Item 3.~~

~~1. During the 40kWexposure, flames shall not spread to the ceiling.~~
~~2. During the 160 kW exposure, the interior finish shall comply with the following:~~
~~2.1. Flame shall not spread to the outer extremity of the sample on any wall or ceiling.~~
~~2.2. Flashover, as defined in NFPA 286, shall not occur.~~
~~3. The total smoke released throughout the NFPA 286 test shall not exceed 1,000 m^2.~~

The interior finish shall comply with the following:

1. During the 40 kW exposure, flames shall not spread to the ceiling.
2. The flame shall not spread to the outer extremity of the sample on any wall or ceiling.
3. Flashover, as defined in NFPA 286, shall not occur.
4. The peak heat release rate throughout the test shall not exceed 800 kW.
5. The total smoke released throughout the test shall not exceed 1,000 m^2.

Reason: There are three changes being made here, for consistency with the IBC.
1. The maximum heat release rate criterion is being added, just like it is in the IBC: heat release rate maximum of 800 kW
2. Textile wall and ceiling materials are permitted to be tested to NFPA 286, just like in the IBC.
3. The remainder of the proposal is purely editorial and intended for simplification. Clearly the interior finish should fail the criteria if the material has flame spreading to the outer extremity of the sample (meaning all the way to the end of the room or ceiling) even before the burner is raised to 160 kW. Also, the material should fail the test is flashover occurs when the burner is still at 40 kW. The present language could be interpreted to mean that a material that burns completely within a minute and/or reaches flashover does not fail the test. That should not be the case.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-RB-2-R302.9.4

RB34–09/10
R302.10.1

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing The Extruded Polystyrene Foam Association

Revise as follows:

R302.10.1 Insulation. Insulation materials, including facings, such as vapor retarders or vapor permeable membranes installed within floor-ceiling assemblies, roof-ceiling assemblies, wall assemblies, crawl spaces and attics shall have a flame-spread index not to exceed 25 with an accompanying smoke-developed index not to exceed 450 when tested in accordance with ASTM E 84 or UL 723.

Exceptions:

1. When such materials are installed in concealed spaces, the flame spread index and smoke-developed index limitations do not apply to the facings, provided that the facing is installed in substantial contact with the unexposed surface of the ceiling, floor or wall finish.
2. Cellulose loose-fill insulation, which is not spray applied, complying with the requirements of Section R302.10.3, shall only be required to meet the smoke developed index of not more than 450.
3. Foam plastic insulation shall comply with Section R316.

Reason: Foam plastic insulations and their fire performance are regulated per IRC Section R316. This new exception provides a pointer to that section and clarifies the requirements for foam plastic insulation.

This is similar to that done in Section 719.1 of the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEITEL-RB-5-R302.10.1

RB35–09/10
R302.11, M1501.2 (New)

Proponent: Julius Ballanco, PE, JB Engineering and Code Consulting, P.C., representing In-O-Vate Technologies, Inc.

1. Revise as follows:

R302.11 Fireblocking. In combustible construction, fireblocking shall be provided to cut off all concealed draft openings (both vertical and horizontal) and to form an effective fire barrier between stories, and between a top *story* and the roof space.

Fireblocking shall be provided in wood-frame construction in the following locations:

1. In concealed spaces of stud walls and partitions, including furred spaces and parallel rows of studs or staggered studs, as follows:

   1.1. Vertically at the ceiling and floor levels.
   1.2. Horizontally at intervals not exceeding 10 feet(3048 mm).

2. At all interconnections between concealed vertical and horizontal spaces such as occur at soffits, drop ceilings and cove ceilings.
3. In concealed spaces between stair stringers at the top and bottom of the run. Enclosed spaces under stairs shall comply with Section R302.7.
4. At openings around vents, pipes, ducts, cables and wires at ceiling and floor level, with an *approved* material to resist the free passage of flame and products of combustion. The material filling this annular space shall not be required to meet the ASTM E 136 requirements.
5. For the fireblocking of chimneys and fireplaces, see Section R1003.19.
6. Fireblocking of cornices of a two-family *dwelling* is required at the line of *dwelling unit* separation.
7. At penetrations of walls by dryer exhaust duct at the dryer location in accordance with Section M1501.2.

2. Add new text as follows:

M1501.2 Dryer exhaust duct penetrations. Where a clothes dryer exhaust duct is located within a framed wall, the penetration of the wall membrane at the location of the dryer shall have the annular space sealed with noncombustible material, approved fire caulking, or a noncombustible dryer exhaust duct wall receptacle.

Reason: This change corrects the concerns expressed during the last cycle. I have modified the proposed change to remove penetration of rated walls, since such penetrations are not permitted by the Code. The remaining issues have been addressed as suggested by the Code Committee.

The difference between a dyer exhaust duct penetration and other penetration is that it is in close proximity to a fuel fired appliance or electric heating appliance. Dryers are more prone to fire than other appliances. To protect the structure, it is important to have a higher level of protection.

The language in this change is consistent with the requirements found in the International Mechanical Code.

The CPSC identified 15,600 fires associated with dryers in a single year. Studies have shown that metal ducts protect the structure from the spread of fire. Additionally, noncombustible material or fire caulk around the annular space prevents the fire from spreading into the wall or ceiling cavity. The same can be accomplished with manufactured noncombustible receptacles. The noncombustible receptacles also allow for the proper storage and recoil of the transition flexible duct to a metal duct.

Cost Impact: The code change proposal may increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BALLANCO-RB-1-R302.11

RB36–09/10
R302.12

Proponent: Fire Chief Kevin A. Gallagher, Town of Acushnet, MA, representing the Fire Chief's Association of Massachusetts

Revise as follows:

R302.12 Draftstopping. In combustible construction where there is usable space both above and below the concealed space of a floor/ceiling assembly, draftstops shall be installed so that the area of the concealed space does not exceed ~~1,000~~ 500 square feet (~~92.9m2~~) (46.45m^2). Draftstopping shall divide the concealed space into approximately equal areas. Where the assembly is enclosed by a floor membrane above and a ceiling membrane below, draftstopping shall be provided in floor/ceiling assemblies under the following circumstances:

1. Ceiling is suspended under the floor membrane.
2. Floor framing is constructed of truss-type open web or perforated members.

Reason: Currently R302.12 requires draftstopping in void spaces created by a floor membrane above and ceiling membrane below if the area (length x width) is in excess of 1,000 square feet. The unit of measurement does not take into consideration the height of the void.

Prefabricated construction allows for the construction of both ceiling and floor assemblies in typical wood frame, "modular" residential residences. When the modular boxes are assembled on-site, the upper story boxes are laid to rest on the top of the lower level boxes. With each unit having a complete ceiling and floor assembly a void space is created between levels of useable space. It is not uncommon for these void spaces to be up to twenty (20) inches in height and encompass the full length and width of the modular boxes.

Two fires in Massachusetts in 2008 demonstrate the speed in which fire can spread once it penetrates the void space. Both fires occurred in two story homes of modular construction and entered the structure from the exterior. Both structures consisted of two, first level boxes measuring 48 feet by 14 feet joined at a marriage wall with two similar size boxes situated above and also attached at a marriage wall. The void spaces created by this assembly was 672 square feet in the front with a similar size void space in the rear. However, the distance between the floor and ceiling membrane measured 20 inches thus creating a void of 1,116 cubic feet.

It is common practice in the prefabricated home industry to utilize polyurethane foam structural adhesives on one side of the structural members that supports the gypsum board ceiling. Tests have shown that certain types of structural adhesives are easy to ignite, burn at a rapid rate, generate considerable heat energy and lose considerable amounts of mass. These adhesives are found inside the void space.

The area created by the void (672 square feet) in either of the two Massachusetts modular homes that were destroyed by fire did not trigger the Code requirement for draftstopping. Once the fire entered the void it spread -- in an unobstructed fashion -- the full length and width of the void space. The fire also destroyed the primary means of affixing the gypsum board to the ceiling membrane thus expedited ceiling collapse and exposing the lower levels to fire conditions.

Draft stops, as defined by Section R202 (Definitions) are designed to "restrict the movement of air within open spaces of concealed areas of building components. " Floor / ceiling assemblies are included in the stated list of qualifying building components. The free movement of superheated air, gases and other products of combustion pre-heats structural members within the void space. In the presence of flammable polyurethane structural adhesives, the spread of heat, gases and fire is increased. The collapse of the ceiling membrane, considerable distances from the location of the fire, is a very real possibility.

This Code change attempts to reduce the size of the void space found in multistory residences of modular construction by reducing the trigger for draftstopping from 1,000 square feet to 500 square feet. As currently written, the Code requires a reduction by 50% of void spaces in excess of 1,000 square feet. A void space meeting the draftstopping requirements and 1,001 square feet would be reduced to two void spaces each approximately 500 square feet in area. Changing the trigger for draftstopping to 500 square feet would capture those void spaces that range in size between 500 – 1,000 square feet.

This proposal substitutes new measurement criteria for current provisions of the Code.


FLOOR
CEILING

Cost Impact: The code change proposal may increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GALLAGHER-RB-2-R302.12

RB37–09/10
R302.12

Proponent: Fire Chief Kevin A. Gallagher, Town of Acushnet, MA, representing the Fire Chief's Association of Massachusetts

Revise as follows:

R302.12 Draftstopping. In combustible construction where there is usable space both above and below the concealed space of a floor/ceiling assembly, draftstops shall be installed so that the ~~area~~ volume of the concealed space does not exceed 1,000 ~~square~~ cubic feet ~~(92.9 m^2)~~ (28.32 m^3). Draftstopping shall divide the concealed space into approximately equal areas. Where the assembly is enclosed by a floor membrane above and a ceiling membrane below, draftstopping shall be provided in floor/ceiling assemblies under the following circumstances:

1. Ceiling is suspended under the floor membrane.
2. Floor framing is constructed of truss-type open web or perforated members.

Reason: Currently R302.12 requires draftstopping in void spaces created by a floor membrane above and ceiling membrane below if the area (length x width) is in excess of 1,000 square feet. The unit of measurement does not take into consideration the height of the void.

Prefabricated construction allows for the construction of both ceiling and floor assemblies in typical wood frame, "modular" residential residences. When the modular boxes are assembled on-site, the upper story boxes are laid to rest on the top of the lower level boxes. With each unit having a complete ceiling and floor assembly a void space is created between levels of useable space. It is not uncommon for these void spaces to be up to twenty (20) inches in height and encompass the full length and width of the modular boxes.

Two fires in Massachusetts in 2008 demonstrate the speed in which fire can spread once it penetrates the void space. Both fires occurred in two story homes of modular construction and entered the structure from the exterior. Both structures consisted of two, first level boxes measuring 48 feet by 14 feet joined at a marriage wall with two similar size boxes situated above and also attached at a marriage wall. The void spaces created by this assembly was 672 square feet in the front with a similar size void space in the rear. However, the distance between the floor and ceiling membrane measured 20 inches thus creating a void of 1,116 cubic feet.

It is common practice in the prefabricated home industry to utilize polyurethane foam structural adhesives on one side of the structural members that supports the gypsum board ceiling. Tests have shown that certain types of structural adhesives are easy to ignite, burn at a rapid rate, generate considerable heat energy and lose considerable amounts of mass. These adhesives are found inside the void space.

The area created by the void (672 square feet) in either of the two Massachusetts modular homes that were destroyed by fire did not trigger the Code requirement for draftstopping. Once the fire entered the void it spread -- in an unobstructed fashion -- the full length and width of the void space. The fire also destroyed the primary means of affixing the gypsum board to the ceiling membrane thus expedited ceiling collapse and exposing the lower levels to fire conditions.

This Code change attempts to reduce the size of the void space found in multistory residences of modular construction by incorporating the height of the void thus changing the unit of measurement from square feet to cubic feet. Draft stops, as defined by Section R202 (Definitions) are designed to "restrict the movement of air within open spaces of concealed areas of building components. " Floor / ceiling assemblies are included in the stated list of qualifying building components. The free movement of superheated air, gases and other products of combustion pre-heats structural members within the void space. In the presence of flammable polyurethane structural adhesives, the spread of heat, gases and fire is increased. The collapse of the ceiling membrane, considerable distances from the location of the fire, is a very real possibility.

Applying this Code change to traditional, stick framed construction would yield the following results; a void space of 1,000 square feet which incorporates floor framing consisting of an open web truss system of 12" depth would calculate to 1,000 cubic feet resulting in no change from the current code. The same void space with an 18" depth to the open web truss would generate 1,500 cubic feet thus requiring draftstopping. A 24" open web truss would create a void space of 2,000 cubic feet thus requiring compartmentalization.

By reducing the overall size of the void, the lightweight engineered structural components found inside the void are offered protection under fire conditions.

This proposal substitutes new measurement criteria for current provision of the Code.

Cost Impact: The code change proposal may increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GALLAGHER-RB-1-R302.12

RB38–09/10
R305.1

Proponent: Rick Davidson, City of Maple Grove, MN

Revise as follows:

R305.1 Minimum height. Habitable space, hallways, ~~bathrooms, toilet rooms,~~ laundry rooms and portions of basements containing these spaces shall have a ceiling height of not less than 7 feet (2134 mm). Bathrooms and toilet rooms shall have a ceiling height of not less than 6 feet 8 inches (2036 mm) including above a minimum area 30 inches (762 mm) by 30 inches (762 mm) at the showerhead in showers or tubs equipped with showerheads.

Exceptions:

1. For rooms with sloped ceilings, at least 50 percent of the required floor area of the room must have a ceiling height of at least 7 feet (2134 mm) and no portion of the required floor area may have a ceiling height of less than 5 feet (1524 mm).
2. ~~Bathrooms shall have a minimum ceiling height of 6 feet 8 inches (2036 mm) at the center of the front clearance area for fixtures as shown in Figure R307.1. The ceiling height above fixtures shall be such that the fixture is capable of being used for its intended purpose. A shower or tub equipped with a showerhead shall have a minimum ceiling height of 6 feet 8 inches (2036 mm) above a minimum area 30 inches (762 mm) by 30 inches (762 mm) at the showerhead.~~
2. The ceiling height above water closets and lavatories shall be permitted to be of any height.

Reason: First section R305.1 sets a minimum ceiling height for bathrooms and toilet rooms at 7 feet. Then Exception 2 reduces that ceiling height in bathrooms (but not toilet rooms) to 6'8" at the center of the front clearance area for fixtures shown in Figure R307.1 and in tubs and showers with showerheads. It is safe to assume that toilet rooms should have been included in this section. It is probably also safe to assume that ceiling heights in bathrooms and toilet rooms need only be 6'8" at any location in the room, not just in the most used areas of the room. It isn't reasonable to think that the ceiling heights in these rooms should be 7 feet but only 6'8" near the fixtures, but this is what the text implies. Since bathrooms and toilet rooms do not have "required floor areas" but rather "clearance area for fixtures", Exception 1 does not apply to bathrooms and toilet rooms. That exception only applies to required floor area. Therefore, Exception 2 is really not an exception to the charging language but is the charging language and should not be in an exception. This proposal corrects that flaw.

The third exception that states "The ceiling height above fixtures shall be such that the fixture is capable of being used for its intended purpose" is unenforceable and any attempt at enforcement would be arbitrary. It is unenforceable because "capable of being used for its intended purpose" is not defined and is subject to discretionary action. The converse would be what ceiling height is acceptable over a water closet? Is 5 feet acceptable? What about 5 ½ feet? Or, 6 feet? And, if in your opinion an acceptable height is 6 feet and you encounter a situation where the height is 5 ½ feet, how do you enforce your opinion? If it can't be enforced it shouldn't be in the code. There is no basis on which to write a correction order no matter what the height above the fixtures is. The language will result in a lack of uniformity. It will lead to confusion as to what is an acceptable height. It will create conflicts between building departments, contractors, and homeowners. The proposed language specifically calls out water closets and lavatories because those are the only fixtures illustrated in Figure 307.1 besides tubs/showers and there are specific height requirements for tub/showers that are retained. Because of the reasons stated and because the market will likely dictate what an acceptable height is, this proposal deletes the offending language and permits the homeowner to decide what height is most appropriate.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-RB-6-R305.1

RB39–09/10
R308.4

Proponent: William E. Koffel, Koffel Associates, Inc., representing the Glazing Industry Code Committee (GICC)

Revise as follows:

R308.4 Hazardous locations. The following shall be considered specific hazardous locations for the purposes of glazing:

1. Glazing in all fixed and operable panels of swinging, sliding and bifold doors.

   Exceptions:

   1. Glazed openings of a size through which a 3-inch diameter (76 mm) sphere is unable to pass.
   2. Decorative glazing.

2. Glazing in an individual fixed or operable panel adjacent to a door where the nearest vertical edge is within a 24-inch (610 mm) arc of the door in a closed position and whose bottom edge is less than 60 inches (1524 mm) above the floor or walking surface.

   Exceptions:

   1. Decorative glazing.
   2. When there is an intervening wall or other permanent barrier between the door and the glazing.
   3. Glazing in walls on the latch side of and perpendicular to the plane of the door in a closed position.
   4. Glazing adjacent to a door where access through the door is to a closet or storage area 3 feet (914 mm) or less in depth.
   5. Glazing that is adjacent to the fixed panel of patio doors <u>which is not required to be safety glazing by another section</u>.

3. Glazing in an individual fixed or operable panel that meets all of the following conditions:
   3.1. The exposed area of an individual pane is larger than 9 square feet (0.836 m2); and
   3.2. The bottom edge of the glazing is less than 18 inches (457 mm) above the floor; and
   3.3. The top edge of the glazing is more than 36 inches (914 mm) above the floor; and
   3.4. One or more walking surfaces are within 36 inches (914 mm), measured horizontally and in a straight line, of the glazing.

   Exceptions:

   1. Decorative glazing.
   2. When a horizontal rail is installed on the accessible side(s) of the glazing 34 to 38 inches (864 to 965) above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot (730 N/m) without contacting the glass and be a minimum of 11/2 inches (38 mm)in cross sectional height.
   3. Outboard panes in insulating glass units and other multiple glazed panels when the bottom edge of the glass is 25 feet (7620 mm) or more above *grade*, a roof, walking surfaces or other horizontal [within 45 degrees (0.79 rad) of horizontal] surface adjacent to the glass exterior.

4. All glazing in railings regardless of area or height above a walking surface. Included are structural baluster panels and nonstructural infill panels.
5. Glazing in enclosures for or walls facing hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) measured vertically above any standing or walking surface.

   Exception: Glazing that is more than 60 inches (1524 mm),measured horizontally and in a straight line, from the waters edge of a hot tub, whirlpool or bathtub.

6. Glazing in walls and fences adjacent to indoor and outdoor swimming pools, hot tubs and spas where the bottom edge of the glazing is less than 60 inches (1524 mm) above a walking surface and within 60 inches (1524 mm), measured horizontally and in a straight line, of the water's edge. This shall apply to single glazing and all panes in multiple glazing.
7. Glazing adjacent to stairways, landings and ramps within 36 inches (914 mm) horizontally of a walking surface when the exposed surface of the glazing is less than 60 inches (1524 mm) above the plane of the adjacent walking surface.

   Exceptions:

   1. When a rail is installed on the accessible side(s) of the glazing 34 to 38 inches (864 to 965 mm) above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot (730 N/m) without contacting the glass and be a minimum of 11/2 inches (38 mm) in cross sectional height.
   2. The side of the stairway has a guardrail or handrail, including balusters or in-fill panels, complying with Sections R311.7.6 and R312 and the plane of the glazing is more than 18 inches (457 mm) from the railing; or
   3. When a solid wall or panel extends from the plane of the adjacent walking surface to 34 inches (863 mm) to 36 inches (914 mm) above the walking surface and the construction at the top of that wall or panel is capable of withstanding the same horizontal load as a *guard*.

8. Glazing adjacent to stairways within 60 inches (1524 mm) horizontally of the bottom tread of a stairway in any direction when the exposed surface of the glazing is less than 60 inches (1524 mm) above the nose of the tread.

   Exceptions:

   1. The side of the stairway has a guardrail or handrail, including balusters or in-fill panels, complying with Sections R311.7.6 and R312 and the plane of the glass is more than 18 inches (457 mm) from the railing; or
   2. When a solid wall or panel extends from the plane of the adjacent walking surface to 34 inches (864 mm) to 36 inches (914 mm) above the walking surface and the construction at the top of that wall or panel is capable of withstanding the same horizontal load as a *guard*.

Reason: After several attempts, Exception #5 was added to the 2009 Edition of the IBC. The rationale submitted in RB42-07/08 was that "it is unlikely that the sliding doors will be reversed by the owner and people are familiar with their home environments." There was not corresponding proposal submitted to address eh issue in the same manner within dwelling units covered by the IBC.

The original rationale is flawed for the following reasons:

1. The new language "patio doors" instead of the original language "sliding doors" extends the application to far more doors.
2. The assumption that the people are familiar with their home environment does not take into consideration guests and horseplay activities.
3. The exception is too broad in nature and could be read to override the other provisions. For example, what if the panel is part of a hot tub enclosure? What if the panel is less than 18 inches above the floor?
4. The proponent based the rationale in part on Exception No. 3 but that exception only applies when the wall is perpendicular to the door.

We do not have injury data to support this proposal since historically the panel was required to be safety glazing. However, there was no technical substantiation to the change proposed last cycle to eliminate the requirement for safety glazing.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KOFFEL-RB-1-R308.4

RB40–09/10
R308.4

Proponent: Tim Pate, City and County of Broomfield, CO, representing the Colorado Chapter ICC Code Change Committee

Revise as follows:

R308.4 Hazardous locations. The following shall be considered specific hazardous locations for the purposes of glazing:

1. Glazing in all fixed and operable panels of swinging, sliding and bifold doors.

   Exceptions:

   1. Glazed openings of a size through which a 3-inch diameter (76 mm) sphere is unable to pass.
   2. Decorative glazing.

2. Glazing in an individual fixed or operable panel adjacent to a door where the nearest vertical edge is within a 24-inch (610 mm) arc of the door in a closed position and whose bottom edge is less than 60 inches (1524 mm) above the floor or walking surface.

   Exceptions:

   1. Decorative glazing.
   2. When there is an intervening wall or other permanent barrier between the door and the glazing.
   3. Glazing in walls on the latch side of and perpendicular to the plane of the door in a closed position.

4. Glazing adjacent to a door where access through the door is to a closet or storage area 3 feet (914 mm) or less in depth.
5. Glazing that is adjacent to the fixed panel of patio doors.

3. Glazing in an individual fixed or operable panel that meets all of the following conditions:
   3.1. The exposed area of an individual pane is larger than 9 square feet (0.836 m2); and
   3.2. The bottom edge of the glazing is less than 18 inches (457 mm) above the floor; and
   3.3. The top edge of the glazing is more than 36 inches (914 mm) above the floor; and
   3.4. One or more walking surfaces are within 36 inches (914 mm), measured horizontally and in a straight line, of the glazing.

   Exceptions:

   1. Decorative glazing.
   2. When a horizontal rail is installed on the accessible side(s) of the glazing 34 to 38 inches (864 to 965) above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot (730 N/m) without contacting the glass and be a minimum of 11/2 inches (38 mm) in cross sectional height.
   3. Outboard panes in insulating glass units and other multiple glazed panels when the bottom edge of the glass is 25 feet (7620 mm) or more above *grade*, a roof, walking surfaces or other horizontal [within 45 degrees (0.79 rad) of horizontal] surface adjacent to the glass exterior.

4. All glazing in railings regardless of area or height above a walking surface. Included are structural baluster panels and nonstructural infill panels.
5. Glazing in enclosures for or walls facing hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) measured vertically above any standing or walking surface.

   Exception: Glazing that is more than 60 inches (1524 mm),measured horizontally and in a straight line, from the waters edge of a hot tub, whirlpool or bathtub.

6. Glazing in walls and fences adjacent to indoor and outdoor swimming pools, hot tubs and spas where the bottom edge of the glazing is less than 60 inches (1524 mm) above a walking surface and within 60 inches (1524 mm), measured horizontally and in a straight line, of the water's edge. This shall apply to single glazing and all panes in multiple glazing.
7. Glazing adjacent to stairways, landings, and ramps within 36 inches (914 m) horizontally of a walking surface when the exposed surface of the glazing is less than 60 inches (1524 mm) above the plane of the adjacent walking surface.

   Exceptions:

   ~~1. When a rail is installed on the accessible side(s) of the glazing 34 to 38 inches (864 to 965 mm) above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per lineal foot (730 N/m) without contacting the glass and be a minimum of 1 ½ inches (38 mm) in cross sectional height.~~
   ~~2~~ 1. The side of the stairway has a guard~~rail~~ or handrail, including balusters or in-fill panels, complying with Sections R311.7.6 and R312 and the plane of the glazing is more than 18 inches (457 mm) from the railing; or
   ~~3~~ 2. When a solid wall or panel extends from the plane of adjacent walking surface to 34 inches (863 mm) to 36 inches (914 mm) above the walking surface and the construction at the top of that wall or panel is capable of withstanding the same horizontal load as a guard and the plane of the glazing is more than 18 inches (457 mm) from the wall or panel.

8. Glazing adjacent to stairways within 60 inches (1524 m) horizontally of the bottom tread of a stairway in any direction when the exposed surface of the glazing is less than 60 inches (1524 mm) above the nose of the tread.

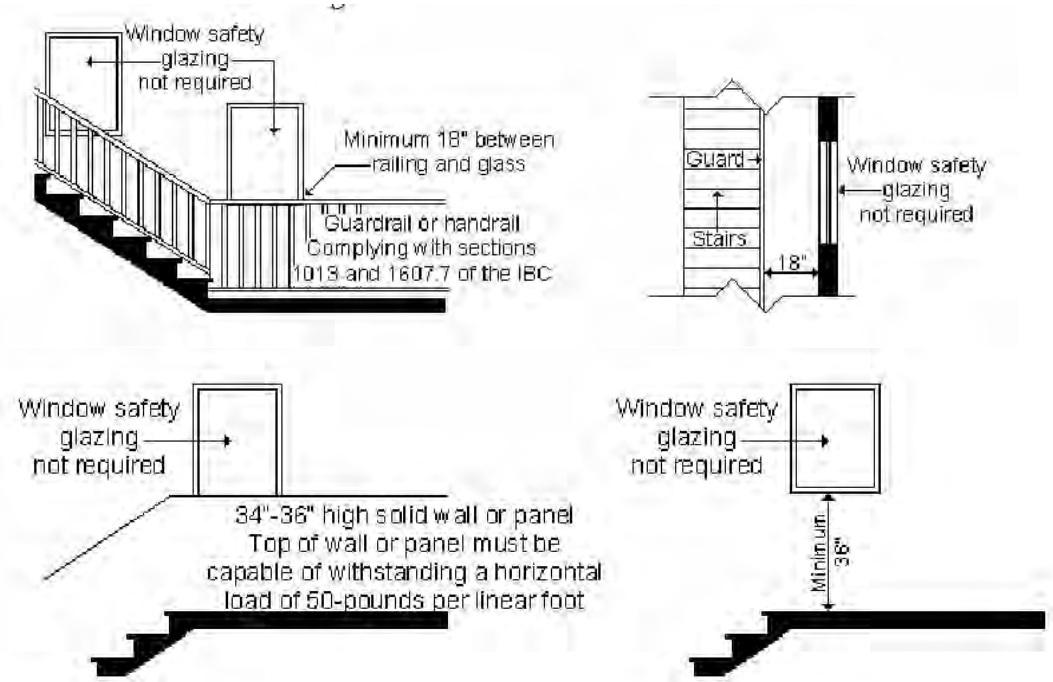
Exceptions:

1. The side of the stairway has a guard~~rail~~ or handrail, including balusters or in-fill panels, complying with Sections R311.7.6 and R312 and the plane of the glazing is more than 18 inches (457 mm) from the railing; or
2. When a solid wall or panel extends from the plane of the adjacent walking surface to 34 inches (864 mm) to 36 inches (914 mm) above the walking surface and the construction at the top of that wall or panel is capable of withstanding the same horizontal load as a guard <u>and the plane of the glazing is more than 18 inches (457 mm) from the wall or panel.</u>

Reason: Code change RB15-00 added exception 9 (9.1 and 9.2) which allowed the protective bar but also required the glazing to be at least 18" away from the stair and bar. Code change RB16-00 was also approved in the same code change cycle which added the reference in exception #5 which would allow the protective bar but not require the 18" separation. This created a direct conflict between the two exceptions in the 2003 IRC and the 2006 IRC. IRC Section R308.4 was modified for the 2009 IRC by reformatting the requirements and exceptions in order to make it more user friendly but no technical changes were made.

Stairs are inherently more dangerous for tripping hazards than normal walking surfaces. It does not make sense to a allow 1 ½" wide bar or a solid wall directly adjacent to stairs and landings and think this gives adequate protection for someone falling into glazing that is not safety glazing. Requiring the glazing to be at least 18" away would provide better protection if someone trips and falls which is exactly what 2009 IRC section R308.4 #7 exception 2 requires.

The following diagrams illustrates what R308.4 #7 exception 2 allows which is the guard or handrail but also the 18" separation which is in conflict with what is allowed in #7 exception 1 or 3 which allows a rail or solid wall but does not require the 18" separation.



I have also made a minor change to change the word guardrail to guard which has already been changed throughout the rest of the Code. Finally this overall code change will now make the IRC requirements exactly the same as the IBC requirements in Section 2406.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PATE-RB-1-R308.4

RB41–09/10
R310.1

Proponent: Mike Rice, Maplewood, MN, representing the Association of Minnesota Building Officials

Revise as follows:

R310.1 Emergency escape and rescue required. *Basements,* habitable attics and every sleeping room shall have at least one operable emergency escape and rescue opening. Where *basements* contain one or more sleeping rooms, emergency egress and rescue openings shall be required in each sleeping room. Where emergency escape and rescue openings are provided they shall have a sill height of not more than 44 inches (1118 mm) measured from the finished floor to the bottom of the clear opening ~~above the floor~~. Where a door opening having a threshold below the adjacent ground elevation serves as an emergency escape and rescue opening and is provided with a bulkhead enclosure, the bulkhead enclosure shall comply with Section R310.3. The net clear opening dimensions required by this section shall be obtained by the normal operation of the emergency escape and rescue opening from the inside. Emergency escape and rescue openings with a finished sill height below the adjacent ground elevation shall be provided with a window well in accordance with Section R310.2. Emergency escape and rescue openings shall open directly into a public way, or to a *yard* or court that opens to a public way.

> **Exception:** *Basements* used only to house mechanical *equipment* and not exceeding total floor area of 200 square feet (18.58 m^2).

Reason: This change would clarify where the sill height is (at the bottom of the clear opening), providing uniformity and take away any confusion as to where that measurement is to be taken. The IRC Commentary describes this situation and I think it would complement the current section without a lot of change, taking away any question of where the sill height is.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE (MIKE)-RB-3-R310.1

RB42–09/10
R310.1.5 (New)

Proponent: Rick Davidson, City of Maple Grove, MN

Add new text as follows:

R310.1.5 Identification. Windows installed as an emergency escape and rescue opening and meeting the requirements of Sections R310.1.1 thru R310.1.4 shall be identified as an "Emergency Escape and Rescue Opening". The identification shall be affixed to the frame or glass of the window as to be visible during inspection. The identification shall be of a type which once applied cannot be removed without being destroyed.

Reason: How do confirm that a window has safety glazing? You look for identification. How do you determine the grade of a floor joist? You look for a grade stamp. How do you confirm the R value of an insulation batt? You look for a label. Why, so the component can be identified in the field as meeting a specific standard or requirement. How do you identify whether or not a window meets emergency egress requirements? We might try measure it and then decide if it is compliant or require additional information from the contractor or window supplier. We don't require any identification for windows used as emergency escape and rescue openings like we do with most other building components. This makes it difficult to verify compliance in the field with egress requirements. Manufacturers identify windows that meet egress requirements in their catalogs. That can be verified at plan review. But a disconnect occurs when that window, or one that is close in size, is installed in the field. Field inspectors cannot carry with them the manufactures literature for the dozens or hundreds of window manufacturers. They can only rely on field measurements. Herein lays the problem. There are numerous windows specified by manufacturers as having clear openable areas that meet egress requirements or that are hundredths of a square foot greater or lesser than required. Field inspectors cannot measure these openings to the exactness necessary to determine if windows that are close to meeting requirements are of the appropriate size. We already require windows to be identified for safety glazing and energy compliance reasons. Placing identification on the window that it meets egress requirements will have a minimal increase in cost and will greatly improve timely validation and compliance in the field.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-RB-8-R310.1.5

RB43–09/10
R310.2.2 (New)

Proponent: Scott Dornfeld, City of Delano, MN, representing the Association Minnesota Building Officials

Add new text as follows:

R310.2.2 Drainage. Window wells shall be designed for proper drainage by connecting to the buildings foundation drainage system required by Section R405.1 or by an approved alternate method.

> **Exception:** A drainage system for window wells is not required when the foundation is on well-drained soil or sand-gravel mixture soils according to the United Soil Classification System, Group I Soils, as detailed in Table R405.1.

Reason: Although many builders are addressing window well drainage, there are those that do not. As an inspector, I have seen the damage caused from not having proper window well drainage and this code change proposal could eliminate that damage. Also when there is a problem with the window well drainage the emergency escape window now becomes a hazard to the occupants. The window may become inoperable, or even blow out into the occupied room causing serious injury. This code change may increase costs to those not currently addressing the issue; however, it may prevent serious injury and costly water damage repair.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DORNFELD-RB-1-R310.2.2

RB44–09/10
R311.3

Proponent: Rick Davidson, City of Maple Grove, MN

Revise as follows:

R311.3 Floors and landings at exterior doors. There shall be a landing or floor on each side of each exterior door. The width of each landing shall not be less than the door served. Every landing shall have a minimum dimension of 36 inches (914 mm) measured in the direction of travel. Exterior landings shall be permitted to have a slope not to exceed 1/4 unit vertical in 12 units horizontal (2-percent).

> **Exception:** ~~Exterior~~ Doors, other than the required exit door, serving exterior balconies ~~less than 60 square feet and only accessible from a door are permitted to have a landing less than 36 inches (914 mm) measured in the direction of travel~~.

Reason: An arbitrary limit on the size of landings at balconies serves no purpose when they don't serve as the required exit door. There is also no reason to prohibit a window from opening onto one of these balconies ("only accessible from a door"). This amendment would eliminate unnecessary regulation and simplify the language.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-RB-2-R311.3

RB45–09/10
R311.3.2

Proponent: Homer Maiel, PE, CBO, City of San Jose, CA, representing the ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay Chapters)

Revise as follows:

R311.3.2 Floor elevations for other exterior doors. Doors other than the required egress door shall be provided with landings or floors not more than 7 ¾ inches (196 mm) below the top of the threshold <u>provided the door does not swing over the landing or floor</u>.

> **Exceptions:** A landing is not required where a stairway of two or fewer risers is located on the exterior side of the door, provided the door does not swing over the stairway.

Reason: This revision is needed to make sure that Section R311.3.2 is consistent with Section R311.3.1. Tripping hazards will be equal regardless of whether a door is or is not a required egress door. The Exception to this section indicates that the door should not be swung over one-riser or two-riser stairway. However, the main body of the section fails to address that a door should not swing over a lower landing, as Section R311.3.1 clearly states.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAIEL-RB-4-R311.3.2

RB46–09/10
R311.7.4.1, R311.7.4.2, R311.7.4.2.1 (New), R311.7.4.3

Proponent: Rick Davidson, City of Maple Grove, MN

1. Revise as follows:

R311.7.4.1 Riser height. The maximum riser height shall be 73/4 inches (196 mm). The riser shall be measured vertically between leading edges of the adjacent treads. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm). <u>Risers shall be vertical or sloped from the underside of the leading edge of the tread above at an angle not more than 30 degrees (0.51 rad) from the vertical. Open risers are permitted provided that the opening between treads does not permit the passage of a 4-inch diameter (102 mm) sphere.</u>

> <u>**Exception:** The opening between adjacent treads is not limited on stairs with a total rise of 30 inches (762 mm) or less.</u>

R311.7.4.2 Tread depth. The minimum tread depth shall be 10 inches (254 mm). The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm). Consistently shaped winders at the walkline shall be allowed within the same flight of stairs as rectangular treads and do not have to be within 3/8 inch (9.5 mm) of the rectangular tread depth. ~~Winder treads shall have a minimum tread depth of 10 inches (254 mm) measured between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline. Winder treads shall have a minimum tread depth of 6 inches (152 mm) at any point within the clear width of the stair. Within any flight of stairs, the largest winder tread depth at the walkline shall not exceed the smallest winder tread by more than 3/8 inch (9.5 mm).~~

2. Add new text as follows:

<u>**R311.7.4.2.1 Winder treads.** Winder treads shall have a minimum tread depth of 10 inches (254 mm) measured between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline. Winder treads shall have a minimum tread depth of 6 inches (152 mm) at any point within the clear width of the stair. Within any flight of stairs, the largest winder tread depth at the walkline shall not exceed the smallest winder tread by more than 3/8 inch (9.5 mm).</u>

3. Revise as follows:

R311.7.4.3 ~~Profile~~ Nosings . The radius of curvature at the nosing shall be no greater than 9/16 inch (14 mm). A nosing not less than 3/4 inch (19 mm) but not more than 11/4 inches (32 mm) shall be provided on stairways with solid risers. The greatest nosing projection shall not exceed the smallest nosing projection by more than 3/8 inch (9.5 mm) between two stories, including the nosing at the level of floors and landings. Beveling of nosings shall not exceed 1/2 inch (12.7 mm). ~~Risers shall be vertical or sloped under the tread above from the underside of the nosing above at an angle not more than 30 degrees (0.51 rad) from the vertical. Open risers are permitted, provided that the opening between treads does not permit the passage of a 4-inch diameter (102 mm) sphere.~~

Exceptions~~:~~

~~1.~~ A nosing is not required where the tread depth is a minimum of 11 inches (279 mm).
~~2. The opening between adjacent treads is not limited on stairs with a total rise of 30 inches (762 mm) or less.~~

Reason: Language related to risers is relocated from the section on "Profile" to the section on "Risers", which is more appropriate. This change is strictly cut and paste. The language on winder treads is made into its own subsection of Treads to enable the user of the code to more easily find that text. The purpose of this code change is to ease use of the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-RB-5-R311.7.4

RB47–09/10

R311.7.4.2, R311.7.4.2.1 (New), R311.7.4.2.2 (New)

Proponent: Jake Pauls, representing self

1. Revise as follows:

R311.7.4.2 Tread depth. The minimum tread depth shall be 10 inches (254 mm). The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's nosing ~~leading edge~~. ~~The greatest tread depth within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm). Consistently shaped winders at the walkline shall be allowed within the same flight of stairs as rectangular treads and do not have to be within 3/8 inch (9.5 mm) of the rectangular tread depth. Winder treads shall have a minimum tread depth of 10 inches (254 mm) measured between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline. Winder treads shall have a minimum tread depth of 6 inches (152 mm) at any point within the clear width of the stair. Within any flight of stairs, the largest winder tread depth at the walkline shall not exceed the smallest winder tread by more than 3/8 inch (9.5 mm).~~

2. Add new text as follows:

R311.7.4.2.1 Uniformity of rectangular tread depths. The greatest tread depth, measured horizontally between nosings of treads as specified in R311.7.4.2 and including the top tread, within each flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm).

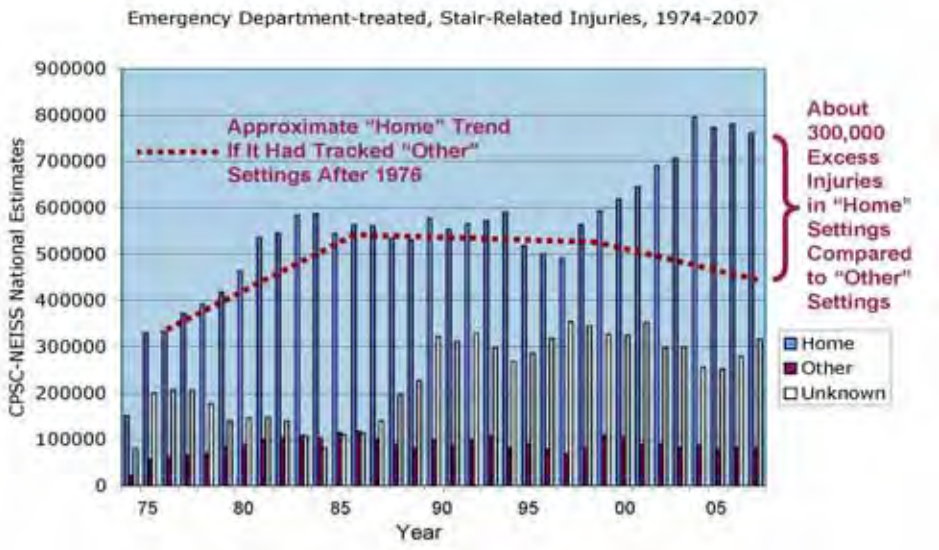
R311.7.4.2.2 Uniformity of winder treads. Consistently shaped winders at the walkline shall be allowed within the same flight of stairs as rectangular treads and do not have to be within 3/8 inch (9.5 mm) of the rectangular tread depth. Winder treads shall have a minimum tread depth of 10 inches (254 mm) measured between the vertical planes of the foremost projection of adjacent treads at the intersections with the walkline. Winder treads shall have a minimum tread depth of 6 inches (152 mm) at any point within the clear width of the stair. Within any flight of stairs, the largest winder tread depth at the walkline shall not exceed the smallest winder tread by more than 3/8 inch (9.5 mm).

Reason: There is no technical change to the requirement in this proposal. It is a clarification of intent by separating out and labeling the separate issues of tread depth and the uniformity of tread depths for rectangular and winder treads, the only two forms of tread addressed in the current code. This proposed change, along with another for R311.7.4.3, is intended to clear up what appears to be widespread confusion resulting in flawed design, inspection, and ICC training plus published guidance regarding the need for every step of a flight to have uniform tread depth (or run) dimensions, measured horizontally, nosing to nosing. (Note that the change also incorporates the change of term "leading edge of tread" to "nosing" as that term was defined in the last cycle and is the term used in R311.7.4.3.) For consistency and to utilize defined terms, "nosing" should be the standard term used here.

A far too common error in design and construction of stairways is the lack of attention to keeping all tread depths, especially the top one in a flight, uniform in size, particularly where projecting nosings are provided on a flight of stairs installed as a manufactured unit which does not include the top or landing nosing projection. ICC IRC guides for inspection and for the homebuilding industry (published by ICC in conjunction with NAHB) fail to even mention these important rules. These two ICC publications are listed in the Bibliography.

The resulting non-uniformities in tread depths, with a larger top tread followed by smaller treads in the flight make the stair flight orders of magnitude more dangerous for descent-direction users. This pervasive systemic defect has also become so concerning to leading stairway safety professionals such as myself that a special website page has been created simply to deal with this issue. See http://web.me.com/bldguse/Site/Stairways.html for information on this including the graph provided below as Figure 1 showing a large increase in the number of home stair-related injuries identified in the CPSC NEISS national estimates for the USA in the last several years. Excerpts of text from the Stairways website page are also quoted below as are excerpts from an American Society of Safety Engineers 2008 Professional Development Conference paper by Pauls and Harbuck. The full ASSE conference paper is freely accessible as a PDF download from the Downloads area of my website, http://web.me.com/bldguse/Site/Downloads.html. Generally, it is suspected that with recent greater use of manufactured stair flights, the incidence of systemic, top-of-flight non-uniformities has grown with resulting significant increases in home stair-related injuries.

Figure 1. Growth of Home Stair-related Injuries in USA in Recent Years.



On the Stairways website page, referenced above, is the following text and photograph (here identified as Figure 2) of a typical dwelling unit stairway with the systemic top-of-flight defect in tread depth non-uniformity. Below Figure 2 is an additional photograph, Figure 3, showing what a stair flight looks like it very likely conforms to the uniformity requirements but which should be properly measured, at least at the top three steps, to confirm that there is not a rare coincidence of both larger tread depth and larger rise dimensions at the top step. Here follows the text from the website which has been publicly available since May 2009.

"While more investigation is required, it appears that a major reason for the recent 'excess' injuries related to home stairs might be a systemic defect on many home stairways (as well as some in other settings) in the USA and Canada. This defect is a non-uniformity of the nosing projection at the top of stair flights; due to the omission of a $10 nosing piece, at the landing level, at the time of stairway construction. This makes the top tread below the landing effectively larger than all the steps below it.

This common defect greatly increases the risk of an 'overstepping misstep' on the second or third step down the flight. Such missteps can lead to a very serious fall down the stair flight, with resulting injuries.

This is why we should now give our stairways 'a second look.' Specifically we should perform the simple 'crouch and sight' test. Do this from the landing above the stair flight you wish to check. Crouch down so you are able to see all the stair nosings (the leading edges) line up. If the top, landing nosing does not line up with all the other step nosings, your stair likely has the systemic defect. Here is a home stairway with the systemic defect."

Figure 2. Typical Dwelling Unit Stairway with the Systemic, Top-of-Flight Defect.

The "Stairways" page of the website goes on to provide advice specifically for homeowners who perform the "crouch and sight" test and discover that their stairway has the systemic, top-of-flight defect.

"If your home stairway has this defect—which results from the non-uniformities of nosing projections and of what are called 'tread depth' or 'run' dimensions—and your home was recently constructed, call your local building inspection authorities and request that the stairway be re-inspected for building code compliance. Both the non-uniform nosing projection and the non-uniform tread depth or run are building code violations, for example under widely used codes in the USA.

If there has been a fall and significant injury on the non-uniform stair flight, you might also want to confer with an attorney (experienced in dealing with stair-related injury cases), especially if the home was recently constructed.

Much more information on this (and other) safety problems with stairways is found in the downloadable files associated with this website. See especially the latest papers and presentations by Jake Pauls on home stairways in the two most recently posted folders.

•Home Stairway Safety and Codes (Posted February 2009)

•Presentations at MUTN Conference in BC, Canada, April 2009

Also, in early summer 2009, watch this website for an announcement of the availability of an educational DVD package, based on the one-day workshop at the MUTN Conference in BC, Canada, in April 2009. (Contact Jake Pauls for purchase information.)"

Figure 3. Dwelling Unit Stair Very Likely Not Having the Systemic, Top-of-Flight Defect.

Any ICC chapter wishing to have their members participate in a one-day workshop (also slated for presentation in Eastern Canada on September 14, 2009) should contact Jake Pauls. It is available in a not-for-profit mode. Code authorities should be prepared to deal knowledgeably with consumers who, upon discovering the systemic defect in their homes (after performing their own "crouch-and-sight" test), contact their local building department and ask for a re-inspection of their home stairways. If there has been an injurious fall on such a stairway they should also be prepared to deal with resulting legal actions that might name the local building department as a third party defendant. They should know how to perform the measurements of the stair step geometry that are of a quality expected in such litigation actions. These measurement techniques,

usually requiring use of a spirit level or electronic level, are all described in the workshop materials posted on the above-mentioned website Downloads area and on the DVD of the Spring 2009 workshop noted above. These measurement techniques are consistent with the ICC requirements both as currently stated and as further clarified if this proposal is accepted.

In order to begin stopping all future misinterpretations of the IRC requirements for tread depth uniformity, it is hoped that all code enforcement authorities heed very carefully the current and clarified requirements of R311.7.4.2 as well as of R311.7.4.3.

Bibliography

- ICC (2007). Residential Inspector's Guide Based on the 2006 IRC, Chapters 1-11. International Code Council, Washington, DC., ISBN 978-1-58001-568-4.
- ICC and NAHB. Home Builders' Jobsite Codes: a Pocket Guide to the 2006 International Residential Code. International Code Council, Washington, DC and National Association of Home Builders, Washington, DC.
- Pauls, J. and Harbuck, S. (2008). Ergonomics-based Methods of Inspecting, Assessing and Documenting Environmental Sites of Injurious Falls Resulting from Missteps on Small Elevation Differences, Slopes and Steps. *Proceedings of the American Society of Safety Engineers Professional Development Conference & Exposition*, Las Vegas, NV, 2008. (Downloadable as file, "Pauls-Harbuck-ASSE-paper.pdf," from folder, "Home Stairway Safety and Codes," accessible from the Downloads area of http://web.me.com/bldguse/Site/Downloads.html.)

Cost Impact: The code change proposal will not increase the cost of construction. (The nosing piece required to comply with both the current code and the code as amended by this proposal costs about $10 per flight in terms of material, in oak, at retail level.)

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PAULS-RB1-311.7.4.2

RB48–09/10

R311.7.3 (New), R311.7.5

Proponent: David W. Cooper, Stair Manufacturing and Design Consultants, representing the Stairway Manufacturers'

1. Add new text as follows:

R311.7.3 Vertical rise. A flight of stairs shall not have a vertical rise larger than 12 feet (3658 mm) between floor levels or landings.

2. Revise as follows:

R311.7.5 Landings for stairways. There shall be a floor or landing at the top and bottom of each stairway. The minimum width perpendicular to the direction of travel shall be no less than the width of the flight served. The edges of landings may be curved or segmented. Landings used to turn the direction of travel less than 90 degrees but no less than 60 degrees shall not be considered winder treads provided the depth at the walk line is no less than 18 inches and the minimum depth is no less than 6 inches (152 mm). Where the stairway has a straight run the minimum depth in the direction of travel need not exceed 36 inches (914 mm).

Exception: A floor or landing is not required at the top of an interior flight of stairs, including stairs in an enclosed garage, provided a door does not swing over the stairs. ~~A flight of stairs shall not have a vertical rise larger than 12 feet (3658 mm) between floor levels or landings. The width of each landing shall not be less than the width of the stairway served. Every landing shall have a minimum dimension of 36 inches (914 mm) measured in the direction of travel.~~

Reason: There are certain attributes of landings that are intended to be or need to be regulated by the code but this section currently needs improvements to consistently determine the allowed dimensions or shape of landings. The common interpretations currently referenced in the commentary have been used to develop this proposal. Further the fractured arrangement of text following the exception is eliminated and prevents confusion of requirement and exception.

1. The **Vertical rise** section being added is actually relocated without change from below the exception in **R311.7.5**. The name and text is technically consistent with the IBC. The information in this section is needed to calculate the number of risers between levels, the riser height, and the tread depth of each flight or stair in a stairway. For this reason, if such a requirement is needed, it should be included with the essential elementary sections that precede the tread and riser sections to assure understanding and compliance.
2. The revision adds text to **R311.7.5** that clarifies what dimension is actually the width or widths of the landing. By stating that width is perpendicular to the direction of travel the shape of landings and the intent to allow curved and segmented corners as stated in the commentary is covered. The required sizes are not changed and remain the same.
3. Differentiation between angular shaped landings and winder treads is also needed and provided by the additional text. The text defines the minimum size that is comparable and slightly exceeds the minimum distance of travel the user experiences on the most common 90-degree landing. Please see figures 1, 2, and 3 attached. It is easy to see that the shape of the landing can be inconsequential to its width and its use in the stairway provided the minimum criteria suggested here are achieved. The clear differentiation between landings and winders stated here is important because landings separate flights and winders do not. Stair components regulated "within a flight" such as handrails, riser height, tread depth, dimensional uniformity, etc. are all dependent upon a determination that currently requires better description for consistent understanding.

R311.5.7 Stairway Landings

Figures 1,2, & 3 below illustrate the minimum dimensions proposed of a stairway landing that turns less than 90 degrees.
Note: The outside of each landing is shown with both segmented and curved options that would clarified if the minimum width of the landing described as "measured perpendicular to the line of travel" by this proposal is clarified.

Figure 1:
Proposed 60 degree minimum Landing. The critical area inside of the walk line is shaded.

Figure 2:
Convetional 90 degree Landing. The total area inside of the walk line is shaded

Figure 3:
The 60 and 90 degree landings are shown superimposed . The total area inside of the walk line of the 60 degree winder is clearly comparable to that of conventional landings when the suggested minimum dimensions are applied.

4. The needed exception remains in tact without change.
5. Please note all the text deleted following the exception has been incorporated within **R311.7.5** or relocated under **Vertical rise** as stated above.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COOPER-RB-3-R311.7.3-R311.7.5

RB49–09/10
R311.7.7.1

Proponent: David W. Cooper, Stair Manufacturing and Design Consultants, representing the Stairway Manufacturers'

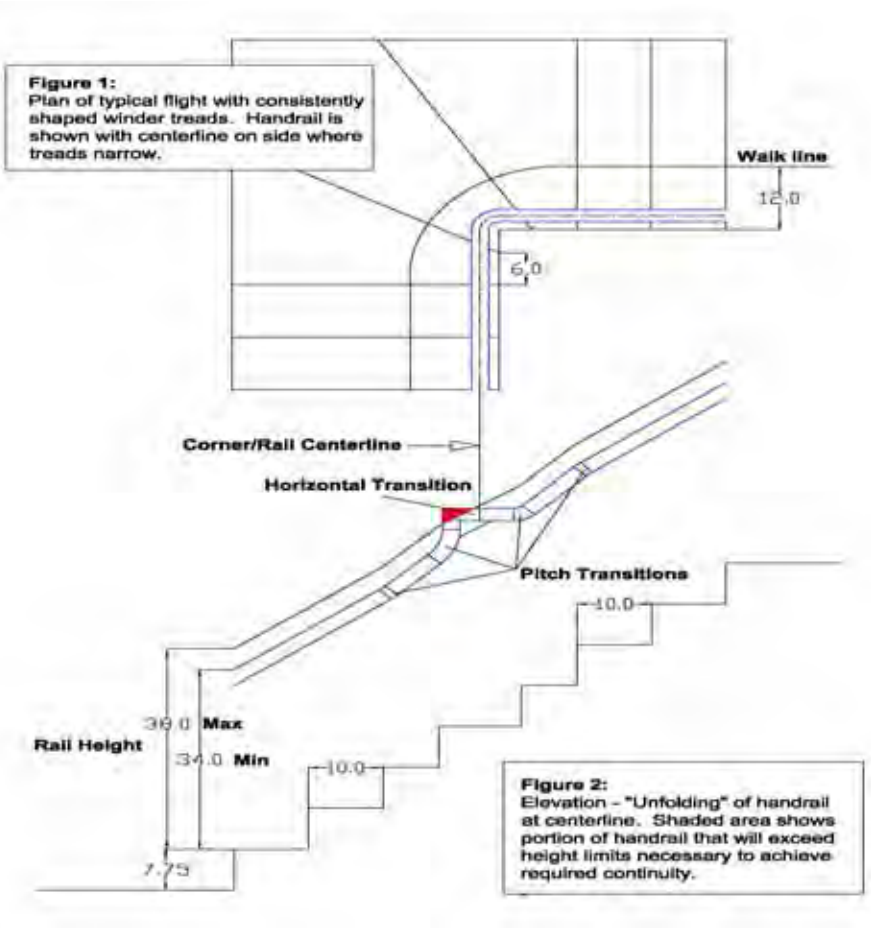
Revise as follows:

R311.7.7.1 Height. Handrail height, measured vertically from the sloped plane adjoining the tread nosing, or finish surface of ramp slope, shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm).

Exceptions:

1. The use of a volute, turnout, or starting easing shall be allowed over the lowest tread.
2. When handrail fittings or bendings are used to provide continuous transition between flights, transitions at winder treads, the transition from handrail to guardrail, or used at the start of a flight, the handrail height at the fittings or bendings shall be permitted to exceed the maximum height.

Reason: Winder treads do not separate flights and the handrail transitions that must occur above them are not considered included by the text of this exception. As the original proponent of this exception adopted in 2007 this was an oversight. When using readily available fittings and bendings to provide continuity of the handrail above winder treads, especially at the side of the stair where the treads are narrower the height of the handrail may exceed the limits of 34 to 38 inches. The radical changes of angle in the short distances are best understood by studying this condition in elevation. Figure 1 shows a typical stairway plan and Figure 2 illustrates the unfolding of the elevation of the handrail and stair geometry. This additional condition should be included as it is of the same nature as those conditions already recognized and cited in the exception.



Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: COOPER-RB-2-R311.7.7.1

RB50–09/10
R311.9 (New)

Proponent: Katherine Bang, City of Portland, OR, representing the City of Portland and Bureau of Development Services

Add new text as follows:

311.9 Exit Discharge. When walkways connecting the required exit door with the public right of way are less than 10 feet from the building and travel in front of other dwelling units or garages, the exterior walls shall have not less than 1-hour fire resistive construction for a distance of 10 feet above grade and openings shall be protected with 45 minute assemblies.

Exceptions:

1. Fully sprinklered buildings.
2. Exterior walkways allowing travel in two directions to either the public right of way or an area of refuge no less than 50 fifty feet from all buildings on the property.

Reason: Townhouses have become more common in recent years and in some instances the townhouses are oriented such that the exterior exit door faces an interior property line. The occupants are required to travel past other dwelling units to reach the public right of way. Since the residential code allows unprotected walls and openings within 3 feet of the property line, the path of exit discharge can be easily compromised. The residential code is silent about the path of exit discharge. This is becoming a fire and life safety concern with the code now allowing multiple dwelling units on the lot.

Cost Impact: There is potential cost impact from the proposed amendment.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BANG-RB-1-R311.9

RB51–09/10
R312.1, R312.2

Proponent: Rick Davidson, City of Maple Grove, MN

Revise as follows:

R312.1 Where required. Guards shall be located along ~~open-sided walking surfaces, including~~ open sides of decks, porches, balconies, raised floor surfaces, stairs, ramps and landings~~,~~ that are located more than 30 inches ~~measured vertically to~~ above the floor or grade below ~~at any point within 36 inches (914 mm) horizontally to the edge of the open side. Insect screening shall not be considered as a guard.~~

Guards shall be provided on porches, balconies, and decks enclosed with insect screening when the porch, balcony, or deck floor is located more than 30 inches (762 mm) above the floor or grade below.

R312.2 Height. Required guards ~~at open-sided walking surfaces, including stairs, porches, balconies or landings,~~ shall be not less than 36 inches (914 mm) high ~~measured vertically above the adjacent walking surface, adjacent fixed seating or the line connecting the leading edges of the treads~~.

Exceptions:

1. Guards on the open sides of stairs shall have a height not less than 34 inches (864 mm) measured vertically from a line connecting the leading edges of the treads.
2. Where the top of the guard also serves as a handrail on the open sides of stairs, the top of the guard shall not be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) measured vertically from a line connecting the leading edges of the treads.

Reason: The current language referencing "open sided walking surfaces" is vague, undefined and unenforceable. It isn't clear if this means ***any*** surface upon which someone could walk, defined walking surfaces, or only those surfaces that are part of a dwelling. One could interpret a driveway adjacent a stepped lot line being a regulated "open sided walking surface" and require a guard along its entire length. One could interpret the upper surface of a retaining wall as a walking surface requiring a guard. If a yard is a walking surface, one could interpret egress window wells as needing a guard. Is this what is intended? Conceivably we could have guards crisscrossing residential lots in willy nilly fashion whenever we have elevation changes. If a retaining wall exists on my neighbors property and there is a 3 foot drop from the top of this wall to the grade below and my driveway or my sidewalk is within 36 inches of this retaining wall, is a guard required even if the elevation change does not occur on my property? It would seem so! The code requires that I measure up to 36 inches away from the walking surface. Then, is it his responsibility to install the guard or is it mine? His lot creates the perceived hazard, not mine. If I install the guard on my property, there is still space on the other side of the guard to walk. Is the neighbor also required to install a guard? If my deck is 24 inches above grade below and 2 feet from my lot line and my neighbor has a 16 inch high retaining wall adjacent the lot line, does my deck require a guard? Is it me that creates the hazard or is it my neighbor? Who is responsible for the guard?

The new language addressing insect screening changes the original intent of these terms. When the code states that insect screening shall not be considered a guard, is it implying that windows must have fall protection and that screening does not constitute a guard? One must ask not just how a building official might interpret this language but how might a jury interpret this language if faced with a fall from a window that had only window screening. Might they conclude the code required additional protection?

Last, the code requires that guard height be measured from "adjacent fixed seating". How far must a fixed seat be from the edge of the surface in question before it isn't considered "adjacent"? Must it be in contact with the guard? If I say my house is adjacent to the park, do I mean my house is on the immediate border of the park or some short distance away? And, if I have a fixed seat next to the edge of a walking surface, is it an open walking surface that would require a guard or not? I can no longer walk on the surface near the elevation change.

This is a horribly worded code section that cannot be understood by the public and cannot be easily interpreted by the building official. The language is vague, ambiguous, and confusing. That is the worst kind of language to try to enforce.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-RB-7-R312.1

RB52–09/10
R312.3

Proponent: Tiffani Kerlik, Louisville, NE, representing self

Revise as follows:

R312.3 Opening limitations. Required *guards* shall not have openings from the walking surface to the required *guard* height which allow passage of a sphere ~~4 inches~~ 2 ½ inches (102 mm) in diameter.

Exceptions:

1. The triangular openings at the open side of a stair, formed by the riser, tread and bottom rail of a *guard*, shall not allow passage of a sphere ~~6 inches~~ 4 inches (153 mm) in diameter.
2. *Guards* on the open sides of stairs shall not have openings which allow passage of a sphere ~~4 3/8 inches~~ 2 ½ inches (111 mm) in diameter.

Reason: The current code is set at a maximum of 4 inches, this allows for small children to squeeze through, which could result in death, death by hanging, or serious injury of a small child. The code for crib rail spacing should be the model and should supersede any cost savings, aesthetically pleasing excuses to keep the unsafe spacing of 4 inches.


11/04/2007


11/04/2007

Cost Impact: The cost of balusters and spindle product costs and installation will increase and could double the original cost prior to this change.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Kerlik-RB-1-R312.3

RB53–09/10
R313.1, R302.2, R302.2.4

Proponent: Rick Davidson, City of Maple Grove, MN

Revise as follows:

R313.1 Townhouse automatic fire sprinkler systems. An automatic residential fire sprinkler system shall be installed in *townhouses*.

Exceptions:

1. Townhouse groups containing six or fewer dwelling units and that are not more than two stories in height above grade plane.
2. An automatic residential fire sprinkler system shall not be required when *additions* or *alterations* are made to existing *townhouses* that do not have an automatic residential fire sprinkler system installed.

R302.2 Townhouses. Each *townhouse* shall be considered a separate building and shall be separated by fire-resistance-rated wall assemblies meeting the requirements of Section R302.1 for exterior walls.

Exception: A common ~~1-hour~~ 2-hour fire-resistance-rated wall assembly tested in accordance with ASTM E 119 or UL 263 is permitted for townhouses if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations shall be installed in accordance with Chapters 34 through 43. Penetrations of electrical outlet boxes shall be in accordance with Section R302.4.

R302.2.4 Structural independence. Each individual *townhouse* shall be structurally independent.

Exceptions:

1. Foundations supporting *exterior walls* or common walls.
2. Structural roof and wall sheathing from each unit may fasten to the common wall framing.
3. Nonstructural wall and roof coverings.
4. Flashing at termination of roof covering over common wall.
5. *Townhouses* separated by a common ~~1-hour~~ 2-hour fire-resistance-rated wall as provided in Section R302.2.

Reason: This proposal accomplishes two things. First, it interjects some reason into requirements for sprinkler systems for small townhouse developments. Small townhouse developments are common in smaller communities for elderly or low income housing. These communities often have limited water supplies available and the cost of sprinkler systems creates an economic hardship. By allowing unsprinklered townhouse groups with no more than six dwelling units and not more than two stories in height, some affordability will be reintroduced to the code. Townhouses have passive fire protection between each unit and do not have a history of unsatisfactory fire performance.

The second part of this code change eliminates the ability to use a 1 hour rated wall in townhouses with fire sprinklers. Townhouses are permitted to have separate water services for each dwelling unit. The recent mortgage crises has resulted in scattered townhouse units being foreclosed and water services in these dwelling units shut off by the water utility both for nonpayment and because the dwelling units are not heated, again possibly for non-payment. This is done without the knowledge of the local building departments and even if the building departments knew of the utility shut offs; they are powerless to require a utility to provide service to a nonpaying customer. This results in occupied townhouses separated from non-occupied townhouses that have no sprinkler protection and only a 1-hour fire wall between them. Unoccupied dwellings are presumed to have a higher fire risk due to the potential for arson or vandalism and allowing the reduction in passive fire protection is inappropriate, dangerous, and short sited.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-RB-9-R313.1

RB54–09/10
R313.1, R313.2, R313.2.1

Proponent: Steven Orlowski, National Association of Home Builders (NAHB)

Revise as follows:

R313.1 Townhouse automatic fire sprinkler systems. When provided, ~~A~~ an automatic residential fire sprinkler system shall be installed in townhouses in accordance with section R313.1.1.

Exception: An automatic residential fire sprinkler system shall not be required when additions, ~~or~~ alterations, or repairs are made to existing townhouses that do not have an automatic residential fire sprinkler system installed.

R313.2 One- and two-family dwellings automatic fire sprinkler systems. ~~Effective January 1, 2011,~~ When provided, an automatic residential fire sprinkler system shall be installed in one- and two-family dwellings in accordance with Section R313.2.1.

Exception: An automatic residential fire sprinkler system shall not be required for additions, ~~or~~ alterations, or repairs to existing buildings that are not already provided with an automatic residential fire sprinkler system.

Reason: The purpose of this proposal is to delete the reference of the mandatory requirement of residential sprinkler systems in all one- and two-family dwellings and townhouses and replace with language that explains the proper installation design and requirements of the system when it is provided. This change will provide the homeowner with the continued ability to choose whether or not a residential fire sprinkler system is appropriate for their situation.

NAHB strongly disagrees with the fire services perception of America's fire problem and the proposed solution to reduce the number of fire fatalities that occur each year. According to NFPA reports, the occupants chances of surviving a residential house fire without any life safety devices such as smoke alarms or sprinklers is 98.87%. By installing smoke alarms and insuring they are in operating condition, the chances of surviving a residential fire is increased to 99.45%. NFPA estimates that an additional 890 lives could be saved each year if smoke alarms were maintained in working condition.

In 1977, less than 0.008% of the housing market was affected by structure fires. In 2005, that number was reduced to less than 0.002%. Over the past three decades, there has a substantial decrease in the number of residential structure fires in relation to the growth of American housing. No one can predict when or where a fire will occur, but to require every home to be equipped with a residential sprinkler system based on the figures below is not cost-effective.

Consideration as to whether the requirement for fire sprinklers in dwellings be mandatory should remain a local issue. The sole purpose of an Appendix P in the 2006 International Code was to provide local jurisdictions with the means to adopt a code or standard that is applicable to their community. Not every jurisdiction agrees that radon resistant construction, patio coverings, and safety inspections of existing appliances need to be regulated or inspected . Contrary to the belief of some activists, several jurisdictions have decided that Appendix P (the provisions for residential sprinkler systems) is not applicable to their state or local jurisdictions. Of the 47 states that have adopted the International Residential Code, none have adopted the 2006 IRC with the inclusion of Appendix P. During the adoption process in six states, there was a proposal put forth to include appendix P in the formal adoption of the 2006 IRC and the proposal was voted down every time.

According to the U.S. fire administration more than half states in America are below the national fire death rate of 13.6 per million and over the past ten years the number of one- and two- family dwelling fires, deaths and injuries have fallen (6%, 18% and 26% respectively).

While the fire service and sprinkler advocates acknowledge that the median age of a home is 32 years, the connection between fire deaths and the age of the home is elusive. For several years data has been collected for several relevant facts about fires. The cause of the fire, whether smoke alarms were present and were working, type of smoke alarm present, whether the fire was confined and did not activate the sprinkler system.

While there have been no studies conducted to investigate whether fire fatalities are less likely to occur in newer homes, there is supporting evidence of this in reports issued by NFPA regarding the performance of smoke alarms. According to these reports, there is a significant difference in the number of fatalities and the number of fires when the smoke alarm present. This includes information regarding smoke alarms that were either battery operated, hardwired with battery backup or hardwired. According to April 2007 Report "U.S. Experience with Smoke Alarms and other Fire Detection/Alarm Equipment" by Marty Ahrens, 65% of the reported residential home fire deaths occurred in homes where there was no smoke alarm present (43%) or did not operate (22%). Of the 35% fire fatalities that occurred when a smoke alarm was present and operated, it was reported that two-thirds of the non-confined home structure fires occurred in dwellings with battery operated smoke alarms with the remaining third evenly divided between homes with hardwired and hardwired with battery backup.

Source	Code Cycle Required	# of Fires	# of Fatalities	# of Injuries	Property Damage in Millions
Battery only	Before 1982	88,300	1,230	5,850	$2,353
Hardwired Only	1982-1992	19,900	170	1,300	$743
Hardwire/Battery	1992- Present	18,000	210	1,490	$568

Reference: April 2007 Report "U.S. Experience with Smoke Alarms and other Fire Detection/Alarm Equipment" by Marty Ahrens

From this information we can see that as the requirements for smoke alarms have evolved, as well as other improvements in the methods used for passive fire protection construction, there are fewer fires and fewer fire fatalities in homes that are equipped with smoke alarms. Along with improvements to the power source, the *National Fire Alarm Code* has also increased the number of required smoke alarms in a one- and two- family dwelling over the years. In 1992 it required that all smoke alarms be interconnected. When you consider the advances made in the requirements of smoke alarms and look at the results in reducing the number of fire fatalities, the solution is educating the public about the importance of working smoke alarms and practicing proper fire prevention.

The most cost-effective means of reducing the loss life is through increasing the public's awareness on the use and maintenance of smoke alarms. According to NFPA reports an estimated 890 live could be saved annually if existing homes were equipped with working smoke alarms. 65% of the reported fire fatalities from 2000-2004 occurred in homes were smoke alarms were either not present or were present but failed to operate. CPSC surveys have shown that while 88% of the households screened had at least one smoke alarm, 72% of these smoke alarms were battery powered only.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ORLOWSKI-RB-1-R313

RB55–09/10
R313.1.1

Proponent: Phillip A. Brown, American Fire Sprinkler Association

Revise as follows:

R313.1.1 Design and installation. Automatic residential fire sprinkler systems for *townhouses* shall be designed and installed in accordance with Section P2904 or NFPA 13D.

Reason: This adds the same requirement to this section as that found in Section P2904.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BROWN-RB-1-R313.1.1

RB56–09/10
R313, R313.1, R313.1.1, R313.2, R313.2.1, Appendix P (New)

Proponent: Steven Orlowski, National Association of Home Builders (NAHB)

1. Delete without substitution:

~~**SECTION R313**~~
~~**AUTOMATIC FIRE SPRINKLER SYSTEMS**~~

~~**R313.1 Townhouse automatic fire sprinkler systems.** An automatic residential fire sprinkler system shall be installed in *townhouses*.~~

~~**Exception:** An automatic residential fire sprinkler system shall not be required when *additions* or *alterations* are made to existing *townhouses* that do not have an automatic residential fire sprinkler system installed.~~

~~**R313.1.1 Design and installation.** Automatic residential fire sprinkler systems for *townhouses* shall be designed and installed in accordance with Section P2904.~~

~~**R313.2 One- and two-family dwellings automatic fire systems.** Effective January 1, 2011, an automatic residential fire sprinkler system shall be installed in one- and two- family *dwellings*.~~

~~**Exception:** An automatic residential fire sprinkler system shall not be required for *additions* or *alterations* to existing buildings that are not already provided with an automatic residential sprinkler system.~~

~~**R313.2.1 Design and installation.** Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section P2904 or NFPA 13D.~~

2. Add new text as follows:

APPENDIX P
AUTOMATIC FIRE SPRINKLER SYSTEMS

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

AP101 Fire sprinklers. An approved automatic fire sprinkler system shall be installed in new one- and two-family dwellings and townhouses in accordance with Section P2904 of the *International Residential Code* or Section 903.3.1 of the *International Building Code*.

Reason: The purpose of this proposal is to delete the reference of the mandatory requirement of residential sprinkler systems in all one- and two-family dwellings and townhouses and reinstate the provisional requirements of mandatory sprinklers into an adoptable Appendix P. Based on the large amount of negative response to the events in Minneapolis, NAHB is seeking to re-establish the adoptable language of Appendix P from the 2006 *International Residential Code* to allow each city, county, and state to determine for themselves whether residential sprinklers should be required. This proposed change will eliminate the need for jurisdictions amend the code and continue to provide communities with the ability to adopt a residential fire sprinkler ordinance when it is appropriate for their community.

NAHB strongly disagrees with the fire services perception of America's fire problem and the proposed solution to reduce the number of fire fatalities that occur each year. According to NFPA reports, the occupants chances of surviving a residential house fire without any life safety devices such as smoke alarms or sprinklers is 98.87%. By installing smoke alarms and insuring they are in operating condition, the chances of surviving a residential fire is increased to 99.45%. NFPA estimates that an additional 890 lives could be saved each year if smoke alarms were maintained in working condition.

In 1977, less than 0.008% of the housing market was affected by structure fires. In 2005, that number was reduced to less than 0.002%. Over the past three decades, there has a substantial decrease in the number of residential structure fires in relation to the growth of American housing. No one can predict when or where a fire will occur, but to require every home to be equipped with a residential sprinkler system based on the figures below is not cost-effective.

Consideration as to whether the requirement for fire sprinklers in dwellings be mandatory should remain a local issue. The sole purpose of an Appendix P in the 2006 International Code was to provide local jurisdictions with the means to adopt a code or standard that is applicable to their community. Not every jurisdiction agrees that radon resistant construction, patio coverings, and safety inspections of existing appliances need to be regulated or inspected . Contrary to the belief of some activists, several jurisdictions have decided that Appendix P (the provisions for residential sprinkler systems) is not applicable to their state or local jurisdictions. Of the 47 states that have adopted the International Residential Code, none have adopted the 2006 IRC with the inclusion of Appendix P. During the adoption process in six states, there was a proposal put forth to include appendix P in the formal adoption of the 2006 IRC and the proposal was voted down every time.

According to the U.S. fire administration more than half states in America are below the national fire death rate of 13.6 per million and over the past ten years the number of one- and two- family dwelling fires, deaths and injuries have fallen (6%, 18% and 26% respectively).

While the fire service and sprinkler advocates acknowledge that the median age of a home is 32 years, the connection between fire deaths and the age of the home is elusive. For several years data has been collected for several relevant facts about fires. The cause of the fire, whether smoke alarms were present and were working, type of smoke alarm present, whether the fire was confined and did not activate the sprinkler system.

While there have been no studies conducted to investigate whether fire fatalities are less likely to occur in newer homes, there is supporting evidence of this in reports issued by NFPA regarding the performance of smoke alarms. According to these reports, there is a significant difference in the number of fatalities and the number of fires when the smoke alarm present. This includes information regarding smoke alarms that were either battery operated, hardwired with battery backup or hardwired. According to April 2007 Report "U.S. Experience with Smoke Alarms and other Fire Detection/Alarm Equipment" by Marty Ahrens, 65% of the reported residential home fire deaths occurred in homes where there was no smoke alarm present (43%) or did not operate (22%). Of the 35% fire fatalities that occurred when a smoke alarm was present and operated, it was reported that two-thirds of the non-confined home structure fires occurred in dwellings with battery operated smoke alarms with the remaining third evenly divided between homes with hardwired and hardwired with battery backup.

Source	Code Cycle Required	# of Fires	# of Fatalities	# of Injuries	Property Damage in Millions
Battery only	Before 1982	88,300	1,230	5,850	$2,353
Hardwired Only	1982-1992	19,900	170	1,300	$743
Hardwire/Battery	1992- Present	18,000	210	1,490	$568

Reference: April 2007 Report "U.S. Experience with Smoke Alarms and other Fire Detection/Alarm Equipment" by Marty Ahrens

From this information we can see that as the requirements for smoke alarms have evolved, as well as other improvements in the methods used for passive fire protection construction, there are fewer fires and fewer fire fatalities in homes that are equipped with smoke alarms. Along with improvements to the power source, the *National Fire Alarm Code* has also increased the number of required smoke alarms in a one- and two- family dwelling over the years. In 1992 it required that all smoke alarms be interconnected. When you consider the advances made in the requirements of smoke alarms and look at the results in reducing the number of fire fatalities, the solution is educating the public about the importance of working smoke alarms and practicing proper fire prevention.

The most cost-effective means of reducing the loss life is through increasing the public's awareness on the use and maintenance of smoke alarms. According to NFPA reports an estimated 890 live could be saved annually if existing homes were equipped with working smoke alarms. 65% of the reported fire fatalities from 2000-2004 occurred in homes were smoke alarms were either not present or were present but failed to operate. CPSC surveys have shown that while 88% of the households screened had at least one smoke alarm, 72% of these smoke alarms were battery powered only.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: ORLOWSKI-RB-2-R313

RB57–09/10

R313, R313.1, R313.1.1, R313.3.2, R313.2.1

Proponent: Rick Davidson, City of Maple Grove, MN

Delete without substitution:

~~SECTION R313~~
~~AUTOMATIC FIRE SPRINKLER SYSTEMS~~

~~R313.1 Townhouse automatic fire sprinkler systems.~~ ~~An automatic residential fire sprinkler system shall be installed in *townhouses*.~~

~~Exception:~~ ~~An automatic residential fire sprinkler system shall not be required when *additions* or *alterations* are made to existing *townhouses* that do not have an automatic residential fire sprinkler system installed.~~

~~R313.1.1 Design and installation.~~ ~~Automatic residential fire sprinkler systems for *townhouses* shall be designed and installed in accordance with Section P2904.~~

~~R313.2 One- and two-family dwellings automatic fire systems.~~ ~~Effective January 1, 2011, an automatic residential fire sprinkler system shall be installed in one- and two- family *dwellings*.~~

~~Exception:~~ ~~An automatic residential fire sprinkler system shall not be required for *additions* or *alterations* to existing buildings that are not already provided with an automatic residential sprinkler system.~~

~~R313.2.1 Design and installation.~~ ~~Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section P2904 or NFPA 13D.~~

Reason: In the run-up to the vote on residential sprinklers in Minneapolis, the reason statements published in the monographs were repeated over and over.

You heard that sprinkler systems won't freeze in cold climates (unfortunately that does happen); that there won't be any increase in water tap fees; that sprinklers add only a few hundred dollars to the cost of a home; that the public feels sprinklered homes are desirable; that more people die in older homes because there are more of them; that a shocking 45% of firefighter deaths occur on the fire ground at residential occupancies, almost always 1- and 2-family dwellings; that smoke alarms aren't reliable enough as they age to protect a home; that homes without a public water supply can always involve design changes to accommodate sprinklers; that use of fire hydrants, not residential sprinkler systems are the cause of some water contamination; that putting the rules in place will drive down the cost of sprinkler systems; that sprinkler systems are maintenance free; that there are plenty of trained installers and inspectors to install and monitor sprinkler systems; that sprinkler systems won't leak; and that moving sprinkler requirements from the appendix to the body of the code is necessary because municipalities aren't adopting the appendix chapter quickly enough. You also heard general statements that sprinkler systems save lives, that the annual loss of lives to fire is a catastrophe, and on and on…

Unfortunately, most of those arguments are speculative, based on anecdotal evidence, or downright false.

You heard "If sprinklers were installed in all new homes constructed in the US, the fire death rate would decrease by 50%". But there are no statistics to project how many lives could be saved in residential dwellings if sprinklers are required. Without some type of analysis, it seems the solution is to throw a bunch of the public's money at the problem, if there is one, and hope that it helps. If the fire death rate were to drop only 2% as a result of these expensive systems, is the solution cost effective in a minimum standard code?

You didn't hear why, if smoke alarms aren't as effective as they age or when they are disabled, the same wouldn't occur with sprinkler systems. And you didn't hear why the fire service doesn't engage in a nationwide effort to have operating smoke alarms in every home in the country. That could be accomplished for a fraction of the cost of installing residential sprinklers and have an immediate impact on fire deaths because there are numerous studies on the number of fire deaths that have occurred when smoke alarms were not present or failed to operate because of dead batteries or age.

You didn't hear projections that if sprinkler systems were installed in all new homes that the number of fires in residences would decline by any specific amount. Again, if there are no studies to support the effectiveness of a solution, isn't there a significant risk that the solution may not work and the money wasted? Doesn't the argument ignore the fact that homes built today are inherently more fire resistant than the homes built 50 years ago? According to the US Fire Administration, the number of fire deaths in residential structures in the US has dropped from 3250 in 1998 to 2895 in 2007, about an 11% reduction, this with an increasing population. Something right must be happening if the numbers are dropping so significantly when the population is on the rise.

You didn't hear how many firefighter lives would be saved if all new residential dwellings were sprinklered. By the way, the statement given by sprinkler proponents that 45% of fire fighter deaths occur at residential occupancies seems to be a gross error. The US Fire Administration has published the document "Firefighter Fatalities in the United States in 2005". The following is from that study:

> *"For the purposes of this study, the term "firefighter" covers all members of organized fire departments in all States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, the Commonwealth of the Northern Mariana Islands, and Guam. It includes career and volunteer firefighters; full-time public safety officers acting as firefighters; State, territory, and Federal Government fire service personnel, including wildland firefighters; and privately employed firefighters, including employees of contract fire departments and trained members of industrial fire brigades, whether full-or part-time. It also includes contract personnel working as firefighters or assigned to work in direct support of fire service organizations.*
>
> *Under this definition, the study includes not only local and municipal firefighters, but also seasonal and full-time employees of the U.S. Forest Service, the Bureau of Land Management, the Bureau of Indian Affairs, the Bureau of Fish and Wildlife, the National Park Service, and State wildland agencies. The definition also includes prison inmates serving on firefighting crews; firefighters employed by other governmental agencies, such as the U.S. Department of Energy; military personnel performing assigned fire suppression activities; and civilian firefighters working at military installations."*

An "on-duty death" is explained as:

> *"The term "on-duty" refers to being involved in operations at the scene of an emergency, whether it is a fire or nonfire incident; responding to or returning from an incident; performing other officially assigned duties such as training, maintenance, public education, inspection, investigations, court testimony, or fundraising; and being on call, under orders, or on standby duty, except at the individual's home or place of business. An individual who experiences a heart attack or other fatal injury at home as he or she prepares to respond to an emergency is considered on duty when the response begins. A firefighter who becomes ill while performing fire department duties and suffers a heart attack shortly after arriving home or at another location may be considered on duty, since the inception of the heart attack occurred while the firefighter was on duty."*

Given these explanations, the study goes on to state that 115 fire fighters died while on-duty in 2005. The following table breaks down the types of duty engaged in that caused the death. It is clear to see that 45% of the fire fighter deaths did not occur on the residential fire ground as was stated by sprinkler proponents.

Table 5. Firefighter Deaths by Type of Duty (2005)

Type of Duty	Number of Deaths
Fireground Operations	27
Responding/Returning	23
Other On Duty	24
Training	14
Nonfire Emergencies	6
After an Incident	21
Total	**115**

The study states that 27 of the 115 fire fighters deaths occurred during fire ground activities. Following is a description of each incident:

Fireground Operations
Twenty-seven firefighters died while engaged in activities at the scene of a fire in 2005:

- *Two New York City Fire Department firefighters were killed when they were trapped by fire progress in an occupied multiple dwelling. Firefighters were forced to make a five-story jump when their escape routes were cut off.*
- *Two Wyoming firefighters were killed when they were overcome by fire progress in a residential fire. The fire emerged from concealed spaces and extended rapidly.*
- *Thirteen firefighters suffered heart attacks at fire scenes in 2005:*
  - *Three of the heart attacks occurred at wildland fires.*
  - *Eight firefighters suffered heart attacks at fires in residential occupancies. Two of these fires had suspicious or arson-related causes.*
  - *A Delaware firefighter suffered a heart attack at an alarm activation incident.*
  - *An Arkansas firefighter suffered a heart attack at the scene of a car fire.*
- *Two firefighters were electrocuted at fire scenes in 2005:*
  - *A California firefighter was electrocuted when he came into contact with an energized wire at a residential structure fire.*
  - *A Kansas firefighter was killed after he called to report a wildland fire resulting from a lightning strike at his home. The firefighter went outside to investigate, contacted a live power line, and was fatally electrocuted.*
- *Two firefighters were killed when rapid changes in fire conditions trapped them. Both fires occurred in residential occupancies, one in New York and the other in Michigan.*
- *A Virginia firefighter was burned fatally as he fought a wildland fire. His body was discovered the next day, after he failed to return from his efforts.*
- *A Kentucky firefighter was killed when the fire apparatus he had driven rolled forward and crushed him at the scene of a residential structure fire.*
- *A North Carolina firefighter was killed when a fire-damaged tree limb crushed him as firefighters attempted to extinguish a fire in the tree.*
- *A Missouri firefighter became entangled in a man lift and was killed during a fire in a mill.*
- *A Texas firefighter was killed while advancing a hoseline in an abandoned residential structure. The roof of an addition collapsed under fire conditions and trapped the firefighter.*
- *A New York firefighter collapsed and died of a CVA that struck as he arrived on the scene of a working residential structure fire.*

Tragically, firefighter deaths occur. But 45% of the firefighter deaths do not occur at residential fires as the above statistics indicate. The statement is just plain false.

The reliability of sprinkler systems was argued to be superior and necessary because of the failure of smoke alarms. But the National Fire Protection Association published a report in June 2007 entitled *"U.S. EXPERIENCE WITH SPRINKLERS AND OTHER AUTOMATIC FIRE EXTINGUISHING EQUIPMENT"* by John R. Hall, Jr. In that report Mr. Hall states: *"Based on 2002-2004 fires reported to U.S. fire departments, when sprinklers cover the area of fire origin, they operate in 93% of all reported structure fires large enough to activate sprinklers. When they operate, they are effective 97% of the time, resulting in a combined effectiveness reliability of 90%."*

While 90% is certainly admirable, it is far from being perfect. It also points out the fallacy in allowing reductions in passive fire protection in lieu of sprinkler systems. A fire that may have been contained with passive systems may be a much more serious event when it occurs in a building with lesser passive protection and a failed sprinkler system.

And it is often argued that sprinkler systems require no maintenance. This has been stated many times by proponents. But that conflicts with NFPA 13D section 4.2 and the installation instructions from sprinkler head manufacturers such as Tyco and others who all state that certain maintenance activities should be performed.

The U.S. Fire Administration published the report "***U.S. Fire Administration/National Fire Data Center*** **Fatal Fires Topical Fire Research Series, Volume 5 – Issue 1** ***March 2005"*** in which it stated:

■ *The leading cause of fires that resulted in fatalities was arson (27%), followed by smoking (18%).*

■ *The leading areas of fire origin in fatal residential structure fires were sleeping (29%) and lounge (21%) areas.*

■ *Smoke alarms either were not present in 42% of residential fatal fires or alarms were present but did not operate in 21% of residential fatal fires.*

CAUSES OF FATAL FIRES
The leading cause of fatal fires in 2002 was incendiary/suspicious (arson), which accounted for 27% of fatal fires. Figure 3 compares the causes of fatal fires in all properties and in residential properties.
Smoking, long the leading cause of fatal fires, trailed as the second leading cause of all fatal fires at 18%. Arson was also the leading cause of the fatal residential structure fires (22%), but by a small margin over smoking (21%). This again is a departure from years past as smoking has long been the leading cause (by a wide margin) of fatal residential fires.
Multiple fatality fires in residential structures were most often caused by heating (26%), followed by arson (23%). By contrast, arson and smoking (each 22%) cause most single fatality residential structure fires.
Figure 4 shows the leading areas of fire origin in fatal residential structure fires. They started most frequently in sleeping (29%) and lounge areas (21%). Fires starting in kitchens account for another 15%.

SMOKE ALARM PERFORMANCE
Smoke alarm performance in fatal residential structure fires is shown in Figure 6. Although more than 90% of homes have smoke alarms today, no smoke alarms were present in 42% of residential structure fires where fatalities occurred. Smoke alarms were present in 58% of fatal residential structure fires, but only operational in 37% of those fatal fires.

This report raises several questions. If the leading cause of fatal fires is arson, would sprinkler systems impact those numbers if tampering is a possibility? And if smoking is a major cause of fire fatalities, should the vast majority of the public be forced to pay for protection made necessary in part by those who chose a particularly unhealthy lifestyle? The failure to have working smoke alarms in so many of the fatal fires is a national travesty. Why isn't more being done to correct this problem? At the very least, this information casts doubt on the validity of spending hundreds of millions (or billions) of dollars on systems that may not solve the problems they are intended to solve.

You also heard testimony on various polls that indicated that the public felt a sprinklered home was more desirable than one without sprinklers. I suspect that a similar poll would find that car owners would find a Cadillac to be more desirable than a Chevy as well. The polls didn't ask if someone would be willing to pay several thousand dollars more to have a sprinkler system installed.

Another argument that was trotted out recently was that having sprinkler requirements in the appendix, which may have been the foot in the door, wasn't sufficient because jurisdictions weren't embracing sprinklers at a pace to satisfy proponents. But those requirements first appeared in the 2006 IRC. The 2006 IRC had hardly been in print before activists began pushing to have the rules moved into the body of the code. Jurisdictions hardly had time to consider the impacts of residential sprinklers or adopt them.

You heard a lot of emotional testimony on this issue. But these decisions should not be based on emotion but on science and facts. And the facts tell a story contradicting the emotional testimony.

The housing industry is in a fragile state. Residential builders are struggling and failing as are building materials suppliers. Homes are appraising at less than the cost to construct them. Building department staff members are being laid off at alarming rates. This is not the time to impose costly and potentially ineffective building systems.

Please approve this code change.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-RB-10-R313

RB58–09/10
R314.1

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

R314.1 Smoke detection and notification. All smoke alarms shall be listed and labeled in accordance with UL 217 and installed in accordance with the provisions of this code and the household fire warning equipment provisions of NFPA 72.

Reason: Only listed products that are labeled have been subjected to periodic, unannounced inspections during production.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EUGENE-RB-10-R314.1

RB59–09/10
R314.4

Proponent: Lou Malattia, Clark County Building Safety Division, representing the Washington Association of Building Officials

Revise as follows:

R314.4 Power source. Smoke alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection. Smoke alarms shall be interconnected.

Exception:

1. Smoke alarms shall be permitted to be battery operated when installed in buildings without commercial power.
2. Interconnection and Hard-wiring of smoke alarms in existing areas shall not be required where alteration or repairs do not result in removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space, or basement available which could provide access for hard-wiring and interconnection without the removal of interior finishes. Physical interconnection of all alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation.

Reason: Although power may be accessible to hard wire one of the existing smoke detectors, it may be difficult to interconnect all of them. The requirement for interconnection being satisfied by a wireless activation isn't universally accepted, and in many jurisdictions this would not be accepted.

The UL Listed wireless interconnected smoke alarm system with AC ionization sensor hardwired would allow all of the smoke detectors to be interconnected without requiring hard wiring all of them. The technology is now available where it is not difficult to interconnect all the smoke detectors and thereby improving life safety.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MALATTIA-RB-1-R314.4

RB60–09/10

R315, R315.1.1, R315.1.2, R315.1.3, Chapter 44

Proponent: Scott Dornfeld, City of Delano, MN

1. Delete without substitution:

~~**SECTION R315**~~
~~**CARBON MONOXIDE ALARMS**~~

~~**R315.1 Carbon monoxide alarms.** For new construction, an approved carbon monoxide alarm shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms in *dwelling units* within which fuel-fired *appliances* are installed and in dwelling units that have attached garages.~~

~~**R315.2 Where required in existing dwellings.** Where work requiring a *permit* occurs in existing *dwellings* that have attached garages or in existing dwellings within which fuel-fired *appliances* exist, carbon monoxide alarms shall be provided in accordance with Section R315.1.~~

~~**R315.3 Alarm requirements.** Single station carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.~~

2. Delete standard as follows:

UL
~~2034-2008 Standard for Single and Multiple Station Carbon Monoxide Alarms~~

Reason: A new rule should never be imposed unless it can be shown that there is a significant hazard posed that can be directly influenced by the rule. It is not the goal of the I-Codes, the stated purpose of which is to provide minimum standards, to eliminate all hazards such that no one will ever be killed or injured as a result of the design of or a defect in a building. It is simply too expensive and impractical to do so. Such is the case with the addition of carbon monoxide requirements in the IRC that nationwide will increase costs to homeowners in the hundreds of millions of dollars with a potentially negligible impact on CO deaths. Additionally, it requires that the alarms be installed any time work is done and a permit is required. This means if I have my house reroofed, I must install CO alarms (but not smoke alarms). I would be required to install them if I have an attached garage even when studies show the likelihood of carbon monoxide poisoning occurring from motor vehicles is extremely low and even if portions of the garage are permanently open to the outside.

Following are some excerpts taken from a publication by the Consumer Product Safety Commission entitled ***"Non-Fire Carbon Monoxide Deaths Associated with the Use of Consumer Products 2003 and 2004 Annual Estimates".***

P. 4 - During 2004, the most recent year for which nearly complete data are available, there were an estimated 162 carbon monoxide (CO) poisoning deaths associated with the use of a consumer product under the jurisdiction of the U.S. Consumer Product Safety Commission (CPSC). There were an estimated 154 fatalities in 2003. Carbon monoxide poisonings referred to in this report do not include those where the CO gas resulted from a fire or a motor vehicle, were intentional in nature or were directly work-related.

Comment: The number of CO deaths was often cited as being in the thousands, not 150-160, which is the accurate number.

Table 1

Estimated Non-Fire Carbon Monoxide Poisoning Deaths

By Associated Fuel-Burning Consumer Product, 1999-2004.

Consumer Product	2002 - 2004+		Annual Estimate					
	Average Estimate	Average Percent	1999	2000	2001	2002	*2003+*	*2004+*
Total Deaths	*166*	*100%*	109	137	122	181	*154*	*162*
Heating Systems	*82*	*49%*	50	81	72	97	*66*	*84*
Unspecified Gas Heating	*7*	*4%*	5	1	5	2	*4*	*14*
LP Gas Heating	*29*	*18%*	22	28	24	41	*22*	*25*
Natural Gas Heating	*30*	*18%*	20	42	28	32	*27*	*30*
Coal/Wood Heating	*3*	*2%*	0	2	6	4	*2*	*4*
Kerosene/Oil Heating	*6*	*4%*	2	8	6	8	*6*	*4*
Diesel Fuel	*< 1*	*< 1%*	*	*	*	1	*	*
Heating Systems, Not Specified	*7*	*4%*	1	*	3	9	*5*	*7*
Charcoal Grills or Charcoal	*7*	*4%*	17	8	10	11	*8*	*3*
Gas Water Heaters	*3*	*2%*	1	3	1	1	*7*	*1*
Gas Grills, Camp Stoves, Lanterns	*5*	*3%*	14	4	1	5	*2*	*8*
Gas Ranges/Ovens	*3*	*2%*	6	12	9	3	*3*	*4*
Other Appliances	*1*	*1%*	1	0	0	0	*2*	*1*
Multiple Appliances	*8*	*5%*	6	2	7	12	*8*	*4*
Engine-Driven Tools	*54*	*33%*	13	27	22	51	*57*	*55*
Generators	*44*	*27%*	7	19	21	41	*50*	*41*
Other Engine-Driven Tools	*10*	*6%*	6	8	1	10	*7*	*14*

\+ Data collection for 2003 and 2004 is incomplete. Italicized estimates may change in the future.

* No reports received by CPSC staff.

Source: U.S. Consumer Product Safety Commission / EPHA.
CPSC Death Certificate File, CPSC Injury or Potential Injury Incident File, CPSC In-Depth Investigation File, National Center for Health Statistics Mortality File, 1999 - 2004.

Note: Reported average percentages by product may not add to total due to rounding.

P. 6 - Of the 47 estimated deaths in 2003 and 2004 that were associated with LP gas heating systems, 32 (68%) involved unvented portable propane heaters. These unvented portable propane heaters were fueled by a propane tank and were not a component of an installed heating system. Unvented portable propane heaters were either camping heaters that used disposable propane tanks, one pound propane bottles, or tank top heaters that used bulk tanks larger than one pound.

Comment: Unvented portable propane heaters cannot be used as a primary heat source in a building. Therefore these incidents likely occurred when they were used for temporary heat or in locations outside a home such as a camping unit. Requiring CO alarms in homes will have no impact on CO deaths that occur in camping trailers and locations other than the home. Requiring CO alarms in homes because someone might bring an unvented heater into their house and improperly use it is unwarranted.

P. 6 - In 2003 and 2004, an estimated 11 CO deaths (3% of the 316 total consumer product estimate) were associated with charcoal or charcoal grills; an estimated eight deaths (3% of the total consumer product estimate) were associated with a gas water heater; gas grills, camp stoves and lanterns were associated with an estimated eight deaths (3% of the total consumer product estimate); gas ranges and ovens were associated with an estimated seven deaths (2% of the total consumer product estimate); and three deaths were either associated with consumer products that did not fit into the categories given above or there was insufficient detail to categorize the appliance. One fatality was associated with a propane-fueled refrigerator, one was associated with a product simply defined as a "propane appliance" and another as a "gas-fueled appliance". These incidents were categorized as "Other appliances". Additionally, in 2003 and 2004 an estimated 12 deaths were associated with multiple appliances (4% of the total consumer product estimate). The multiple appliances category included all incidents where multiple fuel-burning products were used simultaneously such that a single source of the CO could not be determined. Of the 12 multiple appliance fatalities, six were associated with a generator and another product. These other products were a kerosene heater (three deaths), an LP gas heater (two deaths) and a wood stove. Other fatalities where multiple products were simultaneously used and associated with a CO poisoning death involved a portable propane heater and a gas-powered snow thrower; a portable propane heater and a propane lantern; a kerosene heater and a propane heater; a natural gas heater and hot water heater; a propane furnace and a propane oven in a travel camper; and a natural gas furnace and natural gas oven.

Comment: While it may seem cruel, at times one needs to invoke the "any idiot rule". The code should not require CO alarms to deal with people operating charcoal grills or lawn mowers in their living rooms.

P. 6 - An estimated 112 CO poisoning deaths (35% of the estimated total from 2003 and 2004) were associated with engine-driven tools, which includes generators, riding mowers, a concrete cutter, a gas-fueled welder, power washers, a water pump, an air compressor and an ATV. Generator associated deaths comprise the majority of this category. There were an estimated total of 91 generator-related CO poisoning deaths in 2003 and 2004 (81% of all engine-driven tool fatalities and 29% of the total consumer product estimate).

P. 7 - Of the 123 liquid fueled appliance-related fatalities in 2003 and 2004, 112 (91%) were associated with all engine-driven tools (generators, lawn mowers, power washers, concrete saws, etc.). Generators accounted for 91 of the estimated 123 fatalities (74%) in the Liquid Fueled Appliances category.

Table 2

Estimated Non-Fire Carbon Monoxide Poisoning Deaths

Associated with Consumer Products Organized by Fuel Type, 1999-2004.

Consumer Product	2002-2004+ Average Estimate	2002-2004+ Average Percent	Annual Estimate 1999	2000	2001	2002	2003+	2004+
Total Deaths	*166*	*100%*	109	137	122	181	*154*	*162*
Gas Fueled Appliances	*84*	*51%*	67	91	71	92	*72*	*89*
Room / Space Heater	*33*	*20%*	20	39	23	35	*30*	*34*
Natural Gas Fueled	*8*	*5%*	3	17	5	9	*8*	*8*
Propane Fueled	*19*	*12%*	16	21	17	21	*19*	*18*
Other / Unspecified	*5*	*3%*	1	1	1	5	*3*	*8*
Furnace	*40*	*24%*	25	33	37	48	*28*	*43*
Natural Gas Fueled	*22*	*13%*	16	25	23	24	*19*	*23*
Propane Fueled	*10*	*6%*	6	8	7	20	*3*	*7*
Other / Unspecified	*8*	*5%*	3	*	7	4	*6*	*13*
Range, Oven	*3*	*2%*	6	12	9	3	*3*	*4*
Water Heater	*3*	*2%*	1	3	1	1	*7*	*1*
Refrigerator	*<1*	*<1%*	1	*	*	*	*1*	*
Lantern	*2*	*1%*	8	3	*	2	*1*	*4*
Gas Grill, Camp Stove	*2*	*1%*	5	1	1	3	*1*	*2*
Other	*1*	*<1%*	1	*	*	*	*1*	*1*
Solid Fueled Appliances	*11*	*7%*	17	10	16	15	*10*	*7*
Charcoal / Charcoal Grill	*7*	*4%*	17	8	10	11	*8*	*3*
Wood / Coal Heater	*3*	*2%*	*	2	6	4	*2*	*4*
Coal Furnace	*1*	*<1%*	*	1	1	1	*	*1*
Wood / Coal Stove	*1*	*1%*	*	1	5	1	*2*	*1*
Chimney / Fireplace	*1*	*1%*	*	*	*	2	*	*2*
Liquid Fueled Appliances	*61*	*37%*	16	34	28	59	*63*	*60*
Oil Heater / Heating	*1*	*1%*	*	4	5	3	*1*	*
Kerosene Heater / Heating	*5*	*3%*	2	3	1	4	*5*	*4*
Generators	*44*	*27%*	7	19	21	41	*50*	*41*
Other Engine-Driven Tools	*10*	*6%*	6	8	1	10	*7*	*14*
Lantern / Product / Appliance	*<1*	*<1%*	1	1	*	1	*	*1*
Multiple Products Involved	*8*	*5%*	7	2	8	13	*8*	*4*

\+ Data collection is incomplete for 2003 and 2004. Italicized estimates may change in the future.

* No reports received by CPSC staff.

Source: U.S. Consumer Product Safety Commission / EPHA.
CPSC Death Certificate File, CPSC Injury or Potential Injury Incident File, CPSC In-Depth Investigation File, National Center for Health Statistics Mortality File, 1999 - 2004.

Note: Reported average percentages by product may not add to total due to rounding.

Table 3
Estimated Non-Fire Carbon Monoxide Poisoning Deaths Associated with Engine-Driven Tools, 1999-2001 vs. 2002-2004.

Engine-Driven Tools	1999-2001 Average Estimate	2002-2004+ Average Estimate	Annual Estimate 1999	2000	2001	2002	*2003+*	*2004+*
Total	**21**	*54*	**13**	**27**	**22**	**51**	*57*	*55*
Generators	**16**	*44*	**7**	**19**	**21**	**41**	*50*	*41*
Other Engine-Driven Tools	**5**	*10*	**6**	**8**	**1**	**10**	*7*	*14*
Lawn Mowers[1]	5	*6*	6	7	1	5	*6*	*8*
Gas Welder	*	*1*	*	*	*	2	*1*	*
Concrete Saw	*	*1*	*	*	*	1	*	*1*
Power Washer	*	*1*	*	*	*	*	*	*2*
ATV	*	*1*	*	*	*	1	*	*1*
Snow Blower	< 1	*	*	1	*	*	*	*
Air Compressor	*	*< 1*	*	*	*	*	*	*1*
Water Pump	*	*< 1*	*	*	*	*	*	*1*

[1] Lawn Mowers includes riding mowers, garden tractors and gas-fueled powered push mowers.
\+ Data collection is incomplete for 2003 and 2004. Italicized estimates may change in the future.
* No reports received by CPSC staff.
Source: U.S. Consumer Product Safety Commission / EPHA.
CPSC Death Certificate File, CPSC In-Depth Investigation File, CPSC Injury or Potential Injury Incident File, National Center for Health Statistics Mortality File, 1999 - 2004.
Note: Reported average percentages by product may not add to total due to rounding.

P. 11 - Table 6 shows that in 2003 and 2004, an estimated 230 CO poisoning deaths occurred in homes, including manufactured and mobile homes. From 2002-2004, an annual average of 72 percent of CO poisoning deaths occurred in homes, including manufactured and mobile homes. In 2003 and 2004, an estimated 45 deaths took place in temporary shelters, such as tents, recreational vehicles, cube vans, seasonal cabins, and trailers (including horse trailers). In 2002- 2004, an annual average of 17 percent of CO poisoning deaths took place in temporary shelters. In 2003 and 2004, 25 of the 45 estimated deaths in temporary shelters were most commonly associated with portable gas or LP gas heating or cooking appliances. Generator usage in a temporary shelter was the second largest product category with an estimated 11 deaths in 2003 and 2004. Other scenarios included charcoal and charcoal grills, LP gas lanterns, kerosene heaters and a kerosene cooker. A consistently small percentage of deaths occurred in passenger vans, trucks, or automobiles in which victims were spending the night. For 2003 and 2004, of the estimated 13 CO fatalities in this category, nine were associated with portable LP gas heaters.

Comment: CO alarm requirements in the IRC would not impact incidents in mobile homes, tents, RV's, seasonal cabins, trailers, passenger vans, trucks, and automobiles.

Table 6
Estimated Non-Fire Carbon Monoxide Poisoning Deaths by Location of Death, 1999-2004.

Location of Death	2002-2004+ Average Estimate	2002-2004+ Average Percent	Annual Estimate 1999	2000	2001	2002	*2003+*	*2004+*
Total	*166*	*100%*	**109**	**137**	**122**	**181**	*154*	*162*
Home	*119*	*72%*	60	88	85	128	*110*	*120*
Temporary Shelter	*28*	*17%*	35	34	24	39	*23*	*22*
Auto	*7*	*4%*	7	2	10	8	*8*	*5*
Other	*10*	*6%*	7	13	3	5	*10*	*15*
Unknown	*1*	*1%*	*	*	*	2	*2*	*

\+ Data collection is incomplete for 2003 and 2004. Italicized estimates may change in the future.
* No reports received by CPSC staff.
Source: U.S. Consumer Product Safety Commission / EPHA.
CPSC Death Certificate File, CPSC In-Depth Investigation File, CPSC Injury or Potential Injury Incident File, National Center for Health Statistics Mortality File, 1999 - 2004.
Note: Reported average percentages by product may not add to total due to rounding.

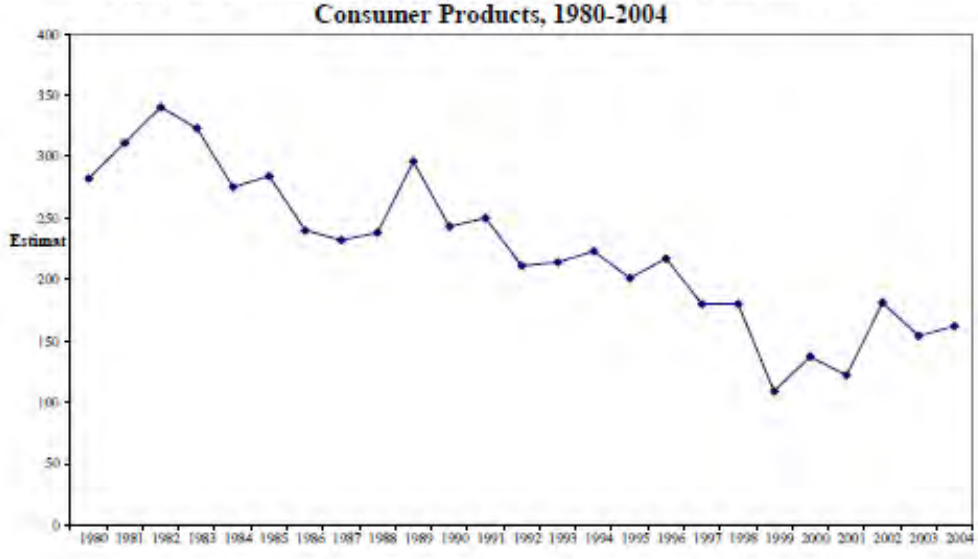
Appendix B: National Estimates of Consumer Product-Related CO Poisoning Deaths, 1980 - 2004

Estimated Non-Fire Carbon Monoxide Poisoning Deaths Associated with Consumer Products, 1980-2004

Year	Estimate
1980	282
1981	311
1982	340
1983	323
1984	275
1985	284
1986	240
1987	232
1988	238
1989	296
1990	243
1991	250
1992	211
1993	214
1994	223
1995	201
1996	217
1997	180
1998	180
1999*	109
2000	137
2001	122
2002	181
2003	154
2004	162

* The Tenth Revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) was implemented.
Source: U.S. Consumer Product Safety Commission / EPHA.

Figure 1: Estimated Non-Fire CO Poisoning Deaths Associated with Consumer Products, 1980-2004



Reading through even these brief excerpts, one wonders if requiring CO alarms would have any impact on CO related deaths at all given the circumstances surrounding most deaths. Furthermore, the number of deaths decreased without government regulation from 340 in 1982 to 162 in 2004. This decrease occurred during a time when the population increased from about 225 million to 296 million in 2004. The steadily decreasing number of deaths and their location doesn't indicate that requiring CO alarms would have any statistical impact on deaths.

Regarding the matter of CO deaths and attached garages, following are excerpts from an article entitled:
The Role of Catalytic Converters in Automobile Carbon Monoxide Poisoning[*] A Case Report by Bradley Vossberg, MD and Judah Skolnick, MD, FCCP
[*] From the Frazier Rehab Center, Jewish Hospital Health Network, Louisville, KY.

Inhaling motor vehicle exhaust fumes is a common method used by people attempting to commit suicide; however, the decreased carbon monoxide concentrations found in the exhaust of late-model automobiles equipped with catalytic converters are changing the clinical presentation of exhaust inhalation.

Closed-environment exposure to MVEGE from automobiles not equipped with catalytic converters can result in death within 30 min. The introduction of catalytic converters beginning with 1975 new-car models dropped CO emission rates to 6.00 g/min. By 1989, the average new-car

CO emission at idling was 0.22 g/min. The catalytic conversion process removes CO, hydrocarbons, and nitrogen oxide; the resultant emission is a more desirable mixture of nitrogen, CO_2, and water. Contemporary three-way catalytic converters eliminate > 99% of CO emissions.

Given the increased efficiency of modern catalytic converters, patients presenting with closed-environment MVEGE exposure may have much lower HbCO levels than would have been previously expected; in some cases, the HbCO level may be normal. Other important factors to be considered are the role of supplemental O_2 given at the scene and the time taken to obtain the HbCO level.

Attached garages do not pose a risk. By definition, an attached garage is three walls and a roof. A garage door is not required. There are no requirements that the garage be air tight or enclosed to a degree that would create any danger, even if CO levels were high.

Clearly, expecting CO alarms to have any positive impact on CO death rates is extremely optimistic and likely unrealistic. If we are going to require the public to spend their money on safety related devices, surely we can find a more productive area on which to spend it.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DORNFELD-RB-2-R315

RB61–09/10

R316.4, R316.4.1 (New), R316.4.2 (New), Chapter 44 (New)

Proponent: Marcelo M. Hirschler, GBH International, representing the American Fire Safety Council

1. Revise as follows:

R316.4 Thermal barrier. Unless otherwise allowed in Section R316.5 or Section R316.6, foam plastic shall be separated from the interior of a building by an *approved* thermal barrier of minimum 1/2 inch (12.7 mm) gypsum wallboard or an *approved* finish material equivalent to a thermal barrier material ~~that will limit the average temperature rise of the unexposed surface to no more than 250°F (139°C) after 15 minutes of fire exposure complying with the ASTME 119 orUL263 standard time-temperature curve. The thermal barrier shall be installed in such a manner that it will remain in place for 15 minutes based on NFPA 286 with the acceptance criteria of Section R302.9.4, FM 4880, UL 1040 or UL 1715~~. The thermal barrier material shall comply with R316.4.1 or R316.4.2.

R316.4.1 The thermal barrier material shall comply with the requirements of the temperature transmission fire test and of the integrity fire test in NFPA 275, Standard Method of Fire Tests for the Evaluation of Thermal Barriers Used Over Foam Plastic Insulation.

R316.4.2 The thermal barrier material shall comply with the temperature transmission test in NFPA 275 and with the conditions of acceptance of FM 4880, UL 1040 or UL 1715 when tested in conjunction with the foam plastic insulation for a period of 15 minutes.

2. Add new standard as follows:

NFPA 275	Standard Method of Fire Tests for the Evaluation of Thermal Barriers Used Over Foam Plastic Insulation

Reason: NFPA 275 was specifically developed to clarify the test for thermal barrier materials to be used over foam plastic insulation. It contains two tests.

The temperature transmission fire test in NFPA 275 uses the ASTM E 119 (or UL 263) time-temperature fire curve to expose the thermal barrier specimen and it requires the following: "4.8.1 During the 15-minute test period, the average measured temperature rise above the average temperature at the start of the fire test for the thermocouples described in Section 4.3 shall not exceed 250°F (139°C), and the measured temperature rise of any such single thermocouple shall not exceed 325°F (181°C)." Therefore, the temperature transmission fire test in NFPA 275 corresponds to what the code requires now.

The integrity fire test in NFPA 275 requires that the thermal barrier material, together with the foam plastic insulation, be tested to NFPA 286 (which is a 15 minute test) and that the pass/fail criteria are identical to those used for NFPA 286 elsewhere in the code (for example Chapter 8).

The code should continue to recognize that thermal barrier materials tested, in conjunction with foam plastic insulation, to FM 4880, UL 1040 and UL 1715 and complying with the conditions of acceptance of these tests are equally acceptable. NFPA 275 also states that the integrity fire test can be conducted in accordance with these alternate test methods, when their pass/fail criteria are used.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, NFPA 275, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-RB-1-R316.4

RB62–09/10
R316.5.3

Proponent: Rick Thornberry, PE, The Code Consortium, Inc., representing the Cellulose Insulation Manufacturers Association (CIMA)

Revise as follows:

R316.5.3 Attics. The thermal barrier specified in Section R316.4 is not required where all of the following apply:

1. Attic access is required by Section R807.1.
2. The space is entered only for purposed of repairs or maintenance.
3. The foam plastic insulation is protected against ignition using one of the following ignition barrier materials:
   - 3.1. 1 ½-inch-thick (38mm) mineral fiber insulation;
   - 3.2. ¼-inch-thick (6.4mm) wood structural panels;
   - 3.3. 3/8-inch (9.5 mm) particleboard;
   - 3.4. ¼-inch (6.4mm) hardboard;
   - 3.5. 3/8-inch (9.5mm) gypsum board; ~~or~~
   - 3.6. Corrosion-resistant steel having a base metal thickness of 0.016 inch (0.406mm)~~.~~;
   - 3.7. 1.5-inch thick (38mm) cellulose loose-fill insulation.

The above ignition barrier is not required where the foam plastic insulation has been tested in accordance with Section R316.6.

Reason: We are proposing the use of 1-1/2 inch thick cellulose loose-fill insulation as another acceptable material for use as an ignition barrier to satisfy the requirements of R314.5.3 for the protection of foam plastic insulation in attics as an alternate to the thermal barrier required by Section 314.4. We are basing this proposal on the equivalent performance to that of Item No. 1 of this section which allows 1-1/2 inch thick mineral fiber insulation that by definition includes both mineral wool and glass fiber. Presently, cellulose insulation is recognized as being equivalent to mineral fiber insulation for the purpose of providing an additional 15 minutes of protection to a fire-resistance rated wall assembly utilizing wood stud construction as specified in Table 721.6.2(5) of the 2009 International Building Code (IBC).

Furthermore, when the Cellulose Insulation Manufacturers Association (CIMA) conducted the full scale fire tests to validate the comparable performance of cellulose insulation in achieving a one-hour fire-resistance rating for wood stud wall assemblies faced with various thicknesses of gypsum wallboard, they also measured the heat transfer through the cellulose insulation within the wall cavity to determine its resistance to the movement of heat through the assembly during the ASTM E119 fire test exposure. The test data indicated that approximately 1-1/2 inches of cellulose insulation was capable of limiting the temperature increase to an average maximum temperature of 250^{o}F for a period of 15 minutes which is the same performance specified for a thermal barrier in Section R314.4.

Therefore, we believe that this proposal to include 1-1/2 inch thick cellulose loose-fill insulation as another material acceptable for an ignition barrier is appropriate.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: THORNBERRY-RB-2-R316.5.3

RB63–09/10
R317.4

Proponent: Dennis Pitts, American Forest & Paper Association

Revise as follows:

R317.4 Wood/plastic composite~~s~~ deck boards, stair treads, handrails and guardrail systems. Wood/plastic composites used in exterior deck boards, stair treads, handrails and guardrail systems used for load supporting purposes shall have performance ratings established and monitored in accordance with ASTM D 7032 and shall bear a *label* indicating the required performance levels ~~and demonstrating compliance with provisions of ASTM D 7032.~~, manufacturer or mill number, and the name or logo of the quality control agency.

Reason: To clarify the intended requirement to have performance ratings established and monitored in accordance with ASTM D7032. The addition of the words “manufacturer or mill number, and the name or logo of the quality control agency” is based on requirements for packaging and identification in D 7032 and is in addition to information contained under the definition of “label”.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PITTS-RB-2-R317.4

RB64–09/10
R202 (New), R317.5 (New), R317.5.1 (New), Chapter 44 (New)

Proponent: Marcelo Hirschler, GBH International, representing the American Fire Safety Council

1. Add new text as follows:

PLASTIC LUMBER. a manufactured product made primarily from thermoplastic materials (filled or unfilled) and typically supplied in sizes that correspond to traditional lumber board and dimensional lumber sizes.

R317.5 Plastic lumber. Plastic lumber used in exterior deck boards shall bear a *label* indicating the required performance levels and demonstrating compliance with the provisions of ASTM D 6662 and ASTM D 7032.

R317.5.1 Plastic lumber decks shall be installed in accordance with the manufacturer's instructions.

2. Add new standard as follows:

ASTM
D 6662-09 Standard Specification for Polyolefin-Based Plastic Lumber Decking Boards

Reason: Numerous plastic lumber decks are used throughout the US, but the IRC and IBC do not reference them. Wood-plastic composite decks, complying with ASTM D 7032, are permitted in the IRC (section R317.4). This proposal adds plastic lumber decks, with the requirements from ASTM D 7032 and also the requirements from ASTM D 6662.

ASTM D 6662 is a specification for plastic lumber decking boards that requires the plastic lumber to comply with properties based on the following ASTM standards:
ASTM D 2565 Standard Practice for Xenon-Arc Exposure of Plastics Intended for Outdoor Applications
ASTM D 2915 Standard Practice for Evaluating Allowable Properties for Grades of Structural Lumber
ASTM D 4329 Standard Practice for Fluorescent UV Exposure of Plastics
ASTM D 6109 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastic Lumber and Related Products
ASTM D 6341 Standard Test Method for Determination of the Linear Coefficient of Thermal Expansion of Plastic Lumber and Plastic Lumber Shapes Between −30 and 140°F [−34.4 and 60°C]
ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM G 151 Standard Practice for Exposing Nonmetallic Materials in Accelerated Test Devices that Use Laboratory Light Sources
ASTM G 154 Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials
ASTM G 155 Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials

ASTM D 7032 (already referenced in the IRC) is a Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails). It requires the material to comply with flexural properties (ASTM D 6109), accelerated decay (ASTM D 2017), Xenon-arc exposure (ASTM D 2565), resistance to termites (ASTM D 3345), structural lumber grade classifications (ASTM D 2915), and so on.

With regard to fire properties, ASTM D 6662 requires that plastic lumber meet ASTM E 84, Steiner tunnel test, with a flame spread index of no more than 200, with a material that is required to remain in place during the test. The wording with regard to ASTM E 84 flame spread testing in ASTM D 6662 is much more explicit than the wording in the test method itself. The following wording is included in the ASTM D 6662 standard:
"6.4.2 The test specimen shall either be self-supporting by its own structural characteristics or held in place by added supports along the test specimen surface. The test specimen shall remain in place throughout the test duration, without such severe sagging that it interferes with the effect of the gas flame on the test specimen. Test results are invalid if the bulk of the test specimen melts or drops to the furnace floor."

ASTM D 7032 also requires wood-plastic composite decks to comply with a flame spread index of no more than 200 when tested to ASTM E 84. However, ASTM D 7032 does not have the additional requirements that the material stay in place.

By requiring that plastic lumber comply with the requirements of ASTM D 6662 and ASTM D 7032 the code would include all physical property and fire test requirements associated with both types of decking materials. Just for information: wood normally complies with a flame spread index of no more than 200. ICC ES has an Evaluation criterion for thermoplastic composite lumber products (AC 109), based on ASTM D 7032, which is used for approving plastic lumber decks.

Structural plastic lumber combines the benefits of long lasting, weather resistant plastic lumber with the structural characteristic of dimensional wood lumber. It is made primarily from recycled plastics from post-consumer waste like plastic milk and detergent bottles. It then includes strengthening additives, UV–inhibited pigments, anti-oxidant processing aids and foaming agents for a highly stable material that is superior to wood lumber in some measures.

A few photographs of actual decks follow.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM D 6662-09, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-RB-4-R202-R317.5

RB65–09/10
R318.4

Proponent: Greg Baumann, National Pest Management Association, representing the National Pest Management Association; Stephen V. Heller, representing Insulating Concrete Form Association (IFCA)

Revise as follows:

R318.4 Foam Plastic protection. In areas where the probability of termite infestation is "very heavy" or "moderate to heavy" as indicated in Figure R301.2(6), extruded and expanded polystyrene, polyisocyanurate and other foam plastics shall not be installed on the exterior face or under interior or exterior foundation walls or slab foundations located below *grade.* The clearance between foam plastics installed above *grade* and exposed earth shall be at least 6 inches (152 mm).

Exceptions:

1. Buildings where the structural members of walls~~,~~ and floors~~, ceiling and roofs~~ are entirely of noncombustible materials or pressure-preservative-treated wood; or the exterior wall envelop is entirely monolithic concrete walls, including flat-wall and waffle grid ICFs, with continuous concrete from the footings to the roofline.
2. When in *addition* to the requirements of Section R318.1, an *approved* method of protecting the foam plastic and structure from subterranean termite damage is used.
3. On the interior side of *basement walls*.
4. Exterior insulated foundation walls with barriers complying with Section R318.3 in addition to the requirements of Section R318.1 (1) or R318.1 (2).

Reason: (Baumann) Current language prohibits plastic foamboard on exterior walls below grade with exceptions based upon the areas of "very heavy" termite infestation using the code map R301.2(6), an antiquated map from the US Forest Service. This proposal updates the code language to illustrate that areas of "moderate to heavy" are also susceptible to termite attack of below grade foamboard. There are no studies which corroborate definitive borders on the map. Since the original code language was implemented, states outside of the "very heavy" areas, lacking IRC language, have modified state codes due to termite pressure. This leads to a patchwork of fixes state by state or locality by locality. Information collected from termite inspectors show damage to foamboard to be found commonly in "moderate to heavy" zones. In addition, there are measures which are available today, such as chemically treated foam, to protect the foam thus allowing an exception. The GIE *Handbook of Pest Control (2004)* notes the much wider use of foamboard since the original code was written. This proposal only restricts use below grade and can still be used above grade on exterior walls.

Exception 1. Clarifications - and recognition of concrete resilience to Termites.

Exception 4. Clarification for ICF foundations below grade, providing termite protection to prevent termites into above grade framed wall construction.

Reason: (Heller) This proposal acknowledges the protection of concrete construction from structural damage due to termites, and provide clarification for the protection available for exterior insulated foundation walls.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BAUMANN-RB-1-HELLER-RB-1-R318.4

RB66–09/10
R321.4 (New)

Proponent: John England, MCO, England Enterprises, Inc.

Add new text as follows:

R321.4 Inspections. Elevators and platform lifts shall be inspected, tested and certified by a third party inspector before operating. A copy of the certification shall be on file with the building department. The inspector shall be approved by the Building Official before the elevator or lift is installed.

Reason: Most inspectors (department) do have the expertise or tools required to perform the proper inspector of elevators and/ or lifts. Since this is such a specialized field –the inspector should rely on a person who is an expert in the field.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ENGLAND-RB-6-R321.4

RB67–09/10
R322.3.2, R322.3.3

Proponent: Rebecca C. Quinn, RCQuinn Consulting, Inc., representing the Department of Homeland Security, Federal Emergency Management Agency

Revise as follows:

R322.3.2 Elevation requirements.

1. All buildings and structures erected within coastal high hazard areas shall be elevated so that the lowest portion of all structural members supporting the lowest floor, with the exception of ~~mat or raft foundations,~~ piling, pile caps, columns, grade beams and bracing, is:
   1.1. Located at or above the design flood elevation, if the lowest horizontal structural member is oriented parallel to the direction of wave approach, where parallel shall mean less than or equal to 20 degrees (0.35 rad) from the direction of approach, or
   1.2. Located at the base flood elevation plus 1 foot (305 mm), or the design flood elevation, whichever is higher, if the lowest horizontal structural member is oriented perpendicular to the direction of wave approach, where perpendicular shall mean greater than 20 degrees (0.35 rad) from the direction of approach.
2. Basement floors that are below *grade* on all sides are prohibited.
3. The use of fill for structural support is prohibited.
4. Minor grading, and the placement of minor quantities of fill, shall be permitted for landscaping and for drainage purposes under and around buildings and for support of parking slabs, pool decks, patios and walkways.

   Exception: Walls and partitions enclosing areas below the design flood elevation shall meet the requirements of Sections R322.3.4 and R322.3.5.

R322.3.3 Foundations. Buildings and structures erected in coastal high-hazard areas shall be supported on pilings or columns and shall be adequately anchored to those pilings or columns. Pilings shall have adequate soil penetrations to resist the combined wave and wind loads (lateral and uplift). Water loading values used shall be those associated with the design flood. Wind loading values shall be those required by this code. Pile embedment shall include consideration of decreased resistance capacity caused by scour of soil strata surrounding the piling. Pile systems design and installation shall be certified in accordance with Section R322.3.6. ~~Mat, raft or other foundations that support columns shall not be permitted where soil investigations that are required in accordance with Section R401.4 indicate that soil material under the mat, raft or other foundation is subject to scour or erosion from wave-velocity flow conditions.~~ Slabs, pools, pool decks and walkways shall be located and constructed to be structurally independent of buildings and structures and their foundations to prevent transfer of flood loads to the buildings and structures during conditions of flooding, scour or erosion from wave-velocity flow conditions, unless the buildings and structures and their foundation are designed to resist the additional flood load.

Reason: The purpose of this code change is to clarify that an observed practice of using mat or raft foundations that are above eroded grade is not consistent with the regulations of the National Flood Insurance Program (NFIP) regarding foundations in coastal high hazard areas (V Zones). See §60.3(e)(4), below. The NFIP regulations require use of pile or column foundations in V Zones, and do not explicitly provide for use of mat or raft foundations. Note that ASCE 24 *Flood Resistant Design and Construction*, a referenced standard in the IRC, allows use of mat or raft foundations under limited circumstances; notably, it requires that such elements be at or below eroded grade. The language in R322.3.2 does not impose a limitation on the elevation of mats, and rafts and thus could lead to violations of the NFIP requirements which would also have significant cost implications for federal flood insurance premiums. ASCE 24 is permitted to be used as an alternate to the IRC provisions for coastal high hazard areas (see R301.2.4.1 and R322.1.1). In addition, designers may use ASCE 24 as guidance, even if not required.

44 CFR §60.3(e)(4) Provide that all new construction and substantial improvements in Zones V1-30 and VE, and also Zone V if base flood elevation data is available, on the community's FIRM, are elevated on pilings and columns so that . . . *[remainder not shown]*

Cost Impact: The code change proposal has no cost impact because it is consistent with local ordinances that are adopted by local jurisdictions for participation in the NFIP.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: QUINN-RB-5-R322.3.2

RB68–09/10
R322.3.3

Proponent: Rebecca C. Quinn, RCQuinn Consulting, Inc., representing the Department of Homeland Security, Federal Emergency Management Agency

Revise as follows:

R322.3.3 Foundations. Buildings and structures erected in coastal high-hazard areas shall be supported on pilings or columns and shall be adequately anchored to those pilings or columns. The space below the elevated building shall be either free of obstruction or, if enclosed with walls, the walls shall meet the requirements of Section R322.3.4. Pilings shall have adequate soil penetrations to resist the combined wave and wind loads (lateral and uplift). Water loading values used shall be those associated with the design flood. Wind loading values shall be those required by this code. Pile embedment shall include consideration of decreased resistance capacity caused by scour of soil strata surrounding the piling. Pile systems design and installation shall be certified in accordance with Section R322.3.6. Mat, raft or other foundations that support columns shall not be permitted where soil investigations that are required in accordance with Section R401.4 indicate that soil material under the mat, raft or other foundation is subject to scour or erosion from wave-velocity flow conditions. Slabs, pools, pool decks and walkways shall be located and constructed to be structurally independent of buildings and structures and their foundations to prevent transfer of flood loads to the buildings and structures during conditions of flooding, scour or erosion from wave-velocity flow conditions, unless the buildings and structures and their foundation are designed to resist the additional flood load.

Reason: The purpose of this code change is to improve consistency with the regulations of the National Flood Insurance Program (NFIP) regarding elevated buildings in coastal high hazard areas (V zones). See §60.3(e)(5), below. NFIP regulations require the space below elevated buildings to be either free of obstruction or have walls that meet certain requirements which are in the IRC at Section R322.3.4. Obstructions other than breakaway walls that are below elevated buildings contribute to damage by increasing loads on foundations or by contributing to the debris load during flood conditions. The NFIP's guidance on this requirement was revised in 2008, NFIP Technical Bulletin #5, *Free-of-Obstruction Requirements for Buildings Located in Coastal High Hazard Areas in accordance with the National Flood Insurance Program* (http://www.fema.gov/plan/prevent/floodplain/techbul.shtm).

44 CFR §60.3(e)(5) Provide that all new construction and substantial improvements within Zones V1-30, VE, and V on the community's FIRM have the space below the lowest floor either free of obstruction or constructed with non-supporting breakaway walls, open wood lattice-work, or insect screening intended to collapse under wind and water loads without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting foundation system. [emphasis added; remainder not shown]

Cost Impact: The code change proposal has no cost impact because it is consistent with local ordinances that are adopted by local jurisdictions for participation in the NFIP.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: QUINN-RB-8-R322.3.3

RB69–09/10
R401.3

Proponent: Jim Olk, City of Farmers Branch, TX, representing Building Officials Association of Texas

Revise as follows:

R401.3 Drainage. Surface drainage shall be diverted to a storm sewer conveyance or other *approved* point of collection that does not create a hazard. *Lots* shall be graded to drain surface water away from the building foundation ~~walls~~. The *grade* shall fall a minimum of 6 inches (152 mm)within the first 10 feet (3048 mm).

Exception: Where *lot lines*, walls, slopes or other physical barriers prohibit 6 inches (152 mm) of fall within 10 feet (3048 mm), drains or swales shall be constructed to ensure drainage away from the structure. Impervious surfaces within 10 feet (3048 mm)of the building foundation shall be sloped a minimum of 2 percent away from the building.

Reason: Over saturation of the soil adjacent to all types of foundations can cause differential soil movement which can lead to foundation failure. For this provision the term foundation walls needs to be expanded to include the perimeter of slab foundations in addition to other types of foundations. Adding the term "the building" and deleting the term "walls" make the provision applicable to all types of foundations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: OLK-RB-2-R401.3

RB70–09/10
R403.1, Figure R403.1(1) (New)

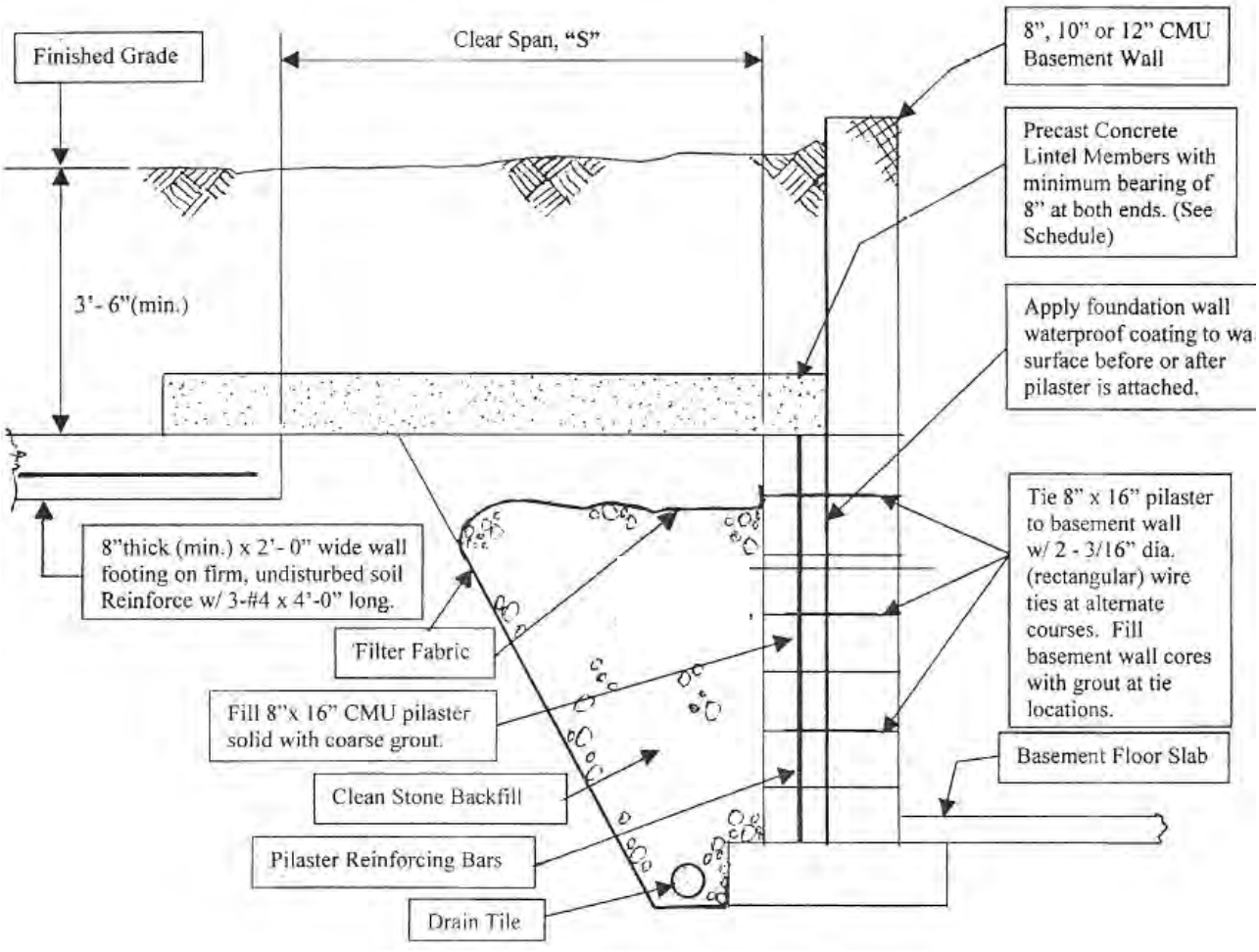
Proponent: Jason Thompson, National Concrete Masonry Association, representing the Masonry Alliance for Codes and Standards

1. Revise as follows:

R403.1 General. All exterior walls shall be supported on continuous solid or fully grouted masonry or concrete footings, crushed stone footings, wood foundations, or other *approved* structural systems which shall be of sufficient design to accommodate all loads according to Section R301 and to transmit the resulting loads to the soil within the limitations as determined from the character of the soil. Footings shall be supported on undisturbed natural soils or engineered fill. Concrete footing shall be designed and constructed in accordance with the provisions of Section R403 or in accordance with ACI 332.

At transitions between footings located at different elevations, precast concrete lintels complying with Figure R403.1(1) shall be permitted.

2. Add new figure as follows:



Required Reinforcement for Each 4 in. by 8 in. Lintel			Required Reinforcement for Each 6 in. by 8 in. Lintel		
Clear Span, S	Top Bar Size	Bottom Bar Size	Clear Span, S	Top Bar Size	Bottom Bar Size
4'-0"	No. 3	No. 3	4'-0"	No. 3	No. 3
4'-8"	No. 3	No. 3	4'-8"	No. 3	No. 3
5'-4"	No. 3	No. 3	5'-4"	No. 3	No. 3
6'-0"	No. 3	No. 3	6'-0"	No. 3	No. 3
6'-8"	No. 3	No. 3	6'-8"	No. 3	No. 4
7'-4"	No. 3	No. 4	7'-4"	No. 3	No. 5
8'-0"	No. 3	No. 5	8'-0"	No. 3	No. 5

1. All reinforcing bars shall comply with ASTM A615, Grade 60.
2. Minimum 28 day compressive strength of the lintel concrete shall be 3,000 psi.
3. The above lintels are designed to carry only the masonry apex area dead load above the lintel plus the lintel self-weight. The triangular masonry apex area is based on a 45-degree slope extended to the peak of the triangle from center of bearing at both ends of the lintel. No other loads on the lintel, within the triangular apex area, are considered in the above table.

FIGURE 403.1(1)
DISCONTINUOUS FOOTERS

Reason: Situations often arise in the field whereby it is not practical to have a continuous footing around the perimeter of a residence, such as at the transition between a basement wall and a stem wall below a garage, which is further complicated due to excavating around the basement. A common solution to this situation is to span between the stem wall footer and basement wall footer using a precast lintel to support surcharge loads applied from above.

This change proposes to introduce an alternative design and construction option to allow discontinuous footers when complying with the requirements of the proposed new Figure 403.1(1). Similar detailing has been used successfully for years in various regions of the country.

The detailing options presented here are applicable only to structures assigned to SDC A, B, and C. For higher seismic design categories, the provisions of Section R403.1.3 are still applicable.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: THOMPSON-RB-3-R403.1-F. R403.1(1)

RB71–09/10
R403.1, R404.6 (New)

Proponent: Dennis Pitts, American Forest & Paper Association

1. Revise as follows:

R403.1 General. All exterior walls shall be supported on continuous solid or fully grouted masonry or concrete footings, crushed stone footings, wood foundations, pier and beam foundations, or other approved structural systems which shall be of sufficient design to accommodate all loads according to Section R301 and to transmit the resulting loads to the soil within the limitations as determined from the character of the soil. Footings shall be supported on undisturbed natural soils or engineered fill. Concrete footings shall be designed and constructed in accordance with the provisions of R403 or in accordance with ACI 332.

2. Add new text as follows:

R404.6 Pier and beam foundations. Pier and beam foundations shall be permitted when of a design approved by the building official.

Reason: The IRC recognizes a number of different methods of foundation construction but is silent on pier and beam construction, a common construction method in some areas of the country. Although the proposed wording permits something already allowed by Section R104.11, *Alternate Materials, Design and Methods of Construction and Equipment*, it makes a clear statement about the acceptability of pier and beam foundations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: PITTS-RB-10-R403.1-R404.6

RB72–09/10
R403.1.3

Proponent: Homer Maiel, PE, CBO, City of San Jose, CA, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay Chapters)

Revise as follows:

R403.1.3 Seismic reinforcing. Concrete footings located in Seismic Design Categories D_0, D_1 and D_2, as established in Table R301.2(1), shall have minimum reinforcement. Bottom reinforcement shall be located a minimum of 3 inches (76 mm) clear from the bottom of the footing.

In Seismic Design Categories D_0, D_1 and D_2 where a construction joint is created between a concrete footing and a stem wall, a minimum of one No. 4 bar shall be installed at not more than 4 feet (1219 mm) on center. The vertical bar shall extend to 3 inches (76 mm) clear of the bottom of the footing, have a standard hook and extend a minimum of 14 inches (357 mm) into the stem wall.

In Seismic Design Categories D_0, D_1 and D_2 where a grouted masonry stem wall is supported on a concrete footing and stem wall, a minimum of one No. 4 bar shall be installed at not more than 4 feet (1219 mm) on center. The vertical bar shall extend to 3 inches (76 mm) clear of the bottom of the footing and have a standard hook.

In Seismic Design Categories D_0, D_1 and D_2 masonry stem walls without solid grout and vertical reinforcing are not permitted.

> **Exception:** In detached one- and two-family *dwellings* which are three stories or less in height and constructed with stud bearing walls~~, plain concrete footings without longitudinal reinforcement supporting walls and~~ isolated plain concrete footings supporting columns or pedestals are permitted.

Reason: In seismic design categories D_0, D_1 and D_2, the flexural demands placed upon footings by the variety of braced wall panels configurations described in IRC Chapter 6, some of which require a hold-down device at one end or each end make the use of plain concrete footings unacceptable. The footing is an integral part of the seismic force load path and deserves to be constructed in as robust a manner as the braced wall panels it is supporting. The exception to use plain concrete isolated footing pads at columns or pedestals is retained because these are not use to support or anchor braced walls unless designed in accordance with accepted engineering practice per Section R602.10.7 Item 2.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MAIEL-RB-2-R403.1.3

RB73–09/10
R202 (New), R403.1.6

Proponent: Gary Ehrlich, National Association of Home Builders (NAHB)

1. Add new definitions as follows:

SILL PLATE. A horizontal wood member anchored to the foundation and supporting floor joists.

SOLE PLATE. A horizontal wood member at the bottom of a wood stud wall, attached to a concrete slab.

2. Revise as follows:

R403.1.6 Foundation anchorage. Where wood sill and sole plates and cold-formed steel framed walls are supported directly on continuous foundation~~s~~ walls or monolithic slabs with integral footings required by the provisions of this code, they shall be anchored to the foundation in accordance with this section.

Wood sole plates at all exterior walls ~~on monolithic slabs~~, wood sole plates of *braced wall panels* at building interiors on monolithic slabs with integral footings, and all wood sill plates shall be anchored to the foundation with ½ inch (12.7 mm) diameter anchor bolts spaced a maximum of 6 feet (1829 mm) on center or approved anchors or anchor straps spaced as required to provide equivalent anchorage to the ½-inch-diameter (12.7 mm) anchor bolts. Bolts shall ~~be at~~

~~least ½ inch (12.7 mm) in diameter and shall~~ extend a minimum of 7 inches (178 mm) into concrete or grouted cells of concrete masonry units. A nut and washer shall be tightened on each anchor bolt. There shall be a minimum of two bolts per plate section with one bolt located not more than 12 inches (305 mm) or less than seven bolt diameters from each end of the plate section. Interior bearing wall sole plates on monolithic slab foundations with integral footings that are not part of a *braced wall panel* shall be positively anchored with *approved* fasteners. Sill plates and sole plates shall be protected against decay and termites where required by Sections R317 and R318. Cold-formed steel framing systems shall be fastened to wood sill plates or anchored directly to the foundation as required in Section R505.3.1 or R603.3.1.

Exceptions:

1. ~~Foundation anchorage, spaced as required to provide equivalent anchorage to 1/2-inch-diameter (12.7 mm) anchor bolts.~~
2. ~~2~~ 1. Walls 24 inches (610 mm) total length or shorter connecting offset *braced wall panels* shall be anchored to the foundation with a minimum of one anchor bolt located in the center third of the plate section and shall be attached to adjacent *braced wall panels* at corners as shown in Figure R602.10.4.4(1).
3. ~~3~~ 2. Connection of walls 12 inches (305 mm) total length or shorter connecting offset *braced wall panels* to the foundation without anchor bolts shall be permitted. The wall shall be attached to adjacent *braced wall panels* at corners as shown in Figure R602.10.4.4(1).

Reason: The purpose of this proposal is to revise the language for anchorage of light-frame wood and cold-formed steel stud walls to the foundations of the house. Without these revisions, we are concerned that the code will present an enforcement nightmare for plan reviewers and inspectors, and lead to anchor bolts and continuous footings being required where they are not necessary and have not traditionally been provided.

The ICC Ad-Hoc Committee on Wall Bracing revised this section during the 2007/2008 code cycle with the intent of insuring that sufficient anchorage is provided on braced wall lines and panels inside a dwelling to transfer lateral loads to either monolithic (thickened) slab foundations or continuous footings. While we agree that providing a continuous load path is important, the change was overly broad in its application and will present an enforcement problem. For instance, the first sentence of the 2009 IRC Section R403.1.6 effectively requires all light-frame walls to be provided with anchor bolts to the foundation. Thus, a non-bearing interior partition that is not part of a braced wall line but which just happens to sit atop a foundation wall or continuous foundation (e.g. at a partial basement, crawlspace, or interior knee wall) would be required to be fastened to the wall or footing below with 1/2" diameter anchor bolts at 6 foot spacing. We are also concerned the new language (in particular the change for walls on interior monolithic slabs) does not explicitly permit anchor bolts to be replaced by wedge anchors, expansion bolts, mudsill straps, or other equivalent anchorage, and also that it may require thickened slabs or continuous footings where they have not traditionally been provided or are not required by other sections of the IRC.

Further, there was no technical justification provided for the increased anchorage requirements. Whole-building structural tests have shown that our current methods of construction are stronger than current engineering practice and engineering design standards give them credit for. An actual house in the field tested by researchers in New Zealand performed 50% better than predicted by engineering design, even with sill plates attached only by single nails, rather than anchor bolts. We also note that the bottom plate of a braced wall line on the interior and supported on floor framing (including a raised floor system over a crawlspace or pier-and-beam foundation) can be attached to the framing with 3-16d nails at 16" spacing, but the same plate on a continuous footing will require 1/2" anchor bolts at 7" spacing. Thus, by implementing these new requirements for additional anchor bolts on braced wall lines inside our structures we are essentially contradicting 40 years of research into light-frame wood construction. We are not aware of any racking failures on interior braced wall lines that would justify adding bolts to these lines.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EHRLICH-RB-5-R202-R403.1.6

RB74–09/10
R403.1.6

Proponent: Dennis Pitts, American Forest & Paper Association

Revise as follows:

R403.1.6 Foundation anchorage. Sill plates and walls supported directly on continuous foundations shall be anchored to the foundation in accordance with this section. Wood sill plates or wood bottom plates shall have full bearing on the foundation system.

Wood sole plates at all exterior walls on monolithic slabs, wood sole plates of *braced wall panels* at building interiors on monolithic slabs and all wood sill plates shall be anchored to the foundation with anchor bolts spaced a maximum of 6 feet (1829 mm) on center. Bolts shall be at least ½ inch (12.7 mm) in diameter and shall extend a minimum of 7 inches (178 mm) into concrete or grouted cells of concrete masonry units. A nut and washer shall be tightened on each anchor bolt. There shall be a minimum of two bolts per plate section with one bolt located not more than 12 inches (305 mm) or less than seven bolt diameters from each end of the plate section. Interior bearing wall sole plates

on monolithic slab foundation that are not part of a *braced wall panel* shall be positively anchored with *approved* fasteners. Sill plates and sole plates shall be protected against decay and termites where required by Sections R317 and R318. Cold-formed steel framing systems shall be fastened to wood sill plates or anchored directly to the foundation as required in Section R505.3.1 or R603.3.1.

Exceptions:

1. Foundation anchorage, spaced as required to provide equivalent anchorage to 1/2-inch-diameter (12.7 mm) anchor bolts.
2. Walls 24 inches (610 mm) total length or shorter connecting offset *braced wall panels* shall be anchored to the foundation with a minimum of one anchor bolt located in the center third of the plate section and shall be attached to adjacent *braced wall panels* at corners as shown in Figure R602.10.4.4(1).
3. Connection of walls 12 inches (305 mm) total length or shorter connecting offset *braced wall panels* to the foundation without anchor bolts shall be permitted. The wall shall be attached to adjacent *braced wall panels* at corners as shown in Figure R602.10.4.4(1).

Reason: Full bearing is required to prevent cross-grain bending stresses of the wood sill plate or wood bottom plate. Further, the *2001 Wood Frame Construction Manual (WFCM) for One- and Two-Family Dwellings*, which is adopted by reference in the IRC, states the following: "3.2.1.7 … Sill plates or bottom plates shall have full bearing on the foundation system."

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PITTS-RB-16-R403.1.6

RB75–09/10
R403.1.6

Proponent: Mark Ferm, Boise, ID

Revise as follows:

R403.1.6 Foundation anchorage. Sill plates and walls supported directly on continuous foundations shall be anchored to the foundation in accordance with this section. Wood sole plates at all exterior walls on monolithic slabs, wood sole plates of *braced wall panels* at building interiors on monolithic slabs and all wood sill plates shall be anchored to the foundation with anchor bolts spaced a maximum of 6 feet (1829 mm) on center. Bolts shall be at least ½ inch (12.7 mm) in diameter and shall extend a minimum of 7 inches (178 mm) into concrete or grouted cells of concrete masonry units. A nut and washer shall be tightened on each anchor bolt. There shall be a minimum of two bolts per plate section with one bolt located not more than 12 inches (305 mm) or less than seven bolt diameters from each end of the plate section. Interior bearing wall sole plates on monolithic slab foundation that are not part of a *braced wall panel* shall be positively anchored with *approved* fasteners. Sill plates and sole plates shall be protected against decay and termites where required by Sections R317 and R318. Cold-formed steel framing systems shall be fastened to wood sill plates or anchored directly to the foundation as required in Section R505.3.1 or R603.3.1.

Exceptions:

1. Foundation anchorage, spaced as required to provide equivalent anchorage to 1/2-inch-diameter (12.7 mm) anchor bolts.
2. Walls 24 inches (610 mm) total length or shorter connecting offset *braced wall panels* shall be anchored to the foundation with a minimum of one anchor bolt located in the center third of the plate section and shall be attached to adjacent *braced wall panels* at corners as shown in Figure R602.10.4.4(1).
3. Connection of walls 12 inches (305 mm) total length or shorter connecting offset *braced wall panels* to the foundation without anchor bolts shall be permitted. The wall shall be attached to adjacent *braced wall panels* at corners as shown in Figure R602.10.4.4(1).
4. Bolts located not more than 12 inches from plate ends may be omitted when sill plate is spliced as required by 602.3.2
5. Bolts located not more than 12 inches from end of sill plates may be omitted when floor sheathing is nailed directly to sill plate.

Reason: This splicing technique is used in other areas of the code (301.2.2.2.2.2, 502.6.1,602.11.2) Furthermore with the different trades concrete, carpentry with one trade setting the anchor bolts and another installing the sill plate. In addition to this the different lumber lengths and species make proper layout difficult.

Cost Impact: Slight impact + or -.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FERM-RB-1-R403.1.6

RB76–09/10
R403.1.9 (New)

Proponent: Daniel J. Walker, PE, Thomas Associates, Inc., representing the National Sunroom Association

Add new text as follows:

R403.1.9 Patio cover and screen enclosure footings. In areas with a frost line depth of zero as specified in Table R301.2 (1), a *patio cover* or *screen enclosure* shall be permitted to be supported on a slab on grade without footings, provided the slab conforms to the provisions of Section R506 of this code, is not less than 3.5 inches (89 mm) thick, and the columns support live and dead loads of less than 750 pounds (3.34 kN) per column.

Reason: This language has long been included in Appendix H of the code. The requirements are specific to this section and therefore should be included here.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WALKER-RB-4-R403.1.9

RB77–09/10
R404.1.1, R404.1.2

Proponent: Robert Rice, Josephine County Building Safety, representing the Southern Oregon Chapter of ICC

Revise as follows:

R404.1.1 Design of masonry foundation walls. Masonry foundation walls shall be designed and constructed in accordance with the provisions of this section or in accordance with the provisions of ASCE 5 or NCMA TR68-A. Construction drawings shall state the standard used and shall show, with sufficient clarity, the detailed requirements of Section R404 or the applicable standard. When TMS 402/ACI 530, NCMA TR68-A or the provisions of this section are used to design masonry foundation walls, project drawings, typical details and specifications are not required to bear the seal of the architect or engineer responsible for design, unless otherwise required by the state law of the jurisdiction having authority.

R404.1.2 Concrete foundation walls. Concrete foundation walls that support light-frame walls shall be designed and constructed in accordance with the provisions of this section, ACI 318, ACI 332 or PCA 100. Concrete foundation walls that support above-grade concrete walls that are within the applicability limits of Section R611.2 shall be designed and constructed in accordance with the provisions of this section, ACI 318, ACI 332 or PCA 100. Construction drawings shall state the standard used and shall show, with sufficient clarity, the detailed requirements of Section R404 or the applicable standard. Concrete foundation walls that support above-grade concrete walls that are not within the applicability limits of Section R611.2 shall be designed and constructed in accordance with the provisions of ACI 318, ACI 332 or PCA 100. When ACI 318, ACI 332, PCA 100 or the provisions of this section are used to design concrete foundation walls, project drawings, typical details and specifications are not required to bear the seal of the architect or engineer responsible for design, unless otherwise required by the state law of the jurisdiction having authority.

Reason: Section R404 and the various standards contain different requirements and it should be made clear on the project drawings which standard are being used. In addition to the different requirements between standards, the requirements vary based on wall height, retained earth height, sill bolt anchoring, joist or blocking connection to sill, etc In order to do a plan check or inspection this information needs to be shown on the construction drawings.

Cost Impact: This proposal does not change the construction requirements of the code and will not change the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-RB-1-R404.1.1

RB78–09/10
R404.1.2.3.6.1, R611.4.4 (New), Chapter 44 (New)

Proponent: Stephen V. Heller, representing the Insulating Concrete Form Association (ICFA)

1. Revise as follows:

R404.1.2.3.6.1 Stay-in-place forms. Stay-in place concrete forms shall comply with this section.

1. Surface burning characteristics. The flame-spread index and smoke-developed index of forming material, other than foam plastic, left exposed on the interior shall comply with Section R302. The surface burning characteristics of foam plastic used in insulating concrete forms shall comply with Section R316.3.
2. Interior covering. Stay-in-place forms constructed of rigid foam plastic shall be protected on the interior of the building as required by Section R316. Where gypsum board is used to protect the foam plastic, it shall be installed with a mechanical fastening
system. Use of adhesives in addition to mechanical fasteners is permitted.
3. Exterior wall covering. Stay-in-place forms constructed of rigid foam plastics shall be protected from sunlight and physical damage by the application of an *approved* exterior wall covering complying with this code. Exterior surfaces of other stay-in-place forming systems shall be protected in accordance with this code.
4. Termite hazards. In areas where hazard of termite damage is very heavy in accordance with Figure R301.2(6), foam plastic insulation shall be permitted below *grade* on foundation walls in accordance with one of the following conditions:
   4.1. Where in addition to the requirements in Section R318.1, an *approved* method of protecting the foam plastic and structure from subterranean termite damage is provided.
   4.2. The structural members of walls, floors, ceilings and roofs are entirely of noncombustible materials or pressure-preservative-treated wood.
   4.3. On the interior side of *basement* walls.
5. Flat IFC wall system forms shall conform to ASTM E 2634.

2. Add new text as follows:

R611.4.4 Flat ICF walls systems. Flat ICF wall system forms shall conform to ASTM E 2634.

3. Add new standard to Chapter 44 as follows:

ASTM

E 2634—08	Standard Specification for Flat Wall Insulating Concrete Form (ICF) Systems

Reason: This proposal adds ASTM E2634 to the code to help users determine acceptance of Flat Wall ICF forming systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E 2634-08, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HELLER-RB-2-R404.1.2.3.6.1-R611.4.4-CH 44

RB79–09/10
R404.1.5.3

Proponent: Bruce D. Spicher, Orangeburg County, SC

Revise as follows:

R404.1.5.3 Pier and curtain wall foundations. Use of pier and curtain wall foundations shall be permitted to support light-frame construction not more than two stories in height, provided the following requirements are met:

1. All load-bearing walls shall be placed on continuous concrete footings placed integrally with the exterior wall footings.

2. The minimum actual thickness of a load-bearing masonry wall shall be not less than 4 inches (102 mm) nominal or 33/8 inches (92 mm) actual thickness, and shall be bonded integrally with piers spaced in accordance with Section R606.9.
3. Piers shall be constructed in accordance with Section R606.6 and Section R606.6.1, and shall be bonded into the load-bearing masonry wall in accordance with Section R608.1.1 or Section R608.1.1.2.
4. The maximum height of a 4-inch (102 mm) load-bearing masonry foundation wall supporting wood-frame walls and floors shall not be more than 4 feet (1219 mm).
5. Anchorage shall be in accordance with Section R403.1.6, Figure R404.1.5(1), or as specified by engineered design accepted by the *building official*.
6. The unbalanced fill for 4-inch (102 mm) foundation walls shall not exceed 24 inches (610 mm) for solid masonry or 12 inches (305 mm) for hollow masonry.
7. ~~In Seismic Design Categories D0, D1 and D2, prescriptive reinforcement shall be provided in the horizontal and vertical direction. Provide minimum horizontal joint reinforcement of two No.9 gage wires spaced not less than 6 inches (152 mm) or one 1/4 inch (6.4 mm) diameter wire at 10 inches (254 mm) on center vertically. Provide minimum vertical reinforcement of one No. 4 bar at 48 inches (1220 mm) on center horizontally grouted in place.~~

Reason: This section allows pier curtain walls in Seismic D zones up to a maximum height of 48" with pier spacing at 48". This leaves an area approximately 32" wide between piers and 48" in height. Note (2) calls for masonry curtain wall to be integrally bonded with piers as shown in Figure R404.1.5(1).

The area between the piers (32" x 48") has no vertical support or horizontal support. You cannot provide wall tie bonding as required by 608.1.2. Figure R404.1.5(1) is showing a strap similar to Simpson's PA51. The figure is showing this strapping running through the 3.5" masonry bonding units. To insert this strap through the hollow cavity of 3.5" masonry unit is impossible.

To construct this pier curtain wall in a Seismic D zone and meet all the requirements of the 2009 IRC for masonry foundation walls is not only impractical, it is impossible.

Cost Impact: As far as an increase in construction cost to move from pier curtain walls to a CMU wall with labor included, it is actually less expensive to install a CMU wall (concrete block 8 x 16) than it is to erect a pier curtain wall. As stated, you can meet all the requirements of the code with a CMU wall, where as a pier curtain wall in a Seismic D zone you cannot.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SPICHER-RB-1-R404.1.5.3

RB80–09/10

R404.1.9 (New), R404.1.9.1 (New), R404.1.9.2 (New), R404.1.9.3 (New), R404.1.9.4 (New), R404.1.9.5 (New), R602.10.7

Proponent: Gary Ehrlich, National Association of Home Builders (NAHB)

1. Add new text as follows:

R404.1.9 Isolated masonry piers. Isolated masonry piers shall be constructed in accordance with this section and the general masonry construction requirements of Section R606. Hollow masonry piers shall have a minimum nominal thickness of 8 in. (203 mm), with a nominal height not exceeding four (4) times the nominal thickness and a nominal length not exceeding three (3) times the nominal thickness. Where hollow masonry units are solidly filled with concrete or grout, piers shall be permitted to have a nominal height not exceeding ten (10) times the nominal thickness. Footings for isolated masonry piers shall be sized in accordance with Section R403.1.1.

R404.1.9.1 Pier cap. Hollow masonry piers shall be capped with 4 inches (102 mm) of solid masonry or concrete, a masonry cap block, or shall have cavities of the top course filled with concrete or grout unless a sill plate of 2-inch (51 mm) minimum nominal thickness and bearing on two face shells is provided. The sill plate shall provide a minimum nominal bearing area of 48 square inches (30 865 square mm). Where required, termite protection for the pier cap or sill plate shall be provided in accordance with Section R318.

R404.1.9.2 Masonry piers supporting floor girders. Masonry piers supporting wood girders complying with Tables R502.5(1) and R502.5(2) shall be permitted in accordance with this section. Piers supporting girders for interior bearing walls shall have a minimum nominal dimension of 12 inches (305 mm) and a maximum height of 10 feet (3 048 mm) from top of footing to bottom of sill plate or girder. Piers supporting girders for exterior bearing walls shall have a minimum nominal dimension of 12 inches (305 mm) and a maximum height of 4 feet (1 220 mm) from top of footing to bottom of sill plate or girder. Girders and sill plates shall be anchored to the pier or footing in accordance with Section R403.1.6 or Figure R404.1.5(1).

R404.1.9.3 Masonry piers supporting braced wall panels. Masonry piers supporting braced wall panels shall be constructed in accordance with Figure R602.10.7.

R404.1.9.4 Seismic design of masonry piers. Masonry piers in all dwellings located in Seismic Design Category D0, D1, D2, and townhouses in Seismic Design Category C, shall be designed in accordance with accepted engineering practice.

R404.1.9.5 Masonry piers in flood hazard areas. Masonry piers for dwellings in flood hazard areas shall be designed in accordance with Section R322.

2. Revise as follow:

R602.10.7 Braced wall panel support. *Braced wall panel* support shall be provided as follows:

1. Cantilevered floor joists, supporting *braced wall lines*, shall comply with Section R502.3.3. Solid blocking shall be provided at the nearest bearing wall location. In Seismic Design Categories A, B and C, where the cantilever is not more than 24 inches (610 mm), a full height rim joist instead of solid blocking shall be provided.
2. Raise floor system ~~Elevated~~ post or pier foundations exceeding 4 feet (1 220 mm) in height and supporting *braced wall panels* shall be designed in accordance with accepted engineering practice. Raised floor system masonry pier foundations not exceeding 4 feet (1 220 mm) in height, and isolated masonry piers in basements, shall be permitted to be designed in accordance with Section R404.1.9.
3. Masonry stem walls with a length of 48 inches (1220 mm) or less supporting *braced wall panels* shall be reinforced in accordance with Figure R602.10.7. Masonry stem walls with a length greater than 48 inches (1220 mm) supporting *braced wall panels* shall be constructed in accordance with Section R403.1 *Braced wall panels* constructed in accordance with Sections R602.10.3.2 and R602.10.3.3 shall not be attached to masonry stem walls.

Reason: The purpose of this proposal is to introduce provisions for isolated masonry piers used as foundations for raised wood floor systems. Masonry pier foundations are a common construction method. However, besides a brief mention in R606.6, no other guidance is given for the construction of these piers, other than a reference in R602.10.6 calling for engineered design of piers supporting braced wall panels.

Language is proposed for Chapter 4 to provide prescriptive guidance for isolated masonry piers constructed inside a basement or crawlspace. The language proposed for R404.1.9 for masonry piers is based on the empirical design limits contained in the MSJC. The language is adopted from the paragraph on Foundation Piers in NCMA's TEK Note 5-3A: "Concrete Masonry Foundation Wall Details". Further limits are provided for piers supporting floor girders, braced wall panels, and for piers in high-seismic or flood hazard areas.

The language in R602.10.6 is modified and coordinated with the proposed R404.1.9 language to allow prescriptive design of short exterior masonry piers and of isolated interior masonry piers complying with R404.1.9. Taller masonry piers supporting an elevated deck, sunroom, or other substantially raised portion of a dwelling are relegated to engineered design. It was the original intent of R602.10.6 to address these full-height piers, not to require engineered design for every raised wood floor/crawlspace regardless of pier height.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EHRLICH-RB-6-R404.1.9-R602.10.7

RB81–09/10
R404.4

Proponent: Robert Rice, Josephine County Building Safety, representing the Southern Oregon Chapter of ICC

Revise as follows:

R404.4 Retaining walls. Retaining walls that are not laterally supported at the top and that retain in excess of 24 inches (610 mm) of unbalanced fill shall be designed in accordance with accepted engineering practice to ensure stability against overturning, sliding, excessive foundation pressure and water uplift. Retaining walls shall be designed for a safety factor of 1.5 against lateral sliding and overturning. Concrete or masonry foundation walls that have permanent lateral support at the top and bottom shall be in accordance with R404.1.

Reason: This proposal is to clarify that the type of "Retaining walls" referred to in section R404.5 are designed as free-standing (cantilevered) retaining walls. This type of wall is very different from the "Concrete and masonry foundation" walls referred to in Section R404.1 where there is lateral support required at top and bottom. If the provisions of the two were combined it could result in a wall that is subject to failure. In the design provisions of the concrete or masonry foundation walls with lateral support at the top and bottom the vertical reinforcement, at distance "d" per Tables R404.1.1(2) through R404.1.1(5), is on the tension side of the wall which is the side away from the soil. In a retaining wall without support at the top, as referred to in R404.5, the reinforcement should be on the soil side. If, for instance, a cantilevered retaining wall was restrained at the top (especially prior to backfill) the tension side of the wall would be away from the soil side which is opposite of the wall design. In addition, there are no prescriptive provisions contained in the IRC for the design of this type of wall. An engineered design would be required for a free-standing cantilevered retaining wall.

Cost Impact: The intent of this proposal is to clarify the existing requirements and no new requirements have been added. There will be no increase in the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-RB-2-R404.4

RB82–09/10

R405.1, R405.1.1 (New), R405.2, R405.2.1, R405.2, R405.2.2, R405.3

Proponent: James Jorgensen, PE, City of Lenexa, KS, representing the Metropolitan Kansas Chapter of ICC

1. Revise as follows:

R405.1 Concrete or masonry foundations. Drains shall be provided around all concrete or masonry foundations that retain earth and enclose habitable or usable spaces located below *grade*. Drainage tiles, gravel or crushed stone drains, perforated pipe or other *approved* systems or materials shall be installed ~~at or~~ below the floor level of the area to be protected and shall discharge ~~by gravity or mechanical means~~ into an *approved* drainage system in accordance with Section R405.3.. Gravel or crushed stone drains shall extend at least 1 foot (305 mm) beyond the outside edge of the footing and 6 inches (152 mm) above the top of the footing, be at least 12 inches deep, and be ~~covered~~ surrounded by ~~with~~ an *approved* filter membrane material. The top of open joints of drain tiles shall be protected with strips of building paper.~~, and~~ The drainage tiles or perforated pipe shall be placed on a minimum of 2 inches (51 mm) of washed gravel or crushed rock at least one sieve size larger than the tile joint opening or perforation and covered with not less than 6 inches (152 mm) of the same material. Perforated pipe drains shall be covered with an approved filter membrane or an approved filter membrane shall surround the gravel/crushed rock covering the drain. Drains shall be placed level or at a positive slope to the point of collection for removal from the structure.

Exceptions:

1. A drainage system is not required when the foundation is installed on well-drained ground or sand-gravel mixture soils according to the Unified Soil Classification System, Group I Soils, as detailed in Table R405.1.
2. Perforated pipe drains may be placed on top of a concrete footing in lieu of a bed of gravel or rock provided it is below the floor level of the usable space.

2. Add new text as follows:

R405.1.1 Perforated pipe drains. Perforated pipe drains and drain tile shall have a minimum interior diameter of 4 inches.

3. Revise as follows:

R405.2 Wood foundations. Wood foundations enclosing habitable or usable spaces located below *grade* shall be adequately drained in accordance with Sections R405.2.1 ~~through~~, R405.2.~~3~~2 and R405.3.

R405.2.1 Base. A porous layer of gravel, crushed stone or coarse sand shall be placed to a minimum thickness of 4 inches (102 mm) under the *basement* floor. Provision shall be made for automatic draining of this layer and the gravel or crushed stone wall footings. To drain the base layer, interior drains complying with Section R405.1 shall be provided below the base layer, around the perimeter of the enclosed area and connected to the drainage system.

R405.2.2 ~~Vapor retarder~~ Moisture barrier. A 6-mil-thick (0.15 mm) polyethylene ~~vapor retarder~~ moisture barrier shall be applied over the porous layer with the *basement* floor constructed over the polyethylene.

~~R405.2~~ R405.3 Drainage system. In other than Group I soils, an approved drainage system shall be provided to ~~a sump shall be provided to~~ drain the ~~porous~~ base layer and footings. The system shall discharge by gravity or mechanical means and shall be capable of removing any accumulated water and discharging it to an approved location to move water away from the structure. Where drainage is by mechanical means a sump shall be provided. The sump shall be at least 24 inches (610 mm) in diameter or 20 inches square (0.0129 m2), shall extend at least 24 inches (610 mm) below the bottom of the *basement* floor ~~and shall be capable of positive gravity or mechanical drainage to remove any accumulated water. The drainage system shall discharge into an *approved* sewer system or to daylight~~. For gravity drainage systems solid pipe shall be provided between the termination point and the connection at the structure and shall terminate in a manner to facilitate cleaning.

Reason: The foundation drainage requirements in the code need clarification to be a more effective component of the code. These requirements have not been updated for many years. A frequent complaint on existing homes is water infiltration into the basement areas. More and more basement areas are used as primary living space. Repairs to dwellings resulting from ineffective installation of the foundation drainage system are costly and is preventable. The codes lack of clarity on this issue leads to ineffective enforcement.

In R405.1 the location of the drains "at or below" the floor level allows for installations that may be ineffective at removing water from the foundation area by allowing water to enter the usable space before it can be drained away. Clarifying that the drains must be below the floor level (top of the floor surface) provides more clarity. Where gravel or crushed stone drains are used the code does not specify a depth of the drain, only that it extends 6 inches above the level of the footing. Since the minimum floor thickness is 4 inches the drain is above the level of the floor which is ineffective. Many standards that address drainage systems require that stone drains be completely enclose to prevent fines from clogging the drainage system. Simply covering the material with a filter membrane does not prevent fines from clogging the drains.

The term "approved filter membrane" does not provide good direction for code officials or builders. Although my research indicates that many roadway projects use AASHTO M288-00 for class 3 for use in drains and French drains I am not sure if this is what is commonly supplied with prefabricated socks for perforated drains. Clarification can be provided in a future code change.

The current code required gravel and stone drains to be covered with a filter membrane, however; the code is silent on the requirements for the protection of perforated drains. To prevent fines from penetrating the openings in the perforated pipe protection by a filter membrane is required around the pipe or around the stone/gravel covering the pipe.

The requirements for removal of water by gravity or mechanical means as been moved to the section on drainage where it can more comprehensively addressed.

The code does not specify a minimum size for drain tile therefore a minimum size of 4 inches interior diameter has been provided. Three inches may be acceptable for some smaller dwellings with short distances to the point of collection but the cost difference is minimal and 4 inches is more effective.

Drains should not have sharp rises or falls that provide for collection points for fine material leading to clodding of the drains over time, therefore a provision for providing a level or positive slope has been added. Section R405.2.1 has been modified to clarify that to drain the porous layer below the base drains complying the R405.1 are required and they shall be installed around the perimeter of the space and below the base layer. Drainage system R405.3. Current Section R405.2.3 only applies to wood foundations. R405.1 only requires that the drains from the protected area discharge to an approved location without clarifying the process. It is inconsistent for wood foundations to be very specific regarding the sump and drainage of the porous layer and have no clarity for concrete and masonry foundations. R405.3 includes the old language in R405.1 for drainage by gravity or mechanical means and adds clarification that for gravity drains the termination point should be such that it could be cleaned of any accumulated debris at the termination from the house to the termination point.

Cost Impact: There may be a slight increase in the initial cost of construction if a jurisdiction did not previously require that perforated drains or crushed gravel drains be protected with an approved filter membrane or provide a means of draining the base layer under basement floors.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: JORGENSEN-RB-1-R405.1

RB83–09/10
R408.3

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing the Extruded Polystyrene Foam Association

Revise as follows:

R408.3 Unvented crawl space. Ventilation openings in under-floor spaces specified in Sections R408.1 and R408.2 shall not be required where:

1. Exposed earth is covered with a continuous Class I vapor retarder. Joints of the vapor retarder shall overlap by 6 inches (152 mm) and shall be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (152 mm) up the stem wall and shall be attached and sealed to the stem wall <u>or insulation</u>; and
2. One of the following is provided for the under-floor space:
   - 2.1. Continuously operated mechanical exhaust ventilation at a rate equal to 1 cubic foot per minute (0.47 L/s) for each 50 square feet (4.7m2) of crawlspace floor area, including an air pathway to the common area (such as a duct or transfer grille), and perimeter walls insulated in accordance with Section N1102.2.9;
   - 2.2. *Conditioned air* supply sized to deliver at a rate equal to 1 cubic foot per minute (0.47 L/s) for each 50 square feet (4.7 m^2) of under-floor area, including a return air pathway to the common area (such as a duct or transfer grille), and perimeter walls insulated in accordance with Section N1102.2.9;
   - 2.3. Plenum in existing structures complying with Section M1601.5, if under-floor space is used as a plenum.

Reason: This code proposal gives the user and /or installer the option to tape or seal to the insulation rather than the stem wall. This option allows the foam to be installed first, then the vapor retarder. This will ease installation and provide greater flexibility without compromising the function of the vapor retarder itself.

A companion code proposal to the IBC is not required since the existing language is not in the IBC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEITEL-RB-6-R408.3

RB84–09/10
R501.3 (New), Chapter 44 (New)

Proponent: Jeff Hugo, CBO, National Fire Sprinkler Association

1. Add new text as follows:

R501.3 Fire Protection. All new one and two family dwellings using floor framing components or systems composed of prefabricated I joists, trusses, and cold formed steel shall be fire sprinklered throughout according to NFPA 13, NFPA 13R, NFPA 13D or Section P2904.1.

2. Add new standard to Chapter 44 as follows:

NFPA
13R—07 Installation of Sprinkler Systems in Residential Occupancies Up to and Including Four Stories in height

Reason: Lightweight construction consisting of prefabricated I joists, trusses, and cold formed steel are excellent materials in many ways. They save labor, time, natural resources, and call backs. However, widespread fire experience shows that floors framed out of these materials do not have the same durability in the event of a fire as solid sawn lumber and are not only hazardous to the occupants evacuating the home, but especially to responding emergency personnel, such as fire fighters.

Several research studies have been performed showing the potential failures of these flooring assemblies during fires and the potential for floor collapse during fire fighter operations. Additional research has shown the ability of fire sprinklers to prevent the fire from reaching the point where it could cause the same kind of damage. This research shows that with fire sprinkler systems in the home, the prefabricated I joists, trusses and cold formed steel materials are safe to use. But without fire sprinklers, these materials could fail catastrophically during a fire.

This requirement is important to put into the IRC even if the requirement for sprinklers is maintained because there are many jurisdictions that will not accept the blanket requirement for sprinklers, but will maintain this option for using sprinklers with this specific type of construction.

Bibliography:
Tyco Fire Suppression & Building Products. A Technical Analysis: The Performance of Composite Wood Joists Under Realistic Fire Conditions. 2008

Su, J.Z., N.; Bawaly, A.C.; Lougheed, G.D.; Taber, B.C.; Leroux, P.; Proulx, G.; Kashef, A.; McCarthey, C.; Thomas, J.R. Fire Performance of Houses, Phase I. Study of Unprotected Floor Assemblies in Basement Fire Scenarios, Summary Report. 12/15/2008

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The proposed new standard, NFPA 13R, is currently referenced in the *International Building Code*.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HUGO-RB-1-R501.3

RB85–09/10
R501.3 (New), Chapter 44 (New)

Proponent: Larry Wainright, Qualtim, Inc., representing the Structural Building Components Association

1. Add new text as follows:

R501.3 Fire Protection of Floors: Floors within dwelling units shall be protected on the underside by a minimum of 1/2" gypsum board applied in accordance with Section R702.3.

Exceptions:

1. Crawl spaces where the maximum clear height from the underside of the subfloor to the void space floor is 3 feet or less and is not intended for mechanical equipment use or storage.
2. The building is protected with an automatic sprinkler system designed to NFPA 13, 13D, 13R, or Section P2904 of this code.
3. Floors of any material or combination of materials achieving a 30-minute fire-resistance rating in accordance with ASTM E 119 or UL 263.
4. Floors that are protected by a material or combination of materials in accordance with the test procedures of ASTM E 84 or UL 723 that exhibits a flame spread index not exceeding 25, no evidence of progressive combustion and a flame front that does not progress more than 10 ½ feet (3200 mm) beyond the centerline of the burner at any time during an extended 30 minute test.

2. Add new standard to Chapter 44 as follows:

NFPA

13R—07 Installation of Sprinkler Systems in Residential Occupancies Up to and Including Four Stories in height

Reason: This proposal would require the underside of floors to be protected, providing a greater level of fire protection than unprotected floors. This would apply to all construction types, thereby creating no competitive advantage for specific building types.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: The proposed new standard, NFPA 13R, is currently referenced in the *International Building Code*.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WAINRIGHT-RB-8-R501.3

RB86–09/10
R501.3 (New)

Proponent: Sal DiCristina, representing Code Solutions, Inc.

Add new text as follows:

R501.3 Fire floor protection: Floors within dwelling units utilizing light-frame construction shall be protected on the underside by a minimum of 5/8" gypsum board applied in accordance with Section R702.3.

Exceptions:

1. Crawl spaces where the maximum clear height from the underside of the subfloor to the void space floor is 3 feet or less and is not intended for mechanical equipment use or storage.
2. The building is protected with an automatic sprinkler system designed to NFPA 13D or Section P2904 of this code.
3. Floors in which the exposed materials are protected by materials achieving a 30-minute fire-resistance rating in accordance with ASTM E 119 or UL 263.
4. Floors in which the exposed materials on the underside are protected by a fire-retardant coating that shall have, when tested in accordance with ASTM E 84 or UL 723 in the form in which it is applied, a listed flame spread index of 25 with no evidence of significant progressive combustion when the test is continued for an additional 20 minute period. In addition, the flame front shall not progress more than 10 ½ feet (3200 mm) beyond the centerline of the burners at any time the test.

Reason: This proposal is essentially the same as a proposal submitted by Battalion Chief Sean DeCrane of the Cleveland Fire Department with the addition of an exception number 4. We support Chief DeCrane's objectives, however, we believe additional flexibility is needed to provide the required level of protection in the vast array of construction configurations that may be encountered in the field.

The purpose of this additional method of protection is to provide an economical method to protect the underside of a floor without the need to apply a covering membrane that would restrict access. This would be important for unfinished basement and lower levels, or crawl spaces that do not meet exception 1.

It is important to note that the parameters required in proposed Exception 4 prevents the underside of the floor from ignited for a period of at least 30 minutes which matches the level of protection Mr. DeCrane seeks in Section R501.3.

ASTM 84 and UL 723 are already utilized in the IRC in Section R302 Fire Resistant Construction, however, the parameters above exceed those in R302 to ensure that a minimum of 30 minutes of protection is provided to the underside of the floors.

Of greater note is that material meeting the requirements of exception 4 meet or exceed the level of protection provided by fire-retardant treated wood (FRTW) that is permitted by Sections R802.1 and R802.1.3 of the IRC for protected roof framing.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DICRISTINA-RB-1-R501.3

RB87–09/10
R501.3 (New)

Proponent: Sean DeCrane, Cleveland, OH Fire Department, representing the International Association of Fire Fighters

Add new text as follows:

R501.3 Fire floor protection. Floors within dwelling units utilizing light-frame construction shall be protected on the underside by a minimum of 5/8" gypsum board applied in accordance with Section R702.3.

Exceptions:

1. Crawl spaces where the maximum clear height from the underside of the subfloor to the void space floor is 3 feet or less and is not intended for mechanical equipment use or storage.
2. The building is protected with an automatic sprinkler system designed to NFPA 13D or Section P2904 of this code.
3. Floors in which the exposed materials are protected by materials achieving a 30-minute fire-resistance rating in accordance with ASTM E 119 or UL 263.

Reason: On August 13, 2006 a Wisconsin fire fighter was killed, and a second fire fighter injured, when the floor they were operating on collapsed sending them into the basement. One fire fighter fell directly into the room of origin and was killed, the second fire fighter landed on the opposite side of a block wall and survived by shielding herself and making an escape through a rear window. They checked the floor to ensure it was safe and solid, just prior to collapse they heard a loud crack. T

The floor they were operating on was unprotected lightweight construction that collapsed without warning. In the ensuing investigation, the National Institute for Occupational Safety and Health released report F2006-26[1]. One of the recommendations is to "modify current building codes to require that lightweight trusses be protected with a fire barrier". This should not only pertain to truss construction. There are additional forms of construction that can be determined to be lightweight, cold form steel, bar joists, wooden engineered I-beam, etc., the recent trend in residential construction is to use products that are financially beneficial. It is the belief of many of us in the fire service that as the industry engineers products to a more finite point we are losing our safety factors.

In their report 2007-12 released May 16, 2008, NIOSH[2] recommended "Ensure fire fighters are trained for extreme conditions such as high winds and rapid fire progression associated with lightweight construction". They further stated, "In this era of new lightweight construction, training procedures covering strategy and tactics in extreme operations conditions, such as high winds and lightweight building construction (i.e. materials and design) are needed for all levels of fire fighters. Lightweight constructed buildings fail rapidly with little warning, complicating rescue efforts. The potential for fire fighters to become trapped or involved in a collapse may be increased. There are twenty-nine actions for fire fighters can take to protect themselves when confronted with buildings utilizing lightweight building components as structural members. They range from looking for signs or indicators that these materials are used in buildings (such as, newer structures, large unsupported spans, and heavy black smoke being generated) to getting involved in newer building code development".

On September 27, 2007 NIOSH released report 2006-24[3] The first recommendation of the report read "Ensure that fire fighters and incident commanders are aware unprotected pre-engineered I-joist floor systems may fail at a faster rate than solid wood joists when exposed to direct fire impingement, and they should plan interior operations accordingly". The discussion of the recommendation is quite lengthy but identifies the advantages of the construction industry using this type of construction but also relates the dangers to fire fighters, "The Illinois Fire Service Institute, at the University of Illinois, conducted tests to help determine the structural stability of sample floor systems. These studies suggest that engineered wooden I-beams can fail in as little as 4 minutes and 40 seconds under controlled test conditions". The report also states that weakened floors are difficult to detect from above as the floor surface may appear intact.

On November 16, 2007, NIOSH released report F2007-07[4]. In this Fire Fighter Death in the Line-of-Duty report, NIOSH recommends "building code officials and local authorities having jurisdiction should consider modifying the current codes to require that lightweight trusses are protected with a fire barrier on both the top and the bottom". The report further states "In this incident, the floor trusses for the first floor did not have any protection on the bottom cord, which immediately exposed the trusses to fire in the basement. Unfinished basements are very common throughout the country. Basements typically house additional fire exposures such as alternative heating sources, hot water heaters, clothes dryers, etc.. It is critical for trusses and lightweight engineered wood I-beams that are used in a load-bearing assembly to be protected with a thermal barrier such as gypsum wallboard. The function of the thermal barrier is a critical factor in the fire performance of the assembly".

In April, 2005, NIOSH released their report "Preventing Injuries and Deaths of Fire Fighters due to Truss System Failures"[5.] In their release they recommended the placement of a labeling system on buildings to indicate the type of construction. While this recommendation will probably not be acceptable to residents of a one or two family home, we can mandate that they increase the protection of the construction type to provide increased safety to the residents and the responding fire fighters.

In fact, NIOSH has been concerned enough with the performance of lightweight floors in fire conditions they released a Workplace Solutions report in February, 2009, *Preventing Deaths and Injuries of Fire Fighters Working Above Fire-Damaged Floor*[6]. Authors of the report recommend; "Builders, contractors, and owners should consider protecting all floor systems, including engineered wood I-joists, by covering the underside with fire-resistant materials".

Many of the opponents of this requirement have made claims that the fire service has failed to provide technical data to support our real world experiences with the lightweight products. Since the previous ICC code cycle there have been three specific reports released by three separate test groups performing tests for different reasons. I have included their results below.

The National Research Council Canada performed a series of tests in creating their report Fire Performance of Houses, Phase I: Study of Unprotected Floor Assemblies in Basement Fire Scenarios, released December 18, 2008. The goal of the report was "With the advent of new materials and innovative construction products and systems for use in construction of houses, there is a need to understand what impacts these materials and products will have on occupant life safety under fire conditions and a need to develop a technical basis for the evaluation of their fire performance".[7] These tests were not intentionally conducted for fire fighter safety but rather to identify the dangers to the civilian occupants and their ability to self evacuate. The report states "With the relatively severe fire scenarios used in the experiments, the times to reach structural failure for the wood I-joist, steel C-joist, metal plate and metal wood truss assemblies were 35-60% shorter than that for the solid wood joist assembly".

Additionally, “For the solid wood joist assemblies, the structural failure occurred after deflection of the floor, mainly in the form of OSB subfloor failure (burn through). For all other floor assemblies, after deflection of the floor, the structural failure occurred either in the form of complete collapse into the basement or in the form of a “V” shaped collapse due to joist or truss failure”. In keeping with the intent of occupant safety the report also found “One engineered floor assembly, which gave the shortest time to reach structural failure in the open basement scenario, failed structurally in the closed basement doorway scenario before the tenability limits were reached for healthy adults of average susceptibility”. This calls into question, if it can not give the occupant time to self evacuate how will it perform when a fire fighter is performing Search and Rescue for that specific occupant. In summarizing the various test results the report found “The time gap between the onset of untenable conditions and the structural failure of the floor assembly was smaller for the engineered floor assemblies than for the solid wood joist assembly used in the experiments”. This is very serious for the responding fire fighter performing life saving Search and Rescue for occupants who have lost consciousness due to the untenable conditions. These victims may still be savable but, the performances of the lightweight assemblies indicate that, savable victims may not be reached due to floor compromise.

In 2008 Tyco Fire Suppression & Building Products performed a series of fire tests. The intent of these tests was to demonstrate the impact residential sprinklers will have in improving fire safety in one and two-family occupancies when lightweight construction is present. The results of these tests were released in 2008 as A Technical Analysis: The Performance of Composite Wood Joists Under Realistic Fire Conditions.[8] In the introduction of the report the author states, “One example of the difference in fire performance of a lightweight structural member compared to solid sawn lumber is the behavior of composite wood joists. When a composite wood joist is exposed to fire, the thin oriented strand board used as the web in the joist is quickly consumed, which results in an inability of the joist to carry the load and ultimately a failure of the supported floor assembly”. Later in the introduction the report continues “Due to the greater mass per unit of surface area of the solid wood joist, it will support the floor assembly for much longer than its lightweight alternative when exposed to equivalent fire conditions”. The first test involving an unsprinklered room fire led to flashover in 7:09 from ignition and floor assembly collapse at the 11:30 mark from ignition. That is roughly four minutes from flashover we had a collapse of almost the entire 16’ x 16’ floor area. The second test results reached flashover in only 5:15 from ignition, collapse in this test occurred at 8:34 from ignition, a stunning three minutes after flashover. This would be the time the fire fighters are entering the structure for suppression and Search and Rescue efforts.

These reports are still not enough for some critics so I am referencing a third report. Underwriters Laboratories, The Chicago Fire Department and the International Association of Fire Chiefs received a grant from the Department of Homeland Security to conduct a number of tests on various topics but the main issue was to conduct tests, and report the findings, to evaluate the performance of lightweight structural components when exposed to fire and if the components can be protected. They recently issued the subsequent report *Structural Stability of Engineered Lumber in Fire Conditions*.[9] Tests assemblies were subjected to the standards of the ASTM E119 Test Standard. Two assemblies did not include a ceiling, six of the assemblies included a ceiling consisting of ½ inch thick gypsum board and one assembly included a ¾ inch plaster ceiling. A load of 40 psf was placed along two of the four edges and two 300 lb fire fighter mannequins were applied to the floor assembly. Results from the tests indicated that unprotected 12” wooden I-joist reached structural failure at the 5:58 mark in the tests. The resulting failure covered a large area of the floor. The unprotected 2” x 10” wooden I-beams reached structural collapse at the 18:45 mark in the test, a difference of over twelve minutes. These twelve minutes are critical in Search and Rescue. Further tests demonstrated that when ½ inch gypsum was placed on the 12” I-joists the collapse did not occur until the 26:45 mark in the test. Just a simple ½ covering extended the collapse time approximately twenty minutes. When the ½ inch covering was applied to the wooden I-beams the collapse time was extended to 44:45 mark in the test. One important factor to point out regarding these tests is that the fire fighters are a dead load and not a live load. Would a simulated live load of fire fighters transferring additional psi with each step or crawl have contributed to an earlier collapse? When we review the Wisconsin fire where Engineer Arnie Wolf was killed, the fire fighters stated the floor felt solid but suffered a catastrophic collapse when they began their search pattern. These tests clearly outline the performances of the various construction practices and the dangers these performances present to fire fighters. Underwriters Laboratories and the Chicago Fire Department followed these tests with an online educational program, to view go to http://www.uluniversity.us/home.aspx, in an attempt to educate the nation’s fire service on the hazards of operating in these environments.

This code change proposal is an attempt to provide a responsible means on residential construction. I have provided examples of fire fighters being killed in occupancies utilizing lightweight construction practices and the subsequent reports detailing the need to protect lightweight construction. I have also provided two reports generated by a neutral governmental agency recommending protection requirements for lightweight construction. These incidents, and others like them, have produced great hardships on the people involved, they have created widows, fatherless children, injured fire fighters and many who bear the pain of fatalities that could have been prevented. I strongly urge your support for this proposed code change.

1. National Institute for Occupational Safety and Health Report F206-26. July, 2007.
2. National Institute for Occupational Safety and Health Report F2007-12, May, 2008.
3. National Institute for Occupational Safety and Health Report F206-24, September, 2007.
4. National Institute for Occupational Safety and Health Report F2007-07, November, 2007.
5. National Institute for Occupational Safety and Health Alert, “Preventing Injuries and Deaths of Fire Fighters due to Truss System Failures”.
6. National Institute for Occupational Safety and Health Workplace Solutions, *Preventing Deaths and Injuries of Fire Fighters Working Above Fire-Damaged Floors*, February, 2009.
7. National Research of Canada, Institute for Research in Construction; Fire performance of Houses, Phase I, Study of Unprotected Floor Assemblies in Basement Fire Scenarios, December, 2008.
8. Tyco Industries, *A Technical Analysis: The Performance of Composite Wood Joists Under Realistic Fire Conditions*, September 2008.
9. Underwriters Laboratories, *Structural Stability of Engineered Lumber in Fire Conditions*, September 30, 2008

Floor assembly where Fire Engineer Arnie Wolf was killed

Residential use of cold form steel with penetrations and 24” on center

Even lighterweight materials – Georgia Pacific XJ-85

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DECRANE-RB-1-R501.3

RB88–09/10
R502.14 (New), Chapter 44 (New)

Proponent: Joseph Fleming, representing the Boston Fire Department

1. Add new text as follows:

R502.14 Fire floor protection. Floors within dwelling units utilizing light-frame construction shall be protected on the underside by a minimum of 5/8" gypsum board applied in accordance with Section R702.3
Exceptions:

1. Crawl spaces where the maximum clear height is 3 feet or less and is not intended for use or storage.
2. The building is protected with an automatic sprinkler system designed to NFPA 13D or Section P2904 of this code.
3. Floors in which the exposed materials on the underside are protected by a Class A Fire-Retardant Coating as defined by NFPA 703.

2. Add new standard to Chapter 44 as follows:

NFPA
703-09 Fire-Retardant Treated Wood and Fire-Retardant Coatings for Building Materials

Reason: When the Building Codes in the US transitioned to lightweight components in order to provide the same structural support at lower costs it was a well intentioned idea. However, it has had tragic unintended consequences in many circumstances. The lightweight components, which provided equivalent performance, at lower cost of construction, to the previously used "heavier components" during normal use, did not provided equivalent performance during structural fires. It may have been assumed that the lighter weight components would survive long enough to let occupants escape but what about occupants who are elderly, handicapped, or trapped because of ineffective smoke alarms. In these cases, firefighters have to conduct search and rescue operations. Often firefighters arrive in the middle of the night with no information about the occupants and must assume that someone needs to be rescued. In these circumstances firefighter's lives, as well as the occupants they are searching for are being put at an unreasonable risk.

The lightweight construction was considered to provide the same "safety factor" as the older heavier construction because it performed in a similar manner under specific tests designed to measure its ability to support a load during normal conditions. However, it is important to keep in mind that these tests measured only one aspect, albeit a critical aspect, of the material's safety. (A design with little flexibility due to conservative or incomplete assumptions has little "*robustness*". A design with a lot of flexibility due to liberal and complete assumptions has a lot of "*robustness"*.) The older heavier construction was extremely "robust," in that it performed for a long time under fire conditions in the same manner that it performed under non-fire conditions. The same cannot be said for light weight construction. The lighter weight construction is not equivalent to the heavier constriction unless it is as "robust" as the heavier construction.

To correct mistakes of the past and to provide better assurance that the light weight construction is equivalent to and as "robust" as the older heavier construction we must provide extra protection to allow it to perform under fire and non-fire conditions in the same manner that heavier construction material performs.

Specific examples where fire fighters have died, or been injured, due to, structural collapse during fire because of the use of this "less expensive" design have been documented by NIOSH Firefighter Fatality Reports.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: The proposed new standard, NFPA 703, is currently referenced in the *International Fire Code*.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FLEMING-RB-2-R502.14

RB89–09/10
R502.1.3, R602.1.1, R802.1.2

Proponent: Dennis Pitts, American Forest & Paper Association

Revise as follows:

R502.1.3 End-jointed lumber. Approved end-jointed lumber identified by a grade mark conforming to Section R502.1 may be used interchangeably with solid-sawn members of the same species and grade. End-jointed lumber used in an assembly required elsewhere in this code to have a fire resistance rating shall have the designation "Heat Resistant Adhesive" or "HRA" included in its grade mark.

R602.1.1 End-jointed lumber. Approved end-jointed lumber identified by a grade mark conforming to Section R602.1 may be used interchangeably with solid-sawn members of the same species and grade. End-jointed lumber used in an assembly required elsewhere in this code to have a fire resistance rating shall have the designation “Heat Resistant Adhesive” or “HRA” included in its grade mark.

R802.1.2 End-jointed lumber. Approved end-jointed lumber identified by a grade mark conforming to Section R802.1 may be used interchangeably with solid-sawn members of the same species and grade. End-jointed lumber used in an assembly required elsewhere in this code to have a fire resistance rating shall have the designation “Heat Resistant Adhesive” or “HRA” included in its grade mark.

Reason: The American Lumber Standards Committee (ALSC) recently added elevated-temperature performance requirements for end-jointed lumber adhesives intended for use in fire resistance-rated assemblies. End-jointed lumber manufactured with adhesives which meet the new requirements is being designated as "Heat Resistant Adhesive" or "HRA" on the grade stamp. Heat Resistant Adhesives are required to be qualified in accordance with one of two new ASTM standards, *D7374-08 Practice for Evaluating Elevated Temperature Performance of Adhesives Used in End-Jointed Lumber* and *D7470-08 Practice for Evaluating Elevated Temperature Performance of End-Jointed Lumber Studs*. End-jointed lumber manufactured with a Heat Resistant Adhesive under an auditing program of an ALSC-accredited grading agency is allowed to carry the HRA mark on the grade-stamp. End-jointed lumber manufactured with an adhesive not qualified as a Heat Resistant Adhesive will be designated as "Non-Heat Resistant Adhesive" or "non-HRA" on the grade stamp. Lumber carrying the HRA mark is permitted to be used interchangeably with solid-sawn members of the same species and grade in fire-rated applications.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PITTS-RB-11-R502.1.3-R602.1.1-R802.1.2

RB90–09/10

Table R301.5, R311.7.4.4, R311.7.7.4, R312.4, R502.1.7, R502.2.2.4, R507 (New), R507.1 (New), R507.2 (New), Table R507.2 (New), R507.2.1 (New), R507.2.2 (New), R507.2.3 (New), Figure R507.2.3 (New), R507.3 (New), R507.3.1 (New)

Proponent: Dennis Pitts, American Forest & Paper Association

1. Revise as follows:

TABLE R301.5
MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS
(in pounds per square foot)

(No changes to table values)

a. through d. (No changes)
e. See Section ~~R502.2.2~~ R507.1 for decks attached to exterior walls.
f. through i. (No changes)

R311.7.4.4 Exterior wood/plastic composite stair treads. Wood/plastic composite stair treads shall comply with the provisions of Section ~~R317.4~~ R507.3.

R311.7.7.4 Exterior wood/plastic composite handrails. Wood/plastic composite handrails shall comply with the provisions of Section ~~R317.4~~ R507.3.

R312.4 Exterior wood/plastic composite guards. Wood/plastic composite *guards* shall comply with the provisions of Section ~~R317.4~~ R507.3.

2. Delete without substitution:

~~**R502.1.7 Exterior wood/plastic composite deck boards.** Wood/plastic composites used in exterior deck boards shall comply with the provisions of Section R317.4.~~

~~**R502.2.2.4 Exterior wood/plastic composite deck boards.** Wood/plastic composite deck boards shall be installed in accordance with the manufacturer’s instructions.~~

3. Add new sections with relocated text as follows:

SECTION R507
DECKS

~~**R502.2.2**~~ **R507.1 Decks.** Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads as applicable. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self- supporting. For decks with cantilevered framing members, connections to exterior walls or other framing members, shall be designed and constructed to resist uplift resulting from the full live load specified inTableR301.5 acting on the cantilevered portion of the deck.

~~**R502.2.2.1**~~ **R507.2 Deck ledger connection to band joist.** For decks supporting a total design load of 50 pounds per square foot (2394 Pa) [40 pounds per square foot (1915 Pa) live load plus 10 pounds per square foot (479 Pa) dead load], the connection between a deck ledger of pressure preservative-treated Southern Pine, incised pressure-preservative-treated Hem-Fir or *approved* decay- resistant species, and a 2-inch (51 mm) nominal lumber band joist bearing on a sill plate or wall plate shall be constructed with 1/2-inch (12.7 m) lag screws or bolts with washers in accordance with Table ~~R502.2.2.1~~ R507.2. Lag screws, bolts and washers shall be hot-dipped galvanized or stainless steel.

TABLE ~~R502.2.2.1~~ R507.2
FASTENER SPACING FOR A SOUTHERN PINE OR HEM-FIR DECK LEDGER AND A 2-INCH NOMINAL SOLID-SAWN SPRUCE-PINE-FIR BAND JOIST[c, f, g]
(Deck live load = 40 psf, deck dead load = 10 psf)

(No change to table values)

a. through c. (No change)
d. Lag screws and bolts shall be staggered in accordance with Section ~~R502.2.2.1.1~~ R507.2.1.
e. through h. (No change)

~~**R502.2.2.1.1**~~ **R507.2.1 Placement of lag screws or bolts in deck ledgers.** The lag screws or bolts shall be placed 2 inches (51 mm)in from the bottom or top of the deck ledgers and between 2 and 5 inches (51 and 127 mm) in from the ends. The lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of the deck ledger.

~~**R502.2.2.2**~~ **R507.2.2 Alternate deck ledger connections.** Deck ledger connections not conforming to Table ~~R502.2.2.1~~ R507.2 shall be designed in accordance with accepted engineering practice. Girders supporting deck joists shall not be supported on deck ledgers or band joists. Deck ledgers shall not be supported on stone or masonry veneer.

~~**R502.2.2.3**~~ **R507.2.3 Deck lateral load connection.** The lateral load connection required by Section ~~R502.2.2~~ R507.1 shall be permitted to be in accordance with Figure ~~R502.2.2.3~~ R507.3. Hold-down tension devices shall be installed in not less than two locations per deck, and each device shall have an allowable stress design capacity of not less than 1500 pounds (6672 N).

FIGURE ~~502.2.2.3~~ R507.2.3
DECK ATTACHMENT FOR LATERAL LOADS

(No change to figure)

~~**R317.4**~~ **R507.3 Wood/plastic composites.** Wood/plastic composites used in exterior deck boards, stair treads, handrails and guardrail systems shall bear a *label* indicating the required performance levels and demonstrating compliance with the provisions of ASTM D 7032.

~~**R317.4.1**~~ **R507.3.1** Wood/plastic composites shall be installed in accordance with the manufacturer's instructions.

Reason: The IRC is seeing an increasing number of deck-related revisions. Rather than scatter them throughout the code, particularly in inappropriate locations, it seems logical to create a deck-related section to provide a single location for the existing provisions. These revisions, which make no technical changes, are proposed for the following reasons:

1. The references in Table R301.5 and Sections R311.5.3.4, R311.7, and R312.3 are changed to reflect the relocation of the existing text in R319.4.
2. R502.1.7 and R502.2.2.4 are deleted because the requirements are repeated in the relocated text of the current R319.4.
3. Various subsections addressing decks are being relocated from the portion of the chapter dealing with general wood floor construction.
4. The text of the current R319.4 is now in a section dealing with protection from decay. There doesn't appear to be anything about the text of existing Sec. R319.4 that deals with that subject matter. It's being relocated unchanged to the new section on decks, a more appropriate place for it.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PITTS-RB-12-T. R301.5-R311-R502-R507

RB91–09/10

R202 (New), R502.1.8 (New), R602.1.4 (New), R802.1.6 (New), Chapter 44 (New)

Proponent: Edward L. Keith, PE, APA-The Engineered Wood Association

1. Add new definition as follows:

STRUCTURAL COMPOSITE LUMBER. Structural members manufactured using wood elements bonded together with exterior adhesives. Examples of structural composite lumber are:

Laminated veneer lumber (LVL). A composite of wood veneer elements with wood fibers primarily oriented along the length of the member. Veneer thickness shall not exceed 0.25 in. (6.4 mm).

Parallel strand lumber (PSL). A composite of wood strand elements with wood fibers primarily oriented along the length of the member. The least dimension of the strands shall not exceed 0.25 in. (6.4 mm) and the average length shall be a minimum of 300 times the least dimension.

Laminated strand lumber (LSL). A composite of wood strand elements with wood fibers primarily oriented along the length of the member. The least dimension of the strands shall not exceed 0.10 in. (2.54 mm) and the average length shall be a minimum of 150 times the least dimension.

Oriented strand lumber (OSL). A composite of wood strand elements with wood fibers primarily oriented along the length of the member. The least dimension of the strands shall not exceed 0.10 in. (2.54 mm) and the average length shall be a minimum of 75 times the least dimension.

2. Add new text as follows:

R502.1.8 Structural composite lumber. Structural capacities for structural composite lumber shall be established and monitored in accordance with ASTM D5456.

R602.1.4 Structural composite lumber. Structural capacities for structural composite lumber shall be established and monitored in accordance with ASTM D5456.

R802.1.6 Structural composite lumber. Structural capacities for structural composite lumber shall be established and monitored in accordance with ASTM D5456.

3. Add new standard to Chapter 44 as follows:

ASTM

D5456-09	Standard Specification for Evaluation of Structural Composite Lumber Products

Reason: ASTM Standard D5456 09 is the standard by which structural composite lumber is evaluated. Structural composite lumber and this standard are already recognized in the 2006 IBC. Products manufactured to this standard are increasingly available in the market place and being used in residential construction even though not specifically recognized by the IRC. These products are being used as beams, headers, long length studs, floor and roof framing; and other applications where high strength, long length, and/or dimensional stability make sawn lumber unacceptable.

Recognition of the appropriate code-recognized standard on the identification marks required by the IRC will provide the designer, builder, plans examiner and building inspector with the assurance that structural composite lumber products are being manufactured with the appropriate quality control systems in place and that the design properties of the product are properly derived and maintained during production.

Cost Impact: The code change proposal will not increase the cost of construction.
Analysis: The proposed new standard, ASTM D 5456, is currently referenced in the *International Building Code*.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KEITH-RB-6-R202-R502.1.8-CH 44

RB92–09/10
R502.2.2, R502.2.2.3

Proponent: Steven Winkel, FAIA, PE, Kelly Cobeen, PE, SE, Building Seismic Safety Council (BSSC) of the National Institute of Building Sciences, representing FEMA/BSSC Code Resource Support Committee

Revise as follows:

R502.2.2 Decks. Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads ~~as applicable~~. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self- supporting. For decks with cantilevered framing members, connections to exterior walls or other framing members, shall be designed and constructed to resist uplift resulting from the full live load specified in Table R301.5 acting on the cantilevered portion of the deck.

R502.2.2.3 Deck lateral load connection. The lateral load connection required by Section R502.2.2 shall be permitted to be in accordance with Figure R502.2.2.3. Where the lateral load connection is provided in accordance with Figure 502.2.2.3, hold-down tension devices shall be installed in not less than two locations per deck, and each device shall have an allowable stress design capacity of not less than 1500 lb (6672 N).

Reason: Sections R502.2.2 and R502.2.2.3 are modified to clarify the intent in response to user comments. Section R502.2.2 is intending to clarify that vertical and lateral load design of decks is always required. Removing the words "as applicable" clarifies that it is always applicable. The second sentence of R502.2.2.3 is modified to indicate that the hold down device quantity and load capacity mentioned are only applicable when the Figure R502.2.2.3 detail is being used to meet the requirement of R502.2.2. If another connection detail is being used, then the connection quantity and load capacity are not applicable. These clarifications are believed to confirm the ICC staff interpretation on this topic.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WINKEL-COBEEN-RB-1-R502.2.2

RB93–09/10
R502.2.2.1.1

Proponent: Dennis Pitts, American Forest & Paper Association

Revise as follows:

R502.2.2.1.1 Placement of lag screws or bolts in deck ledgers. The lag screws or bolts shall be placed not less than 2 inches (51 mm)in from the top of the deck ledger, ¾ inches (19 mm) from the bottom of the deck ledger, 2 inches (51 mm) from the bottom of rimboard, bottom or top of the deck ledgers and between 2 and 5 inches (51 and 127 mm) in from the ends of the deck ledger. The lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of the deck ledger.

Reason: Placement provisions for lag screws and bolts in deck ledgers were added to the IRC last cycle; however, questions arose when designers compared the placement requirements with 2005 *National Design Specification*® (*NDS*®) *for Wood Construction* requirements for similar connections. The proposed changes bring the placement requirements into agreement with the minimum requirements in the 2005 *NDS*.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PITTS-RB4-R502.2.2.1.1

RB94–09/10
R502.2.2.3, Figure R502.2.2.3

Proponent: Diana M. Hanson, representing North American Deck and Railing Association, Inc. (NADRA)

Delete without substitution:

~~**R502.2.2.3 Deck lateral load connection.** The lateral load connection required by Section R502.2.2 shall be permitted to be in accordance with FigureR502.2.2.3. Hold-down tension devices shall be installed in not less than two locations per deck, and each device shall have an allowable stress design capacity of not less than 1500 pounds (6672 N).~~

~~**FIGURE R502.2.2.3**~~
~~**DECK ATTACHMENT FOR LATERAL LOADS**~~

Reason: The language of R502.2.2.3 is ambiguous resulting in potential misinterpretation by builders of decks and code officials. The phrasing "may be permitted to be" when coupled with the referenced Figure R502.2.2.3, results in a misunderstanding that this *example* of how to meet the lateral load requirement of R502.2.2, is a requirement, when in fact it is not.

This section has been the cause of much confusion and misunderstanding since its adoption in 2007. The language of 502.2.2.3 and the related figure is merely a suggestion, not a prescription for the only way to achieve a compliant lateral connection, yet NADRA has had to field inquiries and hold discussions with many builders and code officials who understandably misinterpret this code section and figure.

R502.2.2.3 and related Figure R502.2.2.3 add needless complexity to the code, its enforcement, and application and is potentially prone to misinterpretation. Experience shows such figures have a propensity for taking precedent over actual code language, resulting in commonly accepted construction practices being overlooked, and onerous methods being mistakenly understood to be required by both the builder and the code official, raising the likelihood of increased costs to both materials and labor.

IRC 2009, R101.3 Purpose, states "The purpose of this code is to provide *minimum requirements* to safeguard the public safety…" [emphasis added]. The Figure 502.2.2.3 is taken directly from the FEMA 2007 publication which is specifically for seismic areas. Suggesting that good building practices should meet seismic area requirements is not in line with R101.3.

Further, the language of 502.2.2.3 stating "not less than two" hold-down tension devices makes little sense when the size of the deck being attached is not taken into account.

For the above stated reasons, we propose that Figure 502.2.2.3 and the language of R502.2.2.3 suggesting its use, be removed from the IRC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HANSON-RB-2-R502.2.2.3-F. R502.2.2.3

RB95–09/10
R502.8, Figure R502.8

Proponent: Dennis Pitts, American Forest & Paper Association

Revise as follows:

R502.8 <u>Cutting</u> drilling and notching. Structural floor members shall not be cut, bored or notched in excess of the limitations specified in this section. See Figure R502.8.

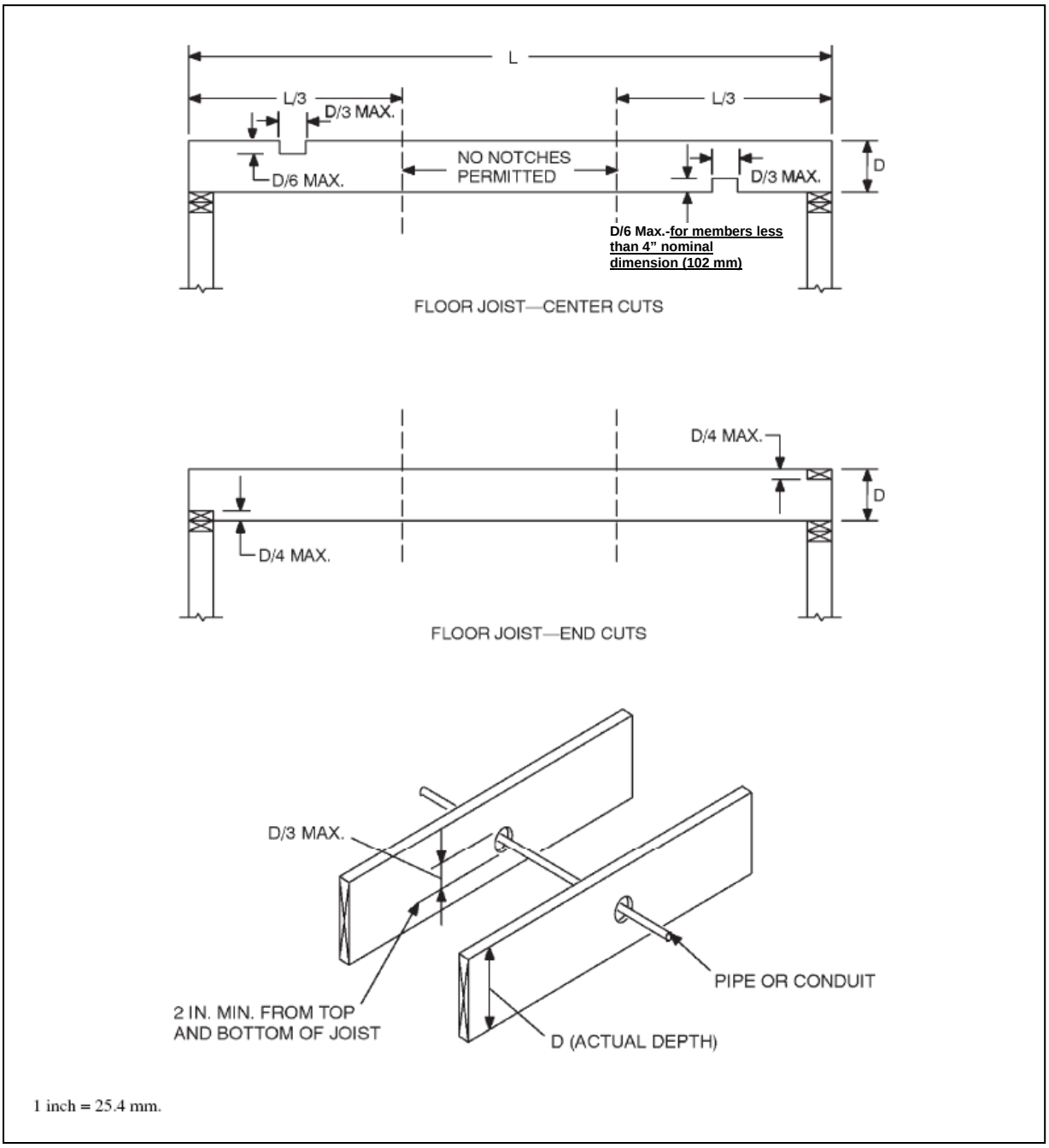


FIGURE R502.8
CUTTING, NOTCHING AND DRILLING

(Revise the top drawing, "Floor joist – Center Cuts" by changing the note that applies to the notch near the right support as follows: D/6 Max. –for members less than 4" nominal dimension (102 mm)

Reason: The revision to the title of R502.8 reflects content of the section which includes "cuts". The revision to the Figure R502.8 notation reflects the text of the code as well as provisions of the NDS®.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PITTS-RB-15-R502.8-F. R502.8

RB96–09/10
R502.11.2, R505.1.3, R802.10.3, R804.3.7

Proponent: Larry Wainright, Qualtim, Inc., representing the Structural Building Components Industry

Revise as follows:

R502.11.2 Bracing. Trusses shall be braced to prevent rotation and provide lateral stability in accordance with the requirements specified in the *construction documents* for the building and on the individual truss design drawings. In the absence of specific bracing requirements, trusses shall be braced in accordance with the Building Component Safety Information (BCSI ~~1-03~~) Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses.

R505.1.3 Floor trusses. Cold-formed steel trusses shall be designed, braced and installed in accordance with AISI S100, Section D4. In the absence of specific bracing requirements, trusses shall be braced in accordance with the Cold-Formed Steel Building Component Safety Information (CFSBCSI)~~,~~ Guide to Good Practice for Handling, Installing & Bracing of Cold-Formed Steel Trusses. Truss members shall not be notched, cut or altered in any manner without an *approved* design.

R802.10.3 Bracing. Trusses shall be braced to prevent rotation and provide lateral stability in accordance with the requirements specified in the *construction documents* for the building and on the individual truss design drawings. In the absence of specific bracing requirements, trusses shall be braced in accordance with the Building Component Safety Information (BCSI ~~1-03~~) Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses.

R804.3.7 Roof trusses. Cold-formed steel trusses shall be designed and installed in accordance with AISI S100, Section D4. In the absence of specific bracing requirements, trusses shall be braced in accordance with the Cold-Formed Steel Building Component Safety Information (CFSBCSI) Guide to Good Practice for Handling, Installing & Bracing of Cold-Formed Steel Trusses. Trusses shall be connected to the top track of the load-bearing wall in accordance with Table R804.3, either with two No.10 screws applied through the flange of the truss or by using a 54 mil (1.37 mm) clip angle with two No.10 screws in each leg.

Reason: The purpose of this code change is to update the references to Building Component Safety Information (BCSI) Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses, to the most current version. The name of this document has changed, removing the "1-03" from the title and is now referenced simply as "BCSI".

For steel trusses, the references for bracing are updated to reflect the most current industry document, Cold-Formed Steel Building Component Safety Information, Guide to Good Practice for Handling, Installing & Bracing of Cold-Formed Steel Trusses. (CFSBCSI).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WAINRIGHT-RB-5-R502.11.2-R802.10.3

RB97–09/10
R505.2, R603.2, R804.2

Proponent: Bonnie Manley, representing the American Iron and Steel Institute

Revise as follows:

R505.2 Structural framing. Load-bearing cold-formed steel floor framing members shall comply with Figure R505.2(1) and with the dimensional and minimum thickness requirements specified in Tables R505.2(1) and R505.2(2). Tracks shall comply with Figure R505.2(2) and shall have a minimum flange width of 11/4 inches (32 mm). The size of the ~~maximum~~ inside bend radius used for the design of members shall be the greater of 3/32 inch (2.4 mm) minus half the base steel thickness or 1.5 times the base steel thickness.

R603.2 Structural framing. Load-bearing cold-formed steel wall framing members shall comply with Figure R603.2(1) and with the dimensional and minimum thickness requirements specified in Tables R603.2(1) and R603.2(2). Tracks shall comply with Figure R603.2(2) and shall have a minimum flange width of 11/4 inches (32 mm). The size of the ~~maximum~~ inside bend radius used for the design of members shall be the greater of 3/32 inch (2.4 mm) minus half the base steel thickness or 1.5 times the base steel thickness.

R804.2 Structural framing. Load-bearing cold-formed steel roof framing members shall comply with Figure R804.2(1) and with the dimensional and minimum thickness requirements specified in Tables R804.2(1) and R804.2(2). Tracks shall comply with Figure R804.2(2) and shall have a minimum flange width of 11/4 inches (32 mm). The size of the ~~maximum~~ inside bend radius used for the design of members shall be the greater of 3/32 inch (2.4 mm) minus half the base steel thickness or 1.5 times the base steel thickness.

Reason: This code change makes a minor modification to the determination of the appropriate inside bend radius in the three applicable places in the IRC. The purpose of this change is to correct a small oversight from last cycle and bring the IRC provisions into agreement with the underlying AISI documents – AISI S230-07, AISI S200-07 and AISI S201-07.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MANLEY-RB-1-R505.2-R603.2-R804.2

RB98–09/10
R505.2, R603.2, R804.2

Proponent: Michael C. Kerner, representing Dietrich Industries, Inc.

Revise as follows:

R505.2 Structural framing. Load-bearing cold-formed steel floor framing members shall comply with Figure R505.2(1) and with the dimensional and minimum thickness requirements specified in Tables R505.2(1) and R505.2(2). Tracks shall comply with Figure R505.2(2) and shall have a minimum flange width of 11/4 inches (32 mm). ~~The maximum inside bend radius for members shall be the greater of 3/32 inch (2.4 mm) minus half the base steel thickness or 1.5 times the base steel thickness.~~

R603.2 Structural framing. Load-bearing cold-formed steel wall framing members shall comply with Figure R603.2(1) and with the dimensional and minimum thickness requirements specified in Tables R603.2(1) and R603.2(2). Tracks shall comply with Figure R603.2(2) and shall have a minimum flange width of 11/4 inches (32 mm). ~~The maximum inside bend radius for members shall be the greater of 3/32 inch (2.4 mm) minus half the base steel thickness or 1.5 times the base steel thickness.~~

R804.2 Structural framing. Load-bearing cold-formed steel roof framing members shall comply with Figure R804.2(1) and with the dimensional and minimum thickness requirements specified in Tables R804.2(1) and R804.2(2). Tracks shall comply with Figure R804.2(2) and shall have a minimum flange width of 11/4 inches (32 mm). ~~The maximum inside bend radius for members shall be the greater of 3/32 inch (2.4 mm) minus half the base steel thickness or 1.5 times the base steel thickness.~~

Reason: The modification of this particular requirement was brought forward incorrectly last cycle from the underlying AISI documents – AISI S230-07, AISI S200-07 and AISI S201-07. The sentence recommended for deletion should only apply to the design of the structural members, something that is not needed in the IRC, hence the request for the change.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KERNER-RB-1-R505.2-R603.2-R804.2

RB99–09/10
R506.1

Proponent: James R. Baty II, Technical Director for the Concrete Foundations Association, representing the Concrete Foundations Association, the American Concrete Institute and ACI Committee 332 – Residential Concrete

Revise as follows:

R506.1 General. Concrete slab-on-ground floors shall be designed and constructed in accordance with the provisions of this section or ACI 332. Floors shall be a minimum 3.5 inches (89 mm) thick (for expansive soils, see Section R403.1.8). The specified compressive strength of concrete shall be as set forth in Section R402.2.

Reason: ACI 332-10 has incorporated the design guidance for slabs-on-ground including post-tensioned slabs and should be an allowable reference for residential slabs in the IRC similar to reference for materials, footings and foundation walls.

Cost Impact: No projected cost impact to industry as practice required to meet the stated standards are within current guidelines.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BATY-RB-1-R506.1

RB100–09/10
R506.2.3

Proponent: Rick Davidson, City of Maple Grove, MN

Revise as follows:

R506.2.3 Vapor retarder. A 6 mil (0.006 inch; 152 µm) polyethylene or *approved* vapor retarder with joints lapped not less than 6 inches (152 mm) shall be placed between the concrete floor slab and the base course or the prepared subgrade where no base course exists.

Exception: The vapor retarder may be omitted:

1. From ~~detached~~ garages, utility buildings and other unheated *accessory structures*.
2. For unheated storage rooms having an area of less than 70 square feet (6.5 m2) and carports.
3. From driveways, walks, patios and other flatwork not likely to be enclosed and heated at a later date.
4. Where *approved* by the *building official*, based on local site conditions.

Reason: When this code change was approved last year, the proponent argued that "attached garages have a high probability of being enclosed at a later date and converted to additional living space like a bedroom or den. These living spaces are typically conditioned which increases the temperature difference between the interior space and the ground below the floor slab which can contribute to moisture migration upward into the living space through the slab." High probability!!! While this may occur in homes built 30-40 years ago, there were no statistics or other supporting documentation to indicate this is occurring with homes built today. Three stall garages are by far the most common garage being constructed with new single family dwellings. These garages are 700 to 1000 square feet. Their size and location in the home do not lend themselves to conversion to living space. And if the space were to be converted to living space in the future, there is nothing to prevent an owner from placing a vapor retarder on top of the slab at the time of the conversion just like is done with a crawl space. Since the code does not require the floor to be concrete, only that it be noncombustible, the floor surface could be pavers, compacted sand, asphalt, or other materials that contained no vapor retarder because none would be required for these surfaces. Conversion of garages with these floor surfaces would present no more of a problem than a slab without a vapor retarder. Furthermore, to establish a rule (and spend the money) to address a conversion that in all likelihood will never occur is poor public policy and establishes a precedent that the IRC Committee should avoid at all costs. Besides the cost to the contractor in labor and materials, this requirement most often means an additional inspection by the building department which in turn will mean higher permit fees. The current code language serves no public purpose and warrants this change.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-RB-3-R506.2.3

RB101–09/10
R601.3, R601.3.1, Table R601.3.1, R601.3.2, R601.3.3, R703.1.3 (New), R703.1.3.1 (New), Table R703.1.3.1 (New), R703.1.3.2 (New), R703.1.3.3 (New)

Proponent: Gary Ehrlich, PE, National Association of Home Builders (NAHB)

Revise as follows:

<u>R703.1.3</u> ~~R601.3~~ Vapor retarders. Class I or II vapor retarders are required on the interior side of frame walls in Zones 5, 6, 7, 8 and Marine 4.

Exceptions:

1. *Basement walls*.
2. Below *grade* portion of any wall.
3. Construction where moisture or its freezing will not damage the materials.

R703.1.3.1 ~~R601.3.1~~ Class III vapor retarders. Class III vapor retarders shall be permitted where any one of the conditions in Table R601.3.1 is met.

TABLE R703.1.3.1~~R601.3.1~~
CLASS III VAPOR RETARDERS

(No change to table values or footnote)

R703.1.3.2 ~~R601.3.2~~ Material vapor retarder class. The vapor retarder class shall be based on the manufacturer's certified testing or a tested assembly.

The following shall be deemed to meet the class specified:

Class I: Sheet polyethylene, unperforated aluminum foil.
Class II: Kraft-faced fiberglass batts.
Class III: Latex or enamel paint.

R703.1.3.3 ~~R601.3.3~~ Minimum clear air spaces and vented openings for vented cladding. For the purposes of this section, vented cladding shall include the following minimum clear air spaces. Other openings with the equivalent vent area shall be permitted.

1. Vinyl lap or horizontal aluminum siding applied over a weather resistive barrier as specified in Table R703.4.
2. Brick veneer with a clear airspace as specified in Section R703.7.4.2.
3. Other *approved* vented claddings.

Reason: The purpose of this proposal is to editorially relocate (again) the provisions on vapor retarders to Section R703 which were moved from Chapter 11 last cycle. The overwhelming majority of the provisions in Chapter 6 deal with the structural resistance of various wall materials (e.g. wood, cold-formed steel, masonry) to gravity, wind, and seismic loads. Vapor retarders have nothing to do with structural capacity. Thus, it was inappropriate to place these requirements in Chapter 6. Moving the vapor retarder provisions to a new Section R703.1.3 will put them where the rest of the provisions for weather resistance and water resistance of exterior wall systems are located.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EHRLICH-RB-7-R601.3-R703.1.3

RB102–09/10
R202 (New), R602.3

Proponent: Jay H. Crandell, PE, d/b/a ARES Consulting, representing the Foam Sheathing Coalition

1. Add new definition as follows:

EXTERIOR WALL COVERING. A material or assembly of materials applied on the exterior side of exterior walls for the purpose of providing a weather-resistive barrier, insulation or for aesthetics, including but not limited to, veneers, siding, exterior insulation and finish systems, architectural trim and embellishments such as cornices, soffits, fascias, gutters and leaders.

2. Revise as follows:

R602.3 Design and construction. Exterior walls of wood-frame construction shall be designed and constructed in accordance with the provisions of this chapter and Figures R602.3(1) and R602.3.(2) or in accordance with AF&PA's NDS. Components of exterior walls shall be fastened in accordance with Tables R602.3(1) through R602.3(4). When used as wall bracing in accordance with Section R602.10 or other structural framing purposes in accordance with this chapter, ~~Structural~~ wall sheathing shall be fastened directly to ~~structural~~ framing members~~. Exterior wall coverings~~ and, when placed on the exterior side of an exterior wall, shall be capable of resisting the wind pressures listed in Table R301.2(2) adjusted for height and exposure using Table R301.2(3). ~~Wood structural panel sheathing used for exterior walls shall conform to the requirements of Table R602.3(3).~~ Wall sheathing used only for exterior wall covering purposes shall comply with Section R703.

Studs shall be continuous from support at the sole plate to a support at the top plate to resist loads perpendicular to the wall. The support shall be a foundation or floor, ceiling or roof diaphragm or shall be designed in accordance with accepted engineering practice.

Exception: Jack studs, trimmer studs and cripple studs at openings in walls that comply with Tables R502.5(1) and R502.5(2).

Reason: The definition of "exterior wall covering" from IBC Chapter 14 is introduced to the IRC for appropriate and consistent usage regardless of building type or occupancy. The proposed revision to section R602.3 then applies this definition and, as an editorial proposal, helps to clarify requirements for sheathing installation on exterior walls. Wall sheathing that is used for structural purposes (e.g., bracing) is addressed in Chapter 6 Wall Framing while wall sheathing that is used solely for exterior wall covering purposes is appropriately addressed in Chapter 7 Wall Covering. The special reference to wood structural panels at the exclusion of listing specific requirements for other sheathing types is deleted because the requirements for applicable wall sheathing materials, including wood structural panels, are adequately addressed by reference to Tables R602.3(1) through R602.3(4). This change will help ensure consistent use of the terms "exterior wall covering" and "wall sheathing" in the IRC and better organize the code to address distinct requirements depending on the application or function of wall sheathing.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:				
	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRANDELL-RB-1-R202-R602.3

RB103–09/10
Table R602.3(2)

Proponent: Randall Shackelford, representing Simpson Strong-Tie Co.

Revise as follows:

TABLE R602.3(2)
ALTERNATE ATTACHMENTS TO TABLE R602.3(1)

NOMINAL MATERIAL THICKNESS (inches)	DESCRIPTION[a,b] OF FASTENER AND LENGTH	SPACING OF FASTENERS	
		Edges (inches)	Intermediate supports (inches)
Wood structural panels subfloor, roof [g] and wall sheathing to framing and particleboard wall sheathing to framing[f]			

a. through f. (No change)

g. Specified alternate attachments for roof sheathing shall be permitted for windspeeds less than 100 mph. Fasteners attaching wood structural panel roof sheathing to gable end wall framing shall be installed using the spacing listed for panel edges.

(Portions of table and footnotes not shown remain unchanged)

Reason: This proposal has two purposes.

1. Clarify that Table R602.3(2) is only to be used as alternate fastening for the locations listed in Table R602.3(1). The title of the table is altered to clarify that these alternate attachments only apply to the fastenings specified in Table R602.3(1). There are other fastening requirements in the IRC that do not use the same fastener size and spacing as in Table R602.3(1), so it needs to be clarified that these fastenings do not apply. For example, fastening of braced wall method ABW uses 8d nails at 6" o.c. for one story and 4" o.c. for first of two story buildings, methods PFH and CS-PF use two rows of 8d nails at 3" o.c., and method PFG uses 8d nails at 3" o.c. The alternates in Table R602.3(2) are only designed to be an alternate to 6d nails at 6" o.c. at edges and 12" o.c. at intermediate panel supports.
2. Add a footnote g to clarify that these alternate attachments are not to be used when the basic windspeed is 100 mph or greater. Refer to the calculations below. They show that two of the three methods specified for ½" roof sheathing do not provide adequate withdrawal resistance to withstand 100 mph winds.

Calculations:

Use the Component and Cladding suction pressures of Table R301.2(2) to calculate the demand pressures on roof sheathing fasteners. Use Roof Slope of >10 degrees up to 30 degrees (not worst case). Use Zone 3, 10 sq. ft. effective wind area.

Actual withdrawal demand will depend on fastener spacing. Table R301.2(2) specifies 6" and 8" spacing for fasteners to intermediate supports (highest demand fastener)

Calculated Demand (multiply pressure by support spacing by fastener spacing):

From Table R301.2(2), P = -34.8 psf.
Assume Trusses or rafters 24" o.c, Spruce Pine Fir species.
8" spacing: (-34.8)(2)(8/12)= -46.4 psf.
6" spacing: (-34.8)(2)(6/12)= -34.8 psf.

Pressure would be higher for lower slope roof (10 degrees or less) or for Exposure C location.

Use ICC-ES ESR-1539, Table 2 to calculate withdrawal capacity for the listed sheathing fasteners for sheathing up to ½" thick. Per Table 2, footnote 4, use the lesser of the actual penetration or 1.34 to calculate withdrawal capacity.

Fastener	Listed withdrawal	Calculation	Withdrawal Capacity	Fastener Spacing	Fastener Demand	OK?
Staple, 15 ga × 1¾"	23 lbs/in.	(23)(1.25)(1.6)=46 lbs.	46 lbs.	8"	-46.4 psf	**NO (?)**
Nail (2¼ × 0.099")	15 lbs/in	(15)(1.34)(1.6)=32.16 lbs.	32 lbs.	6"	-34.8 psf	**NO**
Staple, 16 ga × 1¾"	20 lbs/in	(20)(1.25)(1.6)= 40 lbs.	40 lbs.	6"	-34.8 psf	YES

Bibliography
ICC-ES ESR-1539, Table 2, http://www.icc-es.org/reports/index.cfm.

Cost Impact: The code change proposal could increase costs if these alternate fasteners were used in high wind areas. I do not know for sure because while larger fasteners will have to be used, fewer of them will be required so it may balance out.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: SHACKELFORD-RB-1-T. R602.3(2)

RB104–09/10

R602.7, R602.7.1 (New), Table R602.7.1 (New), Figures R602.7.1(1)-(2) (New)

Proponent: Joseph Lstiburek, Building Science Corporation

1. Revise as follows:

R602.7 Headers. For header spans see Tables R502.5(1) and R502.5(2). Alternative header applications in accordance with this section shall be permitted.

2. Add new text, table and figures as follows:

R602.7.1 Single member headers in exterior bearing walls. Single member headers in exterior bearing walls shall be permitted in accordance with Table R602.7.1. Single headers shall be framed top and bottom with a flat-wise 2x member. To make up the remaining space, cripples shall be installed above the header. See Figure R602.7.1(1). Alternatively, the header can be sized to fill the space between the wall top plate and a flat-wise 2x member. See Figure R602.7.1(2). The header assembly shall bear on a minimum of one jack stud at each end.

TABLE R602.7.1
SPANS FOR MINIMUM No.2 GRADE SINGLE HEADER
FOR EXTERIOR BEARING WALLS[a,b,c]

SINGLE HEADERS SUPPORTING	SIZE	Wood Species	GROUND SNOW LOAD (psf)								
			≤ 20[d]			30			50		
			Building Width (feet)[e]								
			20	28	36	20	28	36	20	28	36
Roof and Ceiling	2x8	Spruce-Pine-Fir	4-10	4-2	3-8	4-3	3-8	3-3	3-7	3-0	2-8
		Hem-Fir	5-1	4-4	3-10	4-6	3-10	3-5	3-9	3-2	2-10
		Douglas-Fir or Southern Pine	5-3	4-6	4-0	4-7	3-11	3-6	3-10	3-3	2-11
	2x10	Spruce-Pine-Fir	6-2	5-3	4-8	5-5	4-8	4-2	4-6	3-11	3-1
		Hem-Fir	6-6	5-6	4-11	5-8	4-11	4-4	4-9	4-1	3-7
		Douglas-Fir or Southern Pine	6-8	5-8	5-1	5-10	5-0	4-6	4-11	4-2	3-9
	2x12	Spruce-Pine-Fir	7-6	6-5	5-9	6-7	5-8	4-5	5-4	3-11	3-1
		Hem-Fir	7-10	6-9	6-0	6-11	5-11	5-3	5-9	4-8	3-8
		Douglas-Fir or Southern Pine	8-1	6-11	6-2	7-2	6-1	5-5	5-11	5-1	4-6
Roof, ceiling and one center-bearing floor	2x8	Spruce-Pine-Fir	3-10	3-3	2-11	3-9	3-3	2-11	3-5	2-11	2-7
		Hem-Fir	4-0	3-5	3-1	3-11	3-5	3-0	3-7	3-0	2-8
		Douglas-Fir or Southern Pine	4-1	3-7	3-2	4-1	3-6	3-1	3-8	3-2	2-9
	2x10	Spruce-Pine-Fir	4-11	4-2	3-8	4-10	4-1	3-6	4-4	3-7	2-10
		Hem-Fir	5-1	4-5	3-11	5-0	4-4	3-10	4-6	3-11	3-4
		Douglas-Fir or Southern Pine	5-3	4-6	4-1	5-2	4-5	4-0	4-8	4-0	3-7
	2x12	Spruce-Pine-Fir	5-8	4-2	3-4	5-5	4-0	3-6	4-9	3-6	2-10
		Hem-Fir	5-11	4-11	3-11	5-10	4-9	4-2	5-5	4-2	3-4
		Douglas-Fir or Southern Pine	6-1	5-3	4-8	6-0	5-2	4-10	5-7	4-10	4-3
Roof, ceiling and one clear span floor	2x8	Spruce-Pine-Fir	3-5	2-11	2-7	3-4	2-11	2-7	3-3	2-10	2-6
		Hem-Fir	3-7	3-1	2-9	3-6	3-0	2-8	3-5	2-11	2-7
		Douglas-Fir or Southern Pine	3-8	3-2	2-10	3-7	3-1	2-9	3-6	3-0	2-9
	2x10	Spruce-Pine-Fir	4-4	3-7	2-10	4-3	3-6	2-9	4-2	3-4	2-7
		Hem-Fir	4-7	3-11	3-5	4-6	3-10	3-3	4-4	3-9	3-1
		Douglas-Fir or Southern Pine	4-8	4-0	3-7	4-7	4-0	3-6	4-6	3-10	3-5
	2x12	Spruce-Pine-Fir	4-11	3-7	2-10	4-9	3-6	2-9	4-6	3-4	2-7
		Hem-Fir	5-6	4-3	3-5	5-6	4-2	3-3	5-4	3-11	3-1
		Douglas-Fir or Southern Pine	5-8	4-11	4-4	5-7	4-10	4-3	5-6	4-8	4-2

For SI: 1 inch=25.4 mm, 1 pound per square foot = 0.0479 kPa.

a. Spans are given in feet and inches.
b. Table is based on a maximum roof-ceiling dead load of 15 psf.
c. The header is permitted to be supported by an approved framing anchor attached to the full-height wall stud and to the header in lieu of the required jack stud.
d. The 20 psf ground snow load condition shall apply only when the roof pitch is 9:12 or greater. In conditions where the ground snow load is 30 psf or less and the roof pitch is less than 9:12, use the 30 psf ground snow load condition.
e. Building width is measured perpendicular to the ridge. For widths between those shown, spans are permitted to be interpolated.

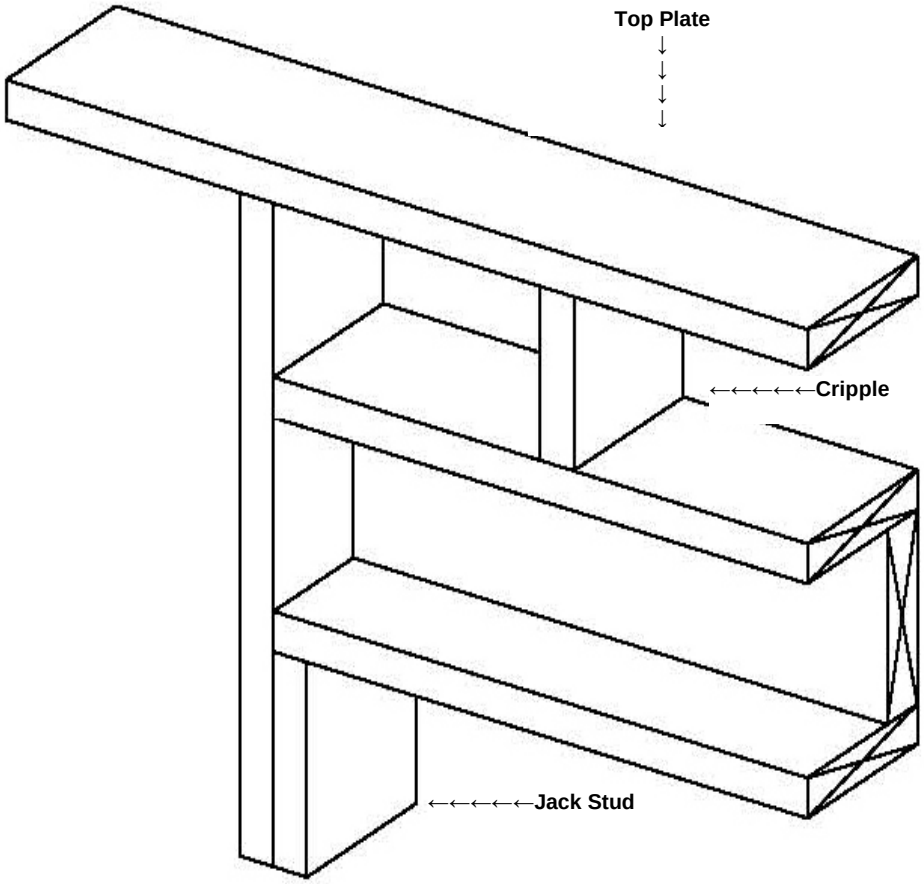


FIGURE R602.7.1(1)
SINGLE MEMBER HEADER IN EXTERIOR BEARING WALL

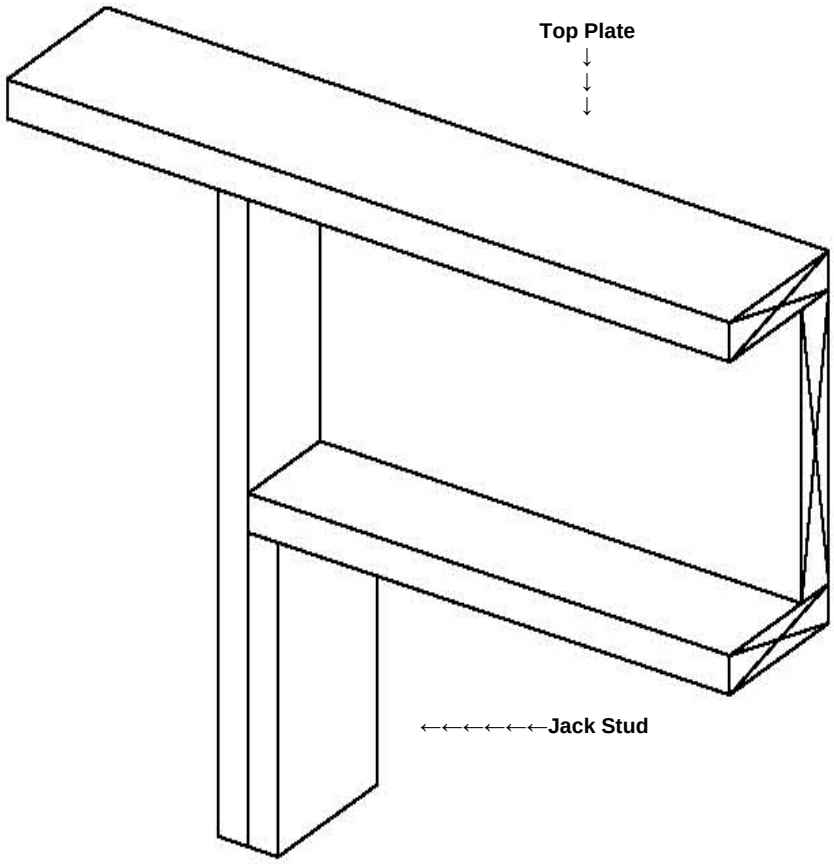


FIGURE R602.7.1(2)
ALTERNATE SINGLE MEMBER HEADER WITHOUT CRIPPLE

Reason: This proposal provides a means of implementing advanced, energy-saving wall construction practices for limited conditions where single headers can be used. Thus, insulation can be placed together with the single header to prevent heat loss through headers which otherwise create a thermal short-circuit in exterior walls. The table is evaluated in accordance with the NDS-2005 and ASCE 7-05 building loads. For ease-of-use, the table format is consistent with the principle header tables found in Chapter 5 of the code. The single header practice has been used successfully in thousands of homes since originally developed under the optimal value engineering "OVE" banner by the NAHB and HUD in the 1960's and more recently under the HUD/PATH and DOE Build America programs.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LSTIBUREK-RB-1-R602.7

RB105–09/10

Table R602.3(1), R602.3.5 (new), Section R602.10 (including figures and tables), Table R802.11

Proponent: Chuck Bajnai, Chesterfield County, VA, Chairman, ICC Ad-Hoc Committee on Wall Bracing

1. Revise Table R602.3(1) as follows:

TABLE R602.3(1)
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER [a,b,c]	SPACING OF FASTENERS
	Roof		
1	Blocking between joists or rafters to top plate, toe nail	3-8d (2 ½" x 0.113")	--
2	Ceiling joists to plate, toe nail	3-8d (2 ½" x 0.113")	--
3	Ceiling joist not attached to parallel rafter, laps over partitions, face nail	3-10d	--
4	Collar tie to rafter, face nail, or 1-1/4" x 20 gage ridge strap	3-10d (3" x 0.128")	--
5	Rafter to plate, toe nail	2-16d (3 ½ "x 0.135")	--
6	Roof rafters to ridge, valley or hip rafters: toe nail face nail	 4-16d (3 ½" x 0.135") 3-16d (3 ½" x 0.135")	 -- --
	Wall		
7	Built-up ~~corner~~ studs –face nail	10d (3" x 0.128")	24" o.c.
8	Abutting studs at intersecting wall corners, face nail	16d (3 ½" x 0.135")	12"oc
~~8~~ 9	Built-up header, two pieces with ½"spacer	16d (3½" x 0.135")	16" o.c. along each edge
~~9~~ 10	Continued header, two pieces	16d (3½" x 0.135")	16" o.c. along each edge
~~10~~ 11	Continuous header to stud, toe nail	4-8d (2 ½" x 0.113")	-
~~11~~ 12	Double studs, face nail	10d (3" x 0.128")	24" o.c.
~~12~~ 13	Double top plates, face nail	10d (3" x 0.128")	24" o.c.
~~13~~ 14	Double top plates, minimum 24-inch offset of end joints, face nail in lapped area	8-16d (3½" x 0.135")	-
~~14~~ 15	Sole plate to joist or blocking, face nail	16d (3½" x 0.135")	16" o.c.
~~15~~ 16	Sole plate to joist or blocking at braced wall panels	3-16d (3½" x 0.135")	16" o.c.
~~16~~ 17	Stud to sole plate, toe nail	3-8d (2 ½" x 0.113") or 2-16d (3½" x 0.135")	- -
~~17~~ 18	Top or sole plate to stud, end nail	2-16d (3½" x 0.135")	-
~~18~~ 19	Top plates, laps at corners and intersections, face nail	2-10d (3" x 0.128")	-
~~19~~ 20	1" brace to each stud and plate, face nail	2-8d (2 ½" x 0.113") 2 staples 1¾"	- -
~~20~~ 21	1" × 6" sheathing to each bearing, face nail	2-8d (2 ½" x 0.113") 2 staples 1¾"	- -
~~21~~ 22	1" × 8" sheathing to each bearing, face nail	2-8d (2 ½" x 0.113") 3 staples 1¾"	- -
~~22~~ 23	Wider than 1" × 8" sheathing to each bearing, face nail	3-8d (2 ½" x 0.113") 4 staples 1¾"	- -
	Floor		
~~23~~ 24	Joist to sill or girder, toe nail	3-8d (2 ½" x 0.113")	-
~~26~~ 25	Rim joist to top plate, toe nail (roof applications also)	8d (2 ½" x 0.113")	6" o.c.
26	Rim joist or blocking to sill plate, toe nail	8d (2 ½" x 0.113")	6" o.c.
~~24~~ 27	1" × 6" subfloor or less to each joist, face nail	2-8d (2 ½" x 0.113") 2 staples 1¾"	- -
~~25~~ 28	2" subfloor to joist or girder, blind and face nail	2-16d (3½" x 0.135")	-
~~27~~ 29	2" planks (plank & beam – floor & roof)	2-16d (3½" x 0.135")	at each bearing
~~28~~ 30	Built up girders and beams, 2-inch lumber layers	10d (3" x 0.128")	Nail each layer as follows: 32"o.c. at top and bottom and staggered. Two nails at ends and at each splice.
~~29~~ 31	Ledger strip supporting joists or rafters	3-16d (3½" x 0.135")	At each joist or rafter

(Remainder of table unchanged except item numbers)

2. Move existing Section R602.10.1.2.1 to new Section R602.3.5 and revise as follows:

R602.3.5 ~~R602.10.1.2.1~~ Braced wall panel uplift load path. Braced wall panels located at exterior walls that support roof rafters or trusses (including stories below top story) shall have the framing members connected in accordance with one of the following:

1. Fastening in accordance with Table R602.3(1) where:
   1.1. The basic wind speed does not exceed 90 mph (40 m/s), the wind exposure category is B, the roof pitch is 5:12 or greater, and the roof span is 32 feet (9754 mm) or less, or
   1.2. The net uplift value at the top of a wall does not exceed 100 plf (146 N/mm). The net uplift value shall be determined in accordance with Section R802.11 and shall be permitted to be reduced by 40 plf (57 N/mm) for each full wall above and 40 plf (57 N/mm) for each floor platform above.
2. Where the net uplift value at the top of a wall exceeds 100 plf (146 N/mm), installing approved uplift framing connectors to provide a continuous load path from the top of the wall to the foundation or to a point where the uplift force is 100 plf (146 N/mm) or less. The net uplift value shall be as determined in Item 1.2 above.
3. Wall sheathing and fasteners designed in accordance with accepted engineering practice to resist combined uplift and shear forces.

3. Delete footnote "f" as follows:

TABLE R802.11
REQUIRED STRENGTH OF TRUSS OR RAFTER CONNECTIONS TO RESIST WIND UPLIFT FORCES[a, b, c, e, ~~f~~]
(Pounds per connection)

(No change to table values)

a. through e. (No change)

~~f. For wall-to-wall and wall-to-foundation connections, the capacity of the uplift connector is permitted to be reduced by 100 pounds for each full wall above. (For example, if a 600-pound rated connector is used on the roof framing, a 500-pound rated connector is permitted at the next floor level down).~~

4. Delete Section R602.10 and replace with the following:

R602.10 Wall bracing. Buildings shall be braced in accordance with this section. Where a building, or portion thereof, does not comply with one or more of the bracing requirements in this section, those portions shall be designed and constructed in accordance with Section R301.1.

R602.10.1 Braced wall lines. For the purpose of determining the amount and location of bracing required in each story level of a building, braced wall lines shall be designated as straight lines on the building plan placed in accordance with this section.

R602.10.1.1 Length of a braced wall line. The length of a braced wall line shall be the distance between its ends. The end of a braced wall line shall be the intersection with a perpendicular braced wall line or an angled braced wall line as permitted in Section R602.10.1.4. In the absence of an intersecting braced wall line, the end shall be the farthest exterior wall of the building as shown in Figure R602.10.1.1.

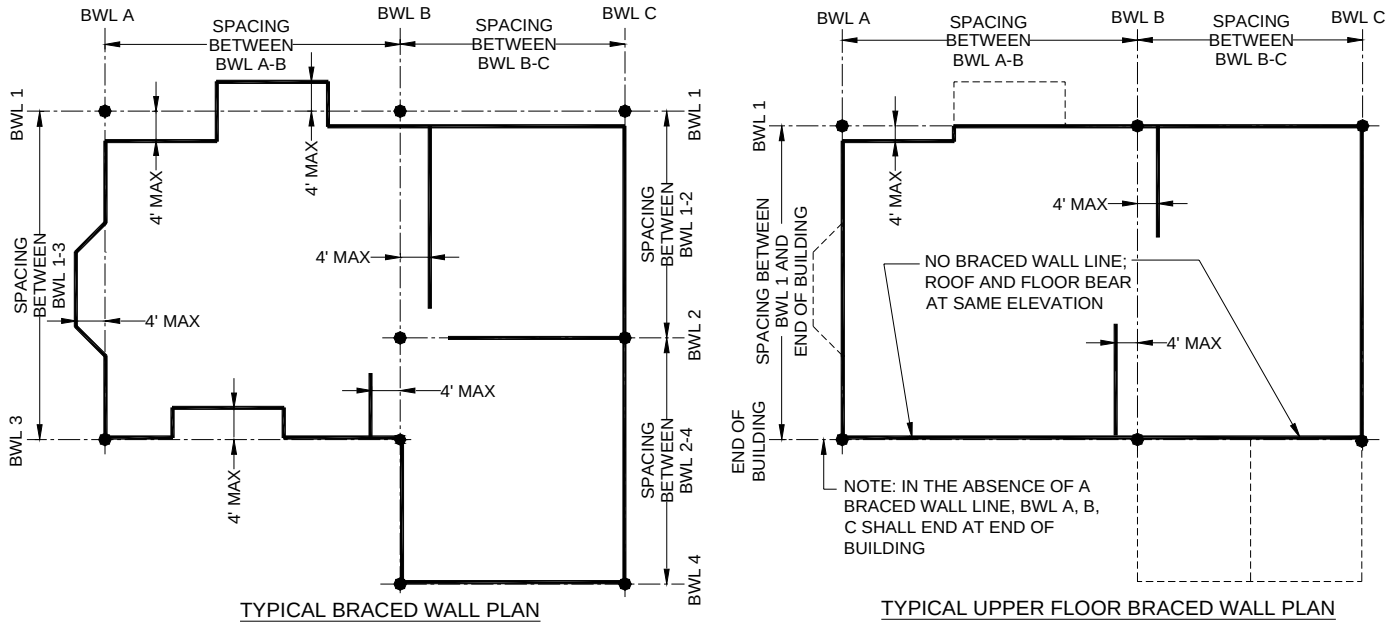


FIGURE R602.10.1.1
BRACED WALL LINES

R602.10.1.2 Offsets along a braced wall line. All exterior walls parallel to a braced wall line shall be permitted to offset up to 4 feet (1219 mm) from the designated braced wall line location as shown Figure R602.10.1.1. Interior walls used as bracing shall be permitted to offset up to 4 feet (1219 mm) from a braced wall line through the interior of the building as shown in Figure R602.10.1.1.

R602.10.1.3 Spacing of braced wall lines. There shall be a minimum of two braced wall lines in both the longitudinal and transverse direction as shown in Figure R602.10.1.1. Intermediate braced wall lines through the interior of the building shall be permitted. The spacing between parallel braced wall lines shall be in accordance with Table R602.10.1.3.

TABLE R602.10.1.3
BRACED WALL LINE SPACING

APPLICATION	CONDITION	BUILDING TYPE	BRACED WALL LINE SPACING CRITERIA	
			Maximum Spacing	Exception to Maximum Spacing
Wind bracing	85 mph to <110 mph	Detached, townhouse	60 feet	None
Seismic bracing	SDC A - C	Detached	Use wind bracing	
	SDC A – B	Townhouse	Use wind bracing	
	SDC C	Townhouse	35 feet	Up to 50 feet with adjustment of required length of bracing per Table R602.10.3(4)
	SDC D_0, D_1, D_2	Detached, townhouses, one- and two-story only	25 feet	Up to 35 feet to allow for a single room not to exceed 900 sq ft. Spacing of all other braced wall lines shall not exceed 25 feet.
	SDC D_0, D_1, D_2	Detached, townhouse	25 feet	Up to 35 feet when length of required bracing per Table R602.10.3(3) is adjusted in accordance with Table R602.10.3(4).

For SI: 1 foot = 304.8 mm

R602.10.1.4 Angled walls. Any portion of a wall along a braced wall line shall be permitted to angle out of plane for a maximum diagonal length of 8 feet (2438 mm). Where the angled wall occurs at a corner, the length of the braced wall line shall be measured from the projected corner as shown in Figure R602.10.1.4. Where the diagonal length is greater than 8 feet (2438 mm), it shall be considered a separate braced wall line and shall be braced in accordance with Section R602.10.1.

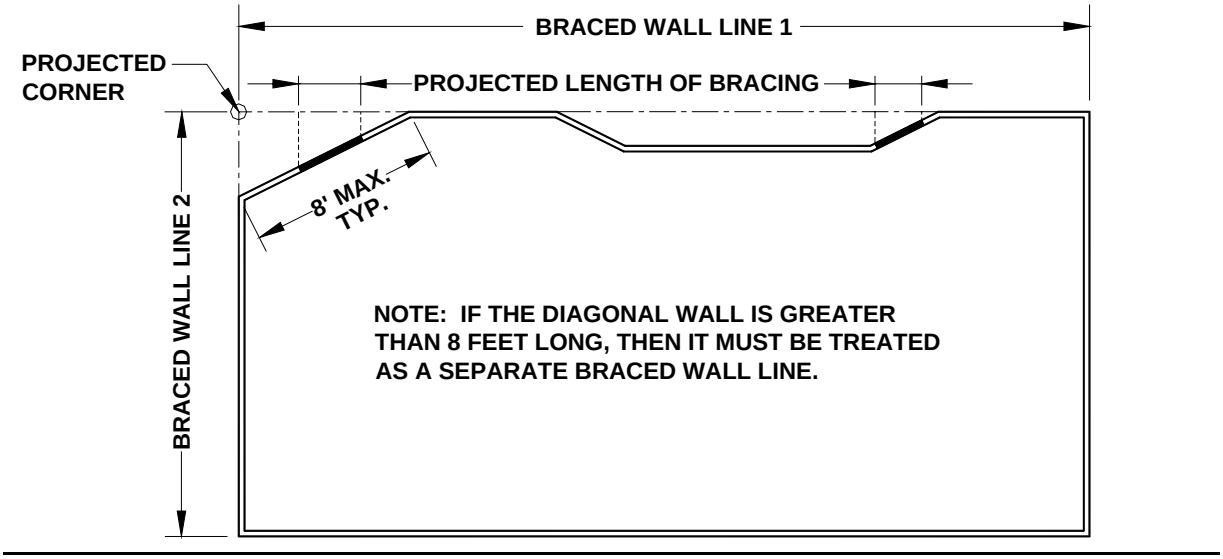


FIGURE R602.10.1.4
ANGLED WALLS

R602.10.2 Braced wall panels. Braced wall panels shall be full-height sections of wall that shall be continuous in the same plane. Braced wall panels shall be constructed and placed along a braced wall line in accordance with this section and the bracing methods specified in Section R602.10.4.

R602.10.2.1 Braced wall panel uplift load path. The bracing lengths in Table R602.10.3(1) apply only when uplift loads are resisted per Section R602.3.5.

R602.10.2.2 Locations of braced wall panels. A braced wall panel shall begin within 10 feet (3810 mm) from each end of a braced wall line as determined in Section R602.10.1.1. The distance between adjacent edges of two braced wall panels shall be no greater than 20 feet (6096 mm) as shown in Figure R602.10.2.2

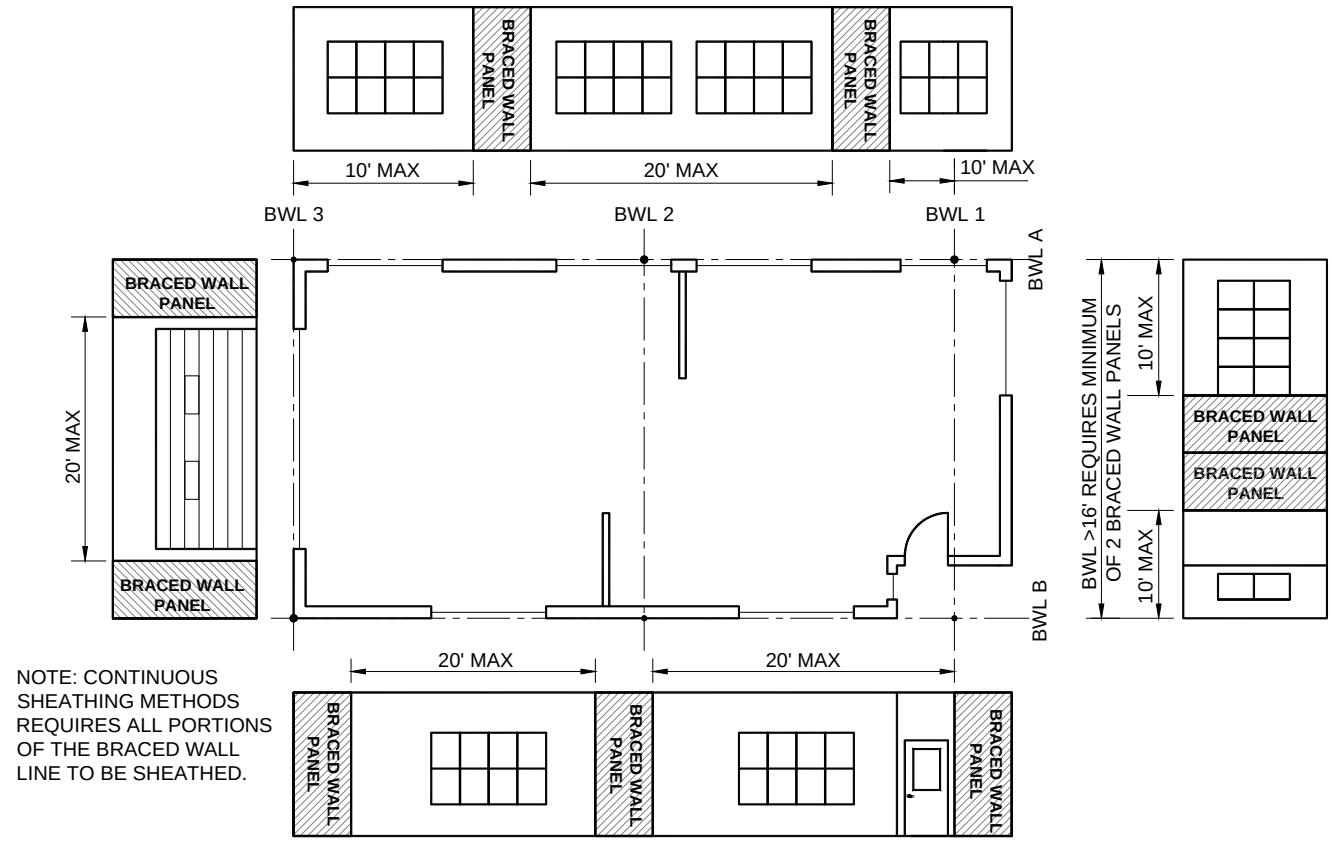


FIGURE R602.10.2.2
LOCATION OF BRACED WALL PANELS

R602.10.2.2.1 Location of braced wall panels in Seismic Design Categories D_0, D_1 and D_2. Braced wall panels shall be located at each end of a braced wall line.

Exception: Braced wall panels constructed of Methods WSP and continuous sheathing methods as specified in Section R602.10.4 shall be permitted to begin no more than 10 feet (3048 mm) from each end of a braced wall line provided each end complies with the following.

1. A minimum 24 in. wide (610 mm) panel for Methods WSP, CS-WSP, CS-G, CS-PF and 32 in. (813 mm) wide panel for Method CS-SFB is applied to each side of the building corner as shown in Condition 4 of Figure R602.10.7.
2. The end of each braced wall panel closest to the end of the braced wall line shall have an 1,800 lb (8 kN) hold-down device fastened to the stud at the edge of the braced wall panel closest to the corner and to the foundation or framing below as shown in Condition 5 of Figure R602.10.7.

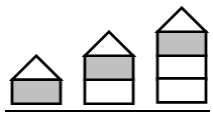
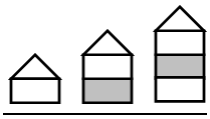
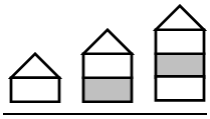
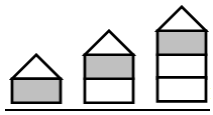
R602.10.2.3 Minimum number of braced wall panels. Braced wall lines with a length of 16 feet (4877 mm) or less shall have a minimum of one braced wall panel. Braced wall lines greater than 16 feet (4877 mm) shall have a minimum of two braced wall panels.

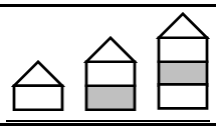
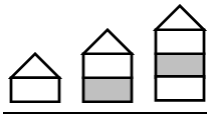
R602.10.3 Required length of bracing. The required length of bracing along each braced wall line shall be determined as follows.

1. All buildings in Seismic Design Categories A and B shall use Table R602.10.3(1) and the applicable adjustment factors in Table R602.10.3(2).
2. Detached buildings in Seismic Design Category C shall use Table R602.10.3(1) and the applicable adjustment factors in Table R602.10.3(2).
3. Townhouses in Seismic Design Category C shall use the greater value determined from Table R602.10.3(1) or R602.10.3(3) and the applicable adjustment factors in Table R602.10.3(2) or R602.10.3(4) respectively.
4. All buildings in Seismic Design Categories D_0, D_1 and D_2 shall use the greater value determined from Table R602.10.3(1) or R602.10.3(3) and the applicable adjustment factors in Table R602.10.3(2) or R602.10.3(4) respectively.

Only braced wall panels parallel to the braced wall line shall contribute towards the required length of bracing of that braced wall line. Braced wall panels along an angled wall meeting the minimum length requirements of Tables R602.10.5 and R602.10.5.2 shall be permitted to contribute its projected length to the braced wall line as shown in Figure R602.10.1.4. Any braced wall panel on an angled wall at the end of a braced wall line shall contribute its projected length for only one of the braced wall lines at the projected corner. In no case shall the required length of bracing along a braced wall line after adjustments be less than 48 inches (1219 mm) total.

TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

• EXPOSURE CATEGORY B • 30 FT MEAN ROOF HEIGHT • 10 FT EAVE TO RIDGE HEIGHT • 10 FT WALL HEIGHT • 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (FEET) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE [a]			
Basic Wind Speed (mph)	**Story Location**	**Braced Wall Line Spacing (feet)**	**Method LIB [b]**	**Method GB [c] (Double Sided)**	**Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB [d]**	**Methods CS-WSP, CS-G, CS-PF**
≤ 85 (mph)		10	3.5	3.5	2.0	1.5
		20	6.0	6.0	3.5	3.0
		30	8.5	8.5	5.0	4.5
		40	11.5	11.5	6.5	5.5
		50	14.0	14.0	8.0	7.0
		60	16.5	16.5	9.5	8.0
		10	6.5	6.5	3.5	3.0
		20	11.5	11.5	6.5	5.5
		30	16.5	16.5	9.5	8.0
		40	21.5	21.5	12.5	10.5
		50	26.5	26.5	15.0	13.0
		60	31.5	31.5	18.0	15.5
		10	NP	9.0	5.5	4.5
		20	NP	17.0	10.0	8.5
		30	NP	24.5	14.0	12.0
		40	NP	32.0	18.0	15.5
		50	NP	39.0	22.5	19.0
		60	NP	46.5	26.5	22.5
≤ 90 (mph)		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5
≤ 100 (mph)		10	4.5	4.5	2.5	2.5
		20	8.5	8.5	5.0	4.0
		30	12.0	12.0	7.0	6.0
		40	15.5	15.5	9.0	7.5
		50	19.0	19.0	11.0	9.5
		60	22.5	22.5	13.0	11.0
		10	8.5	8.5	5.0	4.5
		20	16.0	16.0	9.0	8.0
		30	23.0	23.0	13.0	11.0

• EXPOSURE CATEGORY B • 30 FT MEAN ROOF HEIGHT • 10 FT EAVE TO RIDGE HEIGHT • 10 FT WALL HEIGHT • 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (FEET) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE [a]			
Basic Wind Speed (mph)	**Story Location**	**Braced Wall Line Spacing (feet)**	**Method LIB [b]**	**Method GB [c] (Double Sided)**	**Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB [d]**	**Methods CS-WSP, CS-G, CS-PF**
< 110 (mph)		40	29.5	29.5	17.0	14.5
		50	36.5	36.5	21.0	18.0
		60	43.5	43.5	25.0	21.0
		10	NP	12.5	7.5	6.0
		20	NP	23.5	13.5	11.5
		30	NP	34.0	19.5	16.5
		40	NP	44.0	25.0	21.5
		50	NP	54.0	31.0	26.5
		60	NP	64.0	36.5	31.0
		10	5.5	5.5	3.0	3.0
		20	10.0	10.0	6.0	5.0
		30	14.5	14.5	8.5	7.0
		40	18.5	18.5	11.0	9.0
		50	23.0	23.0	13.0	11.5
		60	27.5	27.5	15.5	13.5
		10	10.5	10.5	6.0	5.0
		20	19.0	19.0	11.0	9.5
		30	27.5	27.5	16.0	13.5
		40	36.0	36.0	20.5	17.5
		50	44.0	44.0	25.5	21.5
		60	52.5	52.5	30.0	25.5
		10	NP	15.5	9.0	7.5
		20	NP	28.5	16.5	14.0
		30	NP	41.0	23.5	20.0
		40	NP	53.0	30.5	26.0
		50	NP	65.5	37.5	32.0
		60	NP	77.5	44.5	37.5

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm.

a. Linear interpolation shall be permitted.
b. Method LIB shall have gypsum board fastened to at least one side with nails or screws per Table R602.3(1) for exterior sheathing or Table R702.3.5 for interior gypsum board. Spacing of fasteners at panel edges shall not exceed 8 inches (203 mm).
c. The length of bracing for Method GB is based on a double sided application. Where GB is used in a one sided application (or in combination of single sided and double sided application), the single sided GB shall only contribute half as much as the double sided GB towards the minimum required length of bracing in this table.
d. Method CS-SFB does not apply where the wind speed is greater than 100 mph.

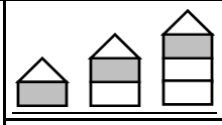
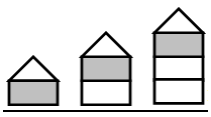
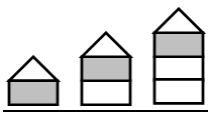
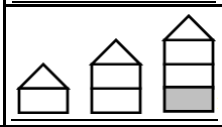
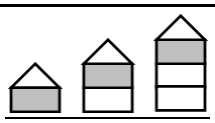
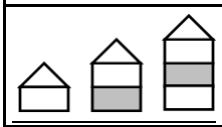
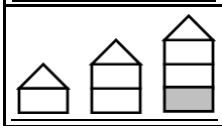
TABLE R602.10.3(2)
WIND ADJUSTMENT FACTORS TO THE REQUIRED LENGTH OF WALL BRACING

ADJUSTMENT BASED ON	STORY/ SUPPORTING	CONDITION	ADJUSTMENT FACTOR [a,b] (multiply length from Table R602.10.3(1) by this factor)	APPLICABLE METHODS
Exposure category	One story structure	B	1.00	All methods
		C	1.20	
		D	1.50	
	Two-story structure	B	1.00	
		C	1.30	
		D	1.60	
	Three-story structure	B	1.00	
		C	1.40	
		D	1.70	
Roof eave-to-ridge height	Roof only	≤5 ft	0.70	
		10 ft	1.00	
		15 ft	1.30	
		20 ft	1.60	
	Roof + 1 floor	≤5 ft	0.85	
		10 ft	1.00	
		15 ft	1.15	
		20 ft	1.30	
	Roof + 2 floors	≤5 ft	0.90	
		10 ft	1.00	
		15 ft	1.10	
		20 ft	Not permitted	
Wall height adjustment	Any story	8 ft	0.90	
		9 ft	0.95	
		10 ft	1.00	
		11 ft	1.05	
		12 ft	1.10	
Number of braced wall lines (per plan direction)	Any story	3	1.30	
		4	1.45	
		≥5	1.60	
Additional 800 lb hold-down device	Top story only	Fastened to the end studs of each braced wall panel and to the foundation or framing below	0.80	DWB, WSP, SFB, PBS, PCP, HPS
Interior gypsum board finish (or equivalent)	Any story	Omitted from inside face of braced wall panels	1.40	DWB, WSP, SFB,PBS, PCP, HPS, CS-WSP, CS-G, CS-SFB
Gypsum board fastening	Any story	4 in. o.c.at panel edges, including top and bottom plates, and all horizontal joints blocked	0.7	GB

For SI: 1 foot = 305 mm, 1 lb = 4.48 N.

a. Linear Interpolation shall be permitted.
b. The total adjustment factor is the product of all applicable adjustment factors.

TABLE R602.10.3(3)
BRACING REQUIREMENTS BASED ON SEISMIC DESIGN CATEGORY

• SOIL CLASS D [b] • WALL HEIGHT = 10 FT • 10 PSF FLOOR DEAD LOAD • 15 PSF ROOF/CEILING DEAD LOAD • BRACED WALL LINE SPACING ≤ 25 FT			MINIMUM TOTAL LENGTH (FEET) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE [a]				
Seismic Design Category	**Story Location**	**Braced Wall Line Length (ft)**	**Method LIB [c]**	**Method GB (Double Sided) [d]**	**Methods DWB, SFB, PBS, PCP, HPS, CS-SFB [e]**	**Method WSP**	**Methods CS-WSP, CS-G,**
C (townhouses only)		10	2.5	2.5	2.5	1.6	1.4
		20	5.0	5.0	5.0	3.2	2.7
		30	7.5	7.5	7.5	4.8	4.1
		40	10.0	10.0	10.0	6.4	5.4
		50	12.5	12.5	12.5	8.0	6.8
		10	NP	4.5	4.5	3.0	2.6
		20	NP	9.0	9.0	6.0	5.1
		30	NP	13.5	13.5	9.0	7.7
		40	NP	18.0	18.0	12.0	10.2
		50	NP	22.5	22.5	15.0	12.8
		10	NP	6.0	6.0	4.5	3.8
		20	NP	12.0	12.0	9.0	7.7
		30	NP	18.0	18.0	13.5	11.5
		40	NP	24.0	24.0	18.0	15.3
		50	NP	30.0	30.0	22.5	19.1
D_0		10	NP	2.8	2.8	1.8	1.6
		20	NP	5.5	5.5	3.6	3.1
		30	NP	8.3	8.3	5.4	4.6
		40	NP	11.0	11.0	7.2	6.1
		50	NP	13.8	13.8	9.0	7.7
		10	NP	5.3	5.3	3.8	3.2
		20	NP	10.5	10.5	7.5	6.4
		30	NP	15.8	15.8	11.3	9.6
		40	NP	21.0	21.0	15.0	12.8
		50	NP	26.3	26.3	18.8	16.0
		10	NP	7.3	7.3	5.3	4.5
		20	NP	14.5	14.5	10.5	9.0
		30	NP	21.8	21.8	15.8	13.4
		40	NP	29.0	29.0	21.0	17.9
		50	NP	36.3	36.3	26.3	22.3
D_1		10	NP	3.0	3.0	2.0	1.7
		20	NP	6.0	6.0	4.0	3.4
		30	NP	9.0	9.0	6.0	5.1
		40	NP	12.0	12.0	8.0	6.8
		50	NP	15.0	15.0	10.0	8.5
		10	NP	6.0	6.0	4.5	3.8
		20	NP	12.0	12.0	9.0	7.7
		30	NP	18.0	18.0	13.5	11.5
		40	NP	24.0	24.0	18.0	15.3
		50	NP	30.0	30.0	22.5	19.1
		10	NP	8.5	8.5	6.0	5.1
		20	NP	17.0	17.0	12.0	10.2
		30	NP	25.5	25.5	18.0	15.3
		40	NP	34.0	34.0	24.0	20.4
		50	NP	42.5	42.5	30.0	25.5
D2		10	NP	4.0	4.0	2.5	2.1
		20	NP	8.0	8.0	5.0	4.3
		30	NP	12.0	12.0	7.5	6.4
		40	NP	16.0	16.0	10.0	8.5
		50	NP	20.0	20.0	12.5	10.6
		10	NP	7.5	7.5	5.5	4.7
		20	NP	15.0	15.0	11.0	9.4
		30	NP	22.5	22.5	16.5	14.0
		40	NP	30.0	30.0	22.0	18.7
		50	NP	37.5	37.5	27.5	23.4
		10	NP	NP	NP	NP	NP
		20	NP	NP	NP	NP	NP
		30	NP	NP	NP	NP	NP
		40	NP	NP	NP	NP	NP
		50	NP	NP	NP	NP	NP

For SI: 1 foot 305 mm

a. Linear interpolation shall be permitted.
b. Wall bracing lengths are based on a soil site class "D." Interpolation of bracing length between the S_{ds} values associated with the Seismic Design Categories shall be permitted when a site-specific S_{ds} value is determined in accordance with Section 1613.5 of the International Building Code.
c. Method LIB shall have gypsum board fastened to at least one side with nails or screws per Table R602.3(1) for exterior sheathing or Table R702.3.5 for interior gypsum board. Spacing of fasteners at panel edges shall not exceed 8 inches (203 mm).
d. The length of bracing for Method GB is based on a double sided application. Where GB is used in a one sided application (or in combination of single sided and double sided application), the single sided GB shall only contribute half as much as the double sided GB towards the minimum required length of bracing in this table.
e. Method CS-SFB applies in SDC C only.

TABLE R602.10.3(4)
SEISMIC ADJUSTMENT FACTORS TO THE REQUIRED LENGTH OF WALL BRACING

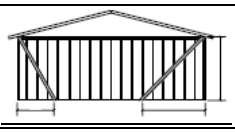
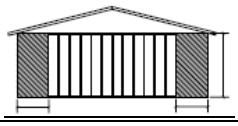
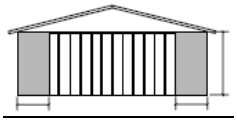
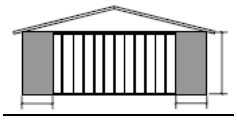
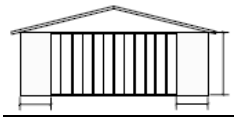
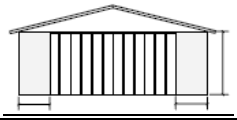
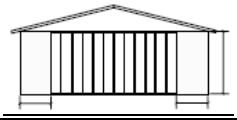
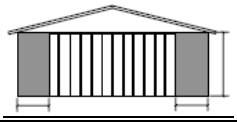
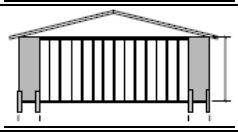
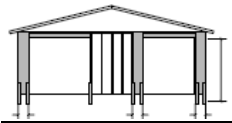
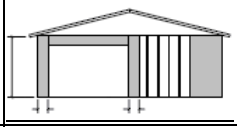
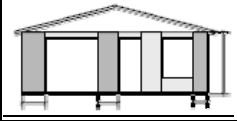
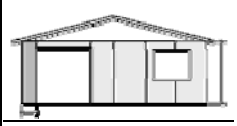
ADJUSTMENT BASED ON:	STORY/ SUPPORTING	CONDITION	ADJUSTMENT FACTOR [a,b] (Multiply length from Table R602.10.3(1) by this factor)	APPLICABLE METHODS
Story height (Section 301.3)	Any story	≤10 ft	1.0	All methods
		>10 ft ≤ 12 ft	1.2	
Braced wall line spacing, townhouses in SDC C	Any story	≤35 ft	1.0	
		>35 ft ≤ 50 ft	1.43	
Braced wall line spacing, in SDC D_0, D_1, D_2 [c]	Any story	<25 ft ≤30 ft	1.2	
		>30 ft ≤ 35 ft	1.4	
Wall dead load	Any story	> 8 ft < 15 ft	1.0	
		<8 psf	0.85	
Roof/ceiling dead load for wall supporting	Roof only or roof plus one or two stories	<15 psf	1.0	
	Roof only	>15 psf ≤ 25 psf	1.2	
	Roof plus one or two stories	>15 psf ≤ 25 psf	1.1	
Walls with stone or masonry veneer	Any story	See Section R703.7		
Interior gypsum board finish (or equivalent)	Any story	Omitted from inside face of braced wall panels	1.5	DWB, WSP, SFB, PBS, PCP, HPS, CS-WSP, CS-G, CS-SFB

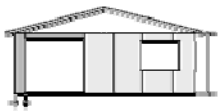
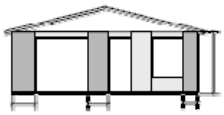
For SI: 1 psf = 47,8 N/m^2.

a. Linear interpolation shall be permitted.
b. The total length of bracing required for a given wall line is the product of all applicable adjustment factors.
c. The length-to-width ratio for the floor/roof *diaphragm* shall not exceed 3:1. The top plate lap splice nailing shall be a minimum of 12-16d nails on each side of the splice.

R602.10.4 Construction methods for braced wall panels. Intermittent and continuously sheathed braced wall panels shall be constructed in accordance with this section and the methods listed in Table R602.10.4.

TABLE R602.10.4
BRACING METHODS

	METHODS, MATERIAL	MINIMUM THICKNESS	FIGURE	CONNECTION CRITERIA [a]	
				Fasteners	Spacing
Intermittent Bracing Methods	**LIB** Let-in-bracing	1x4 wood or approved metal straps at 45° to 60° angles for maximum 16" stud spacing		Wood: 2-8d common nails or 3-8d (2 ½" x 0.113") nails	Wood: per stud and top and bottom plates
				Metal strap: per manufacturer	Metal: per manufacturer
	DWB Diagonal wood boards	¾" (1" nominal) for maximum 24" stud spacing		2-8d (2½" x 0.113") nails or 2 - 1¾" staples	Per stud
	WSP Wood structural panel (See Section R604)	3/8"		Exterior sheathing per Table R602.3(3)	6" edges 12" field
				Interior sheathing per Table R602.3(1) or R602.3(2)	Varies by fastener
	SFB Structural fiberboard sheathing	1/2" or 25/32" for maximum 16" stud spacing		1½" long x 0.12" dia. (for ½ " thick sheathing) 1 3/4" long x 0.12" dia. (for 25/32" thick sheathing) galvanized roofing nails or 8d common (2½"x0.131) nails	3" edges 6" field
	GB [d] Gypsum board (double sided)	1/2"		Nails or screws per Table R602.3(1) for exterior locations	For all braced wall panel locations: 7" edges (including top and bottom plates) 7" field
				Nails or screws per Table R702.3.5 for interior locations	
	PBS Particleboard sheathing (See Section R605)	3/8" or 1/2" for maximum16" stud spacing		For 3/8", 6d common (2"x0.113) nails For ½", 8d common (2½"x0.131) nails	3" edges 6" field
	PCP Portland cement plaster	See Section R703.6 for maximum 16" stud spacing		1½", 11 gage, 7/16" head nails or 7/16", 16 gage staples	6" o.c. on all framing members
	HPS Hardboard panel siding	7/16" for maximum 16" stud spacing		0.092" dia., 0.225" head nails with length to accommodate 1½" penetration into studs	4" edges 8" field
	ABW Alternate braced wall	3/8"		See Section R602.10.6.1	See Section R602.10.6.1
	PFH Portal frame with hold-downs	3/8		See Section R602.10.6.2	See Section R602.10.6.2
	PFG Portal frame at garage	7/16"		See Section R602.10.6.3	See Section R602.10.6.3
Continuous Sheathing Methods	**CS-WSP** Continuously sheathed wood structural panel	3/8"		Exterior sheathing per Table R602.3(3)	6" edges 12" field
				Interior sheathing per Table R602.3(1) or R602.3(2)	Varies by fastener
	CS-G [b,c] Continuously sheathed wood structural panel adjacent to garage openings	3/8"		See Method CS-WSP	See Method CS-WSP

METHODS, MATERIAL	MINIMUM THICKNESS	FIGURE	CONNECTION CRITERIA [a]	
			Fasteners	Spacing
CS-PF Continuously sheathed portal frame	$^{7}/_{16}$"		See Section R602.10.6.4	See Section R602.10.6.4
CS-SFB Continuously sheathed structural fiberboard	$^{1}/_{2}$" or $^{25}/_{32}$" for maximum 16" stud spacing		1½" long x 0.12" dia. (for ½ " thick sheathing) $1^{3}/_{4}$" long x 0.12" dia. (for $^{25}/_{32}$" thick sheathing) galvanized roofing nails or 8d common (2½"x0.131) nails	3" edges 6" field

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm.

a. Adhesive attachment of wall sheathing, including Method GB, shall not be permitted in Seismic Design Categories C, D_0, D_1 and D_2.
b. Applies to panels next to garage door opening when supporting gable end wall or roof load only. May only be used on one wall of the garage. In Seismic Design Categories D_0, D_1, and D_2, roof covering dead load may not exceed 3 psf (0.14 kN/m^2).
c. Garage openings adjacent to a Method CS-G panel shall be provided with a header in accordance with Table R502.5(1). A full height clear opening shall not be permitted adjacent to a Method CS-G panel.
d. "Double sided" GB shall mean that a full length/full height panel of GB sheathing is applied to both sides of the stud wall. GB bracing panels are not required to be aligned back to back – they may be offset from each other so long as their length's comply with Table R602.10.5. Where all of the GB is on one side of the studs or where there is a combination of "double sided" GB and "single sided" GB, the single sided GB shall contribute half of its actual length towards the minimum required length (i.e. 96" of single sided GB is equivalent to 48" of double sided GB).

R602.10.4.1 Mixing methods. Mixing of bracing methods shall be permitted as follows:

1. Mixing intermittent bracing and continuous sheathing methods from story to story shall be permitted.
2. Mixing intermittent bracing methods from braced wall line to braced wall line within a story shall be permitted. Within Seismic Design Categories A, B and C or in regions where the basic wind speed is less than or equal to 100 mph, mixing of intermittent bracing and continuous sheathing methods from braced wall line to braced wall line within a story shall be permitted.
3. Mixing intermittent bracing methods along a braced wall line shall be permitted in Seismic Design Categories A and B, and detached dwellings in Seismic Design Category C provided the length of required bracing in accordance with Table R602.10.3(1) or R602.10.3(3) is the highest value of all intermittent bracing methods used.
4. Mixing of continuous sheathing methods CS-WSP, CS-G and CS-PF along a braced wall line shall be permitted.
5. In Seismic Design Categories A and B, and for detached one- and two-family dwellings in Seismic Design Category C, mixing of intermittent bracing methods along the interior portion of a braced wall line with continuous sheathing methods CS-WSP, CS-G and CS-PF along the exterior portion of the same braced wall line shall be permitted. The length of required bracing shall be the highest value of all intermittent bracing methods used in accordance with Table R602.10.3(1) or R602.10.3(3). The requirements of Section R602.10.7 shall apply to each end of the continuously sheathed portion of the braced wall line.

R602.10.4.2 Continuous sheathing methods. Continuous sheathing methods require structural panel sheathing to be used on all sheathable surfaces on one side of a braced wall line including areas above and below openings and gable end walls and shall meet the requirements of Section R602.10.7.

R602.10.4.3 Braced wall panel interior finish material. Braced wall panels shall have gypsum wall board installed on the side of the wall opposite the bracing material. Gypsum wall board shall be not less than ½ inch (12.7 mm) in thickness and be fastened with nails or screws in accordance with Table R602.3(1) for exterior sheathing or Table R702.3.5 for interior gypsum wall board. Spacing of fasteners at panel edges for gypsum wall board opposite Method LIB bracing shall not exceed 8 inches (203 mm). Interior finish material shall not be glued in Seismic Design Categories D_0, D_1 and D_2.

Exceptions:

1. Interior finish material is not required opposite wall panels that are braced in accordance with Method GB, ABW, PFH, PFG and CS-PF, unless otherwise required by Section R302.6.
2. An approved interior finish material with an in-plane shear resistance equivalent to gypsum board shall be permitted to be substituted, unless otherwise required by Section R302.6.
3. Except for Method LIB, gypsum wall board is permitted to be omitted provided the required length of bracing in Tables R602.10.3(1) and R602.10.3(3) is multiplied by the appropriate adjustment factor in Tables R602.10.3(2) and R602.10.3(4) respectively, unless otherwise required by Section R302.6.

R602.10.5 Minimum length of a braced wall panel. The minimum length of a braced wall panel shall comply with Table R602.10.5. For Methods CS-WSP and CS-SFB, the minimum panel length shall be based on the adjacent clear opening height in accordance with Table R602.10.5 and Figure R602.10.5. When a panel has an opening on either side of differing heights, the taller opening height shall be used to determine the panel length.

R602.10.5.1 Contributing length. For purposes of computing the required length of bracing in Table R602.10.3(1) and R602.10.3(3), the contributing length of each braced wall panel shall be as specified in Table R602.10.5.

TABLE R602.10.5
MINIMUM LENGTH OF BRACED WALL PANELS

METHOD		MINIMUM LENGTH [a] (in)					CONTRIBUTING LENGTH (in)
		Wall Height					
		8 ft	9 ft	10 ft	11 ft	12 ft	
DWG, WSP, SFB, PBS, PCP, HPS, GB [d]		48	48	48	53	58	Actual [b]
LIB		55	62	69	NP		Actual [b]
ABW	SDC A, B and C, wind speed < 110 mph	28	32	34	38	42	48
	SDC D_0, D_1 and D_2, wind speed < 110 mph	32	32	34	NP	NP	
PFH	Supporting roof only	16	16	16	18 [d]	20 [d]	48
	Supporting one story and roof	24	24	24	27 [d]	29 [d]	48
PFG		24	27	30	33 [e]	36 [e]	1.5 x Actual [b]
CS-G		24	27	30	33	36	Actual [b]
CS-PF		16	18	20	22 [f]	24 [f]	Actual [b]
CS-WSP, CS-SFB	Adjacent clear opening height (in)						
	≤ 64	24	27	30	33	36	Actual [b]
	68	26	27	30	33	36	
	72	27	27	30	33	36	
	76	30	29	30	33	36	
	80	32	30	30	33	36	
	84	35	32	32	33	36	
	88	38	35	33	33	36	
	92	43	37	35	35	36	
	96	48	41	38	36	36	
	100		44	40	38	38	
	104		49	43	40	39	
	108		54	46	43	41	
	112			50	45	43	
	116			55	48	45	
	120			60	52	48	
	124				56	51	
	128				61	54	
	132				66	58	
	136					62	
	140					66	
	144					72	

For SI: 1 inch = 25.4 mm
NP = Not permitted

a. Linear interpolation shall be permitted.
b. Use the actual length when it is greater than or equal to the minimum length.
c. As specified in Table R602.10.4, Method GB is intended to be double sided. Where all of the GB is on one side of the studs or where there is a combination of "double sided" GB and "single sided" GB, the single sided GB shall contribute half of its actual length towards the minimum required length (i.e. 96" of single sided GB is equivalent to 48" of double sided GB).
d. Maximum header height for PFH is 10' per Figure R602.10.6.2, but wall height may be increased to 12' with pony wall.
e. Maximum opening height for PFG is 10' per Figure R602.10.6.3, but wall height may be increased to 12' with pony wall.
f. Maximum opening height for CS-PF is 10' per Figure R602.10.6.4, but wall height may be increased to 12' with pony wall

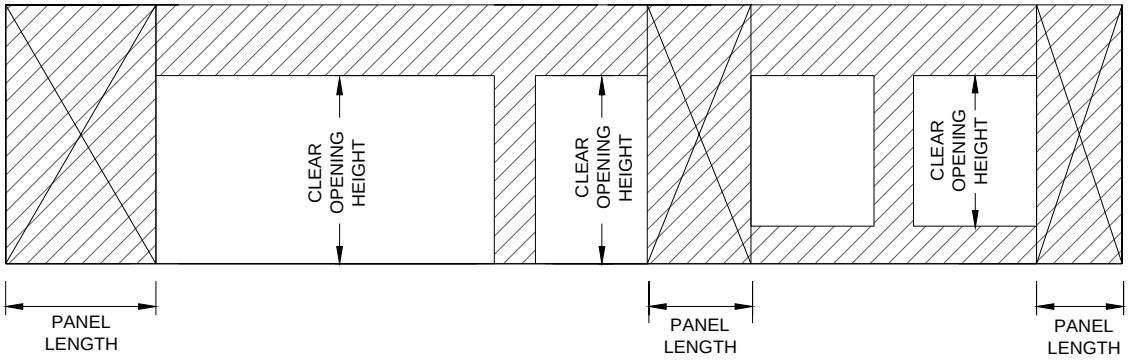


FIGURE R602.10.5
BRACED WALL PANELS WITH CONTINUOUS SHEATHING

R602.10.5.2 Partial credit. For Methods DWB, WSP, SFB, PBS, PCP and HPS in Seismic Design Categories A, B and C, panels between 36 inches and 48 inches in length shall be considered a braced wall panel and shall be permitted to partially contribute towards the required length of bracing in Table R602.10.3(1) and R602.10.3(3), and the contributing length shall be determined from Table R602.10.5.2.

TABLE R602.10.5.2
PARTIAL CREDIT FOR BRACED WALL PANELS LESS THAN 48 INCHES IN ACTUAL LENGTH

Actual Length of Braced Wall Panel (in)	Contributing Length of Braced Wall Panel (in) [a]	
	8 ft Wall Height	9 ft Wall Height
48	48	48
42	36	36
36	27	N/A

For SI: 1 inch = 25.4mm

a. Linear interpolation shall be permitted.

R602.10.6 Construction of Methods ABW, PFH, PFG and CS-PF. Methods ABW, PFH, PFG and CS-PF shall be constructed as specified in Sections R602.10.6.1 through R602.10.6.4.

R602.10.6.1 Method ABW: Alternate braced wall panels. Method ABW braced wall panels shall be constructed in accordance with Figure R602.10.6.1. The hold-down force shall be in accordance with Table R602.10.6.1.

TABLE R602.10.6.1
MINIMUM HOLD-DOWN FORCES FOR METHOD ABW BRACED WALL PANELS

SEISMIC DESIGN CATEGORY AND WIND SPEED	SUPPORTING/STORY	HOLD DOWN FORCE (lb)				
		Height of Braced Wall Panel				
		8 ft	9 ft	10 ft	11 ft	12 ft
SDC A, B and C Wind speed < 110 mph	One story	1800	1800	1800	2000	2200
	First of two story	3000	3000	3000	3300	3600
SDC D_0, D_1 and D_2 Wind speed < 110 mph	One story	1800	1800	1800	NP [a]	NP [a]
	First of two story	3000	3000	3000	NP [a]	NP [a]

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 lb = 4.45 N
NP = Not Permitted.

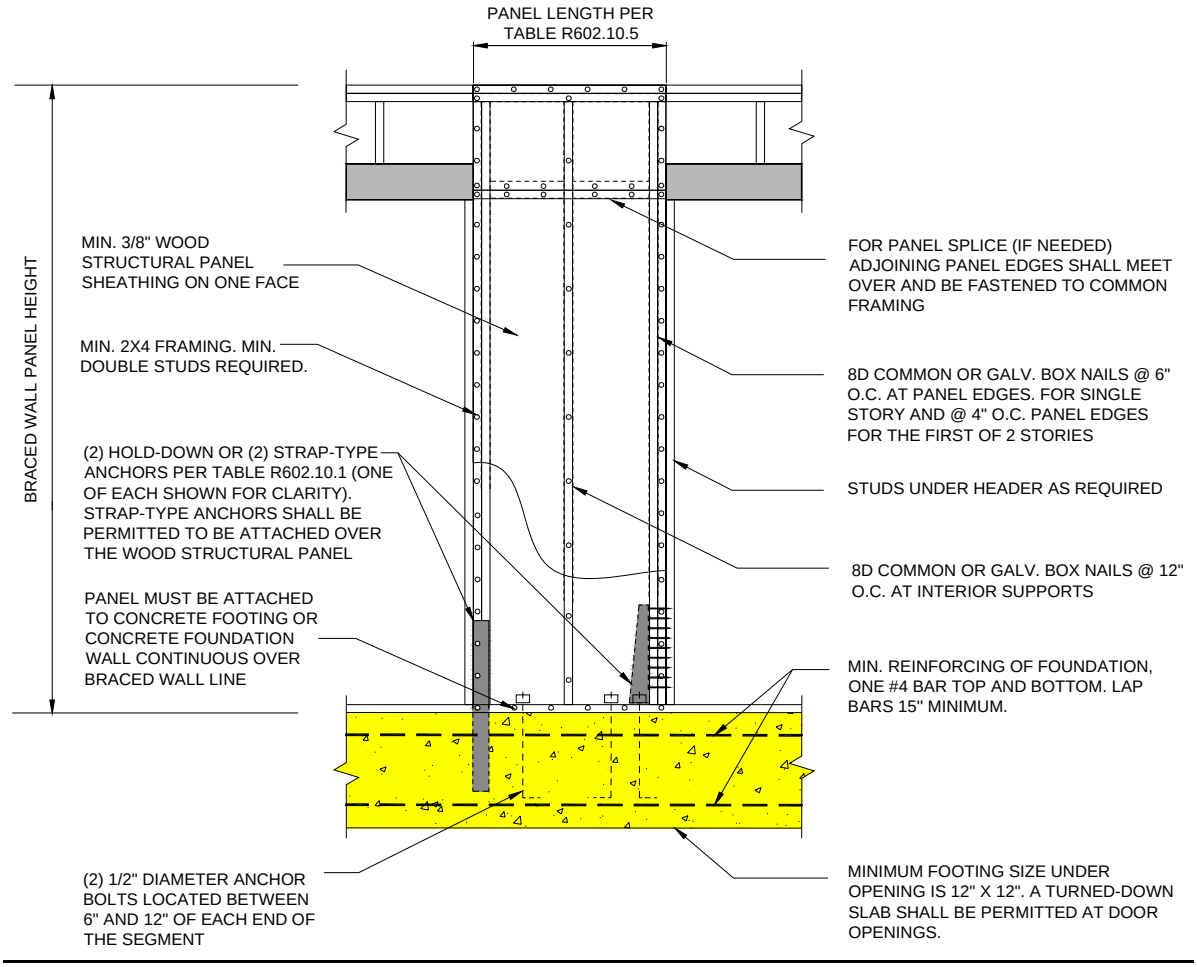
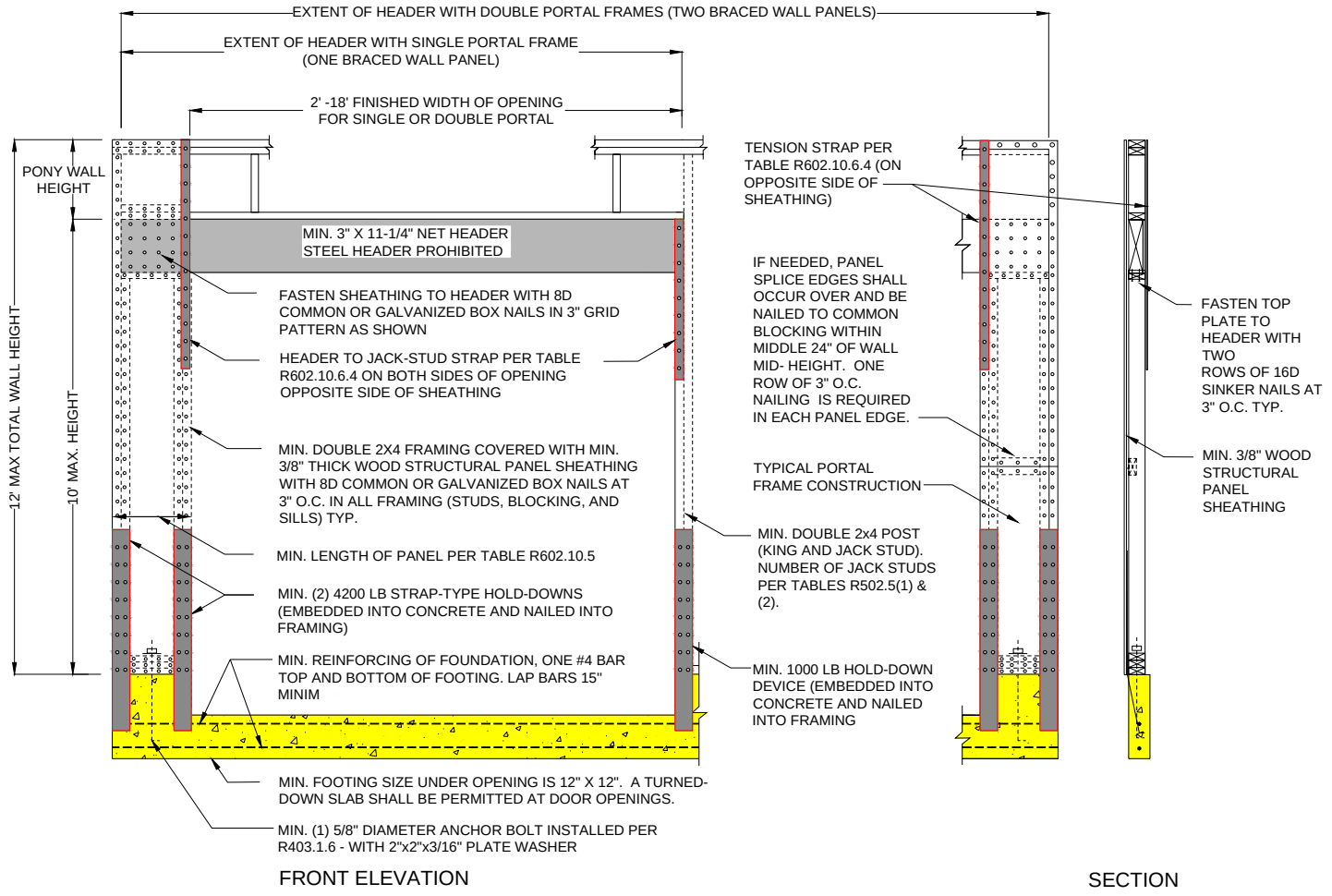


FIGURE R602.10.6.1
METHOD ABW: ALTERNATE BRACED WALL PANEL

R602.10.6.2 Method PFH: Portal frame with hold-downs. Method PFH braced wall panels shall be constructed in accordance with Figure R602.10.6.2.



For SI: 1 inch = 25.4 mm, 1 foot = 305 mm

FIGURE R602.10.6.2
METHOD PFH: PORTAL FRAME WITH HOLD-DOWNS

R602.10.6.3 Method PFG: Portal frame at garage door openings in Seismic Design Categories A, B and C. Where supporting a roof or one story and a roof, a Method PFG braced wall panel constructed in accordance with Figure R602.10.6.3 is permitted on either side of garage door openings.

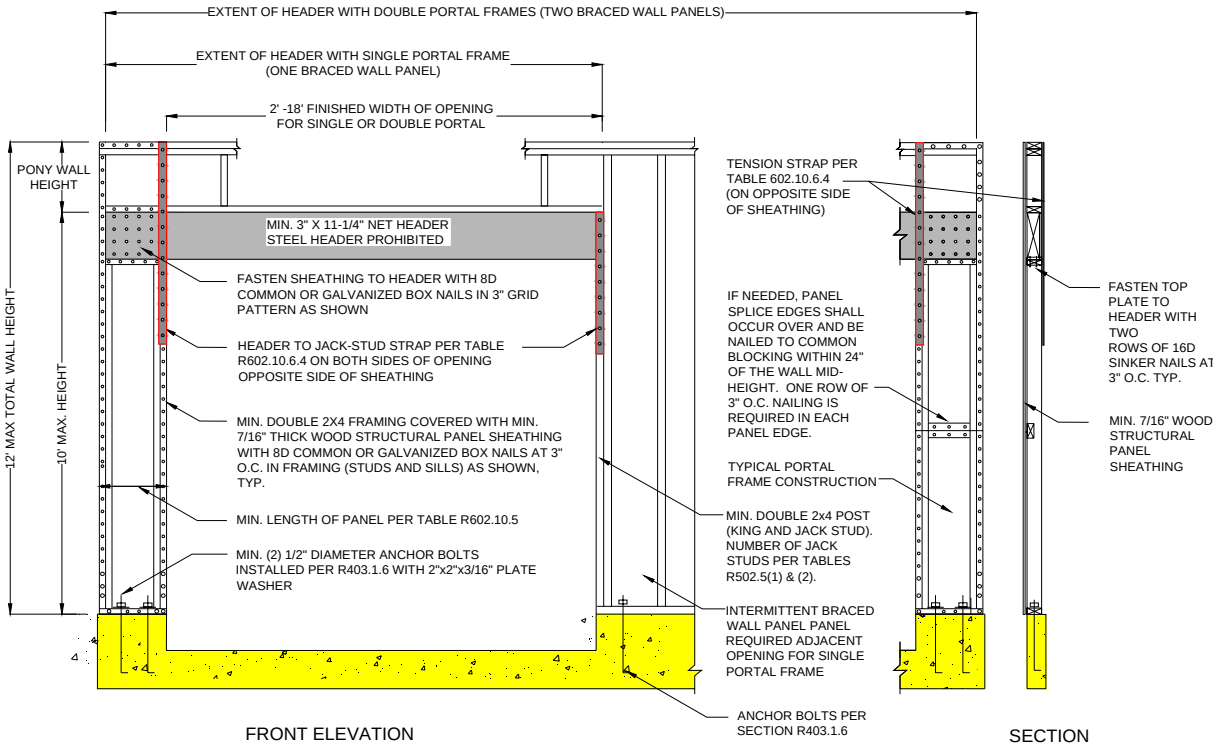


FIGURE R602.10.6.3
METHOD PFG: PORTAL FRAME AT GARAGE DOOR OPENINGS IN SEISMIC DESIGN CATEGORIES A, B AND C

R602.10.6.4 Method CS-PF: Continuously sheathed portal frame. Continuously sheathed portal frame braced wall panels shall be constructed in accordance with Figure R602.10.6.4 and Table R602.10.6.4. The number of continuously sheathed portal frame panels in a single braced wall line shall not exceed four.

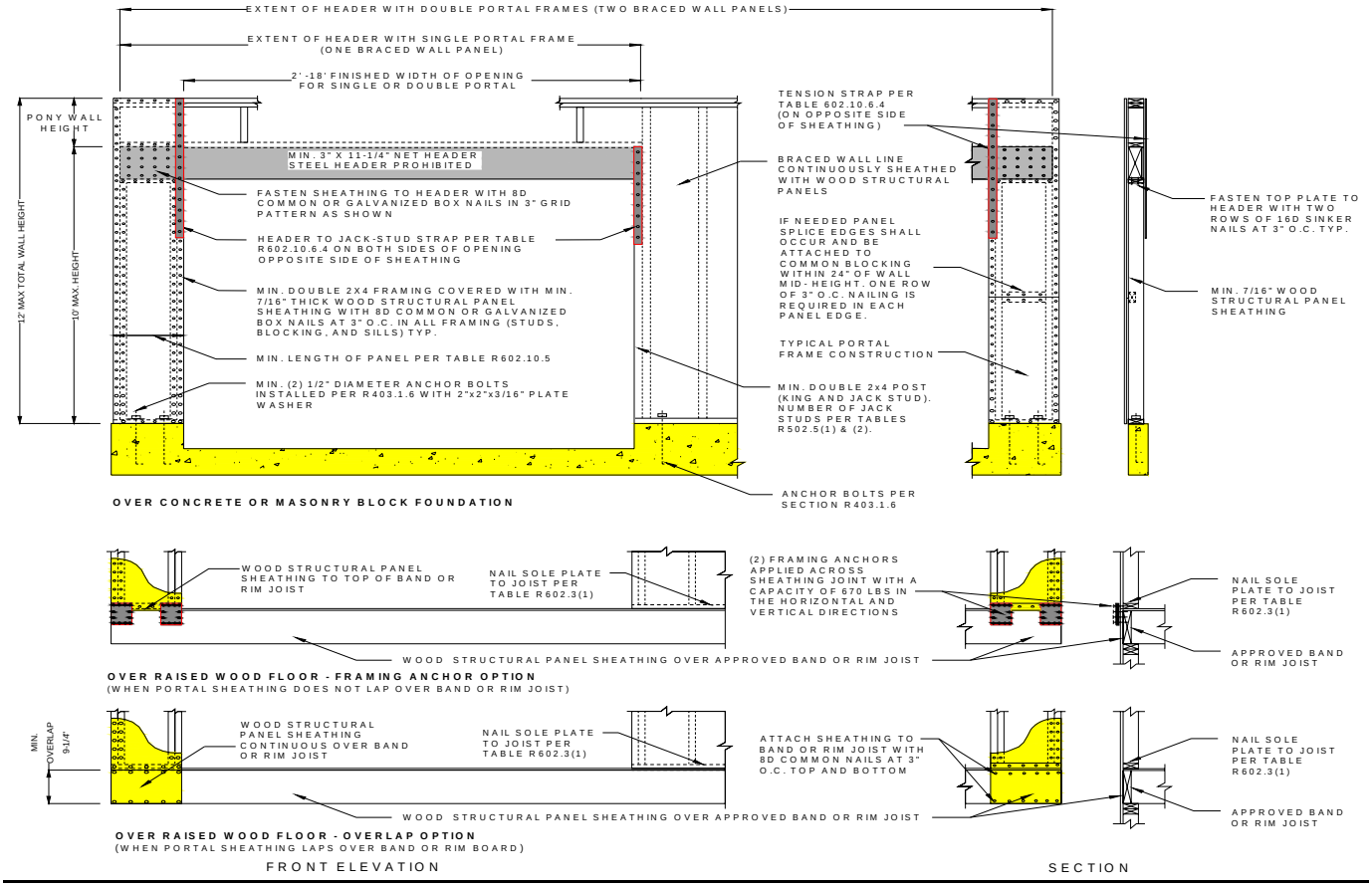
TABLE R602.10.6.4
TENSION STRAP CAPACITY REQUIRED FOR RESISTING WIND PRESSURES PERPENDICULAR TO METHOD PFH, PFG AND CS-PF BRACED WALL PANELS

MINIMUM WALL STUD FRAMING NOMINAL SIZE AND GRADE	MAXIMUM PONY WALL HEIGHT (ft)	MAXIMUM TOTAL WALL HEIGHT (ft)	MAXIMUM OPENING WIDTH (ft)	TENSION STRAP CAPACITY REQUIRED (lb)[a, b]					
				Basic Wind Speed (mph)					
				85	90	100	85	90	100
				Exposure B			Exposure C		
2x4 No. 2 Grade	0	10	18	1000	1000	1000	1000	1000	1000
	1	10	9	1000	1000	1000	1000	1000	1275
			16	1000	1000	1750	1800	2325	3500
			18	1000	1200	2100	2175	2725	DR
	2	10	9	1000	1000	1025	1075	1550	2500
			16	1525	2025	3125	3200	3900	DR
			18	1875	2400	3575	3700	DR	DR
	2	12	9	1000	1200	2075	2125	2750	4000
			16	2600	3200	DR	DR	DR	DR
			18	3175	3850	DR	DR	DR	DR
	4	12	9	1775	2350	3500	3550	DR	DR
			16	4175	DR	DR	DR	DR	DR
2x6 Stud Grade	2	12	9	1000	1000	1325	1375	1750	2550
			16	1650	2050	2925	3000	3550	DR
			18	2025	2450	3425	3500	4100	DR
	4	12	9	1125	1500	2225	2275	2775	3800
			16	2650	3150	DR	DR	DR	DR
			18	3125	3675	DR	DR	DR	DR

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 lb = 4.45 N

a. DR = design required

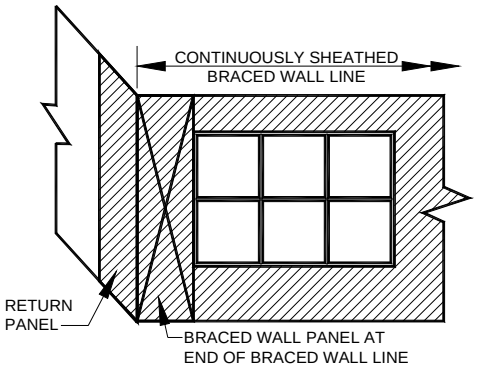
b. Strap shall be installed in accordance with manufacturer's recommendations.



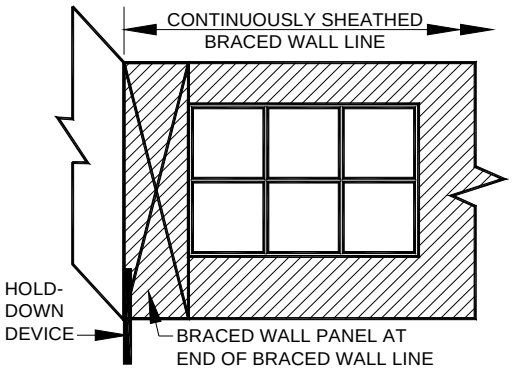
For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 lb = 4.45 N

FIGURE R602.10.6.4
METHOD CS-PF: CONTINUOUSLY SHEATHED PORTAL FRAME PANEL CONSTRUCTION

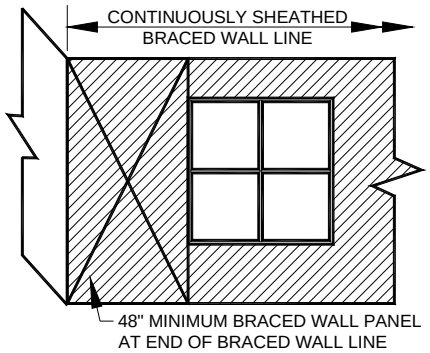
R602.10.7 Ends of braced wall lines with continuous sheathing. Each end of a braced wall line with continuous sheathing shall have one of the conditions shown in Figure R602.10.7.



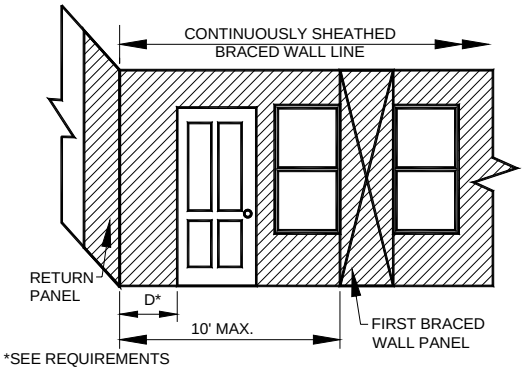
END CONDITION 1



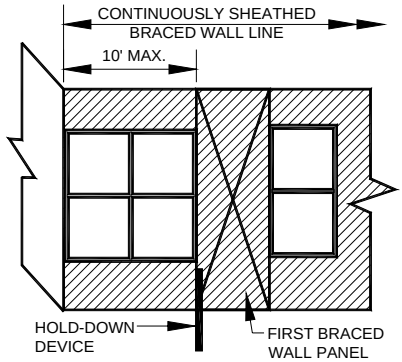
END CONDITION 2



END CONDITION 3



END CONDITION 4



END CONDITION 5

REQUIREMENTS

Return panel: 24" for braced wall lines sheathed with wood structural panels
32" for braced wall lines sheathed with structural fiberboard

Distance D: 24" for braced wall lines sheathed with wood structural panels
32" for braced wall lines sheathed with structural fiberboard

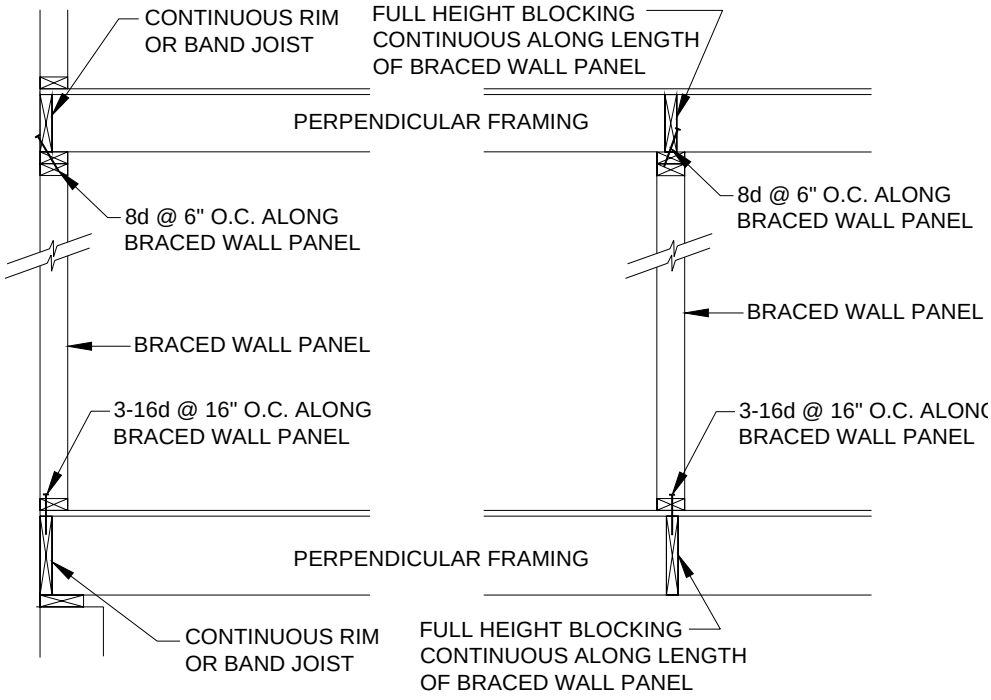
Hold-down device: 800 lbs capacity fastened to the edge of the braced wall panel closest to the corner and to the foundation or floor framing below

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 lb = 4.45 N

FIGURE R602.10.7
END CONDITIONS FOR BRACED WALL LINES WITH CONTINUOUS SHEATHING

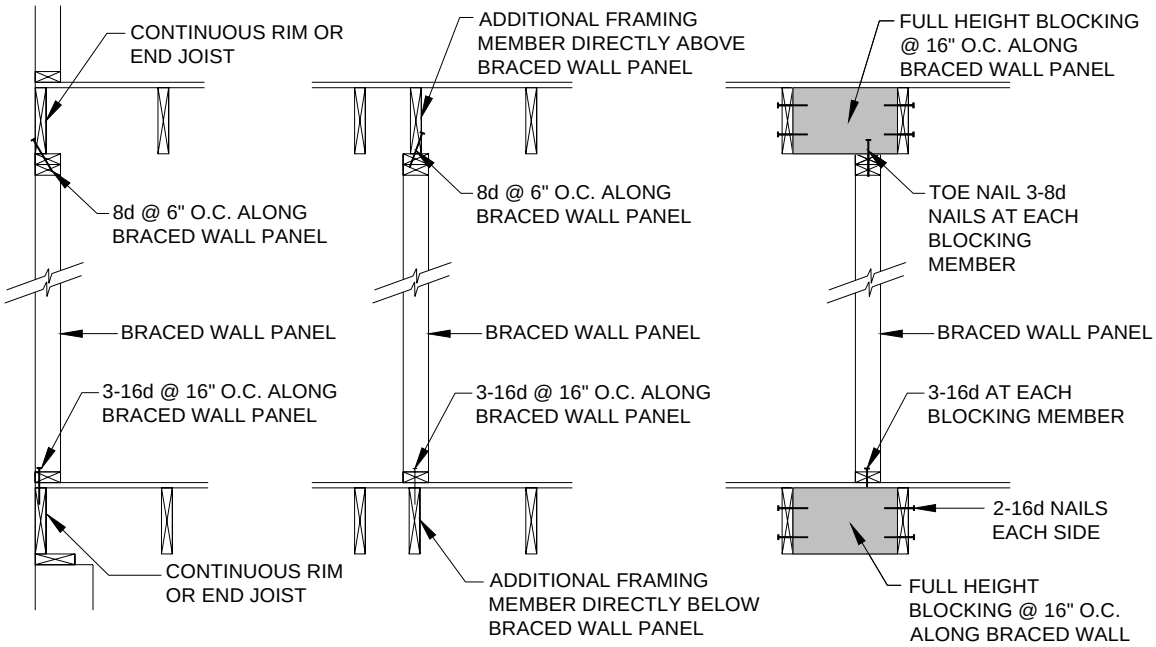
R602.10.8 Braced wall panel connections. Braced wall panels shall be connected to floor framing or foundations as follows:

1. Where joists are perpendicular to a braced wall panel above or below, a rim joist, band joist or blocking shall be provided along the entire length of the braced wall panel in accordance with Figure R602.10.8(1). Fastening of top and bottom wall plates to framing, rim joist, band joist and/or blocking shall be in accordance with Table R602.3(1).
2. Where joists are parallel to a braced wall panel above or below, a rim joist, end joist or other parallel framing member shall be provided directly above and below the braced wall panel in accordance with Figure R602.10.8(2). Where a parallel framing member cannot be located directly above and below the panel, full-depth blocking at 16 inch (406 mm) spacing shall be provided between the parallel framing members to each side of the braced wall panel in accordance with Figure R602.10.8(2). Fastening of blocking and wall plates shall be in accordance with Table R602.3(1) and Figure R602.10.8(2).
3. Connections of braced wall panels to concrete or masonry shall be in accordance with Section R403.1.6.



For SI: 1 inch = 25.4 mm

FIGURE R602.10.8(1)
BRACED WALL PANEL CONNECTION WHEN
PERPENDICULAR TO FLOOR/CEILING FRAMING



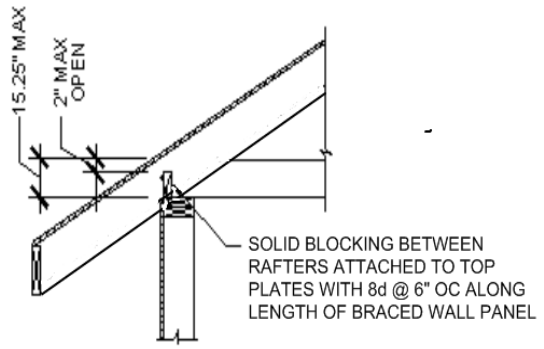
For SI: 1 inch = 25.4 mm

FIGURE R602.10.8(2)
BRACED WALL PANEL CONNECTION WHEN
PARALLEL TO FLOOR/CEILING FRAMING

R602.10.8.1 Braced wall panel connections for Seismic Design Categories D_0, D_1 and D_2. Braced wall panels shall be fastened to required foundations in accordance with Section R602.11.1, and top plate lap splices shall be face-nailed with at least eight 16d nails on each side of the splice.

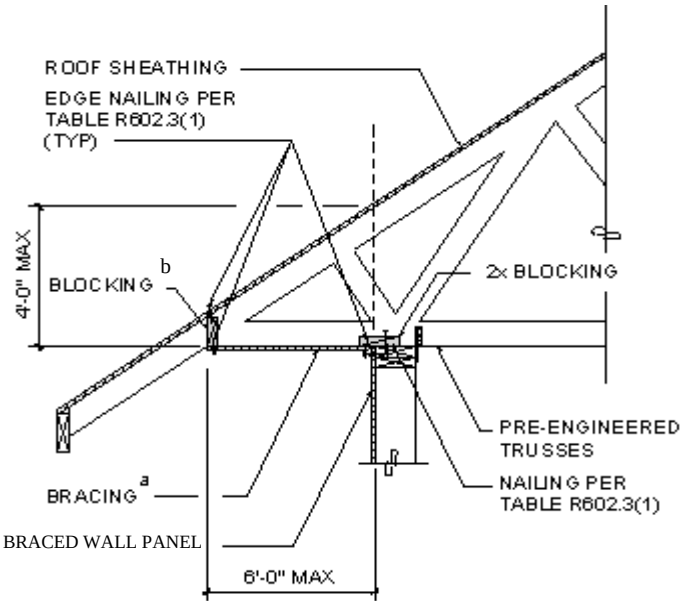
R602.10.8.2 Connections to roof framing. Exterior braced wall panels shall be connected to roof framing as follows.

1. Parallel rafters or roof trusses shall be attached to the top plates of braced wall panels in accordance with Table R602.3(1).
2. For Seismic Design Categories A, B and C and wind speeds less than 100 mph (45 m/s):
   - 2.1. Where the distance from the top of the rafters or roof trusses and perpendicular top plates is 9.25 inches (235 mm) or less, the rafters or roof trusses shall be connected to the top plates of braced wall panels in accordance with Table R602.3(1) and blocking need not be installed.
   - 2.2. Where the distance from the top of the rafters and perpendicular top plates is between 9.25 inches (235 mm) and 15.25 inches (387 mm) the rafters shall be connected to the top plates of braced wall panels with blocking in accordance with Figure R602.10.8.2(1) and attached in accordance with Table R602.3(1).
   - 2.3. Where the distance from the top of the roof trusses and perpendicular top plates is between 9.25 inches (235 mm) and 15.25 inches (387 mm) the roof trusses shall be connected to the top plates of braced wall panels with blocking in accordance with Table R602.3(1).
3. For Seismic Design Categories D_0, D_1 and D_2 or wind speeds of 100 mph (45 m/s) or greater, where the distance between the top of rafters or roof trusses and perpendicular top plates is 15.25 inches (387 mm) or less, rafters or roof trusses shall be connected to the top plates of braced wall panels with blocking in accordance with Figure R602.10.8.2(1) and attached in accordance with Table R602.3(1).
4. For all Seismic Design Categories and wind speeds, where the distance between the top of rafters or roof trusses and perpendicular top plates exceeds 15.25 inches (387 mm), perpendicular rafters or roof trusses shall be connected to the top plates of braced wall panels in accordance with one of the following methods
   - 4.1. In accordance with Figure R602.10.8.2(2),
   - 4.2. In accordance with Figure R602.10.8.2(3),
   - 4.3. With full height engineered blocking panels designed for values listed in American Forest and Paper Association (AF&PA) Wood Frame Construction Manual for One- and Two-Family Dwellings (WFCM). Both the roof and floor sheathing shall be attached to the blocking panels in accordance with Table R602.3(1).
   - 4.4. Designed in accordance with accepted engineering methods.
5. Lateral support for the rafters and ceiling joists shall be provided in accordance with Section R802.8.
6. Lateral support for trusses shall be provided in accordance with Section R802.10.3.



For SI: 1 inch = 25.4 mm

FIGURE R602.10.8.2(1)
BRACED WALL PANEL CONNECTION TO PERPENDICULAR RAFTERS

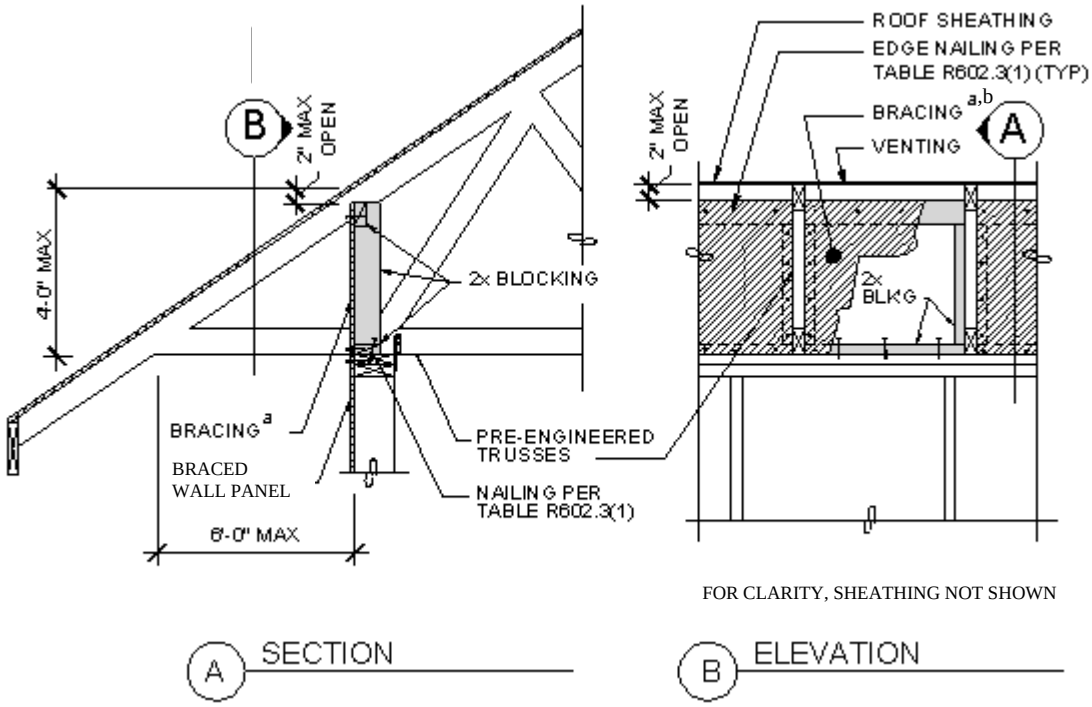


For SI: 1 inch = 25.4 mm

a. Methods of bracing shall be as described in Section R602.10.2 method DWB, WSP, SFB, GB, PBS, PCP OR HPS

b. Provide ventilation (not shown) per Section R806.

FIGURE R602.10.8.2(2)
BRACED WALL PANEL CONNECTION OPTION TO PERPENDICULAR RAFTERS OR ROOF TRUSSES



For SI: 1 inch = 25.4 mm

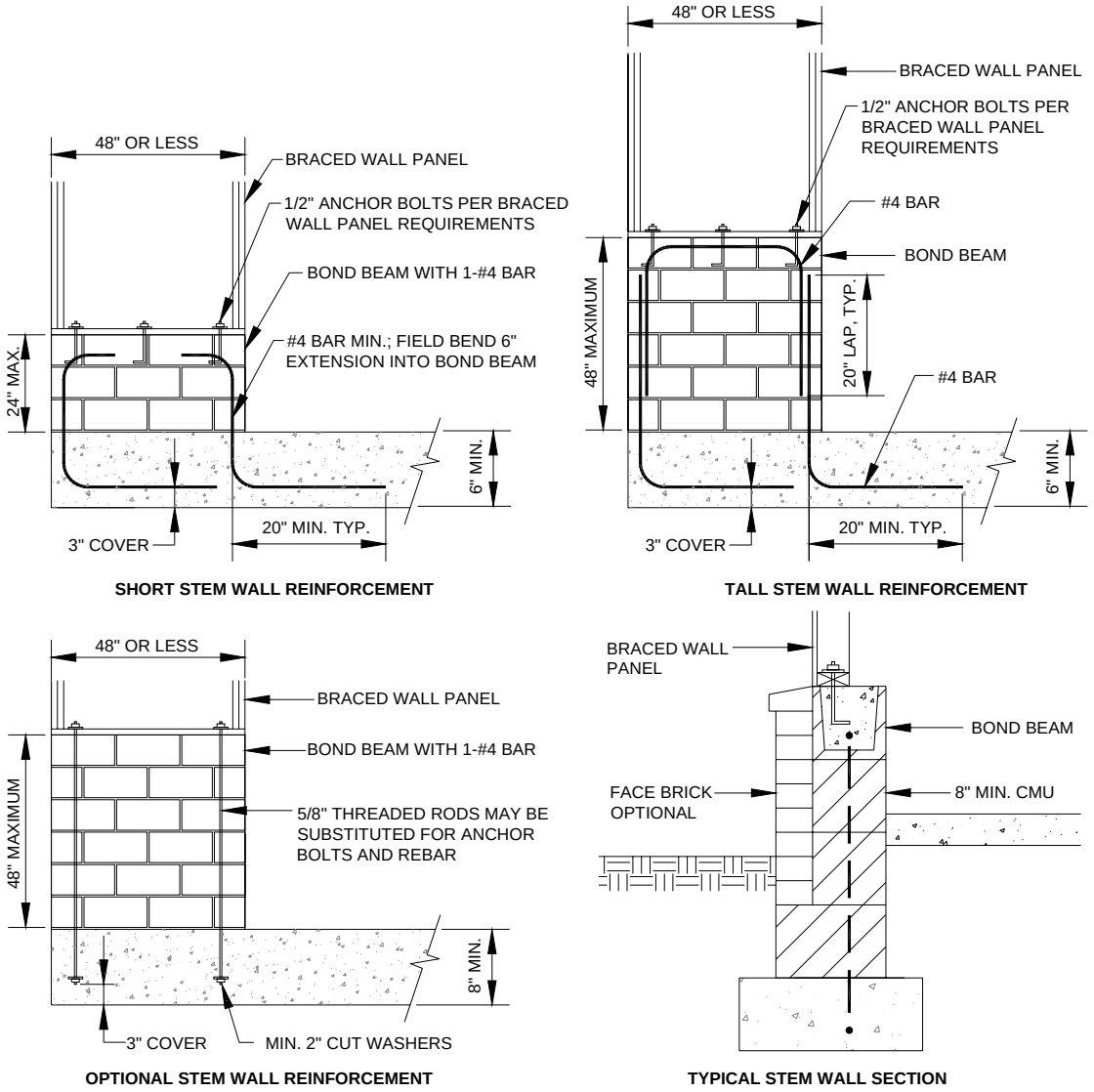
a. Methods of bracing shall be as described in Section R602.10.2 method DWB, WSP, SFB, GB, PBS, PCP OR HPS

b. Provide ventilation (not shown) per Section R608.

FIGURE R602.10.8.2(3)
BRACED WALL PANEL CONNECTION OPTION TO PERPENDICULAR RAFTERS OR ROOF TRUSSES

R602.10.9 Braced wall panel support. Braced wall panel support shall be provided as follows:

1. Cantilevered floor joists complying with Section R502.3.3 shall be permitted to support braced wall panels.
2. Elevated post or pier foundations supporting braced wall panels shall be designed in accordance with accepted engineering practice.
3. Masonry stem walls with a length of 48 inches (1220 mm) or less supporting braced wall panels shall be reinforced in accordance with Figure R602.10.9. Masonry stem walls with a length greater than 48 inches (1220 mm) supporting braced wall panels shall be constructed in accordance with Section R403.1 Methods ABW and PFH shall not be permitted to attach to masonry stem walls.
4. Concrete stem walls with a length of 48" or less, greater than 12 inches tall and less than 6 inches thick shall have reinforcement sized and located in accordance with Figure R602.10.9.



For SI: 1 in=305 mm

FIGURE R602.10.9
MASONRY STEM WALLS SUPPORTING BRACED WALL PANELS

R602.10.9.1 Braced wall panel support for Seismic Design Category D_2. In one-story buildings located in Seismic Design Category D_2, braced wall panels shall be supported on continuous foundations at intervals not exceeding 50 feet (15 240 mm). In two story buildings located in Seismic Design Category D_2, all braced wall panels shall be supported on continuous foundations.

Exception: Two-story buildings shall be permitted to have interior braced wall panels supported on continuous foundations at intervals not exceeding 50 feet (15 240 mm) provided that:

1. The height of cripple walls does not exceed 4 feet (1219 mm).
2. First-floor braced wall panels are supported on doubled floor joists, continuous blocking or floor beams.
3. The distance between bracing lines does not exceed twice the building width measured parallel to the braced wall line.

R602.10.10 Panel joints. All vertical joints of panel sheathing shall occur over, and be fastened to common studs. Horizontal joints in braced wall panels shall occur over, and be fastened to common blocking of a minimum 1-1/2 inch (38 mm) thickness.

Exceptions:

1. Blocking at horizontal joints shall not be required in wall segments that are not counted as braced wall panels.
2. Where the length of bracing provided is at least twice the required length of bracing from Tables R602.10.3(1) and R602.10.3(3) blocking at horizontal joints shall not be required in braced wall panels constructed using Methods WSP, SFB, GB, PBS or HPS.
3. When Method GB panels are installed horizontally, blocking of horizontal joints is not required.

R602.10.11 Cripple wall bracing. In Seismic Design Categories other than D_2, cripple walls shall be braced with a length and type of bracing as required for the wall above in accordance with Tables R602.10.3(1) and R602.10.3(3) with the following modifications for cripple wall bracing:

1. The length of bracing as determined from Tables R602.10.3(1) and R602.10.3(3) shall be multiplied by a factor of 1.15, and
2. The wall panel spacing shall be decreased to 18 feet (5486 mm) instead of 25 feet (7620 mm).

R602.10.11.1 Cripple wall bracing in Seismic Design Categories D_0, D_1 and D_2. In addition to the requirements of Section R602.10.11, where braced wall lines at interior walls occur without a continuous foundation below, the length of parallel exterior cripple wall bracing shall be one and one-half times the length required by Table R602.10.3(3). Where cripple walls braced using Method WSP cannot provide this additional length, the capacity of the sheathing shall be increased by reducing the spacing of fasteners along the perimeter of each piece of sheathing to 4 inches (102 mm) on center.

In Seismic Design Category D_2, cripple walls shall be braced in accordance with Tables R602.10.3(3) and R602.10.3(4).

R602.10.11.2 Redesignation of cripple walls. In any Seismic Design Category, cripple walls shall be permitted to be redesignated as the first story walls for purposes of determining wall bracing requirements. If the cripple walls are redesignated, the stories above the redesignated story shall be counted as the second and third stories respectively.

Reason: As the wall bracing section evolved, it has become more universal and flexible, but, as a result, it has grown in size and complexity. After the Ad Hoc committee's "engineering" work was complete and integrated into the 2009 IRC, we heard back from end users that this section of the code was extremely challenging. The committee therefore wanted to focus on making the 2012 IRC easier to read, easier to understand and easier to use.

The *BIG BANG*: To accommodate over 30 separate editorial and technical "simplification" proposals, the Ad Hoc Committee agreed to delete Section R602.10 in its entirety, and replace it with one single change - rather than try to strikeout and insert individual tables, code sections and figures. The decision to integrate all the individual code changes into a single change was due in part to the complexity and interconnectivity of the pieces, and the necessity to "visualize" the final product in its totality. **Everything in this single change had unanimous support among committee members and was deemed to be non-controversial in nature**.

There are several other changes being proposed by committee members that are being submitted independent of this integrated change because of their scope and nature. Some have the unanimous backing of the committee, but may generate discussion from the floor, and others are being offered separately by individual members of the committee because of their content.

Non-technical changes:
Many of the code changes are reorganizational in nature from the 2009 IRC; we moved similar ideas and concepts together to read more smoothly, we merged or deleted unnecessary or duplicated pieces, and made editorial clarifications and improvements.

Technical changes:
The significant technical changes incorporated into this new section are listed below.

- **Table R602.3(1):**
    - A new row was added to the table that incorporates the nailing requirements of 2009 IRC Figure R602.10.4.4(1) thus eliminating the large and complex figure. All other requirements of the eliminated figure are already covered elsewhere in the IRC. A new requirement for fastening the rim board to sill plate was added to complete the load path from braced wall panels to the foundation.

- **Section R602.10.1.1**:
    - A new figure was added to replace several less effective figures: it clarifies offsets, BWL spacing, and explains how to handle the situation when an intersecting braced wall line is not present to define the length of BWL – it now explains that the end of the building will determine its length.

- **Section R602.10.2.2 and R602.10.2.3:**
    - For consistency, the distance from the end of a BWL to the first BWP was unified at 10 feet for all SDCs and wind speeds.
    - The required summation of end distances was eliminated (2009 IRC Section R602.10.1.4); in its place, braced wall lines up to 16 feet in length may have only one braced wall panel.
    - BWP spacing was changed from 25' o.c.to a 20' edge-to-edge spacing to make it easier to measure.
    - Another new figure was introduced to better demonstrate how BWPs may be located along the walls of the house.

- **Section R602.10.3:**
    - The contribution from BWP on an angled wall was clarified.

- **Tables R602.10.3(1) and (3):**
    - Method GB was redefined as a <u>one sided, 4' application only</u>, because of the problem with interpreting what "double sided GB" meant. To compensate, the required length of bracing for a braced wall line with Method GB was doubled in these two tables.
    - Method CS-SFB was integrated into the tables as well.

- **Section R602.10.5:**
    - Section R602.10.5 was deleted and the provisions for the use of Continuous Sheathing- Structural Fiberboard Sheathing were placed in the appropriate sections
    -
- **Section R602.10.4.1, Item 5:**
    - The option to mix intermittent and continuous methods on a single braced wall line was provided. When a braced wall line begins on the exterior of the building and continues through the interior, the designer can brace the interior portions with intermittent methods and utilize the advantages of continuous sheathing on the exterior portions.

- **Figure R602.10.6.2:**
    - The option for a pony wall atop a PFH portal frame was added so that all portal frames (including PFG and CS-PF) allow the pony wall extension above the header.

- **Figure R602.10.7**:
    - A new end condition was added. Condition 3 allows no return panels or hold-downs if a 4 foot braced wall panel is located at the end of the braced wall line.

The uplift load path section, previously R602.10.1.2.1, was clarified, strengthened and moved to become Section R602.3.5.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Bajnai-AHWB-RB-1-CH 6

RB106–09/10

R602.9, Table R602.10.1.2(2), R602.10.9, R602.10.9.1, R602.10.9.2, R602.10.9.3, R602.11.2

Proponent: Chuck Bajnai, Chesterfield County, VA, Chairman, ICC Ad-Hoc Committee on Wall Bracing

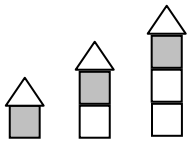
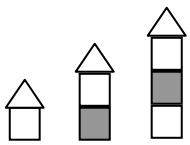
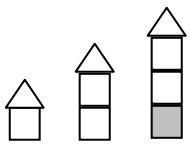
1. Revise as follows:

R602.9 Cripple walls. Foundation cripple walls shall be framed of studs not smaller than the studding above. When exceeding 4 feet (1219 mm) in height, such walls shall be framed of studs having the size required for an additional *story*.

Cripple walls with a stud height less than 14 inches (356 mm) shall be <u>continuously</u> sheathed on ~~at least~~ one side with ~~a~~ wood structural panel<u>s</u> ~~that is~~ fastened to both the top and bottom plates in accordance with Table R602.3(1), or the cripple walls shall be constructed of solid blocking.

<u>All</u> cripple walls shall be supported on continuous foundations.

TABLE R602.10.1.2(2)[a, b, c]
BRACING REQUIREMENTS BASED ON SEISMIC DESIGN CATEGORY
(AS A FUNCTION OF BRACED WALL LINE LENGTH)

SOIL CLASS D[a] WALL HEIGHT = 10 FT 10 PSF FLOOR DEAD LOAD 15 PSF ROOF/CEILING DEAD LOAD BRACED WALL LINE SPACING ≤ 25 FT			MINIMUM TOTAL LENGTH (FEET) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE			
SEISMIC DESIGN CATEGORY (SDC)	**STORY LOCATION**	**BRACED WALL LINE LENGTH**	**METHOD LIB**	**METHODS DWB, SFB, GB, PBS, PCP, HPS**	**METHOD WSP**	**CONT. SHEATHING**
SDC D2		10	NP	4.0	2.5	2.1
		20	NP	8.0	5.0	4.3
		30	NP	12.0	7.5	6.4
		40	NP	16.0	10.0	8.5
		50	NP	20.0	12.5	10.6
		10	NP	7.5	5.5	4.7
		20	NP	15.0	11.0	9.4
		30	NP	22.5	16.5	14.0
		40	NP	30.0	22.0	18.7
		50	NP	37.5	27.5	23.4
		10	NP	NP	NP	NP
		20	NP	NP	NP	NP
		30	NP	NP	NP	NP
		40	NP	NP	NP	NP
		50	NP	NP	NP	NP

SOIL CLASS D[a] WALL HEIGHT = 10 FT 10 PSF FLOOR DEAD LOAD 15 PSF ROOF/CEILING DEAD LOAD BRACED WALL LINE SPACING ≤ 25 FT			MINIMUM TOTAL LENGTH (FEET) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE			
SEISMIC DESIGN CATEGORY (SDC)	**STORY LOCATION**	**BRACED WALL LINE LENGTH**	**METHOD LIB**	**METHODS DWB, SFB, GB, PBS, PCP, HPS**	**METHOD WSP**	**CONT. SHEATHING**
SDC D2	Cripple wall below one- or two-story dwelling	10	NP	NP	7.5	6.4
		20	NP	NP	15.0	12.8
		30	NP	NP	22.5	19.1
		40	NP	NP	30.0	25.5
		50	NP	NP	37.5	31.9

(Portions of table not shown remain unchanged)

R602.10.9 Cripple wall bracing. ~~In Seismic Design Categories other than D2, cripple walls shall be braced with a length and type of bracing as required for the wall above in accordance with Tables R602.10.1.2(1) and R602.10.1.2(2) with the following modifications for cripple wall bracing:~~ Cripple walls shall be constructed in accordance with Section R602.9 and braced in accordance with this section. Cripple walls shall be braced with the length and method of bracing used for the wall above in accordance with Tables R602.10.1.2(1) and R602.10.1.2(2), except that the length of cripple wall bracing shall be multiplied by a factor of 1.15.

~~1. The length of bracing as determined from Tables R602.10.1.2(1) and R602.10.1.2(2) shall be multiplied by a factor of 1.15, and~~
~~2. The wall panel spacing shall be decreased to 18 feet (5486 mm) instead of 25 feet (7620 mm).~~

2. Delete and substitute as follows:

~~**R602.10.9.1 Cripple wall bracing in Seismic Design Categories D0, D1 and D2.** In addition to the requirements of Section R602.10.9, where *braced wall lines* at interior walls occur without a continuous foundation below, the length of parallel exterior cripple wall bracing shall be 11/2 times the length required by Tables R602.10.1.2(1) and R602.10.1.2(2). Where cripple walls braced using Method WSP of Section R602.10.2 cannot provide this additional length, the capacity of the sheathing shall be increased by reducing the spacing of fasteners along the perimeter of each piece of sheathing to 4 inches (102 mm) on center. In Seismic Design Category D2, cripple walls shall be braced in accordance with Tables R602.10.1.2(1) and R602.10.1.2(2).~~

R602.10.9.1 Cripple wall bracing for Seismic Design Categories D_0, D_1 and townhouses in Seismic Design Category C. In addition to the requirements in Section R602.10.9, braced wall panels for cripple walls shall be located no more than 18 feet (5486 mm) on center along a braced wall line.

Where braced wall lines at interior walls are not supported on a continuous foundation below, the adjacent parallel cripple walls, where provided, shall be braced with Method WSP per Section R602.10.2 or Method CS-WSP per Section R602.10.4. The length of bracing required per Table R602.10.1.2(2) for the cripple walls shall be multiplied by 1.5. Where the cripple walls do not have sufficient length to provide the required bracing, the spacing of panel edge fasteners shall be reduced to 4 inches (102 mm) on center and the required bracing length adjusted by 0.7. If the required length can still not be provided, the cripple wall shall be designed in accordance with accepted engineering practice.

R602.10.9.2 Cripple wall bracing for Seismic Design Category D_2. In Seismic Design Category D_2, cripple walls shall be braced in accordance with Tables R602.10.1.2(1) and R602.10.1.2(2).

3. Revise as follows:

R602.10.9.~~2~~3 Redesignation of cripple walls. ~~In any Seismic Design Category,~~ Where all cripple wall segments along a braced wall line do not exceed 48 inches in height, the cripple walls shall be permitted to be redesignated as ~~the~~ a first *story* wall~~s~~ for purposes of determining wall bracing requirements. Where any cripple wall segment in a braced wall line exceeds 48 inches in height, the entire cripple wall shall be counted as an additional story. If the cripple walls are redesignated, the stories above the redesignated *story* shall be counted as the second and third stories, respectively.

R602.11.2 Stepped foundations in Seismic Design Categories D_0, D_1 and D_2. In all buildings located in Seismic Design Categories D_0, D_1 or D_2, where the height of a required *braced wall line* that extends from foundation to floor above varies more than 4 feet (1219 mm), the *braced wall line* shall be constructed in accordance with the following:

1. Where the lowest floor framing rests directly on a sill bolted to a foundation not less than 8 feet (2440 mm) in length along a line of bracing, the line shall be considered as braced. The double plate of the cripple stud wall beyond the segment of footing that extends to the lowest framed floor shall be spliced by extending the upper top plate a minimum of 4 feet (1219 mm) along the foundation. Anchor bolts shall be located a maximum of 1 foot and 3 feet (305 and 914 mm) from the step in the foundation. See Figure R602.11.2.
2. Where cripple walls occur between the top of the foundation and the lowest floor framing, the bracing requirements of Sections R602.10.9, ~~and~~ R602.10.9.1 and R602.10.9.2 shall apply.
3. Where only the bottom of the foundation is stepped and the lowest floor framing rests directly on a sill bolted to the foundations, the requirements of Sections R403.1.6 and R602.11.1 shall apply.

Reason: This proposal clarifies and coordinates the basic cripple wall provisions in Section R602.9 and the cripple wall bracing provisions in Section R602.10.9.

The changes to Section R602.9 are largely editorial. The apparent intent of the provisions for cripple walls shorter than 14" is to require solid blocking or continuous sheathing. However, the current language calls for "a structural panel". Taken literally, that calls for one single sheet of plywood or OSB to be placed on the wall. The language is revised to clarify the apparent intent. Also, the continuous foundation requirement is moved to its own paragraph, as it clearly is intended to apply to all cripple walls, not just 14" and shorter ones.

The 75% minimum WSP bracing requirement for cripple walls in SDC D2 was mistakenly deleted from the reformatted seismic bracing table and is restored to Table R602.10.1.2(2). Consistent with the revisions last cycle, the percentage is converted into a foot length. The 15% reduction for continuous sheathing is also applied.

Section R602.10.9 and R609.10.9.1 are revised to divide the requirements into low-seismic (i.e. governed by wind) and high-seismic sections. The same calculation method and spreadsheet the ICC Ad-Hoc Wall Bracing Committee used to define the wind bracing table, was used to verify that the 1.15x multiplier is accurate for the wind bracing case as well as the seismic bracing case. The 18 foot braced wall panel spacing limit is applied only for high-seismic. There is no documentation of cripple wall failures in wind events, as there is for seismic events. Thus there is no technical justification to apply the additional limit for wind bracing.

The provisions regarding braced wall lines on interior walls not supported on continuous foundations are clarified. The 50% increase in bracing is applied to the adjacent cripple walls. It is noted these walls could potentially be either exterior or interior walls. Also, a complex house plan may have exterior cripple walls that are not adjacent to the unsupported wall (e.g. on an attached garage, den, or other feature) and do not inherit seismic loads from the unsupported wall. It would not then make sense to increase the bracing for those walls. Furthermore, it is clarified that the bracing for the adjacent cripple walls can be either Method WSP or Method CS-WSP. Finally, a specific factor is provided for the increased strength provided by the reduction to 4" edge nailing. Of course, for some plans, the reduction may still result in a required bracing length that exceeds the total length of the cripple wall. Obviously, an engineered solution would be required in that case,

The provision on re-designation of cripple walls is amended to require exterior cripple walls exceeding 48" in height to be considered a story. This is consistent with the calculation performed above to verify the 1.15 multiplier. The increase in bracing for taller cripple walls would begin to approach, and finally equal, the difference in bottom-floor bracing from the addition of a story. Thus, it would make sense to automatically re-designate these taller cripple walls as a story. This will also help clarify the determination of bracing for houses on sloped sites, where figuring out the bracing for the cripple walls occurring on the walls parallel to the slope has been an issue.

Finally, the section references in R602.11.2 are revised to include R602.10.9.2.

Cost Impact: The code change proposal may increase the cost of construction for houses with cripple walls exceeding 48" in height.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BAJNAI-AHWB-RB-3-R602.9-R602.10-R602.11

RB107–09/10

R602.10.1.2, R602.10.1.4.1, Table R602.10.1.2(3), Table R602.10.2, R602.10.2.1, R602.10.3, Table R602.10.3.1, R602.10.3.5 (New), Table R602.10.3.5 (New), Figure R602.10.3.5 (new), R602.12, R703.7

Proponent: Chuck Bajnai, Chesterfield County, VA, Chairman, ICC Ad-Hoc Committee on Wall Bracing

1. Revise as follows:

R602.10.1.2 Length of bracing. The length of bracing along each *braced wall line* shall be the greater of that required by the design wind speed and *braced wall line* spacing in accordance with Table R602.10.1.2(1) as adjusted by the factors in the footnotes or the Seismic Design Category and *braced wall line* length in accordance with Table R602.10.1.2(2) as adjusted by the factors in Table R602.10.1.2(3) or *braced wall panel* location requirements of Section R602.10.1.4. Only walls that are parallel to the *braced wall line* shall be counted toward the bracing requirement of that line, except angled walls shall be counted in accordance with Section R602.10.1.3. In no case shall the minimum total length of bracing in a *braced wall line*, after all adjustments have been taken, be less than 48 inches (1219 mm) total.

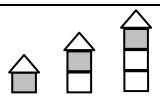
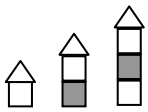
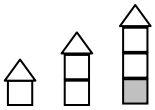
Exception: The length of wall bracing for dwellings in Seismic Design Categories D_0, D_1 and D_2 with stone or masonry veneer installed per Section R703.7 and exceeding the first *story height* shall be in accordance with Section R602.10.3.5.

R602.10.1.4.1 Braced wall panel location in Seismic Design Categories D0, D1 and D2. *Braced wall lines* at exterior walls shall have a *braced wall panel* located at each end of the *braced wall line*.

Exception: For *braced wall panel* construction Method WSP or BV-WSP of Section R602.10.2, the *braced wall panel* shall be permitted to begin no more than 8 feet (2438 mm) from each end of the *braced wall line* provided one of the following is satisfied in accordance with Figure R602.10.1.4.1:

1. A minimum 24-inch-wide (610 mm) panel is applied to each side of the building corner and the two 24-inch-wide (610 mm) panels at the corner are attached to framing in accordance with Figure R602.10.4.4(1), or
2. The end of each *braced wall panel* closest to the corner shall have a hold-down device fastened to the stud at the edge of the *braced wall panel* closest to the corner and to the foundation or framing below. The hold-down
   device shall be capable of providing an uplift allowable design value of at least 1,800 pounds (8 kN). The hold-down device shall be installed in accordance with the manufacturer's recommendations, or
3. For Method BV-WSP, hold-down devices shall be provided in accordance with Table R602.10.3.5 at the ends of each *braced wall panel*.

TABLE R602.10.1.2(3)
ADJUSTMENT FACTORS TO THE LENGTH OF REQUIRED SEISMIC WALL BRACING[a]

ADJUSTMENT BASED ON:		MULTIPLY LENGTH OF BRACING PER WALL LINE BY:	APPLIES TO:
~~Walls with stone or masonry veneer in SDC C-D_2~~	~~See Section R703.7~~		
Walls with stone or masonry veneer, townhouses in SDC C[d,e]		1.0	All intermittent & continuous methods
		1.5	
		1.5	
Walls with stone or masonry veneer, detached one- and two-family dwellings in SDC D_0-D_2[d,e]	Any story	See Table R602.10.3.5	BV-WSP

(Portions of table not shown remain unchanged)

a. through c. (No change)

d. Applies to stone or masonry veneer exceeding the first story height. See Section R602.10.3.5 for requirements when stone or masonry veneer does not exceed the first story height.

e. The adjustment factor for stone or masonry veneer shall be applied to all exterior braced wall lines and all braced wall lines on the interior of the building.

TABLE R602.10.2
INTERMITTENT BRACING METHODS

METHOD	MATERIAL	MINIMUM THICKNESS	FIGURE	CONNECTION CRITERIA
BV-WSP[a]	Wood Structural Panels with Stone or Masonry Veneer (See Section R602.10.3.5)	7/16"	See Figure R602.10.3.5	Fasteners: 8d common (2½"x0.131) nails Spacing: 4" at panel edges 12" at intermediate supports 4" at braced wall panel end posts

(Portions of table not shown remain unchanged)

a. Method applies to detached one- and two-family dwellings in Seismic Design Categories D0-D2 only.

R602.10.2.1 Intermittent braced wall panel interior finish material. Intermittent *braced wall panels* shall have gypsum wall board installed on the side of the wall opposite the bracing material. Gypsum wall board shall be not less than 1/2 inch (12.7 mm) in thickness and be fastened in accordance with Table R702.3.5 for interior gypsum wall board.

Exceptions:

1. Wall panels that are braced in accordance with Methods GB, BV-WSP, ABW, PFG and PFH.
2. When an *approved* interior finish material with an in-plane shear resistance equivalent to gypsum board is installed.
3. For Methods DWB, WSP, SFB, PBS, PCP and HPS, omitting gypsum wall board is permitted provided the length of bracing in Tables R602.10.1.2(1) and R602.10.1.2(2) is multiplied by a factor of 1.5.

R602.10.3 Minimum length of braced panels. For Methods DWB, WSP, SFB, PBS, PCP, ~~and~~ HPS, and BV-WSP, each *braced wall panel* shall be at least 48 inches (1219 mm) in length, covering a minimum of three stud spaces where studs are spaced 16 inches (406 mm) on center and covering a minimum of two stud spaces where studs are spaced 24 inches (610 mm) on center. For Method GB, each *braced wall panel* and shall be at least 96 inches (2438

mm) in length where applied to one face of a *braced wall panel* and at least 48 inches (1219 mm) where applied to both faces. For Methods DWB, WSP, SFB, PBS, PCP, ~~and~~ HPS, and BV-WSP, for purposes of computing the length of panel bracing required in Tables R602.10.1.2(1) and R602.10.1.2(2), the effective length of the *braced wall* panel shall be equal to the actual length of the panel. When Method GB panels are applied to only one face of a *braced wall panel*, bracing lengths required in Tables R602.10.1.2(1) and R602.10.1.2(2) for Method GB shall be doubled.

Exceptions:

1. Lengths of *braced wall panels* for continuous sheathing methods shall be in accordance with Table R602.10.4.2.
2. Lengths of Method ABW panels shall be in accordance with Sections R602.10.3.2.
3. Length of Methods PFH and PFG panels shall be in accordance with Section R602.10.3.3 and R602.10.3.4 respectively.
4. For Methods DWB, WSP, SFB, PBS, PCP and HPS in Seismic Design Categories A, B, and C: Panels between 36 inches (914 mm)and 48 inches (1219 mm) in length shall be permitted to count towards the required length of bracing in Tables R602.10.1.2(1) and R602.10.1.2(2), and the effective contribution shall comply with Table R602.10.3.

TABLE R602.10.3.1
MINIMUM LENGTH REQUIREMENTS FOR BRACED WALL PANELS

SEISMIC DESIGN CATEGORY AND WIND SPEED	BRACING METHOD	HEIGHT OF BRACED WALL PANEL				
		8 ft.	9 ft.	10 ft.	11 ft.	12 ft.
SDC A, B, C, D_o, D_1 and D_2 Wind speed < 110 mph	DWB, WSP, SFB, PBS, PCP, HPS, BV-WSP and Method GB when double sided	4'-0"	4'-0"	4'-0"	4'-5"	4'-10"
	Method GB, single sided	8'-0"	8'-0"	8'-0"	8'-10"	9'-8"

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm.

2. Delete Sections R602.12, R602.12.1, R602.12.1.1 and relocate to new Section R602.3.5 and revise as follows:

R602.10.3.5~~12~~ Wall bracing for dwellings with ~~and~~ stone and masonry veneer in Seismic Design Categories D_0, D_1 and D_2. ~~Where stone and masonry veneer is installed in accordance with Section R703.7, wall bracing shall comply with this section~~.

~~For all buildings in Seismic Design Categories A, B and C, wall bracing at exterior and interior braced wall lines shall be in accordance with Section R602.10 and the additional requirements of Table R602.12(1).~~

Where dwellings in Seismic Design Categories D_0, D_1 and D_2 have stone or masonry veneer installed in accordance with Section R703.7, and the veneer does not exceed the first *story* height, wall bracing shall be in provided accordance with Section R602.10.1.2.

~~For~~ Where detached one- or two-family dwellings in Seismic Design Categories D_0, D_1 and D_2 have stone or masonry veneer installed in accordance with Section R703.7, and the veneer exceeds the first *story height*, wall bracing ~~and hold downs~~ at exterior *braced wall lines* and ~~interior~~ *braced wall lines* on the interior of the building shall be constructed using Method BV-WSP in accordance with this section and Figure R602.10.3.5. ~~Sections R602.10 and R602.11 and the additional requirements of Section R602.12.1 and Table R602.12(2). In Seismic Design Categories D0, D1 and D2, c~~Cripple walls shall not be permitted, and required interior *braced wall lines* shall be supported on continuous foundations.

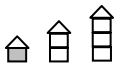
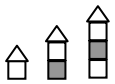
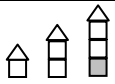
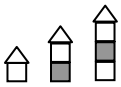
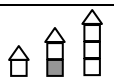
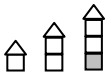
Townhouses in Seismic Design Categories D_0, D_1 and D_2 with stone or masonry veneer exceeding the first *story* height shall be designed in accordance with accepted engineering practice.

~~**R602.12.1 Seismic Design Categories D_0, D_1 and D_2.** Wall bracing where stone and masonry veneer exceeds the first story height in Seismic Design Categories D_0, D_1 and D_2 shall conform to the requirements of Section R602.10 and R602.11 and the following requirements.~~

R602.10.3.5.1~~12.1.1~~ Length of bracing. The length of bracing along each *braced wall line* shall be the greater of that required by the design wind speed and *braced wall line* spacing in accordance with Table R602.10.1.2(1) as adjusted by the factors in the footnotes or the Seismic Design Category and *braced wall line* length in accordance with Table R602.10.3.5~~12(2)~~. Angled walls shall be permitted to be counted in accordance with Section R602.10.1.3, and *braced wall panel* location shall be in accordance with Section R602.10.1.4. The seismic adjustment factors in Table R602.10.1.2(3) shall not be applied to the length of bracing determined using Table R602.10.3.5. In no case shall the minimum total length of bracing in a *braced wall line*, after all adjustments have been taken be less than 48 inches total.

3. Add new table as follows:

TABLE R602.10.3.5
METHOD BV-WSP WALL BRACING REQUIREMENTS

SEISMIC DESIGN CATEGORY	STORY	BRACED WALL LINE LENGTH (FT)					SINGLE STORY HOLD-DOWN FORCE (lb)[a]	CUMULATIVE HOLD DOWN FORCE (lb)[b]
		10	20	30	40	50		
		MINIMUM TOTAL LENGTH (FT) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE						
D_0		4.0	7.0	10.5	14.0	17.5	N/A	—
		4.0	7.0	10.5	14.0	17.5	1900	—
		4.5	9.0	13.5	18.0	22.5	3500	5400
		6.0	12.0	18.0	24.0	30.0	3500	8900
D_1		4.5	9.0	13.5	18.0	22.5	2100	—
		4.5	9.0	13.5	18.0	22.5	3700	5800
		6.0	12.0	18.0	24.0	30.0	3700	9500
D_2		5.5	11.0	16.5	22.0	27.5	2300	—
		5.5	11.0	16.5	22.0	27.5	3900	6200
		NP	NP	NP	NP	NP	N/A	N/A

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.479 kPa, 1 pound-force = 4.448 N.

a. Hold down force is minimum allowable stress design load for connector providing uplift tie from wall framing at end of braced wall panel at the noted story to wall framing at end of braced wall panel at the story below, or to foundation or foundation wall. Use single story hold down force where edges of braced wall panels do not align; a continuous load path to the foundation shall be maintained.

b. Where hold down connectors from stories above align with stories below, use cumulative hold down force to size middle and bottom story hold down connectors.

4. Add new figure as follows:

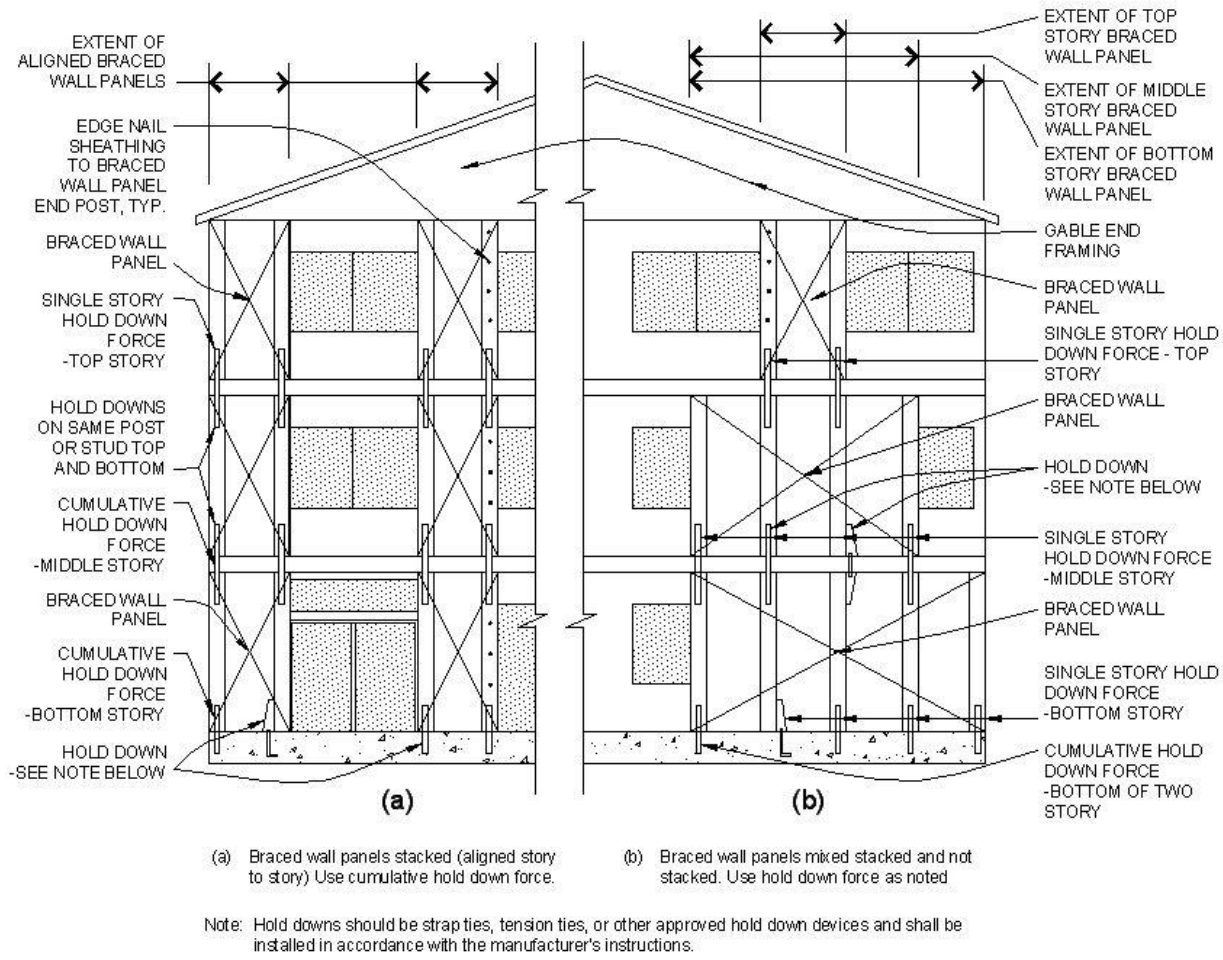


FIGURE R602.10.3.5
METHOD BV-WSP: WALL BRACING FOR DWELLINGS WITH STONE AND MASONRY VENEER IN SEISMIC DESIGN CATEGORIES D_0, D_1 AND D_2

5. Delete remainder of R602.12 as follows:

~~**R602.12.1.2 Braced wall panel location.** Braced wall panels shall begin no more than 8 feet from each end of a braced wall line and shall be spaced a maximum of 25 feet on center.~~

~~**R602.12.1.3 Braced wall panel construction.** Braced wall panels shall be constructed of sheathing with a thickness of not less than 7/16 inch nailed with 8d common nails spaced 4 inches on center at all panel edges and 12 inches on center at intermediate supports. The end of each braced wall panel shall have a hold down device in accordance with Table R602.12(2) installed at each end.~~ Size, height and spacing of wood studs shall be in accordance with Table R602.3(5).

~~**R602.12.1.4 Minimum length of braced panel.** Each braced wall panel shall be at least 48 inches in length, covering a minimum of 3 stud spaces where studs are spaced 16 inches on center and covering a minimum of 2 stud spaced where studs are spaced 24 inches on center.~~

~~**R602.12.1.5 Alternate braced wall panel.** Alternate braced wall panels described in Section R602.10.3.2 shall not replace the braced wall panel specification of this section.~~

~~**R602.12.1.6 Continuously sheathed wall bracing.** Continuously sheathed provisions of Section R602.10.4 shall not be used in conjunction with the wall bracing provisions of this section.~~

~~**TABLE R602.12(1)**~~
~~**STONE OR MASONRY VENEER WALL BRACING REQUIREMENTS,**~~
~~**WOOD OR STEEL FRAMING, SEISMIC DESIGN CATEGORIES A, B AND C**~~

~~**TABLE R602.12(2)**~~
~~**STONE OR MASONRY VENEER WALL BRACING REQUIREMENTS, ONE- AND TWO-FAMILY DETACHED DWELLINGS, SEISMIC DESIGN CATEGORIES D0, D1 AND D2**~~

~~**FIGURE R602.12**~~
~~**HOLD DOWNS AT INTERIOR AND EXTERIOR BRACED WALL PANELS**~~

6. Revise as follows:

R703.7 Stone and masonry veneer, general. Stone and masonry veneer shall be installed in accordance with this chapter, Table R703.4 and Figure R703.7. These veneers installed over a backing of wood or cold-formed steel shall be limited to the first *story* above-grade and shall not exceed 5 inches (127 mm) in thickness. See Section ~~R602.12~~ R602.10 for wall bracing requirements for masonry veneer for wood framed construction and Section R603.9.5 for wall bracing requirements for masonry veneer for cold-formed steel construction.

Exceptions:

1. For all buildings in Seismic Design Categories A, B and C, exterior stone or masonry veneer, as specified in Table R703.7(1), with a backing of wood or steel framing shall be permitted to the height specified in Table R703.7(1) above a noncombustible foundation.
2. For detached one- or two-family *dwellings* in Seismic Design Categories D_0, D_1 and D_2, exterior stone or masonry veneer, as specified in Table R703.7(2), with a backing of wood framing shall be permitted to the height specified in Table R703.7(2) above a noncombustible foundation.

Reason: Last cycle, the special wall bracing requirements for wood-framed buildings with stone or masonry veneer were moved from Section R703.7 to Section R602.12, so they would follow the rest of the wall bracing provisions. This was a substantial clarification to the code. However, with the changes introduced by the Ad-Hoc Wall Bracing Committee to introduce tables of seismic adjustment factors, bracing methods, and other improvements, an opportunity now exists to further simplify matters, bring the special veneer provisions into the main bracing section, and remove duplicated text. As such, this proposal implements the following changes:

1. A new intermittent method, BV-WSP, is defined. The basic sheathing and nailing requirements are relocated from Section R602.12.1.3 to a new row in Table R602.10.2. The hold-down requirement is relocated from Section R602.12.1.3 to Section R602.10.1.4. The reference to Table R602.3(5), the wood stud table, is no longer needed. Once this language was moved to Section R602, that table automatically governs.
2. A new exception is added to R602.10.1.2, replacing the original charging language for R602.12. The remaining SDC-specific requirements are incorporated into new Section R602.10.3.5.
3. A reference to Method BV-WSP is added to the high-seismic end panel location requirements of Section R602.10.1.4.1. The duplicate language in Section R602.12.1.2 is no longer required and can be deleted.
4. The adjustments for SDC A, B, and C are inserted directly into Table R602.10.1.2(3), the seismic adjustment factor. Table R602.12(1) is no longer required and can be deleted.
5. A reference to Method BV-WSP is added to the minimum braced wall panel length requirements of Section R602.10.3 and to Table R602.10.3.1. The duplicate language in Section R602.12.1.4 is no longer required and can be deleted.
6. A new Section R602.10.3.5 is added for the new Method BV-WSP. The requirements of R602.12, R602.12.1, and R602.12.1.1 are moved into the new section. A subsection, R602.10.3.5.1, is defined for the length of bracing, with language similar to Section R602.10.1.2. Figure R602.12 is moved to the new section.
7. Table R602.12(2) is moved to Section R602.10.3.5 and revised to convert the percentages to lengths, similar to Table R602.10.1.2(2).
8. Figure R602.12 is replaced by new Figure R602.10.3.5, which provides a number of clarifications regarding the location and type of hold-down devices
9. Since BV-WSP is now defined as its own separate intermittent bracing method, Sections R602.10.1.5 and R602.12.1.6 are no longer needed and can be deleted.

This change represents an editorial relocation and reorganization of the special wall bracing provisions for structures with veneer. Section R602.12 is effectively deleted and all of its provisions incorporated under the scope of Section R602.10. While the intent was purely editorial, two minor technical changes were made. First, the previous provisions do not indicate whether a gypsum board finish is required. But, Method BV-WSP is essentially a fully-restrained engineered shear wall segment, and typically the effect of finishes is not incorporated in such designs. Thus, we believe the interior finish is not required, and amend Section R602.10.2.1 accordingly. Second, in the new Table R602.10.3.5, which replaces Table R602.12(2), the hold-down requirements were combined as part of the reformatting to make the table look like Table R602.10.1.2(2). In the process, the 3200 lb and 5100 lb hold-downs for a bottom of two-story are now required to be 3500 lb and 5400 lb respectively. However, this does not change the actual required strap or hold-down size which a user would select from a connector manufacturer's catalog.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BAJNAI-AHWB-RB-4-R602.10

RB108–09/10
R602.10.5.4

Proponent: Louis Wagner, representing the American Fiberboard Association

Delete without substitution:

R602.10.5.4 Continuously sheathed braced wall lines. Where a continuously-sheathed *braced wall line* is used in Seismic Design Categories D_0, D_1 and D_2 or regions where the basic wind speed exceeds 100 miles per hour (45 m/s), the *braced wall line* shall be designed in accordance with accepted engineering practice and the provisions of the *International Building Code*. Also, all other exterior *braced wall lines* in the same *story* shall be continuously sheathed.

Reason: During deliberations on 5/29/09 by the ICC Ad Hoc Committee on Wall bracing it was pointed out that limitations on the continuously sheathed method were inconsistent with limitations of other bracing methods in the IRC. For example, the same limitations are not applicable where walls are intermittently-sheathed. At the time this inconsistency was found, it was too late to correct the broader proposal being put forward by the ICC Ad Hoc Committee and therefore recommended to be submitted as a separate change proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WAGNER-RB-1-R602.10.5.4

RB109–09/10
R602.10.6.2, Figure R602.10.6.2(2), Figure R602.10.6.2(3)

Proponent: Gary Ehrlich, National Association of Home Builders (NAHB)

1. Revise as follows:

R602.10.6.2 Connections to roof framing. Exterior *braced wall panels* shall be connected to roof framing as follows.

1. Parallel rafters or roof trusses shall be attached to the top Top plates of exterior *braced wall panels* shall be attached to rafters or roof trusses above in accordance with Table R602.3(1) and this section. Where required by this section, blocking between rafters or roof trusses shall be attached to top plates of *braced wall panels* and to rafters and roof trusses in accordance with Table R602.3(1). A continuous band, rim, or header joist or roof truss parallel to the *braced wall panels* shall be permitted to replace the blocking required by this section. Blocking shall not be required over openings in continuously-sheathed *braced wall lines*. In addition to the requirements of this section, lateral support shall be provided for rafters and ceiling joists in accordance with Section R802.8 and for trusses in accordance with Section R802.10.3. Roof ventilation shall be provided in accordance with R806.1. .

2 1. For SDC A, B and C and wind speeds less than 100 miles per hour (45 m/s), where the distance from the top of the *braced wall panel* to the top of the rafters or roof trusses above and perpendicular top plates is 91/4 inches (235 mm) or less, the rafters or roof trusses shall be connected to the top plates of *braced wall lines* in accordance with Table R602.3(1) and blocking between rafters or roof trusses shall need not be installed required. Where the distance from the top of the *braced wall panel* to the top of the rafters above and perpendicular top plates is between 91/4 inches (235 mm) and 151/4 inches (387 mm) the rafters shall be connected to the top plates of *braced wall panels* with blocking between rafters shall be provided above the *braced wall panel* in accordance with Figure R602.10.6.2(1) and attached in accordance with Table R602.3(1). Where the distance from the top of the *braced wall panel* to the top of the roof trusses and perpendicular top plates above is between 91/4 inches (235 mm) and 151/4 inches (387 mm) the roof trusses shall be connected to the top plates of *braced wall panels* with blocking in accordance with Table R602.3(1) lateral load transfer shall be provided in accordance with Section R802.10.3.

3 2. For SDC D_0, D_1 and D_2 or wind speeds of 100 miles per hour (45 m/s) or greater, where the distance between from the top of the *braced wall panel* to the top of the rafters or roof trusses and perpendicular top plates is 151/4 inches (387 mm) or less, rafters or roof trusses shall be connected to the top plates of *braced wall panels* with blocking between rafters or roof trusses shall be provided above the *braced wall panel* in accordance with Figure R602.10.6.2(1) and attached in accordance with Table R602.3(1).

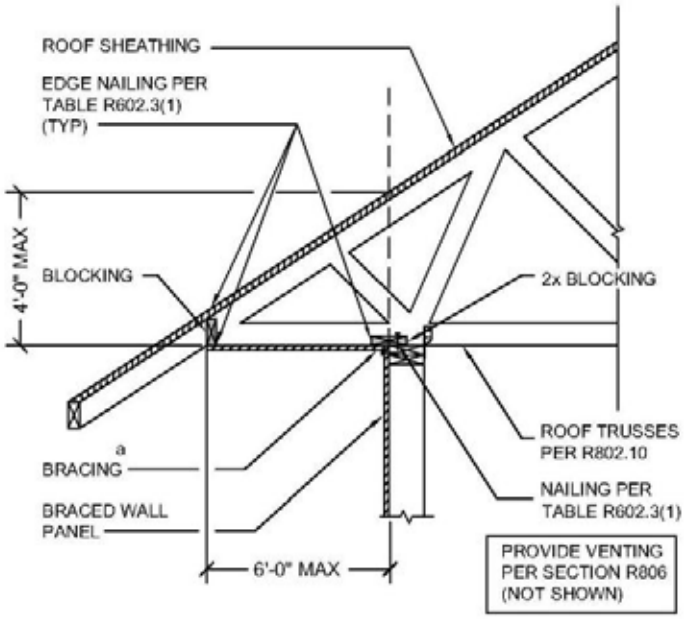
4 3. For all seismic design categories and wind speeds, Where the distance between from the top of the *braced wall panel* to the top of the rafters or roof trusses and perpendicular top plates exceeds 151/4 inches (387 mm), perpendicular rafters or roof trusses shall be connected to the top plates of the *braced wall panels* shall be connected to perpendicular rafters or roof trusses above in accordance with one or more of the following methods:

~~4~~ 3.1. Soffit blocking panels constructed in accordance with Figure R602.10.6.2(2),
~~4~~ 3.2. Vertical blocking panels constructed in accordance with Figure R602.10.6.2(3),
~~4~~ 3.3. ~~With f~~Full ~~-~~height engineered blocking panels designed ~~for values listed in~~ per the AF&PA WFCM ~~American Forest and Paper Association (AF&PA) Wood Frame Construction Manual for One- and Two-Family Dwellings (WFCM). Both the roof and floor sheathing shall be attached to the blocking panels in accordance with Table R602.3(1)~~.

~~4~~ 3.4. Blocking, blocking panels, or other methods of lateral load transfer ~~Designed~~ designed in accordance with accepted engineering ~~methods~~ practice.

~~Lateral support for the rafters and ceiling joists shall be provided in accordance with Section R802.8. Lateral support for trusses shall be provided in accordance with Section R802.10.3. Ventilation shall be provided in accordance with Section R806.1.~~

Replace Figure R602.10.6.2(2) with the following:



a. Methods of bracing shall be as described in Section R602.10.1.1~~R602.10.2 method DWB, WSP, SFB, GB, PBS, PCP OR HPS~~

For SI: 1 inch = 25.4 mm.

FIGURE R602.10.6.2(2)
BRACED WALL PANEL CONNECTION OPTION TO PERPENDICULAR RAFTERS OR ROOF TRUSSES

3. Replace Figure R602.10.6.2(3) with the following:

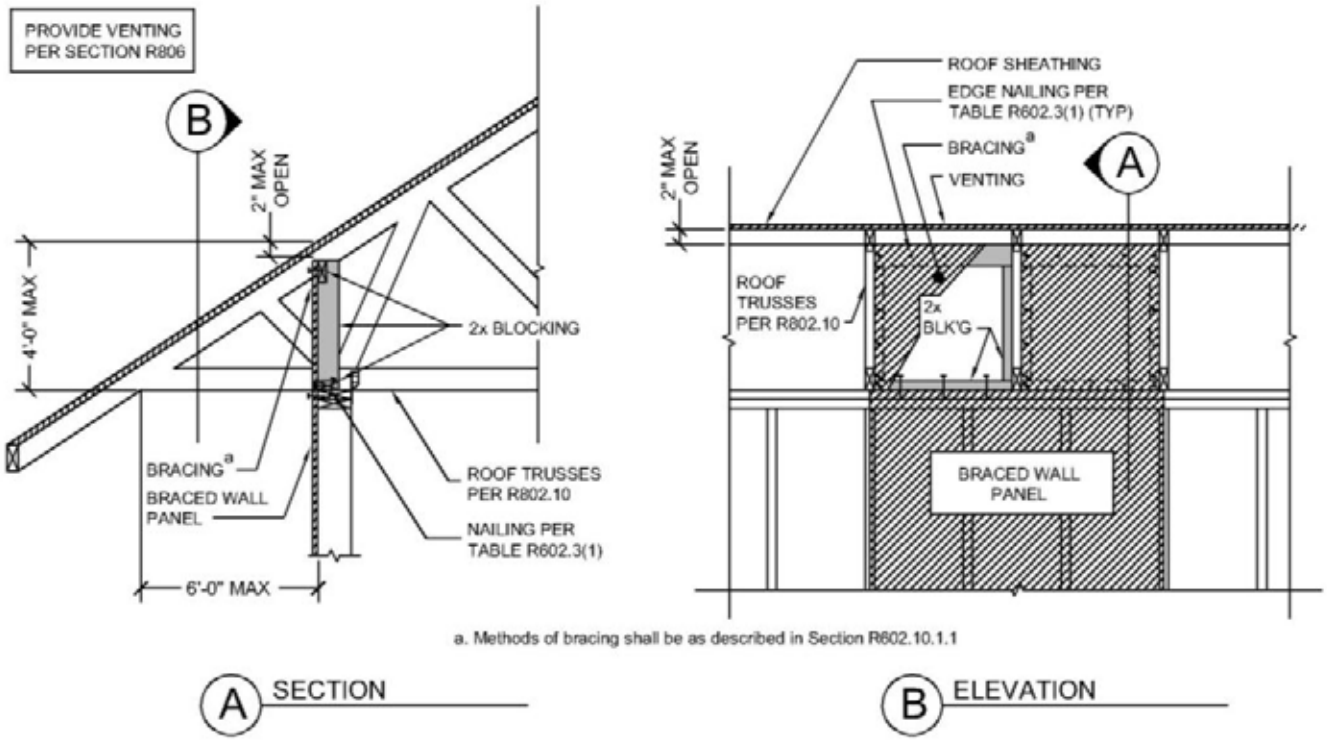


FIGURE R602.10.6.2(3)
BRACED WALL PANEL CONNECTION OPTION TO PERPENDICULAR RAFTERS OR ROOF TRUSSES

Reason: The purpose of this proposal is to amend and simplify the language for blocking between roof rafters and trusses over braced wall panels added during the 2007-2008 Code Development Cycle. The 2009 IRC language is incomprehensible and will create an enforcement nightmare. The change is primarily editorial, although minor technical changes have been introduced.

The terminology in the original code change is often unclear. Terms such as "parallel rafters or roof trusses" and "perpendicular top plates" leave it unclear as to what the framing members or top plates are parallel or perpendicular to. The statement that "blocking need not be installed" is permissive language. The text can even be taken to read that the BLOCKING is what's used to connect the rafter/truss to the top plate. To simplify the requirements, all of the references to "parallel" or "perpendicular" are removed, and the multiple references to Table R602.3(1) replaced with one comprehensive reference in the opening paragraph. Further, since this is the wall section, the blocking requirements and triggers are flipped so the braced wall panel is the point of reference, not the roof framing.

Language allowing a continuous rim board, rim joist, or truss in lieu of the blocking is added. This allows the distinction between "parallel" and "perpendicular" to be removed throughout the proposal, since providing a continuous member over the braced wall panels will be the obvious solution where roof framing direction is parallel to the panels and the framing depth is deep enough to require blocking.

Figures R602.10.6.2(2) and R602.10.6.2(3) are extensively revised. The details are clarified to indicate the blocking panel is only required at the braced wall panels, not along the entire braced wall line. The list of allowable methods is revised to point to Section R602.10.1.1, which includes all the allowable intermittent and continuous bracing methods, including the various alternate narrow wall panels and portal frames. Finally, the reference to "pre-engineered trusses" is replaced with a reference to R802.10, since roof trusses under the IRC are not required to be designed by an engineer.

NAHB asks for your support of this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: EHRLICH-RB-12-R602.10.6.2

RB110–09/10
R602.10.8

Proponent: Larry Wainright, Qualtim, Inc., representing the Structural Building components Association (SBCA)

Revise as follows:

R602.10.8 Panel joints. All vertical joints of panel sheathing shall occur over, and be fastened to common studs. Horizontal joints in *braced wall panels* shall occur over, and be fastened to common blocking of a minimum 11/2 inch (38 mm) thickness.

Exceptions:

1. Vertical joints of panel sheathing occurring over a double stud, fastened in accordance with Table R602.3(1), item 11, shall be permitted to be fastened to the adjoining studs.
~~1~~ 2. Blocking at horizontal joints shall not be required in wall segments that are not counted as *braced wall panels*.
~~2~~ 3. Where the bracing length provided is at least twice the minimum length required by Tables R602.10.1.2(1) and R602.10.1.2(2) blocking at horizontal joints shall not be required in *braced wall panels* constructed using Methods WSP, SFB, GB, PBS or HPS.
~~3~~ 4. When Method GB panels are installed horizontally, blocking of horizontal joints is not required.

Reason: Structures built with pre-manufactured wall panels are becoming more common. Typically, these panels are built with the structural sheathing flush with the edge of the wall section. When two of these sections are installed at the job site, the end stud of each panel is fastened to the abutting panel and the vertical sheathing panel joint is between the two adjoined studs. This common practice should be allowed within the code provided the adjoining studs are properly connected per Table R602.3(1). The result will be wall panels that are easier to manufacture, will result in a higher level of quality since the panels will be easier to keep square, and will incur less damage during transit and installation due to the panel edges being supported by the end studs.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WAINRIGHT-RB-4-R602.10.8

RB111–09/10
R602.10, R602.12 (New)

Proponent: Chuck Bajnai, Chesterfield County, VA, Chairman, ICC Ad-Hoc Committee on Wall Bracing

1. Revise as follows:

R602.10 Wall bracing. Buildings shall be braced in accordance with this section or, when applicable, Section R602.12. Where a building, or portion thereof, does not comply with one or more of the bracing requirements in this section, those portions shall be designed and constructed in accordance with Section R301.1.

Exception: Detached one- and two-family *dwellings* located in Seismic Design Category C are exempt from the seismic bracing requirements of this section. Wind speed provisions for bracing shall be applicable to detached one- and two-family *dwellings*.

2. Add new section as follows:

R602.12 Simplified wall bracing. Buildings meeting all of the conditions listed below shall be permitted to be braced in accordance with this section as an alternate to the requirements of Section R602.10.

1. A rectangle circumscribing the entire enclosed building, as shown in Figure R602.12.3, shall have no side longer than 60 feet (18 288 mm), and the ratio between the long side and short side shall be a maximum of 3:1.
2. There shall be no more than two stories above the top of a concrete or masonry foundation or basement wall. Permanent wood foundations shall not be permitted.
3. Floors shall not cantilever more than 24 inches (607 mm) beyond the foundation or bearing wall below.
4. Wall height shall not be greater than 10 feet (2743 mm).
5. Interior walls shall not contribute toward bracing required in this section.
6. The building shall have a roof eave-to-ridge height of 15 feet (4572 mm) or less.
7. All exterior walls shall have gypsum board with a minimum thickness of 1/2 inches (12.7 mm) installed on the interior side fastened in accordance with Table R702.3.5.
8. The structure shall be located where the basic wind speed is less than or equal to 90 mph (40 m/s), and the Exposure Category is A or B.
9. The structure shall be located in Seismic Design Category of A, B or C for detached one- and two-family dwellings or Seismic Design Category A or B for townhouses.
10. Cripple walls shall not be permitted in two-story buildings.

When the bracing described in this section is used, the use of other bracing provisions of R602.10, except as specified herein, shall not be permitted.

R602.12.1 Sheathing materials. The following sheathing materials installed on the exterior side of exterior walls shall be used to construct a bracing unit as defined in Section R602.12.2. Mixing materials is prohibited.

1. Wood structural panels with a minimum thickness of 3/8 inch (9.5 mm) fastened in accordance with Table R602.3(3).
2. Structural fiberboard sheathing with a minimum thickness of 1/2 inch (12.7 mm) fastened in accordance with Table R602.3(1).

R602.12.2 Bracing unit. A bracing unit shall be a full-height sheathed segment of the exterior wall with no openings and a minimum length as specified below.

1. When all framed portions of all exterior walls are continuously sheathed in accordance with Section R602.12.1, Including areas between bracing units, above and below openings and on gable end walls, the minimum length of a bracing unit shall be 3 feet (914 mm).
2. When the exterior walls are braced with intermittent sheathing in accordance with Section R602.12.1 and infilled with other materials, the minimum length of a bracing unit shall be 4 feet (1219 mm).

R602.12.2.1 Multiple bracing units. Segments of wall compliant with Section R602.12.2 and longer than the minimum bracing unit length shall be considered as multiple bracing units. The number of bracing units shall be determined by dividing the wall segment length by the minimum bracing unit length. The number of bracing units provided by one or more compliant wall segments shall be added together and rounded down to the nearest whole number. Full-height sheathed segments of wall shorter than the minimum bracing unit length shall not contribute toward a bracing unit except as specified in Section R602.12.6.1.

R602.12.3 Number of bracing units. The number of bracing units required along each side of a building shall be determined by circumscribing a rectangle around the entire enclosed building for each story level as shown in Figure R602.12.3. Each side of the rectangle shall have, at a minimum, the number of bracing units per Table R602.12.3 placed on the parallel exterior walls facing the side of the rectangle. Bracing units shall then be placed using the distribution requirements specified in Section R602.12.4. Mixing intermittent and continuous sheathing shall not be permitted.

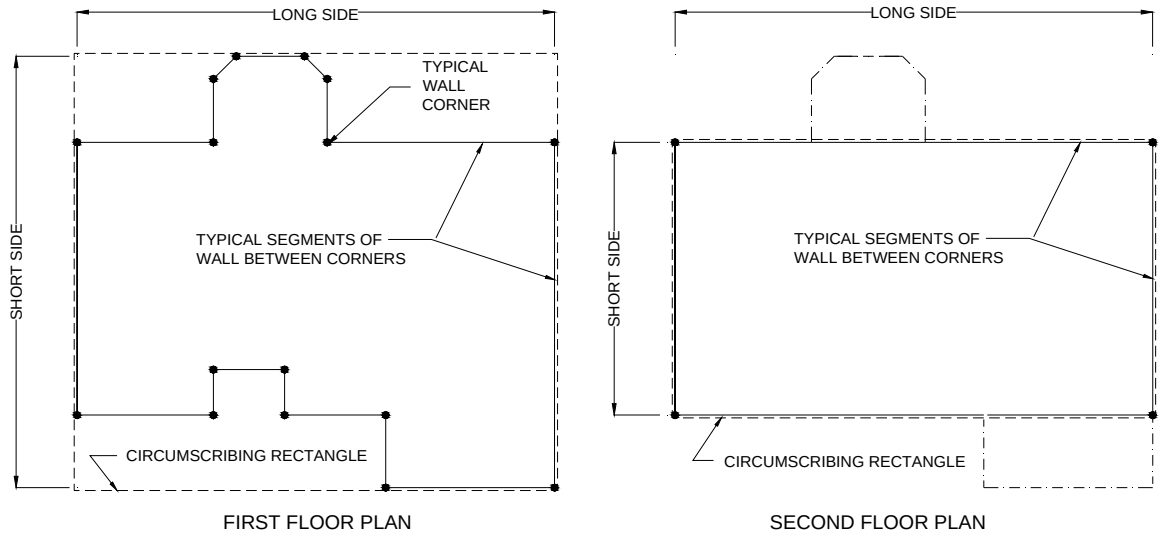
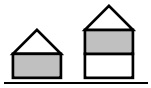
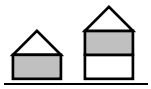


FIGURE R602.12.3
RECTANGLE CIRCUMSCRIBING AN ENCLOSED BUILDING

TABLE R602.12.3
MINIMUM NUMBER OF BRACING UNITS ON EACH SIDE OF A CIRCUMSCRIBED RECTANGLE

STORY LEVEL		EAVE-TO RIDGE HEIGHT (FEET)	MINIMUM NUMBER OF BRACING UNITS ON EACH LONG SIDE [a,b] Length of short side (ft) [c]						MINIMUM NUMBER OF BRACING UNITS ON EACH SHORT SIDE [a,b] Length of long side (ft) [c]					
			10	20	30	40	50	60	10	20	30	40	50	60
	One-story house or second floor of a two-story	10	1	2	2	2	3	3	1	2	2	2	3	3
	First floor of a two-story house		2	3	3	4	5	6	2	3	3	4	5	6
	One-story house or second floor of a two-story	15	1	2	3	3	4	4	1	2	3	3	4	4
	First floor of a two-story house		2	3	4	5	6	7	2	3	4	5	6	7

For SI: 1 ft = 304.8 mm

a. Interpolation shall not be permitted.

b. Cripple walls or wood-framed basement walls in a walk-out condition of a one-story structure shall be designed as the first floor of a two-story house.

c. Actual lengths of the sides of the circumscribed rectangle shall be rounded to the next highest unit of 10 when using this table.

R602.12.4 Distribution of bracing units. The placement of bracing units on exterior walls shall meet all of the following requirements as shown in Figure R602.12.4.

1. A bracing unit shall begin no more than 12 feet (3658 mm) from any wall corner.
2. The distance between adjacent edges of two bracing units shall be no greater than 20 feet (6096 mm).
3. Segments of wall greater than 8 feet (2438 mm) in length shall have a minimum of one bracing unit.

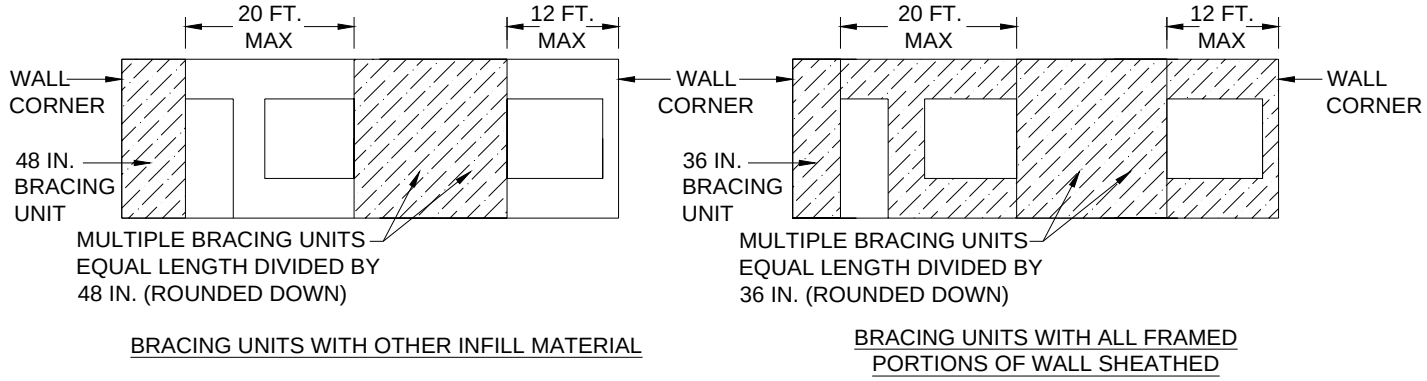


FIGURE R602.12.4
BRACING UNIT DISTRIBUTION

R602.12.5 Narrow panels. The bracing methods referenced in Section R602.10 and specified in Sections R602.12.5.1 through R602.12.5.3 shall be permitted when using simplified wall bracing.

R602.12.5.1 Method CS-G. Braced wall panels constructed as Method CS-G in accordance with Tables R602.10.4.1. and R602.10.4.2 shall be permitted for single story garages when all framed portions of all exterior walls are sheathed with wood structural panels. Each CS-G panel shall be equivalent to 0.5 of a bracing unit. Segments of wall which include a Method CS-G panel shall meet the requirements of Section R602.10.4.4.

R602.12.5.2 Method CS-PF. Braced wall panels constructed as Method CS-PF in accordance with Section R602.10.4.1.1 shall be permitted when all framed portions of all exterior walls are sheathed with wood structural panels. Each CS-PF panel shall equal 0.5 bracing units. A maximum of four CS-PF panels shall be permitted on all the segments of walls parallel to each side of the circumscribed rectangle. Segments of wall which include a Method CS-PF panel shall meet the requirements of Section R602.10.4.4.

R602.12.5.3 Methods PFH and PFG. Braced wall panels constructed as Method PFH and PFG shall be permitted when bracing units are constructed using wood structural panels. Each PFH and panel shall equal one bracing unit, and each PFG shall be equal to 0.75 bracing units.

R602.12.6 Lateral support. For bracing units located along the eaves, the vertical distance from the outside edge of the top wall plate to the roof sheathing above shall not exceed 9.25 inches (235 mm) at the location of a bracing unit unless lateral support is provided in accordance with Section R602.10.6.2.

R602.12.7 Stem walls. Masonry stem walls with a height and length of 48 inches (1219 mm) or less supporting a bracing unit or a Method CS-G, CS-PF or PFG braced wall panel shall be constructed in accordance with Figure R602.10.7. Concrete stem walls with a length of 48" or less, greater than 12 inches tall and less than 6 inches thick shall be reinforced sized and located in accordance with Figure R602.10.7

Reason: As the wall bracing section evolved, it has become more universal and flexible, but, as a result, it has grown in size and complexity. After the Ad Hoc committee's "engineering" work was complete and integrated into the 2009 IRC, we heard back from end users that this section of the code was extremely challenging. The committee therefore wanted to focus on making the 2012 IRC easier to read, easier to understand and easier to use.

The Ad Hoc committee strove to provide an easy, prescriptive procedure that would serve most users throughout the country. We defined the "majority of the country" as users in the 90 mph and SDC A and B areas.

The Committee developed a quick, prescriptive approach for those homes that fall within certain limitations. This simplified approach:

1. Eliminated all of the extra text provisions required for high seismic areas,
2. Eliminated the requirement for braced wall lines,
3. Quantified the amount of bracing using a simple table, and
4. Eliminated from the text the less-often utilized (and frequently the most verbose) bracing methods and concentrated on the most common bracing materials.

Simplified wall bracing incorporates intermittent and continuous sheathing methods (wood structural panels and structural fiberboard), but defines a braced wall panel and its minimum length as a "bracing unit." The minimum number of bracing units is determined by first drawing a rectangle around the building and then using its dimensions to select the total bracing from Table R602.12.3. Bracing units are also required to be placed per the distribution requirements in Section R602.12.4

This simplified method is intended as one easier to use option. Where homes do not qualify because they are located in higher wind or seismic zones, or are more complex in structure, or if the builder simply prefers it, the traditional "long" approach can still be used.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BAJNAI-AHWB-RB-2-R602.10-R602.12

RB112–09/10

R602.12, R603.12.1, R602.12.1.3, Table R602.12(1), Table R602.12(2), Figure R602.12, R703.7, Table R703.7(1), Table R703.7(2)

Proponent: Charles Clark, Brick Industry Association, representing the Masonry Alliance for Codes and Standards (MACS)

Revise as follows:

R602.12 Wall bracing and stone and masonry veneer. Where stone and masonry veneer is installed in accordance with Section R703.7, wall bracing on exterior *braced wall lines*, and *braced wall lines* on the interior of the building, shall comply with this section. In Seismic Design Categories D_0, D_1 and D_2, cripple walls shall not be permitted, and required *braced wall lines* on the interior of the building shall be supported on continuous foundations.

For all buildings in Seismic Design Categories A and~~,~~ B, ~~and~~ for townhouses in Seismic Design Category C, and for one- or two-family dwellings in Seismic Design Category D_0, wall bracing ~~at exterior and interior *braced wall lines*~~ shall be in accordance with Section R602.10 and the additional requirements of Table R602.12(1).

For townhouses in Seismic Design Category D_0 and detached one- or two-family *dwellings* in Seismic Design Categories D_0, D_1 and D_2, wall bracing and hold downs ~~at exterior and interior *braced wall lines*~~ shall be in accordance with Sections R602.10 and R602.11 and the additional requirements of Section R602.12.1, ~~and~~ Table R602.12(2) and Figure R602.12. ~~In Seismic Design Categories D_0, D_1 and D_2, cripple walls are not permitted, and required interior *braced wall lines* shall be supported on continuous foundations.~~

R602.12.1 Townhouses in Seismic Design Category D_0 and one- or two-family dwellings in Seismic Design Categories ~~D_0,~~ D_1 and D_2. Wall bracing where stone and masonry veneer exceeds the first story height for townhouses in Seismic Design Category D_0 and one- or two-family dwellings in Seismic Design Categories ~~D_0,~~ D_1 and D_2 shall conform to the requirements of Sections R602.10 and R602.11 and ~~the following requirements~~ Sections R602.12.1.1 to R602.12.1.6.

R602.12.1.3 Braced wall panel construction. *Braced wall panels* shall be constructed of wood structural panel sheathing with a thickness of not less than 7/16 inch (11 mm) nailed with 8d common nails spaced 4 inches (102 mm) on center at all panel edges and 12 inches (305 mm) on center at intermediate supports. The end of each *braced wall panel* shall have a hold down device in accordance with Table R602.12(2) installed at each end. Size, height and spacing of wood studs shall be in accordance with Table R602.3(5).

TABLE R602.12(1)
STONE OR MASONRY VENEER WALL BRACING REQUIREMENTS USING TABLE R602.10.1.2(2), ~~WOOD OR STEEL FRAMING, SEISMIC DESIGN CATEGORIES A, B AND C~~

STRUCTURE TYPE AND SEISMIC DESIGN CATEGORY	**NUMBER OF ~~WOOD FRAMED~~ STORIES**	**~~WOOD FRAMED~~ STORY**	**MINIMUM ~~SHEATHING AMOUNT~~ BRACED WALL PANEL LENGTH ~~(length of braced wall line length)~~** [ab]
All Structures in SDC A or B and Detached one- and two-family dwellings in SDC C	1, 2 or 3	all	Table R602.10.1.2(2)
Townhouses in SDC C and Detached one- and two-family dwellings in SDC D_0 [a]	1	1 only	Table R602.10.1.2(2)
	2	top	Table R602.10.1.2(2)
		bottom	1.5 times length required by Table R602.10.1.2(2)
	3	top	Table R602.10.1.2(2)
		middle	1.5 times length required by Table R602.10.1.2(2)
		bottom	1.5 times length required by Table R602.10.1.2(2)

a. In Seismic Design Category D_0, cripple walls shall not be permitted and required braced wall lines on the interior of the building shall be supported on a continuous foundation.

b. ~~a.~~ Applies to exterior ~~and interior~~ braced wall lines~~,~~ and braced wall lines on the interior of the building.

TABLE R602.12(2)
STONE OR MASONRY VENEER WALL BRACING REQUIREMENTS
USING 7/16 INCH WOOD STRUCTURAL PANEL SHEATHING~~,~~
~~ONE- AND TWO-FAMILY DETACHED DWELLINGS, SEISMIC DESIGN CATEGORIES D_0, D_1 AND D_2~~

STRUCTURE TYPE AND SEISMIC DESIGN CATEGORY	NUMBER OF STORIES [a]	STORY	MINIMUM ~~SHEATHING AMOUNT~~ BRACED WALL PANEL (percent ~~length~~ of braced wall line length) [b]	MINIMUM BRACED WALL PANEL SHEATHING THICKNESS AND FASTENING	SINGLE STORY HOLD DOWN FORCE (lb) [c]	CUMULATIVE HOLD DOWN FORCE (lb) [d]
Townhouses in SDC D_0	1	1 only	35	7/16-inch wood structural panel sheathing with 8d common nails spaced at 4 inches on center at panel edges, 12 inches on center at intermediate supports; 8d common nails at 4 inches on center at braced wall panel end posts with hold down attached	N/A	---
	2	top	35		1900	---
		bottom	45		3200	5100
	3	top	40		1900	---
		middle	45		3500	5400
		bottom	60		3500	8900
One- or two-family dwellings in SDC D_1	1	1 only	~~45~~ 35		2100	---
	2	top	~~45~~ 35		2100	---
		bottom	~~45~~ 40		3700	5800
	3	top	~~45~~ 35		2100	---
		middle	~~45~~ 40		3700	5800
		bottom	60		3700	9500
One- or two-family dwellings in SDC D_2	1	1 only	~~55~~ 50		2300	---
	2	top	~~55~~ 50		2300	---
		bottom	55		3900	6200

a. Cripple walls ~~are~~ shall not be permitted in Seismic Design Categories D_0, D_1 or D_2.
b. Applies to exterior ~~and interior~~ braced wall lines~~,~~ and braced wall lines on the interior of the building. Required braced wall lines on the interior of the building shall be supported on a continuous foundation.
c. Comply with Figure R602.12. Hold down force is minimum allowable stress load for connector providing uplift tie from wall framing at end of braced wall panel at the noted story to wall framing at end of braced wall panel at the story below, or to foundation or foundation wall. Use single story hold down force where edges of braced wall panels do not align; a continuous load path to the foundation shall be maintained. ~~[See Figure R602.12].~~
d. Comply with Figure R602.12. Where hold down connectors from stories above align with stories below, use cumulative hold down force size middle and bottom story hold down connectors. ~~(See Figure R602.12)~~

FIGURE R602.12
~~HOLD DOWNS AT EXTERIOR AND INTERIOR BRACED WALL PANELS~~
STONE OR MASONRY VENEER WALL BRACING HOLD-DOWN REQUIREMENTS FOR SEISMIC DESIGN

(No change to figure)

R703.7 Stone and masonry veneer, general. Stone and masonry veneer shall be installed in accordance with this chapter, Table R703.4 and Figure R703.7. These veneers installed over a backing of wood or cold-formed steel shall be limited to the first *story* above-grade and shall not exceed 5 inches (127 mm) in thickness. See Section R602.12 for wall bracing requirements for masonry veneer for wood framed construction and Section R603.9.5 for wall bracing requirements for masonry veneer for cold-formed steel construction.

Exceptions:

1. For all buildings in Seismic Design Categories A, B and C, exterior stone or masonry veneer, as specified in Table R703.7(1), with a backing of wood or steel framing shall be permitted to the height specified in Table R703.7(1) above a noncombustible foundation.
2. For all buildings in Seismic Design Category D_0 and for detached one- or two-family *dwellings* in Seismic Design Categories ~~D_0,~~ D_1 and D_2, exterior stone or masonry veneer, as specified in Table R703.7(2), with a backing of wood framing shall be permitted to the height specified in Table R703.7(2) above a noncombustible foundation.

TABLE R703.7(1)
STONE OR MASONRY VENEER LIMITATIONS AND REQUIREMENTS, WOOD OR STEEL FRAMING, SEISMIC DESIGN CATEGORIES A, B AND C

SEISMIC DESIGN CATEGORY	NUMBER OF WOOD OR STEEL FRAMED STORIES	MAXIMUM HEIGHT OF VENEER ABOVE NONCOMBUSTIBLE FOUNDATION OR FOUNDATION WALL[a] (feet)	MAXIMUM NOMINAL THICKNESS OF VENEER (inches)	MAXIMUM WEIGHT OF VENEER (psf)[b]	~~WOOD OR STEEL FRAMED STORY~~
A or B	Steel: 1 or 2 Wood: 1, 2 or 3	30	5	50	~~All~~
C	1	30	5	50	~~1 only~~
	2	30	5	50	~~top~~
					~~bottom~~
	Wood only: 3	30	5	50	~~top~~
					~~middle~~
					~~bottom~~

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.479 kPa.

a. An additional 8 feet ~~is~~ shall be permitted for gable end walls. ~~See also~~ Comply with story height limitations of Section R301.3.

b. Maximum weight ~~is~~ shall be installed weight and shall include~~s~~ weight of mortar, grout, lath and other materials used for installation. Where veneer is placed on both faces of a wall, the combined weight shall not exceed that specified in this table.

TABLE R703.7(2)
STONE OR MASONRY VENEER LIMITATIONS AND REQUIREMENTS, ~~ONE- AND TWO-FAMILY DETACHED DWELLINGS,~~ WOOD FRAMING, SEISMIC DESIGN CATEGORIES D_0, D_1 AND D_2

STRUCTURE TYPE AND SEISMIC DESIGN CATEGORY	NUMBER OF WOOD FRAMED STORIES	MAXIMUM HEIGHT OF VENEER ABOVE NONCOMBUSTIBLE FOUNDATION OR FOUNDATION WALL (feet)	MAXIMUM NOMINAL THICKNESS OF VENEER (inches)	MAXIMUM WEIGHT OF VENEER (psf)
All buildings in SDC D_0	1	20[c]	4	40
	2	20[c]	4	40
	3	30[d]	4	40
One- and two-family dwellings in SDC D_1	1	20[c]	4	40
	2	20[c]	4	40
	3	20[c]	4	40
One- and two-family dwellings in SDC D_2	1	20[c]	3	30
	2	20[c]	3	30

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.479 kPa, 1 pound-force = 4.448 N.

a. Cripple walls ~~are~~ shall not be permitted in Seismic Design Categories D_0, D_1 and D_2.

b. Maximum weight ~~is~~ shall be installed weight and shall include~~s~~ weight of mortar, grout and lath, and other materials used for installation.

c. The veneer shall not exceed 20 feet in height above a noncombustible foundation, with an additional 8 feet permitted for gable end walls, or 30 feet in height with an additional 8 feet for gable end walls where the lower 10 feet has a backing of concrete or masonry wall. ~~See also~~ Comply with story height limitations of Section R301.3.

d. The veneer shall not exceed 30 feet in height above a noncombustible foundation, with an additional 8 feet permitted for gable end walls. ~~See also~~ Comply with story height limitations of Section R301.3.

Reason: This code change adjusts the overly conservative special wall bracing requirements for houses with masonry veneer in moderate to high-seismic regions. This adjustment is based on full-scale whole-building shake-table testing that has demonstrated that the in-plane shear performance of anchored masonry veneer can resist a portion its own seismically-induced load. It showed that the shear capacity of the veneer is significant and can effectively carry a portion of its load directly to the foundation. (Bibliography References 3 & 4 below)

This testing is substantiated by other full-scale tests on whole-houses in the United States, Australia, England, Japan and New Zealand. One study in the United States reported that a two-story split foyer dwelling had a maximum deflection of 0.04 inches (1 mm) at a uniform wind pressure of 25 psf. This deflection was significantly less than that predicted by conventional analysis. Numerous whole-house tests have also been conducted in Australia. These tests demonstrated that conventional residential construction (only slightly different than that in the United States) withstood 2.4 times to 4.75 times its intended design load without failure. In England, researchers have determined that shear loads transferred from veneer to wood-framed shear walls in a full brick-veneered building were reduced by as much as 45% for wind loads. In New Zealand, tests demonstrated that for masonry veneer on conventional wood-stud framing, the veneer can take up to 50% of the lateral in-plane load.

This code change effectively reduces the special wall bracing requirements for wood-stud framing behind masonry veneer in recognition that the veneer carries a significant portion of its own load in-plane.

Bibliography:
1. Johnson, Eric N., McGinley, W. Mark, The In Plane Shear Performance of Brick Veneer and Wood Stud Walls, Ninth *North American Masonry Conference*, June, 2003.
2. Johnson, Eric N., The In-Plane Shear Performance of Brick Veneer and Wood Stud Walls, Master of Science Thesis, North Carolina A & T State University, Greensboro, North Carolina, 2003.
3. Klingner, Richard E., Shing, P. Benson, McGinley, Mark W., McLean, David I., Okail, Hussein, and Jo, Seongwoo, "NSF NEES Small-Group Project on Performance-based Design of Masonry and Masonry Veneer: Overview and Preliminary Results," *TMS Journal*, The Masonry Society, Boulder, Colorado, December 2008 (date submitted for publication).
4. Klingner, Richard E., "Behavior of Anchored Masonry Veneer with Light Wood Stud-Framing or Masonry Backing in Full-Scale Whole-Building Shaking-Table Tests," *TMS Journal*, The Masonry Society, Boulder, Colorado, June 2009 (date submitted for publication).
5. Thurston,S.J., Beattie, G. J., "Seismic performance of New Zealand two-storey brick veneer houses," *2009 New Zealand Society for Earthquake Engineering Conference Proceedings*, Wellington, New Zealand, April, 2009.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CLARK-RB-5-R602.12

RB113–09/10
R602.12, Table R602.12(1), Table R602.12(2)

Proponent: Gary Ehrlich, National Association of Home Builders (NAHB)

Revise as follows:

R602.12 Wall bracing and stone and masonry veneer. Where stone and masonry veneer is installed in accordance with Section R703.7, wall bracing on exterior *braced wall lines*, and *braced wall lines* on the interior of the building, perpendicular to veneered walls shall comply with this section.

For all buildings in Seismic Design Categories A, B and C, wall bracing ~~at exterior and interior *braced wall lines*~~ shall be in accordance with Section R602.10 and the additional requirements of Table R602.12(1).

For detached one- or two-family *dwellings* in Seismic Design Categories D0, D1 and D2, wall bracing and hold downs ~~at exterior and interior *braced wall lines*~~ shall be in accordance with Sections R602.10 and R602.11 and the additional requirements of Section R602.12.1 and Table R602.12(2). In Seismic Design Categories D0, D1 and D2, cripple walls are not permitted, and required ~~interior~~ *braced wall lines* on the interior of the building shall be supported on continuous foundations.

TABLE R602.12(1)
STONE OR MASONRY VENEER WALL BRACING REQUIREMENTS, WOOD ~~OR STEEL~~ FRAMING, SEISMIC DESIGN CATEGORIES A, B AND C

SEISMIC DESIGN CATEGORY	NUMBER OFWOOD FRAMED STORIES	WOOD FRAMED STORY	MINIMUM SHEATHING AMOUNT ~~(length of braced wall line length)~~ [a]
A or B	1, 2 or 3	all	Table R602.10.1.2(2)
C (detached one- and two-family dwellings)	1, 2 or 3	all	Table R602.10.1.2(2)
C (townhouses)	1	1 only	Table R602.10.1.2(2)
	2	top	Table R602.10.1.(2)
		bottom	1.5 times length required by Table R602.10.1.2(2)
	3	top	Table R602.10.1(1)
		middle	1.5 times length required by Table R602.10.1.2(2)
		bottom	1.5 times length required by Table R602.10.1.2(2)

a. Applies to exterior ~~and interior~~ braced wall lines, and braced wall lines on the interior of the building, perpendicular to veneered walls.

TABLE R602.12(2)
STONE OR MASONRY VENEER WALL BRACING REQUIREMENTS,
ONE- AND TWO-FAMILY DETACHED DWELLINGS, SEISMIC DESIGN CATEGORIES D_0, D_1 AND D_2

SEISMIC DESIGN CATEGORY	NUMBER OF STORIES[a]	STORY	MINIMUM SHEATHING AMOUNT (percent ~~length~~ of braced wall line length)[b]	MINIMUM SHEATHING THICKNESS AND FASTENING	SINGLE STORY HOLD DOWN FORCE (lb)[bc]	CUMULATIVE HOLD DOWN FORCE (lb)[cd]

b. Applies to exterior ~~and interior~~ braced wall lines, and braced wall lines on the interior of the building, perpendicular to veneered walls.

(Portions of table and footnotes not shown remain unchanged)

FIGURE R602.12
~~HOLD DOWNS AT EXTERIOR AND INTERIOR BRACED WALL PANELS~~
STONE OR MASONRY VENEER WALL BRACING HOLD-DOWN REQUIREMENTS, ONE- AND TWO-FAMILY DETACHED DWELLINGS, SEISMIC DESIGN CATEGORIES D_0, D_1 AND D_2

(No change to figure)

Reason: The purpose of this proposal is to revise the overly conservative special wall bracing requirements for dwellings with stone or masonry veneer in moderate and high-seismic regions. A common application is for only the front wall of a dwelling to be provided with stone or masonry veneer. However, the provisions as currently stated require the specified bracing length to be increased for every braced wall in the dwelling (both exterior and on the interior), and in high-seismic conditions for hold-downs to be provided on every segment of every braced wall panel in the dwelling.

In recent testing at the University of Texas and UC San Diego, masonry veneer on individual wood-framed wall segments and on a full wood-framed building did not fail until subjected to peak ground accelerations well above the ground motions characteristic of Seismic Design Category D2. Thus, failure did not occur until well beyond the seismic limits of the IRC. Additionally, the major failure mode is veneer falling off the segments and building, rather than any damage to the wood framing back-up.

Additionally, testing at BRANZ in New Zealand of conventionally-braced structure with masonry veneer has shown that the masonry itself is capable of taking as much as 50% of the lateral load delivered in-plane to the wall. Further, the veneer showed good performance up to deflections of an inch. The allowable design capacities for bracing in the IRC result in deflections of around ½-inch, well within the range of good performance seen in the BRANZ tests.

There are no documented racking failures of a properly-braced house with stone or masonry veneer due to a seismic event. (Obviously, lack of veneer reinforcing and ties is an entirely different issue). Based on that fact and the UT, UCSD and BRANZ testing, the current requirement is not technically justified and clearly an onerous burden on masonry veneer construction. The proposed revisions will limit the increases in bracing and vertical load-path connections to just those walls that need to resist the seismic loads imparted to the structure by the masonry veneer.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: EHRLICH-RB-8-R602.12

RB114–09/10
R606.1, Table R606.1 (New)

Proponent: John England, MCO, England Enterprises, Inc.

1. Revise as follows:

R606.1 General. Masonry construction shall be designed and constructed in accordance with the provisions of this section or in accordance with the provisions of ACI 530/ASCE 5/TMS 402. Mortar types and uses shall be in accordance with Table R606.1.

2. Add new table as follows:

TABLE R606.1
MORTAR USES[a]

USE	Type M 2,500 PSI @ 28 days	Type S 1,800 PSI @ 28 days	Type N 750 PSI @ 28 days	Type O 350 PSI @ 28 days
Structural Masonry Units—exterior bearing –underground	X	X		
Structural Masonry Units—exterior bearing –aboveground	X	X	X[b]	
Structural Masonry Units—interior bearing	X	X	X[b]	
Structural Masonry Units—Interior non-bearing	X	X	X	X
Glass block (interior & exterior)		X	X	
Grout	X	X		
Brick Veneer (non-structural)	X	X	X	

a. This table is a summary of mortar types and uses specified in the following locations in this code:
   1. Table R404.1(1) Footnote a;
   2. Section R607.1;
   3. Section R609.1.1;
   4. Section R610.8.

b. Can only be used in Seismic Design Category A, B, or C. See Section R607.1.2.

Reason: This is a new table which will help inspectors, contractor, and design professionals quickly pick the correct mortar for the job at hand.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: ENGLAND-RB-7-R606.1

RB115–09/10
R606.6

Proponent: John England, MCO, England Enterprises, Inc.

Delete and substitute as follows:

~~**R606.6 Piers.** The unsupported height of masonry piers shall not exceed ten times their least dimension. When structural clay tile or hollow concrete masonry units are used for isolated piers to support beams and girders, the cellular spaces shall be filled solidly with concrete or Type M or S mortar, except that unfilled hollow piers may be used if their unsupported height is not more than four times their least dimension. Where hollow masonry units are solidly filled with concrete or Type M, S or N mortar, the allowable compressive stress shall be permitted to be increased as provided in Table R606.5.~~

R606.6 Isolated piers The unsupported height of unfilled hollow masonry piers shall not exceed four times their least dimension.

The unsupported height of solid or hollow masonry unit filled with concrete or Type M or S mortar shall not exceed ten times their least dimension.

Reason: This does not change the meaning. It was reworked to better understand it.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: ENGLAND-RB-8-R606.6

RB116–09/10
R606.6.1

Proponent: Gary Ehrlich, PE, National Association of Home Builders (NAHB)

Revise as follows:

R606.6.1 Pier cap. Hollow piers shall be capped with 4 inches (102 mm) of *solid masonry* or concrete, a masonry cap block, or shall have cavities of the top course filled with concrete or grout, unless a sill plate of 2-inch (51 mm) minimum nominal thickness and bearing on two face shells is provided. The sill plate shall provide a minimum nominal bearing area of 48 square inches (30 865 square mm). ~~or other *approved* methods.~~

Reason: The purpose of this proposal is to provide additional options for providing bearing at the top of masonry piers. No guidance is currently provided in the code for the common condition where the top of a masonry pier does not match the bottom of the floor framing. Even if the pier has been properly constructed with solid masonry or grouted cells, the code does not clearly require direct bearing, and this gap is often filled with shims or small blocks that are not adequate to transfer the reaction from the beam or girder to the pier. Language previously included in Section 1804.6.4 of the 1999 SBC requiring a nominal section of sill plate is added to R606.6.1. Also, a reference to a masonry cap block (or "FHA block") is added. These blocks have a solid top surface over hollow cores and are intended to be used at the top courses of masonry piers or walls. However, the "cap" is not 4" thick, hence the need for a separate reference.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: EHRLICH-RB-9-R606.6.1

RB117–09/10
Table R607.1

Proponent: John England, MCO, England Enterprises, Inc.

Delete existing Table R607.1 and replace as follows:

TABLE R607.1
MORTAR PROPORTIONS[a, b]

		PROPORTIONS BY VOLUME (cementitious materials)								
		Portland cement or blended cement	Mortar cement			Masonry cement			Hydrated lime[c] or lime putty	Aggregate ratio (measured in damp, loose conditions)
MORTAR	TYPE		M	S	N	M	S	N		
Cement lime	M	1	—	—	—	—	—	—	1/4 over 1/4 to 1/2 over 1/2 to 11/4 over 11/4 to 21/2	Not less than 21/4 and not more than 3 times the sum of separate volumes of lime, if used, and cement
	S	1	—	—	—	—	—	—		
	N	1	—	—	—	—	—	—		
	O	1	—	—	—	—	—	—		
Mortar cement	M	1	—	—	1	—	—	—	—	
	M	—	1	—	—	—	—	—		
	S	1/2	—	—	1	—	—	—		
	S	—	—	1	—	—	—	—		
	N	—	—	—	1	—	—	—		
	O	—	—	—	1	—	—	—		
Masonry cement	M	1				—	—	1	—	
	M	—				1	—	—		
	S	1/2				—	—	1		
	S	—				—	1	—		
	N	—				—	—	1		
	O	—				—	—	1		

		PROPORTIONS BY VOLUME (cementitious materials)		
	Type	**Portland Cement or Blended Cement**	**Hydrated Lime[c] or Lime Putty**	**Aggregate Ratio (sand damp and loose)**
Cement Lime Mortar	M	1	1/4	Not less than 2 1/4 and not more than 3 times the sum of the separate volumes of cementitious materials
	S	1	Over 1/4 to 1/2	
	N	1	Over 1/2 to 1 1/4	
	O	1	Over 1 1/4 to 2 1/2	

	Type	**Portland Cement or Blended Cement**	**Mortar Cement or Masonry Cement**	**Type N**	**Aggregate Ratio (sand damp and loose)**
Mortar Cement or Masonry Cement	M, S, N, O	N/A	1	N/A	Not less than 2 1/4 and not more than 3 times the sum of the separate volumes of cementitious materials
	M	1	N/A	1	
	S	1/2	N/A	1	

For SI: 1 cubic foot = 0.0283 m3, 1 pound = 0.454 kg.

a. For the purpose of these specifications, the weight of 1 cubic foot of the respective materials shall be considered to be as follows:

Portland Cement	94 pounds	Masonry Cement	Weight printed on bag
Mortar Cement	Weight printed on bag	Hydrated Lime	40 pounds
Lime Putty (Quicklime)	80 pounds	Sand, damp and loose	80 pounds of dry sand

b. Two air-entraining materials shall not be combined in mortar.

c. Hydrated lime conforming to the requirements of ASTM C 207.

Reason: Easier to read and understand.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: ENGLAND-RB-3-T. R607.1

RB118–09/10
R607.3

Proponent: Charles Clark, Brick Industry Association, representing the Masonry Alliance for Codes and Standards (MACS)

Revise as follows:

R607.3 Installation of wall ties. The installation of wall ties shall be as follows:

1. The ends of wall ties shall be embedded in mortar joints. Wall ties shall have a minimum of 5/8 inch (15.9 mm) mortar coverage from the exposed face. ~~Wall tie ends shall engage outer face shells of hollow units by at least 1/2 inch (13 mm). Wire wall ties shall be embedded at least 11/2 inches (38 mm) into the mortar bed of *solid masonry* units or solid grouted hollow units.~~
2. Wall ties shall not be bent after being embedded in grout or mortar.
3. For solid masonry units, solid grouted hollow units, or hollow units in anchored masonry veneer, wall ties shall be embedded in mortar bed at least 11/2 inches (38 mm).
4. For hollow masonry units in other than anchored masonry veneer, wall ties shall engage outer face shells by at least 1/2 inch (13 mm).

Reason: This code change ensures that anchored masonry veneer, as defined by Section R703.7 as not exceeding 5 inches in thickness, is installed correctly when hollow masonry units are used. For Section R607.3 which addresses wall tie installation, hollow masonry units used in an anchored masonry veneer are distinguished from units that are used otherwise to ensure that wall ties and mortar are installed correctly.

In Item #1, the existing text on minimum tie embedment is deleted and items 3 and 4 are added to address embedment. A requirement for minimum mortar cover of 5/8 inch for wall ties is added. This requirement is the same as the requirement in the anchored masonry veneer provisions of the *Building Code Requirements and Specification for Masonry Structures* (TMS 402/ACI 530/ASCE 5). This document is a consensus standard overseen by three organizations and written under an ANSI-accredited, balanced process to ensure their objectivity. The minimum mortar cover requirements established within this document have been corroborated through this consensus body.

Item #3 is added and requires wall ties used with solid masonry units, solid grouted units or hollow units in anchored masonry veneer be embedded in the mortar bed at least 1½ inches. This is necessary to ensure that there is adequate bond of the mortar to the veneer ties. This embedment requirement is the same as the requirement in the anchored masonry veneer provisions of the *Building Code Requirements and Specification for Masonry Structures* (TMS 402/ACI 530/ASCE 5). This document is a consensus standard overseen by three organizations and written under an ANSI-accredited, balanced process to ensure their objectivity. The minimum embedment provision in this document has been corroborated through this consensus body.

Item #4 is added and requires that wall ties for hollow units used in other applications besides anchored masonry veneer embed the face shell by no less than ½ inch. This allows for the cells of the unit to be subsequently filled with grout.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CLARK-RB-1-R607.3

RB119–09/10
R612.1, R703.8

Proponent: Jeff Lowinski, representing the Window and Door Manufacturers Association (WDMA)

Revise as follows:

R612.1 General. This section prescribes performance and construction requirements for exterior window and door assemblies installed in walls. Windows and doors shall be installed ~~and flashed~~ in accordance with the fenestration manufacturer's written installation instructions. Window and door openings shall be flashed in accordance with Section R703.8. Written installation instructions shall be provided by the fenestration manufacturer for each window or door.

R703.8 Flashing. ~~*Approved* corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. Self-adhered membranes used as flashing shall comply with AAMA 711. The flashing shall extend to the surface of the exterior wall finish. *Approved* corrosion-resistant flashings shall be installed at all of the following locations:~~ Penetrations and openings in exterior walls shall be flashed or sealed in such a manner that will inhibit entry of water into the wall cavity or penetration of water to the building structural framing components. Flashing components shall be applied shingle fashion and shall direct water to the surface of the exterior wall finish. Material and components used to flash penetrations and openings shall be water-resistant and corrosion-resistant. Self-adhered membranes used as flashing shall comply with AAMA 711. The following locations shall be flashed:

1. Exterior window and door openings. Flashing at exterior window and door openings shall extend to the surface of the exterior wall finish or to the water-resistive barrier for subsequent drainage.
2. At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.
3. Under and at the ends of masonry, wood or metal copings and sills.
4. Continuously above all projecting wood trim.
5. Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction.
6. At wall and roof intersections.
7. At built-in gutters.

Exterior wall plumbing penetrations shall be in accordance with Section P2606.

Reason: The revisions proposed for Chapter 6 clarify that it is window and door assemblies that are installed in walls, and removes the inappropriate flashing text in this chapter since flashing requirements for windows and doors are explicit in Chapter 7.

In Chapter 7, the proposed is intended to be editorial and improves the charging language for flashing. The proposal also directs the reader to the requirements in Section P2606 for exterior wall plumbing penetrations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LOWINSKI-RB-4-R612.1-R703.8

RB120–09/10

R313 (New), R313.1 (New), R313.2 (New), R313.3 (New), R313.3.1 (New), R313.3.2 (New), 612.2, 612.3, 612.4, 612.4.1, 612.4.2; IBC 1013.1 (New), 1405.13.2 [IFC [B] 1013.8] (New)

Proponent: Sarah A. Rice, CBO, representing self

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. PART II WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IRC BUILDING/ENERGY

Revise as follows:

SECTION R313
WINDOW SILLS

R313.1 ~~R612.2~~ Window sills. In dwelling units, where the opening of an operable window is located more than 72 inches (1829 mm) above the finished grade or surface below, the lowest part of the clear opening of the window shall be a minimum of 24 inches (610 mm) above the finished floor of the room in which the window is located. Operable sections of windows shall not permit openings that allow passage of a 4 inch (102 mm) diameter sphere where such openings are located within 24 inches (610 mm) of the finished floor.

Exceptions:

1. Windows whose openings will not allow a 4-inchdiameter (102 mm) sphere to pass through the opening when the opening is in its largest opened position.
2. Openings that are provided with window fall prevention devices that comply with Section R313.2 ~~R612.3~~.
3. Openings that are provided with fall prevention devices that comply with ASTM F 2090.
4. Windows that are provided with opening limiting devices that comply with Section R313.3 ~~R612.4~~.

R313.2 ~~R612.3~~ Window fall prevention devices. Window fall prevention devices and window guards, where provided, shall comply with the requirements of ASTM F 2090.

R313.3 ~~R612.4~~ Window opening limiting devices. When required elsewhere in this code, window opening limiting devices shall comply with the provisions of this section.

R313.3.1 ~~R612.4.1~~ General requirements. Window opening limiting devices shall be self acting and shall be positioned to prohibit the free passage of a 4-in. (102-mm) diameter rigid sphere through the window opening when the window opening limiting device is installed in accordance with the manufacturer's instructions.

R313.3.2 ~~R612.4.2~~ Operation for emergency escape. Window opening limiting devices shall be designed with release mechanisms to allow for emergency escape through the window opening without the need for keys, tools or special knowledge. Window opening limiting devices shall comply with all of the following:

1. Release of the window opening-limiting device shall require no more than 15 pounds (66 N) of force.
2. The window opening limiting device release mechanism shall operate properly in all types of weather.
3. Window opening limiting devices shall have their release mechanisms clearly identified for proper use in an emergency.
4. The window opening limiting device shall not reduce the minimum net clear opening area of the window unit below what is required by Section R310.1.1 of the code.

PART II – IBC FIRE SAFETY

1. Add new text as follows:

1013.1 (IFC [B] 1013.1) General. Guards and operable windows shall comply with this section. Guards shall comply with the provisions of Sections 1013.2 through 1013.7. Operable windows with sills located more than 72 inches above finished grade or other surface below shall comply with Section 1013.8.

2. Revise as follows:

~~1405.13.2~~ **1013.8 (IFC [B] 1013.8) Window Sills**. In Occupancy Groups R-2 and R-3, one – and two-family and multiple-family dwellings, where the opening of the sill portion of an operable window is located more than 72 inches above the finished grade or other surface below, the lowest part of the clear opening of the window shall be at a height not less than 24 inches above the finished floor surface of the room in which the window is located. Glazing between the floor and a height of 24 inches shall be fixed or have openings through which a 4-inch diameter sphere cannot pass.

Exception: Openings that are provided with window guards that comply with ASTM F2006 or F2090.

Reason: PART I - See the reason for the companion change to the IBC. Code users are missing this requirement. It is even more a problem in the IRC as the requirement is 'buried' on the 201st page of the Wall Construction Chapter.

PART II - The proposal simply moves the window opening protection provisions from Chapter 14 to place it among the other guard requirements of Chapter 10. The reason for Section 1405.13.2 is essentially a protection from fall requirement. That is the same reason that 1013 exists. Having this section located in Chapter 14 results in it being frequently overlooked by designers and building officials alike. Placing it in Chapter 10 will result in better compliance.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-E1-1013.1

RB121–09/10

R313 (New), R313.1 (New), R313.2 (New), R313.3 (New), R313.3.1 (New), R313.3.2 (New), R612.2, R612.3, R612.4, R612.4.1, R612.4.2

Proponent: Daniel E. Nichols, PE, New York State Division of Code Enforcement and Administration

Relocate to new section as follows:

SECTION R313
WINDOW FALL PROTECTION

~~R612.2~~ **R313.1 Window sills.** In *dwelling* units, where the opening of an operable window is located more than 72 inches (1829 mm) above the finished *grade* or surface below, the lowest part of the clear opening of the window shall be a minimum of 24 inches (610 mm) above the finished floor of the room in which the window is located. Operable sections of windows shall not permit openings that allow passage of a 4 inch (102 mm) diameter sphere where such openings are located within 24 inches (610 mm) of the finished floor.

Exceptions:

1. Windows whose openings will not allow a 4-inchdiameter (102 mm) sphere to pass through the opening when the opening is in its largest opened position.
2. Openings that are provided with window fall prevention devices that comply with Section R612.3.
3. Openings that are provided with fall prevention devices that comply with ASTM F 2090.
4. Windows that are provided with opening limiting devices that comply with Section R612.4.

~~R612.3~~ **R313.2 Window fall prevention devices.** Window fall prevention devices and window guards, where provided, shall comply with the requirements of ASTM F 2090.

~~R612.4~~ **R313.3 Window opening limiting devices.** When required elsewhere in this code, window opening limiting devices shall comply with the provisions of this section.

~~**R612.4.1**~~ **R313.3.1 General requirements.** Window opening limiting devices shall be self acting and shall be positioned to prohibit the free passage of a 4-in. (102-mm) diameter rigid sphere through the window opening when the window opening limiting device is installed in accordance with the manufacturer's instructions.

~~**R612.4.2**~~ **R313.3.2 Operation for emergency escape.** Window opening limiting devices shall be designed with release mechanisms to allow for emergency escape through the window opening without the need for keys, tools or special knowledge. Window opening limiting devices shall comply with all of the following:

1. Release of the window opening-limiting device shall require no more than 15 pounds (66 N) of force.
2. The window opening limiting device release mechanism shall operate properly in all types of weather.
3. Window opening limiting devices shall have their release mechanisms clearly identified for proper use in an emergency.
4. The window opening limiting device shall not reduce the minimum net clear opening area of the window unit below what is required by Section R310.1.1 of the code.

Reason: This proposal places the requirements for fall protection under the guard section. Designers and code officials alike are missing this section as it is within the wall construction section. Other requirements regarding window location, such as light and ventilation, fire separation prohibitions, and windborne debris are all in Chapter 3. This will assist the code users as all of the architectural concerns on window locations will be in the planning chapter.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NICHOLS-RB-1-R612

RB122–09/10
R612.2; IBC 1405.13.2

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. PART II WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IRC BUILDING/ENERGY

Revise as follows:

R612.2 Window sills. In *dwelling* units, where the opening of an operable window is located more than 72 inches (1829 mm) above the finished *grade* or surface below, the lowest part of the clear opening of the window shall be a minimum of ~~24~~ 36 inches (610 mm) above the finished floor of the room in which the window is located. Operable sections of windows shall not permit openings that allow passage of a 4 inch (102 mm) diameter sphere where such openings are located within ~~24~~ 36 inches (610 mm) of the finished floor.

Exceptions:

1. Windows whose openings will not allow a 4-inchdiameter(102 mm) sphere to pass through the opening when the opening is in its largest opened position.
2. Openings that are provided with window fall prevention devices that comply with Section R612.3.
3. Openings that are provided with fall prevention devices that comply with ASTM F 2090.
4. Windows that are provided with opening limiting devices that comply with Section R612.4.

PART II – IBC FIRE SAFETY

Revise as follows:

1405.13.2 Window sills. In Occupancy Groups R-2 and R-3, one- and two-family and multiple-family dwellings, where the opening of the sill portion of an operable window is located more than 72 inches (1829 mm) above the finished grade or other surface below, the lowest part of the clear opening of the window shall be at a height not less than ~~24~~ 36 inches (610 mm) above the finished floor surface of the room in which the window is located. Glazing between the floor and a height of ~~24~~ 36 inches (610 mm) shall be fixed or have openings through which a 4-inch (102 mm) diameter sphere cannot pass.

Exception: Openings that are provided with window guards that comply with ASTM F 2006 or F 2090.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.
This proposed change is a result of the CTC's investigation of the area of study entitled "Child Window Safety". The scope of the activity is noted as:

> Study the incidence and mechanisms of falls from open windows by children and to investigate the necessity and suitability of potential safeguards and/or revisions to the current codes.

The intent of IBC Section 1405.13.2 and IRC Section R612.2 is clearly to provide safety mechanisms to reduce the possibility of children falling through a window. The CTC has determined that this can be realized in the code in three ways: window fall prevention devices; window opening control devices; or reducing the possibility of accessing the window by increasing the minimum sill height. The purpose of this code change is to reduce the potential hazard by increasing the sill height from 24 inches to 36 inches.

In response to the CTC studying the Climbability of Guards, the National Ornamental & Miscellaneous Metals Association (NOMMA) commissioned a paper entitled "Review of Fall Safety of Children Between the Ages of 18 months and 4 Years in Relation to Guards and Climbing in the Built Environment", referred to in this code change as "NOMMA paper". This paper is posted on the CTC website as noted below. The paper provides a summary of the building code requirements, a critical review of relevant per-reviewed scientific literature on guard research and injury data and includes a section entitled "Children's Interaction with the Built Environment". Included in this section is an analysis of falls from windows where it is noted that "Falls from windows are among the most common types of unintended injuries to children and they are a major health concern" (NOMMA paper page 30). The study efficiently places within a few pages the data on window fall incidents and the means of reducing the number of incidents.

U.S. Fall Injury Data
NOMMA report page 7: The 1,421,137 injuries reported by NEISS between 2002 and 2005, inclusive, correspond to a national average of 51,217,603 based on weighting data included with the record data. The average over the four years is 12,804,401. The weighted estimate of 1,117,278 incidents on average annually for children between the ages of 18 months and 4 years represents 8.7 percent of these incidents. For all the incidents to children between the ages of 18 months and 4 years, 5.6 percent involved stairs, 1.22 percent involved windows, and 0.87 percent involved porches, balconies, open-sided floors, and floor openings.

NOMMA paper page 30 – 33. The paper further cites reports which have been compiled in the table below:

Study	Location	Falls	% fatalities
Vish et al. (2005)	Chicago	11/yr	
Istre et al. (2003)	Dallas county	17/yr	
Benoit et al. (2002)	L.A. county	12/yr (11%)	4% (4 yrs old or less)
Stone et al. (2000)	Cincinnati	12/yr (6.3%)	4.7%
Benoit et al. (2000)	Northern Virginia	11/yr (11%)	

Center of Gravity
NOMMA paper page 11, Table 2: The standing center of gravity of children aged 2 to 3.5 years is 24.1 inches (50th percentile is 22.2 inches) and of children aged 3.5 to 4.5 is 25.2 (50th percentile is 23.6).

A reasonable expectation for the Code is that, absent any fall protection in the window opening, a minimum sill height will be required to reduce the ability of a child to climb onto the sill enabling the fall through the opening. Using a child target age of up to 4 years of age and the associated center of gravity, the code mandated height of 24" is not adequate. A child need only extend themselves on their toes, stand on modest stack of books or blocks or hoist themselves a matter of a few inches with their arms to be able to flop onto the sill and expose themselves to the window opening and the associated risk of falling.

The hazards associated with child window falls cannot be understated as evidenced by the following CPSC Press release dated May 15, 2008:

> NEWS from CPSC
> U.S. Consumer Product Safety Commission
> Office of Information and Public Affairs Washington, DC 20207
>
> FOR IMMEDIATE RELEASE
> May 15, 2008
> Release #08-270
>
> CPSC Hotline: (800) 638-2772
> CPSC Media Contact: (301) 504-7908
>
> **Window Falls Prompts CPSC to Issue Warning**
> WASHINGTON, D.C. - With the arrival of the warmer spring weather, families across the nation are opening their windows to let the fresh air in. This pleasant feeling can quickly turn tragic in households with small children. In recent weeks, several children have fallen from windows. The U.S. Consumer Product Safety Commission is warning parents and caregivers to take precautions to keep children from falling from windows.

"CPSC staff is aware of at least 18 falls from windows through media reports, including two deaths, involving small children since April," said CPSC Acting Chairman Nancy Nord. "We are issuing this warning so parents will take the necessary steps to prevent these incidents from happening."

These deaths and injuries frequently occur when kids push themselves against window screens or climb onto furniture located next to an open window.

From 2002-2004, CPSC staff received an average of 25 reports a year of fatalities associated with falls from windows. Children younger than five years of age account for approximately one-third of these reported fatalities. For all age categories, more males died from window falls than females.

To help prevent injuries and tragedies, CPSC recommends the following safety tips:
* Safeguard your children by using window guards or window stops.
* Install window guards to prevent children from falling out of windows. (For windows on the 6th floor and below, install window guards that adults and older children can open easily in case of fire.)
* Install window stops so that windows open no more than 4 inches.
* Never depend on screens to keep children from falling out of windows.
* Whenever possible, open windows from the top -- not the bottom.
* Keep furniture away from windows, to discourage children from climbing near windows.

To see this release on CPSC's web site, please go to:
http://www.cpsc.gov/cpscpub/prerel/prhtml08/08270.html

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HEILSTEDT-RB-2-R612-IBC 1405.13.2

RB123–09/10

R612.2, R612.3, R612.4, R612.4.1, R612.4.2; IBC 1405.13.2, 1405.13.2.1 (New)

Proponent: Paul K. Heilstedt, PE, FAIA, Chair, representing ICC Code Technology Committee (CTC)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. PART II WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IRC BUILDING/ENERGY

1. Revise as follows:

R612.2 Window sills. In dwelling units, where the opening of an operable window is located more than 72 inches (1829 mm) above the finished grade or surface below, the lowest part of the clear opening of the window shall be a minimum of 24 inches (610 mm) above the finished floor of the room in which the window is located. Operable sections of windows shall not permit openings that allow passage of a 4 inch diameter sphere where such openings are located within 24 inches of the finished floor.

Exceptions:

1. Windows whose openings will not allow a 4-inch-diameter (102 mm) sphere to pass through the opening when the opening is in its largest opened position.
2. ~~Openings that are provided with window fall prevention devices that comply with Section R612.3.~~
3. Openings that are provided with window fall prevention devices that comply with ASTM F 2090.
4. Windows that are provided with window opening ~~limiting~~ control devices that comply with ~~Section R612.4.~~ R612.3.

2. Delete without substitution:

~~**R612.3 Window fall prevention devices.** Window fall prevention devices and window guards, where provided, shall comply with the requirements of ASTM F 2090.~~

3. Renumber and revise Section R612.4 as follows:

~~**R612.4**~~ **R612.3 Window opening ~~limiting~~ control devices.** When required elsewhere in this code, window opening ~~limiting~~ control devices shall comply with ~~the provisions of this section.~~ ASTM F 2090. The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the minimum net clear opening area of the window unit to less than the area required by Section R 310.1.1. The device or any portion thereof shall not project more than 1 inch into the required net clear opening for a length not exceeding 3 inches when the window is in the fully open position.

4. Delete without substitution:

~~**R612.4.1 General requirements**. Window opening limiting devices shall be self- acting and shall be positioned so as to prohibit the free passage of a 4.0-in. (102-mm) diameter rigid sphere through the window opening when the window opening limiting device is installed in accordance with the manufacturer's instructions.~~

~~**R612.4.2 Operation for Emergency Escape.** Window opening limiting devices shall be designed with release mechanisms to allow for emergency escape through the window opening without the need for keys, tools or special knowledge. Window opening limiting devices shall comply with all of the following:~~

1. ~~Release of the window opening-limiting device shall require no more than 15 lbf (66 N) of force.~~
2. ~~The window opening limiting device release mechanism shall operate properly in all types of weather.~~
3. ~~Window opening limiting devices shall have their release mechanisms clearly identified for proper use in an emergency.~~
4. ~~The window opening limiting device shall not reduce the minimum net clear opening area of the window unit below what is required by Section R310.1.1 of the code.~~

PART II – IBC FIRE SAFETY

1. Revise as follows:

1405.13.2 Window sills. In Occupancy Groups R-2 and R-3, one- and two-family and multiple-family dwellings, where the opening of the sill portion of an operable window is located more than 72 inches (1829 mm) above the finished grade or other surface below, the lowest part of the clear opening of the window shall be a minimum of 24 inches (610 mm) above the finished floor surface of the room in which the window is located. ~~Glazing between the floor and a height of 24 inches (610 mm) shall be fixed or have openings such that a 4-inch (102 mm) diameter sphere cannot pass through.~~ Operable sections of windows shall not permit openings that allow passage of a 4 inch diameter sphere where such openings are located within 24 inches of the finished floor.

Exception~~s~~:

~~Openings that are provided with window guards that comply with ASTM F 2006 or F 2090.~~

1. Windows whose openings will not allow a 4-inch-diameter (102 mm) sphere to pass through the opening when the opening is in its largest opened position.
2. Openings that are provided with window fall prevention devices that comply with ASTM F 2090.
3. Windows that are provided with window opening control devices that comply with Section 1405.13.2.1..

2. Add new text as follows:

1405.13.2.1 Window opening control devices. When required elsewhere in this code, window opening control devices shall comply with ASTM F 2090. The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the minimum net clear opening area of the window unit to less than the area required by Section 1029.2. The device or any portion thereof shall not project more than 1 inch into the required net clear opening for a length not exceeding 3 inches when the window is in the fully open position.

Reason: The ICC Board established the ICC Code Technology Committee (CTC) as the venue to discuss contemporary code issues in a committee setting which provides the necessary time and flexibility to allow for full participation and input by any interested party. The code issues are assigned to the CTC by the ICC Board as "areas of study". Information on the CTC, including: meeting agendas; minutes; reports; resource documents;

presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the following website: http://www.iccsafe.org/cs/cc/ctc/index.html. Since its inception in April/2005, the CTC has held seventeen meetings - all open to the public.
This proposed change is a result of the CTC's investigation of the area of study entitled "Child Window Safety". The scope of the activity is noted as:

> Study the incidence and mechanisms of falls from open windows by children and to investigate the necessity and suitability of potential safeguards and/or revisions to the current codes.

This code change is a follow-up to code change RB173-07/08 last cycle. At the Final Action Hearings in Minneapolis, the membership approved RB 173-07/08 Part 1 (Public Comment 2) to the IRC to include prescriptive provisions for window opening limiting devices but failed to approve the corresponding and identical provisions to the IBC. The proposal corrects this inconsistent action as well as replaces the prescriptive provisions with a reference to a consensus standard which has been updated to specifically address these devices.

IRC/IBC coordination: The result of this two part code change will be consistency between the IBC and IRC in terms of requirements.
Updated standard ASTM F2090 – 08: Both the IBC and IRC currently reference the 2007 edition of the standard entitled "Specification for Window Fall Prevention Devices with Emergency Escape (Egress Release Mechanisms". This standard was updated in 2008 to address window opening control devices. However, it was not updated in time to be included by reference in the 2009 IBC and IRC. This standard includes the necessary window operational criteria which results in the window not being able to be opened beyond the 4 inch performance threshold which is currently found in IRC Section R612.4.1. This control device can be released to allow the window to be fully opened in order to comply with the emergency escape provisions in both the IBC (1029.2) and IRC (R310.1.1)

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HEILSTEDT-RB-1-R612-IBC 1405.13.2

RB124–09/10

R612.2, R612.3, R612.4, R612.4.1, R612.4.2, Chapter 44 (New)

Proponent: Julie Ruth, JRuth Code Consulting, representing AAMA Window Opening Control Device Task Group

1. Revise as follows:

R612.2 Window sills. In *dwelling* units, where the opening of an operable window is located more than 72 inches (1829 mm) above the finished *grade* or surface below, the lowest part of the clear opening of the window shall be a minimum of 24 inches (610 mm) above the finished floor of the room in which the window is located. Operable sections of windows shall not permit openings that allow passage of a 4 inch (102 mm) diameter sphere where such openings are located within 24 inches (610 mm) of the finished floor.

Exceptions:

1. Windows whose openings will not allow a 4-inchdiameter (102 mm) sphere to pass through the opening when the opening is in its largest opened position.
2. ~~Openings that are provided with window fall prevention devices that comply with Section R612.3.~~
3 ~~3~~ 2. Openings that are provided with fall prevention devices that comply with ASTM F 2090.
4 ~~4~~ 3. Windows that are provided with opening ~~limiting~~ control devices that comply with Section ~~R612.4~~ R612.3.

2. Delete without substitution:

~~**R612.3 Window fall prevention devices.** Window fall prevention devices and window guards, where provided, shall comply with the requirements of ASTM F 2090.~~

3. Renumber and revise as follows:

~~**R612.4**~~ **612.3 Window opening ~~limiting~~ control devices.** When required elsewhere in this code, window opening ~~limiting~~ control devices shall comply with the provisions of ~~this section~~ AAMA 909.

4. Delete without substitution:

~~**R612.4.1 General requirements.** Window opening limiting devices shall be self acting and shall be positioned to prohibit the free passage of a 4-in. (102-mm) diameter rigid sphere through the window opening when the window opening limiting device is installed in accordance with the manufacturer's instructions.~~

~~**R612.4.2 Operation for emergency escape.** Window opening limiting devices shall be designed with release mechanisms to allow for emergency escape through the window opening without the need for keys, tools or special knowledge. Window opening limiting devices shall comply with all of the following:~~

1. ~~Release of the window opening limiting device shall require no more than 15 pounds (66 N) of force.~~
2. ~~The window opening limiting device release mechanism shall operate properly in all types of weather.~~
3. ~~Window opening limiting devices shall have their release mechanisms clearly identified for proper use in an emergency.~~
4. ~~The window opening limiting device shall not reduce the minimum net clear opening area of the window unit below what is required by Section R310.1.1 of the code.~~

5. Add new standard to Chapter 44 as follows:

AAMA 909 Voluntary Specification for Window Opening Control Devices

Reason: The requirements of current Section R612.4 for window opening limiting devices does not provide adequate detail for their design. The 2008 edition of ASTM F2090 attempts to provide greater guidance, but as the members of the AAMA Window Opening Control Device task group, which was created specifically to respond to this new requirement in the International Codes, discovered when they began attempting to design devices to meet this standard, there are inconsistencies and confusion within ASTM F2090-08. Therefore, the members of the AAMA WOCD TG have begun the development of an AAMA standard for these devices, with a goal of completing the standard in time to be referenced in the 2012 International Residential Code.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, AMMA 909, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RUTH-RB-4-R612.2-CH 44

RB125–09/10

R310.2 (New), 612.3, R612.4, R612.4.1, R612.4.2; IBC 1029.4.1 (New), 1405.13.2

Proponent: Jeff Lowinski, representing the Window and Door Manufacturers Association (WDMA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. PART II WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IRC BUILDING/ENERGY

1. Add new text as follows:

R310.2 Window fall prevention devices. Window guards and window opening control devices, where provided, shall comply with ASTM F2090.

2. Delete without substitution:

~~**R612.3 Window fall prevention devices.** Window fall prevention devices and window guards, where provided, shall comply with the requirements of ASTM F 2090.~~

~~**R612.4 Window opening limiting devices.** When required elsewhere in this code, window opening limiting devices shall comply with the provisions of this section.~~

~~**R612.4.1 General requirements.** Window opening limiting devices shall be self acting and shall be positioned to prohibit the free passage of a 4 in. (102 mm) diameter rigid sphere through the window opening when the window opening limiting device is installed in accordance with the manufacturer's instructions.~~

~~**R612.4.2 Operation for emergency escape.** Window opening limiting devices shall be designed with release mechanisms to allow for emergency escape through the window opening without the need for keys, tools or special knowledge. Window opening limiting devices shall comply with all of the following:~~

1. ~~Release of the window opening limiting device shall require no more than 15 pounds (66 N) of force.~~
2. ~~The window opening limiting device release mechanism shall operate properly in all types of weather.~~
3. ~~Window opening limiting devices shall have their release mechanisms clearly identified for proper use in an emergency.~~
4. ~~The window opening limiting device shall not reduce the minimum net clear opening area of the window unit below what is required by Section R310.1.1 of the code.~~

PART II – IBC FIRE SAFETY

1. Add new text as follows:

1029.4.1 Window fall prevention devices. Window guards and window opening control devices, where provided, shall comply with ASTM F2090.

Exception. Window guards installed in windows located more than 75 feet above adjacent grade shall be permitted to comply with ASTM F2006.

2. Delete without substitution:

~~**1405.13.2 Window sills.** In Occupancy Groups R-2 and R-3, one- and two-family and multiple-family dwellings, where the opening of the sill portion of an operable window is located more than 72 inches (1829 mm) above the finished grade or other surface below, the lowest part of the clear opening of the window shall be at a height not less than 24 inches (610 mm) above the finished floor surface of the room in which the window is located. Glazing between the floor and a height of 24 inches (610 mm) shall be fixed or have openings through which a 4-inch (102 mm) diameter sphere cannot pass.~~

~~**Exception:** Openings that are provided with window guards that comply with ASTM F 2006 or F 2090.~~

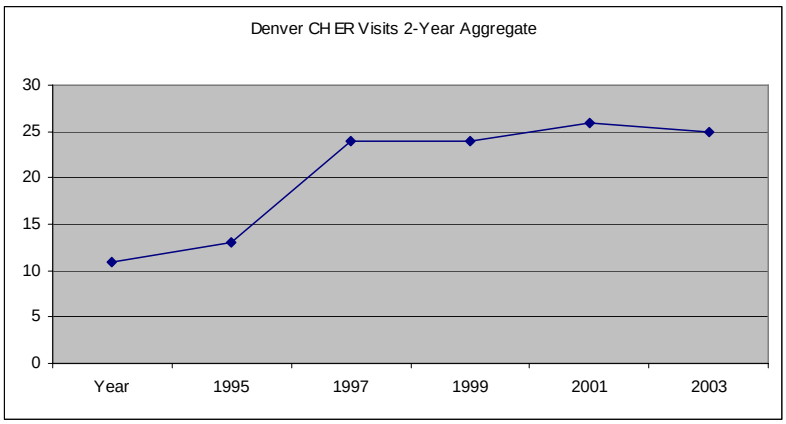
Reason: (Parts 1 and 2) The code contains requirements for minimum sill heights that were intended to reduce the likelihood of child window falls. According to the US CPSC, average annual child fall deaths have decreased from 32 to 14 between 1980 and 2000. In 2008, the CSPC reported that annual deaths dropped to less than 9 per year. This significant improvement in child fall safety is the result of the two-pronged approach of window safety education and window guard regulations enacted by local jurisdictions.

Despite this safety improvement, one large metropolitan MSA has bucked the trend. Denver Children's Hospital has shared data suggesting that ER visits resulting from child window falls have been increasing.

Denver is the only major MSA in the US that has required windows to be installed at a minimum sill height, yet the improved safety record reported by the CPSC does not apply in Denver.

WDMA believes that the continued reliance on a minimum sill height could result in more child falls as parents place furniture, including sofas, beds and cribs beneath open windows. Proponents of sill height minimums have continued to ignore the Denver scenario, but WDMA is concerned that this failure to study the issue could result in more injuries and deaths nationwide.

Approval of this proposal will remove the minimum sill height requirement, but mandate that window opening control devices and window guards comply with the appropriate ASTM standards.



Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LOWINSKI-RB-1-R310.2-IBC-1029.4.1

RB126–09/10

R601.4 (New), R612.2, R612.3, R612.4, R612.4.1, R612.4.2; IBC 1405.13.2

Proponent: Jeff Lowinski, representing Window and Door Manufacturers Association (WDMA)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. PART II WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IRC BUILDING/ENERGY

1. Add new text as follows:

R601.4 Windows. Where window rough openings are located higher than the first story above grade, the window rough opening sill shall be a minimum of 21 inches (533 mm) above the rough floor deck of the room in which the window is located.

Exceptions:

1. Windows above an exterior deck or balcony serving that story.
2. Fixed, non-operable windows.
3. Window openings that do not permit a 4" diameter sphere to pass through the opening in the lower half of the window.
4. Window openings with devices complying with ASTM F 2090.

2. Delete without substitution:

~~**R612.2 Window sills.** In *dwelling* units, where the opening of an operable window is located more than 72 inches (1829 mm) above the finished *grade* or surface below, the lowest part of the clear opening of the window shall be a minimum of 24 inches (610 mm) above the finished floor of the room in which the window is located. Operable sections of windows shall not permit openings that allow passage of a 4 inch (102 mm) diameter sphere where such openings are located within 24 inches (610 mm) of the finished floor.~~

~~**Exceptions:**~~
~~1. Windows whose openings will not allow a 4-inchdiameter (102 mm) sphere to pass through the opening when the opening is in its largest opened position.~~
~~2. Openings that are provided with window fall prevention devices that comply with Section R612.3.~~
~~3. Openings that are provided with fall prevention devices that comply with ASTM F 2090.~~
~~4. Windows that are provided with opening limiting devices that comply with Section R612.4.~~

~~**R612.3 Window fall prevention devices.** Window fall prevention devices and window guards, where provided, shall comply with the requirements of ASTM F 2090.~~

~~**R612.4 Window opening limiting devices.** When required elsewhere in this code, window opening limiting devices shall comply with the provisions of this section.~~

~~**R612.4.1 General requirements.** Window opening limiting devices shall be self acting and shall be positioned to prohibit the free passage of a 4-in. (102-mm) diameter rigid sphere through the window opening when the window opening limiting device is installed in accordance with the manufacturer's instructions.~~

~~**R612.4.2 Operation for emergency escape.** Window opening limiting devices shall be designed with release mechanisms to allow for emergency escape through the window opening without the need for keys, tools or special knowledge. Window opening limiting devices shall comply with all of the following:~~

1. ~~Release of the window opening-limiting device shall require no more than 15 pounds (66 N) of force.~~
2. ~~The window opening limiting device release mechanism shall operate properly in all types of weather.~~
3. ~~Window opening limiting devices shall have their release mechanisms clearly identified for proper use in an emergency.~~
4. ~~The window opening limiting device shall not reduce the minimum net clear opening area of the window unit below what is required by Section R310.1.1 of the code.~~

PART II – IBC FIRE SAFETY

Delete and substitute as follows:

~~**1405.13.2 Window sills.** In Occupancy Groups R-2 and R-3, one- and two-family and multiple-family dwellings, where the opening of the sill portion of an operable window is located more than 72 inches (1829 mm) above the finished grade or other surface below, the lowest part of the clear opening of the window shall be at a height not less than 24 inches (610 mm) above the finished floor surface of the room in which the window is located. Glazing between the floor and a height of 24 inches (610 mm) shall be fixed or have openings through which a 4-inch (102 mm) diameter sphere cannot pass.~~

~~**Exception:** Openings that are provided with window guards that comply with ASTM F 2006 or F 2090.~~

1405.13.2 Window rough openings. Where window rough openings are located higher than the first story above grade, the window rough opening sill shall be a minimum of 21 inches (533 mm) above the rough floor deck of the room in which the window is located.

Exceptions:

1. Windows above an exterior deck or balcony serving that story.
2. Fixed, non-operable windows.
3. Window openings that do not permit a 4" diameter sphere to pass through the opening in the lower half of the window.
4. Window openings with devices complying with ASTM F2090 or F2006.

Reason: (Parts 1 and 2) The current code requirement for minimum sill heights has caused some issues with builders after window installation and the minimum is triggered. By changing the requirement to a rough opening dimension that equates to a 24" sill opening, the construction process will be streamlined. This proposal also simplifies the trigger by removing the 72" dimension from adjacent grade and inserting instead a reference to location above the first story above grade. This change will not result in a material change in the height of window installations.
Removing the prescriptive requirements for window opening-limiting devices removes conflicts between the referenced standard and the code.

Cost Impact: The code change proposal will not increase the cost of construction.

PART I – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LOWINSKI-RB-2-R601.4-IBC 1405

RB127–09/10
R612.8, Chapter 44 (New)

Proponent: Jeff Burton, Director of Codes and Standards, representing Association of Millwork Distributors

1. Revise as follows:

R612.8 Other exterior window and door assemblies. Exterior windows and door assemblies not included within the scope of Section R612.6 or Section R612.7 shall be tested in accordance with ASTM E 330 or AMD SHEDS. Glass in assemblies covered by this exception shall comply with Section R308.5.

2. Add new standard to Chapter 44 as follows:

AMD Association of Millwork Distributors
10047 Robert Trent Jones Boulevard
Port Richey, FL 34655

SHEDS Side Hinged Exterior Door Standard

Reason: The code change proposal adds an additional requirement (option) to the code in that it includes a structural component interchangeability methodology that is prevalent in the side hinged exterior door (SHED) industry but is not addressed in the building codes or its current referenced standards. The addition of the AMD SHEDS (Side Hinged Exterior Door Standard), which is designed in accordance with the current industry ASTM E330 static pressure test, adds that needed structural component interchangeability option.

The current minimum code requirements for SHEDs adequately address concerns with public safety and protection of property, in that, to date, no empirical evidence or testimony has been provided to the ICC code development process proving that SHEDs are a significant failure relating to variable pressure from hurricanes force or high winds, in fact, the foremost leading post hurricane/building code experts provide no significant evidence of actual failures relating to SHEDs*. This lack of evidence supports current regulation and commonly used industry practices (component interchange) in place today. The current code is too restrictive in that it references SHED "system only" test standards and should allow for a SHEDs component interchange option similar to its allowances relating to fire rated doors.

*__Bibliography__
Rainwater Management Performance of Newly Constructed Residential Building Enclosures During August and September 2004 by Dr. Joe Lstiburek of the Building Science Corp., the Home Builders Association of Metro Orlando and the Florida Home Builders Association

The Benefits of Modern Wind Resistant Building Codes on Hurricane Claim Frequency and Severity-A Summary Report by Dr. Timothy Reinhold at the Institute for Business and Home Safety

Post 2004 Hurricane Field Survey-an Evaluation of the Relative Performance of the Standard Building Code and the Florida Building Code by Dr. Kurt Gurley of the University of Florida.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, AMD SHEDS, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: BURTON-RB-1-R612.8

RB128–09/10
Tables R613.3.2, R613.5(1), R613.5(2)

Proponent: Edward L. Keith, representing APA – The Engineered Wood Association

1. Revise as follows:

TABLE R613.3.2
MINIMUM PROPERTIES FOR ORIENTED STRAND BOARD FACERING MATERIAL IN SIP WALLS

Thickness (in.)	Product	Flatwise Stiffness [a] ($lbf\text{-}in^2/ft$)		Flatwise Strength [b] (lbf-in/ft)		Tension [b] (lbf/ft)		Density [a,c] (pcf)
		Along	Across	Along	Across	Along	Across	
7/16	Sheathing	~~54,700~~ 55,600	~~27,100~~ 16,500	~~950~~ 1,040	~~870~~ 460	~~6,800~~ 7,450	~~6,500~~ 5,800	~~35~~ 34

(Footnotes remain unchanged)

2. Delete existing tables and replace as follows:

TABLE R613.5(1)
MINIMUM THICKNESS FOR SIP WALL SUPPORTING
SIP OR LIGHT-FRAME ROOF ONLY (inches)
(underlining omitted for clarity)

Building Width (ft)																	
Wind Speed (3-sec. gust)		Snow Load (psf)	24			28			32			36			40		
Exp. A/B	Exp. C		Wall Height (ft)			Wall Height (ft)			Wall Height (ft)			Wall Height (ft)			Wall Height (ft)		
			8	9	10	8	9	10	8	9	10	8	9	10	8	9	10
85		20	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
		30	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
		50	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
		70	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
100	85	20	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
		30	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
		50	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
		70	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	6.5	4.5	4.5	N/A
110	100	20	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
		30	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	6.5
		50	4.5	4.5	4.5	4.5	4.5	6.5	4.5	4.5	6.5	4.5	4.5	N/A	4.5	4.5	N/A
		70	4.5	4.5	6.5	4.5	4.5	N/A	4.5	4.5	N/A	4.5	6.5	N/A	4.5	N/A	N/A
120	110	20	4.5	4.5	N/A	4.5	4.5	N/A	4.5	4.5	N/A	4.5	4.5	N/A	4.5	4.5	N/A
		30	4.5	4.5	N/A	4.5	4.5	N/A	4.5	4.5	N/A	4.5	4.5	N/A	4.5	6.5	N/A
		50	4.5	4.5	N/A	4.5	6.5	N/A	4.5	N/A	N/A	4.5	N/A	N/A	4.5	N/A	N/A
		70	4.5	N/A	N/A	4.5	N/A	N/A	4.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kN/m2
Deflection criteria: L/240.
Roof load: 7 psf.
Ceiling load: 5 psf.
Wind loads based on Table R301.2(2).
Strength axis of facing materials applied vertically.
N/A indicates not applicable.

TABLE R613.5(2)
MINIMUM THICKNESS FOR SIP WALLS SUPPORTING
SIP OR LIGHT-FRAME ONE STORY AND ROOF (inches)
(underlining omitted for clarity)

Building Width (ft)																	
Wind Speed (3-sec. gust)		Snow Load (psf)	24			28			32			36			40		
Exp. A/B	Exp. C		Wall Height (ft)			Wall Height (ft)			Wall Height (ft)			Wall Height (ft)			Wall Height (ft)		
			8	9	10	8	9	10	8	9	10	8	9	10	8	9	10
85		20	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
		30	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
		50	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	N/A
		70	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	6.5	4.5	4.5	N/A	4.5	N/A	N/A
100	85	20	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	6.5	4.5	4.5	N/A	4.5	4.5	N/A
		30	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	N/A	4.5	4.5	N/A	4.5	N/A	N/A
		50	4.5	4.5	6.5	4.5	4.5	N/A	4.5	4.5	N/A	4.5	N/A	N/A	N/A	N/A	N/A
		70	4.5	4.5	N/A	4.5	6.5	N/A	4.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
110	100	20	4.5	4.5	N/A	4.5	4.5	N/A	4.5	6.5	N/A	4.5	N/A	N/A	N/A	N/A	N/A
		30	4.5	4.5	N/A	4.5	4.5	N/A	4.5	N/A	N/A	4.5	N/A	N/A	N/A	N/A	N/A
		50	4.5	6.5	N/A	4.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		70	4.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
120	110	20	4.5	N/A	N/A	4.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		30	4.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		70	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

Deflection criteria: L/240.
Roof load: 7 psf.
Ceiling load: 5 psf.
Second floor live load: 30 psf.
Second floor dead load: 10 psf.
Second floor dead load from walls: 10 psf.
Wind loads based on Table R301.2(2).
Strength axis of facing materials applied vertically.
N/A indicates not applicable.

Reason: The original Table R613.3.2 minimum properties for facing materials were established by the SIPs industry with a specific grade of wood structural panels. Since the adoption of these properties in the 2007 Supplement to the IRC, it has become evident that the panel properties for the wood structural panel facing materials do not reflect the facing materials commonly available in the marketplace, which typically have higher properties in the along direction and lower properties in the across direction.

As a result, the Structural Insulated Panel Association (SIPA) worked with APA – The Engineered Wood Association, a standard developer accredited by ANSI and a certification agency accredited under ISO Guide 65, to re-evaluate the performance of SIPs using the readily available facing materials. Results of this re-evaluation are documented in APA Report T2009P-28, which shows no performance difference for SIP applications covered in IRC R613 when using the new facing materials with higher properties in the along direction and lower properties in the across direction, as compared to the existing IRC. Therefore, Table R613.3.2 is suggested to be revised as proposed based on the properties benchmarked during the SIPs testing. While there were no performance issues, the assumptions used in generating Tables R613.5(1) and R613.5(2) were also reviewed by the SIPA Technical Advisory Committee, which suggested more stringent criteria by not allowing any load duration increase, including wind load, for SIPs. As a result, Tables R613.5(1) and R613.5(2) are suggested to be revised as proposed.

Copies of APA Report T2009P-28 have been provided to the committee and additional copies are available for free download at www.apawood.org.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KEITH-RB-2-TABLES R613.3.2-R613.5(1)-R613.5(2)

RB129–09/10
R613.7

Proponent: Edward L. Keith, representing APA – The Engineered Wood Association

Revise as follows:

R613.7 Drilling and notching. The maximum vertical chase penetration in SIPs shall have a maximum side dimension of 2 inches (51 mm) centered in the panel core. Vertical chases shall have a minimum spacing of 24-inches (610 mm) on center. Maximum of two horizontal chases shall be permitted in each wall panel - one at 14 inches (360 mm) from the bottom of the panel and one at mid-height of the wall panel. The maximum allowable penetration size in a wall panel shall be circular or rectangular with a maximum dimension of 12 inches (300 mm). The minimum wall length for such a penetration shall be 20 feet (6100 mm) and only one such penetration shall be permitted in each full 20 foot (6100 mm) length of wall. Where multiple penetrations are to be located in a single wall line, they shall be placed no closer together than 20 feet (6100 mm) measured between adjacent edges of two penetrations. Overcutting of holes in facing panels shall not be permitted.

Reason: The existing R613.7 provides no limitation on the field-placement of these holes up to 12" x 12" in size. As such, the proposed language is added to clarify the limitation proposed in the original code proposal in 2006. From an engineering perspective, a hole this size will have minimal impact on the capacity of the wall system as long as the wall or the spacing between holes is sufficiently long (20 feet or longer).

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: KEITH-RB-1-R613.7

RB130–09/10
R614 (New), R614.1 (New)

Proponent: Daniel J. Walker, PE, Thomas Associates, Inc., representing the national Sunroom Association

Add new text as follows:

R614 General. This section prescribes the construction of *patio cover* walls.

R614.1 *Patio Cover* wall configuration. *Patio cover* walls shall be permitted to be open, or enclosed with (1) insect screening, (2) approved translucent or transparent plastic not more than 0.125 inch (3.2 mm) in thickness, (3) glass conforming to the provisions of Section R308, or (4) any combination of the foregoing.

Reason: The current Appendix "H", "Patio Covers" defines the allowable configuration of *patio cover* walls, but is not a part of the body of the code. The term *patio cover* is used in a number of places in the code, so further clarification of the requirements for the allowable wall configuration is necessary.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WALKER-RB-7-R614

RB131–09/10
R702.2 (New), R702.2.1 (New), R702.2.2 (New), R702.2.3 (New), Chapter 44 (New)

Proponent: Michael D. Fischer, The Kellen Company, representing Kellen Technical Services

1. Add new text as follows:

R702.2 Cellulosic Insulation.

R702.2.1 Material. Cellulose insulation shall comply with the requirements of Chapter 11 of this code or the applicable provisions of the IECC. Cellulosic fiber stabilized thermal insulation shall bear a label indicating compliance with ASTM C1497. Cellulosic Fiber loose-fill thermal insulation shall bear a label indicating compliance with ASTM C739.

R702.2.2 Installation. Cellulosic fiber stabilized thermal insulation shall be installed in accordance with manufacturers installation instructions. Cellulosic Fiber loose-fill thermal insulation shall be installed in accordance with ASTM C1015 and manufacturers installation instructions.

R702.2.3 Drying time. Cellulosic fiber stabilized thermal insulation installed in wall cavities shall remain exposed for a minimum of 24 hours after application, and shall not be covered until the moisture level of the insulation material is 25% or less. The insulation installer shall record moisture measurements on the permanent certificate. The measurements shall include the date and time of installation, date and time of moisture content measurement, and recorded moisture content level. Moisture readings shall be taken from exterior walls in a minimum of three rooms.

2. Add new standards to Chapter 44 as follows:

ASTM

C739-08	Standard Specification for Cellulosic Fiber Loose-Fill Thermal Insulation
C1015-06	Standard Practice for Installation of Cellulosic and Mineral Fiber Loose-Fill Thermal Insulation
C1497-04	Standard Specification for Cellulosic Fiber Stabilized Thermal Insulation

Reason: The move towards more sustainable building practices has created opportunity for innovative products with environmentally-favorable attributes including recycled content. In the case of cellulose insulation, which has gained market share, many of the questions related to fire performance, defective or "settled" R-Value have been addressed in the IECC requirements.

This proposal sets minimum standards for product and installation in accordance with consensus ASTM standards as well as individual manufacturers' instructions. The proposal requires that cellulose insulation products be labeled to ensure that appropriate third-party oversight and quality control measures help to ensure that these systems will perform as intended.

The proposal also includes a requirement that addresses the issue of moisture content. Recommendations from individual manufacturers insist upon adequate drying time to ensure proper performance as well as to inhibit mold growth and other undesirable effects of excessive moisture in the wall cavity.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standards proposed for inclusion in the code, ASTM C 739, C 1015 and C 1497, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FISCHER-RB-7-R702.2-CH 44

RB132–09/10
R702.2.1, R702.3.1, Chapter 44 (New)

Proponent: Michael Gardner, representing the Gypsum Association

1. Revise as follows:

R702.2.1 Gypsum plaster. Gypsum plaster materials shall conform to ASTM C 5, C 22, C 28, C 35, C 37, C 59, C 61, C 587, C588, C631, C847, C933, C1032 andC1047, and shall be installed or applied in conformance with ASTM C 843 and C844. Plaster shall not be less than three coats when applied over metal lath and not less than two coats when applied over other bases permitted by this section, except that veneer plaster may be applied in one coat not to exceed 3/16 inch (4.76 mm) thickness, provided the total thickness is in accordance with Table R702.1(1).

R702.3.1 Materials. All gypsum board materials and accessories shall conform to ASTM C 22, C 36, C 79, C 475, C 514, C 630, C 931, C 960, C 1002, C 1047, C 1177, C 1178, C 1278, C 1395, C 1396 or C 1658 and shall be installed in accordance with the provisions of this section. Adhesives for the installation of gypsum board shall conform to ASTM C 557.

2. Add new standard to Chapter 44 as follows:

ASTM

C 22/C 22M-00 (2005)ε01	Specification for Gypsum

Reason: The IBC contains a reference to ASTM C22, *Specification for Gypsum*; however, the same reference has never been incorporated into the IRC. This proposal is intended to correct that oversight.

ASTM C 22 defines the basic parameters for the gypsum used to manufacture gypsum board and gypsum plaster.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: The proposed new standard, ASTM C 22, is currently referenced in the *International Building Code*.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GARDNER-RB-1-R702.2-R702.3-CH 44

RB133–09/10
R702.4.2

Proponent: Barry Reid, Georgia-Pacific, representing Georgia Pacific Gypsum LLC

Revise as follows:

R702.4.2 Fiber-cement, fiber-mat reinforced cement, glass mat gypsum backers and fiber-reinforced gypsum backers. Fiber-cement, fiber-mat reinforced cement, glass mat gypsum backers, glass mat water-resistant gypsum panels, or fiber-reinforced gypsum backers in compliance with ASTM C 1288, C 1325, C 1178, C 1658 or C 1278, respectively, and installed in accordance with manufacturers' recommendations shall be used as backers for wall tile in tub and shower areas and wall panels in shower areas.

Reason: The purpose of this proposal is to add an ASTM material standard for current provisions of the IRC. The revision to section R702.4.2 provides another option of materials standards appropriate for use as a backer for wall tile in tub and shower areas and wall panels in shower areas. The current code provisions exclude ASTM C 1396 and ASTM C 630, product standards recognized in the industry as paper-faced gypsum wallboard and paper –faced water resistant gypsum backing board. Within ASTM C 1658 Section 7.1 is material manufactured for use as a glass mat water resistant gypsum panel.

A comparison of ASTM Standard Specifications for C 1658, glass mat water-resistant gypsum panel, and C1278, fiber-reinforced gypsum backers products reveals that C 1658, Section 7, product physical properties, for use as a water resistant gypsum backer board, are the same as C 1278 for all physical properties including water resistance and surface water absorption which is in the IRC. The inclusion of ASTM C 1658 will benefit the consumer by offering more choices without compromising the performance of the tile assembly

Referenced Standards (3.4 & 3.6):

ASTM Standard Specification C 1658

ASTM C 1658
1.1.3 Glass mat water resistant gypsum panel
7. Physical Properties of Glass Mat Water- Resistant Gypsum Panel

ASTM C 1278
6.1 Physical Properties of Water-Resistant Fiber-Reinforced Gypsum Backing Panels

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: REID-RB-1-R702.4.2

RB134–09/10

R202 (New), R703.1, R703.1.1, R703.2, Table R703.4, R703.6.2.1, R703.6.3, R703.8

Proponent: Joseph Lstiburek, Building Science Corporation

1. Add new definition as follows:

WALL ENCLOSURE. A system or assembly of exterior wall components, including the exterior wall finish materials and the water-resistive barrier, that provides environmental separation between the conditioned space and the exterior environment. Exterior wall components, including the exterior wall covering and the water-resistive barrier, provide protection of the building structural members, including framing and sheathing materials, from the detrimental effects of the exterior environment.

2. Revise as follows:

R703.1 General. ~~Exterior walls shall provide the building with a weather-resistant exterior wall envelope. The exterior wall envelope shall include flashing as described in Section R703.8.~~ The wall enclosure shall be designed and constructed in such a manner as to prevent the accumulation of water within the wall assembly by providing a water-resistive barrier behind the exterior veneer as required in section R703.2 and a means for draining water that enters the assembly to the exterior. The wall enclosure shall include flashing as described in Section R703.8. Protection against condensation in the exterior wall assembly shall be provided in accordance with Section R601.3.

~~**R703.1.1 Water resistance.** The exterior wall envelope shall be designed and constructed in a manner that prevents the accumulation of water within the wall assembly by providing a water-resistant barrier behind the exterior veneer as required by Section R703.2 and a means of draining to the exterior water that enters the assembly. Protection against condensation in the exterior wall assembly shall be provided in accordance with Section R601.3 of this code.~~

Exceptions:

1. ~~A weather-resistant exterior wall envelope shall not be required over~~ Concrete ~~or~~ and masonry walls designed in accordance with Chapter 6 and flashed according to Section R703.7 or R703.8.
2. Compliance with the requirements for a means of drainage, and the requirements of Section R703.2 and Section R703.8, shall not be required for a wall enclosure ~~an exterior wall envelope~~ that has been demonstrated through testing to resist wind-driven rain ~~through testing of the exterior wall envelope~~, including joints, penetrations and intersections with dissimilar materials, in accordance with ASTME 331 under the following conditions:
   2.1. ~~Exterior wall envelope~~ Wall enclosure test assemblies shall include at least one opening, one control joint, one wall/eave interface and one wall sill. All tested openings and penetrations shall be representative of the intended end-use configuration.
   2.2. ~~Exterior wall envelope~~ Wall enclosure test assemblies shall be at least 4 feet (1219 mm) by 8 feet (2438 mm) in size.

2.3. ~~Exterior wall assemblies~~ Wall enclosure test assemblies shall be tested at a minimum differential pressure of 6.24 pounds per square foot (299 Pa).

2.4. ~~Exterior wall envelope~~ Wall enclosure test assemblies shall be subjected to the minimum test exposure for a minimum of 2 hours.

The ~~exterior wall envelope~~ wall enclosure design shall be considered to resist wind-driven rain where the results of testing indicate that water did not penetrate control joints in the exterior wall envelope, joints at the perimeter of openings penetration or intersections of terminations with dissimilar materials.

R703.1.1 ~~R703.2~~ Water-resistive barrier. One layer of No. 15 asphalt felt, free from holes and breaks, complying with ASTM D 226 for Type 1 felt or other approved water-resistive barrier shall be applied over studs or sheathing of all exterior walls. Such felt or material shall be applied horizontally, with the upper layer lapped over the lower layer not less than 2 inches (51 mm). Where joints occur, felt shall be lapped not less than 6 inches (152 mm). The felt or other approved material shall be continuous to the top of walls and terminated at penetrations and building appendages in a manner to meet the requirements of the ~~exterior~~ wall ~~envelope~~ enclosure as described in Section R703.1.

Exception: Omission of the water-resistive barrier is permitted in the following situations:

1. In detached accessory buildings.
2. Under exterior wall finish materials as permitted in Table R703.4.
3. Under paperbacked stucco lath when the paper backing is an approved water-resistive barrier.

TABLE R703.4
~~WEATHER-RESISTANT SIDING~~ WALL COVERING ATTACHMENT AND MINIMUM THICKNESS

(No change to table or footnotes)

R703.6.2.1 Weep screeds. A minimum 0.019-inch (0.5 mm) (No. 26 galvanized sheet gage), corrosion-resistant weep screed or plastic weep screed, with a minimum vertical attachment flange of 31/2 inches (89 mm) shall be provided at or below the foundation plate line on exterior stud walls in accordance with ASTM C 926. The weep screed shall be placed a minimum of 4 inches (102 mm) above the earth or 2 inches (51 mm) above paved areas and shall be of a type that will allow trapped water to drain to the exterior of the building. The ~~weather~~ water-resistant barrier shall lap the attachment flange. The exterior lath shall cover and terminate on the attachment flange of the weep screed.

R703.6.3 Water-resistant ~~resistive~~ barriers. Water- resistant ~~resistive~~ barriers shall be installed as required in Section R703.2 and, where applied over wood-based sheathing, shall include a water-resistant ~~resistive vapor-permeable~~ barrier with a performance at least equivalent to two layers of Grade D paper.

Exception: Where the water-resistant ~~resistive~~ barrier that is applied over wood-based sheathing has a water resistance equal to or greater than that of 60 minute Grade D paper and is separated from the stucco by an intervening, substantially nonwater-absorbing layer or designed drainage space.

R703.8 Flashing. *Approved* corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. Self-adhered membranes used as flashing shall comply with AAMA 711. The flashing shall extend to the surface of the exterior wall finish. *Approved* corrosion-resistant flashings shall be installed at all of the following locations:

1. Exterior window and door openings. Flashing at exterior window and door openings shall extend to the surface of the exterior wall finish or to the water-resistant ~~resistive~~ barrier for subsequent drainage.
2. At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.
3. Under and at the ends of masonry, wood or metal copings and sills.
4. Continuously above all projecting wood trim.
5. Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction.
6. At wall and roof intersections.
7. At built-in gutters.

Reason: The current language of the building code is inconsistent with terms in the engineering, scientific, technical, educational, building science and "common use" communities. In fact terms and language within the code itself are inconsistently used. "Codespeak" makes it difficult to communicate appropriate requirements and concepts. The I-Codes are likely the most effective educational documents used in the construction industry. It behooves us to use the language in them correctly. If you don't call "things" by their proper names how can you expect users of the

documents to execute the actions correctly. The changes proposed in this code change do not change the intent of any of the sections nor do they change any specific requirement they only fix bad terms and language and bad physics. Note that the current IRC does not define exterior wall envelope. The order of two sections are flipped by renumbering. Furthermore, these changes provide consistency to the terms used in this Chapter. Throughout the chapter "water-resistant barrier" is used. In these sections "water-resistive" is used. This change provides consistence. Additionally, vapor permeable is not defined anywhere in the IRC. Vapor permeable membrane is defined but not used. In any event, vapor-permeable is not necessary in the language of R703.6.3 due to the equivalency requirement to Grade D paper.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: LSTIBUREK-RB-4-R202-R703.1

RB135–09/10
Table R703.4

Proponent: Jay H. Crandell, PE, d/b/a ARES Consulting, representing the Foam Sheathing Coalition

Revise table as follows:

TABLE R703.4
WEATHER–RESISTANT SIDING ATTACHMENT AND MINIMUM THICKNESS

SIDING MATERIAL	NOMINAL THICKNESS[a] (INCHES)	JOINT TREATMENT	WATER-RESISTIVE BARRIER REQUIRED	TYPE OF SUPPORTS FOR THE SIDING MATERIAL AND FASTENERS [b,c,d]					
				WOOD OR WOOD STRUCTURAL PANEL SHEATHING INTO STUD	FIBERBOARD SHEATHING INTO STUD	GYPSUM SHEATHING INTO STUD	FOAM PLASTIC SHEATHING INTO STUD	DIRECT TO STUDS	NUMBER OR SPACING OF FASTENERS

(Portions of table not shown remain unchanged)

a. through c. (No change)
d. Nails or staples shall be aluminum, galvanized, or rust-preventative coated and shall be driven into the studs where ~~for~~ fiberboard, ~~or~~ gypsum, or foam plastic sheathing backing is used. Where wood or wood structural panel sheathing is used, nails shall be driven into studs unless otherwise permitted to be driven into sheathing in accordance with the siding manufacturer's installation instructions.
e. through z. (No change)

Reason: For many cases with siding attached over wood or wood structural panel sheathing, insufficient fastener penetration is provided if siding nails required by Table R703.4 are driven only into the sheathing. Only in cases where specific fastening instructions are provided for use of sheathing as a nail base should such a practice be permitted. In general, this will require a closer fastener spacing than currently required in Table R703.4 to account for the reduced withdrawal resistance of the siding nails installed in sheathing only (which may be no thicker than 3/8"). The change to the column heading for 'wood or wood structural panel sheathing' and footnote 'd' in Table R703.4 is needed to address this issue and avoid a common source of confusion resulting in potentially inadequate siding installations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CRANDELL-RB-4-T. R703.4

RB136–09/10
R703.5.1

Proponent: Jay H. Crandell, PE, d/b/a ARES Consulting, representing the Foam Sheathing Coalition

Revise as follows:

R703.5.1 Application. Wood shakes or shingles shall be applied either single-course or double-course over nominal 1/2-inch (13 mm) wood-based sheathing or to furring strips over nominal 1/2-inch (13 mm) nonwood sheathing. A ~~permeable~~ water-resistive barrier shall be provided in accordance with Section R703.2 ~~over all sheathing, with horizontal overlaps in the membrane of not less than 2 inches (51mm) and vertical overlaps of not less than 6 inches (152 mm)~~. Where furring strips are used, they shall be 1 inch by 3 inches or 1 inch by 4 inches (25 mm by 76 mm or 25

mm by 102 mm), shall be preservative treated or naturally durable wood in accordance with Section R317, and shall be fastened horizontally to the studs with 7d or 8d box nails with corrosion resistance in accordance with Section R317. ~~and~~ Furring strips shall be spaced a distance on center equal to the actual weather exposure of the shakes or shingles, not to exceed the maximum exposure specified in Table R703.5.2. The spacing between adjacent shingles to allow for expansion shall not exceed 1/4 inch (6 mm), and between adjacent shakes, it shall not exceed 1/2 inch (13 mm). The offset spacing between joints in adjacent courses shall be a minimum of 11/2 inches (38 mm).

Reason: This proposal references the water resistive barrier requirements in Section R703.2 and thus allows redundant WRB requirements to be deleted from this section which addresses wood shakes and shingles. In addition, language is added to require furring strips to be preservative treated or naturally decay resistant, including complimentary requirements for corrosion-resistant fasteners in treated furring strips. When placed in a horizontal direction as required for wood shakes and shingles, wood furring strips create a water stop behind the siding and it would be especially important to require greater moisture durability of the furring strips and their attachments. This change proposal is intended to compliment and be consistent with separate proposals addressing installation of various sidings over foam sheathing, including the use of furring strips with wood shakes and shingles.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRANDELL-RB-5-R703.5.1

RB137–09/10
R703.7

Proponent: Kimdolyn Boone, representing DuPont Building Innovations

Revise as follows:

R703.7 Stone and masonry veneer, general. Stone and masonry veneer shall be installed in accordance with this chapter, Table R703.4, ~~and~~ Figure R703.7, Section R703.6.3 and Sections 6.1 and 6.3 of ACI 530/ASCE 5/TMS-402. These veneers installed over a backing of wood or cold-formed steel shall be limited to the first *story* above-grade and shall not exceed 5 inches (127 mm) in thickness. See Section R602.12 for wall bracing requirements for masonry veneer for wood framed construction and Section R603.9.5 for wall bracing requirements for masonry veneer for cold-formed steel construction.

Exceptions:

1. For all buildings in Seismic Design Categories A, B and C, exterior stone or masonry veneer, as specified in Table R703.7(1), with a backing of wood or steel framing shall be permitted to the height specified in Table R703.7(1) above a noncombustible foundation.
2. For detached one- or two-family *dwellings* in Seismic Design Categories D0, D1 and D2, exterior stone or masonry veneer, as specified in Table R703.7(2), with a backing of wood framing shall be permitted to the height specified in Table R703.7(2) above a noncombustible foundation.

Reason: Clarification of current requirement of the code. The requirements are currently listed in the Table 703.4 and footnotes. Adding the reference to the text makes both the table & text agree.

Cost Impact: The code change proposal will not increase the cost of construction.

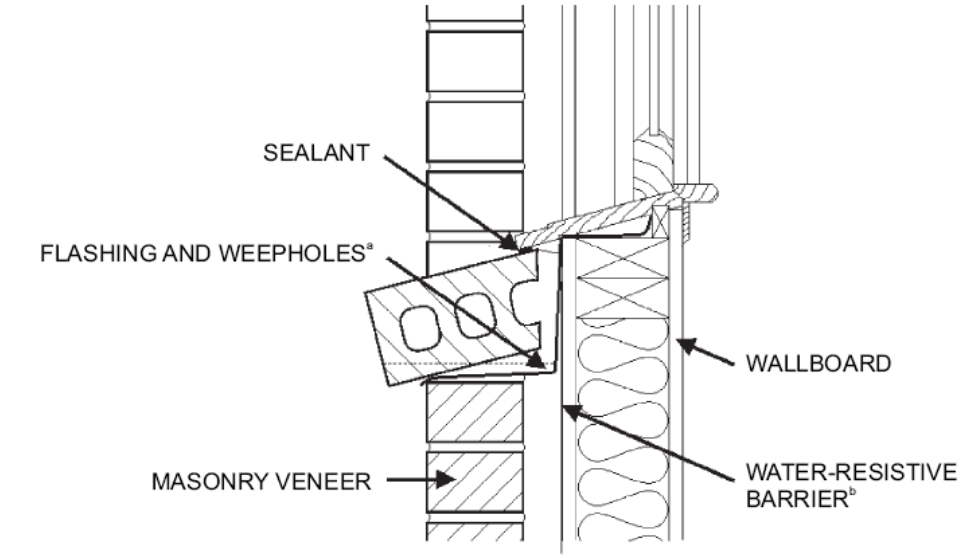
Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

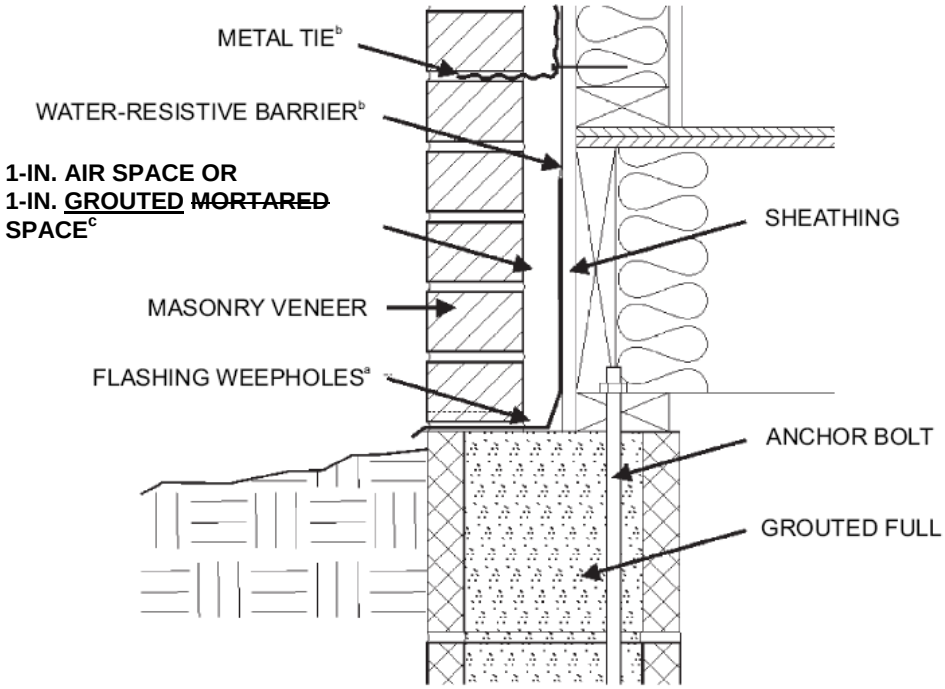
ICCFILENAME: BOONE-RB-1-R703.7

RB138–09/10
Figure R703.7, R703.7.4.3

Proponent: Charles Clark, Brick Industry Association, representing the Masonry Alliance for Codes and Standards (MACS)

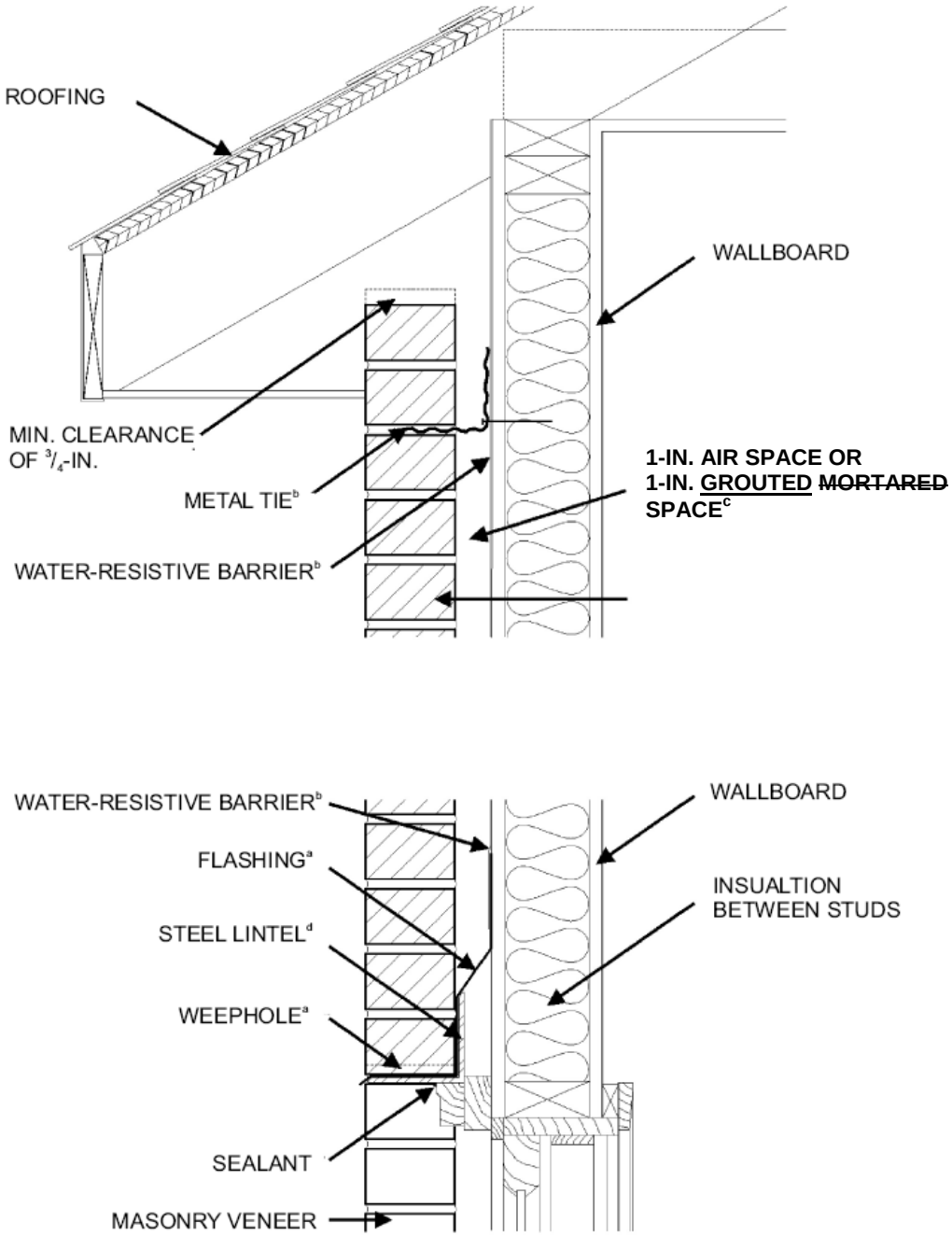
Revise as follows:





For SI: 1 inch = 25.4 mm.

FIGURE R703.7
MASONRY VENEER WALL DETAILS
(continued)



For SI: 1 inch = 25.4 mm.
a. See Sections R703.7.5, R703.7.6 and R703.8.
b. See Sections R703.2 and R703.7.4.
c. See Sections R703.7.4.2 and R703.7.4.3.
d. See Section R703.7.3.

FIGURE R703.7 – continued
MASONRY VENEER WALL DETAILS

R703.7.4. 3 ~~Mortar or~~ Grout fill. As an alternate to the air space required by Section R703.7.4.2, ~~mortar or~~ grout shall be permitted to fill the air space .When the air space is filled with ~~mortar~~ grout, a water-resistive barrier is required over studs or sheathing. When filling the air space, replacing the sheathing and water-resistive barrier with a wire mesh and *approved* water-resistive barrier or an *approved* water-resistive barrier-backed reinforcement attached directly to the studs is permitted.

Reason: This code change is a follow-up to RB189-07/08 which was approved during the previous code cycle to remove from TABLE R703.4 WEATHER-RESISTANT SIDING ATTACHMENT AND MINIMUM THICKNESS the footnote allowing an air space to be filled with mortar or grout.

An anchored masonry veneer wall is designed and intended to incorporate an air space behind the wall to allow water that penetrates the masonry veneer to drain down the air space and then through flashing and weep holes at the bottom to get the water out of the wall. The Brick Industry Association has never recommended the practice of slushing the air space behind a single wythe of brick veneer with mortar. This is because doing so results in the following:

1. **Restricts water flow -** Allowing mortar to intentionally be "slushed" or flung into the air space from the mason's trowel as the veneer is constructed constricts the flow of water down the back of the veneer. A single layer or wythe of masonry veneer is not designed or intended to act as a water-resistive barrier. It needs to have a functioning air space which serves to drain the water from wind-driven rain to the outside of the wall.
2. **Creates pockets that hold water -** Invariably, pockets of air within the slushed mortared space, as shown in the attached photograph, allow a place for water to linger within the wall and significantly increase the possibility that it will make its way into the typically wood or cold-formed steel backing substrate wall behind it.
3. **Prohibits air flow** - This mortar inhibits air flow through the air space and increases the amount of time necessary for moisture to evaporate from the masonry and other components of the wall.

Continuing to allow mortar to be slushed into the air space behind anchored masonry veneer only invites water to linger in a wall and potentially cause problems. While a low slump grout can provide a uniform barrier to water, mortar slushed in an air space cannot provide equivalent protection and should not be allowed. It is time we removed this provision from the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CLARK-RB-6-F. R703.7-R703.7.4.3

RB139–09/10

R703.7.3.2, Table R703.7.3.2 (New)

Proponent: Charles Clark, Brick Industry Association, representing the Masonry Alliance for Codes and Standards (MACS)

1. Revise as follows:

R703.7.3.2 The allowable span shall not exceed 18 feet 3 inches (5562 mm) and shall be constructed to comply with Figure R703.7.3.2 and the following:

1. Provide a minimum length of 18 inches (457 mm) of masonry veneer on each side of opening as shown in Figure R703.7.3.2.
2. Provide a minimum 5 inch by 31/2 inch by 5/16 inch (127 mm by 89 mm by 7.9 mm) steel angle above the opening and shore for a minimum of 7 days after installation.
3. Provide double-wire joint reinforcement extending 12 inches (305 mm) beyond each side of the opening. Lap splices of joint reinforcement a minimum of 12 inches (305 mm). Comply with one of the following:
   3.1. Double-wire joint reinforcement shall be 3/16 inch (4.8 mm) diameter and shall be placed in the first two bed joints above the opening.
   3.2. Double-wire joint reinforcement shall be 9 gauge (0.144 inch or 3.66 mm diameter) and shall be placed in the first three bed joints above the opening.
4. Provide the height of masonry veneer above opening per Table R703.7.3.2.

2. Add new table as follows:

TABLE R703.7.3.2
HEIGHT OF MASONRY VENEER ABOVE OPENING

MINIMUM HEIGHT OF MASONRY VENEER ABOVE OPENING (IN)	MAXIMUM HEIGHT OF MASONRY VENEER ABOVE OPENING (FT)
13	**< 5**
24	**5 TO < 12**
60	**12 TO HEIGHT ABOVE SUPPORT ALLOWED BY SECTION R703.7**

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm

Reason: This code change is a follow-up to RB196-07/08 which was approved during the previous code cycle. This table refers to Figure R703.7.3.2 and indicates the minimum and maximum height of masonry veneer allowed over the opening. These are shown on Figure R703.7.3.2 at the edge of the opening and at the center of the opening respectively.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CLARK-RB-2-R703.7.3.2-T. R703.7.3.2

RB140–09/10
R703.7.4, R703.7.4.2, R703.7.4.3, Table R703.7.4 (New)

Proponent: Charles Clark, Brick Industry Association, representing the Masonry Alliance for Codes and Standards (MACS)

1. Revise as follows:

R703.7.4 Anchorage. Masonry veneer shall be anchored to the supporting wall with corrosion-resistant metal ties embedded in mortar or grout and extending into the veneer a minimum of 11/2 inches (38 mm), with not less than 5/8 inch (15.9 mm) mortar or grout cover to outside face. Masonry veneer shall conform to Table R703.7.4. ~~Where veneer is anchored to wood backings by corrugated sheet metal ties, the distance separating the veneer from the sheathing material shall be a maximum of a nominal 1 inch (25 mm). Where the veneer is anchored to wood backings using metal strand wire ties, the distance separating the veneer from the sheathing material shall be a maximum of 41/2 inches (114 mm). Where the veneer is anchored to cold-formed steel backings, adjustable metal strand wire ties shall be used. Where veneer is anchored to cold-formed steel backings, the distance separating the veneer from the sheathing material shall be a maximum of 41/2 inches (114 mm).~~

2. Delete without substitution:

~~**R703.7.4.2 Air space.** The veneer shall be separated from the sheathing by an air space of a minimum of a nominal 1 inch (25 mm) but not more than 41/2 inches (114 mm).~~

3. Revise as follows:

R703.7.4. 3 Mortar or grout fill. As an alternate to the air space required by ~~Section R703.7.4.2~~ Table R703.7.4, mortar or grout shall be permitted to fill the air space .When the air space is filled with mortar, a water-resistive barrier is required over studs or sheathing. When filling the air space, replacing the sheathing and water-resistive barrier with a wire mesh and *approved* water-resistive barrier or an *approved* water-resistive barrier-backed reinforcement attached directly to the studs is permitted.

4. Add new table as follows:

TABLE R703.7.4
TIE ATTACHMENT AND AIR SPACE REQUIREMENTS

BACKING AND TIE	MINIMUM TIE	MINIMUM TIE FASTENER [A]	MINIMUM AIR SPACE	MAXIMUM AIR SPACE
Wood Backing with Corrugated Sheet Metal	22 U.S. gage (0.0299 in.) x 7/8 in. wide	8d common nail [b]	Nominal 1 in. between sheathing and veneer	Nominal 1 in. between sheathing and veneer
Wood Backing with Metal Strand Wire	W1.7 (No. 9 U.S. gage; 0.148 in.) with hook embedded in mortar joint	8d common nail [b]	Nominal 1 in. between sheathing and veneer	4½ in. between backing and veneer
Cold-Formed Steel Backing with Adjustable Metal Strand Wire	W1.7 (No. 9 U.S. gage; 0.148 in.) with hook embedded in mortar joint	No. 10 screw	Nominal 1 in. between sheathing and veneer	4½ in. between backing and veneer

For SI: 1 inch = 25.4 mm.

a. In Seismic Design Category D_0, D_1 or D_2, the minimum tie fastener shall be an 8d ring-shank nail or a No. 10 screw, 2 ½ inches long.
b. All fasteners shall have rust inhibitive coating suitable for the installation in which they are being used, or be manufactured from material not susceptible to corrosion.

Reason: This code change adds a table to the anchored masonry veneer provisions that accomplishes the following:
1) Makes the code easier to use by having minimum requirements for tie and tie fastener in a tabular form. The table also includes minimum and maximum air space requirements.
2) Footnote a) adds a requirement that a ring-shank nail is to be used when the veneer is constructed in a Seismic Design Category D_0, D_1 or D_2. Recent full-scale building shaking-table testing conducted at the University of California San Diego found that "fasteners on one side of the specimen failed by extraction of nails under dynamic tensile loads, at levels of shaking less than the Design Basis Earthquake (DBE). This behavior is not consistent with performance objectives for veneer. Current IRC requirements for the attachment of connectors to wood-stud backing need improvement in Seismic Design Category D_0 and above. (See references in Bibliography below)
3) Footnote b) requires that the fasteners be able to resist corrosion. This text is very similar to existing text in Section R603.2.4 on fastening requirements.

Bibliography:

1. Klingner, Richard E., Shing, P. Benson, McGinley, Mark W., McLean, David I., Okail, Hussein, and Jo, Seongwoo, "NSF NEES Small-Group Project on Performance-based Design of Masonry and Masonry Veneer: Overview and Preliminary Results," *TMS Journal*, The Masonry Society, Boulder, Colorado, December 2008 (date submitted for publication).
2. Klingner, Richard E., "Behavior of Anchored Masonry Veneer with Light Wood Stud-Framing or Masonry Backing in Full-Scale Whole-Building Shaking-Table Tests," *TMS Journal*, The Masonry Society, Boulder, Colorado, June 2009 (date submitted for publication).

Cost Impact: The code change proposal may slightly increase the cost of anchored masonry veneer construction in Seismic Design Categories D_0, D_1 and D_2.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CLARK-RB-4-R703.7.4

RB141–09/10
R703.7.4.1

Proponent: Charles Clark, Brick Industry Association, representing the Masonry Alliance for Codes and Standards (MACS)

Revise as follows:

R703.7.4.1 Size and spacing. Veneer ties, if strand wire, shall not be less in thickness than No. 9 U.S. gage [(0.148 in.) (4 mm)] wire and shall have a hook embedded in the mortar joint, or if sheet metal, shall be not less than No. 22 U.S. gage by [(0.0299 in.)(0.76 mm)] 7/8 inch (22 mm) corrugated. Each tie shall support not more than 2.67 square feet (0.25 m^2) of wall area and shall be spaced not more than ~~24 inches (610 mm)~~ 32 inches (813 mm) on center horizontally and 24 inches (635 mm) on center vertically ~~and shall support not more than 2.67 square feet (0.25 m2) of wall area~~.

Exception: In Seismic Design Category D_0, D_1 or D_2 or townhouses in Seismic Design Category C or in wind areas of more than 30 pounds per square foot pressure (1.44 kPa), each tie shall support not more than 2 square feet (0.2 m2) of wall area.

Reason: This code change accomplishes the following:
1) Moves the unmodified text indicating the maximum wall area that can be supported by a tie ahead of the tie spacing requirements. This provides more clarity since the tie spacing used on a specific project may be established by dividing the maximum wall area by either the maximum horizontal or vertical spacing requirement which follows next.
2) Changes the tie spacing requirements to match those found in the anchored masonry veneer provisions of the *Building Code Requirements and Specification for Masonry Structures* (TMS 402/ACI 530/ASCE 5). This document is a consensus standard overseen by three organizations and written under an ANSI-accredited, balanced process to ensure their objectivity. The maximum spacing requirements for ties established within this document have been corroborated through this consensus body.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CLARK-RB-3-R703.7.4.1

RB142–09/10
R703.7.4.1

Proponent: Jay H. Crandell, PE, d/b/a ARES Consulting, representing the Foam Sheathing Coalition

Revise as follows:

R703.7.4.1 Size and spacing. Veneer ties, if strand wire, shall not be less in thickness than No. 9 U.S. gage [(0.148 in.) (4 mm)] wire and shall have a hook embedded in the mortar joint, or if sheet metal, shall be not less than No. 22 U.S. gage by [(0.0299 in.)(0.76 mm)] 7/8 inch (22 mm) corrugated. Each tie shall be spaced not more than 24 inches (610 mm) on center horizontally and vertically and shall support not more than 2.67 square feet (0.25 m2) of wall area. <u>The tie shall be fastened to wall framing using a minimum 10d common nail in each tie or an approved fastener in accordance with the tie manufacturer's installation instructions.</u>

Exception: In Seismic Design Category D_0, D_1 or D_2 or townhouses in Seismic Design Category C or in wind areas of more than 30 pounds per square foot pressure (1.44 kPa), each tie shall support not more than 2 square feet (0.2 m^2) of wall area.

Reason: The code is currently silent in regard to the required fastener size for installation of veneer ties to wood wall framing. The proposed 10d common nail should provide a minimum 2-1/2" penetration into framing when applied over a typical ½" thick sheathing. This attachment will provide adequate withdrawal resistance to address the IRC scope of wind speeds (up to 110 mph, Exposure D). While past industry practice has permitted an 8d common nail, the proposed 10d common nail better addresses the scope of the IRC, including the exception statement regarding tie spacing in higher wind and seismic conditions. This proposal is a needed improvement to address an omission in the current code and to be consistent with separate proposals addressing appropriate siding connections over foam sheathing, including masonry and stone veneer.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CRANDELL-RB-2-R703.7.4.1

RB143–09/10
R703.7.7 (New)

Proponent: Tim A. Fleming, Code Solutions, Inc.

Add new text as follows:

<u>R703.7.7 Corner movement flashing.</u> <u>Corner movement flashing shall be located beneath the first course of masonry and the concrete foundation at each outside corner to prevent adhesion of the masonry veneer to the foundation. Corner movement flashing shall be of rigid noncorrosive material 1/16" or 16 gauge in thickness and extend a minimum of 16" along each wall surface from the outside corner. Corner movement flashing shall be installed in addition to the flashing required in sections R703.5 and R703.8.</u>

Reason: The purpose of this code change is to prevent foundation failures due to reduced coverage or exposed concrete reinforcement or exposed post tensioning cable ends. The proposed additional language is necessary because the current wording of the code is intended to only prevent water infiltration and does not specifically address differential movement of the masonry veneer and the foundation. Masonry walls expand and contract at a different rate than concrete foundations buried into the ground. The thin plastic flashing required by section R703.7.5 used for water protection is normally omitted at the outside corners. This thin flashing cannot prohibit adhesion when the foundation has an irregular surface. Without a rigid piece of flashing the first mortar bed joint adheres to the exposed or irregular surface of the foundation. When the masonry expands it does so at a greater rate than the concrete foundation. The masonry that is adhered to the corner of the foundation then breaks the corner of the foundation off, many times exposing reinforcement or post tension cable ends to the environment.

Below are some photographs of this condition commonly referred to as “corner pops”









Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FLEMING-RB-1-R703.7.7

RB144-09/10

R202 (New), R703.8, Chapter 44 (New)

Proponent: Jeff Lowinski, representing the Window and Door Manufacturers Association (WDMA)

1. Add new definition as follows:

PAN FLASHING. Corrosion-resistant flashing at the base of an opening that is integrated into the building exterior wall to direct water to the exterior and is pre-manufactured, fabricated, formed or applied at the job site.

2. Revise as follows:

R703.8 Flashing. *Approved* corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. Self-adhered membranes used as flashing shall comply with AAMA 711. The flashing shall extend to the surface of the exterior wall finish. *Approved* corrosion-resistant flashings shall be installed at all of the following locations:

1. Exterior window and door openings. Flashing at exterior window and door openings shall extend to the surface of the exterior wall finish or to the water-resistive barrier for subsequent drainage. Flashing at exterior window and door openings shall be installed in accordance with one or more of the following:
   1.1. The fenestration manufacturer's installation and flashing instructions, or for applications not addressed in the fenestration manufacturer's instructions, in accordance with the flashing manufacturer's instructions. Where flashing instructions or details are not provided, pan flashing shall be installed at

the sill of exterior window and door openings. Pan flashing shall be sealed or sloped in such a manner as to direct water to the surface of the exterior wall finish or to the water-resistive barrier for subsequent drainage. Openings using pan flashing shall also incorporate flashing or protection at the head and sides.

1.2. In accordance with the flashing design or method of a registered design professional.

1.3. In accordance with other approved methods.

1.4. In accordance with ASTM E 2112.

2. At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.
3. Under and at the ends of masonry, wood or metal copings and sills.
4. Continuously above all projecting wood trim.
5. Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction.
6. At wall and roof intersections.
7. At built-in gutters.

3. Add new standard to Chapter 44 as follows:

ASTM

E 2112-07 Standard Practice for Installation of Exterior Windows, Doors, and Skylights

Reason: The purpose of this proposal is to leverage the proposed revisions to the window and door flashing requirements of a separate WDMA proposal and add the mandatory option of flashing windows and doors to ASTM E2112. This proposal introduces a new reference standard to the IRC, ASTM E2112. As with the previous proposal, this proposal identifies alternate flashing methods for windows and doors that complement the requirements of Section R703.8 and includes mandatory options for window and door flashing depending on the conditions of the project.

WDMA supports installing and flashing windows and doors to ASTM E2112 as one mandatory option for window and door installation and flashing, as presented in this code proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E 2112, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LOWINSKI-RB-6-R202-R703.8

RB145–09/10
R202 (New), R703.8

Proponent: Jeff Lowinski, representing the Window and Door Manufacturers Association (WDMA)

1. Add new definition as follows:

PAN FLASHING. Corrosion-resistant flashing at the base of an opening that is integrated into the building exterior wall to direct water to the exterior and is pre-manufactured, fabricated, formed or applied at the job site.

2. Revise as follows:

R703.8 Flashing. *Approved* corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. Self-adhered membranes used as flashing shall comply with AAMA 711. The flashing shall extend to the surface of the exterior wall finish. *Approved* corrosion-resistant flashings shall be installed at all of the following locations:

1. Exterior window and door openings. Flashing at exterior window and door openings shall extend to the surface of the exterior wall finish or to the water-resistive barrier for subsequent drainage. Flashing at exterior window and door openings shall be installed in accordance with one or more of the following:

1.1. The fenestration manufacturer's installation and flashing instructions, or for applications not addressed in the fenestration manufacturer's instructions, in accordance with the flashing manufacturer's instructions. Where flashing instructions or details are not provided, pan flashing shall be installed at the sill of exterior window and door openings. Pan flashing shall be sealed or sloped in such a manner as to direct water to the surface of the exterior wall finish or to the water-resistive barrier for subsequent drainage. Openings using pan flashing shall also incorporate flashing or protection at the head and sides.

1.2. In accordance with the flashing design or method of a registered design professional.
1.3. In accordance with other approved methods.

2. At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.
3. Under and at the ends of masonry, wood or metal copings and sills.
4. Continuously above all projecting wood trim.
5. Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction.
6. At wall and roof intersections.
7. At built-in gutters.

Reason: This proposal identifies alternate flashing methods for windows and doors that complement the requirements of Section R703.8 and includes mandatory options for window and door flashing depending on the conditions of the project.

Window and door manufactures are required, by Section R613.1, to provide installation instructions for each window and door. Most window and door manufacturers require installation per their instructions and many window and door manufacturers are incorporate a pan flashing in their window and door installation instructions. Window and door manufacturers create installation and flashing instructions for a wide variety of wall conditions but are unable to create installation instructions for every conceivable wall condition. The 2nd and 3rd flashing methods identified in this proposal allows necessary flexibility while retaining the performance requirements of Section R703.8.

This proposal also introduces a definition of pan flashing into the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LOWINSKI-RB-5-R703.8

RB146–09/10
R703.8

Proponent: Mike Rice, Maplewood, MN, representing the Association of Minnesota Building Officials

Revise as follows:

R703.8 Flashing. *Approved* corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. Self-adhered membranes used as flashing shall comply with AAMA 711. The flashing shall extend to the surface of the exterior wall finish. *Approved* corrosion-resistant flashings shall be installed at all of the following locations:

1. Exterior window and door openings. Flashing at exterior window and door openings shall extend to the surface of the exterior wall finish or to the water-resistive barrier for subsequent drainage.
2. At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.
3. Under and at the ends of masonry, wood or metal copings and sills.
4. Continuously above all projecting wood trim.
5. Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction.
6. At wall and roof intersections. Kick out flashing shall be installed where the lower portion of a sloped roof stops within the plane of an intersecting wall cladding in such a manner as to divert or kick out water away from the assembly.
7. At built-in gutters.

Reason: This change would complement the current code addressing wall and roof intersections and further prevent water from entering the wall cavity or penetrating to the structural building components. Step flashing at wall and roof intersections is incomplete without the kick out flashing, where the lower portion of a sloped roof stops within the plane of an intersecting wall. The water must be diverted away or it will find a way behind the water-resistive barrier and the siding or, in some cases, it will go through the siding. The benefit of adding the kick out flashing would far exceed the cost, as the cost would be little.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-RB-2-R703.8

RB147–09/10

Table R703.4, R703.11.2, R703.11.2.1,R703.11.2.2, R703.11.2.3, Table R703.11 (New)

Proponent: Dennis Pitts, American Forest & Paper Association

1. Revise as follows:

TABLE R703.4
WEATHER–RESISTANT SIDING ATTACHMENT AND MINIMUM THICKNESS

Siding Material	Nominal Thickness[a] (inches)	Joint Treatment	Water-Resistive Barrier Required	Type of Supports for the Siding Material and Fasteners b,c,d					
				Wood or wood structural panel sheathing	Fiberboard sheathing into stud	Gypsum sheathing into stud	Foam plastic sheathing into stud	Direct to Studs	Number or spacing of fasteners
Vinyl siding[l]	0.035	Lap	Yes	0.120 nail (shank) with a .313 head or 16 gage staple with 3/8 to 1/2-in. crown[y,z]	0.120 nail (shank) with a .313 head or 16 gage staple with 3/8 to 1/2-in. crown[y]	0.120 nail (shank) with a .313 head or 16 gage staple with 3/8 to 1/2-in. crown[y]	~~0.120 nail (shank) with a 0.313 head per~~ See Section R703.11.2	Not allowed	16 inches on center or as specified by the manufacturer instructions or test report

(Portions of table and footnotes not shown remain unchanged)

2. Delete and substitute as follows:

~~**R703.11.2 Foam plastic sheathing.** Vinyl siding used with foam plastic sheathing shall be installed in accordance with Section R703.11.2.1, R703.11.2.2, or R703.11.2.3.~~

~~**Exception:** Where the foam plastic sheathing is applied directly over wood structural panels, fiberboard, gypsum sheathing or other *approved* backing capable of independently resisting the design wind pressure, the vinyl siding shall be installed in accordance with Section R703.11.1.~~

R703.11.2 Backing material. Vinyl siding certified per D 3679 is rated for use where the vinyl siding is directly applied over wood structural panels, structural fiberboard, exterior gypsum sheathing, or other approved backing material capable of independently resisting the design suction wind loads in Table R703.11, Case 1. For vinyl siding over foam plastic sheathing or other backing material not approved to independently resist the design wind loads, the vinyl siding must be rated for the design suction wind loads in Table R703.11, Case 2 or 3.

3. Delete without substitution:

~~**R703.11.2.1 Basic wind speed not exceeding 90 miles per hour and Exposure Category B.** Where the basic wind speed does not exceed 90 miles per hour (40 m/s), the Exposure Category is B and gypsum wall board or equivalent is installed on the side of the wall opposite the foam plastic sheathing, the minimum siding fastener penetration into wood framing shall be 11/4 inches (32 mm) using minimum 0.120-inch diameter nail (shank) with a minimum 0.313-inch diameter head, 16 inches on center. The foam plastic sheathing shall be minimum 1/2-inch-thick (12.7 mm) (nominal) extruded polystyrene per ASTM C578, 1/2 inch thick (12.7 mm) (nominal) polyisocyanurate per ASTM C1289, or 1-inch-thick (25 mm)(nominal) expanded polystyrene perASTMC578.~~

~~**R703.11.2.2 Basic wind speed exceeding 90 miles per hour or Exposure Categories C and D.** Where the basic wind speed exceeds 90 miles per hour (40 m/s) or the Exposure Category is C or D, or all conditions of Section R703.11.2.1 are not met, the adjusted design pressure rating for the assembly shall meet or exceed the loads listed in~~

~~Tables R301.2(2) adjusted for height and exposure using Table R301.2(3). The design wind pressure rating of the vinyl siding for installation over solid sheathing as provided in the vinyl siding manufacturer's product specifications shall be adjusted for the following wall assembly conditions:~~

~~1. For wall assemblies with foam plastic sheathing on the exterior side and gypsum wall board or equivalent on the interior side of the wall, the vinyl siding's design wind pressure rating shall be multiplied by 0.39.~~
~~2. For wall assemblies with foam plastic sheathing on the exterior side and no gypsum wall board or equivalent on the interior side of wall, the vinyl siding's design wind pressure rating shall be multiplied by 0.27.~~

~~**R703.11.2.3 Manufacturer specification.** Where the vinyl siding manufacturer's product specifications provide an *approved* design wind pressure rating for installation over foam plastic sheathing, use of this design wind pressure rating shall be permitted and the siding shall be installed in accordance with the manufacturer's installation instructions.~~

4. Add new table as follows:

TABLE R703.11
REQUIRED NEGATIVE (SUCTION) WIND LOAD RATINGS (psf) FOR VINYL SIDING CERTIFIED PER ASTM D 3679[a,b]

Case	Backing Material	Wind Exposure	Basic Wind Speed (mph - 3 second gust)				
			85	90	100	105	110
1	Exterior Side: Wood structural panels, structural fiberboard, exterior gypsum sheathing, or other approved backing capable of independently resisting the design wind load. Infill materials are permitted between the vinyl siding and the backing material if the minimum fastener penetration is maintained.	B	17.4 [c]	19.5 [c]	24.1 [c]	26.6 [c]	29.1 [c]
		C	24.4 [c]	27.3 [c]	33.7	37.2	40.7
		D	28.9 [c]	32.4	40.0	44.2	48.3
2	Exterior Side: Foam plastic sheathing or other backing material not approved to independently resist the design wind loads. Interior Side: Gypsum wallboard or equivalent on interior side of wall.	B	45.1	50.6	62.5	69.0	75.4
		C	63.2	70.8	87.5	96.5	105.6
		D	74.9	83.9	103.7	114.5	125.2
3	Exterior Side: Foam plastic sheathing or other backing material not approved to independently resist the design wind loads. Interior Side: None	B	64.4	72.2	89.3	98.5	107.8
		C	90.2	101.1	125.0	137.9	150.9
		D	107.0	119.9	148.2	163.5	178.9

NOTES:
a. The tabulated wind load ratings are based on a 30' mean roof height. For other mean roof heights, multiply the tabulated wind load ratings for Exposure B by the Adjustment Coefficients in Table R301.2(2).

b. The vinyl siding shall be attached directly to the studs. If the manufacturer requires the vinyl siding to be attached to the backing material to achieve higher wind load ratings, the backing material shall be the same material as tested.

c. Vinyl siding certified to ASTM D 3679 has been rated for at least 29.1 psf negative (suction) wind load. For higher wind load ratings, contact the manufacturer.

Reason: Vinyl siding is required to be certified per ASTM D3679 which includes negative (suction) wind testing to set a design wind rating. This wind rating is based on tests conducted with OSB or plywood used as backing material and assumes that the vinyl siding will be applied over similar backing material that can independently resist the negative wind loads. During the last cycle, provisions were added to IRC 703.11 to address the common condition where vinyl siding is installed over foam sheathing. Under this condition, the vinyl siding must resist the full wind load since the foam sheathing does not resist the negative wind loads.

At the final hearings, a new provision was added that provided a prescriptive solution for the case where the basic wind speed does not exceed 90 mph, the Exposure Category is B, and gypsum wallboard or equivalent is installed on the side of the wall opposite the foam plastic sheathing. In support, the following data was provided:

WIND PRESSURE TESTING OF WALL ASSEMBLIES
WITH FOAM SHEATHING AND VINYL SIDING PRODUCTS

(NAHB Research Center Report #4107003013108)

	Backing Material	Ult. Test Capacity (psf)	Wind Load resisted by Vinyl Siding	Safety Factor on Vinyl Siding	Wind Rating (psf)	Reference
Low Capacity Vinyl Siding	**CONTROL:** Vinyl Siding test (OSB backing material perforated per D 3679)					
	(none)	22.7	36%	1.50	42.1	D 3679
	Vinyl Siding + Foam Sheathing test (Solid foam sheathing backing material)					
	3/8" EPS	29.1	100%	2.00	14.6	2009 IRC
	1/2" ISO	41.1	100%	2.00	20.6	2009 IRC
	1/2" XPS	41.6	100%	2.00	20.8	2009 IRC
High Capacity Vinyl Siding	**CONTROL:** Vinyl Siding test (OSB backing material perforated per D 3679)					
	(none)	81.9	36%	1.50	151.6	D 3679
	Vinyl Siding + Foam Sheathing test (Solid foam sheathing backing material)					
	3/8" EPS	77.0	100%	2.00	38.5	2009 IRC
	1/2" ISO	86.1	100%	2.00	43.1	2009 IRC
	1/2" XPS	89.5	100%	2.00	44.7	2009 IRC

For the CONTROL case, the vinyl siding was wind rated at 42.1 psf using the procedures in D 3679. This rating was determined from the ultimate test capacity of the vinyl siding acting alone, divided by 0.36 in recognition that the backing material is resisting most of the wind load and by a safety factor of 1.5 since the vinyl siding is serving primarily as an exterior covering. The ultimate test capacity of the vinyl siding backed by solid foam sheathing was divided by 1.0 in recognition that the vinyl siding attachment must resist the wind load and by a safety factor of 2.0 since the vinyl siding is now acting as a structural sheathing to protect the building envelop. For the low capacity vinyl siding, the vinyl siding backed by 3/8" EPS was not capable of resisting the minimum wind loads in the IRC; however, ½" ISO and ½" XPS were capable of resisting the 19.5 psf negative wind loads associated with 90 mph, Exposure B. This case was selected as the basis of the current prescriptive provisions in R703.11.2.1.
Upon further study of the CONTROL case in the previous table, it can be seen that the low-capacity vinyl siding used in the tests would have a wind rating of 42.1 psf, not the minimum of 29.1 psf permitted by D 3679. A re-analysis was conducted to see what the result would be if minimum vinyl siding was used over foam sheathing:

	Backing Material	D 3679 min. Capacity (psf)	Wind Load resisted by Vinyl Siding	Safety Factor on Vinyl Siding	Wind Rating (psf)	Reference
D 3679 min. Vinyl Siding	OSB	15.7	36%	1.50	29.1	D 3679
	3/8" EPS	15.7	100%	2.00	7.9	2009 IRC
	1/2" ISO	15.7	100%	2.00	7.9	2009 IRC
	1/2" XPS	15.7	100%	2.00	7.9	2009 IRC

In order for the vinyl siding to resist the full wind load, this re-analysis suggests that it would take a medium grade of vinyl siding to meet the minimum negative wind loads and a high grade of vinyl siding and attachment to meet the moderate negative wind loads. For this reason, it is recommended that Section R703.11.2 and R703.11.2.1 be deleted and replaced with wind Table R703.11. Also, the prescriptive fastening in Table R703.4 should be replaced by a reference to the general section since the fastening schedule is linked to the wind rating.

Section R703.11.2.2 was previously added to provide an adjustment to the D 3679 wind ratings for cases where foam sheathing is used as the backing material. It requires the user to multiply the D 3679 wind ratings provided by the vinyl siding manufacturer in literature or an Evaluation Report, with a factor associated with the construction. In this proposed change, Section R703.11.2.2 was deleted and the adjustment factors were incorporated as increases in the required wind ratings in a new Table R703.11. Until D 3679 is modified to provide a means of determining wind ratings using the actual backing materials, this method should be used to prevent confusion and aid the user in selecting the proper vinyl siding.

Section R703.11.3 was added to provide guidance on the use of data for combined vinyl siding and foam sheathing tests. However, no standardized test procedure exists and any information developed by the vinyl siding manufacturer should be evaluated carefully prior to approval. This section is redundant with Section R104.11 and is, therefore, recommended for deletion.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: PITTS-RB-5-T. R703.4-R703.11

RB148 –09/10
R202 (New), R703.13 (New), Chapter 44 (New)

Proponent: Marcelo M. Hirschler, GBH International, representing the American Fire Safety Council

1. Add new definition as follows:

POLYPROPYLENE SIDING. A shaped material, made principally from polypropylene homopolymer, or copolymer, which in some cases may contain fillers and/or reinforcements, that is used to clad exterior walls of buildings.

2. Add new text as follows:

R703.13 Polypropylene siding. Polypropylene siding shall be certified and labeled as conforming to the requirements of R703.13.1, of R703.13.2 or of R703.3 by an approved quality control agency. Polypropylene siding shall be installed in accordance with the manufacturer's installation instructions.

R703.13.1 Flame spread index. The polypropylene siding material shall comply with the requirements of ASTM D 7254. The certification shall be accompanied by a test report stating that all portions of the test specimen ahead of the flame front remained in position during the test in accordance with ASTM E 84 or UL 723.

R703.13.2 Heat release. The polypropylene siding material shall comply with the requirements of ASTM D 7254 and a 4 foot by 8 foot (1.22 x 2.44 m) section of the polypropylene siding material shall exhibit a peak rate of heat release not exceeding 100 kW when tested in accordance with NFPA 289 using the 20 kW ignition source at the thickness intended for use.

R703.13.3 Fire separation distance. The polypropylene siding shall comply with all the requirements of ASTM D 7254 and the fire separation distance between a building with polypropylene siding and the adjacent building shall be no less than 10 feet (3.05 m).

3. Add new standards to Chapter 44 as follows:

NFPA

289 Standard Method of Fire Test for Individual Fuel Packages (2009)

ASTM

D 7254 Standard specification for polypropylene (PP) siding

Reason: Polypropylene siding is being used in construction now although the IBC does not permit it. Therefore, it is important to regulate the use of polypropylene siding in a way that it can be used safely. The new sections are similar to the existing sections on vinyl siding, except for the fire testing. Vinyl siding is known to have adequate fire performance since the siding needs to be made of rigid (unplasticized) PVC in accordance with ASTM D 3679. Polypropylene is known not to have adequate fire performance unless properly fire retarded.

A new standard specification has been issued for polypropylene siding, ASTM D 7254. The specification addresses many of the key requirements for the material. Unfortunately the fire test requirement in ASTM D 7254 is not explicit enough. ASTM D 7254 does not require that, when fire testing is conducted in the ASTM E 84 (Steiner tunnel), the test specimen must remain in place during the test and flaming drips and falling test specimens are not allowed to happen. This requirement is critical for materials that are used exposed so that the flame spread index assesses actual surface flame spread on the material surface. The standards committee responsible for the ASTM E 84 fire test (ASTM E05) decided that this issue should be addressed in the code rather than in the standard itself. Polypropylene that has not been appropriately fire retarded will release abundant amount of heat, much more than other combustible sidings permitted by the code, such as wood siding or vinyl (PVC) siding, and spread fire through flaming drips. Such flaming drips will contribute to ignite mulch and debris found near the building and spread the fire. Table 1 shows such results.

Recent fire tests were also conducted in the Steiner tunnel, ASTM E 84, on a rigid PVC material 0.06 in. thick; it exhibited a flame spread index of 10. Under the same test conditions, a fire retarded polypropylene material 0.15 in. thick exhibited a flame spread index of 50. These are both very adequate values, in view of the fact that both the polypropylene material and the PVC material remained in place during the ASTM E 84 test and did not generate flaming drips.

Table 1: Results of Steiner Tunnel Tests (ASTM E 84)

Material	Flame Spread Index	Maximum Flame Front Advance (ft)	Time to Max. Flame Front Advance (min:s)	Flaming on Floor (Duration) (min:s)
PVC	10	4.6	7:48	None
FR Polypropylene	50	19.5	6:24	4:18

This shows that it is possible to use fire retarded polypropylene materials that give very adequate flame spread values and also very adequate heat release values, without flaming drips. Consequently, polypropylene siding should only be used when it is shown to exhibit the appropriate fire performance.

When polypropylene siding material (which does not have the appropriate fire performance) is tested in ASTM E 84 (Steiner tunnel) the test specimen will often fall ahead of the arrival of the flame giving incorrect results.

Table 2 shows new results of cone calorimeter heat release tests with polypropylene and PVC:

Table 2: Results of Cone Calorimeter (ASTM E 1354) Tests					
Material	**Peak Heat Release Rate**	**Total Heat Released**	**Time to Ignition**	**Effective Heat of Combustion**	**Fire Performance Index**
	kW/m^2	MJ/m^2	s	MJ/kg	$s\ m^2/kW$
PVC	186.8	16.7	36	9.2	0.19
Non FR Polypropylene	768.3	47.2	23	40.3	0.03

Table 3 shows some earlier results with polypropylene, PVC and wood materials in the cone calorimeter:

Table 3 - Cone Calorimeter Data on Plastics and Douglas Fir					
	Flux 20 kW/m^2				
Material	**Pk HRR**	**THR**	**TTI**	**EHC**	**FPI**
	(kW/m^2)	**(MJ/m^2)**	**(s)**	**(MJ/kg)**	**($s\ m^2/kW$)**
PVC Rigid, Custom Inj. Mold.	40	3.0	5159	1.4	1343
PVC Rigid, Extrusion	102	2.9	3591	7.3	31.4
PP Non FR	1170	231.3	218	72.0	0.19
PP FR	236		382	23.6	1.62
PE Non FR	913	161.9	403	41.1	0.44
XLPE FR	88	87.6	750	22.4	8.08
Douglas Fir	237	46.5	254	13.1	1.10
	Flux 40 kW/m^2				
PVC Rigid, Custom Inj. Mold.	175	24.3	73	5.1	0.42
PVC Rigid, Extrusion	183	90.8	85	13.3	0.46
PP Non FR	1509	206.9	86	42.1	0.06
PP FR	243		80	23.9	0.33
PE Non FR	1408	221.0	159	46.6	0.06
XLPE FR	192	126.2	105	24.2	0.55
Douglas Fir	221	64.1	34	17.6	0.15
	Flux 70 kW/m^2				
PVC Rigid, Custom Inj. Mold.	191	93.0	45	12.7	0.24
PVC Rigid, Extrusion	190	96.5	48	10.8	0.25
PP Non FR	2421	231.1	41	43.1	0.02
PE Non FR	2735	227.5	47	42.6	0.02
XLPE FR	268	129.2	35	24.7	0.13
Douglas Fir	196	50.0	12	13.5	0.06

Table 3 shows that, when tested in the cone calorimeter, ASTM E 1354, under the same conditions, it was found that non fire retarded polypropylene exhibits a peak heat release rate of 1509 kW/m^2, while a non fire retarded PVC material exhibits a peak heat release rate of 183 kW/m^2, and a Douglas fir material exhibits a peak heat release rate of 221 kW/m^2. Such a very high heat release rate is unacceptable for a siding material. Testing in the cone calorimeter, including the testing above, is normally conducted in the horizontal orientation with radiant heat exposing the test specimen from above, thus capturing any flaming drips and assessing their effects.

Table 4 shows that wood materials, when not fire retarded, will usually exhibit flame spread index values that are less than 200 and will correspond to Class B or Class C categories. At the same time rigid PVC (vinyl) materials will generally exhibit flame spread index values less than 25. Neither wood nor PVC materials will cause flaming drips or molten material burning on the ground.

Table 4. Steiner tunnel (ASTM E 84) Data for Wood and Vinyl Materials					
Material/Product	Flame Spread Index		Material/Product	Flame Spread Index	
	Low	High		Low	High
Cellulose fiberboard ceiling tile	70	80	Ponderosa pine B	105	170
Cottonwood	115		Poplar	170	185
Cypress	145	150	Red Gum	140	155
Douglas fir	70	100	Red oak flakeboard	70	190
Douglas fir overlay	110	140	Red Oak Flooring	100	100
Douglas fir/cedar plywood	190	230	Red Pine	140	
Eastern White Pine	85		Redwood	65	70
Hemlock/cedar plywood	190		Southern yellow pine	130	195
Lauan hardwood	150	170	Vinyl faced plywood	110	130
Lodgepole Pine	95		Vinyl profile	15	20
Maple flooring	105		Vinyl Siding	10	15
Northern white pine A	190	215	Vinyl vapor barrier	10	15
Northern white pine B	120	180	Walnut	130	140
Pacific silver fir	70		West Coast Hemlock	60	70
Pacific Yellow Cedar	80		Western Red Cedar	70	
Particleboard	135	180	Western spruce	100	
Plywood paneling over gypsum	130	150	Western white pine	75	
Ponderosa pine A	170	230	Yellow birch	105	110

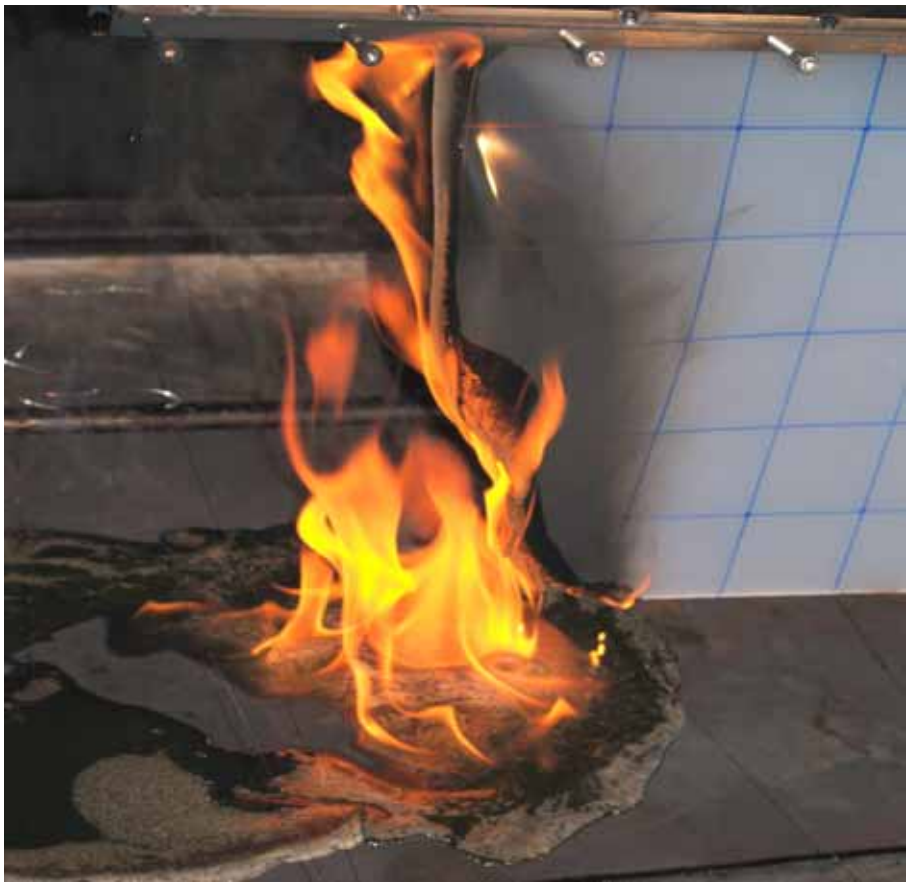
Figure 1 shows char from a PVC siding fire (no foam backing): the material softened, charred and burned but is still substantially intact. Figure 2 shows a vertical PP sheet melting and resulting in flaming drips on the floor.

The reason that heat release rate and floor flaming are important issues is because it has been shown that the heat radiated by siding is a major contributor to the ignition of neighboring houses, as is the spread of fire along the ground, particularly when there are loose combustibles present.

That is the reason that the third option allows polypropylene siding to be used, but with a larger separation distance, when the results of the ASTM E 84/UL 723 (Steiner tunnel) test are based on a test specimen that is not self supporting and falls to the floor of the tunnel during the test. The standard ASTM E 84 states: "1.4 Testing of materials that melt, drip, or delaminate to such a degree that the continuity of the flame front is destroyed, results in low flame spread indices that do not relate directly to indices obtained by testing materials that remain in place." Therefore valid test results require the test specimen to stay in place ahead of the exposing flame.

Figure 1 – Remains of vinyl siding fire

Figure 2 Polypropylene siding melting and flaming on the floor.



NFPA 289 was developed to test individual fuel packages and is similar in concept to UL 1975, already widely used in the ICC codes.

Cost Impact: The code does not at present allow the use of polypropylene siding. In order to safely use polypropylene siding construction costs would have to increase either by using materials that would meet test requirements for adequate fire safety or by increasing fire separation distances.

Analysis: A review of the standards proposed for inclusion in the code, NFPA 289 and ASTM D 7254, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-RB-5-R202-R703.13

RB149–09/10
R801.3

Proponent: Jim Olk, City of Farmers Branch, TX, representing Building Officials Association of Texas

Revise as follows:

R801.3 Roof drainage. In areas where expansive or collapsible soils are known to exist, all *dwellings* shall have a controlled method of ~~water disposal~~ drainage from roofs in conformance with Chapter 4 or provide a system that will collect and discharge roof drainage to the ground surface at least 5 feet (1524 mm) from the building foundation ~~walls~~ or to an *approved* drainage system.

Reason: Over saturation of the soil adjacent to all types of foundations can cause differential soil movement which can lead to foundation failure on all types of foundations.

This proposal will allow proper grading as well as drainage system to comply with the intent of the code.

Bibliography:

Letter dated March 13, 2009 from MLAW Consultants and Engineers, Kirby T. Meyer, P.E. to the Building Officials Association of Texas President, Scott McDonald, in support of this proposal.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: OLK-RB-1-R801.3

RB150–09/10
R802.3.2

Proponent: Dennis Pitts, American Forest & Paper Association

Revise as follows:

R802.3.2 Ceiling joists lapped. Ends of ceiling joists shall be lapped a minimum of 3 inches (76 mm) or butted over bearing partitions or beams and toenailed to the bearing member. When ceiling joists are used to provide resistance to rafter thrust, lapped joists shall be nailed together in accordance with Table ~~R602.3(1)~~ R802.5.1(9) and butted joists shall be tied together in a manner to resist such thrust. When the joists are not resisting thrust they shall be permitted to be nailed in accordance with Table R602.3(1).

Reason: This corrects a conflict between R802.3.2 and R802.3.1. Table R805.1(9), mentioned in R802.3.1, addresses nailing of ceiling joist lap splices in situations where the ceiling joists resist the outward thrust of rafters. Table R602.3(1) addresses the situation in which lapped ceiling joists are not resisting rafter thrust, typically joists not attached to rafters.

Cost Impact: The code change proposal will not increase the cost of construction.

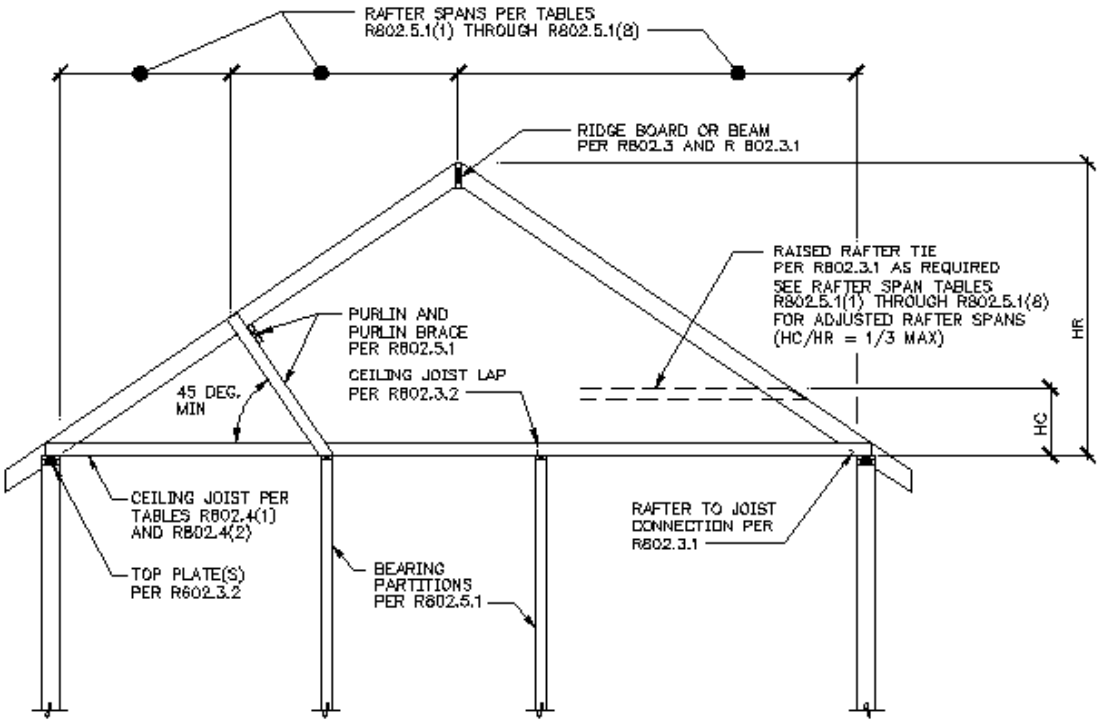
Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PITTS-RB-1-R802.3.2

RB151–09/10
Figure R802.5.1

Proponent: Robert Rice, Grants Pass, OR, representing Josephine County Building Safety and Southern Oregon Chapter of ICC

Delete existing Figure R802.5.1 and replace as follows:



For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 degree = 0.018 rad.
Note: Where ceiling joists run perpendicular to the rafter, rafter ties shall be installed per R802.3.1
HC = Height of ceiling joists or rafter ties measured vertically above the top of rafter support walls
HR = Height of roof ridge measured vertically above the top of the rafter support walls.

FIGURE R802.5.1
BRACED RAFTER CONNECTION

Reason: The existing figure is lacking in some information and references to pertinent sections of code. This proposal updates the figure.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-RB-4-F. R802.5.1

RB152–09/10

R802.7, R802.7.1, R802.7.1.1 (New), Figure R802.7.1.1 (New), R802.7.1.2 (New), Figure R802.7.1.2

Proponent: Dennis Pitts, American Forest and Paper Association

1. Revise as follows:

R802.7 Cutting, drilling and notching. Structural roof members shall not be cut, bored or notched in excess of the limitations specified in this section.

R802.7.1 Sawn lumber. Cuts, notches, and holes, ~~Notches~~ in solid lumber joists, rafters, blocking and beams shall ~~not exceed one-sixth of the depth of the member, shall not be longer than one-third of the depth of the member and shall not be located in the middle one-third of the span. Notches at the ends of the member shall not exceed one-fourth the depth of the member. The tension side of members 4 inches (102 mm) or greater in nominal thickness shall not be notched except at the ends of the members. The diameter of the holes bored or cut into members shall not exceed one-third the depth of the member. Holes shall not be closer than 2 inches (51 mm) to the top or bottom of the member, or to any other hole located in the member. Where the member is also notched, the hole shall not be closer than 2 inches (51 mm) to the notch~~ comply with the provisions of R502.8.1 except that cantilevered portions of rafters shall be permitted in accordance with Section R802.7.1.1.

R802.7.1.1 Cantilevered portions of rafters. ~~**Exception:**~~ Notches on cantilevered portions of rafters are permitted provided the dimension of the remaining portion of the rafter is not less than ~~4~~ 3-1/2-inch ~~nominal~~ (~~102~~ 89 mm) and the length of the cantilever does not exceed 24 inches (610 mm) in accordance with Figure R802.7.1.1.

2. Add new figure as follows:

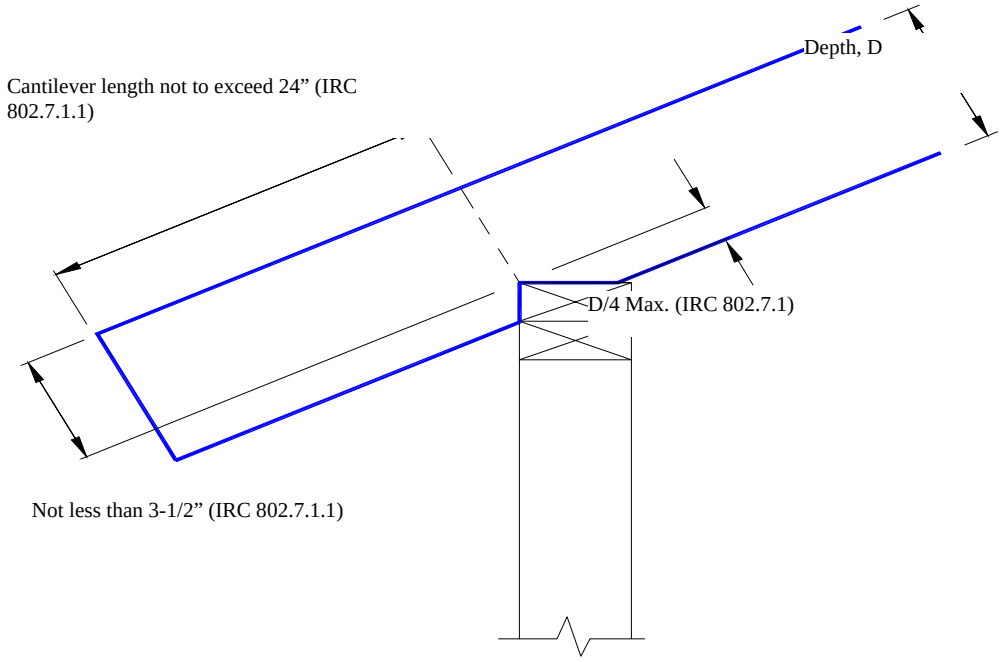


FIGURE R802.7.1.1
RAFTER NOTCH

3. Add new text as follows:

R802.7.1.2 Ceiling joist taper cut. Taper cuts at the ends of the ceiling joist shall not exceed one-fourth the depth of the member in accordance with Figure R802.7.1.2.

4. Add new figure as follows:

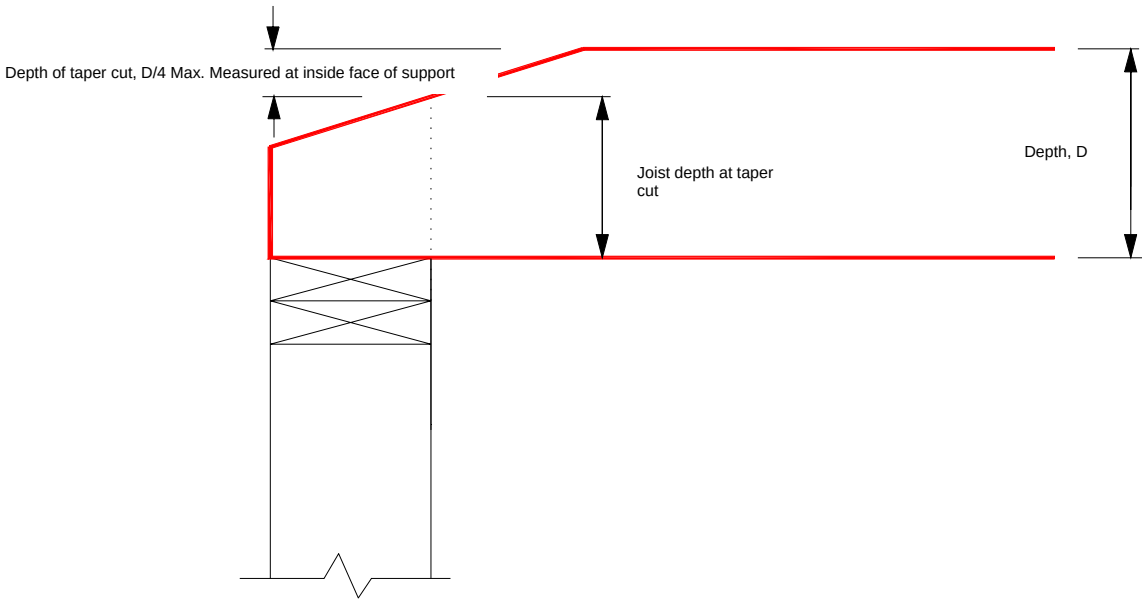


FIGURE R802.7.1.2
CEILING JOIST TAPER CUT

Reason: The revision simplifies text by referencing material elsewhere in the code. The exception is re-written as a section on cantilever portions of rafters and includes a figure to clarify the intent. The actual dimension "3-1/2 inch" replaces "4-inch nominal" to clarify the minimum dimension remaining after the notching. "Nominal" is typically used to describe standard sizes. The section on ceiling joist taper cut is added to clarify application of the D/4 provision to a ceiling joist taper cut.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PITTS-RB-6-R802.7

RB153–09/10
R802.10.2.1

Proponent: Larry Wainright, Qualtim, Inc., representing the Structural Building Components Industry

Revise as follows:

R802.10.2.1 Applicability limits. The provisions of this section shall control the design of truss roof framing when snow controls for buildings not greater than 60 feet (18 288 mm) in length perpendicular to the joist, rafter or truss span, not greater than 36 feet (10 973 mm) in width parallel to the joist, rafter or truss span, not more than three stories above *grade plane* in height, ~~not greater than two stories in height with each *story* not greater than 10 feet (3048 mm) high,~~ and roof slopes not smaller than 3:12 (25-percent slope) or greater than 12:12 (100-percent slope). Truss roof framing constructed in accordance with the provisions of this section shall be limited to sites subjected to a maximum design wind speed of 110 miles per hour (49 m/s), Exposure A, B or C, and a maximum ground snow load of 70 psf (3352 Pa). For consistent loading of all truss types, roof snow load is to be computed as: 0.7 *p*g.

Reason: The purpose of this code change is to harmonize the language used within the IRC. This change harmonizes this section with the scope of the IRC, Section R101.2:

> **R101.2 Scope.** The provisions of the *International Residential Code for One- and Two-family Dwellings* shall apply to the construction, *alteration*, movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal and demolition of detached one- and two-family dwellings and townhouses not more than three stories above *grade plane* in height with a separate means of egress and their *accessory structures*.

and also with the scope of the steel roof Section R804.1.1

R804.1.1 Applicability limits. The provisions of this section shall control the construction of cold-formed steel roof framing for buildings not greater than 60 feet (18 288 mm) perpendicular to the joist, rafter or truss span, not greater than 40 feet (12 192 mm)in width parallel to the joist span or truss, less than or equal to three stories above *grade* plane and with roof slopes not less than 3:12 (25-percent slope) or greater than 12:12 (100 percent slope). Cold-formed steel roof framing constructed in accordance with the provisions of this section shall be limited to sites subjected to a maximum design wind speed of 110 miles per hour (49 m/s), Exposure B or C, and a maximum ground snow load of 70 pounds per square foot (3350 Pa).

This change removes a competitive disadvantage wood trusses currently have with steel trusses. As much as is possible, materials should be subject to the same requirements within the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WAINRIGHT-RB-6-R802.10.2.1

RB154–09/10

R301.2.1, Table R602.3(1), R802.10.5, R802.11.1, R802.11.1.2 (New), R802.11.1.3 (New), Table R802.11

Proponent: T. Eric Stafford, PE, representing the Institute for Business and Home Safety

1. Revise as follows:

R301.2.1 Wind limitations. Buildings and portions thereof shall be limited by wind speed, as defined in Table R301.2(1) and construction methods in accordance with this code. Basic wind speeds shall be determined from Figure R301.2(4). Where different construction methods and structural materials are used for various portions of a building, the applicable requirements of this section for each portion shall apply. Where loads for wall coverings, curtain walls, roof coverings, exterior windows, skylights, garage doors and exterior doors are not otherwise specified, the loads listed in Table R301.2(2) adjusted for height and exposure using Table R301.2(3) shall be used to determine design load performance requirements for wall coverings, curtain walls, roof coverings, exterior windows, skylights, garage doors and exterior doors. Asphalt shingles shall be designed for wind speeds in accordance with Section R905.2.6. A continuous load path shall be provided to transmit the applicable uplift forces in Section R802.11.1 from the roof assembly to the foundation.

TABLE R602.3(1)
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER[a,b,c]	SPACING OF FASTENERS
5	Rafter or roof truss to plate, toe nail	~~2~~3-16d box nails (3½"x0.135") or 3-10d common nails (3"x0.148")	2 toe nails on one side and 1 toe nail on opposite side of each rafter or truss[j]

(Portions of table not shown remain unchanged)

a. through i. (No change)

j. Where a rafter is fastened to an adjacent parallel ceiling joist in accordance with this schedule, provide two toe-nails on one side of the rafter and toe-nails from the ceiling joist to top plate in accordance with this schedule. The toe-nail on the opposite side of the rafter shall not be required.

2. Delete without substitution:

~~**R802.10.5 Truss to wall connection.** Trusses shall be connected to wall plates by the use of *approved* connectors having a resistance to uplift of not less than 175 pounds (779 N) and shall be installed in accordance with the manufacturer's specifications. For roof assemblies subject to wind uplift pressures of 20 pounds per square foot (960 Pa) or greater, as established in TableR301.2(2), adjusted for height and exposure per Table R301.2(3), see section R802.11.~~

3. Revise as follows:

R802.11.1 Uplift resistance. Roof assemblies shall have uplift resistance in accordance with Sections R802.11.1.2 and R802.11.1.3 ~~which are subject to wind uplift pressures of 20 pounds per square foot (960 Pa) or greater shall have roof rafters or trusses attached to their supporting wall assemblies by connections capable of providing the resistance required in Table R802.11. Wind uplift pressures shall be determined using an effective wind area of 100 square feet (9.3 m2) and Zone 1 in Table R301.2(2), as adjusted for height and exposure per Table R301.2(3).~~

Where the uplift force does not exceed 200 pounds, rafters and trusses spaced not more than 24 inches on center shall be permitted to be attached to their supporting wall assemblies in accordance with Table R602.3(1).

Where the basic wind speed does not exceed 90 mph, the wind exposure category is B, the roof pitch is 5:12 or greater, and the roof span is 32 feet or less, rafters and trusses spaced not more than 24 inches on center shall be permitted to be attached to their supporting wall assemblies in accordance with Table R602.3(1).

~~A continuous load path shall be designed to transmit the uplift forces from the rafters or trusses to the foundation.~~

4. Add new text as follows:

R802.11.1.2 Truss uplift resistance. Trusses shall be attached to supporting wall assemblies by connections capable of resisting uplift forces as specified on the Truss Design Drawings. Uplift forces shall be permitted to be determined as specified by Table R802.11, if applicable, or as determined by accepted engineering practice.

R802.11.1.3 Rafter uplift resistance. Individual rafters shall be attached to supporting wall assemblies by connections capable of resisting uplift forces as determined by Table R802.11 or as determined by accepted engineering practice, Connections for beams used in a roof system shall be designed in accordance with accepted engineering practice.

5. Delete existing Table R802.11 and replace as follows:

TABLE R802.11
RAFTER OR TRUSS UPLIFT CONNECTION FORCES FROM WIND
(POUNDS PER CONNECTION)

Rafter or Truss Spacing	Roof Span (feet)	EXPOSURE B							
		Basic Wind Speed (MPH)							
		85		90		100		110	
		Roof Pitch		Roof Pitch		Roof Pitch		Roof Pitch	
		<5:12	≥5:12	<5:12	≥5:12	<5:12	≥5:12	<5:12	≥5:12
12" o.c.	12	47	41	62	54	93	81	127	110
	18	59	51	78	68	119	104	165	144
	24	70	61	93	81	145	126	202	176
	28	77	67	104	90	163	142	227	197
	32	85	74	115	100	180	157	252	219
	36	93	81	126	110	198	172	277	241
	42	105	91	143	124	225	196	315	274
	48	116	101	159	138	251	218	353	307
16" o.c.	12	63	55	83	72	124	108	169	147
	18	78	68	103	90	159	138	219	191
	24	93	81	124	108	193	168	269	234
	28	102	89	138	120	217	189	302	263
	32	113	98	153	133	239	208	335	291
	36	124	108	168	146	264	230	369	321
	42	139	121	190	165	299	260	420	365
	48	155	135	212	184	335	291	471	410

Rafter or Truss Spacing	Roof Span (feet)	EXPOSURE B							
		Basic Wind Speed (MPH)							
		85		90		100		110	
		Roof Pitch		Roof Pitch		Roof Pitch		Roof Pitch	
		<5:12	≥5:12	<5:12	≥5:12	<5:12	≥5:12	<5:12	≥5:12
24" o.c.	12	94	82	124	108	186	162	254	221
	18	117	102	155	135	238	207	329	286
	24	140	122	186	162	290	252	404	351
	28	154	134	208	181	326	284	454	395
	32	170	148	230	200	360	313	504	438
	36	186	162	252	219	396	345	554	482
	42	209	182	285	248	449	391	630	548
	48	232	202	318	277	502	437	706	614
12" o.c.	12	94	82	114	99	157	137	206	179
	18	120	104	146	127	204	177	268	233
	24	146	127	179	156	251	218	330	287
	28	164	143	201	175	283	246	372	324
	32	182	158	224	195	314	273	414	360
	36	200	174	246	214	346	301	456	397
	42	227	197	279	243	394	343	520	452
	48	254	221	313	272	441	384	583	507
16" o.c.	12	125	109	152	132	209	182	274	238
	18	160	139	194	169	271	236	356	310
	24	194	169	238	207	334	291	439	382
	28	218	190	267	232	376	327	495	431
	32	242	211	298	259	418	364	551	479
	36	266	231	327	284	460	400	606	527
	42	302	263	372	324	524	456	691	601
	48	338	294	416	362	587	511	775	674
24" o.c.	12	188	164	228	198	314	273	412	358
	18	240	209	292	254	408	355	536	466
	24	292	254	358	311	502	437	660	574
	28	328	285	402	350	566	492	744	647
	32	364	317	448	390	628	546	828	720
	36	400	348	492	428	692	602	912	793
	42	454	395	558	485	786	684	1040	905
	48	508	442	626	545	882	767	1166	1014

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mph = 0.447 m/s, 1 pound = 0.454 kg.

a. The uplift connection forces are based on a maximum 33 foot mean roof height and Wind Exposure Category B or C. For Exposure D, the uplift connection force shall be selected from the Exposure C portion of the table using the next highest tabulated basic wind speed. The Adjustment Coefficients in Table R301.2(3) shall not be used to multiply the above forces for Exposures C and D or for other mean roof heights.
b. The uplift connection forces include an allowance for roof and ceiling assembly dead load of 15 psf.
c. The tabulated uplift connection forces are limited to a maximum roof overhang of 24 inches.
d. The tabulated uplift connection forces shall be permitted to be multiplied by 0.75 for connections not located within 8 feet of building corners.
e. For buildings with hip roofs with 5:12 and greater pitch, the tabulated uplift connection forces shall be permitted to be multiplied by 0.70. This reduction shall not be combined with any other reduction in tabulated forces.
f. For wall-to-wall and wall-to-foundation connections, the uplift connection force shall be permitted to be reduced by 60 plf for each full wall above.
g. Linear interpolation between tabulated roof spans and wind speeds shall be permitted.
h. The tabulated forces for a 12” on center spacing shall be permitted to be used to determine the uplift load in pounds per linear foot.

Reason: The issue of roof uplift connections, the limits of conventional nailed connections, and the point at which pre-engineered metal clips or straps are required has been a topic of much debate over the last several code cycles. A 200 pound maximum capacity for conventional rafter-to-wall or truss-to-wall connections has been suggested, based largely on capacities calculated directly from AF&PA's NDS. At the same time, the existing Table R802.11 has not been updated in some time and is overly conservative for many typical houses. The uplift loads are based on low-slope (4:12 pitch or less) roofs. The table does not account for the reduction in uplift loads that occur on higher-slope (5:12 pitch or greater) roofs or on hip roofs per ASCE 7. Thus the code does not encourage the use of high-slope roofs, which have been shown to experience significantly less damage in high-wind events. The triggers proposed by the insurance industry, coupled with the current table, would subject many houses in low-wind areas to a requirement for roof-to-wall ties (not to mention continuous straps to the foundation) that is not justified by the actual performance of roof systems in low-wind areas. This requirement is particularly unjustified on higher-slope roofs where the uplift loads can be substantially reduced through a detailed analysis using ASCE 7.

This proposal rolls together elements of several proposals concerning roof uplift connections (RB132-07/08, RB206-07/08, and RB207-07/08) from the last cycle. First, three options are provided for selection of the roof uplift: Table R802.11, the truss designer, or an engineered approach. In many jurisdictions (particularly rural ones), an engineered truss design is not required and the local truss fabricator will run the software from the plate company. These jurisdictions may also have limited or no plan review. Thus, there is less opportunity to insure the proper wind speed, building dimensions, mean roof height, etc. are used, and a possibility that overly conservative roof uplift loads will be generated on the truss design drawing. Hence, the ability to determine an uplift load from Table R802.11 even when there are truss drawings must be preserved. However, to address issues previously raised by code officials in relation to this section, we have introduced language to limit the use of Table R802.11 to roof rafters and single-ply trusses within the applicability limits of R802.10.1.1, and to clarify that and girder trusses and roof beams require engineered connections and/or use of the truss design drawing values.

Second, this proposal replaces the current Table R802.11 with a new table based on Table 2.2A of the WFCM, which is based on the latest ASCE 7 wind load provisions. The new table expands upon both the existing IRC table and the WFCM table by incorporating values for high-slope roofs. These factors were derived using the ASCE 7 wind provisions and the calculation method used to develop Table 2.2A of the WFCM. A factor for hip roofs is also added, as hip roofs have seen similar improved performance in high-wind events. This table was proposed as part of the public comment to RB207-07/08. The failure of the public comment was due to concerns over the triggering language. The technical content of the proposed table was unchallenged; in fact a number of industry groups including IBHS, SBCA, AF&PA, and the Foam Sheathing Coalition who are not often in agreement with each other spoke in favor of the proposed revisions.

By introducing clarity to the trigger language for uplift connectors and providing this revised table, the IRC provisions for roof uplift connections will be substantially improved. Builders and building officials will have improved direction for when pre-engineered metal connectors are actually required. Additionally, the use of hip roofs and high-slope roofs will be encouraged, as designers, engineers and builders will be able to appropriately reduce uplift loads and avoid triggering uplift connector requirements for building locations and for roof configurations where the requirements are not justified.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: STAFFORD-RB-1-R301.2.1-T. R602.3(1)-R802

RB155–09/10

R802.10.5, R802.11.1, R802.11.1.2 (New), R802.11.1.3 (New)

Proponent: Larry Wainright, Qualtim, Inc., representing the Structural Building Components Association

1. Delete without substitution:

~~**R802.10.5 Truss to wall connection.** Trusses shall be connected to wall plates by the use of *approved* connectors having a resistance to uplift of not less than 175 pounds (779 N) and shall be installed in accordance with the manufacturer's specifications. For roof assemblies subject to wind uplift pressures of 20 pounds per square foot (960 Pa) or greater, as established in TableR301.2(2), adjusted for height and exposure per Table R301.2(3), see section R802.11.~~

2. Delete and substitute as follows:

R802.11.1 Uplift resistance. ~~Roof assemblies which are subject to wind uplift pressures of 20 pounds per square foot (960 Pa) or greater shall have roof rafters or trusses attached to their supporting wall assemblies by connections capable of providing the resistance required in Table R802.11.Wind uplift pressures shall be determined using an effective wind area of 100 square feet (9.3m2) and Zone 1 inTableR301.2(2), as adjusted for height and exposure per Table R301.2(3).~~

~~A continuous load path shall be designed to transmit the uplift forces from the rafter or truss ties to the foundation.~~

Connections to resist uplift forces on trusses and rafters shall be designed in accordance with sections R802.11.1.2 and R802.11.1.3. Where the uplift force does not exceed 200 pounds, rafters and trusses shall be permitted to be attached to their supporting wall assemblies in accordance with Table R602.3(1). Where the basic wind speed does not exceed 90 mph (40 m/s), the wind exposure category is B, the roof pitch is 5:12 or greater, and the roof span is 32 feet (9754 mm) or less, rafters and trusses shall be permitted to be attached to their supporting wall assemblies in accordance with Table R602.3(1).

3. Add new text as follows:

R802.11.1.2 Truss uplift resistance. Trusses shall be attached to supporting wall assemblies by connections capable of resisting uplift forces as specified on the Truss Design Drawings. Uplift forces shall be permitted to be determined as specified by Table R802.11, if applicable, or as determined by accepted engineering practice.

R802.11.1.3 Rafter uplift resistance. Individual rafters shall be attached to supporting wall assemblies by connections capable of resisting uplift forces as determined by Table R802.11 or as specified by accepted engineering practice, Connections for beams used in a roof system shall be designed in accordance with the uplift forces as determined by accepted engineering practice

For wall framing connections to resist uplift load, refer to Section R602.10.2.1, Table R602.3(1), AF&PA/WFCM, or as determined by accepted engineering practice .

Reason: The general requirement of Section R801.2 states:

"…Roof and ceiling construction shall be capable of accommodating all loads imposed according to Section R301 and of transmitting the resulting loads to the supporting structural elements."

Chapter 6, wall construction, provides the requirements for connecting wall top plates to roof framing in Table 602.3(1) and with the addition of Section 602.10.1.2.1, braced wall panel uplift load path, during the last code cycle, the continuous load path language in Section R802.11 is redundant. Further, Section R602.10.1.2.1 establishes the connection in Table R602.3(1) as good for 100 plf.

R602.10.1.2.1 Braced wall panel uplift load path. *Braced wall panels* located at exterior walls that support roof rafters or trusses (including stories below top *story*) shall have the framing members connected in accordance with one of the following:

1. Fastening in accordance with Table R602.3(1) where:

   1.1. The basic wind speed does not exceed 90 mph (40 m/s), the wind exposure category is B, the roof pitch is 5:12 or greater, and the roof span is 32 feet (9754 mm) or less, or

   1.2. The net uplift value at the top of a wall does not exceed 100 plf. The net uplift value shall be determined in accordance with Section R802.11 and shall be permitted to be reduced by 60 plf (86 N/mm) for each full wall above.

2. Where the net uplift value at the top of a wall exceeds 100 plf (146 N/mm), installing *approved* uplift framing connectors to provide a continuous load path from the top of the wall to the foundation. The net uplift value shall be as determined in Item 1.2 above.

3. Bracing and fasteners designed in accordance with accepted engineering practice to resist combined uplift and shear forces.

This is in conflict with R802.10.5 which states:

R802.10.5 Truss to wall connection. Trusses shall be connected to wall plates by the use of *approved* connectors having a resistance to uplift of not less than 175 pounds (779 N) and shall be installed in accordance with the manufacturer's specifications. For roof assemblies subject to wind uplift pressures of 20 pounds per square foot (960 Pa) or greater, as established in TableR301.2(2), adjusted for height and exposure per Table R301.2(3), see section R802.11.

This proposal accomplishes to things.

1. It replaces the continuous load path requirement in R802.11.1 with a pointer back to the more detailed requirements of R602.10.2.1
2. It deletes Section R802.10.5, which has truss to wall connection requirements that are in conflict with R602.10.2.1
3. Coordinates the 100 plf trigger found in R602.10.1.2.1 with the rafter and truss connections in R802.11.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WAINRIGHT-RB-2-R802.10.5-R802.11

RB156–09/10

Table R602.3(1), Section R602.10.1.2.1, R802.10.5, R802.11.1, Table R802.11

Proponent: Gary Ehrlich, PE, National Association of Home Builders (NAHB)

1. Revise as follows:

TABLE R602.3(1)
FASTENER SCHEDULE FOR STRUCTURAL MEMBERS

ITEM	DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER[a,b,c]	SPACING OF FASTENERS
5	Rafter or roof truss to plate, toe nail	~~2~~3-16d box nails (3½"x0.135") or 3-10d common nails (3"x0.148")	2 toe nails on one side and 1 toe nail on opposite side of each rafter or truss[j]

(Portions of table not shown remain unchanged)

a. through i. (No change)

j. Where a rafter is fastened to an adjacent parallel ceiling joist in accordance with this schedule, provide two toe-nails on one side of the rafter and toe-nails from the ceiling joist to top plate in accordance with this schedule. The toe-nail on the opposite side of the rafter shall not be required.

R602.10.1.2.1 Braced wall panel uplift load path. *Braced wall panels* located at exterior walls that support roof rafters or trusses (including stories below top *story*) shall have the framing members connected in accordance with one of the following:

1. Fastening in accordance with Table R602.3(1) where~~:~~
   ~~1.1. The basic wind speed does not exceed 90 mph (40 m/s), the wind exposure category is B, the roof pitch is 5:12 or greater, and the roof span is 32 feet (9754 mm) or less, or~~
   ~~1.2.~~ The net uplift value at the top of a wall does not exceed ~~100~~ 115 plf. The net uplift value shall be determined in accordance with Section R802.11 and shall be permitted to be reduced by 60 plf (86 N/mm) for each full wall above.
2. Where the net uplift value at the top of a wall exceeds ~~100~~ 115 plf (146 N/mm), installing *approved* uplift framing connectors to provide a continuous load path from the top of the wall to the foundation. The net uplift value shall be as determined in Item 1.2 above.
3. Bracing and fasteners designed in accordance with accepted engineering practice to resist combined uplift and shear forces.

2. Delete without substitution:

~~**R802.10.5 Truss to wall connection.** Trusses shall be connected to wall plates by the use of *approved* connectors having a resistance to uplift of not less than 175 pounds (779 N) and shall be installed in accordance with the manufacturer's specifications. For roof assemblies subject to wind uplift pressures of 20 pounds per square foot (960 Pa) or greater, as established in TableR301.2(2), adjusted for height and exposure per Table R301.2(3), see section R802.11.~~

3. Delete and substitute as follows:

~~**R802.11.1 Uplift resistance.** Roof assemblies which are subject to wind uplift pressures of 20 pounds per square foot (960 Pa) or greater shall have roof rafters or trusses attached to their supporting wall assemblies by connections capable of providing the resistance required in Table R802.11.Wind uplift pressures shall be determined using an effective wind area of 100 square feet (9.3m2) and Zone 1 inTableR301.2(2), as adjusted for height and exposure per Table R301.2(3). A continuous load path shall be designed to transmit the uplift forces from the rafter or truss ties to the foundation.~~

R802.11.1 Uplift resistance. Individual rafters and trusses shall be attached to supporting wall assemblies by connections capable of resisting uplift forces as determined by one of the following methods:

1. as specified in Table R802.11; or
2. as specified on the Truss Design Drawings; or
3. as specified by a registered design professional.

Where the uplift force does not exceed 230 pounds, rafters and trusses shall be permitted to be attached to their supporting wall assemblies in accordance with Table R602.3(1).

Connections for girder trusses and roof beams shall be designed in accordance with the uplift forces specified on the Truss Design Drawings or as determined by a registered design professional.

~~**TABLE R802.11**~~
~~**REQUIRED STRENGTH OF TRUSS OR RAFTER CONNECTIONS TO RESIST WIND UPLIFT FORCES**~~[a, b, c, e, f]
~~**(Pounds per connection)**~~

TABLE R802.11
RAFTER OR TRUSS UPLIFT CONNECTION FORCES FROM WIND (POUNDS PER CONNECTION)

Rafter or Truss Spacing	Roof Span (feet)	Exposure B				Exposure C			
		Basic Wind Speed (mph)				Basic Wind Speed (mph)			
		85	90	100	110	85	90	100	110
12" O.C.	12	47	62	93	127	94	114	157	206
	18	59	78	119	165	120	146	204	268
	24	70	93	145	202	146	179	251	330
	28	77	104	163	227	164	201	283	372
	32	85	115	180	252	182	224	314	414
	36	93	126	198	277	200	246	346	456
	42	105	143	225	315	227	279	394	520
	48	116	159	251	353	254	313	441	583
16" O.C.	12	63	83	124	169	125	152	209	274
	18	78	103	159	219	160	194	271	356
	24	93	124	193	269	194	238	334	439
	28	102	138	217	302	218	267	376	495
	32	113	153	239	335	242	298	418	551
	36	124	168	264	369	266	327	460	606
	42	139	190	299	420	302	372	524	691
	48	155	212	335	471	338	416	587	775
24" O.C.	12	94	124	186	254	188	228	314	412
	18	117	155	238	329	240	292	408	536
	24	140	186	290	404	292	358	502	660
	28	154	208	326	454	328	402	566	744
	32	170	230	360	504	364	448	628	828
	36	186	252	396	554	400	492	692	912
	42	209	285	449	630	454	558	786	1040
	48	232	318	502	706	508	626	882	1166

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mph = 0.447 m/s, 1 pound = 0.454 kg.

a. The tabulated uplift connection forces are based on a maximum 33 foot mean roof height, and Wind Exposure Category B or C. For Exposure D, the uplift connection force shall be selected from the Exposure C portion of the table using the next highest tabulated basic wind speed. The Adjustment Coefficients in Table R301.2(3) shall not be used to multiply the above forces for Exposures C and D or for other mean roof heights. Linear interpolation between tabulated roof spans and wind speeds shall be permitted.
b. The tabulated uplift connection forces include an allowance for roof and ceiling assembly dead load of 15 psf.
c. The tabulated uplift connection forces are limited to a maximum roof overhang of 24 inches.
d. The tabulated uplift connection forces shall be permitted to be multiplied by one of the reduction factors listed in the table below. Tabulated reduction factors shall not be combined.

Roof Type	Roof Pitch	Connection Location	Adjustment Factor
Any	Any	Within 8 feet of building corners	1.00
		8 feet or more from building corners	0.75
Monoslope or gable roof	5:12 or greater	Within 8 feet of building corners	0.87
		8 feet or more from building corners	0.75
Hip roof	5:12 or greater	Within 8 feet of building corners	0.70
		8 feet or more from building corners	0.75

e. The tabulated forces for a 12" on center spacing shall be permitted to be used to determine the uplift load in pounds per linear foot.

Reason: The purpose of this proposal is to provide sensible and simplified requirements for roof uplift connections. The issue of roof uplift connections, the limits of conventional nailed connections, and the point at which pre-engineered metal clips or straps are required has been a topic of much debate over the last several code cycles. The insurance industry and others have been trying to mandate a 200 pound maximum capacity for conventional rafter-to-wall or truss-to-wall connections, based largely on capacities calculated directly from AF&PA's NDS. At the same time, the existing Table R802.11 has not been updated in some time and is overly conservative for many typical houses. The uplift loads are based on low-slope (4:12 pitch or less) roofs. The table does not account for the reduction in uplift loads that occur on higher-slope (5:12 pitch or greater) roofs or on hip roofs per ASCE 7. Thus the code does not encourage the use of high-slope roofs, which have been shown to experience significantly less damage in high-wind events. The triggers proposed by the insurance industry, coupled with the current table, would subject many houses in low-wind areas to a requirement for roof-to-wall ties (not to mention continuous straps to the foundation) that is not justified by the actual performance of roof systems in low-wind areas. This requirement is particularly unjustified on higher-slope roofs where the uplift loads can be substantially reduced through a detailed analysis using ASCE 7.

This proposal is similar to a companion proposal which rolls together elements of several proposals concerning roof uplift connections (RB132-07/08, RB206-07/08, and RB207-07/08) from the last cycle. The key difference is the proposed trigger of 230 pounds in this proposal. This value is consistent with the capacities seen in uplift testing of both individual components and roof assemblies conducted by the NAHB Research Center, Clemson University, State Farm, and others. It is a modest increase from the 200 pound capacity previously proposed by IBHS. The benefit in this small yet technically-justified increase is an ability to simplify the proposed code language by including a house with a 32' span low-slope roof in 90mph Exposure B in the scope of conventional connections. This will allow the prescriptive kick-out for the 32' high-slope condition to be removed and the overall table to be simplified.

By introducing clarity to the trigger language for uplift connectors and providing this revised table, the IRC provisions for roof uplift connections will be substantially improved. Builders and building officials will have improved direction for when pre-engineered metal connectors are actually required. Additionally, the use of hip roofs and high-slope roofs will be encouraged, as designers, engineers and builders will be able to appropriately reduce uplift loads and avoid triggering uplift connector requirements for building locations and for roof configurations where the requirements are not justified.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: EHRLICH-RB-10-T. R602.3(1)-R602.10.1.2.1-R802.10.5-R802.11.1

RB157–09/10
R806.1, R806.2, R806.3 (New)

Proponent: Michael Fischer, The Kellen Company, representing the Roof Attic Ventilation Coalition

1. Revise as follows:

R806.1 Ventilation required. Enclosed *attics* and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain or snow. Ventilation openings shall have a least dimension of 1/16 inch (1.6 mm) minimum and 1/4 inch (6.4 mm) maximum. Ventilation openings having a least dimension larger than 1/4 inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth, or similar material with openings having a least dimension of 1/16 inch (1.6 mm) minimum and 1/4 inch (6.4 mm) maximum. Openings in roof framing members shall conform to the requirements of SectionR802.7. Required ventilation openings shall open directly to the outside air.

R806.2 Minimum area. The total net free ventilating area shall not be less than 1/150 of the area of the attic or rafter ~~space ventilated except that reduction of the total area to 1/300 is permitted provided that at least 50 percent and not more than 80 percent of the required ventilating area is provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above the eave or cornice vents with the balance of the required ventilation provided by eave or cornice vents~~. As an alternative, the net free cross-ventilation area may be reduced to 1/300 when a Class I or II vapor retarder is installed on the warm-in-winter side of the ceiling.

2. Add new text as follows:

R806.3 Cross-ventilation. At least 40 percent and not more than 50 percent of the required ventilating area shall be provided by ventilators located in the upper portion of the attic or rafter space. Upper ventilators shall be located no more than 3 feet (914 mm) below the ridge or highest point of the space, measured vertically, with the balance of the required ventilation provided by eave or cornice vents.

Exception. Where the location of wall or roof framing members conflicts with the installation of upper ventilators, installation more than 3 feet below the ridge or highest point of the space shall be permitted.

Reason: The code sets minimum requirements for ventilated attics. This proposal establishes an appropriate requirement for cross-ventilation as the default condition instead of allowing a reduction in ventilation for what is the most commonly recommended practice for ventilated attics. An exception for conditions where framing might preclude cross-ventilation to the specific location required allows some design flexibility for non-typical roof/wall assemblies. The proposal further clarifies that ventilators open to outside air, as opposed to adjacent attic or rafter spaces or some other interior space.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FISCHER-RB-5-R806.1

RB158–09/10
R806.2

Proponent: Joseph Lstiburek, Building Science Corporation

Revise as follows:

R806.2 Minimum area. The total net free ventilating area shall not be less than ~~1/150~~ 1/300 of the area of the space ventilated where ~~except that reduction of the total area to 1/300 is permitted provided that~~ at least 50 percent and not more than 80 percent of the required ventilating area is provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above the eave or cornice vents with the balance of the required ventilation provided by eave or cornice vents. ~~As an alternative, the net free cross-ventilation area may be reduced to 1/300 when~~ In climate zones 5, 6, 7 and 8 a Class I or II vapor retarder ~~is~~ shall be installed on the warm-in-winter side of the ceiling.

Reason: This language is now more consistent with the IBC, which only allows one ventilation ratio. It also is consistent with the appropriate building science/physics.

The previous wording encouraged installing vapor retarders in ceilings in hot humid climates in order to reduce ventilation areas. That is very bad in terms of the governing physics. This wording fixes that.

Vapor retarders are required in cold climates regardless of ventilation area. This wording makes that clear as well.

Bottom line: if you choose to vent a roof this language says vent it according to the 1:300 ratio everywhere. In cold climates you need to add a vapor retarder. The language relating to vapor retarders is now consistent with the vapor retarder changes made to wall assemblies in the two previous code cycles.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LSTIBUREK-RB-3-R806.2

RB159–09/10
R806.2

Proponent: Michael D. Fischer, The Kellen Company, representing the Roof-Attic Ventilation Coalition

Revise as follows:

R806.2 Minimum area. The total net free ventilating area shall not be less than 1/150 of the area of the space ventilated except that reduction of the total area to 1/300 is permitted provided that at least 50 percent and not more than 80 percent of the required ventilating area is provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet (914 mm) above the eave or cornice vents with the balance of the required ventilation provided by eave or cornice vents. ~~As an alternative, the net free cross-ventilation area may be reduced to 1/300 when a Class I or II vapor retarder is installed on the warm-in-winter side of the ceiling.~~

Reason: The code sets minimum requirement for ventilated attics. This proposal removes an allowable reduction in ventilation if vapor retarders are installed on the warm-in-winter side of the ceiling assembly. While this practice may function in some climate zones, it does not justify a reduction in ventilation area across all climate regions.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FISCHER-RB-6-R806.2

RB160–09/10
R806.4 (New)

Proponent: Michael D. Fischer, The Kellen Company, representing the Roof-Attic Ventilation Coalition

Add new text as follows:

R806.4 Installation and weather protection. Ventilators shall be installed in accordance with manufacturer's installation instructions. Installation of ventilators in roof systems shall be in accordance with the requirements of R903. Installation of ventilators in wall systems shall be in accordance with the requirements of Section R703.1.

(Renumber subsequent sections)

Reason: The code sets minimum requirements for ventilated attics. This proposal requires that ventilators be installed in accordance with the manufacturers' installation instructions. This requirement is essential if ventilation systems are to provide proper cross-ventilation and perform as intended. The proposal further clarifies that the weather protection requirements applicable for roof and wall penetrations, including flashing requirements, are considered.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FISCHER-RB-4-R806.4

RB161–09/10
R806.4

Proponent: Joseph Lstiburek, Building Science Corporation

Revise as follows:

R806.4 Unvented attic assemblies. Unvented *attic* and unvented enclosed rafter assemblies (spaces between the ceiling joists of the top *story* and the roof rafters) and unvented enclosed rafter assemblies (spaces between ceilings that are applied directly to the underside of roof framing members/rafters and the structural roof sheathing at the top of the roof framing members/rafters) shall be permitted if all the following conditions are met:

1. The unvented *attic* space is completely contained within the *building thermal envelope*.
2. No interior class I vapor retarders are installed on the ceiling side (*attic* floor) of the unvented *attic* assembly or on the ceiling side of the unvented enclosed rafter assembly.
3. Where wood shingles or shakes are used, a minimum1/4 inch (6 mm) vented air space separates the shingles or shakes and the roofing underlayment above the structural sheathing.
4. In climate zones 5, 6, 7 and 8, any *air-impermeable insulation* shall be a class II vapor retarder, or shall have a class II vapor retarder coating or covering in direct contact with the underside of the insulation.
5. Either Items 5.1, 5.2 or 5.3 shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing.
   - 5.1. *Air-impermeable insulation* only. Insulation shall be applied in direct contact with the underside of the structural roof sheathing.
   - 5.2. Air-permeable insulation only. In addition to the air-permeable installed directly below the structural sheathing, rigid board or sheet insulation shall be installed directly above the structural roof sheathing as specified in Table R806.4 for condensation control.
   - 5.3. Air-impermeable and air-permeable insulation. The *air-impermeable insulation* shall be applied in direct contact with the underside of the structural roof sheathing as specified in Table R806.4 for condensation control. The air-permeable insulation shall be installed directly under the *air-impermeable insulation*.

5.4 Where preformed insulation board is used as the air-impermeable insulation layer, it shall be sealed at the perimeter of each individual sheet interior surface to form a continuous layer.

Reason: The main reason for this change is to allow unvented roof construction for both attics and cathedral ceilings. The current language does not explicitly allow unvented roof construction for cathedral ceilings. Attics and ceilings are similar – the governing physics are identical - so the requirements will work for both. The language defining cathedral ceilings comes directly from similar language in the IBC Section 1203.2.

When the changes to vapor retarder definitions were made in the previous two code change cycles this section was inadvertently not changed. This proposed change inserts the new terminology and the appropriate specific class of vapor retarder.

The new note 5.4 acknowledges that rigid insulation sheets do meet the material properties of air-impermeable insulation directly. However, they are an air-impermeable insulation if their edges are not sealed to provide a continuous plane of airtightness. This new note clarifies the use of rigid insulation sheets.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: LSTIBUREK-RB-2-R806.4

RB162–09/10

R903.2.1

Proponent: Mike Rice, Maplewood, MN, representing the Association of Minnesota Building Officials

Revise as follows:

R903.2.1 Locations. Flashings shall be installed at wall and roof intersections, wherever there is a change in roof slope or direction and around roof openings. Kick out flashing shall be installed where the lower portion of a sloped roof stops within the plane of an intersecting wall cladding in such a manner as to divert or kick out water away from the assembly. Where flashing is of metal, the metal shall be corrosion resistant with a thickness of not less than 0.019 inch (0.5 mm) (No. 26 galvanized sheet).

Reason: This would be consistent with the code change proposal of R703.8 This change would also complement the current code addressing wall and roof intersections and prevent water from entering the wall cavity or penetrating to the structural building components. Step flashing at wall and roof intersections is incomplete without the kick out flashing, where the lower portion of a sloped roof stops within the plane of an intersecting wall. The water must be diverted away or it will find a way behind the water-resistive barrier and the siding or in some cases, it will go through the siding. The benefit of adding the kick out flashing would far exceed the cost, as the cost would be little.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: RICE-RB-1-R903.2.1

RB163–09/10

R903.5, R903.5.1, R903.5.2, Figure R903.5, R907.3

Proponent: Michael D. Fischer, The Kellen Company, representing the Asphalt Roofing Manufacturers Association

1. Delete without substitution:

~~**R903.5 Hail exposure.** Hail exposure, as specified in Sections R903.5.1 andR903.5.2, shall be determined using FigureR903.5.~~

~~**R903.5.1 Moderate hail exposure.** One or more hail days with hail diameters larger than 1.5 inches (38 mm) in a 20-year period.~~

~~**R903.5.2 Severe hail exposure.** One or more hail days with hail diameters larger than or equal to 2.0 inches (51 mm) in a 20-year period.~~

~~**FIGURE R903.5**~~
~~**HAIL EXPOSURE MAP**~~

2. Revise as follows:

R907.3 Recovering versus replacement. New roof coverings shall not be installed without first removing all existing layers of roof coverings where any of the following conditions exist:

1. Where the existing roof or roof covering is water-soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.
4. ~~For asphalt shingles, when the building is located in an area subject to moderate or severe hail exposure according to Figure R903.5.~~

Exceptions:

1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
2. Installation of metal panel, metal shingle and concrete and clay tile roof coverings over existing wood shake roofs shall be permitted when the application is in accordance with Section R907.4.
3. The application of new protective coating over existing spray polyurethane foam roofing systems shall be permitted without tear-off of existing roof coverings.

Reason: This proposal removes the hail hazard map (Fig. R903.5), the definitions of hail exposure, and the current re-roofing limitation for asphalt shingles in some regions. The IRC requirement for reroofing is posed as a solution to minimize damage to asphalt shingles from hail events, but there is no data that concludes that limiting the application of asphalt shingles to a single layer provides appropriate cost savings to the homeowner. While this requirement may provide some benefit to insurers, that does not justify its inclusion in the IRC.

The reroofing section provides for limitations where the roof system is damaged and will not support an additional layer of shingles. This performance requirement should outweigh an arbitrary and universal ban on reroofing over an existing layer of asphalt shingles. The limitation is also vague in that it does not specify if the ban applies to the existing layer or to the reroof material. For example, would installation of metal roofing over an existing layer of asphalt shingles be allowed under this requirement in hail exposure areas? If so, the requirement unfairly provides preferential treatment of one type of roof covering without technical justification. The additional and often unnecessary expense of tear-off and disposal can result in delays of reroofing as homeowners struggle to decide what home maintenance they can afford. As the reroofing is delayed, additional water intrusion may cause other problems for occupants.

The current requirements are based upon a 20-year return period as contained in the definition of moderate and severe exposure conditions. Design requirements for other products, including resistance from windborne debris, are based upon a 50-year mean recurrence and annual probability of 2%. Using a 20-year standard suggests that this requirement is not intended to protect the structure or its occupants, but mitigate property loss by asking the consumer to pay more for re-roofing.

Requiring removal of an existing layer of asphalt shingles creates a significant impact on environmental issues. While many states and local jurisdictions have appropriate recycling programs in place, in many areas the tear-off materials end up in landfills. According to the US EPA, 11 million tons of asphalt shingles are manufactured and disposed of each year, and make up about 8% of the total building waste stream. The impact on landfills is an important consideration. Building materials take up significant space, and asphalt roofing products can encapsulate other landfill materials and delay the process of decay and degradation. Removing this requirement will allow local governments to buy time and implement programs that will provide for the re-use of asphalt shingles in roadways and other applications.

Figure R903.5 was introduced into the IRC during final action in Detroit on a Sunday afternoon with only a handful of governmental voting members present. These requirements were approved despite the fact that the map does not represent the work of any consensus body, the concept provided no technical or economic justification, and the proposal was disapproved by the IRC code development committee. Attempts to expand the use of this concept to new installations have been disapproved by the ICC in subsequent code cycles. Approval of this proposal will allow all stakeholders to properly address concerns in hail-prone regions through the development of consensus-based codes and standards, will have a positive impact on the environment and our landfills, and will provide a significant cost benefit for homeowners seeking to properly maintain their property.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FISCHER-RB-3-R903.5

RB164–09/10
R905.1

Proponent: W. Harvey Cappel, PE, Racelectric Engineering

Revise as follows:

R905.1 Roof covering application. Roof coverings shall be applied in accordance with the applicable provisions of this section and the manufacturer's installation instructions. Unless ~~otherwise specified in this section,~~ specifically waived by a listed exception in the appropriate code section, roof coverings shall be installed to resist the component and cladding loads specified in Table R301.2(2), adjusted for height and exposure in accordance with Table R301.2(3).

Reason: The term “otherwise specified” without a definition basically means “anything specified” which makes this Section R905.1 meaningless and basically void. The original intent here is to require roof coverings to be installed to resist specific wind loads. With this undefined “otherwise specified” loophole the intent of R905.1 is cancelled. We want roof coverings to be installed to resist the wind loads so let’s be clear about what we want.

Cost Impact: There will be no cost impact (as compared to the original intent of the Code) related to this proposed code change.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CAPPEL-RB-3-R905.1

RB165–09/10
R905.2.4.1

Proponent: W. Harvey Cappel, PE, Racelectric Engineering

Revise as follows:

R905.2.4.1 Wind resistance of asphalt shingles ~~s~~ adhesive strips. Asphalt shingles shall be tested for wind resistance of the adhesive strips (required to secure the shingle tabs) in accordance with ASTM D 7158. Asphalt shingles shall meet the classification requirements of Table R905.2.4.1 (1) for the appropriate maximum basic wind speed. Asphalt shingle packaging shall bear a label to indicate compliance with ASTM D 7158 and the required classification in Table R905.2.4.1 (1).

Exception: Asphalt shingles not included in the scope of ASTM D 7158 shall be tested and labeled to indicate compliance with ASTM D 3161 and the required classification in Table R905.2.4.1 (2).

Reason: The referenced test standards test the adhesive and its resistance to failure due to wind loads (test simulated) on the upwind side of the roof. These tests do not test fasteners or the resistance of fasteners to withdrawal from the wood deck. The tests aren’t even (test simulated) on the correct side of the roof (downwind) required for testing the fasteners. Mr. Mike Noone, Chairman of ASTM Subcommittee D08-02 (the authors of ASTM D 3161 and similar test codes) will confirm this. The problem with the current wording is that it is misleading causing some to believe that use of the manufactures' nail standard during this test is a test of the nails and therefore the standard nailing required, for these shingles, on any roof for winds up to the test standard wind speeds. This is not true. For high wind areas (110 mph or greater) the fasteners must be designed for the wind speed, mean roof height and exposure. Fasteners are not tested nor do they need to be. Sufficient data is already available to Engineers for the design of fastener systems.

Cost Impact: The only impact this code change proposal will have on cost is to those that have been wrongly interpreting the intent of the Code. In this case the cost of only a few more nails per shingle will be insignificant especially as compared to the cost of a failed shingle system cause by inadequate nailing.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CAPPEL-RB-1-R905.2.4.1

RB166–09/10
R905.2.5

Proponent: W. Harvey Cappel, PE, Racelectric Engineering

Revise as follows:

R905.2.5 Fasteners. Fasteners for asphalt shingles shall be galvanized steel, stainless steel, aluminum or copper roofing nails, minimum 11 gage (0.1205 (3mm) ~~12 gage (0.105 inch (3mm))~~ shank with a minimum 3/8-inch (10 mm) diameter head, ASTM F 1667, of a length to penetrate through the roofing materials and penetrate through the minimum required roof sheathing or penetrate to an equivalent embedment into the thicker than minimum required roof sheathing. ~~a minimum of ¾ inch (19 mm) into the roof sheathing. Where the roof sheathing is less than ¾ inch (19mm) thick, the fasteners shall penetrate through the sheathing.~~ Fasteners shall comply with ASTM F 1667.

Reason: 1) The 12 gage nails are rarely if ever used anymore and in many cases inadequate. The outdated standard is copied from the typical manufacturer’s installation instructions (also outdated). The minimum standard needs to be updated.

2) The current Section wording is outdated (copied from the typical shingle manufacturer’s installation instructions, also outdated) and ambiguous. It implies an either or standard with the in between not in compliance with the Code. This is ridiculous. If a 3/8 inch penetration is in compliance with the Code then all greater penetrations and embedment’s up to and including the other Code required ¾ inch penetration are also in compliance with the Code. The problem with this incorrect wording is that it is being used as evidence of non compliance, which is senseless.

Cost Impact: 1) Probably no cost impact at all to go to the new 11 gage nail since the 12 gage nail isn't normally being used anyway, but even where it is, the cost impact will be minimal.

2) There will be no cost impact related to this proposed Code change; only less confusion and potentially a cost savings.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CAPPEL-RB-2-R905.2.5

RB167–09/10
R905.2.6

Proponent: W. Harvey Cappel, PE, Racelectric Engineering

Revise as follows:

R905.2.6 Attachment. Asphalt shingles shall have the minimum number of fasteners required by the manufacturer, but not less than four fasteners per strip shingle or two fasteners per individual shingle. Where the roof slope exceeds 21 units vertical in 12 units horizontal (21:12, 175 percent slope), or where the basic wind speed is equal to or exceeds100 mph shingles shall be installed as required by the manufacturer, but with not less than six nails per shingle and as required to comply with Section R905.1.

Reason: The current code is being misinterpreted (mainly because of a misunderstanding of the ASTM D 3161 test [it only tests adhesives] requirement for high wind areas) regarding the fastening requirements to resist wind loads. This proposed change will help reinforce the known requirement that additional fasteners are required in high wind areas. The shingle manufacturers cannot be relied on for this requirement since they cannot and do not take responsibility for fastening design or fastening installation in high wind areas. Their wind related limit of warranty and responsibility typically stops with assurance against manufacturer's defects and compliance with one of the ASTM adhesive tests standards. Knowing that four nails per shingle are typically inadequate in high wind areas, here is an opportunity to set a minimum standard for high wind areas. The extreme number of shingle failures as a result of recent hurricanes Rita and Ike with wind speeds well below the typical coastal design standards, should be sufficient motivation to make a change in our shingle installation codes. What we have in force now, (basically four nails per shingle everywhere) is not working.

Cost Impact: There will be no cost impact (as compared to the original intent of the Code) related to this proposed Code change. Even if this change causes some construction projects to use six nails per shingle instead of the incorrect four nails per shingle, the additional cost will be minimal, especially as compared to the cost of an inadequate and failed shingle installation.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: CAPPEL-RB-4-R905.2.6

RB168–09/10
R905.2.8.3

Proponent: Gary Ehrlich, PE, National Association of Home Builders (NAHB)

Revise as follows:

R905.2.8.3 Sidewall flashing. Flashing against a vertical sidewall shall be ~~by the step flashing method. The flashing shall be~~ a minimum of 4 inches (102 mm) high and 4 inches (102 mm) wide~~. At the end of the vertical sidewall the step flashing shall be turned out in a manner that~~ and shall direct~~s~~ water away from the vertical sidewall ~~and~~ onto the roof and/or into the gutter. Where siding is provided on the vertical sidewall, the vertical leg of the flashing shall be continuous under the siding.

Reason: The purpose of this proposal is to clarify the requirements for the use of flashing at a vertical wall-to-roof intersection. The use of "step flashing" is fine for masonry wall construction; but to use it where siding is provided is incorrect. Walls with siding should be provided with continuous "J"-shaped sections of flashing, with the vertical leg continuous under the siding. A "J" turn back lip on the horizontal leg of the siding controls the water and directs it down the roof to the gutter. Step flashing does not have the return lip. "J"-shaped flashing sections are continuous, requiring fewer joints, look much better, and also reduce the opportunity for water to have multiple points of possible entry.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: EHRLICH-RB-11-R905.2.8.3

RB169–09/10
R905.2.8.3.1 (New); IBC 1405.2.1 (New)

Proponent: Edward L. Paxton, Salt Lake County, UT, representing the Utah Chapter of ICC

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. PART II WILL BE HEARD BY THE IBC FIRE SAFETY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IRC BUILDING/ENERGY

Add new text as follows:

R905.2.8.3.1. Counter-flashing. A 6" tall counter-flashing with drip edge shall be installed on the sidewall, overlapping the step flashing a minimum of 2 inches. Required weather barrier/building paper or house wrap and exterior coverings shall overlap the counter-flashing. Vertical sidewall exterior coverings with any required weep screed or drip edge shall terminate a minimum of 4" above the finished roof surface.

PART II – IBC FIRE SAFETY

Add new text as follows:

1405.2.1 Termination above roof surfaces. All exterior wall coverings installed on vertical surfaces shall terminate a minimum of 4" above any intersecting roof surface, or as required by roofing manufacturer. Flashing and water resistive barriers shall be installed as to allow replacement of the roof covering with required flashings without removal of the exterior wall covering.

Reason: Building finishes on vertical surfaces are regularly installed tight to roofing surface. This does not allow for proper drainage of installed building exterior coverings. The result is improper drainage which leads to mold growth, covering failures and leaks. When roof replacement is necessary, the ability to properly install new step flashing is not possible without removing and repairing building exterior coverings. Alternatively, the new step flashing is often improperly installed over top of the exterior wall covering, trapping moisture that drains out of the bottom of the exterior covering weep or drip edge.

The minimal increase in cost to add an extra counter-flashing is minimal when compared to the cost to repair damage wall covering or to properly replace the roof when necessary.

Cost Impact: The code change proposal will increase the cost of construction.

PART I – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART I – IBC FIRE SAFETY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: PAXTON-RB-1-R905.2.8.3.1- FS1-1405.2.1

RB170–09/10
R905.2.8.5 (New)

Proponent: Logan G. Sauter, Salt Lake City Corporation, representing the Utah Chapter of ICC

Add new text as follows:

R905.2.8.5 Drip Edge. Provide drip edge at eaves and gables of shingle roofs. Overlap to be a minimum of 2 inches (51 mm). Eave drip edges shall extend 0.25 inch (6.4 mm) below sheathing and extend back on the roof a minimum of 2 inches (51 mm). Drip edges shall be mechanically fastened a maximum of 12 inches (305 mm) o.c.

Reason: Unlike the IBC, the IRC does not include drip edge requirements for shingle roofs. This new text brings the IRC into uniformity with the IBC, reflects manufacturers' requirements for shingle roof installations, and uses identical wording and placement as found in IBC 1507.2.9.3.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SAUTER-RB-1-R905.2.8.5

RB171–09/10
R907.3

Proponent: Robert McCluer, RMc Code Consulting, representing the Metal Construction Association (MCA)

Revise as follows:

R907.3 Re-covering versus replacement. New roof coverings shall not be installed without first removing all existing layers of roof coverings where any of the following conditions occur:

1. Where the existing roof or roof covering is water-soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is wood shake, slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.
4. For asphalt shingles over existing asphalt shingles, when the building is located in an area subject to moderate or severe hail exposure according to Figure R903.5.

Exceptions:

1. Complete and separate roofing systems, such as standing-seam metal roof systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
2. Installation of metal panel, metal shingle, and concrete and clay tile roof coverings over existing wood shake roofs shall be permitted when the application is in accordance with Section R907.4.
3. The application of new protective coating over existing spray polyurethane foam roofing systems shall be permitted without tear-off of existing roof coverings.

Reason: The purpose of this code change is only to clarify the application of the current text of item 4 of Section R907.3. This change is needed since the current text is not clear and could be misapplied.

The purpose of item 4 is to address the behavior of more than one layer of asphalt shingles on a roof located in a moderate or severe hail exposure. This condition results in a "sponge" effect in the top layer of the shingles that reduces the impact resistance of the roof. Thus the top layer is more susceptible to penetration by hailstones that increases the potential for water penetration under the roof covering.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MCCLUER-RB-1-R907.3

RB172–09/10
R907.5

Proponent: Rick Davidson, City of Maple Grove, MN

Revise as follows:

R907.5 Reinstallation of materials. Existing slate, clay or cement tile shall be permitted for reinstallation, except that damaged, cracked or broken slate or tile shall not be reinstalled. ~~Existing vent flashing, metal edgings, drain outlets, collars and metal counter flashings~~ Any existing flashings, edgings, outlets, collars, vents or similar devices that are a part of the roof assembly shall ~~not be reinstalled where~~ be replaced when rusted, damaged or deteriorated. Aggregate surfacing materials shall not be reinstalled.

Reason: The current language states that only specific items cannot be reused if damaged. This implies that those items not listed may be reused even if damaged. The proposal also makes it clear that damaged components must be replaced even if they are not "reinstalled" but simply reused in-place.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DAVIDSON-RB-1-R907.5

RB173–09/10
R1004.3

Proponent: Jim Buckley, Buckley Rumford Co., representing the Masonry Alliance for Codes and Standards (MACS) and Clay Flue Lining Institute (CFLI)

Revise as follows:

R1004.3 Decorative shrouds. Decorative shrouds shall not be installed at the termination of <u>air-cooled</u> chimneys for factory-built fireplaces <u>listed to UL 127</u> except where the shrouds are listed and *labeled* for use with the specific factory-built fireplace system and installed in accordance with the manufacturer's installation instructions.

Reason: Add the words "air-cooled" and "listed to UL127" as non listed decorative shrouds can interfere with the air flow of air-cooled metal chimneys listed to UL 127 for factory-built fireplaces. There is no problem, however, adding decorative shrouds to insulated factory-built chimneys listed to UL 103 that are used for masonry fireplaces, stoves, furnaces and many other appliances. The language here should be specific to aircooled UL 127 chimneys and distinguished from insulated Class A chimneys specified in Section R1005.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BUCKLEY-RB-2-R1004.3

RB174–09/10
1005.2

Proponent: Jim Buckley, Buckley Rumford Co., representing the Masonry Alliance for Codes and Standards (MACS) and Clay Flue Lining Institute (CFLI)

Revise as follows:

R1005.2 Decorative shrouds. ~~Decorative shrouds shall not be installed at the termination of factory-built chimneys except where the shrouds are *listed* and *labeled* for use with the specific factory-built chimney system and installed in accordance with the manufacturer's installation instructions.~~ <u>Decorative shrouds shall comply with the provisions of R1003.9.</u>

Reason: There is no problem adding decorative shrouds to insulated factory-built chimneys listed to UL 103 that are used for masonry fireplaces, stoves, furnaces and many other appliances provided they comply with the general provisions for chimney terminations in Section R1003.9.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BUCKLEY-RB-3-R1005.2

RB175–09/10
AG101.2

Proponent: Lorraine Ross, Intech Consulting, Inc., representing the Association of Pool and Spa Professionals

Revise as follows:

AG101.2 Pools in flood hazard areas. Pools that are located in flood hazard areas established by Table R301.2(1), including above-ground pools, on-ground pools and in-ground pools that involve placement of fill, shall comply with Sections AG101.2.1 or AG101.2.2.

> **Exception:** Pools located in riverine flood hazard areas which are outside of designated floodways <u>and pools in flood hazard areas not directly connected to a watercourse</u>.

Reason: The 2009 IRC adopted new provisions regarding pools located in flood hazard areas. This proposed revision is intended to clarify that the exception applies to pools in flood hazard areas not directly connected to a flowing body of water, which is called a watercourse in other parts of the National Flood Insurance Program (NFIP) regulations.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROSS-RB-2-AG101.2

RB176–09/10

AG106.1, AG106.2 (New), AG106.3 (New), AG106.4 (New), AG106.5 (New), AG108 (New); IBC 3109.5.1 (New), 3109.5.2 (New), 3109.5.3 (New), 3109.5.4 (New), Chapter 35 (New)

Proponent: Gary S. Duren, Code Compliance, Inc., representing Pool Safety Council

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. PART II WILL BE HEARD BY THE IBC GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IRC BUILDING/ENERGY

1. Delete and substitute as follows:

~~**AG106.1 General.** Suction outlets shall be designed and installed in accordance with ANSI/APSP-7.~~

AG106.1 General. Suction outlets shall be designed to produce circulation throughout the pool or spa. Single-outlet systems, such as automatic vacuum cleaner systems, or multiple suction outlets, whether isolated by valves or otherwise, shall be protected against user entrapment.

2. Add new text as follows:

AG106.2 Suction fittings. Pool and spa suction outlets shall have a cover that conforms to ANSI/ASME A112.19.8.

Exception: Surface skimmers

AG106.3 Vacuum relief system required. Pool and spa single- or multiple-outlet circulation systems shall be equipped with a vacuum relief system should grate covers located therein become missing or broken. All pool and spa single- or multiple-outlet circulation systems shall be equipped with an approved or engineered vacuum relief system of the type specified herein, as follows:

1. Safety vacuum release system conforming to ASME A112.19.17 or ASTM F 2387; or
2. An approved gravity drainage system.

AG106.4 Dual drain separation. Single or multiple pump circulation systems shall be provided with a minimum of two suction outlets of the approved type. A minimum horizontal or vertical distance of 3 feet (914 mm) shall separate the outlets. These suction outlets shall be piped so that water is drawn through them simultaneously through a vacuum relief-protected line to the pump or pumps.

AG106.5 Pool cleaner fittings. Where provided, vacuum or pressure cleaner fitting(s) shall be located in an accessible position(s) at least 6 inches (152 mm) and not more than 12 inches (305 mm) below the minimum operational water level or as an attachment to the skimmer(s).

3. Add new standards to AG108 as follows:

ANSI/ASME

A112.19.8a-08	Suction Fittings for use in Swimming Pools, Wading Pools, Spas and Hot Tubs
A112.19.17-09	Manufactured Safety Vacuum Release Systems (SVRS) For Residential and Commercial Swimming Pool, Spa, Hot Tub and Wading Pool Suction Systems

ASTM

F 2387-04 Standard specification for manufactured safety vacuum release systems, swimming pools, spas and hot tubs

PART II – IBC GENERAL

1. Delete and substitute as follows:

~~**3109.5 Entrapment avoidance.** Suction outlets shall be designed and installed in accordance with ANSI/APSP-7.~~

3109.5 Entrapment avoidance. Suction outlets shall be designed to produce circulation throughout the pool or spa. Single-outlet systems, such as automatic vacuum cleaner systems, or multiple suction outlets, whether isolated by valves or otherwise, shall be protected against user entrapment.

2. Add new text as follows:

3109.5.1 Suction fittings. Pool and spa suction outlets shall have a cover that conforms to ANSI/ASME A112.19.8.

Exception: Surface skimmers

3109.5.2 Vacuum relief system required. Pool and spa single- or multiple-outlet circulation systems shall be equipped with a vacuum relief system should grate covers located therein become missing or broken. All pool and spa single- or multiple-outlet circulation systems shall be equipped with an approved or engineered vacuum relief system of the type specified herein, as follows:

1. Safety vacuum release system conforming to ASME A112.19.17 or ASTM F 2387; or
2. An approved gravity drainage system.

3109.5.3 Dual drain separation. Single or multiple pump circulation systems shall be provided with a minimum of two suction outlets of the approved type. A minimum horizontal or vertical distance of 3 feet (914 mm) shall separate the outlets. These suction outlets shall be piped so that water is drawn through them simultaneously through a vacuum relief-protected line to the pump or pumps.

3109.5.4 Pool cleaner fittings. Where provided, vacuum or pressure cleaner fitting(s) shall be located in an accessible position(s) at least 6 inches (152 mm) and not more than 12 inches (305 mm) below the minimum operational water level or as an attachment to the skimmer(s).

3. Add new standards to Chapter 35 as follows:

ANSI/ASME

A112.19.8a-08 Suction Fittings for use in Swimming Pools, Wading Pools, Spas and Hot Tubs

A112.19.17-09 Manufactured Safety Vacuum Release Systems (SVRS) For Residential and Commercial Swimming Pool, Spa, Hot Tub and Wading Pool Suction Systems

ASTM

F 2387-04 Standard specification for manufactured safety vacuum release systems, swimming pools, spas and hot tubs

Reason: During the last code change cycle the proponents of APSP-7 made representations that the APSP standard would bring the IRC into consistency with the Virginia Gramme Baker Pool and Spa Safety Act. This is a false statement as to I-Code models were utilized as the model for the safety prescription contained in the Act.

The incorporation of the APSP-7 standard removed the prescription for body and limb entrapment safety. The adverse affect of incorporation of the APSP-7 standard is that the liability for safe pool and spa construction was shifted away from the APSP constituent-manufacturers and placed squarely on the back of the installer, designer and/or the authority having jurisdiction.

By incorporating the safety prescription above installers, designers and the authority having jurisdiction can readily determine code compliance and more important if the pool or spas is as safe as possible.

Cost Impact: There may be an increase in costs associated with installing the proper safety equipment in pools and spas in the neighborhood of $500.00 – $2,000.00 dependant on the system used to achieve compliance with the safety prescription.

Analysis: A review of the standards proposed for inclusion in the code, ANSI/ASME A112.19.8a, A112.19.17 and ASTM F 2387, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II –- IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: DUREN-RB-1-AG106-G-1-3109.5

RB177–09/10

AG106.2 (New), AG108 (New), Chapter 44 (New); IBC 3109.51 (New), Chapter 35 (New)

Proponent: Jesse J. Beitel, Hughes Associates, Inc., representing the Pool Safety Council

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. PART II WILL BE HEARD BY THE IBC GENERAL COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.

PART I – IRC BUILDING/ENERGY

1. Add new text as follows:

AG106.2 Vacuum relief system required. All pool and spa single- or multiple-outlet circulation systems that incorporate submerged suction outlet fittings shall be equipped with an approved or engineered vacuum relief system as follows:

1. Safety vacuum release systems conforming to ASME A112.19.17 or ASTM F 2387; or
2. An approved gravity drainage system.

2. Add new standards to Chapter 44 and AG108 as follows:

ANSI/ASME

A112.19.17-09	Manufactured Safety Vacuum Release Systems (SVRS) For Residential and Commercial Swimming Pool, Spa, Hot Tub and Wading Pool Suction Systems

ASTM

F 2387-04	Standard Specification for Manufactured Safety Vacuum Release Systems (SVRS) For Swimming Pools, Spas, Hot Tubs

PART II – IBC GENERAL

1. Add new text as follows:

3109.5.1 Vacuum relief system required. All pool and spa single- or multiple-outlet circulation systems that incorporate submerged suction outlet fittings shall be equipped with an approved or engineered vacuum relief system as follows:

1. Safety vacuum release systems conforming to ASME A112.19.17 or ASTM F 2387; or
2. An approved gravity drainage system.

2. Add new standards to Chapter 35 as follows:

ANSI/ASME

A112.19.17-09	Manufactured Safety Vacuum Release Systems (SVRS) For Residential and Commercial Swimming Pool, Spa, Hot Tub and Wading Pool Suction Systems

ASTM

F 2387-04	Standard Specification for Manufactured Safety Vacuum Release Systems (SVRS) For Swimming Pools, Spas, Hot Tubs

Reason: This code change provides a final layer of protection against potential entrapments. While the APSP-7 provides partial protection against entrapment, it does not protect swimmers or waders in the event that problems occur with improperly designed pools, some types of blocked drains, etc. These events can and do occur and when they occur, this proposal provides a mechanism to help prevent entrapment.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: A review of the standards proposed for inclusion in the code, ANSI/ASME A112.19.17 and ASTM F 2387, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

PART I – IRC BUILDING/ENERGY

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

PART II – IBC GENERAL

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BEITEL-RB-2-APDX G-IBC-G-1- 3109.5.1

RB178–09/10

R202 (New), Appendix G, R324 (New), R325 (New), R326 (New), Chapter 44

Proponent: Tom Neltner, National Center for Healthy Housing, representing National Center for Healthy Housing and Alliance for Healthy Homes

1. Add new definitions as follows:

ABOVE-GROUND/ON-GROUND POOL. See "Swimming pool."

BARRIER. A fence, wall, building wall or combination thereof which completely surrounds the swimming pool and obstructs access to the swimming pool.

HOT TUB. See "Swimming pool."

IN-GROUND POOL. See "Swimming pool."

RESIDENTIAL. That which is situated on the premises of a detached one- or two-family dwelling or a one-family townhouse not more than three stories in height.

SPA. A structure intended for recreational bathing, in which all controls, water-heating and water-circulating equipment are an integral part of the product. A spa may be either a nonportable spa or a portable spa.

SPA, NONPORTABLE. See "Swimming pool."

SPA, PORTABLE. A nonpermanent structure intended for recreational bathing, in which all controls, water-heating and water-circulating equipment are an integral part of the product.

SWIMMING POOL. Any structure intended for swimming or recreational bathing that contains water over 24 inches (610 mm) deep. This includes in-ground, above-ground and on-ground swimming pools, hot tubs and spas.

SWIMMING POOL, INDOOR. A swimming pool which is totally contained with a structure and surrounded on all four sides by the walls of the enclosing structure.

SWIMMING POOL, OUTDOOR. Any swimming pool that is not an indoor swimming pool.

2. Delete Appendix G in its entirety without substitution:

~~**APPENDIX G**~~
~~**SWIMMING POOLS, SPAS AND HOT TUBS**~~

3. Add new text as follows:

SECTION R324
SWIMMING POOLS, SPAS AND HOT TUBS

R324.1 General. The provisions of this section shall control the design and construction of swimming pools, nonportable spas and hot tubs installed in or on the lot of a one- or two-family dwelling.

R324.2 Pools in flood hazard areas. Pools that are located in flood hazard areas established by Table R301.2(1), including above-ground pools, on-ground pools and in-ground pools that involve placement of fill, shall comply with Sections R324.2.1 or R324.2.2.

Exception: Pools located in riverine flood hazard areas which are outside of designated floodways.

R324.2.1 Pools located in designated floodways. Where pools are located in designated floodways, documentation shall be submitted to the *building official*, which demonstrates that the construction of the pool will not increase the design elevation at any point within the *jurisdiction*.

R324.2.2 Pools located where floodways have not been designated. Where pools are located where design flood elevations are specified but floodways have not been designated, the applicant shall provide a floodway analysis that demonstrates that the proposed pool will not increase the design flood elevation more than 1 foot (305 mm) at any point within the jurisdiction.

R324.3 In-ground pools. In-ground pools shall be designed and constructed in conformance with ANSI/NSPI-5 as listed in Chapter 35.

R324.4 Above-ground and on-ground pools. Above-ground and on-ground pools shall be designed and constructed in conformance with ANSI/NSPI-4 as listed in Chapter 35.

R324.5 Pools in flood hazard areas. In flood hazard areas established by Table R301.2(1), pools in coastal high hazard areas shall be designed and constructed in conformance with ASCE 24.

R324.6 Permanently installed spas and hot tubs. Permanently installed spas and hot tubs shall be designed and constructed in conformance with ANSI/NSPI-3 as listed in Chapter 35

R324.7 Portable spas and hot tubs. Portable spas and hot tubs shall be designed and constructed in conformance with ANSI/NSPI-6 as listed in Chapter 35.

SECTION R325
BARRIER REQUIREMENTS

R325.1 Application. The provisions of this chapter shall control the design of barriers for residential swimming pools, spas and hot tubs. These design controls are intended to provide protection against potential drownings and near drownings by restricting access to swimming pools, spas and hot tubs.

R325.2 Outdoor swimming pools. An outdoor swimming pool, including an in-ground, above-ground or on-ground pool, hot tub or spa, shall be surrounded by a barrier which shall comply with the following:

1. The top of the barrier shall be at least 48 inches (1219 mm) above grade measured on the side of the barrier which faces away from the swimming pool. The maximum vertical clearance between grade and the bottom of the barrier shall be 2 inches (51 mm) measured on the side of the barrier which faces away from the swimming pool. Where the top of the pool structure is above grade, such as an above-ground pool, the barrier may be at ground level, such as the pool structure, or mounted on top of the pool structure. Where the barrier is mounted on top of the pool structure, the maximum vertical clearance between the top of the pool structure and the bottom of the barrier shall be 4 inches (102 mm).
2. Openings in the barrier shall not allow passage of a 4-inch-diameter (102 mm) sphere.
3. Solid barriers which do not have openings, such as a masonry or stone wall, shall not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints.
4. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is less than 45 inches (1143 mm), the horizontal members shall be located on the swimming pool side of the fence. Spacing between vertical members shall not exceed 1 ¾ inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1 ¾ inches (44 mm) in width.

5. Where the barrier is composed of horizontal and vertical members and the distance between the tops of the horizontal members is 45 inches (1143 mm) or more, spacing between vertical members shall not exceed 4 inches (102 mm). Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1 ¾ inches (44 mm) in width.
6. Maximum mesh size for chain link fences shall be a 2 ¼ - inch (57 mm) square unless the fence has slats fastened at the top or the bottom which reduce the openings to not more than 1 ¾ inches (44 mm).
7. Where the barrier is composed of diagonal members, such as a lattice fence, the maximum opening formed by the diagonal members shall not be more than 1 ¾ inches (44 mm).
8. Access gates shall comply with the requirements of Section R325.2, Items 1 through 7, and shall be equipped to accommodate a locking device. Pedestrian access gates shall open outward away from the pool and shall be self-closing and have a self-latching device. Gates other than pedestrian access gates shall have a self-latching device. Where the release mechanism of the self-latching device is located less than 54 inches (1372 mm) from the bottom of the gate, the release mechanism and openings shall comply with the following:
   8.1. The release mechanism shall be located on the pool side of the gate at least 3 inches (76 mm) below the top of the gate: and
   8.2. The gate and barrier shall have no opening larger than ½ inch (12.7 mm) within 18 inches (457 mm) of the release mechanism.
9. Where a wall of a dwelling serves as part of the barrier, one of the following conditions shall be met:
   9.1. The pool shall be equipped with powered safety cover in compliance with ASTM F 1346; or
   9.2. Doors with direct access to the pool through that wall shall be equipped with an alarm which produces an audible warning when the door and/or its screen, if present, are opened. The alarm shall be listed and labeled in accordance with UL 2017. The deactivation switch(es) shall be located at least 54 inches (1372 mm) above the threshold of the door; or
   9.3. Other means of protection, such as self-closing doors with self-latching devices, which are approved by the governing body, shall be acceptable as long as the degree of protection afforded is not less than the protection afforded by Item 9.1 or 9.2 described above.
10. Where an above-ground pool structure is used as a barrier or where the barrier is mounted on top of the pool structure, and the means of access is a ladder or steps;
   10.1. The ladder or steps shall be capable of being secured, locked or removed to prevent access; or
   10.2. The ladder or steps shall be surrounded by a barrier which meets the requirements of Section R325.2, Items 1 through 9. When the ladder or steps are secured, locked or removed, any opening created shall not allow the passage of a 4-inch-diameter (102 mm) sphere.

R325.3 Indoor swimming pool. Walls surrounding an indoor swimming pool shall comply with Section R325.2 Item 9.

R325.4 Prohibited locations. Barriers shall be located to prohibit permanent structures, equipment or similar objects from being used to climb them.

R325.5 Barrier exceptions. Spas or hot tubs with a safety cover which complies with ASTM F1346, as listed in Chapter 35, shall be exempt from these barrier requirement provisions.

SECTION R326
ENTRAPMENT PROTECTION FOR SWIMMING POOL AND SPA SUCTION OUTLETS

R326.1 General. Suction outlets shall be designed and installed in accordance with ANSI/APSP-7.

4. Add new standards as follows:

ANSI/NSPI

ANSI/NSPI-3-99	Standard for Permanently Installed Residential Spas.
ANSI/NSPI-4-99	Standard for Above-ground/On-ground Residential Swimming Pools.
ANSI/NSPI-5-2003	Standard for Residential In-ground Swimming Pools.
ANSI/NSPI-6-99	Standard for Residential Portable Spas.

ANSI/APSP

ANSI/APSP-7-06	Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs and Catch Basins.

ASCE

ASCE/SEI-24-05	Flood Resistant Design and Construction.

ASTM

ASTM F 1346-91 (2003)	Performance Specifications for Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot Tubs.

UL

2017-2000	Standard for General-purpose Signaling Devices and Systems-with Revisions through June 2004.

Reason: In December 2007, the National Center for Healthy Housing (NCHH) and the U.S. Centers for Disease Control and Prevention (CDC) convened an Expert Panel consistent with National Institute of Health guidelines to assess the effectiveness of various interventions to make homes healthier and safer. NCHH and CDC published the report of the experts in January 2009. See www.nchh.org/LinkClick.aspx?fileticket=2lvaEDNBIdU%3d&tabid=229 for the full report.

The Expert Panel reviewed the peer-reviewed research on the topic and concluded that that 4-sided isolation pool fencing significantly reduces childhood drowning, and that this type of fencing performs significantly better than 3-sided perimeter fencing. The studies showed the following:

- The risk of drowning in a fenced pool was about three times lower, compared to an unfenced pool (Fergusson DM, Horwood LJ. 1984. Risks of Drowning in Fenced and Unfenced Domestic Swimming Pools. New Zealand Medical Journal 97(767): 777–779. Fergusson and Horwood 1984). See also Pitt WR, Balanda KP. 1991. Childhood Drowning and Near-Drowning in Brisbane—The Contribution of Domestic Pools. Medical Journal of Australia 154(10): 661–665.)
- Four-sided isolation fencing is about five times more effective than three-sided perimeter fencing (Intergovernmental Working Party on Swimming Pool Safety. 1988. Pre-School drowning in private swimming pools. Perth: Health Department of Western Australia.

One study (Morgenstern H, Bingham T, Reza A. 2000. Effects of pool fencing ordinances and other factors on childhood drowning in Los Angeles County, 1990-1995. American Journal of Public Health 90(4): 595–601) failed to show that an ordinance requiring pool fencing in Los Angeles reduced drowning significantly. It is possible that this study was confounded by a public education campaign, the fact that the legislation only required 3-sided fencing, possible inadequate enforcement, and other factors.

Consistent with the Expert Panel conclusion, this code change proposal brings the requirements for swimming pools, spas and hot tubs out of Appendix G and into the body of the code text. Safety requirements for pools should not be optional they need to be mandatory.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: NELTNER-RB-1-R324-R325-R326

RB179–09/10

New Chapter

Proponent: Lorraine Ross, Intech Consulting, Inc., representing the Association of Pool and Spa Professionals

Add new chapter as follows:

Move current **APPENDIX G SWIMMING POOLS, SPAS AND HOT TUBS** into the body of the IRC by establishing a new chapter. Number accordingly.

Reason: This code change recognizes the importance of utilizing national consensus standards for the design and construction of residential swimming pools, spas and hot tubs. Provisions for construction of swimming pools, spas and hot tubs have been in the IRC as a non-mandatory appendix for many years. With the increased attention to pool safety, as illustrated by the 2009 IRC adoption of *ANSI/APSP-7 Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Catch Basins*, this is the opportune time to move the requirements of Appendix G into the main body of the code.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ROSS-RB-1-NEW CHAPTER

RB180–09/10

R202 (New), R325 (New), Appendix F

Proponent: Jane Malone, Alliance for Healthy Homes, representing National Center for Healthy Housing and Alliance for Healthy Homes

1 Add new definitions as follows:

DRAIN TILE LOOP. A continuous length of drain tile or perforated pipe extending around all or part of the internal or external perimeter of a basement or crawl space footing.

RADON GAS. A naturally-occurring chemically inert, radio-active gas that is not detectable by human senses. As a gas, it can move readily through particles of soil and rock and can accumulate under the slabs and foundations of homes where it can easily enter into the living space through construction cracks and openings.

SOIL-GAS-RETARDER. A continuous membrane of 6-mil (0.15 mm) polyethylene or other equivalent material used to retard the flow of soil gases into a building.

SUBSLAB DEPRESSURIZATION SYSTEM (Active). A system designed to achieve lower sub-slab air pressure relative to indoor air pressure by use of a fan-powered vent drawing air from beneath the slab.

SUBSLAB DEPRESSURIZATION SYSTEM (Passive). A system designed to achieve lower sub-slab air pressure relative to indoor air pressure by use of a vent pipe routed through the conditioned space of a building and connecting the sub-slab area with outdoor air, thereby relying on the convective flow of air upward in the vent to draw air from beneath the slab.

SUBMEMBRANE DEPRESSURIZATION SYSTEM. A system designed to achieve lower-sub-membrane air pressure relative to crawl space air pressure by use of a vent drawing air from beneath the soil-gas-retarder membrane.

2. Add new text as follows:

SECTION R325
RADON CONTROL METHODS

R325.1 General. The following construction techniques are required to resist radon entry and prepare the building for post-construction radon mitigation in areas designated by the jurisdiction as having high and moderate potential risk of radon exposure. The determination for designating such areas shall be made using the map contained in Figure R325.1, the list contained in Table R325.1, or locally available data.

R325.2 Subfloor preparation. A layer of gas-permeable material shall be placed under all concrete slabs and other floor systems that directly contact the ground and are within the walls of the living spaces of the building, to facilitate future installation of a sub-slab depressurization system, if needed. The gas-permeable layer shall consist of one of the following:

1. A uniform layer of clean aggregate, a minimum of 4 inches (102mm)thick. The aggregate shall consist of material that will pass through a 2-inch (51mm)sieve and be retained by a 1/4-inch (6.4 mm) sieve.
2. A uniform layer of sand (native or fill), a minimum of 4 inches (102 mm) thick, overlain by a layer or strips of geotextile drainage matting designed to allow the lateral flow of soil gases.
3. Other materials, systems or floor designs with demonstrated capability to permit depressurization across the entire sub-floor area.

R325.3 Soil-gas-retarder. A minimum 6-mil (0.15 mm) [or 3-mil (0.075 mm) cross-laminated] polyethylene or equivalent flexible sheeting material shall be placed on top of the gas-permeable layer prior to casting the slab or placing the floor assembly to serve as a soil-gas-retarder by bridging any cracks that develop in the slab or floor assembly and to prevent concrete from entering the void spaces in the aggregate base material. The sheeting shall cover the entire floor area with separate sections of sheeting lapped at least 12 inches (305 mm). The sheeting shall fit closely around any pipe, wire or other penetrations of the material. All punctures or tears in the material shall be sealed or covered with additional sheeting.

R325.4 Entry routes. Potential radon entry routes shall be closed in accordance with Sections R325.4.1 through R325.4.10.

R325.4.1 Floor openings. Openings around bathtubs, showers, water closets, pipes, wires or other objects that penetrate concrete slabs or other floor assemblies shall be filled with a polyurethane caulk or equivalent sealant applied in accordance with the manufacturer's recommendations.

R325.4.2 Concrete joints. All control joints, isolation joints, construction joints and any other joints in concrete slabs or between slabs and foundation walls shall be sealed with a caulk or sealant. Gaps and joints shall be cleared of loose material and filled with polyurethane caulk or other elastomeric sealant applied in accordance with the manufacturer's recommendations.

R325.4.3 Condensate drains. Condensate drains shall be trapped or routed through nonperforated pipe to daylight.

R325.4.4 Sumps. Sump pits open to soil or serving as the termination point for sub-slab or exterior drain tile loops shall be covered with a gasketed or otherwise sealed lid. Sumps used as the suction point in a sub-slab depressurization system shall have a lid designed to accommodate the vent pipe. Sumps used as a floor drain shall have a lid equipped with a trapped inlet.

R325.4.5 Foundation walls. Hollow block masonry foundation walls shall be constructed with either a continuous course of solid masonry, one course of masonry grouted solid, or a solid concrete beam at or above finished ground surface to prevent passage of air from the interior of the wall into the living space. Where a brick veneer or other masonry ledge is installed, the course immediately below that ledge shall be sealed. Joints, cracks or other openings around all penetrations of both exterior and interior surfaces of masonry block or wood foundation walls below the ground surface shall be filled with polyurethane caulk or equivalent sealant. Penetrations of concrete walls shall be filled.

R325.4.6 Dampproofing. The exterior surfaces of portions of concrete and masonry block walls below the ground surface shall be dampproofed in accordance with Section R406 of this code.

R325.4.7 Air-handling units. Air-handling units in crawl spaces shall be sealed to prevent air from being drawn into the unit.

Exception: Units with gasketed seams or units that are otherwise sealed by the manufacturer to prevent leakage.

R325.4.8 Ducts. Ductwork passing through or beneath a slab shall be of seamless material unless the air-handling system is designed to maintain continuous positive pressure within such ducting. Joints in such ductwork shall be sealed to prevent air leakage. Ductwork located in crawl spaces shall have all seams and joints sealed by closure systems in accordance with Section M1601.4.1.

R325.4.9 Crawl space floors. Openings around all penetrations through floors above crawl spaces shall be caulked or otherwise filled to prevent air leakage.

R325.4.10 Crawl space access. Access doors and other openings or penetrations between basements and adjoining crawl spaces shall be closed, gasketed or otherwise filled to prevent air leakage.

R325.5 Passive submembrane depressurization system. In buildings with crawl space foundations, the following components of a passive sub-membrane depressurization system shall be installed during construction.

Exception: Buildings in which an approved mechanical crawl space ventilation system or other equivalent system is installed.

R325.5.1 Ventilation. Crawl spaces shall be provided with vents to the exterior of the building. The minimum net area of ventilation openings shall comply with Section R408.1 of this code.

R325.5.2 Soil-gas-retarder. The soil in crawl spaces shall be covered with a continuous layer of minimum 6-mil (0.15mm) polyethylene soil-gas-retarder. The ground cover shall be lapped a minimum of 12 inches (305 mm) at joints and shall extend to all foundation walls enclosing the crawl space area.

R325.5.3 Vent pipe. A plumbing tee or other approved connection shall be inserted horizontally beneath the sheeting and connected to a 3- or 4-inch-diameter (76 mm or 102 mm) fitting with a vertical vent pipe installed through the sheeting. The vent pipe shall be extended up through the building floors, terminate at least 12 inches (305 mm) above the roof in a location at least 10 feet (3048 mm) away from any window or other opening into the conditioned spaces of the building that is less than 2 feet (610 mm) below the exhaust point, and 10 feet (3048 mm) from any window or other opening in adjoining or adjacent buildings.

R325.6 Passive subslab depressurization system. In basement or slab-on-grade buildings, the following components of a passive sub-slab depressurization system shall be installed during construction.

R325.6.1 Vent pipe. A minimum 3-inch-diameter (76 mm) ABS, PVC or equivalent gas-tight pipe shall be embedded vertically into the sub-slab aggregate or other permeable material before the slab is cast. A “T” fitting or equivalent method shall be used to ensure that the pipe opening remains within the sub-slab permeable material. Alternatively, the 3-inch (76 mm) pipe shall be inserted directly into an interior perimeter drain tile loop or through a sealed sump cover where the sump is exposed to the sub-slab aggregate or connected to it through a drainage system. The pipe shall be extended up through the building floors, terminate at least 12 inches (305 mm) above the surface of the roof in

a location at least 10 feet (3048 mm) away from any window or other opening into the conditioned spaces of the building that is less than 2 feet (610 mm) below the exhaust point, and 10 feet (3048 mm) from any window or other opening in adjoining or adjacent buildings.

R325.6.2 Multiple vent pipes. In buildings where interior footings or other barriers separate the sub-slab aggregate or other gas-permeable material, each area shall be fitted with an individual vent pipe. Vent pipes shall connect to a single vent that terminates above the roof or each individual vent pipe shall terminate separately above the roof.

R325.7 Vent pipe drainage. All components of the radon vent pipe system shall be installed to provide positive drainage to the ground beneath the slab or soil-gas-retarder.

R325.8 Vent pipe accessibility. Radon vent pipes shall be accessible for future fan installation through an attic or other area outside the habitable space.

> **Exception:** The radon vent pipe need not be accessible in an attic space where an approved roof-top electrical supply is provided for future use.

R325.9 Vent pipe identification. All exposed and visible interior radon vent pipes shall be identified with at least one label on each floor and in accessible attics. The label shall read: “Radon Reduction System.”

R325.10 Combination foundations. Combination basement/crawl space or slab-on-grade/crawl space foundations shall have separate radon vent pipes installed in each type of foundation area. Each radon vent pipe shall terminate above the roof or shall be connected to a single vent that terminates above the roof.

R325.11 Building depressurization. Joints in air ducts and plenums in unconditioned spaces shall meet the requirements of Section M1601. Thermal envelope air infiltration requirements shall comply with the energy conservation provisions in Chapter 11. Fireblocking shall meet the requirements contained in Section R302.11.

R325.12 Power source. To provide for future installation of an active sub-membrane or sub-slab depressurization system, an electrical circuit terminated in an approved box shall be installed during construction in the attic or other anticipated location of vent pipe fans. An electrical supply shall also be accessible

Insert Figure AF101 and renumber as Figure R325.1 follows:

a. pCi/L standard for picocuries per liter of radon gas. EPA recommends that all homes that measure 4 pCi/L and greater be mitigated.

The United States Environmental Protection Agency and the United States Geological Survey have evaluated the radon potential in the United States and have developed a map of radon zones designed t assist building officials in deciding whether radon-resistant features are applicable in new construction.

The map assigns each of the 3,141 counties in the United States to one of three zones based on radon potential. Each zone designation reflects the average short-term radon measurement that can be expected t be measured in a building without the implementation of radon control methods. The radon zone designation of highest priority is Zone 1. Table **R325.1 of this section** lists the Zone 1 counties illustrated o the map. More detailed information can be obtained from state-specific booklets (EPA-402-R-93-021 through 070) available through State Radon Offices or from U.S. EPA Regional Offices.

FIGURE ~~AF101~~ R325.1
EPA MAP OF RADON ZONES

Insert Table AF101(1) and renumber as Table R325.1 as follows:

TABLE ~~AF101(1)~~ R325.1
HIGH RADON POTENTIAL (ZONE 1) COUNTIES[a]

(No change to table contents)

Insert Figure AF102 and renumber as Figure 2 as follows:

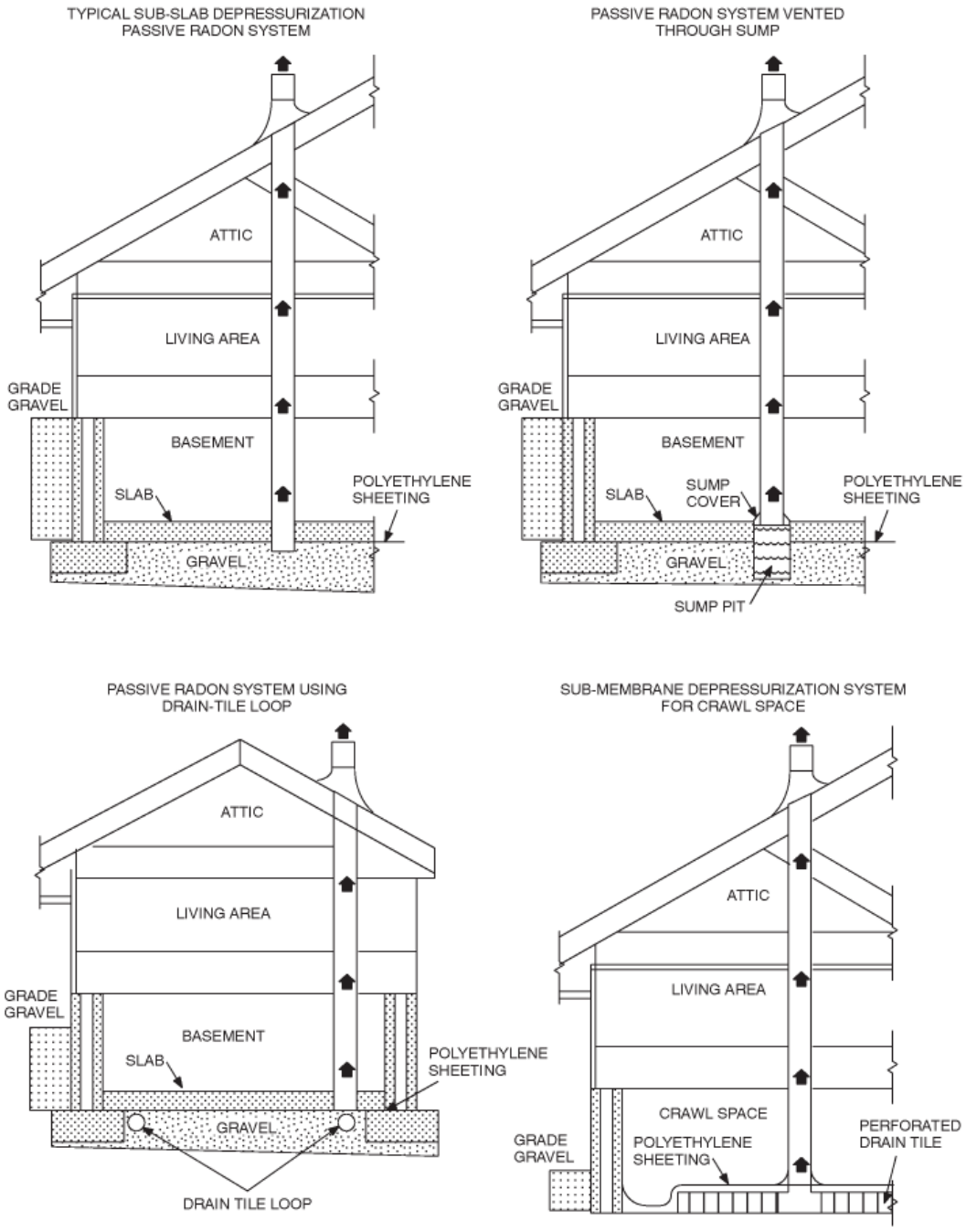


FIGURE ~~AF102~~ 2
RADON-RESISTANT CONSTRUCTION DETAILS FOR
FOR FOUR FOUNATION TYPES

3. Delete Appendix F Radon Control Procedures.

~~**APPENDIX F**~~
~~**RADON CONTROL METHODS**~~

Reason: The purpose of this requirement is to protect occupants from deadly exposure to radon gas. In the current code, provision for radon control, commonly known as radon-resistant new construction, is contained in the optional Appendix F. This proposal to elevate radon control to a requirement in areas documented to have potential for exposing occupants to radon is in response to the dramatic impact of radon exposure. Radon is the second leading cause of lung cancer – second only to smoking – and more significant than secondhand smoke. In the US alone, 18,000-21,000 lung cancer deaths each year are caused by radon exposure. The World Health Organization estimates that between 6% and 15% of lung cancer cases worldwide are caused by radon exposure.

Radon is a tasteless, colorless and odorless gas that is a decay product of uranium and occurs naturally in soil and rock. The main source of high-level radon pollution in buildings is surrounding uranium-containing soil such as granite, shale, phosphate and pitchblende. Radon enters a home through cracks in walls, basement floors, foundations and other openings.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MALONE-RB-1-R202-R325

RB181–09/10
R325 (New), Chapter 44 (New)

Proponent: Jane Malone, Alliance for Healthy Homes, representing National Center for Healthy Housing and Alliance for Healthy Homes

1. Add new text as follows:

SECTION R325
RADON CONTROL METHODS

R325.1 General. The following radon-resistant new construction techniques are intended to prevent radon entry as required in areas designated by the jurisdiction as having high or moderate potential risk of radon exposure. Such areas shall be designated as high potential (Zone 1) or moderate potential (Zone 2) using the map contained in Figure R325.1, the list contained in Table R325.1, or locally available data.

R325.1.1 Active sub-slab soil depressurization radon reduction (fan-powered). An active sub-slab soil depressurization system (fan powered) shall be provided in accordance with ASTM E 1465 where areas are designated as high radon potential (Zone 1).

R325.1.2 Passive sub-slab soil depressurization system. A passive sub-slab soil depressurization system shall be provided in accordance with ASTM E 1465 where areas are designated as moderate radon potential (Zone 2).

Insert Figure AF101 and renumber as Figure R325.1 as follows:

a. pCi/L standard for picocuries per liter of radon gas. EPA recommends that all homes that measure 4 pCi/L and greater be mitigated.

The United States Environmental Protection Agency and the United States Geological Survey have evaluated the radon potential in the United States and have developed a map of radon zones designed t assist building officials in deciding whether radon-resistant features are applicable in new construction.

The map assigns each of the 3,141 counties in the United States to one of three zones based on radon potential. Each zone designation reflects the average short-term radon measurement that can be expected t be measured in a building without the implementation of radon control methods. The radon zone designation of highest priority is Zone 1. Table **R325.1 of this section** lists the Zone 1 counties illustrated o the map. More detailed information can be obtained from state-specific booklets (EPA-402-R-93-021 through 070) available through State Radon Offices or from U.S. EPA Regional Offices.

FIGURE ~~AF101~~ R325.1
EPA MAP OF RADON ZONES

Insert Table AF101(1) and renumber as Table R325.1 as follows:

~~TABLE AF101(1)~~ TABLE R325.1
HIGH RADON POTENTIAL (ZONE 1) COUNTIES[a]

(No change to table contents)

2. Add new standard to Chapter 44 as follows:

ASTM

E1465-08a Standard Practice for Radon Control Options for the Design and construction of New Low-Rise Residential Buildings

Reason: The purpose of this requirement is to protect occupants from deadly exposure to radon gas. In the current code, provision for radon control, commonly known as radon-resistant new construction, is contained in the optional Appendix F. This proposal to elevate radon control to a requirement in areas documented to have high or moderate potential for exposing occupants to radon is in response to the dramatic impact of radon exposure. Radon is the second leading cause of lung cancer – second only to smoking – and more significant than secondhand smoke. In the US alone, 18,000-21,000 lung cancer deaths each year are caused by radon exposure. The World Health Organization estimates that between 6% and 15% of lung cancer cases worldwide are caused by radon exposure.

Radon is a tasteless, colorless and odorless gas that is a decay product of uranium and occurs naturally in soil and rock. The main source of high-level radon pollution in buildings is surrounding uranium-containing soil such as granite, shale, phosphate and pitchblende. Radon enters a home through cracks in walls, basement floors, foundations and other openings.

Under this proposal, the most recently updated ASTM consensus standard for radon control would be added to the code. Among the advantages of the more health protective ASTM standard over the optional Appendix F is its specification for an active fan-powered radon control system. The US Environmental Protection Agency recommends this standard as the approach for radon resistant new construction; through agreement with ASTM, EPA can provide a free copy of the standard - see http://www.epa.gov/radon/pubs/index.html.

Cost Impact: The code change proposal will increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E 1465, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MALONE-RB-2-R325

RB182–09/10
Appendix R (New)

Proponent: Diana M. Hanson, representing the North American Deck and Railing Association, Inc. (NADRA)

Add new text as follows:

APPENDIX R
DECKS

SECTION AR101
GENERAL

AR101.1 Scope. Decks shall conform to the requirements of this appendix chapter.

SECTION AR102
DEFINITIONS

AR102.1 General. Decks include exterior floor systems that are supported by attachment to at least one exterior wall and/or are self-supporting

DECK. An exterior floor system supported on at least two opposing sides by an adjoining structure and/or post, piers, or other independent supports.

ATTACHED DECKS. Decks that are supported by attachment to one or more exterior walls of a dwelling or accessory structure and/or the ground or grade.

FREE STANDING DECKS. Decks that are self-supporting and are not structurally dependant on support from an attachment to a dwelling or accessory structure.

MANUFACTURED DECKING MATERIALS. Deck boards, railings, balusters, posts, and all other guards, which are made of other than sawn lumber; such as wood/plastic composites, plastic, metal, glazed materials and the like.

SECTION AR103
PERMITTED USES

AR103.1 General. Decks shall be permitted to be attached to or detached from dwelling or accessory structures. Decks shall be used only for recreational, outdoor living purposes and not as storage rooms or habitable rooms.

SECTION AR104
PERMITTING

AR104.1 General. Permits are required for decks unless exempted under Section R105.2 of this code.

SECTION AR105
DESIGN LOADS

AR105.1 General. Decks shall be designed and constructed to sustain, within the stress limits of this code, dead and live loads in accordance with Table R301.5.

SECTION AR106
MATERIALS AND CONSTRUCTION

AR106.1 Columns. Where decks are designed to include columns, they shall comply with Section R407.

AR106.2 Deck boards.

AR106.2.1 Common lumber species deck boards. Decks which are designed with Common Lumber Species Deck Boards shall be installed to comply with Table AR106.2.1 of this Appendix R:

Table AR106.2.1
Wet Service Deck Board Span Tables

Species	Dimension	Perpendicular to Joist	Angled to Joist
Southern Pine or Douglas Fir	5/4 x 6	16"	12"
	2 x 4	24"	16"
Redwood or Cedar	5/4 x 6	16"	12"
	2 x 4	24"	16"
	2 x 6	24"	16"
Mahogany or Ipe	1 x 4	20"	16"
	5/4 x 6	24"	16"

AR106.2.2 Manufactured deck boards. Decks which are designed to include Manufactured Deck Boards shall be designed and installed in accordance with the provisions of this code, and the manufacturer's installation instructions.

AR106.2.3 Treated wood deck boards. Decks which are designed to include preservative-treated wood shall be of a type, and installed in accordance with R317.

AR106.3 Fasteners. Where decks are designed to use preservative-treated wood, fasteners shall comply with Section R317.3 of this code.

AR106.4 Footings. Footings shall comply with Section R403 of this code.

AR106.5 Joist spans. Joist spans for decks shall comply with Table AR106.5 of this Appendix R.

Table AR106.5
Wet Service Joist Span Table[a, b]

Joist Dimension (inches)	Species	On-center Joist Spacing	Live Load 40 psf	Live Load 60 psf	Live Load 100 psf
2 x 6	Hem Fir	12"	9-6	8-4	6-10
		16"	8-8	7-5	5-11
		24"	7-2	6-1	4-10
	Southern Pine	12"	10-4	9-1	7-6
		16"	9-5	8-1	6-6
		24"	7-10	6-8	5-3
2 x 8	Hem Fir	12"	12-6	10-10	8-8
		16"	11-1	9-5	7-6
		24"	9-1	7-8	6-1
	Southern Pine	12"	13-8	11-11	9-8
		16"	12-5	10-6	8-4
		24"	10-2	8-7	6-10
2 x 10	Hem Fir	12"	15-8	13-3	10-7
		16"	13-7	11-6	9-2
		24"	11-1	9-4	7-6
	Southern Pine	12"	17-5	15-2	12-6
		16"	15-10	13-7	10-10
		24"	13-1	11-1	8-10
2 x 12	Hem Fir	12"	18-2	15-4	12-3
		16"	15-9	13-4	10-7
		24"	12-10	10-10	8-8
	Southern Pine	12"	21-2	18-5	14-8
		16"	18-10	15-11	12-8
		24"	15-5	13-0	10-4

a. The following assumptions have been made to perform the calculations used to create these spans:
   Joist material #2 Grade or better
   10 psf dead load
   Southern Pine wood of 0.55 Specific Gravity
   Hem Fir wood of 0.43 Specific Gravity
   Adjustment factors applied for wet service on both woods. Incised factor applied to Hem Fir.
   Deflection is limited to span in inches divided by I/360 on live load.

b. For species and dimensions not included in this table, see AF&PA Maximum Span Calculator for Joists and Rafters online at http://www.awc.org/calculators/span/calc/timbercalcstyle.asp

AR106.6 Ledger connections. Attached Decks shall comply with Section R502.2.2 of this code.

AR106.7 Manufactured decking materials. Decks which are designed with manufactured decking materials shall be installed according to manufacturer's specifications, and shall comply with the applicable standard(s) in accordance with this code. Manufactured decking materials shall consist of:

1. Wood/plastic composites complying with ASTM D7032.
2. Glazed material complying with CPSC 16 CFR 1201, or ANSI Z97.1.
3. Other approved manufactured material.

AR106.7.1 Wood/plastic composites shall be labeled according to R317.4 of this code.

AR106.7.2 Treated wood. Decks which are designed to include preservative-treated wood shall be of a type, and installed in accordance R317.

SECTION R107
FLASHING

AR107.1 General. Attached decks shall comply with Section R703.8 of this code.

SECTION AR108
GLAZING

AR108.1 General. Where decks are designed near or adjacent to glazing, they shall comply with Section R308.4 of this code.

SECTION AR109
GUARD REQUIREMENTS

AR109.1 General. Where decks are designed to include guards, they shall comply with Section R312 of this code, and Table R301.5.

SECTION AR110
STAIRWAYS

AR110.1 General. Where decks are designed to include stairways, they shall comply with Section R311.7 of this code.

Reason: This proposal to add Appendix R to the IRC is to rectify a deficiency currently existing with respect to decks. While many of the components of a deck are addressed the IRC, since a deck is not a house and is sometimes detached, it is at best difficult for the code official and the builder to find and use the correct IRC sections, or specified prescriptive detailed direction on decks that are required to be engineered and certified for the design when done. As a result, approving plans and performing inspections on decks is a frustrating experience for even the most IRC-fluent code official. In addition, because the IRC is written with respect to houses, not everything required of a deck for safe building is contained in the IRC.

All of the above puts the decking industry in a similar situation as both the awning and the pool and spa industry, which already have appendices in the IRC, namely Appendix G *"Swimming Pools, Spas and Hot Tubs"* and Appendix H *"Patio Covers."* We are simply looking to use a tool that has been used before, to address specific areas related to decking.

North American Deck and Railing Association, Inc. (NADRA) is a trade organization whose membership is comprised of approximately 2/3rds deck builders, with the remaining members being manufacturers and suppliers of goods and services to the decking industry. NADRA is committed to encouraging safe deck building, and educating the consumer. While NADRA is the proponent of Appendix R, understand that its undertaking involved input from areas outside of our organization including seasoned code officials, engineers, and representatives from other trade organizations, to build an Appendix useful not only the code professional, but to the builder and consumer as well.

While a central function of model codes is to create uniformity in building safety practices, such uniformity is not possible for deck builds due to the complicated way decks are currently referenced in the IRC. The result of this deficiency is that many jurisdictions adopt their own sets of deck regulations. Such locally created regulations routinely contradict each other, are not all based on the IRC, but rather on that jurisdiction's ideas of good building practices; and some even prescribe name brand product. Granting Appendix R a place in the IRC will curb the growing number of single jurisdiction instructions, and will continue the ICC purpose of uniform building safety practices.

Proposed Appendix R directly addresses attached and detached deck builds by indexing specific deck related IRC sections, and standards in one location. It also includes reputable source guidelines to address deficiencies such as wood floor joists rated for outdoor use.

The two wood span tables in proposed Appendix R originate from IRC tables, but include a wet service factor calculation. This is an area of serious frustration for builders and code officials since the IRC does not address exterior use of the types and shapes of wood necessary for safe deck building. Table AR106.5 allows for quick verification of compliance without doing the lengthy math, which is the basis for the wood span tables currently in the dry section of the main body of code. The wet service calculation for Table AR106.5 (joists) comes from AF&PA Maximum Span Calculator for Joists and Rafters. Table AR106.2.1 (deck boards) is based on good building practices within the industry.

Proposed Appendix R provides the reference for basic deck construction. We estimate that this will cover 75 – 80% of the decks being built now. Other more complicated designs will, appropriately, continue to need engineering. However, without the approval of Appendix R, even the most simple prescriptive deck can be said to need an engineer's stamp for a permit. Certainly, proposed Appendix R is an improvement to the code, and will additionally reserve a location for further deck specific code as model code continues to evolve.

References for Table AR106.5:
http://www.calredwood.org/ref/pdf/deckcon.pdf
http://newstore.southernpine.com/images/ref307.pdf
http://www.wrcla.org/pdf/WRCLA_Specifying_Decking.pdf
http://www.wclib.org/pdfs/SimpSpanTbls.pdf

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HANSON-RB-1-APPENDIX R

RB183 –09/10
Appendix R (New)

Proponent: Joseph R. Hetzel, PE, Thomas Associates, Inc., representing Door & Access Systems Manufacturers Association (DASMA)

Add new text as follows:

APPENDIX R
AUTOMATIC VEHICULAR GATES

SECTION AR101
GENERAL

AR101.1 General. The provisions of this appendix shall control the design and construction of automatic vehicular gates installed on the lot of a one- or two-family dwelling.

SECTION AR102
DEFINITIONS

AR102.1 General. For the purposes of these requirements, the terms used shall be defined as follows and as set forth in Chapter 2.

VEHICULAR GATE. A gate that is intended for use at a vehicular entrance or exit to the lot of a one- or two-family dwelling, and that is not intended for use by pedestrian traffic.

SECTION AR103
AUTOMATIC VEHICULAR GATES

AR103.1 Vehicular gates intended for automation. Vehicular gates intended for automation shall be designed, constructed and installed to comply with the requirements of ASTM F 2200.

AR103.2 Vehicular gate openers. Vehicular gate openers, when provided, shall be listed in accordance with UL 325.

SECTION AR104
ABBREVIATIONS

AR104.1 General

ASTM – ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428

UL – Underwriters Laboratories, Inc.
333 Pfingsten Road
Northbrook, IL 60062-2096

SECTION AR105
STANDARDS

AR105.1 General

ASTM
F2200-05 Standard Specification for Automated Vehicular Gate Construction…..AR103.1

UL
325-2006 Door, Drapery, Gate, Louver, and Window Operators and Systems…..AR103.2

Reason: The purpose of the proposed code change is to address an omission in the IRC by including an Appendix section on Automatic Vehicular Gates, and to also harmonize the IRC with the IFC and the IBC regarding the subject. The 2009 IFC utilizes the proposed language in Sections 503.5 (required gates or barricades), 503.6 (security gates) and Appendix D103.5 (fire apparatus access road gates). The 2009 IBC utilizes the proposed language in Section 3110. The only deviation from the language in the IBC is the definition of "automatic gate" which has been modified to fit the scope of the IRC.

The current Code provisions are inadequate because public safety needs are not addressed regarding automatic operation of vehicular gates. Protection is needed from potential entrapment of individuals between an automatically moving gate and a stationary object, or surface, in close proximity to such gate. Gates intended for automation require specific design, construction and installation to accommodate entrapment protection to minimize or eliminate certain excessive gate gaps, openings and protrusions identified as contributing to the hazard of entrapments that have historically caused numerous serious injuries and deaths.

The Code will be improved by including provisions referencing UL 325 and ASTM F 2200. UL 325 is an ANSI recognized safety standard containing provisions governing gate openers. Gate openers listed to the requirements of UL 325 provide the public with assurance that safety requirements have been met for such openers. ASTM F 2200 is a consensus document containing provisions governing the construction of vehicular gates intended for automation, and has been harmonized with the applicable provisions of UL 325.

Death and injury data does exist associated with automated vehicular gates. A previous related proposal on the topic, submitted in 2002 by the Consumer Product Safety Commission and designated as E34-02, pointed out the following information compiled by the CPSC from 1985 to that time:

1. Reports of 32 deaths relating to automatically operated vehicular gates were received, many as a result of entrapment between a moving gate and a stationary object.
2. Data from the National Electronic Injury Surveillance System estimated that approximately 2,000 people are treated annually in hospital emergency rooms due to injuries in such gates. Many of these injuries have been identified as serious, involving amputation, broken arms and broken legs.

Cost Impact: The code change proposal will increase the cost of construction. However, the resulting safety benefits will outweigh the increased cost.

Analysis: A review of the standard proposed for inclusion in the code, ASTM F2200 and UL 325, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HETZEL-RB-2-APPENDIX R

RE1 –09/10

N1101.2, N1101.2.1 through N1101.9, N1102, N1103, Appendix R (New)

Proponent: Bill Fay, Efficient Codes Coalition; Brian Dean, ICF International

1. Revise as follows:

N1101.2 Compliance. Compliance shall be demonstrated by ~~either~~ meeting the requirements of the *International Energy Conservation Code* ~~or meeting the requirements of this chapter. Climate zones from Figure N1101.2 or Table N1101.2 shall be used in determining the applicable requirements from this chapter~~.

2. Delete Sections N1101.2.1-N1101.9, N1102 and N1103 in their entirety (including all tables).

3. Add new text as follows to the appendix to the International Residential Code:

APPENDIX R
INTERNATIONAL ENERGY CONSERVATION CODE

(This appendix excerpts sections of the *International Energy Conservation Code* relevant to buildings regulated by the *IRC*. This appendix is informative and is not part of the code; however, note that section N1101.2 requires building regulated by the *IRC* to meet the requirements of the *IECC*.)

Reprint the following sections of the *International Energy Conservation Code* as Appendix R:

***(1) IECC* Chapter 1 Administration (all Sections, except Sections 101.1-101.2, 101.4.6, and 101.5)**
***(2) IECC* Chapters 2-4 and Chapter 6.**

Reason: This proposal is intended to permanently resolve the growing inconsistencies between the *IECC* (which is also referenced in the IBC) and the *IRC* by referencing a single set of energy efficiency requirements for all three codes (the *IECC*) and, for ease of reference, including the requirements in new Appendix R of the *IRC*. The proposal also makes code compliance and enforcement more uniform and streamlined.

The Problem. The problem of an inconsistent *IRC* and *IECC*, where the *IRC* energy provisions are weaker and less rigorous than the *IECC*, is well-known. The *IECC* and *IRC* are reviewed by two different code development committees. Proposals must be heard twice (using substantially more resources and prolonging the hearings by days), and the outcome is frequently different. It is then up to the code officials at the Final Action Hearing to sort through the two committees' differing opinions and decide on the best course. As long as there are two codes and two committees, inconsistency will continue to grow, creating problems for jurisdictions that seek to implement a single set of energy efficiency requirements for residential buildings.

The Solution. This proposal presents the best long-term solution for code consistency and uniform enforcement. Just as *IBC* Chapter 13 references the *IECC* for its energy efficiency requirements, *IRC* Chapter 11 would reference the *IECC*. To preserve the convenience of a single-volume residential code, ICC would reprint the relevant sections of the *IECC* in a new Appendix at the end of the *IRC*. In subsequent cycles, as the *IECC* is updated, the *IRC* Chapter 11 would be automatically (and identically) updated by virtue of the reference to the *IECC*. Because Chapter 11 would already require compliance with the IECC, jurisdictions would not need to specifically adopt the new appendix in order for the IECC to be effective.

The general approach of replacing the *IRC* energy chapter with the *IECC* has already been tested in several states. In fact, the *IRC* already references the *IECC* for the performance path (N1101.2), so any state that adopts the *IRC* already automatically adopts the requirements of the *IECC* as a compliance option. Several states have already taken the step suggested by this proposal by exclusively referencing the *IECC* for energy efficiency requirements. The new appendix will add even more convenience to this solution.

The *IECC* Is the Best Single Energy Efficiency Standard. The *IECC* is recognized in federal law and nationwide as the comprehensive model energy code for all residential and commercial buildings. More than two thirds of states have adopted the *IECC* as their mandatory statewide energy code. National, state and local policymakers are demanding a substantially improved level of energy efficiency in building energy codes to meet the nation's security, environmental and energy cost needs. At the same time, building officials demand uniformity and consistency in the International family of codes.

Under the federal Energy Policy Act of 1992, the US Department of Energy (DOE) is required to review each new version of the *IECC* and determine if it is an improvement in energy efficiency over previous versions. (*IRC* Chapter 11 does not undergo such a rigorous assessment by DOE, so it is not clear whether it would meet the same high standard for energy efficiency improvement.) States are also required by federal law to undertake a review of the state energy code and determine whether state energy efficiency requirements meet the stringency of the *IECC* every time the Department of Energy makes a determination on the updated *IECC*.

The *IECC* also serves as the basis for federal tax credits for energy efficient homes, energy efficiency standards for federal buildings, and qualification for FHA mortgages. The *IECC* is also referenced in LEED and many other state and federal programs.

Most recently, the adoption of the 2009 *IECC* was designated by Congress as a threshold requirement for states to receive $3.2 billion in State Energy Program funds through the American Recovery and Reinvestment Act (Stimulus Bill). None of these programs even references the *IRC*. For all these reasons, the *IECC* is the logical selection as the single energy efficiency standard for the International Codes.

The Benefits of the *IECC* as the Single Energy Efficiency Standard

- **True Consistency**. This proposal fixes inconsistencies between the *IRC* and the *IECC*/*IBC* that have developed over time, and ensures consistency in the future. Even if all code change proposals in the current cycle were 100% consistent, the *IECC* and *IRC* would still be different because of changes made in earlier editions, and would likely be different in the future because two separate committees are reviewing the same code language.

This proposal does not expand or reduce the number of compliance options available to builders. It simply consolidates them in the most reasonable place. The energy efficiency requirements of the *IBC*, *IRC* and *IECC* would be unified into a single set of requirements that comply with all three codes and ensures that all three codes meet the same energy efficiency and building quality standards in the future.

- **Proposals Reviewed and Approved By a Balanced Committee of Experts.** The *IECC* is currently developed by a committee that it is populated by experts in building energy efficiency and where no organization has more than one voting seat.

- **Streamlined Enforcement**. Once all three I-codes have a unified set of energy efficiency requirements, enforcement will become much simpler. A builder complying with the *IRC* Chapter 11 will automatically meet the requirements of the *IBC* and *IECC*. Builders will only need to follow one set of requirements, and code officials can enforce a single set of requirements.

Less Complicated Code Hearings. This proposal would eliminate a good deal of redundancy in the current code development process by centralizing the energy efficiency requirements in a single committee. Rather than force proponents and code officials to endure hours – even days – of the same testimony before two different committees, this proposal would streamline the process and yield a more consistent result.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: FAY-RE-1-N1101.2-APPENDIX R

RE2 –09/10

N1101.2-N1101.9, N1102 and N1103

Proponent: Jeff Harris, Alliance to Save Energy and Ronald Majette, US Department of Energy

1. Revise as follows:

N1101.2 Compliance. Compliance shall be demonstrated by ~~either~~ meeting the requirements of the *International Energy Conservation Code* ~~or meeting the requirements of this chapter. Climate zones from Figure N1101.2 or Table N1101.2 shall be used in determining the applicable requirements from this chapter~~. For consistency and convenience, the relevant administrative provisions, supplemental definitions, prescriptive and mandatory requirements of the *IECC* applicable to buildings regulated by this code are reprinted below. For the Simulated Performance Alternative, buildings regulated by this code shall comply with *IECC* Section 405. Solely for the purpose of compliance with this section, in the event of any conflicts in definitions or referenced standards between the *IECC* and *IRC*, the respective definition or referenced standard from the *IECC* shall control.

2. Delete Sections N1101.2.1-N1101.9, N1102 and N1103 in their entirety (including all tables), and reprint the following sections of the IECC, coordinated with the section numbering of the IRC:

(1) IECC Chapter 1 Administration (all Sections, except Sections 101.1-101.2, 101.4.6, and 101.5)
(2) IECC Chapter 2 Definitions (all Sections)
(3) IECC Chapter 3 Climate Zones (all Sections)
(4) IECC Chapter 4 Residential Energy Efficiency (Sections 401-404)
(5) IECC Chapter 6 Referenced Standards (All Standards).

Reason (Harris) : This proposal is intended to permanently resolve the growing inconsistencies between the *IECC* (which is referenced by the *IBC*) and the *IRC* by referencing a single set of energy efficiency requirements for all three codes (the *IECC*) and reprinting those requirements directly in Chapter 11 of the *IRC*. The proposal also makes code compliance and enforcement more uniform and streamlined.

The Problem. The problem of an inconsistent *IRC* and *IECC* , where the *IRC* energy provisions are weaker and less rigorous than the *IECC*, is well-known. The *IECC* and *IRC* are reviewed by two different code development committees. Proposals must be heard twice (using substantially more resources and prolonging the hearings by days), and the outcome is frequently different. It is then up to the code officials at the Final Action Hearing to sort through the two committees' differing opinions and decide on the best course. As long as there are two codes and two committees, inconsistency will continue to grow, creating problems for jurisdictions that seek to implement a single set of energy efficiency requirements for residential buildings.

The Solution. This proposal presents a reasonable long-term solution for code consistency and uniform enforcement. Just as *IBC* Chapter 13 references the *IECC* for its energy efficiency requirements, *IRC* Chapter 11 would reference the *IECC*. To preserve the convenience of a single-volume residential code, ICC would reprint the relevant sections of the *IECC* in chapter 11 of the *IRC*. In subsequent cycles, as the *IECC* is updated, the *IRC* Chapter 11 would be automatically (and identically) updated by virtue of the reference to the *IECC*.

The general approach of replacing the *IRC* energy chapter with the *IECC* has already been tested in several states. In fact, the *IRC* already references the *IECC* for the performance path (N1101.2), so any state that adopts the *IRC* already automatically adopts the requirements of the *IECC* as a compliance option. Several states have already taken the step suggested by this proposal by exclusively referencing the *IECC* for energy efficiency requirements. The new appendix will add even more convenience to this solution.

The *IECC* Is the Best Single Energy Efficiency Standard. The *IECC* is recognized in federal law and nationwide as the comprehensive model energy code for all residential and commercial buildings. More than two thirds of states have adopted the *IECC* as their mandatory statewide energy code. National, state and local policymakers are demanding a substantially improved level of energy efficiency in building energy codes to meet the nation's security, environmental and energy cost needs. At the same time, building officials demand uniformity and consistency in the International family of codes.

Under the federal Energy Policy Act of 1992, the US Department of Energy (DOE) is required to review each new version of the *IECC* and determine if it is an improvement in energy efficiency over previous versions. (*IRC* Chapter 11 does not undergo such a rigorous assessment by DOE, so it is not clear whether it would meet the same high standard for energy efficiency improvement.) States are also required by federal law to undertake a review of the state energy code and determine whether state energy efficiency requirements meet the stringency of the *IECC* every time the Department of Energy makes a determination on the updated *IECC*.

The *IECC* also serves as the basis for federal tax credits for energy efficient homes, energy efficiency standards for federal buildings, and qualification for FHA mortgages. The *IECC* is also referenced in LEED and many other state and federal programs.

Most recently, the adoption of the 2009 *IECC* was designated by Congress as a threshold requirement for states to receive $3.2 billion in State Energy Program funds through the American Recovery and Reinvestment Act (Stimulus Bill). None of these programs even references the *IRC*. For all these reasons, the *IECC* is the logical selection as the single energy efficiency standard for the International Codes.

The Benefits of the *IECC* as the Single Energy Efficiency Standard

- **True Consistency**. This proposal fixes inconsistencies between the *IRC* and the *IECC*/*IBC* that have developed over time, and ensures consistency in the future. Even if all code change proposals in the current cycle were 100% consistent, the *IECC* and *IRC* would still be different because of changes made in earlier editions, and would likely be different in the future because two separate committees are reviewing the same code language.
  This proposal does not expand or reduce the number of compliance options available to builders. It simply consolidates them in the most reasonable place. The energy efficiency requirements of the *IBC*, *IRC* and *IECC* would be unified into a single set of requirements that comply with all three codes and ensures that all three codes meet the same energy efficiency and building quality standards in the future.
- **Proposals Reviewed and Approved By a Balanced Committee of Experts.** The *IECC* is currently developed by a committee that it is populated by experts in building energy efficiency and where no organization has more than one voting seat.
- **Streamlined Enforcement**. Once all three I-codes have a unified set of energy efficiency requirements, enforcement will become much simpler. A builder complying with the *IRC* Chapter 11 will automatically meet the requirements of the *IBC* and *IECC*. Builders will only need to follow one set of requirements, and code officials can enforce a single set of requirements.
-

Less Complicated Code Hearings. This proposal would eliminate a good deal of redundancy in the current code development process by centralizing the energy efficiency requirements in a single committee. Rather than force proponents and code officials to endure hours – even days – of the same testimony before two different committees, this proposal would streamline the process and yield a more consistent result.

Reason (Majette): The proposed change is intended to eliminate inconsistencies between the IECC and IRC, the two primary codes that relate to residential buildings, and reduce the significant burden of maintaining two similar but not quite identical codes in the ICC's code development process. It does so by eliminating the nearly duplicative provisions of IRC Chapter 11 and replacing them with a reference to the IECC.

This approach is consistent with the way the IBC (Chapter 13) references the IECC for energy efficiency requirements, but to accommodate residential builders' need for a single-volume code solution, the portions of the IECC relevant to one- and two-family dwellings and townhouses three stories or less above grade will be reprinted for convenience in place of the current Chapter 11 text.

The consolidation of the ICC's two residential energy efficiency codes around the IECC is appropriate for the following reasons:

- The IECC is the unambiguous standard of reference that DOE, by Congressional mandate, establishes for its energy code determinations. The Energy Policy Act of 1992 (EPAct-92) requires DOE to evaluate each new version of the IECC to determine whether it will save energy in residences. Because the IRC energy chapter differs in substantive ways from the IECC, DOE is unable to recognize it as an equivalent code.

- The IECC is the unambiguous standard of reference for DOE's evaluations of state energy codes. EPAct-92 requires that states, following any DOE determination that a new version of the IECC saves energy, certify to DOE whether it is appropriate to upgrade their code(s) to meet or exceed that new IECC version.
- The IECC is the predominant residential building energy code in the U.S. About two-thirds of the states reference or are based on some version of the IECC.
- The IECC is the predominant standard of reference for residential above-code programs in the U.S. It serves as the baseline for federal tax credits for energy efficient homes, energy efficiency standards for federal buildings, and qualification for FHA mortgages. It is also referenced in LEED and many other state and federal programs and has been used as the primary source for baseline assumptions in RESNET's home energy rating systems.
- The IECC is the unambiguous threshold for states seeking State Energy Program funds made available by the American Recovery and Reinvestment Act of 2009.
- Because the IRC currently lags behind the IECC in overall energy efficiency, DOE cannot provide compliance tools and support for states that adopt it.
- Maintaining both the IECC and the IRC energy chapter in the ICC's code development process represents a near doubling of efforts by interested parties and ICC staff, with the typical outcome that the IRC energy chapter cannot be used in any of the programs listed above.

This proposal would eliminate the duplicative efforts, eliminate confusion within state governments, streamline code enforcement and the necessary training and tool development, lessen the bureaucratic load on the U.S. DOE, guarantee true consistency between the IECC and the IRC, and sustain the availability of the IRC as a single-volume residential code.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HARRIS-RE-1-MAJETTE-RE-1-N1101.2, N1101.9

RE3–09/10
Chapter 11

Proponent: Guy Tomberlin, Fairfax County, VA, representing Plumbing and Mechanical Inspectors/VA Building and Code Officials and ICC Region 7

Delete and substitute as follows:

Delete existing Chapter 11 in its entirety. Replace with Chapter 4 of the International Energy Conservation Code.

Reason: The process has become far too cumbersome trying to keep these two documents coordinated. There should not be two different sets of rules, that simply goes against the foundation of the energy code. Unfortunately, giving control of Chapter 11 to the IECC Code Development Committee cannot be accomplished in a code change proposal, but this would certainly be the ideal situation. This proposal is a fresh approach at starting over and "clearing the slate." It will allow a new beginning with the two documents containing the exact same provisions. Making Chapter 11 of the IRC identical with Chapter 4 of the IECC, right now, will establish total consistency and encourage them to remain parallel in the future.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-RE-1-CHAPTER 11

RE4–09/10
Chapter 11

Proponent: Guy Tomberlin, Fairfax County, VA, representing Plumbing and Mechanical Inspectors/VA Building and Code Officials and ICC Region 7

1. Delete without substitution as follows:

Delete the current text of Chapter 11 in its entirety with the exception of Section N1101.1.

2. Add new text as follows:

N1101.2 Requirements. Buildings shall be designed and constructed in accordance with Chapter 4 of the *International Energy Conservation Code*.

Reason: The process has become far too cumbersome trying to keep these two documents coordinated. The there should not be two different sets of rules, that simply goes against the foundation of the energy code. The International Code Council already has a similar situation as this recommended practice set in place and it is working quite well with the International Fuel Gas Code and the International Residential Code Chapter 24 provisions. Maintaining consistency between the commercial and residential provisions should not be a membership function and it is not

reasonable for the members to be responsible for this administrative task. It has become extremely time consuming, not to mention nearly impossible, just trying to cover all the changes applicable to both codes and then come back the next code cycle and attempt to coordinate. In the current process one code or the other is behind a complete cycle while proponents work feverishly to try to catch up. Now with the new policies in place, for the code development hearings between print editions, the current system will equal 3 years of inconsistent regulations. The make–up of the IECC Code Development Committee could easily be altered to accommodate all the interested parties. An added benefit to this proposal would be the time savings during the code change process by just by having a single committee hear all the energy proposals.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: TOMBERLIN-RE-1-CHAPTER 11-2

RE5–09/10
N1102.3.7 (New)

Proponent: Garrett A. Stone, Brickfield Burchette Ritts & Stone, representing Cardinal Glass Industries

Add new text as follows:

N1102.3.7 Maximum fenestration U-factor and SHGC. The area-weighted average maximum fenestration U-factor permitted using trade-offs under this code shall be 0.48 in Zones 4 and 5 and 0.40 in Zones 6 through 8 for vertical fenestration, and 0.75 in zones 4 through 8 for skylights. The area weighted average maximum fenestration SHGC permitted using trade-offs under this code in Zones 1 through 3 shall be 0.50.

Reason: This proposal will make the *IECC* and *IRC* consistent by inserting the trade-off maximum from the IECC into the *IRC*.

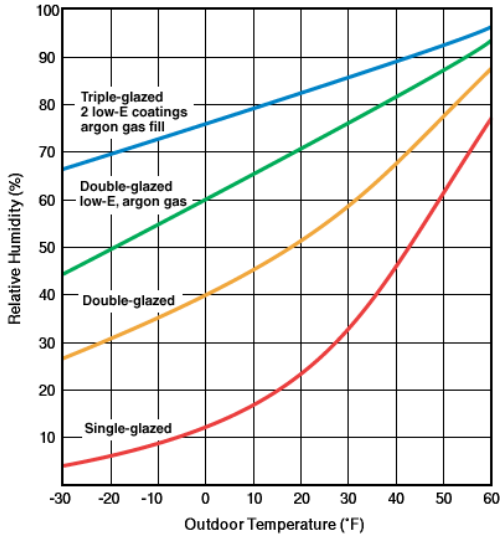
Given that windows are the weakest energy efficiency link in the building envelope, it is critical that we get windows right in homes. The best windows are typically about R-3 – less efficient than an un-insulated wall. The fenestration trade-off maximums proposed here are simple, mandatory limits that ensure all new homes contain high-quality, cost-effective windows. This objective is important to save energy and reasonably preserve comfort in all climate zones. These limits will result in windows that resist condensation in colder climates and block unwanted solar gain in warmer climates. Peak demand and HVAC sizing will also be reduced. In short, the limits are necessary to make sure that reasonable windows are not traded away with enormous unintended negative consequences.

The Limits Allow Sufficient Flexibility: The proposed provision allows considerable flexibility for builders to install decorative glass, glass block, and other fenestration products, while maintaining a baseline performance for the home's overall glazing – this flexibility comes from the fact that the provision is satisfied based on area-weighted average SHCG or U-factor. As a result, not all products need to individually meet the limits; only the area weighted average of all products in the home is required to meet the designated limit. Flexibility is further enhanced because the limit in each climate zone is one value – in northern climates the limit is based on U-factor and in southern climates on SHGC. Thus, there is substantial room and flexibility for the builder to use products that are exceptions. The limits are modest numbers that are achievable by most glazing products currently on the market in each climate zone. The *IRC and IECC* currently employs a number of other mandatory measures (including a mandatory maximum fenestration air leakage number) to ensure that the minimum code house is reasonably constructed –this proposal is no different.

The Limits Facilitate Ease of Compliance: These trade-off limits are effective and easy to understand and comply with. They have been successfully applied under the *IECC* for the past few years. All states that have already adopted the 2006 or 2009 *IECC*s have adopted these maximums without amendment. They are also already built in "under the hood" for compliance software such as REScheck.

The Limits Protect the Consumer and Builder. The trade-off limits are a key safety net and homeowner protection in a code that allows unlimited glazing area in the Prescriptive and Total UA compliance paths (indeed, the adoption of the maximums in the first place was in part a response to the elimination of glazing restrictions in 2004). By ensuring good windows, consumers are protected from higher energy bills, condensation and discomfort – while builders are protected from call-backs on these fronts.

The Limits Result in Improved Condensation Resistance. Efficient windows as required by the proposed limits will improve condensation resistance. The following chart is found on the Efficient Window Collaborative (EWC) website (www.efficientwindows.org). It shows the condensation potential for different window types.

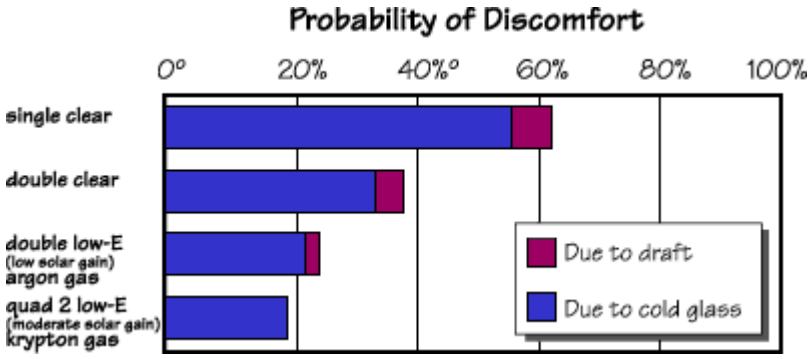


Note: Condensation occurs above the lines for each product type

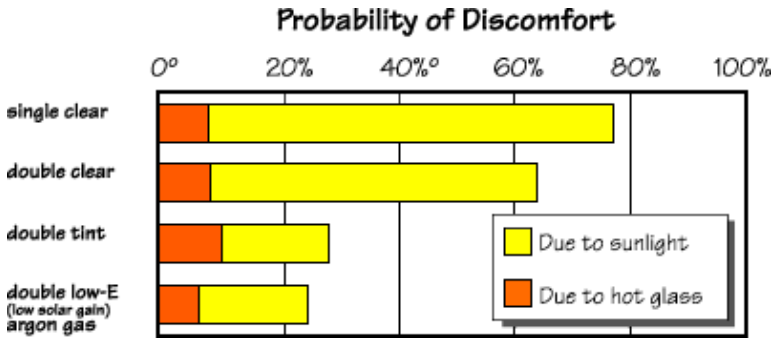
According to the chart, a typical double-glazed low-e window can withstand a 0 degree outdoor temperature and 60% relative humidity inside before condensation will begin to collect. By contrast, a regular double-glazed window can only withstand 40% humidity at the same outdoor temperature. In other words, a low-e window has a 50% more effective ability to resist condensation. A single-glazed window is far worse – it can withstand less than 15% humidity at the same temperature – a virtual guarantee of damaging condensation. The fenestration maximums substantially reduce the likelihood of condensation in the colder months, reducing call-back and consumer dissatisfaction and enhancing durability and long-term benefits for the homeowner.

The Limits Result in More Comfortable Homes and Less Energy Use. Without adequate occupant comfort, any perceived energy savings will be instantly lost when an occupant adjusts the thermostat to correct their discomfort. Relatively small changes in window U-factors and SHGCs can have a disproportionate impact on occupant comfort. Everyone has experienced discomfort at some point due to poor windows. Hot spots created by high solar gain in the summer and cold or drafty glass in the winter months can force an occupant to adjust the thermostat to compensate. The charts below, again displayed on the EWC website, show that the likelihood of significant occupant discomfort can double or triple, depending on the type of glass installed.

For example, the following graph shows the probability of discomfort during winter from poorer windows ranging from over 60% with single pane clear windows and almost 40% with double pane clear windows. This risk declines to almost 20% with a low-e window as specified by the limits for northern climates. This problem is due to the cold window -- at zero degrees outdoors, the single pane glass is less than 20 degrees on the inside surface, the double clear glass is slightly over 40 degrees, while the low-e glass is approaching 60 degrees. Obviously, the warmer the interior glass surface, the less likelihood of discomfort.

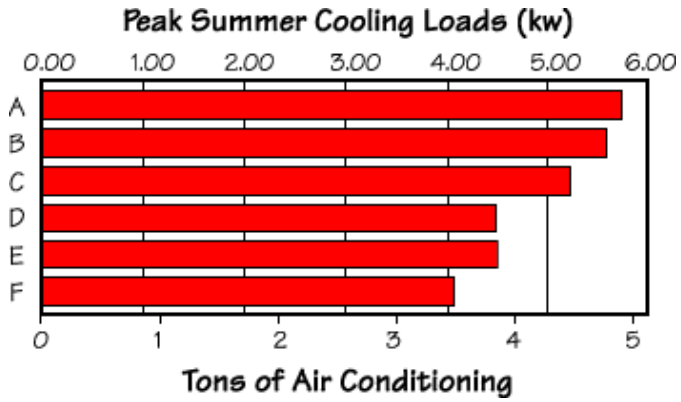


Similarly, the following graph from the same source shows the probability of discomfort during summer from sunlight and hot glass. The potential comfort problem from bad windows is even worse in the summer. The summertime probability of discomfort ranges from almost 80% with single clear and over 60% with double clear declining to almost 20% with windows as specified by the proposed limits.



The Limits Reduce Peak Demand and HVAC Sizing. By requiring efficient windows, the limits create immediate cost savings for the builder by permitting the downsizing of heating and cooling equipment. On a national policy level, high-quality windows can help reduce the strain on both the electric grid and gas transmission system and delay the need to build peak generation.

The following chart, also from the EWC website, shows the potential for saving peak demand and reducing HVAC sizing for different window types. Window F is the low SHGC, low U-factor window that would satisfy the window maximums across the country (by contrast, window A is a single pane window). As is readily apparent, improved windows are crucial to lower peak cooling loads and smaller HVAC sizes (with lower costs). Trade-offs against other building components, even if one believed that they saved the same amount of energy, would clearly lose these benefits.



As shown above, the fenestration limits in the *IECC* serve an important role in ensuring residential energy efficiency and meeting national policy goals. We recommend that the fenestration maximums be adopted in the *IRC* to correct the *IRC*/*IECC* inconsistency.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: STONE-RE-1-N1102.3.7

RE6–09/10
N1102.4.5

Proponent: Alex Bosenberg, National Electrical Manufacturers Association, representing the Luminaire Product Section

Delete and substitute as follows:

N1102.4.5 ~~Recessed lighting.~~ ~~Recessed luminaires installed in the *building thermal envelope* shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and *labeled* as meeting ASTM E 283 when tested at 1.57 psi (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the *conditioned space* to the ceiling cavity. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.~~

Recessed luminaires. Recessed luminaires installed in contact with the building thermal envelope shall be sealed to limit air-leakage between conditioned and unconditioned spaces. When installed in contact with the building thermal envelope, recessed luminaires shall be Type IC rated and certified to have no more than 2.0 cfm (0.944 L/s) air movement from the conditioned space to the ceiling cavity. The luminaire shall be tested at or 1.57 lbs/ft^2 (75 Pascals) pressure difference and have a label attached, showing compliance with this test method. All recessed luminaires in contact with the building thermal envelope shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.

Reason: The proposed changes clarify that only those recessed luminaires that are in contact with the thermal envelope need to be sealed, IC rated, and be tested to the air leakage requirement as described in ASTM E 283. Many recessed luminaires are installed in unconditioned spaces, or in walls or ceilings between similarly conditioned spaces, and no benefit is gained by adding these requirements where they are unnecessary. Further, IC rated luminaires are allowed to be buried in insulation and could be installed in the building thermal envelope without compromising the envelope or reducing the efficiency. Only those that are installed in contact with the envelope where there is a clear difference in temperature between the two spaces present the potential for energy loss. The current language could be interpreted to require application of this section for all recessed luminaires even if they are installed far from the building thermal envelope.

The recessed luminaires that are built to be compliant with this section are already tested and marked by the manufacturer as complying with the requirement. ASTM E283 is a standard for air leakage for windows, curtain walls, and doors between spaces of similar temperature and humidity, and it is inappropriate to require any product to be listed to a standard that was developed for a different purpose. The revised language makes it clear that those products installed through the building thermal envelope must have a visible marking verifying compliance with the air leakage requirement to aid in inspection. Requiring these products to be "Labeled", per the definition in the IECC, means tested and certified by a third party testing laboratory, usually for very specific applications. There was no substantiation given in the proposal for the 2009 Edition to add this requirement, and none was offered in testimony at either the Code Development Hearings or the Final Action Hearings. The only problem cited by the submitter was poor workmanship by installers. Adding the cost of third-party listing and labeling of the product to the ASTM air leakage standard will do nothing to improve the construction of the product or the quality of the installation. Adding this requirement will drive up the cost of these products, and the cost of construction, with no benefit in efficiency. (Note that these products are already listed by a recognized testing laboratory for electrical and fire safety.)

Cost Impact: The code change proposal will reduce the cost of construction by eliminating requirements where there is no benefit, and will maintain an equal standard of energy efficiency compared with the 2009 Edition of the IECC.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BOSENBERG-RE-1-N1102.4.5

RE7–09/10
N1103.4

Proponent: John R. Addario, PE, NYS Department of State-Division of code Enforcement and Administration

Revise as follows:

N1103.4 ~~Circulating~~ Hot water <u>supply temperature maintenance</u> systems. All circulating service hot water <u>and heat traced</u> piping shall be insulated to at least R-2. ~~Circulating~~ Hot water systems shall include an automatic or *readily accessible* manual switch that can turn off the hot water circulating pump <u>or heat trace system</u> when the system is not in use.

Reason: The intent of this section is to require systems that maintain system hot water temperature to be properly insulated. Heat traced systems, like circulating systems, should be required to limit the amount of energy they consume by requiring a minimum amount of insulation. This proposed change includes heat trace systems within the intent of the code and renames the title to include both types of systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: ADDARIO-RE-1-N1103.4

INTERNATIONAL RESIDENTIAL CODE-
PLUMBING/MECHANICAL COMMITTEE

IRC —PLUMBING/MECHANICAL CODE COMMITTEE

Dave Cantrell - *Chair*
Chief Plumbing Inspector
Public Health - Seattle & King County
Renton, WA

Lynn Underwood, CBO – *Vice Chair*
Building Official
City of Norfolk
Norfolk, VA

Patrick Bridges
Rep: National Association of Home Builders
Pat Bridges & Assoc. Inc.
Portland, OR

Mel Fink
Rep: National Association of Home Builders
Melvin Fink & Associates
Brockton, MA

Greg Ford, CBO
Field Insp. And Assist. Manager Military Housing
Institute for Building Technology and Safety
Rautown, MO

Gary Kozan, CPD
Rep: Plumbing Heating and Cooling Contractors
COO
Ridgeway Plumbing
Boynton Beach, FL

Miriam McGiver, PE
Senior Bldg Construction Engineer
New York State, Department of State
Albany, NY

Richard Meyer
Rep: National Association of Home Builders
Asst. Manager, Military Housing
Institute for Building Technology and Safety
Stafford, VA

Clarence Milligan, MCP
Assistant Township Manager
Upper Providence Township
Oaks, PA

Barry Pines, CPD
Estimator
C&R Plumbing & Heating, Inc.
Shelby Township, MI

Gil Rossmiller
Chief Building Official
Town of Parker
Parker, CO

Richard Schunk
Rep: National Association of Home Builders
Wyndham Homes, Inc.
Brewster, NY

Staff Secretariat:
Gregg Gress
Senior Technical Staff
International Code Council

Fred Grable, PE
Staff Engineer - Plumbing
International Code Council

TENTATIVE ORDER OF DISCUSSION

2009-2010 PROPOSED CHANGES TO THE INTERNATIONAL RESIDENTIAL CODE

PLUMBING/MECHANICAL

The following is the tentative order in which the proposed changes to the code will be discussed at the public hearings. Proposed changes which impact the same subject have been grouped to permit consideration in consecutive changes.

Proposed change numbers that are indented are those which are being heard out of numerical order. Indentation **does not** necessarily indicate that one change is related to another. Proposed changes may be grouped for purposes of discussion at the hearing at the discretion of the chair.

IRC PLUMBING

- P7-09/10 Part II
- P8-09/10 Part II
- P10-09/10 Part II
- P16-09/10 Part II

RP1-09/10

- P18-09/10 Part II
- P156-09/10 Part II
- P19-09/10 Part II
- P36-09/10 Part II
- P37-09/10 Part II
- P40-09/10 Part II
- P41-09/10 Part II

RP7-09/10

- P42-09/10 Part II
- P52-09/10 Part II
- P53-09/10 Part II
- P54-09/10 Part II
- P55-09/10 Part II

RP8-09/10

RP4-09/10

RP5-09/10

RP2-09/10

- P60-09/10 Part II
- P61-09/10 Part II
- P62-09/10 Part II
- P63-09/10 Part II
- P64-09/10 Part II
- P65-09/10 Part II
- P66-09/10 Part II
- P67-09/10 Part II
- P68-09/10 Part II
- P69-09/10 Part II
- P70-09/10 Part II
- P71-09/10 Part II
- P72-09/10 Part II
- P73-09/10 Part II

RP6-09/10

- P75-09/10 Part II

RP9-09/10

RP10-09/10

RP11-09/10

RP12-09/10

RP13-09/10

RP14-09/10

RP15-09/10

- P83-09/10 Part II
- P84-09/10 Part II
- P86-09/10 Part II
- P87-09/10 Part II
- P90-09/10 Part II
- P154-09/10 Part II
- P92-09/10 Part II
- P93-09/10 Part II
- P94-09/10 Part II
- P95-09/10 Part II
- P96-09/10 Part II
- P99-09/10 Part II
- P100-09/10 Part II
- P102-09/10 Part II
- P103-09/10 Part II
- P104-09/10 Part II
- P106-09/10 Part II
- P108-09/10 Part II
- P109-09/10 Part II
- P110-09/10 Part II
- P111-09/10 Part II
- P114-09/10 Part II
- P115-09/10 Part II
- P116-09/10 Part II
- P121-09/10 Part II

RP3-09/10

- P159-09/10 Part II
- P124-09/10 Part II
- P127-09/10 Part II
- P128-09/10 Part II
- P131-09/10 Part II
- P135-09/10 Part II
- P136-09/10 Part II
- EC122-09/10 Part II
- S2-09/10 Part III
- P152-09/10 Part II
- P157-09/10 Part II
- P158-09/10 Part II
- P160-09/10 Part II
- P153-09/10 Part II

IRC MECHANICAL

- M1-09/10, Part II
- M6-09/10, Part II
- M9-09/10, Part II
- M10-09/10, Part II

RM1-09/10

RM2-09/10

RM3-09/10

RM4-09/10

RM5-09/10

- M121-09/10, Part II

RM6-09/10

RM7-09/10

- M130-09/10, Part II
- M131-09/10, Part II
- M133-09/10, Part II

RM8-09/10

- M126-09/10, Part II

RM9-09/10

RM10-09/10

- M35-09/10, Part II
- M36-09/10, Part II

RM11-09/10

RM12-09/10

- M38-09/10, Part II
- M39-09/10, Part II
- M40-09/10, Part II

RM13-09/10

- M45-09/10, Part II

RM14-09/10

- M46-09/10, Part II

RM15-09/10

RM16-09/10

RM17-09/10

RM18-09/10

RM19-09/10

- M31-09/10, Part II

RM21-09/10

- M102-09/10, Part II
- M103-09/10, Part II

RM22-09/10

- M98-09/10, Part II
- M105-09/10, Part II
- M110-09/10, Part II
- M111-09/10, Part II
- M112-09/10, Part II

RM23-09/10

RM24-09/10

RM25-09/10

RM26-09/10

RM27-09/10

RM28-09/10

RM29-09/10

RM30-09/10

RM31-09/10

RM32-09/10

RM33-09/10

RM34-09/10

- M128-09/10, Part II

RM35-09/10

RM36-09/10

- M127-09/10, Part II

RM37-09/10

- M140-09/10, Part II
- M141-09/10, Part II
- M142-09/10, Part II
- M148-09/10, Part II

RM38-09/10

- M114-09/10, Part II
- M117-09/10, Part II
- M119-09/10, Part II
- M151-09/10, Part II
- M152-09/10, Part II

RP1–09/10
P2503.5.1

Proponent: Michael Cudahy, Plastic Pipe and Fittings Association (PPFA) for Plastic Pipe and Fittings Association (PPFA).

Revise as follows:

P2503.5.1 Rough plumbing. DWV systems shall be tested on completion of the rough piping installation by water or, for piping systems other than plastic, by air with no evidence of leakage. Either test shall be applied to the drainage system in its entirety or in sections after rough piping has been installed, as follows:

1. Water test. Each section shall be filled with water to a point not less than 10 feet (3048 mm) above the highest fitting connection in that section, or to the highest point in the completed system. Water shall be held in the section under test for a period of 15 minutes. The system shall prove leak free by visual inspection.
2. Air test. The portion under test shall be maintained at a gauge pressure of 5 pounds per square inch (psi) (34 kPa) or 10 inches of mercury column (34 kPa). This pressure shall be held without introduction of additional air for a period of 15 minutes.

Reason: To carry over the language on air testing of plastic piping systems from the IPC to the IRC. This change would correct an oversight in the IRC section. IPC Section 312.1 "Required tests", contains the specific language: **"**All plumbing system piping shall be tested with either water or, for piping systems other than plastic, by air. After the plumbing fixtures have been set and their traps filled with water, the entire drainage system shall be submitted to final tests." The reason for this language is that under some conditions, air testing poses additional risks for installers. The IRC should reflect the same language as found in the IPC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Cudahy-RP1-P2503.5.1

RP2–09/10
Table P2701.1

Proponent: Abraham I. Murra, Canadian Standards Association, representing the Canadian Standards Association

Revise table as follows:

TABLE P2701.1
PLUMBING FIXTURES, FAUCETS AND FIXTURE FITTINGS

MATERIAL	STANDARD
Macerating toilet systems and related components	ASME A112.3.4, CSA B45.9

(Portions of table not shown remain unchanged)

Reason: The acceptance of the proposed change will enable manufacturers with products certified to CSA B45.9 to have their products used as options to products that meet the requirements of ASME A112.3.4. This change will also allow the authorities having jurisdiction to allow the use of products that meet either CSA B45.9 or ASME A112.3.4. The standard is already referenced in IRC Section P3007.5.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Murra-RP6-TP2701.1

RP3–09/10
P2702.1, P2706.1

Proponent: Guy McMann, Jefferson County Colorado, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

P2702.1 Plumbing fixtures. Plumbing fixtures, other than water closets, shall be provided with approved strainers.

Exception: Hub drains and standpipes.

P2706.1 General. Every waste receptor shall be of an approved type. Plumbing fixtures or other receptors receiving the discharge of indirect waste pipes shall be shaped and have a capacity to prevent splashing or flooding and shall be readily accessible for inspection and cleaning. Waste receptors and standpipes shall be trapped and vented and shall connect to the building drainage system. A removable strainer or basket shall cover the waste outlet of waste receptors. Waste receptors shall be installed in ventilated spaces. Waste receptors shall not be installed in bathrooms or in any inaccessible or unventilated space such as a closet. Ready access shall be provided to waste receptors.

Exceptions:

1. Open hub waste receptors shall be permitted in the form of a hub or pipe extending not less than 1 inch (25 mm) above a water-impervious floor, and are not required to have a strainer.
2. Clothes washer standpipes shall not be prohibited in bathrooms.

Reason: Hub drains and standpipes simply do not need to have strainers and there is no harm or technical justification to disallow a cloth washer in a residential bathroom

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: McMann-RP-3-P2702.1

RP4–09/10
P2709.1

Proponent: Shawn Martin, Plumbing Manufacturers Institute, representing the Plumbing Manufacturers Institute

Revise as follows:

P2709.1 Construction. Shower receptors shall have a finished curb threshold not less than 1 inch (25 mm) below the sides and back of the receptor where provided. The curb shall be not less than 2 inches (51 mm) and not more than 9 inches (229 mm) deep when measured from the top of the curb to the top of the drain. The finished floor shall slope uniformly toward the drain not less than ¼ unit vertical in 12 units horizontal (2-percent slope) nor more than ½ inch (13 mm), and floor drains shall be flanged to provide a water-tight joint in the floor.

Reason: Market research and discussions with focus groups, builders and contractors indicate that consumers are showering much more frequently than bathing. Research also indicates that baby boomers that are nearing retirement age and are planning for life's remaining years at home are looking for home solutions that limit safety hazards by providing no hindrance in entering the showering. A barrier exists because an elderly person requiring the use of a walker or confined to a wheelchair cannot access the shower because of the threshold, curb or dam height requirements. We are therefore proposing that the threshold, curb or dam height be optional.

Cost Impact: This code change will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: MARTIN-RP3-2709.1

RP5–09/10
P2709.1

Proponent: Eric Gundersen, Masco Bath representing Masco Bath

Revise as follows:

P2709.1 Construction. Where ~~S~~shower receptors have a finished curb threshold it shall ~~have a finished curb threshold~~ be not less than 1 inch (25mm) below the sides and back of the receptor. The curb shall be not less than 2 inches (51mm) and not more than 9 inches (229mm) deep when measured from the top of the curb to the top of the drain. The finished floor shall slope uniformly toward the drain not less than ¼ unit vertical in 12 units horizontal (2-percent slope) nor more than ½ unit vertical per 12 units horizontal (4-percent slope) ~~inch (13mm) per foot~~, and floor drains shall be flanged to provide a water-tight joint in the floor.

Reason: Not all shower receptors have a finished curb threshold. Those used in accessible buildings are not required to have one, and with an ageing population, the need to eliminate thresholds over which people need to step is important. As long as the shower receptor has adequate provisions to drain the water into the waste system, there should be no need for such a threshold. The IPC does not include such a requirement. To rectify an editorial error in the slope statement.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Gunderson-RP1-P2709.1

RP6–09/10
P2711.5 (New), P2714.3 (New)

Proponents: Ronald L. George, CIPE, CPD, President of Ron George Design and Consulting Services, Amy Acton of The Phoenix Society for Burn Survivors, Angela Mickalide of the Home Safety Council

Add new text as follows:

P2711.5 Hot Water Temperature Limit. Hot water delivered from a lavatory faucet shall not exceed 120°F (49°C). A water heater thermostat shall not be used as a temperature limiting device to comply with the requirement of this section.

P2714.5 Hot Water Temperature Limit. Hot water delivered from a sink faucet shall not exceed 120°F (49°C). A water heater thermostat shall not be used as a temperature limiting device to comply with the requirement of this section.

Reason: Water heater thermostats cannot properly control the water temperatures to a domestic hot water system. All water heater thermostats have an allowable tolerance plus or minus 11 to 15 degrees Fahrenheit that allows temperature swings in the domestic hot water system up to 30 degrees from the burner or heating element "on" temperature setting to the burner or heating element "off" temperature setting. Coupled with thermal layering in un-circulated storage type water heaters, the temperature variation can be as much as 50 degrees in an un-circulated storage type heater. Instantaneous heaters have temperature fluctuations as the flow changes. A thermostatic mixing valve installed in the hot water piping downstream of the water heater will mix cold water with the varying hot water temperatures to deliver a relatively constant and safe temperature of hot water to the domestic hot water system.

Many children are scalded every year because of scalding hazards in a home. These injuries are very preventable with a small thermostatic mixing valve located at the water heater or on the branch to fixtures used for bathing and washing.

Water Heater Thermostats

The reason the water heater thermostat for burner "on" and burner "off" control is being used to control how water system temperatures is there is nothing mandating thermostatic controls to be installed on hot water systems. Although water heater manufacturers are recommending that installers set thermostats at 120 to 125 degrees F, and most of them ship the water heaters at lower temperature settings.
Plumbing engineers continue to recommend hot water systems be designed with the intended storage temperatures for several reasons.

1. The water heater is sized based on 140 degrees Fahrenheit so if you turn down the temperature you will most likely run out of hot water during peak periods.
2. Higher temperatures reduce the threat of Legionellae bacteria growth in the water heater tank.
3. Using 140 degree hot water and mixing down to a safe delivery temperature around 120-125 degrees Fahrenheit allows a constant hot water delivery temperature.
4. If a water heater burner control thermostat is turned down to a lower temperature, the water heater has a reduced capacity to deliver hot water.

As a result, when users run out of hot water and the water heater thermostat is then re-adjusted to a temperature above 120 degrees F, there is a chance the water thermostat can be turned even higher. If the maximum temperature limit stop is not readjusted, then everyone is in danger of being scalded.

Water Heater Burner Control Accuracy

Water heater thermostats were never intended to provide precise temperature controls for hot water system temperatures. For example: The thermostat dial calibration test of ANSI Z21.10.1-1998, which is the applicable standard for gas-fired water heaters, allows the temperature to vary 10 degrees above or below the thermostat setting. I have talked to water heater manufacturers and factory engineers that have indicated the controls can vary as much as 15 to 18 degrees Fahrenheit above or below the set point. The thermostat is inserted into the lower portion of a water heater tank and turns the fuel supply to the water heater "on" and "off" . There is no way to know what the temperature in the tank is with most water heater thermostat dials.

Many children are scalded every year because of scalding hazards in a home. I investigate many scald injuries every year and find through a variety of reasons, a child can find their way up onto the counter where there is a lavatory and they are amused by the water. These young children do not understand how the faucet controls work and are often scalded when they turn the faucet to the hot setting and the hot water temperatures are dangerously high. (Above 120 degrees F.) These injuries are very preventable with a small thermostatic mixing valve located at the water heater or on the branch to fixtures used for bathing and washing. The thermostatic valve can be adjusted to a setting that provides a safe and useable temperature of hot water.

Theoretically, if the water heater thermostatic element is set at 120 degrees Fahrenheit, the burner would come on when the temperature at the thermostat reaches about 105 degrees Fahrenheit. The burner stays on until the water around the thermostatic element (near the bottom of the heater) reaches about 135 degrees Fahrenheit then it turns the fuel supply to the burner or heating element off. (15 degrees F above the set-point of the thermostat). The maximum temperature limit test of ANSI Z21.10.1 gas water heater standard allows the outlet water temperature of the water heater to rise about 30 degrees F above the thermostat setting. This provision accounts for the phenomenon known as "stacking" or "layering" of hot water in the top of a water heater. Stacking or layering occurs when hot water rises to the top of the water heater due to recurring short duration heating cycles caused by a frequent number of small quantity hot water uses which draws cold water into the bottom of the heater. Although the above example addresses gas water heaters, this phenomenon can also occur in other types of storage water heaters. So at the top of a water heater that is theoretically set for 120 degrees Fahrenheit, the outlet hot water temperatures can easily reach 165 degrees Fahrenheit.

This is why we should mandate a thermostatic mixing valve conforming to ASSE 1017 or CSA B-125.3 on the outlet piping of a water heater to limit the hot water distribution temperatures to a maximum safe delivery temperature of 120 to 125 degrees Fahrenheit. If high temperature hot water uses are required for a process application a thermostatic mixing valve conforming to ASSE 1070 can be installed on the local branch piping serving a fixture or group of fixtures. Additional supporting information is shown on my website at: www.rongeorgedesign.com

Cost Impact: Minimal

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: GEORGE-RP3-P2711.5 NEW

RP7–09/10
P2713.3

Proponent: Sally Remedios, Delta Faucet Company, representing Delta Faucet Company.

Revise as follows:

P2713.3 Bathtub and whirlpool bathtub valves. The hot water supplied to bathtubs and whirlpool bathtubs shall be limited to a maximum temperature of 120°F (49°) by a water-temperature limiting device that conforms to ASSE 1070 or CSA B125.3, except where such protection is otherwise provided by a combination tub/shower valve in accordance with Section P2708.3.

Reason: This alternate standard is already referenced in the 2009 IPC and it was an oversight not to include it in the IRC at the same time.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Remedios-RP2-P2713.3

RP8–09/10
P2709.2

Proponent: Pat Clark, Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

P2709.2 Lining required. The adjoining walls and floor framing enclosing on-site built-up shower receptors shall be lined with one of the following materials.

1. Sheet lead,
2. Sheet copper,
3. Plastic liner material that complies with ASTM D 4068 or ASTM D 4551,
4. Hot mopping in accordance with Section P2709.2.3 or
5. Sheet-applied load-bearing, bonded waterproof membranes that comply with ANSI A118.10.

The lining material shall extend not less than ~~3 inches (76 mm)~~ 2 inches (51 mm) beyond or around the rough jambs and not less than ~~3 inches (76 mm)~~ 2 inches (51 mm) above finished thresholds. Sheet-applied load bearing, bonded waterproof membranes shall be applied in accordance with the manufacturer's installation instructions.

Reason: This is inconsistent with IPC Section 417.5.2 which calls for 2 inches. There is no technical justification for a 3 inch dimension and brings uniformity to the two documents.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Clark-RP1-P2709.2

RP9–09/10
Section 2904 (New)

Proponent: Guy Tomberlin, Fairfax County, Virginia representing the Virginia Plumbing and Mechanical Inspectors Association (VPMIA) and the Virginia Building and Code Officials Association (VBCOA)

Add new text as follows:

SECTION 2904
HOT WATER SUPPLY SYSTEMS

2904.1 Where required. Hot water shall be supplied to all plumbing fixtures and equipment utilized for bathing, washing or culinary purposes.

P2904.2 Hot water supply temperature maintenance. Where the developed length of hot water piping from the source of hot water supply to the furthest fixture exceeds 40 feet (12192 mm), the hot water supply system shall be provided with a recirculating pump system to maintain hot water temperature to a point that is not further than 40 feet (12 192 mm) in developed pipe length from any fixture.

P2904.2.1 Piping insulation. Circulating hot water system piping shall be insulated in accordance with Section N1103.4.

P2904.2.2 Hot water system controls. Circulating hot water system pump controls shall be in accordance with Section N1103.4.

2904.2.3 Recirculating pump. Where a thermostatic mixing valve is used in a system with a hot water recirculating pump, the hot water or tempered water return line shall be routed to the coldwater inlet pipe of the water heater and the cold water inlet pipe or the hot water return connection of the thermostatic mixing valve.

Reason: Current IRC provides no guidance for the hot water piping installed in a dwelling unit. Several hundred feet of hot water piping can be installed with no regard to energy conservation. Water heaters are being installed in remote locations based on space allotment. Significant water and energy are wasted waiting for the hot water to get to the fixture. These are similar to the provisions that have always been included in the IPC .

Cost Impact: This code change proposal could increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Tomberlin-RP3-P2904 NEW

RP10–09/10
P2904.1

Proponent: Philip A. Brown, American Fire Sprinkler Association

Revise as follows:

P2904.1 General. Where installed, residential fire sprinkler systems, or portions thereof, shall be in accordance with NFPA 13D or Section P2904, which shall be considered equivalent to NFPA 13D. Section P2904 shall apply to stand-alone and multipurpose wet-pipe sprinkler systems that do not include the use of antifreeze. A multipurpose fire sprinkler system shall supply domestic water to both fire sprinklers and plumbing fixtures. A stand-alone sprinkler system shall be separate and independent from the water distribution system. A backflow flow preventer shall ~~not~~ be required to separate a stand-alone sprinkler system from the water distribution system.

Reason: Backflow prevention is normally required by local water purveyors to separate non-flowing water systems from flowing systems.

Cost Impact: The code change proposal will increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BROWN-RP2-P2904.1

RP11–09/10
P2904.1

Proponent: Julius Ballanco, P.E./JB Engineering and Code Consulting, P.C. representing himself

Revise as follows:

P2904.1 General. ~~Where installed,~~ The design and installation of residential fire sprinkler systems~~, or portions thereof,~~ shall be in accordance with NFPA 13D or Section P2904, which shall be considered equivalent to NFPA 13D. Partial residential sprinkler systems shall be permitted to be installed only in buildings not required to be equipped with a residential sprinkler system. Section P2904 shall apply to stand-alone and multipurpose wet-pipe sprinkler systems that do not include the use of antifreeze. A multipurpose fire sprinkler system shall provide domestic water to both fire sprinklers and plumbing fixtures. A stand-alone sprinkler system shall be separate and independent from the water distribution system. A backflow flow preventer shall not be required to separate a stand-alone sprinkler system from the water distribution system.

Reason: The first sentence clarifies that this section regulates the design and installation of residential sprinklers, and does not mandate residential sprinkler systems. The addition of the second sentence emphasizes that it would be permissible to install a partial system when residential sprinklers are not required. The reason for adding such wording is so that the section can stand on its own whether sprinklers are mandated or not. When mandated by Chapter 3, partial system can still be installed in existing residential units.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BALLANCO-RP2-2904.1

RP12–09/10
P2904.1

Proponent: Richard J. Prospal, on behalf of The American Society of Sanitary Engineering

1. Revise as follows:

P2904.1 General. Where installed, residential fire sprinkler systems, or portions thereof, shall be in accordance with NFPA 13D or Section P2904, which shall be considered equivalent to NFPA 13D. Section P2904 shall apply to stand-alone and multipurpose wet-pipe sprinkler systems that do not include the use of antifreeze. A multipurpose fire sprinkler system shall supply domestic water to both fire sprinklers and plumbing fixtures. Installers of multipurpose fire

sprinkler systems shall meet the requirements of ASSE 7010. A stand-alone sprinkler shall system shall be separate and independent from the water distribution system. A backflow preventer shall not be required to separate a stand-alone system from the water distribution system.

2. Add standard to Chapter 44 as follows:

ASSE
7010 - 2008, Professional Qualifications Standard for Plumbing-Based Residential Fire Protection Systems Installers for One and Two-Family Dwellings

Reason: The installers of multipurpose residential fire sprinkler systems must be qualified and pass a certification process assuring the general public of their knowledge of NFPA 13D and Section P2904.

Cost Impact: This code change proposal will not increase the cost of construction.

Analysis: Review of proposed new standard, ASSE 7010-2008, for compliance with ICC criteria for referenced standards given in Section 3.6 of Council Policy #CP 28 will be posted on the ICC website on or before September 24, 2009.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Prospal-RP-1-P2904.1

RP13–09/10
P2904.2.4.2, Table P2904.2.4.2 (New)

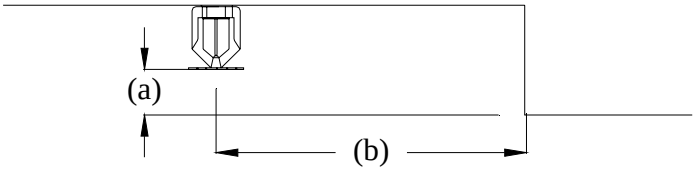
Proponent: Ron Coleman/IRC Fire Sprinkler Coalition/IRC Fire Sprinkler Coalition

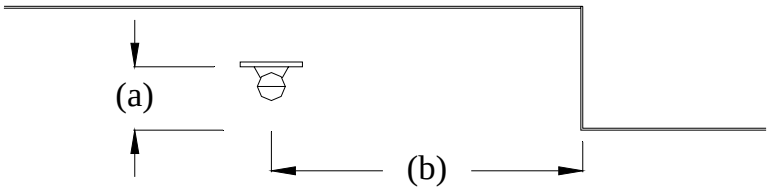
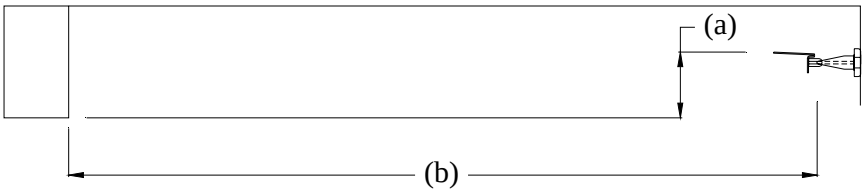
1. Revise as follows:

P2904.2.4.2 Obstructions to coverage. Sprinkler discharge shall not be blocked by obstructions unless additional sprinklers are installed to protect the obstructed area. Additional sprinklers shall not be required where the sprinkler separation from obstructions ~~shall comply~~ complies with the greater of the minimum distance indicated in Table P2904.2.4.2 and the minimum distances specified in the sprinkler manufacturer's instructions.

2. Add new table as follows:

TABLE P2904.2.4.2
MINIMUM SEPARATION FROM OBSTRUCTION

Pendent Sprinklers	
Distance from Deflector to Plane at Bottom of Obstruction (a) (inches)	Minimum Distance to Obstruction (b) (feet)
1	1-1/2
3	3
5	4
7	4-1/2
9	6
11	6-1/2
14	7

Sidewall Sprinkler Side Obstruction	
Distance from Deflector to Plane at Bottom of Obstruction (a) (inches)	Minimum Distance to Obstruction (b) (feet)
1	1-1/2
3	3
5	4
7	4-1/2
9	6
11	6-1/2
14	7
Sidewall Sprinkler Forward Obstruction	
Distance from Deflector to Plane at Bottom of Obstruction (a) (inches)	Minimum Distance to Obstruction (b) (feet)
1	8
2	10
3	11
4	12
6	13
7	14
9	15
11	16
14	17

Reason: To allow Section P2904 to stand alone as an installation standard, specific requirements regarding the minimum spacing to obstructions need to be added. Although some manufacturers provide detailed information regarding spacing with respect to obstructions in their installation instructions, there are some that currently just rely on NFPA 13D. This change will add general obstruction requirements that are consistent with NFPA 13D, while still permitting greater flexibility when permitted by installation instructions (which are required to be approved by UL or other approved listing agencies). The proposed addition will also provide a useful tool to the code official during inspection.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Coleman-RP1-P2904.2.4.2

RP14–09/10
P2904.3.1, P2904.8.1

Proponent: Julius Ballanco, P.E./JB Engineering and Code Consulting, P.C. representing himself

Revise as follows:

P2904.3.1 Nonmetallic pipe and tubing. ~~Nonmetallic pipe and tubing, such as CPVC and PEX, shall be listed for use in residential fire sprinkler systems.~~ CPVC pipe, PEX tubing, PEX-Al-PEX tubing, and PE-AL-PE tubing shall be third

party certified as conforming to one of the standards listed in Table P2905.4. CPVC pipe, PEX tubing, PEX-Al-PEX shall be certified for a pressure rating of not less than 130 psi (8.9 bar) at 120°F (49°C)

P2904.8.1 Pre-concealment Inspection. The following items shall be verified prior to the concealment of any sprinkler system piping:

1. Sprinklers are installed in all areas as required by Section P2904.1.1.
2. Where sprinkler water spray patterns are obstructed by construction features, luminaires or ceiling fans, additional sprinklers are installed as required by Section P2904.2.4.2.
3. Sprinklers are the correct temperature rating and are installed at or beyond the required separation distances from heat sources as required by Sections P2904.2.1 and P2904.2.2.
4. The pipe size equals or exceeds the size used in applying Tables P2904.6.2(4) through P2904.6.2(9) or, if the piping system was hydraulically calculated in accordance with Section P2904.6.1, the size used in the hydraulic calculation.
5. The pipe length does not exceed the length permitted by Tables P2904.6.2(4) through P2904.6.2(9) or, if the piping system was hydraulically calculated in accordance with Section P2904.6.1, pipe lengths and fittings do not exceed those used in the hydraulic calculation.
6. Non-metallic piping that conveys water to sprinklers is ~~listed~~ certified for ~~use with fire sprinklers~~ a pressure rating of not less than 130 psi (8.9 bar) at 120°F (49°C).
7. Piping is supported in accordance with the pipe manufacturer's and sprinkler manufacturer's installation instructions.
8. The piping system is tested in accordance with Section P2503.6

Reason: The requirement for plastic pipe is that it meets the appropriate ASTM standard regulating the pipe or tube. In addition, NFPA 13D specifies the minimum pressure and temperature rating when used in a residential sprinkler system. There is no fire testing required by NFPA 13D for plastic pipe. Since Section P2904 is very specific regarding the type of sprinkler system used, the requirements for plastic pipe should provide the applicable requirements. The intent was always to parallel the requirements for water distribution systems. The pipe must meet the requirements for water distribution pipe.

It should be noted that Section P2904 does not permit the use of a fire department connection. The piping system is piped as a part of the plumbing system with the same pressure limitations. Hence, there is no justification for any higher ratings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Ballanco-RP-3-P2904.3.1

RP15–09/10
P2904.6.1

Proponent: Philip A. Brown, American Fire Sprinkler Association

Revise as follows:

P2904.6.1 Method of sizing pipe. Pipe supplying sprinklers shall be sized using the prescriptive method in Section P2904.6.2 for nonlooped tree systems only or by hydraulic calculation in accordance with NFPA 13D. The minimum pipe size from the water supply source to any sprinkler shall be 3/4 inch (19 mm) nominal. Threaded adapter fittings at the point where sprinklers are attached to the piping shall be a minimum of 1/2 inch (13 mm) nominal.

Reason: The flow and pressure requirements for a sprinkler system are strongly affected where piping systems are interconnected (looped/gridded). The use of the Tables P2904.6 (2) through P2904.6 (9) as discussed in Step 8 of Section P2904.6.2.2 is for a straight flow (non-looped) system.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BROWN-RP1-P2904.6.1

RM1–09/10
Chapter 14, M1401.2, M1401.3, M1401.4

Proponent: Sam Dardano, City of Boulder, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

CHAPTER 14
HEATING AND COOLING EQUIPMENT AND APPLIANCES

M1401.2 Access. Heating and cooling equipment and appliances shall be located with respect to building construction and other equipment and appliances to permit maintenance, servicing and replacement. Clearances shall be maintained to permit cleaning of heating and cooling surfaces; replacement of filters, blowers, motors, controls and vent connections; lubrication of moving parts; and adjustments

Exception: Access shall not be required for ducts, piping, fittings or other components intended for concealment.

.

M1401.3 Sizing. Heating and cooling equipment and appliances shall be sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculation methodologies.

M1401.4 Exterior installations. Equipment and appliances installed outdoors shall be listed and labeled for outdoor installation. Supports and foundations shall prevent excessive vibration, settlement or movement of the equipment. Supports and foundations shall be ~~level and conform to the manufacturer's installation instructions~~ in accordance with Section M1305.1.4.1.

Reason: This is a simple fix to include appliances in the text as it's obvious that this is the true intent. Appliances are mentioned throughout Chapter 14. The definition of **Equipment** excludes appliances. The exception recognizes that by definition, equipment includes the mentioned items and not all parts of systems necessarily need to be accessible at all. A pointer has been installed to direct the user to the proper section for ground clearance.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Dardano-RM-5-M1401

RM2–09/10
M1403.2

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Delete without substitution:

~~**M1403.2 Foundations and supports**. Supports and foundations for the outdoor unit of a heat pump shall be raised at least 3 inches (76 mm) above the ground to permit free drainage of defrost water, and shall conform to the manufacturer's installation instructions~~.

Reason: This is redundant language which is already covered in M1305.1.4.1.This applies to all equipment and appliances.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: McMann-RM-9-M1403.2

RM3–09/10
M1405.1, Chapter 44 (New)

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

M1405.1 General. Electric baseboard convectors shall be installed in accordance with the manufacturer's installation instructions and Chapters 34 through 43 of this code. Electric baseboard heaters shall be listed and labeled in accordance with UL 1042.

2. Add new standard to Chapter 44 as follows:

UL 1042 –94 Electric Baseboard Heating Equipment – with revisions through February 2008

Reason: UL 1042 includes a comprehensive set of construction and performance requirements that are specifically used to evaluate and list electric baseboard heaters. Over a dozen companies have electric baseboard heater listings.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-3-M1405.1-Ch 44

RM4–09/10
M1406.1, M1406.5, Chapter 44 (New)

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

M1406.1 General. Electric radiant heating systems shall be installed in accordance with the manufacturer's installation instructions and Chapters 34 through 43 of this code and shall be listed for the application. Electric radiant heating panels and heating panel sets shall comply with UL 1693. Electric space heating cables shall comply with UL 1673.

2. Delete without substitution:

~~**M1406.5 Gypsum panels.** Where radiant heating systems are used on gypsum assemblies, operating temperatures shall not exceed 125°F (52°C).~~

3. Add new standards to Chapter 44 as follows:

UL 1673-96 Electric Space Heating Cables – with revisions through July 2003
UL 1693-02 Electric Radiant Heating Panels and Heating Panel Sets

Reason: UL 1673 and UL 1693 include a comprehensive set of construction and performance requirements that are used to evaluate and list electric space heating cables and electric radiant heating panels. Over 20 companies currently have heating cables and radiant heating panels listed. UL 1673 and UL 1693 do not require a temperature rating to be marked on the surface of the product or in the instructions. Instead, the product is specifically evaluated to the application and surfaces to which it is to be in contact. The instructions detail the surface (e.g. in concrete, on gypsum, above subfloor covered in tile, etc.). Note also that different surfaces have different temperature allowances in accordance with the standard, so all of these applications would all need to be itemized if temperatures limits are to continue to be maintained.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-5-M1406.1-Ch 44

RM5–09/10
M1406.3

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

M1406.3 Installation of radiant panels. Radiant panels installed on wood or steel framing shall conform to the following requirements:

1. Heating panels shall be installed parallel to framing members and secured to the surface of framing members or mounted between framing members.
2. ~~Panels~~ Mechanical fasteners shall ~~be nailed or stapled~~ penetrate only ~~through~~ the unheated portions provided for this purpose. ~~and~~ Panels shall not be fastened at any point closer than ¼ inch (7 mm) to an element. Other methods of attachment of the panels shall be in accordance with the panel installation instructions.
3. Unless listed and labeled for field cutting, heating panels shall be installed as complete units.

Reason: Item 2 only addresses nails and staples as the only means to fasten the panels. The penetration of screws into the heating elements is also a concern. Various systems use other means of attachment (such as clips or adhesives), which are evaluated as part of the listing of the panels. Proposed revision is to provide guidance on how to secure the panels to the wood framing.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-7-M1406.3

RM6–09/10
M1408.1

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

M1408.1 General. Oil-fired vented floor furnaces shall ~~conform to~~ comply with UL 729 and shall be installed in accordance with their listing, the manufacturer's installation instructions and the requirements of this code.

Reason: To clarify that UL 729 is only applicable for oil-fired floor furnaces.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-11-M1408.1

RM7–09/10
M1409.1

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

M1409.1 General. Oil-fired vented wall furnaces shall ~~conform to~~ comply with UL 730 and be installed in accordance with their listing, the manufacturer's installation instructions and the requirements of this code.

Reason: To clarify that UL 730 is only applicable for oil-fired wall furnaces.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-2-M1409.1

RM8–09/10
M1412.1

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

M1412.1 Approval of equipment. Absorption systems shall be installed in accordance with the manufacturer's installation instructions. Absorption equipment shall comply with UL 1995.

Reason: UL 1995 includes a comprehensive set of construction and performance requirements that are used to evaluate and list absorption equipment, and is already adopted by reference in other sections of the IRC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-4-M1412.1

RM9–09/10
M1413.1

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

M1413.1 General. Cooling equipment that uses evaporation of water for cooling shall be installed in accordance with the manufacturer's installation instructions. Evaporative coolers shall be installed on a level platform or base not less than 3 inches (76 mm) above the adjoining ground and secured to prevent displacement. Openings in exterior walls shall be flashed in accordance with Section R703.8. Evaporative cooling equipment shall comply with UL 1995.

Reason: UL 1995 includes a comprehensive set of construction and performance requirements that are used to evaluate and list evaporative cooling equipment and is already adopted by reference in other sections of the IRC.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Eugene-RM-6-M1413.1

RM10–09/10
M1501.1, M1506, M1506.2 (New), M1507.2

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

1. Revise as follows:

M1501.1 Outdoor discharge. The air removed by every mechanical exhaust system shall be discharged to the outdoors in accordance with Section M1506.2. ~~Air shall not be exhausted into an attic, soffit, ridge vent or crawl space~~.

Exception: Whole-house ventilation-type attic fans that discharge into the attic space of dwelling units having private attics shall be permitted.

SECTION M1506
EXHAUST DUCTS AND EXHAUST OPENINGS

2. Add new text as follows:

M1506.2 Exhaust openings. Air exhaust openings shall terminate not less than 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable and non-operable openings into the building and 10 (3048 mm) feet from mechanical air

intakes except where the opening is located 3 feet (914 mm) above the air intake. Openings shall comply with Sections R303.4.2 and R303.5.

3. Revise as follows:

M1507.2 Recirculation of air. Exhaust air from bathrooms and toilet rooms shall not be re-circulated within a residence or to another dwelling unit and shall be exhausted directly to the outdoors. ~~Exhaust air from bathrooms and toilet rooms shall not discharge into an attic, crawl space or other areas inside the building.~~

Reason: The logic in this proposal is consistent with the approval of M-22 last cycle which concluded that ventilation openings belong in the ventilation chapter and exhaust openings belong in the exhaust chapter. This handles all exhaust that would be encountered in residences and includes nothing new.
The stricken text in M1501.1 and M1507.2 is redundant and not needed as it will be covered under M1506.2.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: McMann-RB-2-R303.4.2-M1501-M1506

RM11–09/10
M1502.4.4.1

Proponent: Don Surrena, CBO, National Association of Home Builders (NAHB)

Revise as follows:

M1502.4.4.1 Specified length. The maximum length of the exhaust duct shall be ~~25~~ 35 feet (~~7620mm~~) (10,668mm) from the connection to the terminus of the transition duct from the dryer to the outlet terminal. Where fittings are utilized, the maximum length of the exhaust duct shall be reduced in accordance with Table M1502.4.4.1.

Reason: The purpose of this proposal is to reinstate the 35 foot maximum length of a dryer duct, and to more clearly define how to measure the duct length. This proposal will also help minimize any misinterpretation by code officials and correlate the same provisions with the IMC and IFGC.

During the 2007-2008 code development cycle, there was a proposal submission error made by the proponent that inadvertently changed the permitted length of duct from 35 feet to 25 feet in the IRC. There was no data produced at the hearing that showed the permitted 35 foot length was dangerous. However research has shown, dryer manufactures indicate 35 feet is an acceptable length according to their installation instructions. The 35 foot length allows more flexibility in design allowing for increased energy savings and allowing for more versatile utilization of green building practices. In addition this proposal adds the term "terminus" to clarify and prevent confusion on the part of the inspector as to where to start measuring the "dryer duct," and to not include the "transition duct." (The duct connection from the appliance to the exhaust duct)

We encourage the adoption of this proposal to reinstate the 35 foot maximum length for dryer duct. The requirements of the IRC, IMC and the IFGC, should be consistent in regard to Dryer Duct Length.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Surrena-RM-2-M1502.4.4.1

RM12–09/10
M1502.4.4.1

Proponent: Guy Tomberlin, Fairfax County, VA, representing the Virginia Plumbing and Mechanical Inspectors/Virginia Building and Code Officials

Revise as follows:

M1502.4.4.1 Specified length. The maximum length of the exhaust duct shall be ~~25~~ 35 feet (~~7620mm~~)from the connection to the transition duct from the dryer to the outlet terminal. Where fittings are utilized, the maximum length of the exhaust duct shall be reduced in accordance with Table M1502.4.4.1.

Reason: This is an attempt to correct an error that occurred last code cycle. The entire section of M1502 was re-written for clarity and better usability. The previous IRC 2006 edition included the 35 foot allowance. Unfortunately, during the re-write the 35 feet was inadvertently changed

back to 25 feet. Substantial data was presented to support the additional 10 feet during the 03 to 06 cycle which illustrated that the majority of clothes dryers manufactured today have no problem complying with the 35 length and the reductions for changes in direction.

Cost Impact: (None given)

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Tomberlin-RM-2-M1502.4.4.1

RM13–09/10
M1503.1

Proponent: Robert Adkins, Prince William, VA, representing Virginia Plumbing & Mechanical Inspectors Association/Virginia Building and Code Officials Association

Revise as follows:

M1503.1 General. A range hood or a down-draft exhaust system shall be provided for each range or cooktop. Range hoods and down-draft exhaust systems shall discharge to the outdoors ~~through a single-wall duct~~. The duct serving the hood shall have a smooth interior surface, shall be air tight and shall be equipped with a backdraft damper. Ducts serving range hoods shall not terminate in an attic or crawl space or areas inside the building.

> ~~**Exception:** Where installed in accordance with the manufacturer's installation instructions and where mechanical or natural ventilation is otherwise provided, listed and labeled ductless range hoods shall not be required to discharge to the outdoors.~~

M1503.3 Kitchen exhaust rates. ~~Where~~ domestic kitchen ~~cooking *appliances* are equipped with ducted~~ range hoods ~~or~~ and down-draft exhaust systems~~, the fans~~ shall ~~be sized in accordance~~ comply with Section M1507.3.

Reason: This ties all the requirements for residential range hoods together in one place and requires exhaust to the outdoors for each cooking appliance. Current text fails to require a hood and only addresses them where they are chosen to be installed. Most range manufacturers recommend the installation of hoods. Range hoods are necessary to achieve proper kitchen ventilation..

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Adkins-RM-1-M1503.1

RM14–09/10
M1503.1

Proponent: Forrest Fielder, City of Surprise, AZ, representing the Arizona Building Officials

Revise as follows:

M1503.1 General. Range hoods shall discharge to the outdoors through a single-wall duct. The duct serving the hood shall have a smooth interior surface, shall be air tight and shall be equipped with a backdraft damper. Changes in duct size or direction shall be accomplished with pre-manufactured transition fittings. Ducts serving range hoods shall not terminate in an *attic* or crawl space or areas inside the building.

> **Exception:** Where installed in accordance with the manufacturer's installation instructions, and where mechanical or natural *ventilation* is otherwise provided, *listed* and *labeled* ductless range hoods shall not be required to discharge to the outdoors.

Reason: The taped connections allowed by the Code fail quickly in the event of a grease fire occurring when the exhaust is operating, and taped connections are recognized as non-durable. Without mechanical connections to keep the exhaust system intact, flame can be fan-forced into unprotected attics in the event of fire. Under normal (non-emergency) circumstances, taped connections will fail, and allow exhaust directly into attics. This change clarifies the code's intent that these connections be made permanently, reliably intact.

Cost Impact: This code change will not increase the cost of construction.

RM15–09/10

M1503.1, M1503.3, Table M1507.3

Proponent: Steve Ferguson, American Society of Heating, Refrigerating, and Air-Conditioning Engineers

Revise as follows:

M1503.1 General. Range hoods shall discharge to the outdoors through a single-wall duct. The duct serving the hood shall have a smooth interior surface, shall be air tight and shall be equipped with a backdraft damper. Ducts serving range hoods shall not terminate in an attic or crawl space or areas inside the building.

Exception: Where installed in accordance with the manufacturer's installation instructions, and where mechanical ~~or natural ventilation~~ exhaust is otherwise provided in accordance with Section M1503.3, listed and labeled ductless range hoods shall ~~not~~ be permitted ~~required to discharge to the outdoors~~.

M1503.3 Kitchen exhaust ~~rates~~. ~~Where domestic kitchen cooking appliances are equipped with ducted range hoods or down draft exhaust systems, the fans shall be sized in accordance with Section M1507.3.~~ In each dwelling unit, not less than one range or cooktop shall be provided with a ducted range hood or down-draft fan that discharges to the outdoors. Such hoods and down-draft fans shall comply with Section M1507.3.

Exception: Range hoods and down-draft exhaust systems are not required where other mechanical exhaust systems serve the kitchen and provide continuous exhaust in accordance with Section M1507.3.

TABLE M1507.3
MINIMUM REQUIRED EXHAUST RATES FOR ONE- AND TWO-FAMILY DWELLINGS

AREA TO BE ~~VENTILATED~~ EXHAUSTED	**~~VENTILATION~~ EXHAUST RATES**[a]
Kitchens	100 cfm intermittent or ~~25 cfm continuous~~5 air changes per hour continuous based on total kitchen volume
Bathrooms, ~~Toilet~~ Water Closet Rooms	~~Mechanical exhaust capacity of~~ 50 cfm intermittent or 20 cfm continuous

For SI: 1 cubic foot per minute = 0.4719 L/s.

a. Equipment shall be tested and rated in accordance with HVI 916.

Reason: The purpose of this proposal is to strengthen the requirement for kitchen ventilation by increasing the stringency for allowable systems.

The existing provisions allow the use of windows for the intended purpose of exhausting contaminants produced by kitchen appliances. These systems are not able to remove kitchen contaminants from new housing. This change will improve the code by assuring that kitchen contaminants are exhausted outdoors and not simply redistributed in the home. It allows the use of ductless range hoods when either a down-draft or other wall- or ceiling-mounted fan that provides at least 5 ACH is installed. The reference to HVI 916 is provided to ensure that fans comply with industry standards for air flow verification. As a point of reference, MN state code 7672.1000 currently references HVI 916. HVI 916 is a consensus standard that is also referenced by Energy Star's Ventilation Fan Specification for measurement and verification of fan flow rates (note that NO on-site measurement or verification is required).

Substantiation: Cooking and other kitchen activities produce large quantities of indoor air quality contaminants such as moisture, organic compounds and a wide spectrum of particles. These contaminants can lead to condensation on cold building materials, leading to mold, discoloration, and damage. Modern houses with low infiltration and window use rates do not have sufficient ventilation to be able to cope with kitchen contaminants being dispersed throughout the home These contaminants cannot be filtered out and must be removed to avoid health problems and damage to the home. Windows do not always exhaust air; air just as often comes in as goes out. IF windows are open, roughly half the time they do not serve to exhaust kitchen contaminants but push them into the rest of the house. Windows are generally not used often enough to be depended upon and many occupants never open their windows for a number of reasons. Similarly, down-draft appliances of 50-100 cfm cannot capture significant amounts of contaminants, which rise due to buoyancy. The values in Table M1606.3 are effective when used with vented range hoods, which have good capture efficiency because of their shape. For down-draft or room-based exhaust systems, the capture efficiency is poor, and five room air changes of exhaust are necessary to keep contaminants from dispersing into other rooms.

Bibliography: ASHRAE Standard 62.2-2007 Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. http://www.ashrae.org/technology/page/548

Price, P.N. and M.H. Sherman "Ventilation Behavior and Household Characteristics in New California Houses," April 2006. LBNL-59620 http://epb.lbl.gov/Publications/lbnl-59620.pdf

Sherman, M. H. and A.T. Hodgson. "Formaldehyde as a Basis for Residential Ventilation Rates", 2002 LBNL-49577. http://epb.lbl.gov/Publications/lbnl-49577.pdf

Walker, I. S. and M. H. Sherman "Evaluation of Existing Technologies for Meeting Residential Ventilation Requirements."2006, LBNL-59998. http://epb.lbl.gov/Publications/lbnl-59998.pdf

Sherman, M.H., Chan W. R., "Building Airtightness: Research and Practice" in Building Ventilation: the state of the art, (Santamouris, Wouters, Eds) Earthscan ISBN-13: 978-1-84407-130-2 pp. 137-162, 2006, http://epb.lbl.gov/Publications/lbnl-53356.pdf

Cost Impact: This proposal will increase the cost of construction in those cases where a vented range hood costs more to install than a ductless range hood or if down-draft ventilation capacity needs to be increased to meet the 5 ACH requirement. However, NAHB has indicated that 70-80% of new homes have ducted range hoods or down-draft fans, so the overall cost impact is minimal.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Ferguson-RM-2-M1503-T. M1507.3

RM16–09/10

R202 (New), R303.3, M1507.1, M1507.2, M1507.3, Table M1507.3, Chapter 44 (New)

Proponent: Steve Ferguson, American Society of Heating, Refrigerating, and Air-Conditioning Engineers

1. Add new definition as follows:

BATHROOM. A room containing a bathtub, shower, spa, hot tub, or other bathing fixture.

2. Revise as follows:

R303.3 Bathrooms. Bathrooms, water closet ~~compartments~~ rooms and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 square feet (0.279 m2), one-half of which must be openable. Bathrooms shall be mechanically exhausted in accordance with Section M1507.

Exception: The glazed areas shall not be required where artificial light is provided and a mechanical ~~ventilation~~ exhaust system in accordance with Section M1507 ~~are~~ is provided. ~~The minimum ventilation rates shall be 50 cfm (23.6 L/s) for intermittent ventilation or 20 cfm (9.4 L/s) for continuous ventilation.~~ ~~Ventilation~~ Exhaust air from the space shall be exhausted directly to the ~~outside~~ outdoors.

M1507.1 General. Kitchens ~~Where toilet rooms~~ and bathrooms shall be ~~are~~ mechanically exhausted ~~ventilated,~~. T~~t~~he ~~ventilation~~ exhaust equipment shall be installed in accordance with this section.

M1507.2 Recirculation of air. Exhaust air from kitchens, bathrooms and water closet ~~toilet~~ rooms shall not be recirculated within a residence or to another dwelling unit and shall be exhausted directly to the outdoors. Exhaust air from kitchens, bathrooms and water closet ~~toilet~~ rooms shall not discharge into an attic, crawl space or other areas inside the building.

M1507.3 ~~Ventilation~~ Exhaust rate. ~~Ventilation~~ Exhaust systems shall be designed to have the capacity to exhaust the minimum air flow rate determined in accordance with Table M1507.3.

TABLE M1507.3
MINIMUM REQUIRED EXHAUST RATES FOR ONE- AND TWO-FAMILY DWELLINGS

AREA TO BE ~~VENTILATED~~ EXHAUSTED	~~VENTILATION~~ EXHAUST RATES[a]
Kitchens	100 cfm intermittent or ~~25 cfm continuous~~5 air changes per hour continuous based on total kitchen volume
Bathrooms, ~~- Toilet~~ Water Closet Rooms	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous

For SI: 1 cubic foot per minute = 0.0004719 m3/s.
a. Exhaust equipment shall be tested and rated in accordance with HVI 916.

3. Add new standard to Chapter 44 as follows:

HVI Home Ventilating Institute
1000 North Rand Road
Suite 214
Wauconda, IL 60084

HVI
916-09 Airflow Test Procedure

Reason: The purpose of this proposal is to strengthen the requirement for bathroom exhaust ventilation by disallowing the use of windows as the primary exhaust means. Water closet rooms and similar rooms do not have to be mechanically exhausted if they have operable windows.

The existing provisions allow the use of windows for the intended purpose of exhausting of moisture created by the bath, shower or other activities. Windows are not able to directly remove moisture from new housing. This change will improve the code by assuring that bathroom moisture is exhausted outdoors and not simply redistributed in the home. Odors can sometimes be vented using windows, depending on the design of the house, the weather, and the occupants, and is "self-induced". But moisture is a much bigger concern.

Substantiation: Bathing and other bathroom activities produce large quantities of moisture, as well as a wide spectrum of other contaminants. Modern houses with low infiltration and low-window use rates do not have sufficient ventilation to be able to cope with moisture being dispersed throughout the home, especially the moisture created due to bathing. This is especially true in humid climates and severe climates. Moisture must be removed to avoid health problems and damage to the home such as those that might be caused by molds. Even if opened, windows do not always exhaust air; air just as often comes in as goes out. So for roughly half the time windows are opened, the windows do not exhaust moisture but push it into the rest of the house. Further, a study commissioned by the California Air Resources Board and California Energy Commission found that of 1,448 new households, 29% did not open their windows at all during the winter, demonstrating that installation of operable windows does not in itself provide a reliable method for moisture control.

The reference to HVI 916 is provided to ensure that fans comply with industry standards for air flow verification. As a point of reference, MN state code 7672.1000 currently references HVI 916. HVI 916 is also referenced by Energy Star's Ventilation Fan Specification for measurement and verification of fan flow rates (note that NO on-site measurement or verification is required).

Bibliography: ASHRAE Standard 62.2-2007 *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings http://www.ashrae.org/technology/page/548*

Offermann, F.J., et al., "Window usage, ventilation, and formaldehyde concentrations in new California homes: summer field sessions", in IAQ 2007, Healthy and Sustainable Buildings. 2007, American Society of Heating Refrigerating, and Air Conditioning Engineers, Inc.: Baltimore, MD. p. 497-526 (preprints); http://www.iee-sf.com/pdf/SummerFieldResults.pdf.

Cost Impact: This proposal will increase the cost of construction in those cases where bathroom exhaust fans are not currently installed.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Ferguson-RB-2-R202-R303.3-M1507

RM17–09/10

R202 (New), R303.1, R303.3, M1507.1, M1507.3 (New), M1507.3.1 (New), M1507.3.2 (New), M1507.3.3 (New), Table M1507.3.3(1) (New), Table M1507.3.3(2) (New), M1507.4, Table M1507.4

Proponent: Mike Moore, Newport Ventures, Inc., representing Broan NuTone

1. Add new definitions as follows:

LOCAL EXHAUST. An exhaust system that uses one or more fans to exhaust air from a specific room or rooms within a dwelling

WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM. An exhaust system, supply system, or combination thereof that is designed to mechanically exchange indoor air for outdoor air for the purpose of diluting and removing indoor air contaminants within a dwelling. The system is designed to provide ventilation air continuously or through a programmed intermittent schedule to satisfy the ventilation rates required for the whole house. Local exhaust or supply fans can serve as such a system.

2. Revise as follows:

R303.1 Habitable rooms. All habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. Natural *ventilation* shall be through windows, doors, louvers or other *approved* openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants. The minimum openable area to the outdoors shall be 4 percent of the floor area being ventilated.

Exceptions:

1. The glazed areas need not be openable where the opening is not required by Section R310 and ~~an *approved* mechanical *ventilation* system capable of producing 0.35 air change per hour in the room is installed or~~ a whole-house mechanical *ventilation* system is installed ~~capable of supplying outdoor *ventilation* air of 15 cubic feet per minute (cfm) (78 L/s) per occupant computed on the basis of two occupants for the first bedroom and one occupant for each additional bedroom~~ in accordance with Section M1507.

2. The glazed areas need not be installed in rooms where Exception 1 above is satisfied and artificial light is provided capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.
3. Use of sunroom *additions* and patio covers, as defined in Section R202, shall be permitted for natural *ventilation* if in excess of 40 percent of the exterior sunroom walls are open, or are enclosed only by insect screening.

R303.3 Bathrooms. Bathrooms, water closet compartments and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 square feet (0.3 m2), one-half of which must be openable.

Exception: The glazed areas shall not be required where artificial light and a ~~mechanical ventilation~~ local exhaust system are provided. The minimum local exhaust ~~ventilation~~ rates shall be determined in accordance with Section M1507.4. ~~50 cubic feet per minute (24 L/s) for intermittent ventilation or 20 cubic feet per minute (10 L/s) for continuous ventilation~~. ~~Ventilation~~ Exhaust air from the space shall be exhausted directly to the ~~outside~~ outdoors.

M1507.1 General. Where local exhaust or whole-house mechanical ventilation is provided ~~toilet rooms, and bathrooms are mechanically ventilated,~~ the ~~ventilation~~ equipment shall be designed in accordance with this section.

3. Add new text and tables as follows:

M1507.3 Whole-house mechanical ventilation system. Whole-house mechanical ventilation systems shall be designed in accordance with Sections M1507.3.1 through M1507.3.3.

M1507.3.1 System design. The whole-house ventilation system shall consist of one or more supply or exhaust fans or a combination of such and associated ducts and controls. Where local supply or exhaust fans are used as part of such a system, they shall be tested and rated in accordance with HVI 916, and the fans' rated flow at 0.25 in w.c. static pressure shall equal or exceed the required ventilation rate determined by Section M1507.3.3. Outdoor air ducts connected to the return side of an air handler shall be considered to provide supply ventilation.

M1507.3.2 System Controls. The whole-house mechanical ventilation system shall be provided with controls that enable manual override.

M1507.3.3 Mechanical ventilation rate. The whole-house mechanical ventilation system shall provide outdoor air at a continuous rate not less than that determined in accordance with Table M1507.3.3(1).

Exception: The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25% of each 4 hour segment and the ventilation rate prescribed in Table M1507.3.3(1) is multiplied by the factor determined in accordance with Table M1507.3.3(2).

TABLE M1507.3.3(1)
CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

Dwelling Unit Floor Area (square feet)	Number of Bedrooms				
	0-1	2-3	4-5	6-7	>7
	Airflow in CFM				
<1500	30	45	60	75	90
1501-3000	45	60	75	90	105
3001-4500	60	75	90	105	120
4501-6000	75	90	105	120	135
6001-7500	90	105	120	135	150
>7500	105	120	135	150	165

TABLE M1507.3.3(2)
INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS[a, b]

Run-Time Percentage In Each 4 Hour Segment	25%	33%	50%	66%	75%	100%
Factor[a]	4	3	2	1.5	1.3	1.0

a. For ventilation system run time values between those given, the factors are permitted to be determined by interpolation.
b. Extrapolation beyond the table is prohibited.

4 Revise as follows:

M1507.43 Local exhaust rates ~~Ventilation rate~~. Local exhaust ~~Ventilation~~ systems shall be designed to have the capacity to exhaust the minimum air flow rate determined in accordance with Table M1507.43.

TABLE M1507.43
MINIMUM REQUIRED LOCAL EXHAUST RATES FOR ONE- AND TWO-FAMILY DWELLINGS

AREA TO BE ~~VENTILATED~~ EXHAUSTED	~~VENTILATION~~ EXHAUST RATES
Kitchens	100 cfm intermittent or 25 cfm continuous
Bathrooms—Toilet Rooms	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous

For SI: 1 cubic foot per minute = 0.4719 L/s.

Reason: This proposal is intended to provide clear guidance to builders and code officials on the design and specification of mechanical ventilation systems for homes IF such systems are installed. Instead of mandating mechanical ventilation, it provides much needed guidance on both whole-house mechanical ventilation systems and local exhaust, including definitions of the same. The language proposed serves to streamline the code by placing all requirements for mechanical ventilation systems within the current M1507, which is aptly titled "Mechanical Ventilation".

Language that is proposed for M1507 is basically a distilled version of ASHRAE 62.2. The proposed language is intended to take ASHRAE's ten page standard and reduce it to the nuts and bolts of mechanical ventilation that are simple and straightforward. ASHRAE has issued a copyright release for the table of whole-house ventilation rates. Not only are these the same rates in ASHRAE 62.2, but they are also the same rates that are now referenced in the state building codes of California and Maine as well as being referenced within the National Green Building Standard.

Similarly, the intermittent multipliers are sourced from ASHRAE 62.2 and are included to provide builders with more options for delivering equivalent ventilation.

Cost Impact: Because this language does not require whole house mechanical ventilation or local exhaust, it will not in itself increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: Moore-RB-1-R202-R303-M1507

RM18–09/10

R303.1, R303.4 (New), R303.4.1 (New), Table R303.4.1(1) (New), Table R303.4.1(2) (New), R303.4.2 (New), R303.4.3 (New), Chapter 44 (New)

Proponent: Steve Ferguson, American Society of Heating, Refrigerating, and Air-Conditioning Engineers

1. Revise as follows:

R303.1 Habitable rooms. All habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. Natural *ventilation* shall be through windows, doors, louvers or other *approved* openings to the outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants. The minimum openable area to the outdoors shall be 4 percent of the floor area being ventilated.

Exceptions:

~~1. The glazed areas need not be openable where the opening is not required by Section R310 and an *approved* mechanical *ventilation* system capable of producing 0.35 air change per hour in the room is~~

~~installed or a whole-house mechanical *ventilation* system is installed capable of supplying outdoor *ventilation* air of 15 cubic feet per minute (cfm) (78 L/s) per occupant computed on the basis of two occupants for the first bedroom and one occupant for each additional bedroom.~~

~~2~~1. The glazed areas need not be installed in rooms where Exception 1 above is satisfied and artificial light is provided capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.

~~3~~2. Use of sunroom *additions* and patio covers, as defined in Section R202, shall be permitted for natural *ventilation* if in excess of 40 percent of the exterior sunroom walls are open, or are enclosed only by insect screening.

2. Add new text and tables as follows:

R303.4 Mechanical ventilation. Dwelling units shall be provided with a mechanical exhaust system, supply system, or combination thereof to provide whole-building ventilation with outdoor air. Such system shall comply with Sections R303.4.1 through R303.4.3.

Exception: Dwelling units in climate zones 1 and 2 where refrigeration air conditioning is not installed.

R303.4.1 Mechanical ventilation rate. The mechanical ventilation system shall provide outdoor air continuously at a rate of not less than that determined in accordance with Table R303.4.1(1).

Exception: Continuous operation of the system is not required where the system completes a cycle at least once every 6 hours and the ventilation rate prescribed in Table R303.4.1(1) is multiplied by the factor determined in accordance with Table R303.4.1(2).

TABLE R303.4.1(1)
MECHANICAL VENTILATION AIR REQUIREMENTS, (cfm)

Floor Area Dwelling Unit (square feet)	Number of Bedrooms				
	0-1	2-3	4-5	6-7	>7
	Outdoor Airflow Rate in CFM				
<1500	30	45	60	75	90
1501-3000	45	60	75	90	105
3001-4500	60	75	90	105	120
4501-6000	75	90	105	120	135
6001-7500	90	105	120	135	150
>7500	105	120	135	150	165

TABLE R303.4.1(2)
INTERMITTENT MECHANICAL VENTILATION RATE FACTORS[a, b]

Ventilation System Percent Run-Time Based on a 24 Hour Period	25%	33%	50%	66%	75%
Factor	4	3	2	1.5	1.3

a. Interpolation between entries is permitted.
b. The ventilation system run time shall be not less than 25%.

R303.4.2 System design. The required whole-house ventilation system shall consist of one or more supply or exhaust fans or a combination thereof and associated ducts and controls. Where local supply or exhaust fans are used as part of such a system, they shall be tested and rated in accordance with HVI 916, and the fan airflow rate shall be taken at 0.25 in w.c. static pressure. Outdoor air ducts connected to the return side of an air handler shall be considered to be supply ventilation where the manufacturer's requirements for minimum return air temperature for the air handler are met.

R303.4.3 System Controls. The mechanical ventilation system shall be provided with controls that enable occupant override.

3. Add new standard to Chapter 44 as follows:

HVI Home Ventilating Institute
1000 North Rand Road
Suite 214
Wauconda, IL 60084

HIV 916-09 Airflow Test Procedure

Reason: The purpose of this proposal is to provide modest levels of continuous mechanical ventilation in detached one- and two-family houses and low-rise townhouses in order to provide minimum levels of ventilation.

For health and safety reasons, minimum ventilation is necessary to provide acceptable indoor air quality. Modern homes are much tighter than the building stock and do not provide adequate ventilation through air leakage or infiltration. Occupants do not operating windows to provide minimum ventilation levels. Providing continuous mechanical ventilation is required to provide minimum ventilation rates in current construction.

Substantiation: Ventilation is used to control pollutant concentrations in buildings. These pollutants are emitted from building materials, consumer products, and from occupants themselves. Continuous mechanical ventilation reduces these large concentrations and reduces the large exposures for building occupants.

Because of the effects it has on health, comfort, and serviceability, indoor air quality in our homes is becoming of increasing concern to many people. According to the American Lung Association elements within our homes have been increasingly recognized as threats to our respiratory health. The Environmental Protection Agency lists poor indoor air quality as the forth-largest environmental threat to our country. Asthma is leading serious chronic illness of children in the U.S. Moisture-related construction defects and damage are on the increase in new houses. A 2007 California study revealed formaldehyde exposure in most new homes is beyond limits recommended by the California Air Resources Board. Minimum residential ventilation can improve many of these indoor air quality problems.

ASHRAE Standard 62.2-2007 is the only national consensus standard on residential ventilation rates. ASHRAE, the American Society of Heating, Refrigerating and Air-conditioning Engineers, has been setting minimum ventilation rates for buildings for over 100 years in order to provide acceptable indoor air quality. The rates in this proposal are the minimum rates as incorporated in the current version of Standard 62.2. As an ANSI standard, these rates represent the consensus of a balanced committee and have undergone extensive public review.
Sherman and Hodgson (2002) have shown that the rates in this proposal are barely sufficient to dilute the typical amount of formaldehyde emitted in typical new construction. The consensus of knowledgeable and balanced experts supports the ventilation rates in Standard 62.2-2007. As of the drafting of this proposal, several states have adopted similar ventilation requirements (e.g. MN, VT, WA, CA, ME). Of these, California and Maine have now adopted ASHRAE 62.2 by reference.

Price and Sherman (2006) have shown that occupants of new homes do not operate their windows and doors sufficiently to meet minimum ventilation requirements through controlled openings. While there are 20% of the population who would manage their windows effectively during mild periods, the vast majority of occupants keep their windows closed most of the time and do not get sufficient ventilation from window and door operation.

Sherman and Chan (2006) have reviewed air tightness data. New houses are substantially tighter than the existing stock and do not get enough ventilation through air infiltration and air leakage to meet minimum rates. Walker and Sherman (2006) have shown that the energy costs of meeting ASHRAE Standard 62.2 would be substantially higher for a house that was leaky enough to meet it through infiltration.

The reference to HVI 916 is provided to ensure that fans comply with industry standards for air flow verification. As a point of reference, MN state code 7672.1000 currently references HVI 916. HVI 916 is a consensus standard that is also referenced by Energy Star's Ventilation Fan Specification for measurement and verification of fan flow rates (note that NO on-site measurement or verification is required).

Bibliography: ASHRAE Standard 62.2-2007 *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings.* http://www.ashrae.org/technology/page/548

Price, P.N. and M.H. Sherman "Ventilation Behavior and Household Characteristics in New California Houses," April 2006. LBNL-59620 http://epb.lbl.gov/Publications/lbnl-59620.pdf

Sherman, M. H. and A.T. Hodgson. "Formaldehyde as a Basis for Residential Ventilation Rates", 2002. LBNL-49577. http://epb.lbl.gov/Publications/lbnl-49577.pdf

Walker, I. S. and M. H. Sherman "Evaluation of Existing Technologies for Meeting Residential Ventilation Requirements." 2006. LBNL-59998. http://epb.lbl.gov/Publications/lbnl-59998.pdf

Sherman, M.H., Chan W. R., "Building Airtightness: Research and Practice" in Building Ventilation: the state of the art, (Santamouris, Wouters, Eds) Earthscan ISBN-13: 978-1-84407-130-2 pp. 137-162, 2006, http://epb.lbl.gov/Publications/lbnl-53356.pdf

Offermann, F.J., et al., "Window usage, ventilation, and formaldehyde concentrations in new California homes: summer field sessions", in IAQ 2007, Healthy and Sustainable Buildings. 2007, American Society of Heating Refrigerating, and Air Conditioning Engineers, Inc.: Baltimore, MD. p. 497-526 (preprints); http://www.iee-sf.com/pdf/SummerFieldResults.pdf

Cost Impact: The proposal will increase the cost of construction modestly by requiring a mechanical fan system rated for continuous operation.

Analysis: The proposed exception to Section R303.4.1 provides no definition or criteria for the required run cycle. For example, if 25% run time is chosen, the system would have to run 6 hours a day, but, it is not indicated how that 6 hours is to be distributed across the required number of cycles.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Ferguson-RB-1-R303.1-R303.5

RM19–09/10
R303.4.1

Proponent: Guy McMann, Jefferson County, CO, representing the CO Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

R303.4.1 Intake openings. Mechanical and gravity outdoor air intake openings shall be located a minimum of 10 feet (3048 mm) from any hazardous or noxious contaminant, such as vents, chimneys, plumbing vents, streets, alleys, parking lots and loading docks, except as otherwise specified in this code. Where a source of contaminant is located within 10 feet (3048 mm) of an intake opening, such opening shall be located a minimum of ~~2~~ 3 feet (~~610~~ 914 mm) below the contaminant source.

For the purpose of this section, the exhaust from *dwelling* unit toilet rooms, bathrooms and kitchens shall not be considered as hazardous or noxious.

Reason: This dimension is inconsistent with many other code books such as IMC-401.4 #3; IRC-G2427.6.6 and G2427.8 #1; IFGC-503.6.7; IFGC-618.5 and IFGC-503.8 #1. This 3-foot dimension has been around for years and was also found in the legacy codes. It's important that sources of contamination don't make its way into building openings and there have still been issues where 2 feet doesn't work. This dimension was also changed last cycle in M22. Also, proposals have been submitted to the plumbing to complete the transition.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: McMann-RB-1-R303.4.1

RM20–09/10
M1601.1, M1601.1.1

Proponent: Sam Dardano, City of Boulder, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

M1601.1 Duct design. Duct systems serving heating, cooling and ventilation equipment shall be ~~fabricated~~ installed in accordance with the provisions of this section and ACCA Manual D or other approved methods

M1601.1.1 Above-ground duct systems. Above-ground duct systems shall conform to the following:

1. Equipment connected to duct systems shall be designed to limit discharge air temperature to a maximum of 250°F (121°C).
2. Factory-made air ducts shall be constructed of Class 0 or Class 1 materials as designated in Table M1601.1.1(1)
3. Fibrous duct construction shall conform to the SMACNA Fibrous Glass Duct Construction Standards or NAIMA Fibrous Glass Duct Construction Standards.
4. Minimum thickness of metal duct material shall be as listed in Table M1601.1.1(2). Metallic ducts shall be fabricated in accordance with *SMACNA Duct Construction Standards Metal and Flexible*. Galvanized steel shall conform to ASTM A 653.
5. Use of gypsum products to construct return air ducts or plenums is permitted, provided that the air temperature does not exceed 125°F (52°C) and exposed surfaces are not subject to condensation.
6. *Duct systems* shall be constructed of materials having a flame spread index not greater than 200.
7. Stud wall cavities and the spaces between solid floor joists to be used as air plenums shall comply with the following conditions:
   - 7.1. These cavities or spaces shall not be used as a plenum for supply air.
   - 7.2. These cavities or spaces shall not be part of a required fire-resistance-rated assembly.
   - 7.3. Stud wall cavities shall not convey air from more than one floor level.
   - 7.4. Stud wall cavities and joist-space plenums shall be isolated from adjacent concealed spaces by tight fitting fire blocking in accordance with Section R602.8.

Reason: Ducts are not fabricated according to Manual D, they are installed according to that standard. Ducts in general are fabricated according to the SMACNA Standard. This is a simple clarification.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Dardano-RM-1-M1601.1

RM21–09/10
M1601.1.1

Proponent: Sam Dardano, City of Boulder, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

M1601.1.1 Above-ground duct systems. Above-ground duct systems shall conform to the following:

1. Equipment connected to duct systems shall be designed to limit discharge air temperature to a maximum of 250°F (121°C).
2. Factory-made air ducts shall be constructed of Class 0 or Class 1 materials as designated in Table M1601.1.1(1)
3. Fibrous duct construction shall conform to the SMACNA Fibrous Glass Duct Construction Standards or NAIMA Fibrous Glass Duct Construction Standards.
4. Minimum thickness of metal duct material shall be as listed in Table M1601.1.1(2). Galvanized steel shall conform to ASTM A 653.
5. Use of gypsum products to construct return air ducts or plenums is permitted, provided that the air temperature does not exceed 125°F (52°C) and exposed surfaces are not subject to condensation.
~~6.~~ ~~*Duct systems* shall be constructed of materials having a flame spread index not greater than 200.~~
~~7~~6. Stud wall cavities and the spaces between solid floor joists to be used as air plenums shall comply with the following conditions:

   ~~7.1~~. 6.1. These cavities or spaces shall not be used as a plenum for supply air.
   ~~7.2~~. 6.2. These cavities or spaces shall not be part of a required fire-resistance-rated assembly.
   ~~7.3~~. 6.3. Stud wall cavities shall not convey air from more than one floor level.
   ~~7.4~~. 6.4. Stud wall cavities and joist-space plenums shall be isolated from adjacent concealed spaces by tight fitting fire blocking in accordance with Section R602.8.

Reason: # 6 is broken. It doesn't say or qualify what kind of duct system it's referring to. This is a great example of poor code language that's not enforceable or able to be explained with any certainty. What makes this stand out is that it does not have to meet a 25 flame-spread rating as # 2 requires?

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Dardano-RM-4-M1601.1.1

RM22–09/10
Table M1601.1.1(2)

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Revise as follows:

TABLE M1601.1.1(2)
GAGES OF METAL DUCTS AND PLENUMS USED FOR HEATING OR COOLING

	Galvanized		Aluminum
DUCT SIZE	**Minimum thickness inches and (mm)**	**Equivalent galvanized ~~sheet~~ gauge no.**	**Minimum thickness (in.)**
Round ducts and enclosed rectangular ducts			
14" or less	.0157 (.3950 mm)	28	~~.0175~~ .0145
16 and 18 inch	.0187 (.4712 mm)	26	.018
20 inch and over	.0236 (.6010 mm)	24	.023
Exposed rectangular ducts			
14" or less	.0157 (.3950 mm)	28	~~.0175~~ .0145
Over 14" [a]	.0187 (.4712 mm)	26	.018

For SI: 1 inch = 25.4 mm.

a. For duct gages and reinforcement requirements at static pressures of 1/2 inch, 1 inch and 2 inches w.g., SMACNA *Duct Construction Standard*, Tables 2-1; 2-2 and 2-3 shall apply.

Reason: This is to correct an error. The maximum was typed instead of the minimum.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: McMann-RM-3-T. M1601.1.1(2)

RM23–09/10
1601.4.1

Proponent: Sam Dardano, City of Boulder, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Delete and substitute as follows:

~~**M1601.4.1 Joints and seams.** Joints of duct systems shall be made substantially airtight by means of tapes, mastics, liquid sealants gasketing or other approved closure systems. Closure systems used with rigid fibrous glass ducts shall comply with UL 181A and shall be marked "181A-P" for pressure-sensitive tape, "181 A-M" for mastic or "181 A-H" for heat-sensitive tape. Closure systems used with flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181B-FX" for pressure-sensitive tape or "181B-M" for mastic. Duct connections to flanges of air distribution system equipment or sheet metal fittings shall be mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked 181B-C. Crimp joints for round metal ducts shall have a contact lap of at least 1½ inches (38 mm) and shall be mechanically fastened by means of at least three sheet-metal screws or rivets equally spaced around the joint. Closure systems used to seal metal ductwork shall be installed in accordance with the manufacturers' instructions~~.

~~**Exceptions:**~~

1. ~~Spray polyurethane foam shall be permitted to be applied without additional joint seals.~~
2. ~~Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion of the joint so as to prevent a hinge effect.~~
3. ~~Continuously welded and locking type longitudinal joints and seams in ducts operating at static pressures less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems.~~

M1601.4.1 Joints, seams and connections. All longitudal and transverse joints, seams and connections in metallic and nonmetallic ducts shall be constructed as specified in SMACNA HVAC Duct Construction Standards—Metal and Flexible and NAIMA Fibrous Glass Duct Construction Standards. All joints, longitudinal and transverse seams, and connections in ductwork shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems or tapes. Closure systems used to seal flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181 B-FX" for pressure sensitive tape or "181 B-M" for mastic. Duct connections to flanges of air distribution system equipment shall be sealed and mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked 181B-C. Closure systems used to seal metal ductwork shall be installed in accordance with the manufacturers' instructions. Round metallic ducts shall be mechanically fastened by means of at least three sheet metal screws or rivets spaced equally around the joint. Unlisted duct tape shall not be permitted as a sealant on any duct.

Exceptions:

1. Spray polyurethane foam shall be permitted to be applied without additional joint seals.
2. Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion of the joint so as to prevent a hinge effect.
3. Continuously welded and locking type longitudinal joints and seams in ducts operating at static pressures less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems.

Reason: This text is being replaced with that of the IMC. The IMC language is more concise and complete. The language covering contact lap is deliberately deleted as it is inconsistent with the SMACNA Standard which calls for a one inch lap. Also language covering unlisted tape is not present in the IRC text. This is strictly editorial in nature with no new content.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Dardano-RM-2-M1601.4.1

RM24–09/10
M1601.4.1

Proponent: William Easterling, Sr., Grand Haven, MI

Revise as follows:

M1601.4.1 Joints and seams. Joints of *duct systems* shall be made substantially airtight by means of tapes, mastics, liquid sealants, gasketing or other *approved* closure systems. Closure systems used with rigid fibrous glass ducts shall comply with UL181A and shall be marked 181A-P for pressure-sensitive tape, 181A-M for mastic or 181 A-H for heat-sensitive tape. Closure systems used with flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked 181B-FX for pressure-sensitive tape or 181B-M for mastic. Duct connections to flanges of air distribution system *equipment* or sheet metal fittings shall be mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked 181B-C. Crimp joints for round metal ducts shall have a contact lap of at least 11/2 inches (38 mm) and shall be mechanically fastened by means of at least three sheet-metal screws or rivets equally spaced around the joint. Closure systems used to seal metal ductwork shall be installed in accordance with the manufacturer's installation instructions.

Exceptions:

1. Spray polyurethane foam shall be permitted to be applied without additional joint seals.
2. Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion of the joint so as to prevent a hinge effect.
3. Continuously welded and locking type longitudinal joints and seams in ducts operating at static pressures less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems.
4. Cleats and other mechanical lap joints of metal duct systems that are not located in a garage, that operate at static pressures less than 2 inches of water column (500 Pa) pressure classification and that are located on the conditioned side of the building thermal envelope shall not require additional closure systems.

Reason: As acknowledged by the duct tightness test exception found in IRC N1103.2.2, duct systems located within the conditioned space should not be held to the same tightness requirements as duct systems located outside of the conditioned space. Additionally cleats and mechanical lap joints should be defined as a recognized approved closure system in this application.

Cost Impact: Should reduce the unnecessary cost of applying mastics and tapes to duct system joints located within the conditioned space.

Analysis: It may not be generally understood what is meant by "cleat and mechanical lap joints".

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Easterling-RM-1-M1601.4.1

RM25–09/10
M1601.4.8 (New), Chapter 44 (New)

Proponent: Steve Ferguson, American Society of Heating, Refrigerating, and Air-Conditioning Engineers

1. Add new text as follows:

M1601.4.8 Duct leakage. HVAC systems that include air handlers located in a garage or return air ducts located in a garage or both, shall have a total system air leakage of not more than 6% of the total fan airflow when measured at 0.1 in w.c. (25 Pa) static pressure using test method B of ASTM E 1554. The test shall be conducted with the garage door open to the outdoors and the supply and return leakage results shall be added to get the total system air leakage.

2. Add new standard to Chapter 44 as follows:

ASTM E 1554-03 Standard Test Methods for Determining External Air Leakage of Air Distribution Systems by Fan Pressurization

Reason: The purpose of this proposal is to add requirements to prevent the migration of contaminants (including carbon monoxide) from attached garages to occupiable spaces.

Garages attached to residences may contain numerous sources of air contaminants. These contaminants can be transported into the residence through either leaks in the separating walls or through leaky air handlers and ducts. This change will improve the code by reducing the potential for contaminant transport from garages into residences.

Substantiation: Many pollutant sources are commonly stored or used in residential attached garages such as gasoline-fired engines (automobiles, lawnmowers, etc.), paints, and solvents. Pressure differences across air leakage paths between the garage and adjoining living space can result in the transport of these contaminants to the living space. Factors influencing this transport include temperature differences, wind, the placement of the air handler or ducts in the garage, duct leakage, and equipment operation, such as exhaust fans and vented combustion appliances. A recent literature review (Emmerich et al. 2003) found substantial evidence that transport of contaminants from garages has the potential to negatively impact residential indoor air quality in either an acute or chronic manner.

Traditional practice assumed that garages were leaky structures and that infiltration would keep garages adequately ventilated. However, conventional construction practice for garages today result in significantly tighter structures with little infiltration and elevated contaminant concentrations in the garage. In fact, recent field measurements (Emmerich et al. 2003) have found that the envelopes of modern attached garages can be as tight as the envelopes of houses. Additionally, houses with HVAC system air handlers and ducts in the garage provide another potential pathway for pollutants to travel from garages to living spaces. Many studies have found that typical HVAC systems and their ductwork can be very leaky. Limiting the leakage of such systems located in garages will reduce the potential for contaminants to be transported into houses via this pathway. A simple test is needed to verify that air handlers and ductwork in garages is not excessively leaky.

Note that per Interpretation IC 62.2-2004-3 of ANSI/ASHRAE Standard 62.2-2004, test method B of ANSI/ASTM E1554-03 is considered to be an equivalent test method to the California Title 24 method which is currently listed in Standard 62.2.

Bibliography:
ANSI/E1554-03 (2003) *Standard Test Methods for Determining External Air Leakage of Air Distribution Systems by Fan Pressurization*.

Cost Impact: This proposal will increase the cost of construction in those cases where ducts or air handlers are located in garages thus requiring an air leakage test.

Analysis: The proposed text does not indicate which total fan airflow rate to use for the 6% leakage limit calculation. Residential system airflow rates differ between heating and cooling modes.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME:Ferguson-RM-1-M1601.4.8-Ch 44

RM26–09/10
M1601.5.2

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

M1601.5.2 Materials. The under-floor space, including the sidewall insulation, shall be formed by materials having flame spread ~~ratings~~ index values not greater than 200 when tested in accordance with ASTM E84 or UL 723.

Reason: UL 723 is an alternative standard to ASTM E84, as determined in the last code cycle.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-8-M1601.5.2

RM27–09/10
M1804.2.6, Chapter 44 (New)

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

M1804.2.6 Mechanical draft systems. Mechanical draft systems shall comply with UL 378 and shall be installed in accordance with their listing, the manufacturer's installation instructions and, except for direct vent appliances, the following requirements:

1. The vent terminal shall be located not less than 3 feet (914 mm) above a forced air inlet located within 10 feet (3048 mm).
2. The vent terminal shall be located not less than 4 feet (1219 mm) below, 4 feet (1219 mm) horizontally from, or 1 foot (305 mm) above any door, window or gravity air inlet into a dwelling.
3. The vent termination point shall not be located closer than 3 feet (914 mm) to an interior corner formed by two walls perpendicular to each other.
4. The bottom of the vent terminal shall be located at least 12 inches (305 mm) above finished ground level.
5. The vent termination shall not be mounted directly above or within 3 feet (914 mm) horizontally of an oil tank vent or gas meter.
6. Power exhauster terminations shall be located not less than 10 feet (3048 mm) from lot lines and adjacent buildings.
7. The discharge shall be directed away from the building.

2. Add new standard to Chapter 44 as follows:

UL 378-06 Draft Equipment

Reason: UL 378 includes a comprehensive set of construction and performance requirements that are used to evaluate and list draft equipment. Five companies currently have draft equipment listed.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-10-M1804.2.6

RM28–09/10
M1805.4 (New)

Proponent: Guy McMann, Jefferson County, CO, representing the Colorado Association of Plumbing and Mechanical Officials (CAPMO)

Add new text as follows:

M1805.4 Factory-built chimney off-sets. Factory-built chimneys shall comply with Section R1005. Changes of direction in an offset shall not exceed an angle of 30°.

Reason: This is an important pointer to direct the user to the proper code section addressing chimney off-sets because the body of the text is not located in this section. This is a logical section to refer to initially for this subject matter and will speed up the process in locating the needed information.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: McMann-RM-8-M1805.4

RM29–09/10
Chapter 19

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

CHAPTER 19
SPECIAL ~~FUEL-BURNING~~ APPLIANCES, EQUIPMENT AND SYSTEMS

Reason: Rename the chapter, because it covers more than just fuel-burning equipment

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-12-Ch 19

RM30–09/10
M1901.1

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

M1901.1 Clearances. Freestanding or built-in ranges shall have a vertical clearance above the cooking top of not less than 30 inches (762 mm) to unprotected combustible material. Reduced clearances are permitted in accordance with the listing and labeling of the range hoods or appliances. Installation of a listed and labeled cooking appliance or microwave oven over a listed and labeled cooking appliance shall be in accordance with Section 1504.1. Clearances for a domestic open-top broiler unit shall be in accordance with Section M1505.1.

Reason: Section M1504.1 provides specific direction on the appropriate vertical clearance for microwave ovens over a cooking top as part of the Listed and labeled appliance investigation. Section M1505.1 further limits the vertical clearance for domestic open broilers to materials above.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-14-1901.1

RM31–09/10
M1901.2, Chapter 44 (New)

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

M1901.2 Cooking appliances. ~~Household~~ Cooking appliances shall be listed and labeled for household use and shall be installed in accordance with the manufacturer's installation instructions. The installation shall not interfere with combustion air or access for operation and servicing. Electric cooking appliances shall comply with UL 1026 or UL 858. Solid-fuel-fired fireplace stoves shall comply with UL 737.

2. Add new standards to Chapter 44 as follows:

UL 737-07 Fireplace Stoves
UL 858-05 Household Electric Ranges – with revisions through November 2007
UL 1026-07 Electric Household Cooking and Food Serving Appliances

Reason: UL 858 is already referenced in Section 917.1 of the International Mechanical Code. UL 737, UL 858 and UL 1026 all include a comprehensive set of construction and performance requirements that are used to evaluate and list cooking equipment specifically for use in dwelling units.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-16-1901.2-Ch 44

RM32–09/10
M1901.3 (New)

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Add new text as follows:

M1901.3 Prohibited location. Cooking appliances designed, tested, listed and labeled for use in commercial occupancies shall not be installed within dwelling units or within any area where domestic cooking operations occur.

Reason: Commercial cooking appliances are prohibited by the IMC (Sections 917.2 and 917.3) in dwelling units due to the difference in temperature requirements and operations between commercial and household appliances. This prohibition should also be in the IRC for consistency.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: Sections G2447.2 and G2447.3 address the issue for gas-fired cooking appliances.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-18-1901.3

RM33–09/10
M1902.2, Chapter 44 (New)

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

M1902.2 Installation. Sauna heaters shall be installed in accordance with the manufacturer's installation instructions. Sauna heaters shall comply with UL 875.

2. Add new standard to Chapter 44 as follows:

UL 875-09 Electric Dry-Bath Heaters

Reason: UL 875 is already referenced in Section 914.2 of the International Mechanical Code, and includes a comprehensive set of construction and performance requirements that are specifically used to evaluate and list sauna heaters. Four companies currently have listings for sauna heaters.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-20-1902.2-Ch 44

RM34–09/10
M1903.1, Chapter 44 (New)

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

M1903.1 General. Stationary fuel cell power plants having a power output not exceeding 1,000 kW, shall ~~be tested in accordance~~ comply with ~~ANSI Z21.83~~ ANSI/CSA America FC 1 and shall be installed in accordance with the manufacturer's installation instructions and NFPA 853.

2. Add new standard to Chapter 44 as follows:

ANSI/CSA America FC1-03 Stationary Fuel Cell Power Systems

Reason: The standard ANSI Z21.83 has been superseded by ANSI/CSA America FC 1. This change would correlate the IRC with IMC Section 924.1 and IFGC Section 633.1. Changing to the FC1 standard also harmonizes with NFPA 853. The standard establishes construction and performance requirements.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-13-1903.1-Ch 44

RM35–09/10
M2001.1.1, Chapter 44 (New)

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

M2001.1.1 Standards. Oil-fired boilers and their control systems shall be listed and labeled in accordance with UL 726. Electric boilers and their control systems shall be listed in accordance with UL 834. Solid-fuel-fired boilers shall be listed and labeled in accordance with UL2523. Boilers shall be designed and constructed in accordance with the requirements of ASME CSD-1 and as applicable, the ASME *Boiler and Pressure Vessel Code* , Sections I and IV. Gas-fired boilers shall conform to the requirements listed in Chapter 24.

2. Add new standard to Chapter 44 as follows:

UL 2523-09 Outline of Investigation for Solid Fuel-Fired Water Heaters and Boilers

Reason: The UL Subject 2523 Outline of Investigation includes a comprehensive set of construction and performance requirements that are used to evaluate and list factory built manually and/or automatically fueled solid fuel-fired boilers.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-15-M2001.1.1-Ch 44

RM36–09/10
M2005.1

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

M2005.1 General. Water heaters shall be installed in accordance with the manufacturer's installation instructions and the requirements of this code. Water heaters installed in an attic shall ~~conform to~~ comply with the requirements of Section M1305.1.3. Gas-fired water heaters shall ~~conform to~~ comply with the requirements in Chapter 24. Domestic electric water heaters shall ~~conform to~~ comply with UL 174 ~~or UL 1453~~. ~~Commercial electric water heaters shall conform to UL 1453.~~ Oiled-fired water heaters shall ~~conform to~~ comply with UL 732.

Reason: The scope of the IRC does not include commercial installations. UL 1453 permits tanks larger than 120 gallons and to be equipped with temperature-regulating controls that permit a water temperature of more than 85°C (185°F). UL 174 limits tank capacity to 120 gallons, and requires a temperature-regulating thermostat having no marked dial setting more than 77°C (171°F) and provided with a stop to prevent adjustment to a higher setting.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-22-M2005.1

RM37–09/10
M2006.1

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

Revise as follows:

M2006.1 General. Pool and spa heaters shall be installed in accordance with the manufacturer's installation instructions. Oil-fired pool heaters shall ~~be tested in accordance~~ comply with UL 726. Electric pool and spa heaters shall ~~be tested in accordance~~ comply with UL 1261.

Reason: This is an editorial revision to use consistent language for referencing product standards..

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-17-M2006.1

RM38–09/10
M2301, M2301.1, M2302 (New), M2302.1 (New), M2302.2 (New), M2302.2.1 (New), M2302.2.2 (New), M2302.2.3 (New), M2302.2.4 (New), M2302.3 (New), M2302.4 (New), Chapter 44

Proponent: Bob Eugene, Underwriters Laboratories, Inc.

1. Revise as follows:

SECTION M2301
THERMAL SOLAR ENERGY SYSTEMS

M2301.1 General. This section provides for the design, construction, installation, alteration and repair of equipment and systems using thermal solar energy to provide space heating or cooling, hot water heating and swimming pool heating.

2. Add new text as follows:

SECTION M2302
PHOTOVOLTAIC SOLAR ENERGY SYSTEMS

M2302.1 General. This section provides for the design, construction, installation, alteration and repair of photovoltaic equipment and systems.

M2302.2 Installation. The installation of photovoltaic systems shall comply with the manufacturer's installation instructions, Sections M2302.2.1 through M2302.2.4 and NFPA 70.

M2302.2.1 Access. Photovoltaic panels, modules, inverters, converters, and combiner boxes shall be accessible for inspection, maintenance, repair and replacement.

M2302.2.2 Roof-mounted panels and modules. Where photovoltaic panels and modules are installed on roofs, the roof shall be constructed to support the loads imposed by such modules. Roof-mounted photovoltaic panels and modules that serve as a roof covering shall conform to the requirements for roof coverings in Chapter 9. Where mounted on or above the roof coverings, the photovoltaic panels and modules and supporting structure shall be constructed of noncombustible materials or fire-retardant-treated wood equivalent to that required for the roof construction.

M2302.2.3 Roof and wall penetrations. Roof and wall penetrations shall be flashed and sealed in accordance with Chapter 9 to prevent entry of water, rodents and insects.

M2302.2.4 Ground-mounted panels and modules. Ground-mounted panels and modules shall be installed in accordance with the manufacturer's installation instructions.

M2302.3 Photovoltaic panels and modules. Photovoltaic panels and modules shall be listed and labeled in accordance with UL 1703

M2302.4 Inverters. Inverters shall be listed and labeled in accordance with UL 1741. Systems connected to the utility grid shall use inverters listed for utility interaction.

3. Add new standards to Chapter 44 as follows:

UL 1703-02	Flat-Plate Photovoltaic Modules and Panels – with revisions through April 2008
UL 1741-99	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources – with revisions through November 2005

Reason: The purpose of the code change is to distinguish between two types of solar systems – thermal and photovoltaic – and provide basic safety requirements for photovoltaic systems.

Cost Impact: The code change proposal will not increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: Eugene-RM-19-2301-2302-Ch 44

2009/2010 PROPOSED CHANGES TO THE INTERNATIONAL WILDLAND-URBAN INTERFACE CODE

Proposed changes to the *International Wildland-Urban Interface Code* are heard by the International Fire Code Committee. See the tentative order of discussion for the International Fire Code Committee on page F2.

WUIC1–09/10
403.4.1

Proponent: Lawrence Brown, CBO, National Association of Home Builders

Revise as follows:

403.4.1 Sign construction. All road identification signs and supports shall be of noncombustible materials. Signs shall be 6 inch (152 mm) minimum in height. ~~have minimum 4-inch-high (102 mm) reflective~~ Letters shall be 4 inch (102 mm) minimum in height with a 1/2 inch (~~12.7~~ 13 mm) minimum stroke. Letters shall be of the reflecting type and be on a contrasting background color. ~~6-inch-high (152 mm) sign~~. Road identification signage shall be mounted ~~at a height of~~ 7 feet (2134 mm) in height measured from the road surface to the bottom of the sign.

Reason: This is an editorial change related to format of text, and to provide clarity as to the intent of the provision. The term "background color" adds clarity as to *contrasting* with the reflective letters. The term "minimum" is added to height for mounting the sign. Without the term "minimum" the height is absolute at 7 feet (cannot be more or less).

Cost Impact: The code change proposal will not increase the cost of construction

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: BROWN-WUIC1-403.4.1.DOC

WUIC2–09/10
501.3 (New), Chapter 7

Proponent: Marcelo M. Hirschler, GBH International, representing American Fire Safety Council

1. Add new text as follows:

501.3 Fire-resistance rated construction. Where this code requires 1-hour fire-resistance-rated construction, the fire-resistance rating of building elements, components or assemblies shall be determined in accordance with the test procedures set forth in ASTM E 119 or UL 263.

2. Add new standards to Chapter 7 as follows:

ASTM

E 119-2008a	Standard Test Methods for Fire Tests of Building Construction and Materials

UL

263-03	Standard for Fire Test of Building Construction and Materials

Reason: In several locations in Chapter 5 of the IWUIC there are requirements for 1-hour fire-resistance-rated construction but the corresponding test methods are not explicitly stated. Throughout the ICC codes fire resistance ratings are assessed based on ASTM E 119 or UL 263, which are basically equivalent standards.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: ASTM E119 and UL 263 are currently referenced in the IBC.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: HIRSCHLER-WUIC1-501.3.DOC

WUIC3–09/10
503.2, Chapter 7

Proponent: John Scott, Roxul, Inc.

1. Revise as follows:

503.2 Ignition-resistant building material. Ignition-resistant building materials shall comply with any one of the following:

1. Extended ASTM E 84 testing. Materials that, when tested in accordance with the test procedures set forth in ASTM E 84 or UL 723, for a test period of 30 minutes, comply with the following:
   1.1. Flame spread. Material shall exhibit a flame spread index not exceeding 25 and shall show no evidence of progressive combustion following the extended 30 minute test.
   1.2. Flame front. Material shall exhibit a flame front that does not progress more than 10 1/2 feet (3200 mm) beyond the centerline of the burner at any time during the extended 30 minute test.
   1.3. Weathering. Ignition-resistant building materials shall maintain their performance in accordance with this section under conditions of use. Materials shall meet the performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) contained in the following standards, as applicable to the materials and the conditions of use:
      1.3.1. MethodA"Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing" in ASTM D 2898, for fire-retardant-treated wood, wood-plastic composite and plastic lumber materials.
      1.3.2. ASTMD7032 for wood-plastic composite materials.
      1.3.3. ASTM D 6662 for plastic lumber materials.
   1.4. Identification. All materials shall bear identification showing the fire test results.
2. Noncombustible material. Material that complies with the requirements for *noncombustible* materials in Section 202.
3. Fire-retardant-treated wood. Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section 2303.2 of the *International Building Code*.
4. Fire-retardant-treated wood roof coverings. Roof assemblies containing fire-retardant-treated wood shingles and shakes which comply with the requirements of Section 1505.6 of the *International Building Code* and classified as Class A roof assemblies as required in Section 1505.2 of the *International Building Code*.
5. Roof Insulation. Roof insulations that comply with the requirements for Class NC (noncombustible core) in accordance with the requirements of FM 4470.

2. Add new standard to Chapter 7 as follows:

FM Factory Mutual Global Research
Standards Laboratories Department
1301 Atwood Avenue, P.O. Box 7500
Johnston, RI 02919

4470 (2009) Approval Standard for Class 1 Roof Covers .

Reason: To introduce a new type of Ignition-resistant building material into the IWUIC, based upon testing and conformance with the newest edition (2009) of FM 4470 Approval Standard for Single-Ply, Polymer-Modified Bitumen Sheet,Built-Up Roof (BUR) and Liquid Applied Roof Assemblies.

The 2009 edition of FM Approval Standard 4470 has introduced a new category of roofing insulation defined as Class "NC" non-combustible core.

In order for a roof insulation material to be classified as "NC", the roof insulation must meet the following stringent criterion:

1. ASTM D482, Standard Test Method for Ash from Petroleum Products
2. ASTM E2058, Standard Test Methods for Measurement of Synthetic Polymer Material Flammability Using a Fire Propagation Apparatus (FPA)
3. ISO 1716:2002 Reaction to Fire Tests for Building Products - Determination of the Heat of Combustion

The first test acceptance criteria used by FM for these materials is very stringent, and includes a minimum total solids content of 90% per ASTM D 482.

In addition, during the ASTM E2058 test, no visible flaming of the insulation is permitted for the full 15 minute duration, and the test is extended beyond 15 minutes in duration if there is any evidence of the sample still exhibiting mass loss and/or visible vapors being emitted. The test is continued until the mass loss and/or visible vapors have also ceased.

The third test method is ISO Standard 1716 which is used for determination of the Heat of Combustion of building materials. The insulation core must have a maximum heat of combustion of 2.0 kJ/g (860 BTU/lb).

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: FM 4470 (1992) is currently referenced in the IBC.

Public Hearing: Committee: AS AM D
Assembly: ASF AMF DF

ICCFILENAME: SCOTT-WUIC1-503.2.DOC

WUIC4–09/10
503.2, Chapter 7

Proponent: John Woestman, The Kellen Company, representing the Composite Lumber Manufacturers Association (CLMA)

1. Delete Section 503.2 and replace with the following:

503.2 Ignition-resistant building material. Ignition-resistant building materials shall comply with 503.2.1, 503.2.2, 503.2.3, or 503.2.4.

503.2.1 Composite materials and plastic materials. Composite materials and plastic materials shall comply with 503.2.1.1, 503.2.1.2, and 503.2.1.3.

503.2.1.1 Minimum standards. Wood-plastic composite deck boards, stair treads, handrails and guardrail systems shall comply with ASTM D 7032, and plastic lumber deck boards shall comply with ASTM D 6662.

503.2.1.2 Fire testing. Composite materials and plastic materials shall comply with one of following fire tests after exposure to weathering required by section 503.2.1.1.

1. ASTM E 84 or UL 723. Materials tested in accordance with ASTM E 84 or UL 723 for a test period extended to 30 minutes shall exhibit a flame spread index not exceeding 25 and shall show no evidence of progressive combustion following the 30 minute test period and shall exhibit a flame front that does not progress more than 10 ½ feet (3200 mm) beyond the centerline of the burner at any time during the 30 minute test period.
2. ASTM E 1354. Materials complying with ASTM D 7032, shall be tested in accordance with ASTM E 1354 for a 40 minute test observation period with a maximum net peak heat release of 25 kW/sq ft.

503.2.1.3 Identification. Materials shall be labeled or be identified with a manufacturer's designation on the material, assembly, or its packaging.

503.2.2. Noncombustible material. Material that complies with the requirements for *noncombustible* materials in Section 202.

503.2.3. Fire-retardant-treated wood. Fire-retardant-treated wood meeting the requirements of Section 2303.2 of the *International Building Code*.

503.2.4. Fire-retardant-treated wood roof coverings. Roof assemblies containing fire-retardant-treated wood shingles and shakes which comply with the requirements of Section 1505.6 of the *International Building Code* and classified as Class A roof assemblies as required in Section 1505.2 of the *International Building Code*.

2. Add new standard to Chapter 7 as follows:

ASTM

E 1354-09 Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter

Reason: The IWUIC will benefit from a re-write of Section 503.2.

With this proposal, Section 503.2 has been reformatted for ease of understanding.

And, what used to be Item 1 - now Section 503.2.1 - has been titled to reflect the materials intended to be regulated in this section, and these materials are now explicitly required to comply with the appropriate standards (ASTM D 7032 or ASTM D 6662).

In proposed section 503.2.1.2, the language requires weathering prior to the fire testing per the standards referenced in proposed section 503.2.1.1. Both these standards require aggressive weathering to comply with the standard. The technical requirements of the fire test (ASTM E84 / UL 723) have not changed while the language has been revised for ease of understanding.

ASTM E1354 testing for materials complying with ASTM D7032 has been included as a fire test for the IWUIC. ASTM E1354 has been demonstrated as a valid fire test for determining the heat release rate of construction materials. The maximum net peak heat release of 25 kW/sq ft required of the ASTM E1354 test is consistent with current WUIC material test requirements set forth in California's WUIC, a state which has used input from the scientific community and stakeholders alike in developing its WUIC language applicable to these building materials.

The identification language of proposed section 503.2.1.3 has been revised to be explicit as to what is required. The remaining sections have only been reformatted with section numbering for consistency.

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: ASTM E1354 is currently referenced in the IBC.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: WOESTMAN-WUIC1-503.2.DOC

WUIC5–09/10
504.2.1 (New), Chapter 7

Proponent: John Scott, Roxul, Inc.

1. Revise as follows:

504.2.1 Roof insulation. Roof insulations that comply with the requirements for Class NC (noncombustible core) in accordance with the requirements of FM 4470.

(Renumber subsequent section)

2. Add new standard to Chapter 7 as follows:

FM Factory Mutual Global Research
Standards Laboratories Department
1301 Atwood Avenue, P.O. Box 7500
Johnston, RI 02919

4470 (2009) Approval Standard for Class 1 Roof Covers .

Reason: To introduce a new Class of Ignition-resistant building material into the IWUIC, based upon testing and conformance with the newest edition (2009) of FM 4470 Approval Standard for Single-Ply, Polymer-Modified Bitumen Sheet,Built-Up Roof (BUR) and Liquid Applied Roof Assemblies.

The IWUIC has very stringent expectations for Class 1 Ignition Resistant Construction. While the definitions in Section 202 addresses "Noncombustible Roof Coverings", this really only applies to the weathering membrane on the exterior surface of the roof (i.e. such as shingles, sheets, and tiles), rather than the potentially high fuel loads coming from some combustible insulation materials beneath them. Consequently, there is a need to further restrict the use of combustible roof insulations where required.

The 2009 edition of FM Approval Standard 4470 has introduced a new category of roofing insulation defined as Class "NC" non-combustible core.

In order for a roof insulation material to be classified as "NC", the roof insulation must meet the following stringent criterion:

1. ASTM D482, Standard Test Method for Ash from Petroleum Products
2. ASTM E2058, Standard Test Methods for Measurement of Synthetic Polymer Material Flammability Using a Fire Propagation Apparatus (FPA)
3. ISO 1716:2002 Reaction to Fire Tests for Building Products - Determination of the Heat of Combustion

The first test acceptance criteria used by FM for these materials is very stringent, and includes a minimum total solids content of 90% per ASTM D 482.

In addition, during the ASTM E2058 test, no visible flaming of the insulation is permitted for the full 15 minute duration, and the test is extended beyond 15 minutes in duration if there is any evidence of the sample still exhibiting mass loss and/or visible vapors being emitted. The test is continued until the mass loss and/or visible vapors have also ceased.

The third test method is ISO Standard 1716 which is used for determination of the Heat of Combustion of building materials. The insulation core must have a maximum heat of combustion of 2.0 kJ/g (860 BTU/lb).

Cost Impact: The code change proposal will not increase the cost of construction.

Analysis: FM 4470 (1992) is currently referenced in the IBC.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SCOTT-WUIC2-504.2.1.DOC

Z1–09/10
503.1 (New)

Proponent: Craig Conner, Building Quality, representing self

Add new text as follows:

CHAPTER 5
RESIDENTIAL ZONES

SECTION 503
ORIENTATION

503.1 Lot orientation. A minimum of 70% of the lots within a residential zone shall be designated with the primary face of the building facing within 20 degrees of South or North.

Exception: Where the building official or planning commission determine local conditions make this requirement impractical.

Reason: When it is practical, building orientation is one of the most cost-effective forms of energy efficiency. Properly oriented buildings increase the effectiveness of a number of solar and day lighting design strategies.

Cost Impact: The code change proposal will note increase the cost of construction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: CONNER-Z1-503.1 NEW

Z2–09/10
801.4.3 (New), Chapter 14

Proponent: Stephen V. Skalko, PE, representing Portland Cement Association

1. Revise as follows:

801.4 Design of parking facilities. The design of parking facilities shall be in accordance with Sections 801.4.1 through ~~801.4.7~~ 801.4.8.

801.4.1 Driveway width. Every parking facility shall be provided with one or more access driveways, the width of which shall be the following:

1. Private driveways at least 9 feet (2743 mm).
2. Commercial driveways:
   2.1. Twelve feet (3658 mm) for one-way enter/exit.
   2.2. Twenty-four feet (7315 mm) for two-way enter/exit.

801.4.2 Driveway and ramp slopes. The maximum slope of any *driveway* or ramp shall not exceed 20 percent. Transition slopes in driveways and ramps shall be provided in accordance with the standards set by the code official and the jurisdiction's engineer.

2. Add new text as follows:

801.4.3 Minimum pavement design. The design of ground supported pavement for parking facilities shall comply with Sections 801.4.3.1 through 801.4.3.3

Exceptions:

1. Concrete pavements designed in accordance with ACI 330R.
2. Asphalt pavements designed in accordance with IS-181.

801.4.3.1. Sub-base. The soil supporting the pavement for parking facilities shall have a minimum California Bearing Ratio (CBR) of 3 determined in accordance with ASTM D1883 and a minimum resistance value (R) of 6 determined in accordance with ASTM D2844.

801.4.3.2 Concrete surfaces. The minimum compressive strength of the concrete (f'_c) for concrete pavements shall be 4000 psi. The minimum thickness of the concrete pavement shall be 4.0 inches

801.4.3.3 Asphalt concrete surfaces. The asphalt pavement shall comply with Section 801.4.3.3.1 or 801.4.3.3.2.

801.4.3.3.1 Full depth asphalt pavement: Where full depth asphalt pavements are constructed using asphalt concrete and emulsified asphalt base mixes the minimum thickness of the asphalt pavement shall be one of the following:

1. A minimum of 1 inch of asphalt concrete for the top surface and 3.5 inches of asphalt concrete or Type I emulsified asphalt mix for the base.
2. A minimum of 2 inches of asphalt concrete for the top surface and 2.5 inches of Type II emulsified asphalt mix for the base.
3. A minimum of 2 inches of asphalt concrete for the top surface and 4.5 inches of Type III emulsified asphalt mix for the base.

801.4.3.3.2 Asphalt pavement with untreated aggregate base and sub-base: Where asphalt pavements are constructed using asphalt concrete placed over untreated aggregate bases and sub-bases the thickness of the asphalt pavement shall be a minimum of 1 inch of asphalt concrete for the top surface, 2.5 inches of asphalt concrete base and 4.0 inches of untreated aggregate base. The untreated aggregate base shall comply with ASTM D2940.

(Renumber subsequent sections)

2. **Add the following standards to Chapter 14 as follows:**

ACI

330-08	Guide for the Design and construction of Concrete Parking Lots

AI

IS-181-81	Asphalt Pavement Thickness Design. A simplified and Abridged Version of 1981 Edition AI Thickness Design Manual

ASTM

D1833-87 (2007)	Standard Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils
D2844-07	Standard Test Method for resistance R-value and Expansion Pressure of Compacted Soils
D2940-03	Standard Specification for Graded Aggregate Material for Bases or Sub-bases for Highways or Airports

Reason: The *International Zoning Code* provides the minimum requirements for the design of parking facilities. However, the provisions are not complete without specifying the minimum requirements for the pavement thickness. This proposal places requirements for concrete and asphalt pavement thicknesses into the IZC to make it more complete for parking facilities and to give jurisdictions guidance on the commonly used pavement sections.

The provisions were based on the pavement design procedures in ACI 330R-08, *Guide for the Design and Construction of Concrete Parking Lots,* published by American Concrete Institute, and *Asphalt Pavement Thickness Design,* 2nd Edition, January 1983 by The Asphalt Institute. The design assumed minimum acceptable soil conditions for the sub-base (CBR = 3 and R = 6). In addition, the designs assumed a light volume of heavy truck traffic (Traffic Category A for concrete and Traffic Class I for asphalt).

The minimum compressive strength of the concrete was set at 4,000 psi to insure a minimum level of durability for the pavement.

Cost Impact: The code change proposal should not increase the cost of construction if proper pavement design is presently followed in a jurisdiction.

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

ICCFILENAME: SKALKO-Z1-801.4.3